

OPTICS & PHOTONICS International Congress 2016



# OPIC 2016



# Advance Program

同時開催：OPTICS & PHOTONICS International Exhibition 2016



<http://opicon.jp/>

■開催日： 2016年5月17日(火) ~20日 (金)

■会 場： パシフィコ横浜・会議センター

#### 統括主催

一般社団法人OPTICS & PHOTONICS INTERNATIONAL協議会 (OPI協議会)

#### 専門国際会議主催

一般社団法人 レーザー学会、公益社団法人 応用物理学会、大阪大学レーザーエネルギー学研究センター、名古屋大学赤崎記念研究センター、一般社団法人 レーザ加工学会、一般社団法人 レーザー学会「マイクロ固体フォトニクス」専門委員会、宇宙と地球のためのレーザー実行委員会、理化学研究所放射光科学総合研究センター、大阪大学大学院工学研究科附属超精密科学研究センター

#### 後援

文部科学省，経済産業省，農林水産省，厚生労働省，国土交通省，日本経済団体連合会

#### 協賛・協力

産業技術総合研究所、新エネルギー・産業技術総合開発機構、科学技術振興機構、日本原子力研究開発機構、理化学研究所、日本原子力学会、プラズマ・核融合学会、一般社団法人 日本光学会、光産業技術振興協会、レーザー技術総合研究所、日本フォトニクス協議会、SPIE (米)、OSA (米)、メッセシユトアウトガルト (独)、PIDA (台)、KAPID (韓)、Photonics Media (米)

## 開催趣旨

本国際会議（OPIC）は、光・レーザー技術を基盤とした学術および産業に関する最先端の研究・開発を国際的に集結し、学術発表と技術展示を併設することにより、光・レーザー技術によりもたらされる未来社会への具体的な指針を得ることを目的として毎年開催する。

OPICは光・レーザー分野に関し、産業界（インダストリー）と学界（アカデミア）との連携・協力を促進し、光技術・光産業の振興により、科学技術に立脚した我国の産業を継続的に発展させるため、日本の学術研究者の総力を挙げて定期的に開催する唯一の光関連の国際会議と位置付けている。2012年の第1回開催以来、毎年4月にパシフィコ横浜で開催して、年々新しい専門会議が加わり、各会議あたりの参加者数が増加して日本発信の国際会議として定着しており、2016年は第5回OPICとなる。

2015年は光および光技術の国際年（IYL 2015）に当たり、IYL 2015の理念を踏まえ、光・レーザー技術が科学・技術と産業の中心的な担い手になることを期待してOPIC2015を開催し、成功裏に終えることができた。

OPIC2016はIYL2015の趣旨を継続し、地球規模の諸課題の解決と世界の持続的な発展における光技術の重要性を喚起し、世界の研究者との連携により会議を企画し、情報発信と国際連携の場として開催する。また、併催されるOPTICS & PHOTONICS International Exhibition (OPIE) との連携を深め、産業界と学会との交流を強化する。

## Committee Members

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Andreas Ostendorf (Chair, Ruhr-University Bochum, Germany)

Chris Barty (Chair, Lawrence Livermore National Laboratory, USA)

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的場 修（神戸大学、BISC）  
白神宏之（大阪大学、CLES）  
細貝知直（大阪大学、HEDS）  
本田 徹（工学院大学、LEDIA）  
鷲尾邦彦（パラダイムレーザーリサーチ、  
LIC）  
塚本雅裕（大阪大学、SLPC）  
三村秀和（東京大学、XOPT）

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近藤宣之（日本レーザー）

中井哲哉（ソーラボジヤパン）  
中村 強（トルンプ）

### 会議日程

5月17日（火）専門国際会議  
5月18日（水）プレナリーセッション、ジョイントセッション、専門国際会議、レセプション  
5月19日（木）専門国際会議、ポスターセッション  
5月20日（金）専門国際会議、ポスターセッション

### PLENARY SESSION

OPIC2016 第2日の2016年5月18日（水）にプレナリーセッションを開催します。光・フォトニクス技術についてのプレナリー講演が行われます。OPIE'16の来場登録者は無料で参加できます。

### JOINT SESSION

OPIC2016 第2日の2016年5月18日（火）午後に3つのジョイントセッションを開催します。  
JOINT Session ALPS&HEDS&XOPT  
JOINT Session LIC&PLD&SLPC  
JOINT Session OMC&BISC

### POSTER SESSION

各専門会議では、オーラルプレゼンテーションの他にポスターセッションを予定しています。  
詳しくは、各会議のプログラムをご覧ください。

公式言語：英語

## 技術展示会 (OPIE'16)

OPTICS & PHOTONICS International Exhibition 2016が5月18日(水)～20日(金)にパシフィコ横浜展示ホールにて開催されます。

■ レーザーEXPO、■ レンズ設計・製造展、■ 赤外・紫外応用技術展、■ 光測定&ポジショニングEXPO、■ メディカル&イメージングEXPO、■ 宇宙・天文光学EXPO、■ 【新設】マイクロ・ナノ応用技術展

### 全体スケジュール

|               | 5月17日(火)           | 5月18日(水)   | 5月19日(木)             | 5月20日(金)  |
|---------------|--------------------|--|----------------------|-----------|
| 展示会           |                    | OPTICS & PHOTONICS International Exhibition 2016 |                      |           |
| 専門国際会議<br>(群) | ALPS'16            | OPIC<br>プレナリ<br>セッション                            | ALPS'16              | ALPS'16   |
|               | HEDS 2016          |  | ALPS<br>HEDS<br>XOPT | HEDS 2016 |
|               | CLES 2016          |  | XOPT 2016            | XOPT 2016 |
|               | LSSE 2016          |  | CLES 2016            | CLES 2016 |
|               |                    |  | LEDIA'16             | LEDIA'16  |
|               |                    |  | LSSE 2016            | LSSE 2016 |
|               |                    |  | BISC'16              | BISC'16   |
|               | BISC<br>OMC        | OMC'16   |                      |           |
|               | LIC'16             | LIC'16   |                      |           |
|               | LIC<br>PLD<br>SLPC | PLD'16   |                      |           |
|               | SLPC 2016          | SLPC 2016  |                      |           |
| その他           |                    | OPIC レセプション                                      | ポスターセッション            | ポスターセッション |

### 参加登録費

#### Member\*

|                      | On /Before Apr. 15, 2016 | After Apr. 16, 2016<br>& On-Site |
|----------------------|--------------------------|----------------------------------|
| Conference (General) | ¥40,000                  | ¥45,000                          |
| (Student、 Retiree)   | ¥18,000                  | ¥21,000                          |

\* Member of organizer、 sponsor and cooperative societies

#### Non-Member

|                      | On /Before Apr. 15, 2016 | After Apr. 16, 2016<br>& On-Site |
|----------------------|--------------------------|----------------------------------|
| Conference (General) | ¥45,000                  | ¥50,000                          |
| (Student、 Retiree)   | ¥21,000                  | ¥23,000                          |

OPIC 2016は以下の団体よりご支援を頂いております。

■ **Financial Support**

立石科学技術振興財団、ツルギフォトンクス財団、テレコム先端技術支援センター  
ユニカミノルタ科学技術振興財団、中部電気利用基礎研究振興財団、日本板硝子材料工学助成会

■ **Sponsor ship**

オプトサイエンス、浜松ホトニクス、日本レーザー、ソーラボジヤパン、片岡製作所、  
岡本光学加工所

■ **International Partner**

SPIE

■ **Media Partner**

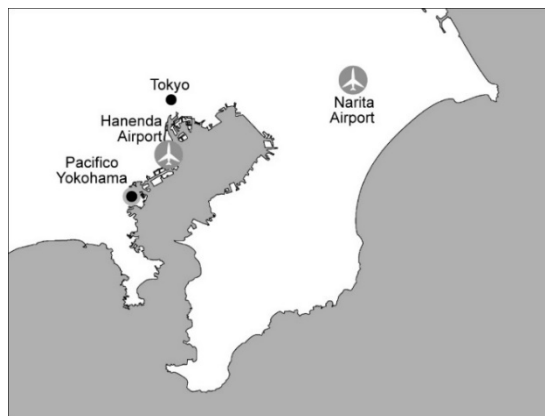
PHOTONICS MEDIA、オプトロニクス社

場所 パシフィコ横浜 会議センター

〒220-0012 横浜市西区みなとみらい1-1-1

Tel:045-221-2166

<http://www.pacifico.co.jp/english/index.html>



連絡先

一般社団法人OPTICS & PHOTONICS INTRENATIONAL協議会

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## OPIC2016 Congressプログラム

### Plenary Session

会議室 501+502

5月18日 (水) 午前 9:00 - 12:10

■ **Greetings:** Congress chair and IAB chairs

- Andreas Ostendorf (Ruhr-University Bochum, Germany)
- 中井 貞夫 (大阪大学名誉教授)
- Reinhart Poprawe (Fraunhofer Inst. for Laser Tech., Germany)



■ **First Session**

Chair: 伊賀 健一 (東京工業大学 前学長)

- 「虹彩結像レーザーアイウェア：弱視補助からスマートグラス」  
菅原 充 (QD レーザー(株) 社長)
- 「透明酸化物における電子応答機能性の開拓」  
細野 秀雄 (東京工業大学 応用セラミックス研究所 教授)



■ **Second Session**

Chair: Chris Barty (Lawrence Livermore National Laboratory. USA)

- 「30m望遠鏡プロジェクト」  
家 正則 (国立天文台教授、次世代超大型望遠鏡 TMT 推進室長)
- 「ELI: The CERN of laser research」  
Georg Korn (Extreme Light Infrastructure(ELI). Czech Republic)



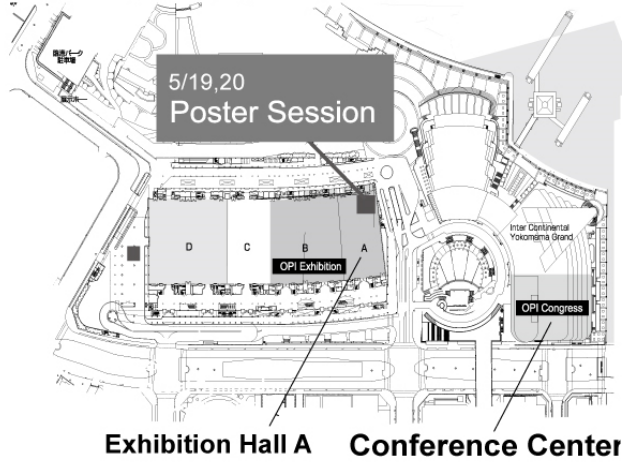
## JOINT Sessions & Conferences 各会議室 5月17日(火)～20日(金)

OPIC2016 はプレナリーセッションと下記11の専門国際会議で構成されます。

- **ALPS'16 (先進レーザーと光源技術)** : The 5th Advanced Lasers and Photon Sources  
主催 : レーザー学会、 議長 : **米田仁紀** (電気通信大学) 
  
- **BISC'16 (バイオイメージングと光計測)** : Biomedical Imaging and Sensing Conference 2016  
主催 : 宇都宮大学オブティクス教育研究センター、 議長 : **谷田貝豊彦** (宇都宮大学) 
  
- **CLES 2016 (レーザーエネルギー学)** : Conference on Laser Energy Science  
主催 : 大阪大学レーザーエネルギー学研究センター、 議長 : **疇地 宏** (大阪大学) 
  
- **HEDS 2016 (高エネルギー密度科学の応用)** : International Conference on High Energy Density Science 2016  
主催 : レーザー学会、 議長 : **兒玉了祐** (大阪大学) 
  
- **LEDIA'16 (LED とその産業応用)** : The 4th International Conference on Light-Emitting Devices and Their Industrial Applications  
主催 : 名古屋大学赤崎記念研究センター、 議長 : **天野 浩** (名古屋大学) 
  
- **LIC'16 (レーザー点火)** : The 4th Laser Ignition Conference 2016  
主催 : レーザー学会「マイクロ固体フォトニクス」専門委員会、  
議長 : **平等拓範** (分子科学研究所) 
  
- **LSSE 2016 (宇宙と地球のためのレーザー)** : Laser Solution for Space and the Earth  
主催 : 宇宙と地球のためのレーザー実行委員会、 議長 : **戎崎俊一** (理化学研究所) 
  
- **OMC'16 (光マニピュレーション)** : The 3rd Optical Manipulation Conference  
主催 : 応用物理学会、 議長 : **尾松孝茂** (千葉大学) 
  
- **PLD'16 (レーザーダメージ)** : The 5th Pacific-rim Laser Damage Conference  
共催 : 大阪大学レーザーエネルギー学研究センター、 SPIE、 SIOM Chinese Academy of Science  
議長 : **實野孝久** (大阪大学) 
  
- **SLPC 2016 (レーザー加工)** : The 2nd Smart Laser Processing Conference  
主催 : レーザ加工学会、 議長 : **岡本康寛** (岡山大学) 
  
- **XOPT'16 (X線光学要素技術と応用)** : International Conference on X-ray Optics, Detectors, Sources, and Their Applications 2016  
共催 : 理化学研究所放射光科学総合研究センター、 大阪大学大学院工学研究科附属超精密科学研究センター  
議長 : **石川哲也** (理化学研究所) 、 **山内和人** (大阪大学)  

会場、会議室配置図

# Pacifico Yokohama



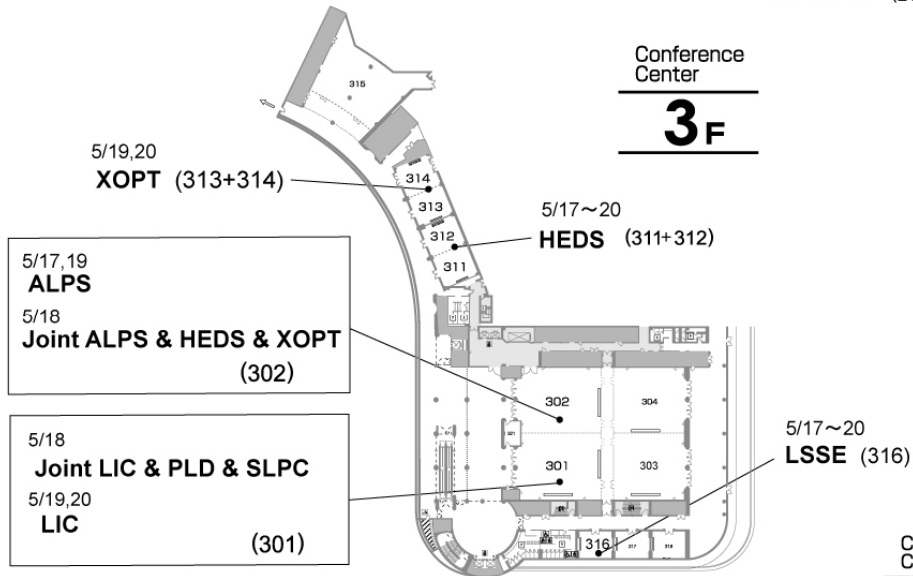
Conference Center

**2F**



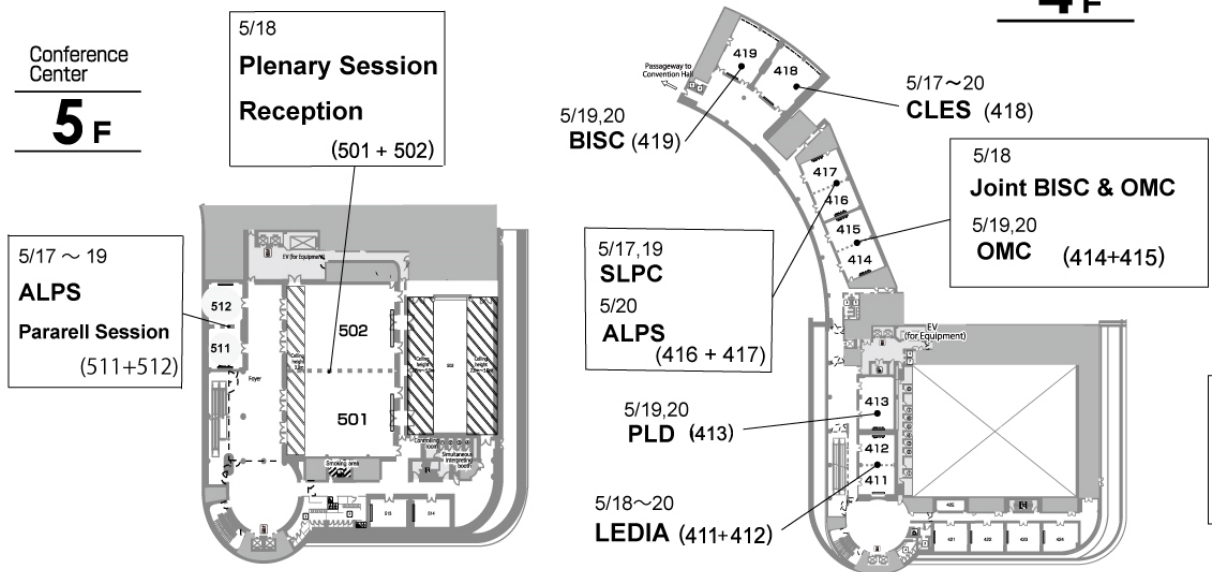
Conference Center

**3F**



Conference Center

**4F**



Conference Center

**5F**

## OPIC2016 専門国際会議プログラム(詳細)

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# The 5<sup>th</sup> Advanced Lasers and Photon Sources Conference

## ALPS'16

Tuesday, May 17

8:55-9:00

### Opening Address

Room 302

Chair: H. Yoneda, Conference Chair

Inst. for Laser Sci., Univ. Electro-Comm., Japan

9:00-10:30

### ALPS1 : Frequency comb generation

Room 302

Chair: M. Yan Max-Planck-Inst. Quantenoptik, Germany

ALPS1-1 (Invited) GHz fiber laser technology and 30 GHz astro-comb

9:00

Z. Zhang, Y. Ma, C. Li, and A. Wang  
State Key Lab. of Adv. Optical Comm. System and Networks, School of Electronics Eng. and Computer Sci., Peking Univ., China

ALPS1-2 Fully Monolithic Mode-Locked Laser Frequency Comb

9:30

W. Xie<sup>1</sup>, C.-C. Lee<sup>1</sup>, T. Shoji<sup>1</sup>, S. Todaro<sup>1</sup>, K. L. Silverman<sup>2</sup>, A. Feldman<sup>2</sup>, T. Harvey<sup>2</sup>, R. P. Mirin<sup>2</sup>, and T. R. Schibli<sup>1,3,4</sup>  
<sup>1</sup>Dept. of Phys., Univ. of Colorado at Boulder, USA, <sup>2</sup>NIST, USA, <sup>3</sup>Dept. of Electrical, Computer and Energy Eng. Univ. of Colorado, USA, <sup>4</sup>JILA, NIST and Univ. of Colorado, USA

ALPS1-3 Effects with Kerr comb in silica toroid microcavity: Raman scattering and third harmonic generation

9:45

R. Suzuki, T. Kato, A. Chen-Jinnai, T. Kobatake, S. Fujii and T. Tanabe  
Keio Univ., Japan

ALPS1-4 Tunable mid-infrared optical frequency comb based on supercontinuum at 1  $\mu\text{m}$  wavelength range

10:00

L. Jin<sup>1</sup>, M. Yamanaka<sup>1</sup>, V. Sonnenschein<sup>1</sup>, H. Tomita<sup>1</sup>, T. Iguchi<sup>1</sup>, A. Sato<sup>2</sup>, A. Omori<sup>2</sup>, A. Ideno<sup>2</sup>, T. Oh-hara<sup>2</sup>, N. Nishizawa<sup>1</sup>  
<sup>1</sup>Nagoya Univ., Japan, <sup>2</sup>Sekisui Medical Co. Ltd. Japan

ALPS1-5 Mode filtering of fiber-based optical frequency comb by use of Fabry-Perot cavities and its application

10:15

S. Yoshida<sup>1,2</sup>, A. Nishiyama<sup>1,2,3</sup>, A. Asahara<sup>1,2</sup>, Y. Nakajima<sup>1,2</sup>, K. Minoshima<sup>1,2</sup>  
<sup>1</sup>Univ. Electro-Comm., Japan, <sup>2</sup>JST, ERATO IOS Project, Japan, <sup>3</sup>JSPS, Japan

---- Break (10:30-10:45)----

10:45-12:00

### ALPS2 : Applications of optical frequency comb

Room 302

Chair: Z. Zhang Peking Univ., China

ALPS2-1 (Invited) Laser frequency combs for new approaches to molecular spectroscopy

10:45

M. Yan<sup>1,2</sup>, T. W. Hänsch<sup>1,2</sup>, N. Picqué<sup>1,2</sup>  
<sup>1</sup>Max-Planck-Institut für Quantenoptik, Germany, <sup>2</sup>Ludwig-Maximilians-Universität München, Fakultät für Physik, Germany

ALPS2-2 Time-Domain Measurements for Characterization of Solids by Dual-Comb Spectroscopy and Asynchronous Optical Sampling

11:15

A. Asahara<sup>1,2</sup>, A. Nishiyama<sup>1,2,3</sup>, S. Yoshida<sup>1,2</sup>, K. Kondo<sup>1</sup>, Y. Nakajima<sup>1,2</sup>, and K. Minoshima<sup>1,2</sup>  
<sup>1</sup>Univ. Electro-Comm., Japan, <sup>2</sup>ERATO IOS Project, Japan, <sup>3</sup>JSPS, Japan

ALPS2-3 Frequency comb two-color interferometry for self-correction of refractive index of air beyond accuracy of empirical equation

11:30

K. Miyano<sup>1,2</sup>, G. Wu<sup>3</sup>, T. Makino<sup>1</sup>, Y. Nakajima<sup>1,2</sup>, K. Minoshima<sup>1,2</sup>  
<sup>1</sup>Univ. Electro-Comm., Japan, <sup>2</sup>JST, ERATO IOS, Japan, <sup>3</sup>Tsinghua Univ., China

ALPS2-4 Spectral interferometric imaging with chirped frequency comb for non-scanning three-dimensional measurement

11:45

T. Kato<sup>1,2</sup>, M. Uchida<sup>1</sup>, K. Minoshima<sup>1,2</sup>  
<sup>1</sup>Univ. Electro-Comm., Japan, <sup>2</sup>JST, ERATO IOS project, Japan

11:00-12:00

### ALPS3 : Ultrafast technologies

Room 511+512

Chair: A. Pirozhkov Kansai Photon Sci. Inst., JAEA, Japan

ALPS3-1 (Invited) Laser-Plasma-Based Secondary Sources: Accelerating Particles and Light

11:00

C. Spielmann<sup>1,2</sup>  
<sup>1</sup>Inst. of Optics and Quantum Electronics, Abbe Center of Photonics, Jena Univ., Germany, <sup>2</sup>Helmholtz Inst. Jena, Germany

ALPS3-2 Suppression of Gain Narrowing in Ti:Sapphire by Polarization Encoded Chirped Pulse Amplification

11:30

M. Kalashnikov<sup>1,2</sup>, H. Cao<sup>2</sup>, K. Osvay<sup>2</sup>, V. Chvykov<sup>2</sup>, N. Khodakovskiy<sup>1</sup>, R. S. Nagymihaly<sup>2</sup>  
<sup>1</sup>Max-Born-Inst. for Nonlinear Optics and Short Pulse Spectroscopy, Germany, <sup>2</sup>ELI-Hu Nkft., Hungary

ALPS3-3 Ti:sapphire Laser Pumped by Wavelength Multiplexed 521/478-nm InGaN Diode Lasers

11:45

R. Sawada, H. Tanaka, F. Kannari  
Keio Univ., Japan

---- Lunch Break (12:00-13:00)----

13:00-15:00

**ALPS4 : Fiber-based novel sources**

**Room 302**

**Chair: T. Schibli, Program Committee Member**  
Univ. of Colorado, USA

**Chair: S. Matsushita, Program Committee Member**  
Furukawa Electric Co., Ltd., Japan

**ALPS4-1 (Invited) Higher-Order Mode Fiber Lasers**  
**13:00** J. W. Nicholson, R. Ahmad, K. Abedin<sup>1</sup> A. DeSantolo, P. S. Westbrook, R.S. Windeler, C. Headley, and D. J. DiGiovanni  
OFS Laboratories, USA

**ALPS4-2 Coherent, broadband supercontinuum Optical Frequency Comb Based on Er-doped Ultrashort Pulse Fiber Laser**  
**13:30** T. Niinomi<sup>1</sup>, Y. Nomura<sup>1</sup>, L. Jin<sup>1</sup>, Y. Ozeki<sup>2</sup>, and N. Nishizawa<sup>1</sup>  
<sup>1</sup>Nagoya Univ., Japan, <sup>2</sup>Univ. of Tokyo, Japan

**ALPS4-3 Fully and high-quality phase stabilized high-repetition-rate optical frequency comb based on a mode-locked Yb: fiber laser**  
**13:45** H. Yasui<sup>1,2</sup>, B. Xu<sup>1,2</sup>, Y. Nakajima<sup>1,2</sup>, Y. Ma<sup>3</sup>, Z. Zhang<sup>3</sup>, K. Minoshima<sup>1,2</sup>  
<sup>1</sup>Univ. Electro-Comm., Japan, <sup>2</sup>Univ. Electro-Comm., ERATO IOS Project, Japan, <sup>3</sup>Peking Univ., China

**ALPS4-4 Mid-infrared comb generation at 3  $\mu$ m through DFG using high repetition rate Er-doped fiber laser with SWNT**  
**14:00** M. Tsuzuki<sup>1</sup>, Y. Nomura<sup>1</sup>, L. Jin<sup>1</sup>, M. Yamanaka<sup>1</sup>, V. Sonnenchein<sup>1</sup>, H. Tomita<sup>1</sup>, T. Iguchi<sup>1</sup>, A. Sato<sup>2</sup>, A. Omori<sup>2</sup>, A. Ideno<sup>2</sup>, T. Ohara<sup>2</sup>, Y. Sakakibara<sup>3</sup>, E. Omoda<sup>3</sup>, H. Kataura<sup>3</sup>, Y. Sakakibara<sup>3</sup>, and N. Nishizawa<sup>1</sup>  
<sup>1</sup>Dept. of Quantum Eng., Nagoya Univ., Japan, <sup>2</sup>Sekisui Medical Co. Ltd, Japan, <sup>3</sup>AIST, Japan

**ALPS4-5 High power supercontinuum generation with Gaussian-like spectral shape in 2100 nm spectral band for optical coherence tomography**  
**14:15** T. Sato, H. Kawagoe, M. Yamanaka, N. Nishizawa  
Nagoya Univ., Japan

**ALPS4-6 Tunable SESAM mode-locked Tm fiber laser at the wavelength range of two micron**  
**14:30** Y. Mashiko, E. Fujita, M. Tokurakawa  
Inst. for Laser Sci., Univ. Electro-Comm., Japan

**ALPS4-7 Femtosecond Er-Doped Fiber Laser Mode-Locked by Hybrid Scheme of Nonlinear Polarization Rotation and Single-Wall Carbon Nanotube**  
**14:45** L. Jin, K. Nonobe, N. Nishizawa  
Dept. Quantum Eng., Nagoya Univ., Japan

13:00-15:00

**ALPS5 : Petawatt and high power lasers**

**Room 511+512**

**Chair: H. Yoneda, Conference Chair**  
Inst. for Laser Sci., Univ. Electro-Comm., Japan

**Chair: C. Spielmann**  
Inst. of Optics and Quantum Electronics, Germany

**ALPS5-1 (Invited) Next generation Petawatt Laser Systems**  
**13:00** C. Haefner  
NIF Photon Science, Lawrence Livermore National Laboratory, USA

**ALPS5-2 PENELOPE laser system update - on the way to first light**  
**13:30** D. Albach<sup>1</sup>, M. Siebold<sup>1</sup>, M. Loeser<sup>1,2</sup>, F. Roeser<sup>1</sup>, P. Eisele<sup>1,2</sup> and U. Schramm<sup>1,2</sup>  
<sup>1</sup>Helmholtz-Zentrum Dresden-Rossendorf, Germany<sup>2</sup>, Tech. Univ. Dresden, Germany

**ALPS5-3 Meter-size Gratings for Multi-Petawatt Lasers**  
**13:45** A. Cotel, and B. Villier  
HORIBA Jobin Yvon SAS, France

**ALPS5-4 The development of ozone grating for high energy lasers**  
**14:00** Y. Michine, H. Yoneda  
Inst. for Laser Sci., Univ. Electro-Comm., Japan

**ALPS5-5 Spectral control of x-ray atomic laser pumped with intense XFEL pulses**  
**14:15** T. Masutani<sup>1</sup>, Y. Michine<sup>1</sup>, T. Suzuki<sup>1</sup>, Y. Inubushi<sup>2</sup>, M. Yabashi<sup>2</sup>, and H. Yoneda<sup>1</sup>  
<sup>1</sup>Inst. for Laser Sci., Univ. Electro-Comm., Japan, <sup>2</sup>RIKEN XFEL, Japan

**ALPS5-6 Development of high rep. rate 100-J class diode-pumped solid-state laser system**  
**14:30** Y. Takeuchi, T. Sekine, Y. Hatano, T. Kurita, Y. Muramatsu, Y. Kato, N. Sato, and T. Kawashima  
Industries Development Lab., Hamamatsu Photonics K.K., Japan

**ALPS5-7 Discharge-pumped Non-chain HF/DF Lasers with Joule Output**  
**14:45** L. You, X. Fang, X. Liang, Q. Wang, G. Yin  
Anhui Inst. of Optics and Fine Mechanics, Chinese Academy of Sci., China

----- Break (15:00-15:30) -----

| 15:30-17:30<br>ALPS6 : Fiber lasers and laser diodes                             |   | 15:30-17:30<br>ALPS7 : Ultrafast light sources      |  |
|--|---|---|--|
| Room 302   |   | Room 511+512  |  |
| <b>Chair: J. W. Nicholson, Program Committee Member</b><br>OFS Laboratories, USA |   | <b>Chair: A. Suda</b><br>Tokyo Univ. of Sci., Japan |  |
| <b>ALPS6-1</b><br><b>15:30</b>   | <b>(Invited) Scaling ultrafast fiber source performances: coherent combining of femtosecond pulses</b><br>F. Guichard <sup>1</sup> , M. Hanna <sup>2</sup> , Y. Zaouter <sup>1</sup> , F. Druon <sup>2</sup> , C. Hönninger <sup>1</sup> , E. Mottay <sup>1</sup> , and Patrick Georges <sup>2</sup><br><sup>1</sup> Amplitude Systèmes, France, <sup>2</sup> Lab. Charles Fabry, Inst. d'Optique, CNRS, Univ. Paris-Sud, France  | <b>ALPS7-1</b><br><b>15:30</b>                      | <b>(Invited) Concepts for scaling peak power and average power via Frequency domain OPA (FOPA)</b><br>Mathieu Giguere <sup>1</sup> , Guilmot Ernotte <sup>2</sup> , Philippe Lassonde <sup>2</sup> , Adam Stephanides <sup>3</sup> , Torsten Mans <sup>3</sup> , François Légaré <sup>2</sup> , Bruno E. Schmidt <sup>1</sup><br><sup>1</sup> Few-cycle Inc., Canada, <sup>2</sup> NRS-EMT, Canada, <sup>3</sup> AMPHOS GmbH, Germany  |
| <b>ALPS6-2</b><br><b>16:00</b>   | <b>Divided Pulse Amplification: Spectral Phase and Combining Efficiency</b><br>K. Iwata, H. Tünnermann, A. Shirakawa<br>Inst. for Laser Sci., Univ. Electro-Comm., Japan  | <b>ALPS7-2</b><br><b>16:00</b>                      | <b>Sub-Two-Cycle, Millijoule IR Light Source for Attosecond Streaking of Extreme Ultraviolet High Harmonics</b><br>N. Ishii <sup>1</sup> , N. Saito T. Kanai <sup>1</sup> , S. Watanabe <sup>2</sup> , and J. Itatani<br><sup>1</sup> The Inst. for Solid State Phys., Japan, <sup>2</sup> Tokyo Univ. of Sci., Japan  |
| <b>ALPS6-3</b><br><b>16:15</b>   | <b>Phase-locked 7-core multi-core photonic crystal fiber laser</b><br>Y. Kurosu <sup>1</sup> , T. Kubouchi <sup>1</sup> , H. Tünnermann <sup>1</sup> , A. Shirakawa <sup>1</sup> , K. Saito <sup>2</sup><br><sup>1</sup> Inst. for Laser Sci., Univ. Electro-Comm., Japan, <sup>2</sup> Toyota Tech. Inst., Grad. School of Eng., Japan   | <b>ALPS7-3</b><br><b>16:15</b>                      | <b>Retrieval of Vacuum-Ultraviolet Waveform and Plasma Mirror Reflectivity Using Frequency-Resolved Optical Gating</b><br>R. Itakura, T. Kumada, M. Nakano, H. Akagi<br>Kansai Photon Sci. Inst., JAEA, Japan  |
| <b>ALPS6-4</b><br><b>16:30</b>   | <b>Experimentally fabrication of a monolithic fiber end cap collimator with long collimation length for high power applications</b><br>X. Zhou, Z. Chen, Z. Wang, J. Hou, X. Xu<br>College of Optoelectric Sci. and Eng., National Univ. of Defense Tech., China  | <b>ALPS7-4</b><br><b>16:30</b>                      | <b>Chirped-Pulse Amplification Using Thulium-Doped Fluoride Fibers</b><br>Y. Nomura and T. Fuji<br>Inst. for Molecular Sci., Japan   |
| <b>ALPS6-5</b><br><b>16:45</b>   | <b>Generation of red Q-switch pulse laser in Pr-doped double-clad structured waterproof fluoride glass fiber with graphene thin film</b><br>S. Kajikawa <sup>1,2</sup> , T. Terao <sup>1,2</sup> , S. Motokoshi <sup>3</sup> , M. Yoshida <sup>1</sup> , O. Ishii <sup>4</sup> , M. Yamazaki <sup>5</sup> , Y. Fujimoto <sup>2</sup><br><sup>1</sup> Faculty of Sci. and Eng. Kindai Univ., Japan, <sup>2</sup> ILE, Osaka Univ., Japan, <sup>3</sup> Inst. of Laser Tech., <sup>4</sup> Production Eng. Section, Optical Glass Production Dept. Sumita Optical Glass, Inc., Japan, <sup>5</sup> Glass Res. Division, R&D Dept. Sumita Optical Glass, Inc., Japan | <b>ALPS7-5</b><br><b>16:45</b>                      | <b>Ultrashort 34 fs, 50 μJ fiber source through nonlinear compression in hypocycloid core Kagome fiber</b><br>F. Guichard <sup>1</sup> , L. Lavenu <sup>1,2</sup> , Y. Zaouter <sup>1</sup> , M. Hanna <sup>2</sup> , Q. Mocaer <sup>1</sup> , G. Machinet <sup>1</sup> , B. Debord <sup>3</sup> , F. Gerome <sup>3,4</sup> , C. Hönninger <sup>1</sup> , E. Mottay <sup>1</sup> , F. Benabid <sup>3,4</sup> , and P. Georges <sup>2</sup><br><sup>1</sup> Amplitude Systèmes, France, <sup>2</sup> Lab. Charles Fabry, France, <sup>3</sup> GPPM group laboratoire XLIM, GLOphotonics, France |
| <b>ALPS6-6</b><br><b>17:00</b>   | <b>976nm 300W Fiber Coupled Laser Diode Module</b><br>E. Katayama, Y. Ishige, Y. Ohki, H. Mori, T. Kimura, T. Mukaiharu<br>Furukawa Electric Co., Ltd., Japan   | <b>ALPS7-6</b><br><b>17:00</b>                      | <b>Synchronization of Two-Color Femtosecond Fiber Chirped-Pulse Amplifiers by Use of Dispersive-Wave Generation</b><br>D. Yoshitomi and K. Torizuka<br>AIST, Japan   |
| <b>ALPS6-7</b><br><b>17:15</b>   | <b>Wavelength locking and bandwidth narrowing for spatial beam-combined high-power laser-diode stacks using single volume Bragg grating</b><br>T. Sekine, Y. Zheng, H. Kan, N. Satoh, and T. Kawashima<br>Hamamatsu Photonics K.K., Japan   | <b>ALPS7-7</b><br><b>17:15</b>                      | <b>Measurement of time-dependent plasma formation in noncollinear high harmonic generation</b><br>M. Kohga, K. Sato, T. Kuroda, M. Hata, and A. Suda<br>Dept. of Phys. Faculty of Sci. and Tech., Tokyo Univ. of Sci., Japan   |

Wednesday, May 18

9:00-12:10 OPIC Plenary Session

Room 501+502

---- Lunch (12:10-13:30) ----

| 13:30-15:30<br>ALPS, HEDS, XOPT Joint Session 1<br>Room 302 |  | 13:30-15:30<br>ALPS8 : Novel structured lasers/nonlinear media<br>Room 511+512 |   |
|---|--|--|---|
| Chair: M. Yabashi<br>T. Hosokai                             |  | Chair: S. Kurimura, Program Committee Member                                   |   |
| SPring-8/SACLA, Japan<br>Osaka Univ., Japan                 |  | National Inst. for Materials Sci., Japan                                       |   |
| XOPTj-1<br>13:30  | (Invited) X-rays as a Subject for Optics Research<br>T. Ishikawa<br>RIKEN SPring-8 Center, Japan   | ALPS8-1<br>13:30   | (Invited) Optical parametric vortex lasers and their applications towards chiral materials science<br>T. Omatsu<br>Chiba Univ., Japan   |
| XOPTj-2<br>14:00  | (Invited) LCLS-II: A High Repetition Rate X-ray Laser Facility<br>D. M. Fritz<br>SLAC National Accelerator Laboratory, USA   | ALPS8-2<br>14:00   | High-Power 355-nm UV Generation in Prism-Coupled CsLiB <sub>6</sub> O <sub>10</sub><br>M. Yoshimura <sup>1</sup> , K. Ueda <sup>1</sup> , Y. Orii <sup>2</sup> , Y. Takahashi <sup>1</sup> , G. Okada <sup>2</sup> , and Y. Mori <sup>1</sup><br><sup>1</sup> Osaka Univ., Japan, <sup>2</sup> Spectronix Corp., Japan  |
| HEDSj-1<br>14:30  | (Invited) Exploration of New fields of High Energy Density Science<br>R. Kodama<br>Osaka Univ., Japan  | ALPS8-3<br>14:15   | Evaluation of the thermally induced birefringence in a Nd:YAG/diamond composite laser fabricated with the room-temperature bonding<br>K. Yamaguchi, Y. Okuyama, H. Ichikawa, and I. Shoji<br>Chuo Univ., Japan  |
| ALPSj-1<br>15:00  | (Invited) HiLASE100: a cryo-cooled 100 J, 10 Hz DPSSL System<br>A. Lucianetti, M. Divoký, J. Pilař, O. Slezák, M. Sawicka-Chyla, V. Jambunathan, P. Navrátil, M. Hanuš, M. Boehm, M. Lukaszewski, and T. Mocek<br>HiLASE Centre, Inst. of Phys., CAS, Czech Republic | ALPS8-4<br>14:30   | (Invited) Photonic quantum devices using single light emitters<br>H. Takashima <sup>1-3</sup> , A. W. Schell <sup>1</sup> , A. Fukuda <sup>1</sup> , S. Fujita <sup>1</sup> , Y. Oe <sup>1-3</sup> , S. Kamioka <sup>2,3</sup> , M. Fujiwara <sup>2,3</sup> , S. Takeuchi <sup>1-3</sup><br><sup>1</sup> Grad. School of Eng., Kyoto Univ., Japan, <sup>2</sup> Res. Inst. for Electronic Sci., Hokkaido Univ., Japan, <sup>3</sup> The Inst. of Scientific and Industrial Res., Osaka Univ., Japan |
|   |  | ALPS8-5<br>15:00   | 750-nm LED-pumped Nd:YAG laser with 9% optical efficiency<br>K.-Y. Huang, C.-K. Su, M.-W. Lin, Y.-C. Chiu, Y.-C. Huang<br>National Tsing Hua Univ., Taiwan  |
|   |  | ALPS8-6<br>15:15   | Illusion Medium Mimicking Scattered Waves of a Bump on a Flat Surface Based on Transformation Electromagnetics<br>T. Nagayama, A. Sanada<br>Yamaguchi Univ., Japan  |

---- Break (15:30-15:45) ----

| 15:45-16:45<br>ALPS, HEDS, XOPT Joint Session 2<br>Room 302 |   | 15:45-17:15<br>ALPS9 : Metamaterials, Photon handling<br>Room 511+512 |  |
|---|---|---|--|
| Chair: J. Itatani, Program Committee Member                 |   | Chair: T. Tanabe, Program Committee Member                            |  |
| Univ. Tokyo, Japan  |   | Keio Univ., Japan   |  |
| ALPSj-2<br>15:45  | (Invited) Current status of PW laser at CoReLS and applications<br>S. K. Lee<br>GIST, Korea                                       | ALPS9-1<br>15:45  | (Invited) Spin-orbit interaction in optical metamaterials<br>J. W. Wu<br>Ewha Womans Univ., Korea      |
| HEDSj-2<br>16:15  | (Invited) High-energy Density Science and plasma physics at ELI Beamlines<br>G. Korn<br>Director of ELI Beamlines, Czech Republic | ALPS9-2<br>16:15  | (Invited) Terahertz Component Platforms Inspired by Metamaterials<br>T. Suzuki<br>Ibaraki Univ., Japan |
|   |   | ALPS9-3   | Bio-inspired, nanostructured anti-reflective   |

- 16:45 surfaces for laser applications**  
Z. Diao<sup>1</sup>, J.-H. Dirks<sup>1,2</sup>, J. P. Spatz<sup>1,3</sup>  
<sup>1</sup>Dept. of New Mater. and Biosystems, Max Planck Inst. for Intelligent Systems, Germany, <sup>2</sup>Dept. for Biomimetics, Hochschule Bremen-Univ. of Applied Sci., Germany, <sup>3</sup>Dept. of Biophysical Chemistry, Univ. of Heidelberg, Germany
- ALPS9-4 Low Loss Asymmetrical Optical Power Splitter on SOI Platform with Various Influenced Parameters**  
17:00 C. P. Vardhani, N. Pendam  
Osmania Univ., India

----- Break / Move ( 1700 -18:00)-----

**18:00 - 20:00 OPIC Reception**

**Room 501+502**

**Thursday, May 19**

| <b>9:00-10:30</b>                                   |   | <b>9:00-10:30</b>                                   |   |
|---|---|---|---|
| <b>ALPS10 :High power lasers</b>                    |   | <b>ALPS11 : Biomedical imaging and applications</b> |   |
| <b>Room 302</b>                                     |   | <b>Room 511+512</b>                                 |   |
| <b>Chair: J. Kawanaka, Program Committee Member</b> |   | <b>Chair: N. Nishizawa, Program Committee Chair</b> |   |
|   | Osaka Univ., Japan  |   | Nagoya Univ., Japan   |
| <b>ALPS10-1</b>                                     | <b>(Invited) Diode-pumped amplification of broad band pulses to more than 50 J</b><br>9:00 J. Hein<br>Friedrich Schiller Univ. Jena, Germany  | <b>ALPS11-1</b>                                     | <b>(Invited) Progress of high-speed optical coherence tomography</b><br>9:00 M. Ohmi<br>Osaka Univ., Japan  |
| <b>ALPS10-2</b>                                     | <b>High energy regenerative amplifier based on Yb:CaF<sub>2</sub></b><br>9:30 J.-G. Brisset, P. Sevilano, A. Courjaud<br><sup>1</sup> Max Born Inst., Germany, <sup>2</sup> Univ. de Genève, GAP-Biophotonics, Switzerland, <sup>3</sup> Amplitude Systèmes, France   | <b>ALPS11-2</b>                                     | <b>Optical coherence microscopy in 1700 nm spectral band for deep and 3D high-resolution imaging of biological samples</b><br>9:30 T. Teranishi, M. Yamanaka, H. Kawagoe, N. Nishizawa<br>Dept. quantum Eng. Nagoya Univ. Japan   |
| <b>ALPS10-3</b>                                     | <b>Development of a High-Energy, Compact Power Laser System Using Diode-Pumped Solid-State Laser Technologies</b><br>9:45 Y. Kato <sup>1,3</sup> , T. Kurita <sup>1,3</sup> , T. Morita <sup>1,3</sup> , T. Sekine <sup>1,3</sup> , Y. Tamaoki <sup>1,3</sup> , Y. Takeuchi <sup>1,3</sup> , M. Miyamoto <sup>2</sup> , T. Fujita <sup>2</sup> , D. Hori <sup>2</sup> , M. Takauji <sup>2</sup> , T. Kokubo <sup>2</sup> , T. Nagakura <sup>2</sup> , H. Suzuki <sup>2</sup> , and T. Kawashima <sup>1,3</sup><br><sup>1</sup> Hamamatsu Photonics K.K., Development Bureau, Industries Development Lab., Japan, <sup>2</sup> Miyakoda Factory, Japan, <sup>3</sup> ImPACT Program, Japan | <b>ALPS11-3</b>                                     | <b>Scaling in Frame Number of Single-shot Ultrafast 2D-burst Imaging by STAMP utilizing Spectral Filtering</b><br>9:45 T. Suzuki, R. Hida, R. Ueda, F. Isa, and F. Kannari<br>Keio Univ., Japan   |
| <b>ALPS10-4</b>                                     | <b>Recent Progress of the Development of the Kumgang Laser - Coherent Beam Combination Laser using Self-controlled Stimulated Brillouin Scattering Phase Conjugate Mirrors (SBS-PCMs)</b><br>10:00 H. J. Kong <sup>1</sup> , S. Park <sup>1</sup> , S. Cha <sup>1</sup> , S. Choi <sup>1</sup> , H. Ahn <sup>1</sup> , H. Lee <sup>1</sup> , J. Oh <sup>1</sup> , J. S. Kim <sup>2</sup><br><sup>1</sup> KAIST, Korea, <sup>2</sup> Laser Spectronix, Korea   | <b>ALPS11-4</b>                                     | <b>Single-Shot Multispectral Imaging by SF-STAMP System Using a Supercontinuum Pulse</b><br>10:00 R. Hida, T. Suzuki, R. Ueda, F. Isa, and F. Kannari<br>Keio Univ., Japan  |
| <b>ALPS10-5</b>                                     | <b>Exploring the optimal temperature for the cryogenic 946-nm Nd:YAG laser</b><br>10:15 C.-Y. Cho, H. P. Cheng, and Y.-F. Chen, Dept. of Electrophysics, National Chiao Tung Univ., Taiwan  | <b>ALPS11-5</b>                                     | <b>Ablation property of demineralized dentin by nanosecond pulsed laser irradiation at wavelengths around 3 μm</b><br>10:15 K. Shimizu <sup>1</sup> , K. Ishii <sup>1</sup> , K. Hashimura <sup>1,2</sup> , K. Yoshikawa <sup>3</sup> , K. Yasuo <sup>3</sup> , K. Yamamoto <sup>3</sup> , K. Awazu <sup>1,4,5</sup><br><sup>1</sup> Grad. School of Eng., Osaka Univ., Japan, <sup>2</sup> Res. Fellow of JSPS, Japan, <sup>3</sup> Dept. of Operative Dentistry Dental Univ., Japan, <sup>4</sup> Grad. School of Frontier Biosciences, Osaka Univ., Japan, <sup>5</sup> Global Center for Medical Eng. and Informatics, Osaka Univ., Japan |

----- Break (10:30-11:00)-----

| 11:00-12:00<br>ALPS12 :High power lasers   | Room 302 | 11:00-12:00<br>ALPS13 : Biomedical imaging and applications  | Room 511+512 |
|--|----------|--|--------------|
| <b>Chair: J. Hein</b><br>Friedrich schiller Univ. Jena, Germany  |          | <b>Chair: M. Ohmi, Program Committee Member</b><br>Osaka Univ., Japan  |              |
| <b>ALPS12-1</b><br><b>11:00</b><br><b>(Invited) High-Light-Extraction Nanophotonic Structure for High-power DUV-LEDs</b><br>S.-I. Inoue<br>Adv. ICT Res. Inst., National Inst. of Information and Comm. Tech. (NICT), Japan  |          | <b>ALPS13-1</b><br><b>11:00</b><br><b>(Invited) Hollow optical fiber probe for Raman spectroscopy</b><br>T. Katagiri <sup>1</sup> , Y. Matsuura <sup>2</sup><br><sup>1</sup> Dept. of Eng., Tohoku Univ., Japan, <sup>2</sup> Dept. of Biomedical Eng., Tohoku Univ., Japan  |              |
| <b>ALPS12-2</b><br><b>11:30</b><br><b>Nanosecond pulsed operation of a PCSEL for high peak powers</b><br>H. Nishida <sup>1</sup> , X. Guo <sup>1,2</sup> , S. Tokita <sup>1</sup> , K. Ishizaki <sup>2</sup> , S. Noda <sup>2</sup> , K. Hirose <sup>3</sup> , T. Sugiyama <sup>3</sup> , A. Watanabe <sup>3</sup> , J. Kawanaka <sup>1</sup><br><sup>1</sup> ILE, Osaka Univ., Japan, <sup>2</sup> Dept. of Electronic Sci. and Eng. Kyoto Univ., Japan, <sup>3</sup> Industries Development Lab. Hamamatsu Photonics K.K., Japan |          | <b>ALPS13-2</b><br><b>11:30</b><br><b>Temperature determination at the nanoscale via tip-enhanced THz-Raman spectroscopy</b><br>M. V. Balois <sup>1</sup> , N. Hayazawa <sup>1,2</sup> , F. C. Catalan <sup>2</sup> , S. Kawata <sup>3</sup> , T. Tanaka <sup>1</sup> , T. Yano <sup>4</sup> , T. Hayashi <sup>4</sup><br><sup>1</sup> Innovative Photon Manipulation Res. Team-RIKEN, Japan, <sup>2</sup> Surface and Interface Sci. Lab.-RIKEN, Japan, <sup>3</sup> Osaka Univ., Japan, <sup>4</sup> Tokyo Inst. of Tech., Japan |              |
| <b>ALPS12-3</b><br><b>11:45</b><br><b>Photonic Crystal Surface Emitting Laser Directly Pumped Cryogenically Cooled Yb:YAG Oscillator</b><br>X. Guo <sup>1,3</sup> , S. Tokita <sup>1</sup> , K. Hirose <sup>2</sup> , T. Sugiyama <sup>2</sup> , A. Watanabe <sup>2</sup> , K. Ishizaki <sup>3</sup> , S. Noda <sup>3</sup> , J. Kawanaka <sup>1</sup><br><sup>1</sup> Osaka Univ., Japan, <sup>2</sup> Hamamatsu Photonics K.K., Japan, <sup>3</sup> Kyoto Univ., Japan   |          | <b>ALPS13-3</b><br><b>11:45</b><br><b>Femtosecond Mid-Infrared Spectrometer Using Chirped-Pulse Upconversion in a Wide-Bandgap Nonlinear Crystal</b><br>Y. Inagaki <sup>1,2</sup> , H. Hata <sup>1,2</sup> , T. Kamimura <sup>2</sup> , N. Umemura <sup>3</sup> , N. Hamada <sup>1</sup> , R. Nakamura <sup>1</sup><br><sup>1</sup> Osaka Univ., Japan, <sup>2</sup> Osaka Inst. Tech., Japan, <sup>3</sup> Chitose Inst. Sci. Tech., Japan  |              |
| ----- Lunch Break (12:00-13:00)-----   |          |  |              |

| 13:00-15:00<br>ALPSp14: Poster Session  | Exhibition Hall A |
|---|-------------------|
| <b>ALPSp14</b><br><b>-01</b><br><b>The Effects on the Microstructures and Photoluminescence Properties of the IGZO Films in Various Sputtering Angles</b><br>T-C Li, J.-F. Lin<br>National Cheng Kung Univ., Taiwan   |                   |
| <b>ALPSp14</b><br><b>-02</b><br><b>Mutual Influence of Silica Oxide and Calcium Oxide on Transparency of Cr<sup>4+</sup>:YAG Ceramics</b><br>M. Chaika, O. Vovk, N. Dulina, A. Doroshenko, S. Parkhomenko, A. Tolmachev<br>Inst. for Single Crystals of National Academy of Sci. of Ukraine, Ukraine  |                   |
| <b>ALPSp14</b><br><b>-03</b><br><b>p-i-n Integrated Photonic Crystal Nanocavity Optical Functional Device</b><br>N. Ashikin B. Daud <sup>1</sup> , Y. Ooka <sup>2</sup> , T. Tanabe <sup>3</sup><br>Faculty of Sci. and Tech., Keio Univ., Japan  |                   |
| <b>ALPSp14</b><br><b>-04</b><br><b>Ultrafast Plasmon Source Combined with a Dual-probe Scanning Near-field Optical Microscopy for Ultrafast Spatiotemporal Nano-photonics</b><br>Y. Kojima, Y. Masaki, F. Kannari<br>Keio Univ., Japan  |                   |
| <b>ALPSp14</b><br><b>-05</b><br><b>Fabrication of Pr:ZBLAN Waveguides for Laser Using Refractive Index Change Induced by Ultra-fast Laser Pulses</b><br>T. Sato, Y. Yamanaka, and F. Kannari<br>Keio Univ., Japan   |                   |
| <b>ALPSp14</b><br><b>-06</b><br><b>Bismuth-Based Rational Harmonic Mode-Locked Short-Cavity Fiber Laser</b><br>Y. Fukuchi, T. Matsuura, A. Enda, H. Shirane, S. Takai<br>Tokyo Univ. of Sci., Japan   |                   |
| <b>ALPSp14</b><br><b>-07</b><br><b>(Withdraw)</b>   |                   |
| <b>ALPSp14</b><br><b>-08</b><br><b>Optical Waveform Generation in a Figure-Eight SOA-Based Fiber Laser</b><br>L.-T. Gao, J.-Y. Wang, W.-H. Kuan, and K.-H. Lin<br>Univ. of Taipei, Taiwan   |                   |
| <b>ALPSp14</b><br><b>-09</b><br><b>Reflectivity of the Rotating Wedge Stimulated Brillouin Scattering Phase Conjugate Mirrors (SBS-PCMs) for High Power Laser</b><br>J. Oh, S. Cha, S. Park, and H. J. Kong<br>KAIST, Korea   |                   |
| <b>ALPSp14</b><br><b>-10</b><br><b>Development of a longitudinally excited CO<sub>2</sub> laser using fast high-voltage solid state switch</b><br>M. Tanaka <sup>1</sup> , M. Tei <sup>1</sup> , K. Uno <sup>2</sup> , M. Tsuyama <sup>1</sup> , H. Nakano <sup>1</sup><br><sup>1</sup> Kindai Univ., Japan, <sup>2</sup> Univ. of Yamanashi, Japan |                   |
| <b>ALPSp14</b><br><b>-11</b><br><b>Pr<sup>3+</sup>:YLF Visible Lasers Directly Pumped by InGaN Diode Lasers</b><br>K. Iijima, R. Kariyama, H. Tanaka, Y. Kiyota, F. Kannari   |                   |

Keio Univ., Japan

- ALPSP14-12** **Analysis of fluorescence properties for exciting in Cr<sup>3+</sup> <sup>4</sup>T<sub>1</sub> level of Nd/Cr:YAG ceramics**  
T. Yamada<sup>1</sup>, Y. Honda<sup>2</sup>, S. Motokoshi<sup>3</sup>, T. Jitsuno<sup>2</sup>, J. Kawanaka<sup>2</sup>, K. Fujioka<sup>2</sup>, M. Yoshida<sup>1</sup>  
<sup>1</sup>Kinki Univ., Japan, <sup>2</sup>ILE Osaka Univ., Japan, <sup>3</sup>ILT, Japan
- ALPSP14-13** **Recyclable metal air cell using sintered Si pastes with reduced Si nanoparticles by pulse laser ablation in liquids**  
T. Saiki, K. Nakamura, S. Nakata, K. Nakamura, T. Uematsu, S. Masuda  
Dept. of Electrical and Electronic Eng., Faculty of Eng. Sci., Kansai Univ., Japan
- ALPSP14-14** **Fabrication of Core Inductor Using Sintered Aluminum Nano-paste with Aluminum Nano-polycrystalline structure**  
T. Saiki, Y. Iida, S. Masuda  
Dept. of Electrical and Electronic Eng. Faculty of Eng. Sci., Kansai Univ., Japan
- ALPSP14-15** **A monolithic 0.8 to 4.5 μm supercontinuum source with a low-loss fusion spliced joint between silica and fluoride fibers**  
K. Yin, B. Zhang, J. Yao, Z. Chen, S. Chen, and J. Hou  
College of Optoelectronic Sci. and Eng., National Univ. of Defense Tech., China
- ALPSP14-16** **Influence of pulse delay time on material processing by double pulses of femtosecond lasers**  
T. Sugihara<sup>1</sup>, S. Kubodera<sup>1</sup>, M. Kaku<sup>1</sup>, A. Yokotani<sup>1</sup>, M. Katto<sup>1,2</sup>  
<sup>1</sup>Grad. School of Eng., Univ. of Miyazaki, Japan, <sup>2</sup>CRCC, Univ. of Miyazaki, Japan
- ALPSP14-17** **Development of Self-Q-switched and Mode-locked Nd/Cr:YAG Ceramic Pulse Laser Using Cr<sup>4+</sup>:YAG Crystal**  
S. Kanemori<sup>1</sup>, N. Hirota, T. Saiki  
Dept. of Electrical and Electronic Eng. Faculty of Eng. Sci., Kansai Univ., Japan
- ALPSP14-18** **Nanoablation on Si Induced by Surface Plasmon Polaritons with an Intense Femtosecond Laser Pulse**  
M. Hagiya and G. Miyaji  
Dept. of Applied Phys., Tokyo Univ. of Agriculture and Tech., Japan
- ALPSP14-19** **(Withdraw)**
- ALPSP14-20** **Characteristics of Laser Microphone using Self-coupling Effect of the Semiconductor Laser**  
D. Mizushima, N. Tsuda, and J. Yamada  
Aichi Inst. of Tech., Japan
- ALPSP14-21** **Development of laser distance sensor by utilizing fluctuation of terminal voltage due to self-coupling effect**  
T. Yoshimatsu, K. Goshima, M. Aoki, N. Tsuda, and J. Yamada  
Aichi Inst. of Tech., Japan
- ALPSP14-22** **Study on Simultaneous Measurement of Thickness and Speed of Object using Semiconductor Laser**  
T. Michihiro, N. Tsuda, and J. Yamada  
Aichi Inst. of Tech., Japan
- ALPSP14-23** **Short Distance Calibration of Laser Distance Meters**  
O. Terra<sup>1</sup>, M. Medhat<sup>2</sup>, M. Sobee<sup>1</sup>, and H. Hussein<sup>1</sup>  
<sup>1</sup>National Inst. for Standard, Egypt, <sup>2</sup>Faculty of Sci., Ain-Shams Univ., Egypt
- ALPSP14-24** **High power narrow-linewidth linearly-polarized 1610 nm Er:Yb all-fiber MOPA**  
E. Fujita, Y. Mashiko, and M. Tokurakawa  
Inst. for Laser Sci., Univ. of Electro-Comm., Japan
- ALPSP14-25** **Bi-lateral Comparison Between The National Metrology Institutes Of Egypt and South Africa for The Calibration of an Optical Time Domain Reflectometer**  
O. Terra<sup>1</sup>, H. Hussein<sup>1</sup>, and M. Nel<sup>2</sup>  
<sup>1</sup>National Inst. For Standards, Egypt, <sup>2</sup>National Metrology Inst. of South Africa, South Africa
- ALPSP14-26** **Repetition-rate-tunable Yb-doped Fiber Chirped Pulse Amplifier Toward Waveguide Direct Writing in Transparent Materials**  
H. Tanaka, K. Hirokawa, F. Kannari  
Dept. of Electronics and Electrical Eng., Keio Univ., Japan
- ALPSP14-27** **Electron Acceleration by Laser Driven Beat Wave Excited by Cross-Focused q-Gaussian Laser Beams in Thermal Quantum Plasma with Nonlinear Absorption**  
N. Gupta and A. Singh  
National Inst. of Tech. Jalandhar, India
- ALPSP14-28** **Photon-stimulated desorption surface spectroscopy of polymers by VUV emissions from a laser-produced plasma**  
M. Kaku<sup>1</sup>, M. Katto<sup>1</sup>, W. Sasaki<sup>2</sup>, S. Kubodera<sup>1</sup>  
<sup>1</sup>Dept. of Electrical and Systems Eng. Univ. of Miyazaki, Japan, <sup>2</sup>NTP Inc., Japan
- ALPSP14-29** **High-efficient, high-pulse-energy Cr:ZnSe master oscillator power amplifier pumped with Tm:YAG laser**  
M. Yumoto, N. Saito, and S. Wada  
Photonics control tech. team, RIKEN, Japan
- ALPSP14-30** **Nonlinear Dynamics in Radially Polarized Laser Beam with Pump Modulation**  
C.-P. Chiu, X.-W. Jiang, K.-C. Chang, and M.-D. Wei  
Dept. of Photonics, National Cheng Kung Univ., Taiwan
- ALPSP14-31** **High efficient MLD-THz-TDS with super focusing effects and laser chaos**  
Y. Akamine<sup>1</sup>, K. Iwao<sup>1</sup>, M. Oi<sup>1</sup>, S. Goda<sup>1</sup>, T. Shirasaki<sup>1</sup>, N. Sakaue<sup>1</sup>, T. Kishibata<sup>1</sup>, F. Kuwashim<sup>1</sup>, M. Tani<sup>2</sup>, K. Yamamoto<sup>2</sup>, K. Kurihara<sup>3</sup>, K. Ngashima<sup>4</sup>, M. Nakashima<sup>5</sup>, M. Hangyo<sup>5</sup>  
<sup>1</sup>Fukui Univ. of Tech., Japan, <sup>2</sup>Res. Center for Development of Far-Infrared Region, Japan, <sup>3</sup>Faculty of Education and Regional

- Studies, Univ. of Fukui, Japan, <sup>4</sup>Setsunan Univ., Japan, <sup>5</sup>ILE Osaka Univ., Japan
- ALPSp14 -32 All-waveguide Talbot Cavity Laser with Intra-cavity Second Harmonic Generation**  
K. Hirose<sup>1</sup>, F. Shohda<sup>1</sup>, T. Yanagisawa<sup>1</sup>, and F. Kannari<sup>2</sup>  
<sup>1</sup>Mitsubishi Electric Co., Japan, <sup>2</sup>Keio Univ., Japan
- ALPSp14 -33 Challenge to Excitation of the Low Frequency Collective Vibrational Mode in Proteins by using Intense Coherent Terahertz-Waves**  
T. Notake, K. Nawata, Y. Takida, Y. Tokizane, Z. Han, M. Koyama and H. Minamide  
RIKEN, Japan
- ALPSp14 -34 Study on Parametric Gain of Nonlinear Wavelength Conversion in a LiNbO<sub>3</sub>**  
S. Hayashi<sup>1,2</sup>, K. Nawata<sup>1</sup>, H. Ishizuki<sup>3</sup>, K. Murate<sup>2</sup>, K. Imayama<sup>2</sup>, Y. Takida<sup>1</sup>, Y. Tokizane<sup>1</sup>, T. Taira<sup>3</sup>, K. Kawase<sup>2,1</sup>, and H. Minamide<sup>1</sup>  
<sup>1</sup>RIKEN Center for Adv. Photonics, Japan, <sup>2</sup>Nagoya Univ., Japan, <sup>3</sup>Inst. for Molecular Sci., Japan
- ALPSp14 -35 Generation of tunable sub-THz wave from DAST-DFG by multi-wavelength pump beam**  
T. Y. Tokizane, K. Nawata, Z. Han, M. Koyama, T. Notakake, Y. Takida and H. Minamide  
RIKEN, Japan
- ALPSp14 -36 Control of Two-photon Excited Fluorescence and Photobleaching with Two-dimensional LCOS-SLM**  
N. Kamiyama, S. Maesako, K. Toda, and A. Suda  
Tokyo Univ. Sci., Japan
- ALPSp14 -37 Hollow optical-fiber probe for analysis of CO<sub>2</sub> gas**  
T. Iida<sup>1</sup>, T. Katagiri<sup>2</sup>, Y. Matsuura<sup>1</sup>  
<sup>1</sup>Grad. School of Biomedical Eng., Tohoku Univ., Japan, <sup>2</sup>Grad. School of Eng., Tohoku Univ., Japan
- ALPSp14 -38 Breath analysis by ultraviolet gas spectroscopy using hollow-optical fiber as gas cell**  
T. Iwata<sup>1</sup>, T. Katagiri<sup>2</sup>, Y. Matsuura<sup>1</sup>  
<sup>1</sup>Grad. School of Biomedical Eng., Tohoku Univ., Japan, <sup>2</sup>Grad. School of Eng., Tohoku Univ., Japan
- ALPSp14 -39 Spectroscopic gas analysis using hollow-optical fiber gas cell and infrared quantum cascade laser**  
K. Yaegashi<sup>2</sup>, T. Katagiri<sup>1</sup>, Y. Matsuura<sup>2</sup>  
<sup>1</sup>Grad. School of Eng., Tohoku Univ., Japan, <sup>2</sup>Grad. School of Biomedical Eng., Tohoku Univ., Japan
- ALPSp14 -40 Ultrahigh speed time-domain en face optical coherence tomography using KTN optical beam deflector**  
Y. Shinya<sup>1</sup>, T. Imai<sup>2</sup>, S. Toyoda<sup>2</sup>, J. Kobayashi<sup>2</sup>, T. Sakamoto<sup>2</sup>, and M. Ohmi<sup>1</sup>  
<sup>1</sup>Osaka Univ., Japan, <sup>2</sup>NTT Co., Japan
- ALPSp14 -41 Three dimensional imaging of diseased rat lung and liver using ultrahigh resolution optical coherence tomography**  
M. Nanbu<sup>1</sup>, Y. Ando<sup>1</sup>, H. Kawagoe<sup>1</sup>, M. Yamanaka<sup>1</sup>, M. Matsushima<sup>2</sup>, K. Mori<sup>3</sup>, T. Kawabe<sup>2</sup>, H. Shoji<sup>4</sup>, and N. Nishizawa<sup>1</sup>  
<sup>1</sup>Dept. Quantum Eng., Nagoya Univ., Japan, <sup>2</sup>Grad. School of Medicine, Nagoya Univ., Japan, <sup>3</sup>Grad. School of Information Sci., Nagoya Univ., Japan, <sup>4</sup>Dept. Medicine, Kyoto Prefectural Univ. of Medicine, Japan
- ALPSp14 -42 Engineering the Photonic Band Gap for Simultaneous Multi-parametric Sensing**  
R. Mudachathi<sup>1</sup>, T. Tanaka<sup>1,3</sup>, M. M. Varma<sup>4,5</sup>  
<sup>1</sup>RIKEN Metamaterials Lab., Japan, <sup>2</sup>RIES, Hokkaido Univ., Japan, <sup>3</sup>Interdisciplinary Grad. School of Sci. and Eng., Tokyo inst. of Tech., Japan, <sup>4</sup>Center for Nano Sci. and Eng. Indian. <sup>5</sup>Inst. of Sci. Bangalore, India Dept. of ECE, Indian Inst. of Sci., India
- ALPSp14 -43 Monitoring Microsecond Conformational Dynamics of Biomolecules Based on Realtime Detection of Fluorescence Photon Sequence**  
K. Kitabayashi<sup>1,2</sup>, T. Kamimura<sup>2</sup>, N. Hamada<sup>1</sup>, R. Nakamura<sup>1</sup>  
<sup>1</sup>Osaka Univ., Japan, <sup>2</sup>Osaka Inst. Tech., Japan
- ALPSp14 -44 High-power supercontinuum generation using 182-MHz soliton-similariton mode-locked fiber laser for ultrahigh-resolution optical coherence tomography in 1600 nm spectral band**  
M. Yamanaka, H. Kawagoe, and N. Nishizawa  
Nagoya Univ., Japan
- ALPSp14 -45 Frequency Comb Source Using a Bismuth-Based Actively Mode-Locked Laser**  
Y. Fukuchi, T. Matsuura, S. Takai, A. Enda, M. Yamamoto, H. Shirane  
Tokyo Univ. of Sci., Japan
- ALPSp14 -46 Experiment on Optical Phase Locking of Two Longitudinal Modes of a Dual-Mode Microchip Laser for Millimeter-Wave Signal Generation**  
M. Hyodo<sup>1</sup>, K. Sato<sup>1</sup>, A. Kawakami<sup>2</sup>, S. Saito<sup>2</sup>, M. Watanabe<sup>3</sup>, and M. Adachi<sup>1</sup>  
<sup>1</sup>Faculty of Mechanical Eng., Kanazawa Univ., Japan, <sup>2</sup>Adv. ICT Res. Inst. National Inst. of Information and Comm. Tech., Japan, <sup>3</sup>Dept. of Eng. Sci., Univ. Electro-Comm., Japan
- ALPSp14 -47 High-Precision Spectroscopy of Molecular Iodine Using an Ultra-Compact Laser at 561 nm**  
K. Yoshii<sup>1,2</sup>, Y. Hisai<sup>1</sup>, and F.-Lei Hong<sup>1,2</sup>  
<sup>1</sup>Dep. Physics, YNU, Japan, <sup>2</sup>JST-ERATO, Japan
- ALPSp14 -48 All polarization-maintaining, fiber laser-based optical frequency comb using single wall carbon nanotube**  
M. Togashi<sup>1</sup>, G. Park<sup>1</sup>, T. Nagaïke<sup>1</sup>, L. Jin<sup>1</sup>, Y. Sakakibara<sup>2</sup>, E. Omoda<sup>2</sup>, H. Kataura<sup>2</sup>, N. Nishizawa<sup>1</sup>  
<sup>1</sup>Nagoya Univ., Japan, <sup>2</sup>AIST, Japan
- ALPSp14 -49 Light generation enhancement by double resonance in metal-insulator-metal structure**  
Soon-Hong Kwon  
Dept. of Physics, Chung-Ang University, Korea



**Friday, May 20**

**9:00-10:30**

**ALPS15 : Terahertz-wave sensing and devices**

**Room 416+417**

**Chair: J.-H. Son, Program Committee Member**  
Univ. of Seoul, Korea

- ALPS15-1 (Invited) Noninvasive THz Sensing of Critical Components in Human Blood**  
9:00  
C.-K. Sun and T.-D. Wang  
<sup>1</sup>National Taiwan Univ., <sup>2</sup>Taiwan, National Taiwan Univ. Hospital, Taiwan
- ALPS15-2 Injection-Seeded Terahertz-Wave Parametric Generator at 77 K**  
9:30  
Y. Takida, K. Nawata, Y. Tokizane, Z. Han, M. Koyama, T. Notake, S. Hayashi, and H. Minamide  
RIKEN, Japan
- ALPS15-3 Terahertz parametric amplification using KTiOPO<sub>4</sub>**  
9:45  
M.-H. Wu<sup>1</sup>, Y.-C. Chiu<sup>1</sup>, T.-D. Wang<sup>2</sup>, G. Zhao<sup>3</sup>, A. Zukauskas<sup>4</sup>, Y.-C. Huang<sup>1</sup>, and F. Laurell<sup>4</sup>  
<sup>1</sup>National Tsing Hua Univ., Taiwan, <sup>2</sup>CSIST Inc., Taiwan, <sup>3</sup>Peking Univ., China, <sup>4</sup>KTH Univ., Sweden
- ALPS15-4 Terahertz wave generation from cluster plasma produced by double pulse-laser beams**  
10:00  
K. Mori<sup>1,2</sup>, M. Hashida<sup>1,2</sup>, T. Nagashima<sup>3</sup>, K. Teramoto<sup>1,2</sup>, S. Inoue<sup>1,2</sup>, and S. Sakabe<sup>1,2</sup>  
<sup>1</sup>ICR, Kyoto Univ., Japan, <sup>2</sup>GSS, Kyoto Univ., Japan, <sup>3</sup>Setsunan Univ., Japan
- ALPS15-5 Analysis of propagation modes in THz-hollow optical fibers by time-domain spectroscopy**  
10:15  
K. Ito<sup>1</sup>, T. Katagiri<sup>2</sup>, and Y. Matsuura<sup>1</sup>  
<sup>1</sup>Grad. School of Biomedical Eng., Tohoku Univ., Japan, <sup>2</sup>Grad. School of Eng., Tohoku Univ., Japan
- Break (10:30-11:00)-----

**11:00-12:00**

**ALPS16 : Terahertz-wave imaging**

**Room 416+417**

**Chair: C.-K. Sun, Program Committee Member**  
National Taiwan Univ., Taiwan

- ALPS16-1 (Invited) Recent Advances in Terahertz Cancer Imaging**  
11:00  
J.-H. Son  
Dept. of Phys., Univ. of Seoul, Korea
- ALPS16-2 THz spectroscopic imaging of concealed chemicals using is-TPG**  
11:30  
M. Kato<sup>1</sup>, K. Murate<sup>1</sup>, K. Imayama<sup>1</sup>, S. R. Tripathi<sup>1</sup>, K. Kawase<sup>1,2</sup>  
<sup>1</sup>Nagoya Univ., Japan, <sup>2</sup>RIKEN, Japan
- ALPS16-3 THz Frequency Combs generated from Off-axis THz Parametric Oscillator at Room Temperature**  
11:45  
Y.-C. Chiu<sup>1</sup>, T.-D. Wang<sup>2</sup>, P.-C. Wang<sup>1</sup>, Y.-C. Huang<sup>1</sup>  
<sup>1</sup>Inst. of Photonics Tech./Dept. of Electrical Eng., National Tsinghua Univ., Taiwan, <sup>2</sup>Chung-San Inst. of Sci. and Tech., Taiwan

----- Lunch Break (12:00-13:00)-----

**13:00-15:00**

**ALPS17 : Intense lasers**

**Room 416+417**

**Chair: H. Minamide, Program Committee Member**  
RIKEN, Japan

- Chair: H. Nishioka**  
Univ. Electro-Comm., Japan
- ALPS17-1 KTA-Based Optical Parametric Amplifiers at 3.4- $\mu$ m for Millijoule-Class Mid-Infrared Source**  
13:00  
F. M. Lu, T. Kanai, Y. Matsumoto, N. Ishiii, and J. Itatani  
The inst. for Solid State Phys., The Univ. of Tokyo, Japan
- ALPS17-2 0.6-3.2  $\mu$ m broadband supercontinuum generation in step-index Germania-core fiber**  
13:15  
K. Yin, B. Zhang, L. Yang, J. Yao, Z. Chen, and J. Hou  
College of Optoelectronic Sci. and Eng., National Univ. of Defense Tech., China
- ALPS17-3 Photoionization mechanisms and high-efficiency pulsed Lyman-alpha generation by resonant laser wave mixing in low pressure Kr-Ar gas**  
13:30  
O. A. Louchev<sup>1</sup>, N. Saito<sup>1</sup>, Y. Oishi<sup>3</sup>, K. Miyazaki<sup>1</sup>, K. Okamura<sup>1</sup>, J. Nakamura<sup>3</sup>, M. Iwasaki<sup>2</sup>, S. Wada<sup>1</sup>  
<sup>1</sup>RIKEN Center for Adv. Photonics, Japan, <sup>2</sup>Adv. Meson Sci. Lab., RIKEN, Japan, <sup>3</sup>Muon Sci. Lab., KEK-IMSS, Japan
- ALPS17-4 High-efficiency LBO-based femtosecond optical parametric oscillator**  
13:45  
W. Tian, X. Meng, N. Zhang, Z. Wang, J. Zhu, and Z. Wei  
<sup>1</sup>Beijing National Lab. for Condensed Matter Phys. Inst. of Phys., Chinese Academy of Sci., China, <sup>2</sup>School of Phys. and Optoelectronic Eng., Xidian Univ., China
- ALPS17-5 Towards an intra-cavity pulse energy of 100  $\mu$ J in an ultrafast Kerr lens mode-locked thin-disk ring oscillator**  
14:00  
A. A. Eilanlou<sup>1</sup>, Y. Nabekawa<sup>1</sup>, M. K.-Gonokami<sup>2,3</sup>, and K. Midorikawa<sup>1,2</sup>  
<sup>1</sup>RIKEN Center for Adv. Photonics, Japan, <sup>2</sup>Inst. for Photon Sci. and Tech., The Univ. of Tokyo, Japan, <sup>3</sup>Grad. School of Sci., The Univ. of Tokyo, Japan
- ALPS17-6 (Invited) Toward compact and ultra-intense laser based soft x-ray lasers**  
14:15  
S. Sebban<sup>1</sup>, A. Depresseux<sup>1</sup>, E. Oliva<sup>2</sup>, J. Gautier<sup>1</sup>, F. Tissandier<sup>1</sup>, J. Nejd<sup>3</sup>, M. Kozlova<sup>3</sup>, G. Maynard<sup>2</sup>, J.P. Goddet<sup>1</sup>, A. Tafzi<sup>1</sup>, A. Lifschitz<sup>1</sup>, H. T. Kim<sup>4</sup>, S. Jacquemot<sup>5</sup>, V. Malka<sup>1</sup>, K. Ta Phuoc<sup>1</sup>, C. Thaury<sup>1</sup>, P. Rousseau<sup>1</sup>, G. Iaquaniello<sup>1</sup>, T. Lefrou<sup>1</sup>, A. Flacco<sup>1</sup>, B. Vodungbo<sup>1</sup>, G. Lambert<sup>1</sup>, P. Zeitoun<sup>1</sup> and A. Rousse<sup>1</sup>  
<sup>1</sup>LOA, Univ. Paris-Saclay, France, <sup>2</sup>LPGP, CNRS-Univ., France, <sup>3</sup>ELI Beamlines Project, Czech Republic, <sup>4</sup>APRI GIST, Korea, <sup>5</sup>LULI, France
- ALPS17-7 High Power Short Pulse CO<sub>2</sub> Laser for HVM EUV Lithography**  
14:45  
H. Hamano, K. Nowak, T. Suganuma, Y. Kurosawa, Y. Kawasuji  
Gigaphoton Inc., Japan

-----Break (15:00-15:30)-----

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15:30-16:30

**ALPS18 : New sources**

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**Room 416+417**

**Chair: F. Kannari, Steering Committee Chair**

Keio Univ., Japan

**ALPS18-1 High-energy picosecond source based on an  
15:30 hybrid architecture**

J. Pouysegur<sup>1</sup>, F. Guichard<sup>1</sup>, Y. Zaouter<sup>1</sup>, Q. Mocaé<sup>1</sup>,  
M. Hanna<sup>2</sup>, F. Druon<sup>2</sup>, C. Hönninger<sup>2</sup>, E. Mottay<sup>2</sup>,  
and P. Georges<sup>2</sup>

<sup>1</sup>Amplitude Systèmes, France, <sup>2</sup>Lab. Charles Fabry,  
France

**ALPS18-2 A cryogenically cooled Nd:YLF laser with  
15:45 orthogonally polarized emission**

T.-L. Huang, C.-Y. Cho, Y.-F. Chen

Dept. of Electrophysics, National Chiao Tung Univ.,  
Taiwan

**ALPS18-3 Development of a 1 J Yb:YAG TRAM amplifier  
16:00 cooled by a closed-cycle cryocooler**

K. Iyama<sup>1,2</sup>, S. Tokita<sup>1</sup>, T. Kawashima<sup>2</sup>, J. Kawanaka<sup>1</sup>

<sup>1</sup>IIE, Osaka Univ., Japan, <sup>2</sup>Hamamatsu Photonics  
K.K., Japan

**ALPS18-4 High-power coherent beam combining (CBC):  
16:15 Beam quality and coupling efficiency in CBC**

H. Chosrowjan<sup>1</sup>, T. Kitamura<sup>1</sup>, S. Taniguchi<sup>1</sup>, M.  
Fujita<sup>1,2</sup>, K. Tsubakimoto<sup>2</sup>, H. Yoshida<sup>2</sup>, N.  
Miyanaga<sup>2</sup>, and Y. Izawa<sup>1</sup>

<sup>1</sup>Inst. for Laser Tech., Japan, <sup>2</sup>Inst. of Laser Eng.,  
Japan

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16:30

**Closing**

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**Room416+417**

16:30-16:40

**Award Ceremony**

**N. Nishizawa, Program Committee Chair**

Nagoya Univ., Japan

16:40-16:50

**Closing Remarks**

**F. Kannari, Steering Committee Chair**

Keio Univ., Japan

# Biomedical Imaging and Sensing Conference 2016

## BISC'16

Wednesday, May 18

**9:00-12:10 OPIC Plenary Session** Room 501+502

---- Break Lunch (12:10-13:30) ----

**13:30-16:30 BISC & OMC Joint Session**

Room 414+415

**Chairs: T. Omatsu (Chiba Univ., Japan)**  
**O. Matoba (Kobe Univ., Japan)**

**BISC&OMC-1 (Invited) Direct Real Time *En-face* Optical Coherence Tomography**  
**13:30**

A. Podoleanu<sup>1,4</sup>, A. Bradu<sup>1</sup>, S. Rivet<sup>1</sup>, K. Kapinchev<sup>2</sup>, F. Barnes<sup>2</sup>, M. Maria<sup>1,3</sup>, T. Feuchter<sup>3</sup>, L. Leick<sup>3</sup>, T. Garway-Heath<sup>4</sup>, P. Keane<sup>4</sup>, R. Rajendram<sup>4</sup>

<sup>1</sup>Appl. Opt. Univ. of Kent, UK, <sup>2</sup>School of Comput. Univ. of Kent, UK, <sup>3</sup>NKT Photonics A/S, Denmark, <sup>4</sup>Univ. Col. London, UK

**BISC&OMC-2 (Invited) Nanoscale Localization Sampling by Plasmonic Aperture Arrays for Imaging Molecular Events**  
**14:00**

D. Kim  
Yonsei Univ., Republic of Korea

**BISC&OMC-3 (Invited) Advanced Light Shaping for Biomedical Applications**  
**14:30**

K. Dholakia  
Univ. of St Andrews, UK

---- Break (15:00-15:30) ----

**BISC&OMC-4 (Invited) Improvements and Applications in "*in vivo*" Multi-photon Microscopy**  
**15:30**

T. Nemoto, R. Kawakami, T. Hibi, K. Otomo, S. Ipponjima, K. Sawada, A. Tanabe  
Hokkaido Univ., Japan

**BISC&OMC-5 Full-field Optical Coherence Tomography Using Ultrathin Forward-imaging Short Multimode Fiber**  
**16:00**

M. Sato<sup>1</sup>, D. Saito<sup>1</sup>, K. Shouji<sup>1</sup>, I. Nishidate<sup>2</sup>  
<sup>1</sup>Yamagata Univ., Japan, <sup>2</sup>Tokyo Univ. of Agriculture and Technology, Japan

**BISC&OMC-6 Optical Trapping of Quantum-dot Conjugated Cell Surface Molecules of Neuronal Cell Cultured onto a Plasmonic Chip**  
**16:15**

C. Hosokawa<sup>1</sup>, K. Miyauchi<sup>1,2</sup>, S. N. Kudoh<sup>2</sup>, T. Taguchi<sup>3</sup>, K. Tawa<sup>2</sup>  
<sup>1</sup>AIST, Japan, <sup>2</sup>Kwansei Gakuin Univ., Japan, <sup>3</sup>NICT, Japan

**18:00-20:00 OPIC Reception** Room 501+502

Thursday, May 19

**9:00-9:15 Opening** Room 419

**Opening Remark**

**9:00** T. Yatagai, Chair of BISC'16, Utsunomiya Univ., Japan

**9:15-10:45 BISC1: OCT, Phase Imaging** Room 419

**Chairs: O. Matoba (Kobe Univ., Japan)**

**B. Canse (Utsunomiya Univ., Japan)**

**BISC1-1 (Invited) Towards Intraoperative Evaluation of Microvascular Anastomosis Based on Fourier Domain Optical Coherence Tomography**  
**9:15**

Y. Huang  
Beijing Institute of Technology, China

**BISC1-2 (Invited) Dispersion-Insensitive Optical Coherence Tomography Based on Spectral Intensity Interferometry**  
**9:45**

T. Shirai  
AIST, Japan

**BISC1-3 Sensor-less Adaptive Optics Optical Coherence Tomography with a Liquid Crystal Wavefront Corrector and a 3.0 mm Beam**  
**10:15**

M. Reddikumar<sup>1</sup>, A. Tanabe<sup>2</sup>, N. Hashimoto<sup>2</sup>, B. Cense<sup>1</sup>

<sup>1</sup>Center for Optical Research and Education, Utsunomiya Univ., Japan, <sup>2</sup>Citizen Holding, Japan

**BISC1-4 Compact and Optical Table Free Quantitative Phase Microscope for non-Invasive Live Cell Imaging**  
**10:30**

T. Yamauchi, H. Yamada, K. Goto, Y. Ueda  
Hamamatsu Photonics K.K., Japan

---- Break (10:45-11:15) ----

**11:15-12:15 BISC2: Microscopy**

Room 419

**Chairs: G. Nishimura (Hokkaido Univ., Japan)**

**M. Sato (Yamagata Univ., Japan)**

**BISC2-1 (Invited) Emerging Endomicroscopy Technologies for Histological Imaging of Biological Tissues *in vivo***  
**11:15**

Xingde Li  
Johns Hopkins Univ., USA

**BISC2-2 High Resolution Imaging of Biological Cell by EXA Microscope with Electron Irradiation Damage Suppression**  
**11:45**

M. Fukuta<sup>1</sup>, Y. Nawa<sup>2</sup>, W. Inami<sup>2</sup>, Y. Kawata<sup>2</sup>  
<sup>1</sup>Shizuoka Univ., Japan, <sup>2</sup>RIE Shizuoka Univ., Japan

**BISC2-3 High Resolution Raman Imaging by Structured Line Illumination Microscopy**  
**12:00**

K. Watanabe<sup>1</sup>, A. F. Palonpon<sup>1</sup>, N. I. Smith<sup>2</sup>, L. Chiu<sup>3</sup>, A. Kasai<sup>4,5</sup>, H. Hashimoto<sup>4,6,7</sup>, S. Kawata<sup>1</sup>, K. Fujita<sup>1</sup>

<sup>1</sup>Osaka Univ., Japan, <sup>2</sup>IFReC, Osaka Univ., Japan, <sup>3</sup>Univ. of Tokyo, Japan, <sup>4</sup>Graduate School of Pharmaceutical Sciences, Osaka Univ., Japan, <sup>5</sup>Institute for Academic Initiatives, Osaka Univ., Japan, <sup>6</sup>Graduate School of Pharmaceutical Sciences, Osaka Univ., Japan, <sup>7</sup>Molecular Research Center for Children's Mental Development, United Graduate School of Child Development, Osaka Univ., Kanazawa Univ., Hamamatsu Univ. School of Medicine, Chiba Univ. and Univ. of Fukui, Japan.

---- Lunch Break (12:15-13:30) ----

**13:30-15:00 BISC3: Holography**

Room 419

Chairs: O. Matoba (Kobe Univ., Japan)  
Y. Awatsuji (Kyoto Inst. Tech., Japan)

**BISC3-1** (Invited) Spatial-spectral Biomedical  
13:30 Holographic Microscopy  
Y. Luo  
National Taiwan Univ., Taiwan

**BISC3-2** (Invited) Interferometric Generation of  
14:00 Vortex Beams from Gaussian Beam  
D. N. Naik, N. K. Viswanathan  
<sup>1</sup>Univ. of Hyderabad, India

**BISC3-3** 4D Imaging of Zebrafish Microcirculation  
14:30 by Digital Holography  
D. Donnarumma, A. Brodoline, D. Alexandre, M. Gross  
Laboratoire Charles Coulomb - UMR 5221 CNRS-Université de Montpellier, France

**BISC3-4** Non-axial-scanning Multifocal Confocal  
14:45 System with Volume Holographic Gratings  
P.-H. Wang<sup>1,2</sup> K.-B. Sung<sup>2,3</sup>, Y. Luo<sup>1,2</sup>  
<sup>1</sup>Inst. of Medical Device and Imaging, National Taiwan Univ., Taiwan, R.O.C, <sup>2</sup>Molecular Imaging Center, National Taiwan Univ., Taiwan, R.O.C, <sup>3</sup>National Taiwan Univ., Taiwan, R.O.C  
----- Break (15:00-15:30) -----

**15:30-18:00 Organized Session BISC4: Adaptive Optics: Pushing the boundaries of deep imaging in living cells and tissues**  
Room 419

Chairs: Y. Tamada (Natl. Inst. Basic Biol., Japan)  
M. Hattori (Natl. Inst. Basic Biol., Japan)

**15:30** Opening remark  
Y. Tamada (Natl. Inst. Basic Biol., Japan)

**BISC4-1** (Invited) Adaptive Optics from  
15:33 Microscopy to Nanoscopy  
Martin Booth  
Univ. Oxford, UK

**BISC4-2** (Invited) A Test Bench of General Purpose  
16:08 Adaptive Optics and its Application to Microscopy  
M. Hattori  
Natl. Inst. Basic Biol., Japan

**BISC4-3** (Invited) Super-resolution and Chromatic  
16:33 Correction above the Cover Slip  
A. Matsuda  
Natl. Inst. Inform. Commun. Tech., Japan

**BISC4-4** (Invited) A Practical Way to Use Adaptive  
16:58 Optics in Optical Coherence Tomography for Retinal Imaging  
B. Cense  
Utsunomiya Univ., Japan

**BISC4-5** (Invited) Adaptive Optical Microscopy  
17:23 Using Direct Wavefront Sensing  
J. Kubby  
Univ. California, USA

**17:58** Closing remark  
Y. Tamada (Natl. Inst. Basic Biol., Japan)

Friday, May 20

**9:00-10:00 BISC5: Multi-modal Imaging, Photo-acoustic Imaging**

Room 419

Chairs: T. Yasui (Tokushima Univ., Japan)  
K. Fujita (Osaka Univ., Japan)

**BISC5-1** (Invited) Label-free Multimodal Imaging  
9:00 for Discrimination of Cell Type and Pathogen Response  
N. Smith  
IFReC Osaka Univ., Japan

**BISC5-2** (Invited) Improvement of Imaging Speed  
9:30 and Contrast in Two-photon Photoacoustic Microscopy (TP-PAM)  
Y. Yamaoka  
Saga Univ., Japan  
----- Break (10:00-10:30) -----

**10:30-12:00 BISC6: Poster Session**

Exhibition Hall A

Chair: Y. Awatsuji (Kyoto Inst. Tech., Japan)

**BISC6p-1** Unstained Biological Cell Imaging Using a  
Phase-Contrast Scanning Optical  
Microscope with Annular illumination  
Y. Miyake<sup>1</sup>, M. Hisaka<sup>2</sup>, T. Ikuta<sup>3</sup>  
<sup>1</sup>Graduate School of Biomed. Eng., Osaka Electro-Communication Univ., Japan, <sup>2</sup>Dept. of Biomed. Eng., Osaka Electro-Communication Univ., Japan, <sup>3</sup>Dept. of Elect. and Electron. Eng., Osaka Electro-Communication Univ., Japan

**BISC6p-2** Non-scanning *in-vivo* Three-dimensional  
Structured Illumination Microscopy  
C.Y. Lin<sup>1,2</sup>, W.-H. Lin<sup>2,3</sup>, J.-H. Chien<sup>2</sup>, Y. Luo<sup>2,4</sup>

<sup>1</sup>Dept. of Electr. Eng. and Graduate Institute of Photonics and Optoelectronics, National Taiwan Univ., Taiwan ROC, <sup>2</sup>Institute of Medical Device and Imaging, National Taiwan Univ., Taiwan R.O.C, <sup>3</sup>School of Medicine, National Taiwan University, Taiwan R.O.C, <sup>4</sup>Molecular Imaging Center, National Taiwan Univ., Taiwan

**BISC6p-3** Real-time Phase Analysis by Differential  
Interference Contrast Microscope Using  
Pixelated Polarization Camera  
S. Shibata<sup>1</sup>, H. Ishiwata<sup>2</sup>, Y. Otani<sup>1</sup>, T. Yatagai<sup>1</sup>

<sup>1</sup>Utsunomiya Univ., Japan, <sup>2</sup>Olympus Corp., Japan

**BISC6p-4** Object Recovery from Diffused Light  
Vinu R. V, R.K. Singh  
Department of Physics, Indian Institute of Space Science and Technology (IIST), India

**BISC6p-5** Interference of Coherence Waves  
R.K. Singh<sup>1</sup>, S. Vyas<sup>2</sup>, Y. Miyamoto<sup>2</sup>

<sup>1</sup>Department of Physics, Indian Institute of Space Science and Technology (IIST), India, <sup>2</sup>Department of Engineering Sciences, The Univ. of Electro-Communications, Japan.

**BISC6p-6** Measuring Temporal Fluctuations of  
Optical Field Scattered from Cell-  
aggregate by Heterodyne Mach-Zehnder  
Interferometer

S. Wang<sup>1,2</sup>, H. Yamada<sup>1</sup>, T. Yamauchi<sup>1</sup>, K. Goto<sup>1</sup>, Y. Ueda<sup>1</sup>, H. Zhang<sup>2</sup>

<sup>1</sup>Hamamatsu Photonics K.K., Japan, <sup>2</sup>State Key Laboratory of Modern Optical

- BISC6p-7** Instrumentation, Zhejiang Univ., China  
**Phase Sensitive CT Measurement Using a Pixelated Polarizing Shearing Interferometer**  
 D. I. Serrano-Garcia<sup>1</sup>, Y. Otani<sup>1,2</sup>  
<sup>1</sup>Center of Optical Research and Education, Utsunomiya Univ., Japan, <sup>2</sup>Department of Optical Engineering, Utsunomiya Univ., Japan
- BISC6p-8** **Holographic Fluorescence Mapping Using Space-division Matching**  
 R. Abe<sup>1</sup>, M. Iwanaga<sup>2</sup>, H. Miyakawa<sup>3</sup>, Y. Hayasaki<sup>1</sup>  
<sup>1</sup>Center for Optical Research & Education (CORE), Utsunomiya Univ., Japan, <sup>2</sup>Faculty of Agriculture, Utsunomiya Univ., Japan, <sup>3</sup>Center for Bioscience Research and Education (CBRE), Utsunomiya Univ., Japan
- BISC6p-9** **Algorithm for Removing the Limitation of Intensity Ratio in Four-step Dual-wavelength Digital Holography Based on Phase-division Multiplexing**  
 T. Tahara<sup>1</sup>, K. Omae<sup>1</sup>, R. Otani<sup>2</sup>, Y. Arai<sup>1</sup>, Y. Takaki<sup>3</sup>  
<sup>1</sup>Faculty of Engineering Science, Kansai University, Japan, <sup>2</sup>Sigmakoki Co., Ltd., Japan, <sup>3</sup>Institute of Engineering, Tokyo Univ. of Agriculture and Technology, Japan
- BISC6p-10** **Color Digital Holographic Microscopy Using Speckle Illuminations for Removing Twin Image**  
 H. Funamizu, T.Q. Chen, Y. Aizu  
 Division of Mechanical Systems and Materials Engineering, Muroran Institute of Technology, Japan
- BISC6p-11** **Magnification and Wavelet Processing in Digital Inline Holographic Microscopy**  
 J.C. Aguilar<sup>1</sup>, M. Misawa<sup>1</sup>, K. Matsuda<sup>1</sup>, L. R. Berriel-Valdos<sup>2</sup>  
<sup>1</sup>Human Technology Research Institute, AIST, Japan, <sup>2</sup>Instituto Nacional de Astrofísica, Óptica y Electrónica, México
- BISC6p-12** **Phase Measurement by Parallel Phase-Shifting Digital Holographic Microscopy**  
 T. Fukuda<sup>1</sup>, P. Xia<sup>2</sup>, K. Nishio<sup>1</sup>, Y. Awatsuji<sup>1</sup>, O. Matoba<sup>2</sup>  
<sup>1</sup>Kyoto Institute of Technology, Japan, <sup>2</sup>Kobe Univ., Japan
- BISC6p-13** **Quantitative Imaging of Refractive Index of Transparent Object by Parallel Phase-shifting Digital Holography**  
 Y. Wang<sup>1</sup>, P. Xia<sup>2</sup>, Y. Awatsuji<sup>3</sup>, K. Nishio<sup>4</sup>, O. Matoba<sup>2</sup>  
<sup>1</sup>Graduate School of Science and Technology, Kyoto Institute of Technology, Japan, <sup>2</sup>Graduate School of System Informatics, Kobe Univ., Japan, <sup>3</sup>Faculty of Electrical Engineering and Electronics, Kyoto Institute of Technology, Japan, <sup>4</sup>Advanced Technology Center, Kyoto Institute of Technology, Japan
- BISC6p-14** **Numerical Simulation of Parallel Phase-shifting Digital Holographic Tomography**  
 M. Shinomura<sup>1</sup>, P. Xia<sup>2</sup>, Y. Awatsuji<sup>1</sup>, K. Nishio<sup>1</sup>, O. Matoba<sup>2</sup>
- BISC6p-15** **Miniaturization of Low-cost Portable Digital Holographic Microscopy**  
 S. Abiru, M. Sano, T. Shimobaba, T. Kakue, T. Ito  
 Graduate School of Engineering, Chiba Univ. Japan
- BISC6p-16** **In vivo Swept Source Optical Coherence Tomography Monitoring of Plant Seeds Treated with Different NaCl Concentrations**  
 N.K. Ravichandran<sup>1</sup>, R.E. Wijesinghe<sup>1</sup>, S.-Y. Lee<sup>2</sup>, M.F. Shirazi<sup>1</sup>, K. Park<sup>1</sup>, H.-Y. Jung<sup>2</sup>, M. Jeon<sup>1</sup>, J. Kim<sup>1</sup>  
<sup>1</sup>School of Electronics Engineering, College of IT Engineering, Kyungpook National Univ., Korea, <sup>2</sup>School of Applied Biosciences, Kyungpook National Univ., Korea
- BISC6p-17** **Bio-optical Measurement for the Morphological Analysis of Anthracnose Infected *Diospyros Kaki***  
 R.E. Wijesinghe<sup>1</sup>, S.-Y. Lee<sup>2</sup>, R.N. Kumar<sup>1</sup>, R.K. Jha<sup>1</sup>, H.-Y. Jung<sup>2</sup>, M. Jeon<sup>1</sup>, J. Kim<sup>1</sup>  
<sup>1</sup>School of Electronics Engineering, College of IT Engineering, Kyungpook National Univ., Korea, <sup>2</sup>School of Applied Biosciences, Kyungpook National Univ., Korea
- BISC6p-18** **Spectral Domain Optical coherence tomography Using Wavelet Transform**  
 T. Serizawa<sup>1</sup>, T. Suzuki<sup>1</sup>, S. Choi<sup>2</sup>, O. Sasaki<sup>2</sup>  
<sup>1</sup>Niigata Univ., Graduate School of Science and Technology, Japan, <sup>2</sup>Niigata University, Faculty of Engineering, Japan
- BISC6p-19** **Dual Path Handheld System for Cornea and Retina Imaging Using Optical Coherence Tomography**  
 M.F. Shirazi, R.E. Wijesinghe, K. Park, M. Jeon, J. Kim  
 School of Electronics Engineering, College of IT Engineering, Kyungpook National Univ., Korea
- BISC6p-20** **Monte Carlo Study for Traumatic Brain Edema Treatment Based on Near-infrared Spectrum**  
 Z. Qian, Y. Liu, W. Li  
 Department of Biomedical Engineering, Nanjing Univ. of Aeronautics and Astronautics, China
- BISC6p-21** **Real-Time Spectroscopic Monitoring of Thermal Damage in Laser Induced Thermotherapy of Porcine Liver**  
 L. Dai, A. Qian, G. Hua  
 Department of Mechanical Engineering, Nantong University, China
- BISC6p-22** **Experimental Estimation of Influence of Cosmetic Foundation on Optical Path Length in the Skin**  
 R. Sato, M. Kato, E. Okada  
 Department of Electronics and Electrical Engineering, Keio Univ., Japan

- BISC6p-23** **Theoretical and Numerical Analysis of Light Reflection from the Human Skin Based on Wave Optics**  
R. Sakai<sup>1</sup>, T. Igarashi<sup>2</sup>, M. Takabayashi<sup>1</sup>, T. Okamoto<sup>1</sup>  
<sup>1</sup>Graduate School of Computer Science and Systems Engineering, Kyushu Institute of Technology, Japan, <sup>2</sup>Kao Corporation, Japan
- BISC6p-24** **Simulation of Spectral Reflectance Image in Human Skin Model Having a Measured Surface Texture by Ray Tracing**  
T. Yuasa<sup>1</sup>, K. Mizunuma<sup>1</sup>, R. Goto<sup>1</sup>, T. Maeda<sup>2</sup>, H. Funamizu<sup>1</sup>, Y. Aizu<sup>1</sup>  
<sup>1</sup>Muroran Institute of Technology, Japan, <sup>2</sup>Kushiro National College of Technology, Japan
- BISC6p-25** **Near-Infrared Reflectance Spectroscopy System for Noninvasive Estimation of Skin Hydration**  
I. Saknite<sup>1</sup>, A. Zavorins<sup>2</sup>, J. Spigulis<sup>1</sup>, J. Kisis<sup>2</sup>  
<sup>1</sup>Institute of Atomic Physics and Spectroscopy, University of Latvia, Latvia, <sup>2</sup>Department of Infectology and Dermatology, Riga Stradins Univ., Latvia
- BISC6p-26** **Non-contact Measurement of Heart Rate Variability Using Time Series Color Images of Human Skin**  
Y. Aoki<sup>1</sup>, A. Hoshi<sup>1</sup>, K. Nakano<sup>2</sup>, K. Niizeki<sup>3</sup>, Y. Aizu<sup>4</sup>, I. Nishidate<sup>1</sup>  
<sup>1</sup>Graduate School of Bio-Applications & Systems Engineering, Tokyo Univ. of Agriculture and Technology, Japan, <sup>2</sup>Faculty of Science, Tokyo Univ. of Science, Japan, <sup>3</sup>Graduate School of Science and Engineering Yamagata Univ., Japan, <sup>4</sup>Graduate School of Mechanical Systems and Materials Engineering, Muroran Institute of Technology, Japan
- BISC6p-27** **Optical Spectroscopy of Ketone Bodies for Blood Screening of Diabetes**  
C.H. Lin<sup>1</sup>, M. Iigo<sup>2</sup>, M. Ogawa<sup>3</sup>, N. Anzai<sup>4</sup>, T. Yatagai<sup>1</sup>  
<sup>1</sup>Center for Optical Research and Education, Utsunomiya Univ., Japan, <sup>2</sup>Center for Bioscience Research and Education, Utsunomiya Univ., Japan, <sup>3</sup>Faculty of Science and Engineering, Teikyo Univ., Japan, <sup>4</sup>Department of Pharmacology and Toxicology, Dokkyo Medical Univ., Japan
- BISC6p-28** **Extensive Pelagic Spectroscopic Measurement Using an Ultrasonically Assisted Unit Based on a Traveling Wave**  
K. Mori<sup>1</sup>, K. Nogo<sup>1</sup>, M. Yoshida<sup>1</sup>, P.K.W. Abeygunawardhana<sup>1</sup>, S. Suzuki<sup>1</sup>, A. Nishiyama<sup>2</sup>, K. Wada<sup>2</sup>, I. Ishimaru<sup>1</sup>  
<sup>1</sup>Faculty of Engineering Kagawa Univ., Japan, <sup>2</sup>Faculty of Medicine Kagawa Univ., Japan
- BISC6p-29** ***In vivo* Photoacoustic Imaging of Rehabilitation Process of Mouse after Traumatic Brain Injury**  
W. Li<sup>1</sup>, H. Wang<sup>1,2</sup>, L. Nie<sup>2</sup>, Z. Qian<sup>1</sup>  
<sup>1</sup>Department of Biomedical Engineering, Nanjing Univ. of Aeronautics and Astronautics, China, <sup>2</sup>School of Public Health, Xiamen Univ., China
- BISC6p-30** **High Sensitivity Terahertz Electron Paramagnetic Resonance Spectroscopy**  
M. Grosman<sup>1</sup>, A. Larkin<sup>2</sup>  
<sup>1</sup>Universite Louis Pasteur de Strasbourg, France, <sup>2</sup>National Research Nuclear University MEPHI, Russia
- BISC6p-31** **Estimation of Stress Condition Based on Autonomic Nervous Function by Bio-Speckle Imaging**  
N. Yokoi<sup>1</sup>, Y. Shimatani<sup>2</sup>, M. Kyoso<sup>2</sup>, H. Funamizu<sup>3</sup>, Y. Aizu<sup>3</sup>  
<sup>1</sup>Department of Mechanical Systems Engineering, Asahikawa National College of Technology, Japan, <sup>2</sup>Biomedical Engineering Department, Tokyo City University, Japan, <sup>3</sup>Division of Science for Composite Functions, Muroran Institute of Technology, Japan
- BISC6p-32** **Simultaneous Imaging of Blood Flow and Blood Concentration Change Using Laser Speckle in Fiber Illumination**  
T. Shinohara<sup>1</sup>, N. Yokoi<sup>2</sup>, H. Funamizu<sup>1</sup>, T. Yuasa<sup>1</sup>, Y. Aizu<sup>1</sup>  
<sup>1</sup>Muroran Institute of Technology, Japan, <sup>2</sup>Asahikawa National College of Technology, Japan
- BISC6p-33** **Visual Evoked Potential of Stereoscopic Vision in Brain Networks**  
L. Xing, X. Wang, Z. Qian, D. Fang  
Department of Biomedical Engineering, Nanjing Univ. of Aeronautics and Astronautics, China
- BISC6p-34** **Imaging of Tissue Oxygen Saturation in Ocular Fundus of Rat Using a Digital RGB Camera**  
R. Hirofujii, I. Nishidate  
Graduate School of Bio-Applications & Systems Engineering, Tokyo Univ. of Agriculture and Technology, Japan
- BISC6p-35** **Imaging of Regional Cerebral Oxygen Saturation of Rat with a Digital Red-green-blue Camera**  
Y. Harasaki<sup>1</sup>, I. Nishidate<sup>1</sup>, S. Kawauchi<sup>2</sup>, S. Sato<sup>2</sup>, M. Sato<sup>3</sup>, Y. Kokubo<sup>4</sup>  
<sup>1</sup>Graduate School of Bio-Applications & Systems Engineering, Tokyo Univ. of Agriculture and Technology, Japan, <sup>2</sup>Division of Biomedical Information Sciences, National Defense Medical College Research Institute, Japan, <sup>3</sup>Graduate School of Science and Engineering, Yamagata Univ., Japan
- BISC6p-36** **Improvement of Source-collector Geometries in Single Reflectance Fiber Probe System for *in vivo* Estimation of Optical Properties in Brain Tissue**  
T. Tanabe<sup>1</sup>, I. Nishidate<sup>1</sup>, S. Kawauchi<sup>2</sup>, S. Sato<sup>2</sup>, M. Sato<sup>3</sup>  
<sup>1</sup>Graduate School of Bio-Applications & Systems Engineering, Tokyo Univ. of Agriculture and Technology, Japan,

- <sup>2</sup>Division of Biomedical Information Sciences, National Defense Medical College Research Institute, Japan, <sup>3</sup>Graduate School of Science and Engineering, Yamagata Univ., Japan
- BISC6p-37** **Estimation of Scattering Characteristics of Artificial Scattering Medium by Lamination Technique with Shifted Structure**  
N. Nakatani<sup>1,2</sup>, W. Yan<sup>1</sup>, O. Matoba<sup>1</sup>  
<sup>1</sup>Graduate school of System Informatics, Kobe Univ., Japan, <sup>2</sup>SCREEN Holdings Co., Ltd., Japan
- BISC6p-38** **Experimental Verification of Optical Power Ratio Distribution to Extract Absorbers in Scattering Media**  
T. Yamaoki, Y. Hamada, O. Matoba  
Graduate School of System Informatics, Kobe Univ. Japan
- BISC6p-39** **Infrared Thermal Imaging by Bundled Tube-leaky Hollow Optical Fibers**  
T. Kobayashi<sup>1</sup>, T. Katagiri<sup>2</sup>, Y. Matsuura<sup>1</sup>  
<sup>1</sup>Graduate School of Biomedical Engineering, Tohoku Univ., Japan, <sup>2</sup>Graduate School of Engineering, Tohoku Univ., Japan
- BISC6p-40** **Long-period Fiber Grating Biomedical Sensor Based on Dual-peak Resonance near PMTP**  
Z. Gu, Q. Ling  
College of Science, Univ. of Shanghai for Sci. and Tech., China
- BISC6p-41** **Application of CVD-diamonds Films for Sensing Selected Blood Component**  
D. Milewska<sup>1</sup>, M. Ficek<sup>1</sup>, K. Karpienko<sup>1</sup>, M. Wąsowicz<sup>2</sup>, P. Niedziałkowski<sup>3</sup>, T. Ossowski<sup>3</sup>, M. Jędrzejewska-Szczerska<sup>1</sup>  
<sup>1</sup>Department of Metrology and Optoelectronics, Faculty of Electronics, Telecommunications and Informatics, Gdańsk Univ. of Technology, Poland, <sup>2</sup>Department of Morphological Sciences, Faculty of Veterinary Medicine, Warsaw Univ. of Life Sciences, Poland, <sup>3</sup>Faculty of Chemistry, Univ. of Gdansk, Poland
- BISC6p-42** **Lipid Nanoparticles Encapsulating Near-infrared Dye as a Non-targeted Exogenous Contrast Agent to Improve the Resolution for Angiography**  
Jia-You Fang<sup>1</sup>, C.-J. Wen<sup>2</sup>, Y.-H. Huang<sup>1</sup>  
<sup>1</sup>Pharmaceutics Laboratory, Graduate Institute of Natural Products, Chang Gung Univ., Taiwan, <sup>2</sup>Center for Vascularized Composite Allotransplantation, Chang Gung Memorial Hospital, Taiwan
- BISC6p-43** **Choosing the Right Video Interface for Medical Imaging Systems**  
J. Phillips  
Pleora Technologies, Canada
- BISC6p-44** **Compressive Sensing for an Imaging Method with One Dimensional Hadamard Patterns Illumination**  
K. Morimoto, S. Hayashi, K. Nitta, O. Matoba  
Graduate of System Informatics, Kobe Univ.
- Japan
- BISC6p-45** **Experimental Verification for a Method for Computational Ghost Imaging with Laser Array Modulation**  
C. Kitada, K. Nitta, O. Matoba  
Graduate of System Informatics, Kobe Univ.  
Japan
- Lunch Break (12:00-13:00) -----
- 13:00-15:00** **BISC7: Nano, Fluorescence, Spectral Imaging, Biosensor**
- Room 419
- Chairs: Y. Matsuura (Tohoku Univ., Japan)**  
**I. Ishimaru (Kagawa Univ., Japan)**
- BISC7-1** **(Invited) Application of Fluorescent Nanodiamonds to Bio-imaging**  
13:00  
Y. Harada  
Kyoto Univ., Japan
- BISC7-2** **(Invited) Integrated Differential Si-Ring Resonator Biosensors for Selective Detection of Antigen-Antibody Reaction**  
13:30  
S. Yokoyama<sup>1,2</sup>, T. Taniguchi<sup>2,1</sup>, T. Ikeda<sup>3,1</sup>, A. Kuroda<sup>3,1</sup>  
<sup>1</sup>Res. Inst. Nanodevice and Bio Sys., Hiroshima Univ., Japan, <sup>2</sup>Dept. Semicon. Electr. Integ. Sci., Hiroshima Univ., Japan, <sup>3</sup>School of Advanced Sci. Matter, Hiroshima Univ., Japan
- BISC7-3** **Optical Far-field Nanoscopy with Local Probes**  
14:00  
X. Chen, F. Sun  
Univ. of Science and Technology of China, China
- BISC7-4** **Enhanced Imaging of Lipid in Atherosclerotic Tissue-mimicking Phantom by Multispectral Angioscope at Wavelengths around 1200 nm**  
14:15  
D. Matsui<sup>1</sup>, K. Ishii<sup>1</sup>, K. Awazu<sup>1,2,3</sup>  
<sup>1</sup>Graduate School of Eng., Osaka Univ., Japan, <sup>2</sup>Graduate School of Frontier Biosciences, Osaka Univ., Japan, <sup>3</sup>Global Center for Med. Eng. Informat., Osaka Univ., Japan
- BISC7-5** **Bayesian-based Localization of Fluorescence-encoded Images for Single Shot Super-resolution Fluorescence Imaging**  
14:30  
H. Kimura, T. Nishimura, Y. Ogura, J. Tanida  
Osaka Univ., Japan
- BISC7-6** **Combined Far-field and Near-field Imaging Using a Multimodal Architecture**  
14:45  
S. G. Stanciu, C. Stoichita, R. Hristu, D. E. Tranca, G. A. Stanciu  
Univ. Politehnica of Bucharest, Romania
- Break (15:00-15:25) -----
- 15:25-17:55** **BISC8: Brain imaging, spectral imaging, image processing**
- Room 419
- Chairs: E. Okada (Keio Univ., Japan)**  
**Y. Otani (Utsunomiya Univ., Japan)**
- BISC8-1** **(Invited) Visible Brain-wide Networks at Single-neuron Resolution**  
15:25  
Q. Luo

|                                |   |                                       |   |
|--------------------------------|---|---------------------------------------|---|
|                                | Huazhong Univ. of Science and Technology,<br>China  |                                       | Barkova <sup>3</sup>  |
| <b>BISC8-2</b><br><b>15:55</b> | <b>A New Strategy of the Time-domain<br/>Fluorescence Imaging for a Semi-infinite<br/>Turbid Media</b><br>K. Prieto, G. Nishimura<br>Hokkaido Univ., Japan  | <b>BISC8-9</b><br><b>17:40</b>        | <sup>1</sup> Universidad de las Fuerzas Armadas ESPE,<br>Ecuador, <sup>2</sup> Colegio Fiscal Eloy Alfaro,<br>Ecuador, <sup>3</sup> Siberian Federal Univ., Russia  |
| <b>BISC8-3</b><br><b>16:10</b> | <b>Determination of Anisotropy Factor<br/>Spectrum for Biological Tissue Based on<br/>Spectroscopic Measurement of Scattering<br/>Angular Distributions</b><br>M. Iwamoto <sup>1</sup> , K. Ishii <sup>1</sup> , D. Fukutomi <sup>1</sup> , D.<br>Matsui <sup>1</sup> , K. Awazu <sup>1,2,3</sup><br><sup>1</sup> Graduate School of Eng., Osaka Univ.,<br>Japan, <sup>2</sup> Graduate School of Frontier<br>Biosciences, Osaka Univ. Japan, <sup>3</sup> Global<br>Center for Med. Eng. Informat., Osaka Univ.<br>Japan   |                                       | <b>Acousto-optic Enhancement of Image<br/>Contrast for Morphological Diagnostics<br/>Cancer</b><br>K. B. Yushkov <sup>1</sup> , V. Y. Molchanov <sup>1</sup> , S. I.<br>Chizhikov <sup>1</sup> , P. V. Belousov <sup>2</sup> , A. Y.<br>Abrosimov <sup>3</sup><br><sup>1</sup> National Univ. of Science and Technology,<br>Russia, <sup>2</sup> Faculty of Biology, Lomonosov<br>Moscow State Univ., Russia,<br><sup>3</sup> Federal State Institution, Russia |
| <b>BISC8-4</b><br><b>16:25</b> | <b>Brillouin Imaging/Sensing via Time-<br/>Resolved Optical (BISTRO)<br/>Measurements</b><br>C. W. Ballmann, Z. Meng, G. I. Petrov, V. V.<br>Yakovlev<br>Texas A&M University, USA  | <b>17:55-18:00</b>                    | <b>Closing</b> Room 419   |
| <b>BISC8-5</b><br><b>16:40</b> | <b>In vivo Imaging of Hemodynamics in Liver<br/>Tissue during Ischemia- Reperfusion<br/>Based on Spectrocolorimetry</b><br>S. Akter <sup>1</sup> , S. Maejima <sup>2</sup> , S. Kawauchi <sup>3</sup> , S.<br>Sato <sup>3</sup> , A. Hinoki <sup>2</sup> , S. Aosasa <sup>2</sup> , J. Yamamoto <sup>2</sup> ,<br>I. Nishidate <sup>1</sup><br><sup>1</sup> Graduate School of Bio-Appl. Sys. Eng.,<br>Tokyo Univ. of Agriculture and Technology,<br>Japan <sup>2</sup> Dept. of Surgery, National Defense<br>Medical College, Japan, <sup>3</sup> Division of<br>Biomedical Information Sciences, National<br>Defense Medical College Research Institute,<br>Japan | <b>Closing Remark</b><br><b>17:55</b> | O. Matoba, Kobe Univ., Japan  |
| <b>BISC8-6</b><br><b>16:55</b> | <b>Evaluation of Spontaneous Low-<br/>frequency Oscillations in Cerebral<br/>Intrinsic Optical Signals with a Digital<br/>Red-green-blue Camera</b><br>A. Mustari <sup>1</sup> , Y. Aoki <sup>1</sup> , I. Nishidate <sup>1</sup> , S.<br>Kawauchi <sup>2</sup> , S. Sato <sup>2</sup> , M. Sato <sup>3</sup><br><sup>1</sup> Graduate School of Bio-Appl. Sys. Eng.,<br>Tokyo Univ. of Agriculture and Technology,<br>Japan, <sup>2</sup> Division of Biomedical Information<br>Sciences, National Defense Medical College<br>Research Institute, Japan, <sup>3</sup> Graduate School<br>of Science and Engineering, Yamagata Univ.<br>Japan                       |                                       |   |
| <b>BISC8-7</b><br><b>17:10</b> | <b>Noncontact Image Sensing of Pulse Wave<br/>Velocity Using Digital Red-Green-Blue<br/>Images</b><br>K. Nakano <sup>1</sup> , Y. Aoki <sup>2</sup> , R. Satoh <sup>2</sup> , H. Suzuki <sup>3</sup> ,<br>I. Nishidate <sup>2</sup><br><sup>1</sup> Faculty of Sci. Division, Tokyo Univ. of<br>Science, Japan, <sup>2</sup> Graduate School of Bio-<br>appl. Sys. Eng., Tokyo Univ. of Agriculture<br>and Technology, Japan, <sup>3</sup> Imaging Science<br>and Engineering Laboratory, Tokyo Institute<br>of Technology, Japan   |                                       |   |
| <b>BISC8-8</b><br><b>17:25</b> | <b>Processing Dental Images by Shearlet<br/>Transform</b><br>L. Cadena <sup>1</sup> , N. Espinosa <sup>1</sup> , F. Cadena <sup>2</sup> , D.  |                                       |   |



# Conference on Laser Energy Science 2016

## CLES2016

Tuesday May 17

**9:00 – 9:15 Opening** Room 418

### **Opening Remarks**

**9:00 H. Azechi**  
Conference Chair of CLES2016,  
Director, Institute of Laser Engineering, Osaka  
Univ., Japan  
**H. Shiraga**  
Co-Chair of FIWS2016,  
Institute of Laser Engineering, Osaka Univ.,  
Japan

### **9:15-10:30 CLES1 : Integrated Experiment (Electron)**

Room 418

**Chair: P. Norreys**, Univ. Oxford, UK

#### **CLES1-1 (Invited) Where Do the Fast Electrons Deposit Energy in Laser-Compressed High-Density Fast-Ignition Targets?**

**9:15** F. Beg<sup>1</sup>, C. Jarrott<sup>1</sup>, M. Wei<sup>2</sup>, C. McGuffey<sup>1</sup>, A. Solodov<sup>3</sup>, W. Theobald<sup>3</sup>, C. Stoeckl<sup>3</sup>, R. Betti<sup>3</sup>, H. Chen<sup>4</sup>, H., Habara<sup>5</sup>, H. Mclean<sup>4</sup>, P. Patel<sup>4</sup>, J. Santos<sup>6</sup>, H. Sawada<sup>7</sup>, Rich, Stephens<sup>2</sup>, and Toshi Yabuuchi<sup>5</sup>

<sup>1</sup>Center for Energy Research, Univ. of California at San Diego, USA <sup>2</sup>General Atomics, San Diego, USA <sup>3</sup>Laboratory for Laser Energetics, Univ. of Rochester, USA <sup>4</sup>Lawrence Livermore National Laboratory, USA <sup>5</sup>Osaka Univ., Japan <sup>6</sup>Centre Lasers Intenses et Applications, Univ. of Bordeaux, France <sup>7</sup>Univ. of Nevada, USA

#### **CLES1-2 (Invited) Progress of FIREX Project in Japan.**

**9:45** S. Fujioka<sup>1</sup>, and FIREX Project Team<sup>1</sup>  
<sup>1</sup>Institute of Laser Engineering, Osaka Univ.,  
Japan

#### **CLES1-3 First Demonstration of Heating Effect in Indirect-Drive Integrated Fast Ignition Experiment,**

**10:15** Y. Gu  
Laser Fusion Research Center, CAEP, China

---- Break (10:30-11:00) ----

### **11:00-12:30 CLES2 : Electron Transport and Generation**

Room 418

**Chair: S. Fujioka**, Osaka Univ., Japan

#### **CLES2-1 Study of Magnetic Instability on the Divergence of Ultraintense Laser-Driven Electrons**

**11:00** X. Yang, B. Xu, Z. Ge, H. Zhuo, and Y. Ma  
College of Science, National Univ. of Defense  
Technology, China

#### **CLES2-2 Selectron Transport in The Background Plasma with Steep Density Gradient**

**11:15** Y. Hayashi<sup>1</sup>, A. Das<sup>2</sup>, H. Habara<sup>1</sup>, P. Kaw<sup>2</sup>, K. A. Tanaka<sup>1</sup>  
<sup>1</sup>Osaka Univ., Japan, <sup>2</sup>Institute of Plasma  
Research, India

#### **CLES2-3 High Current Electron Beam Transport in Fast Ignition**

**11:30** L. Cao<sup>1,2,3</sup>

#### **CLES2-4 Investigation of Resistive Guiding of Fast Electrons in Ultra Intense Laser-Solid Interactions**

**11:45** K. Lancaster<sup>1</sup>, N. Booth<sup>2</sup>, J. Green<sup>2</sup>, C. Murphy<sup>1</sup>, C. Ridgers<sup>1</sup>, and A. Robinson<sup>2</sup>  
<sup>1</sup>York Plasma Institute, Department of Physics,  
Univ. of York, UK <sup>2</sup>Central Laser Facility, STFC  
Rutherford Appleton Laboratory, UK

#### **CLES2-5 Resistivity Gradient Based Guiding of Fast Electrons in the Inverse Conical Taper Configuration**

**12:00** A. Robinson<sup>1</sup>, and H. Schmitz<sup>1</sup>  
<sup>1</sup>Plasma Physics Group, Central Laser Facility,  
STFC Rutherford-Appleton Laboratory, UK

#### **CLES2-6 Characteristics of Fast Electrons Generated by Multi Beam of LFEX Laser**

**12:15** M. Hata<sup>1</sup>, H. Sakagami<sup>2</sup>, T. Johzaki<sup>3</sup>, Y. Ssentoku<sup>4</sup>, and H. Nagatomo<sup>1</sup>

<sup>1</sup>Institute of Laser Engineering, Osaka Univ.,  
Japan, <sup>2</sup>National Institute for Fusion and  
Sciences, Japan, <sup>3</sup>Hiroshima Univ., Japan <sup>4</sup>Univ.  
of Nevada, USA

---- Break (12:30-13:30) ----

### **13:30-15:30 CLES3 : Proton Fast Ignition**

Room 418

**Chair: J. Fernandez**, Los Alamos National Laboratory, USA

#### **CLES3-1 (Invited) Progress in Fundamental and Applied Proton Fast Ignition Research**

**13:30** C. McGuffey<sup>1</sup>, J. Kim<sup>1</sup>, M.-S. Wei, H. Habara<sup>3</sup>, T. Yabuuchi<sup>3,8</sup>, K. Tanaka<sup>3</sup>, W. Theobald<sup>4</sup>, B. Qiao<sup>1</sup>, F.-N. Beg<sup>1</sup>, S.-N. Chen<sup>5</sup>, P.-M. Nilson<sup>4</sup>, R. Stephens<sup>2</sup>, J. Fuchs<sup>5</sup>, M. Foord<sup>6</sup>, H. Mclean<sup>6</sup>, H. Shiraga<sup>7</sup>

<sup>1</sup>Univ. of California San Diego, USA, <sup>2</sup>General  
Atomics, USA, <sup>3</sup>Osaka Univ., Japan <sup>4</sup>Laboratory  
for Laser Energetics, Rochester, USA, <sup>5</sup>LULL,  
École Polytechnique, CNRS, CEA, UPMC,  
France, <sup>6</sup>Lawrence Livermore National  
Laboratory, USA, <sup>7</sup>Institute of Laser Engineering,  
Osaka Univ., Japan, <sup>8</sup>(currently) RIKEN,  
Spring-8 Center, Japan

#### **CLES3-2 (Invited) Proton Fast Ignition Scheme Revisited**

**14:00** J. Honrubia<sup>1</sup>, A. Morace<sup>2</sup> and M. Murakami<sup>2</sup>  
<sup>1</sup>School of Aerospace Engineering, Polytechnic  
Univ. of Madrid, Spain, <sup>2</sup>Institute of Laser  
Engineering, Osaka Univ., Japan

#### **CLES3-3 Integrated Simulations of Core Heating for Ion Assisted Fast Ignition**

**14:30** H. Sakagami<sup>1</sup>, T. Johzaki<sup>2</sup>, A. Sunahara<sup>3</sup>, and H. Nagatomo<sup>4</sup>

<sup>1</sup>Fundamental Physics Simulation Division,  
National Institute for Fusion Science, Japan, <sup>2</sup>  
Graduate School of Engineering, Hiroshima  
Univ., Japan, <sup>3</sup>Institute for Laser Technology,  
Japan, <sup>4</sup>Institute of Laser Engineering, Osaka  
Univ., Japan

**CLES3-4  
14:45 Proton Fast Ignition: Limits of the Classic Method and Alternative Approaches.**

A. Morace<sup>1</sup>, J. Honrubia<sup>2</sup>, T. Johzaki<sup>3</sup>, H. Sakagaami<sup>4</sup>, S. Fujioka<sup>1</sup>, A. Yogo<sup>1</sup>, M. Murakami<sup>1</sup>, Y. Arikawa<sup>1</sup>, S. Kojima<sup>1</sup>, S. Sakata<sup>1</sup>, Y. Abe<sup>1</sup>, N. Kamitsukasa<sup>1</sup>, S.-H. Lee<sup>1</sup>, S. Tosaki<sup>1</sup>, K. Matsuo<sup>1</sup>, A. Sagisaka<sup>5</sup>, K. Kondo<sup>5</sup>, A. Pirozhkov<sup>5</sup>, T. Norimatsu<sup>1</sup>, T. Jitsuno<sup>1</sup>, N. Miyanaga<sup>1</sup>, H. Shiraga<sup>1</sup>, M. Nakai<sup>1</sup>, H. Nishimura<sup>1</sup> and H. Azechi<sup>1</sup>

<sup>1</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>2</sup>ETSIA, Univ. Politecnica de Madrid, Spain, <sup>3</sup>Graduate School of Engineering, Hiroshima Univ., Japan, <sup>4</sup>National Institute of Fusion Science, Japan, <sup>5</sup>Kansai Photon Science Institute, Japan Atomic Energy Agency, Japan

**CLES3-5  
15:00 Fast Ignition Using Shock Accelerated Ions in the Target Corona**

E. Boella<sup>1</sup>, R. Bingham<sup>2</sup>, R. Cairns<sup>3</sup>, P. Norreys<sup>2,4</sup>, R. Trines<sup>2</sup>, M. Vranic<sup>1</sup> and L. Silva<sup>1</sup>

<sup>1</sup>Centro de Fisicade Plasma, Instituto Superior Tecnico, Portugal, <sup>2</sup>STFC Rutherford Appleton Laboratory, UK, <sup>3</sup>Univ. of St. Andrews, UK, <sup>4</sup>Univ. of Oxford, UK

**CLES3-5  
15:15 Effect of Resistivity Gradient on Laser Driven Electron Transport and Ion Acceleration**

H. Zhuo<sup>1</sup>, X. Yang<sup>1</sup>, and S. Zhang<sup>1</sup>  
<sup>1</sup>College of Science, National Univ. of Defense Technology, China

----- Break (15:30-16:00) -----

**16:00-18:00 CLES4 : Ion Acceleration**

Room 418

**Chair: M. Roth**, Technische Univ., Darmstadt, Germany

**CLES4-1  
16:00 (Invited) Towards Spectral Control of Laser-Driven Ion Beams Generated in the Relativistic Transparency Regime**

J. Fernandez<sup>1</sup>, S. Palaniyappan<sup>1</sup>, C. Huang<sup>1</sup>, D. Gautier<sup>1</sup>, C. Hamilton<sup>1</sup>, M. Santiago<sup>1</sup>, C. Kreuzer<sup>2</sup>, and R. Shah<sup>1</sup>

<sup>1</sup>Los Alamos National Laboratory, USA, <sup>2</sup>Ludwig-Maximilian-Univ., Germany

**CLES4-2  
16:30 (Invited) Anomalous Electron Heating and Ion Acceleration with High Contrast Laser Pulses on LFEX**

A. Yogo<sup>1</sup>, N. Iwata<sup>1</sup>, K. Mima<sup>2</sup>, A. Morace<sup>1</sup>, S. Tosaki<sup>1</sup>, S. Fujioka<sup>1</sup>, Y. Arikawa<sup>1</sup>, Y. Abe<sup>1</sup>, S. Kojima<sup>1</sup>, S. Sakata<sup>1</sup>, S.-H. Lee<sup>1</sup>, K.-F. Law<sup>1</sup>, K. Matsuo<sup>1</sup>, H. Nagatomo<sup>1</sup>, A. Sunahara<sup>2</sup>, T. Johzaki<sup>3</sup>, H. Sakagami<sup>5</sup>, T. Ozaki<sup>5</sup>, T. Sano<sup>1</sup>, Y. Fujimoto<sup>1</sup>, K. Yamanoi<sup>1</sup>, T. Norimatsu<sup>1</sup>, S. Tokita<sup>1</sup>, Y. Nakata<sup>1</sup>, J. Kawanaka<sup>1</sup>, T. Jitsuno<sup>1</sup>, N. Miyanaga<sup>1</sup>, M. Nakai<sup>1</sup>, H. Nishimura<sup>1</sup>, H. Shiraga<sup>1</sup>, S. Bulanov<sup>6</sup>, A. Sagisaka<sup>5</sup>, K. Ogura<sup>5</sup>, K. Kondo<sup>6</sup>, and H. Azechi<sup>1</sup>

<sup>1</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>2</sup>The Graduate School for the Creation of New Photon Industries, Japan, <sup>3</sup>Institute for Laser Technology, Japan, <sup>4</sup>Graduate School of Engineering, Hiroshima Univ., Japan, <sup>5</sup>National Institute for Fusion Science, Japan, <sup>6</sup>Kansai Photon Science Institute, Japan Atomic Energy Agency, Japan

**CLES4-3  
17:00 Electron Heating and Ion Acceleration Mechanisms in Pico-Second Scale Interaction between Solid Foil and High Intensity Lasers**

N. Iwata<sup>1</sup>, A. Yogo<sup>1</sup>, S. Tosaki<sup>1</sup>, K. Koga<sup>1</sup>, H. Nagatomo<sup>1</sup>, Y. Kishimoto<sup>2</sup>, H. Nishimura<sup>1</sup>, K. Mima<sup>3</sup> and H. Azechi<sup>1</sup>

<sup>1</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>2</sup>Graduate School of Energy Science, Kyoto Univ., Japan, <sup>3</sup>The Graduate School for the Creation of New Photonics Industries, Japan

**CLES4-4  
17:15 Efficient Ion Acceleration by Collision-Less Shock for Fast Ignition**

K. Mima<sup>1</sup>, Q. Jia<sup>2</sup>, H.-B. Cai<sup>2</sup>, T. Taguchi<sup>3</sup>, T. Asahina<sup>4</sup>, N. Iwata<sup>4</sup>, H. Nagatomo<sup>4</sup>, A. Yogo<sup>4</sup>

<sup>1</sup>The Graduate School for the Creation of New Photonics Industries, Japan, <sup>2</sup>HEDPS, Center for Applied Physics and Technology, Peking Univ. and Institute of Applied Physics and Computational Mathematics, China, <sup>3</sup>Faculty of Engineering, Setsunan Univ., Japan, <sup>4</sup>Institute of Laser Engineering, Osaka Univ., Japan

**CLES4-5  
17:30 Enhanced Laser-Driven Proton Acceleration from Relativistically Transparent Transversely Nano-striped Target**

M. Murakami<sup>1</sup>, J. Wang<sup>1,2</sup>, H. Xu<sup>3</sup>, J. Ju<sup>2</sup> and W. Yu<sup>2</sup>

<sup>1</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>2</sup>State Key Laboratory of High Field Laser Physics, SIOM, China, <sup>3</sup>National Laboratory for Parallel and Distributed Processing, China,

**CLES4-5  
17:45 Quasi-Monoenergetic Laser-Driven Ion Acceleration by Coulomb Explosion of Optimized Two-Species Nanocluster**

X. Zhou<sup>1</sup> and M. Murakami<sup>1</sup>

<sup>1</sup>Institute of Laser Engineering, Osaka University, Japan □

**Wednesday May 18**

**9:00-12:10 OPIC Plenary**

Room 501+502

----- Break Lunch (12:10-13:30) -----

**13:30-15:30 CLES5 : Magnetic Field Assisted fast Ignition**

Room 418

**Chair: H.-B. Cai**, Institute of Applied Physics & Computational Mathematics, China

**CLES5-1  
13:30 (Invited) Collimation of Relativistic Electron Beams in Dense Matter by Externally Imposed Magnetic Field**

M. Bailly-Grandvaux<sup>1</sup>, D. Batani<sup>1</sup>, C. Bellei<sup>1</sup>, J.-L. Dubois<sup>1</sup>, M. Ehret<sup>1,2</sup>, P. Forestier-Colleoni<sup>1</sup>, S. Fujioka<sup>3</sup>, L. Giuffrida<sup>1</sup>, J. Honrubia<sup>4</sup>, S. Hulin<sup>1</sup>, S. Kojima<sup>3</sup>, P. Korneev<sup>1,5</sup>, J. Marquès<sup>6</sup>, A. Morace<sup>3</sup>, P. Nicolai<sup>1</sup>, O. Peyrusse<sup>1</sup>, A. Poyé<sup>1</sup>, M. Roth<sup>2</sup>, S. Sakata<sup>3</sup>, G. Schaumann<sup>2</sup>, J. Serval<sup>1</sup>, V. Tikhonchuk<sup>1</sup>, Z. Zhang<sup>3</sup>, and J. Santos<sup>1</sup>

<sup>1</sup>Univ. Bordeaux, CNRS, CEA, CELIA, UMR, France, <sup>2</sup>Institut für Kernphysik, Tech. Univ., Germany, <sup>3</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>4</sup>Univ. Politécnica de Madrid, Spain, <sup>5</sup>National Research Nuclear Univ. MEPhI,

Russian Federation, <sup>6</sup>LULI, Ecole Polytechnique, CNRS, CEA, UMR, France <sup>7</sup>CEA/DAM/CESTA, France

**CLES5-2**  
**14:00**  
**(Invited) Magnetically Assisted Fast Ignition**  
W.-M. Wang<sup>1</sup>, P. Gibbon<sup>2</sup>, Z. Sheng<sup>3</sup>, Y.-T. Li<sup>1</sup> and J. Zhang<sup>3</sup>

<sup>1</sup>Beijing National Laboratory for Condensed Matter Physics, Institute of Physics, CAS, China, <sup>2</sup>Forschungszentrum Jülich GmbH, Institute for Advanced Simulation, Jülich Supercomputing Centre, Germany, <sup>3</sup>Key Laboratory for Laser Plasmas (MoE) and Department of Physics and Astronomy, Shanghai JiaoTong Univ., China

**CLES5-3**  
**14:30**  
**(Invited) Optimum Solid Target Compression Under the Strong Magnetic Field for Fast Ignition**

H. Nagatomo<sup>1</sup>, T. Johzaki<sup>2</sup>, K. Matsuo<sup>1</sup>, T. Asahina<sup>1</sup>, M. Hata<sup>1</sup>, A. Sunahara<sup>3</sup>, H. Sakagami<sup>4</sup>, S.-H. Lee<sup>1</sup>, S. Fujioka<sup>1</sup>

<sup>1</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>2</sup>Hiroshima Univ., Japan, <sup>3</sup>Institute for Laser Technology, Japan, <sup>4</sup>National Institute for Fusion Science, Japan

**CLES5-4**  
**15:00**  
**Computational Study on Thermal Conduction in Magnetized Plasmas**

T. Asahina<sup>1</sup>, H. Nagatomo<sup>1</sup>, A. Sunahara<sup>2</sup>, T. Johzaki<sup>3</sup>, M. Hata<sup>1</sup> and Y. Sentoku<sup>4</sup>

<sup>1</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>2</sup>Institute for Laser Technology, Japan, <sup>3</sup>Graduate School of Engineering, Hiroshima Univ., Japan, <sup>4</sup>Univ. of Nevada, USA

**CLES5-5**  
**15:15**  
**Hydrodynamic Instability of High-Energy-Density-Plasma in Strong Magnetic Field**

K. Matsuo<sup>1</sup>, H. Nagatomo<sup>1</sup>, T. Sano<sup>1</sup>, Z. Zhang<sup>2</sup>, P. Nicolai<sup>3</sup>, J. Breil<sup>3</sup>, Y. Sakawa<sup>1</sup>, Y. Hara<sup>1</sup>, H. Shimogawara<sup>1</sup>, Y. Arikawa<sup>1</sup>, S. Sakata<sup>1</sup>, K.-F. Law<sup>1</sup>, S.-H. Lee<sup>1</sup>, S. Kojima<sup>1</sup>, H. Kato<sup>1</sup>, K. Shigemori<sup>1</sup>, S. Fujioka<sup>1</sup> and H. Azechi<sup>1</sup>

<sup>1</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>2</sup>Institute of Physics Chinese Academy of Sciences, China, <sup>3</sup>CELIA Univ. of Bordeaux, France

**CLES6-3**  
**17:00**  
**Temporal Evolution of External Magnetic Fields Applied to the Cone Target**

A. Sunahara<sup>4</sup>, K.-F. Law<sup>1</sup>, S. Sakata<sup>1</sup>, S.-H. Lee<sup>1</sup>, Y. Arikawa<sup>1</sup>, S. Fujioka<sup>1</sup>, T. Johzaki<sup>2</sup>, H. Sakagami<sup>3</sup>, H. Nagatomo<sup>1</sup>, H. Shiraga<sup>1</sup>, H. Azechi<sup>1</sup>, and FIREX Group<sup>1</sup>

<sup>1</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>2</sup>Hiroshima Univ., Japan, <sup>3</sup>National Institute for Fusion Science, Japan, <sup>4</sup>Institute for Laser Technology, Japan

**CLES6-4**  
**17:15**  
**High Magnetic Field Generation by Short Pulse Lasers for FI**

Z. Zhang<sup>1</sup>, S. Fujioka<sup>2</sup>, B.-J. Zhu<sup>1</sup>, F. Li<sup>1</sup> W.-M. Jiang<sup>1</sup>, Y.-H. Zhang<sup>1</sup>, Y. Abe<sup>2</sup> and Y.-T. Li<sup>1</sup>

<sup>1</sup>Institute of Physics, Chinese Academy of Sciences, China, <sup>2</sup>Institute of Laser Engineering, Osaka Univ. Japan

**CLES6-5**  
**17:30**  
**Electron Acceleration by Laser Driven Beat Wave Excited by Cross-Focused Cosh-Gaussian Laser Beams in Thermal Quantum Plasma**

N. Gupta and A. Singh  
National Institute of Technology, Jalandhar, India

**CLES6-6**  
**17:45**  
**(Invited) New Regime of Magnetic Reconnection Laboratory Experiment Realized by Kilo-Tesla Magnetic Field Generated with a Snail Target and LFEX Laser**

Y. Abe<sup>1</sup>, K.-F. Law<sup>1</sup>, A. Morace<sup>1</sup>, A. Yogo<sup>1</sup>, S. Kojima<sup>1</sup>, S. Sakata<sup>1</sup>, S.-H. Lee<sup>1</sup>, K. Matsuo<sup>1</sup>, A. Oshima<sup>1</sup>, Y. Arikawa<sup>1</sup>, M. Nakai<sup>1</sup>, Y. Sakawa<sup>1</sup>, K. Kondo<sup>2</sup>, E. d'Humieres<sup>3</sup>, V. Tikhonchuk<sup>3</sup>, J. J. Santos<sup>3</sup>, Z. Zhang<sup>4</sup>, Y.-Y. Li<sup>4</sup>, T. Norimatsu<sup>1</sup>, H. Azechi<sup>1</sup>, P. Korneev<sup>5</sup> and S. Fujioka<sup>1</sup>

<sup>1</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>2</sup>RLNR, Tokyo Institute of Technology, Japan, <sup>3</sup>CELIA, Univ. of Bordeaux, France, <sup>4</sup>Institute of Physics, Chinese Academy of Science, China, <sup>5</sup>NRNU MEPhI, Russian Federation

----- Break (15:30-16:00) -----

**18:00-20:00 OPIC Reception**

Room 501+502

**16:00-18:00 CLES6 : High Field Generation with Laser**

Room 418

**Chair: E. Hill**, Plasma Physics Group, Imperial College, UK

**CLES6-1**  
**16:00**  
**(Invited) THz Generation from Relativistic Laser Produced Plasmas**

Y.-T. Li<sup>1</sup>, G. Liao<sup>1</sup>, C. Li<sup>1</sup>, W.-M. Wang<sup>1</sup> and Z. Sheng<sup>2</sup>

<sup>1</sup>Institute of Physics, Chinese Academy of Sciences, China, <sup>2</sup>Key Laboratory for Laser Plasmas (MoE) and Department of Physics, Shanghai Jiao Tong Univ., China

**CLES6-2**  
**16:30**  
**(Invited) Taming of Laser Produced Spontaneous Magnetic Fields**

P. Korneev<sup>1</sup>, S. Fujioka<sup>2</sup>, Y. Aabe<sup>2</sup>, E. d'Humieres<sup>3</sup>, J. Antos<sup>3</sup> and V. Tikhonchuk<sup>3</sup>

<sup>1</sup>National Research Nuclear Univ. "MEPh", Russian Federation, <sup>2</sup>Institute of Laser

**Thursday May 19**

**9:00-10:30 CLES7 : Integrated Simulation and Modeling**

Room 418

**Chair: P. Patel**, Lawrence Livermore National Laboratory, USA  
**CLES7-1**  
**9:00**  
**(Invited) Physical Studies of Fast Ignition at the IAPCM**

H.-B. Cai, S.-Z. Wu, H. Zhang, J.-F. Wu, G.-L. Ren, L.-H. Cao, M.-Q. He, C.-T. Zhou, S.-P. Zhu and X.-T. He

Institute of Applied Physics & Computational Mathematics, China

**CLES7-2**  
**9:30**  
**(Invited) Integrated Simulation of Imploded Core Heating for the FIREX Project**

T. Johzaki<sup>1</sup>, H. Nagatomo<sup>2</sup>, Y. Sentoku<sup>3</sup>, H. Sakagami<sup>4</sup>, A. Sunahara<sup>5</sup>, S. Fujioka<sup>2</sup>, A. Yogo<sup>2</sup>, H. Shiraga<sup>2</sup>, H. Azechi<sup>2</sup>, and FIREX Project

Group<sup>2</sup>  
<sup>1</sup>Hiroshima Univ., Japan, <sup>2</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>3</sup>Univ. of Nevada, USA, <sup>4</sup>National Institute for Fusion Science, Japan <sup>5</sup>Institute for Laser Technology, Japan

**CLES7-3**  
**10:00** (Invited) **Converting High Laser Light Absorption into Efficient Isochoric Heating of Dense Plasmas**

S. Wilks<sup>1</sup>, M. Tabak<sup>1</sup>, K. Akli<sup>2</sup>, D. Higginson<sup>1</sup>, C. Jarrott<sup>1</sup>, S. Jiang<sup>1</sup>, R. Kirkwood<sup>1</sup>, M. Levy<sup>3</sup>, S. Libby<sup>1</sup>, A. Link<sup>1</sup>, P. Norreys<sup>3</sup>, D. Turnbull<sup>1</sup> and D. Schumacher<sup>2</sup>

<sup>1</sup>Lawrence Livermore National Laboratory, USA, <sup>2</sup>Ohio State Univ., USA, <sup>3</sup>Oxford Univ., UK

---- Break (10:30-11:00) ----

**11:00-12:30 CLES8 : Novel Scheme of Fast Ignition**

Room 418

**Chair: A. Robinson**, STFC Rutherford-Appleton Laboratory, UK

**CLES8-1**  
**11:00** (Invited) **Dense Plasma Heating using Crossed Relativistic Electron Beams**

P. Norreys<sup>1,2,3</sup>, N. Ratan<sup>1</sup>, L. Ceurvorst<sup>1</sup>, J. Sadler<sup>1</sup>, M. Kasim<sup>1</sup>, J. Holloway<sup>1</sup>, R. Trines<sup>2</sup> and R. Bingham<sup>2</sup>

<sup>1</sup>Clarendon Laboratory, Univ. of Oxford, UK, <sup>2</sup>Central Laser Facility, STFC Rutherford Appleton Laboratory, UK

**CLES8-2**  
**11:30** (Invited) **Counter-Beam Fast Ignition Experiments and the Related Studies**

Y. Kitagawa<sup>1</sup>, Y. Mori<sup>1</sup>, Y. Nishimura<sup>1,2</sup>, K. Ishii<sup>1</sup>, R. Hanayama<sup>1</sup>, S. Nakayama<sup>1</sup>, T. Sekine<sup>3</sup>, N. Sato<sup>3</sup>, T. Kurita<sup>3</sup>, T. Kawashima<sup>3</sup>, H. Kan<sup>3</sup>, T. Nishi<sup>4</sup>, T. Hioki<sup>5</sup>, T. Motohiro<sup>5</sup>, H. Azuma<sup>6</sup>, A. Sunahara<sup>7</sup>, Y. Sentoku<sup>8</sup>, E. Miura<sup>9</sup>, Y. Arikawa<sup>10</sup>, Y. Abe<sup>10</sup>, and S. Ozaki<sup>11</sup>

<sup>1</sup>The Graduate School for the Creation of New Photonics Industries, Japan, <sup>2</sup>TOYOTA Technical Development Corp., Japan, <sup>3</sup>Hamamatsu Photonics, K. K., Japan, <sup>4</sup>TOYOTA Central R&D Labs, Inc., Japan, <sup>5</sup>Nagoya Univ., GREMO, Japan, <sup>6</sup>Aichi SR Center, Japan, <sup>7</sup>Institute for Laser Technology, Japan, <sup>8</sup>Univ. of Nevada, USA, <sup>9</sup>National Institute of Advanced Industrial Science and Technology, Japan, <sup>10</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>11</sup>National Institute for Fusion Science, Japan

**CLES8-3**  
**12:00** **Physics of Fast Heating of an Imploded Core under Counter Beam Irradiation**

Y. Mori<sup>1</sup>, Y. Nishimura<sup>1</sup>, K. Ishii<sup>1</sup>, R. Hanayama<sup>1</sup>, Y. Kitagawa<sup>1</sup>, T. Sentoku<sup>2</sup>, T. Kurita<sup>2</sup>, N. Sato<sup>2</sup>, T. Kawashima<sup>2</sup>, H. Kan<sup>2</sup>, T. Nishi<sup>3</sup>, T. Hioki<sup>4</sup>, T. Momohiro<sup>4</sup>, H. Azuma<sup>5</sup>, A. Sunahara<sup>6</sup>, Y. Sentoku<sup>7</sup> and E. Miura<sup>8</sup>

<sup>1</sup>The Graduate School for the Creation of New Photonics Industries, Japan, <sup>2</sup>Hamamatsu Photonics, K. K., Japan, <sup>3</sup>TOYOTA Central Research and Development Laboratories, Inc., Japan, <sup>4</sup>Nagoya Univ., GREMO, Japan, <sup>5</sup>Aichi Synchrotron Radiation Center In "Knowledge

Hub Aichi", Japan, <sup>6</sup>Institute for Laser Technology, Japan, <sup>7</sup>Univ. of Nevada, USA, <sup>8</sup>National Institute of Advanced Industrial Science and Technology, Japan

**CLES8-4**  
**12:15** **Observation of Trace due to Laser-Driven Fast-Electron Currents in a CD Target**

R. Hanayama<sup>1</sup>, Y. Nishimura<sup>1,2</sup>, Y. Mori<sup>1</sup>, K. Ishii<sup>1</sup>, Y. Kitagawa<sup>1</sup>, T. Sekine<sup>3</sup>, T. Kurita<sup>3</sup>, N. Sato<sup>3</sup>, T. Kawashima<sup>3</sup>, H. Kan<sup>3</sup>, T. Nishi<sup>4</sup>, T. Hiroki<sup>5</sup>, T. Motohiro<sup>5</sup>, H. Azuma<sup>6</sup>, A. Sunahara<sup>7</sup>, Y. Sentoku<sup>8</sup> and E. Miura<sup>9</sup>

<sup>1</sup>The Graduate School for the Creation of New Photonics Industries, Japan, <sup>2</sup>TOYOTA Technical Development Corporation, Japan, <sup>3</sup>Hamamatsu Photonics, K. K., Japan, <sup>4</sup>TOYOTA Central Research and Development Laboratories, Inc., Japan, <sup>5</sup>Nagoya Univ., GREMO, Japan, <sup>6</sup>Aichi Synchrotron Radiation Center In "Knowledge Hub Aichi", Japan, <sup>7</sup>Institute for Laser Technology, Japan, <sup>8</sup>Univ. of Nevada, Reno, USA, <sup>9</sup>National Institute of Advanced Industrial Science and Technology, Japan

---- Break (12:30-13:30) ----

**13:30-15:30 CLES9 : High Energy Density Physics with High Intensity Lasers**

Room 418

**Chair: Y.-T. Li**, Institute of Physics, Chinese Academy of Sciences, China

**CLES9-1**  
**13:30** (Invited) **Nuclear Physics with Laser-Accelerated Ion Beams and Progress in Proton Fast Ignition**

M. Roth, Technische Univ., Darmstadt, Germany

**CLES9-2**  
**14:00** (Invited) **Integrated Modeling of Short-Pulse Laser Interactions with Buried-Layer Targets**

M. Sherlock<sup>1</sup>, E. Hill<sup>1</sup>, S. Rose<sup>1</sup> and W. Rozmus<sup>2</sup>  
<sup>1</sup>Imperial College London, UK, <sup>2</sup>Univ. of Alberta, Canada

**CLES9-3**  
**14:30** (Invited) **Electron-Positron Pair Production in HED Plasmas**

E. Hill<sup>1</sup>, O. Pike<sup>1</sup> and S. Rose<sup>1</sup>  
<sup>1</sup>Plasma Physics Group, Imperial College, UK

**CLES9-4**  
**15:00** (Invited) **New Approach to Experimental Observation of the Breit-Wheeler Pair Generation Process**

X. Ribeyre<sup>1</sup>, E. d'Humieres<sup>1</sup>, S. Jequier<sup>1</sup>, O. Jansen<sup>1</sup> and V. Tikhonchuk<sup>1</sup>  
<sup>1</sup>Univ. of Bordeaux-CNRS-CEA, Centre Lasers Intenses et Applications, France

---- Break (15:30-16:00) ----

**16:00-17:45 CLES10 : Fuel Assembly Production**

Room 418

**Chair: D. Batani**, CELIA, Univ. of Bordeaux, France

**CLES10-1**  
**16:00** (Invited) **Flash X-Ray Radiography of High Density Spherical Targets for Fast-Ignition**

H. Sawada<sup>1</sup>, S. Fujioka<sup>2</sup>, S. Lee<sup>2</sup>, Y. Arikawa<sup>2</sup>, H. Nagatomo<sup>2</sup>, K. Shigemori<sup>2</sup>, H. Nishimura<sup>2</sup>, A. Sunahara<sup>3</sup>, T. Shirotto<sup>4</sup>, N. Ohnishi<sup>4</sup>, W. Theobald<sup>5</sup>, F. Perez<sup>6</sup>, P. Patel<sup>7</sup> and F. Beg<sup>8</sup>

<sup>1</sup>Univ. of Nevada, USA, <sup>2</sup>Institute of Laser

Engineering, Osaka Univ., Japan, <sup>3</sup>Institute for Laser Technology, Japan, <sup>4</sup>Department of Aerospace Engineering, Tohoku Univ., Japan <sup>5</sup>Laboratory for Laser Energetics, Univ. of Rochester, USA, <sup>6</sup>LULI, Ecole Polytechnique, France, <sup>7</sup>Lawrence Livermore National Laboratory, USA <sup>8</sup>Univ. of California San Diego, USA

**CLES10-2**  
**16:30** **Effect of High Energy X-Ray on the Indirect Drive Ablative RT Instability**  
B. Xu<sup>1</sup>, Y. Ma<sup>1</sup>, X. Yang<sup>1</sup>, W. Tang<sup>1</sup>, Z. Ge<sup>1</sup> and Y. Zhao<sup>1</sup>

<sup>1</sup>National Univ. of Defense Technology, China

**CLES10-3**  
**16:45** **Double-Shell Target Design and Experiment on SGIII Facility**  
Z. Dai<sup>1</sup>, J. Li<sup>1</sup>, W. Zheng<sup>1</sup>, J. Yan<sup>2</sup>, W. Pei<sup>1</sup> and S. Zhu<sup>1</sup>

<sup>1</sup>Institute of applied physics and computational mathematics, China, <sup>2</sup>Laser Fusion Research Center, China

**CLES10-4**  
**17:00** **A New Turning Method of the Low-Model Asymmetry for Ignition Capsule Implosions**  
J. Gu<sup>1</sup>, Z. Dai<sup>1</sup>, S. Zou<sup>1</sup>, P. Song<sup>1</sup>, W. Ye<sup>1</sup>, W. Zheng<sup>1</sup> and P. Gu<sup>1</sup>

<sup>1</sup>Institute of Applied Physics and Computational Mathematics, China

**CLES10-5**  
**17:15** **Shock Velocity Measurement using Frequency Domain Interferometer with Chirped Pulse Laser**

K. Ishii<sup>1</sup>, Y. Nishimura<sup>1,2</sup>, Y. Mori<sup>1</sup>, R. Hanayama<sup>1</sup>, Y. Kitagawa<sup>1</sup>, T. Sekine<sup>3</sup>, T. Kurita<sup>3</sup>, N. Sato<sup>3</sup>, T. Kawashima<sup>3</sup>, H. Kan<sup>3</sup>, T. Nishi<sup>4</sup>, T. Hiroki<sup>5</sup>, T. Momohiro<sup>5</sup>, H. Azuma<sup>6</sup>, A. Sunahara<sup>7</sup>, Y. Sentoku<sup>8</sup>, and E. Miura<sup>9</sup>

<sup>1</sup>The Graduate School for the Creation of New Photonics Industries, Japan, <sup>2</sup>TOYOTA Technical Development Corporation, Japan, <sup>3</sup>Hamamatsu Photonics, K. K., Japan, <sup>4</sup>TOYOTA Central Research and Development Laboratories, Inc., Japan, <sup>5</sup>Nagoya Univ., GREMO, Japan, <sup>6</sup>Aichi Synchrotron Radiation Center In "Knowledge Hub Aichi", Japan <sup>7</sup>Institute for Laser Technology, Japan, <sup>8</sup>Univ. of Nevada, USA, <sup>9</sup>National Institute of Advanced Industrial Science and Technology, Japan

**CLES10-6**  
**17:30** **Phase Transition in Single Crystal Yttria-Stabilized Zirconia by Ultra-Intense Laser-Driven Compression**

Y. Nishimura<sup>1,2</sup>, K. Ishii<sup>1</sup>, Y. Kitagawa<sup>1</sup>, Y. Mori<sup>1</sup>, R. Hanayama<sup>1</sup>, H. Azuma<sup>3</sup>, T. Hioki<sup>4</sup>, T. Motohiro<sup>4,5</sup>, T. Nishi<sup>5</sup>, T. Sekine<sup>5</sup>, N. Sato<sup>5</sup>, T. Kurita<sup>5</sup>, T. Kawashima<sup>5</sup>, H. Kan<sup>5</sup>, A. Sunahara<sup>7</sup>, Y. Sentoku<sup>8</sup>, and E. Miura<sup>9</sup>

<sup>1</sup>The Graduate School for the Creation of New Photonics Industries, Japan, <sup>2</sup>TOYOTA Technical Development Corp., Japan, <sup>3</sup>Aichi SR Center, Japan, <sup>4</sup>GREMO, Nagoya Univ., Japan, <sup>5</sup>TOYOTA Central R&D Labs., Inc., Japan, <sup>6</sup>Hamamatsu Photonics K.K., Japan, <sup>7</sup>Institute of Laser Technology, Japan, <sup>8</sup>Department of Physics, Univ., of Nevada, USA, <sup>9</sup>National Institute of Advanced Industrial Science and Technology, Japan

**Friday May 20**

**9:00-10:30** **CLES11 : Integrated experiment and simulation**

Room 418

**Chair: H. Nagatomo**, Institute of Laser Engineering, Osaka Univ., Japan

**CLES11-1**  
**9:00** **(Invited) Shock Ignition Studies at the Laboratory for Laser Energetics**  
R. Betti<sup>1</sup>, A. Bose<sup>1</sup>, W. Shang<sup>1,2</sup> and W. Theobald<sup>1</sup>

<sup>1</sup>Fusion Science Center for Extreme States of Matter, Univ. of Rochester, USA, <sup>2</sup>Research Center for Laser Fusion, Chinese Academy of Engineering, China

**CLES11-2**  
**9:30** **(Invited) Laser-Plasma Interaction and Shock Generation in the Shock-Ignition Intensity Regime**

D. Batani<sup>1</sup>, L. Antonelli<sup>1,2</sup>, G. Boutoux<sup>1</sup>, A. Colaitis<sup>1</sup>, P. Nicolai<sup>1</sup>, S. Atzeni<sup>2</sup>, G. Cristoforetti<sup>3</sup>, L. Gizzi<sup>3</sup>, E. Krousky<sup>4</sup>, O. Renner<sup>4</sup> and M. Smid<sup>4</sup>  
<sup>1</sup>CELIA, Univ. of Bordeaux, France <sup>2</sup>Univ. of Roma «La Sapienza», Italy <sup>3</sup>Intense Laser Irradiation Laboratory, INO-CNR, Italy, <sup>4</sup>Institute of Physics, Czech Republic

**CLES11-3**  
**10:00** **(Invited) Direct Drive Fast Ignition Experiments on SG-II Up Laser Facility**

W. Wang<sup>1</sup>, C. Wang<sup>1</sup>, Z. Fang<sup>1</sup>, H. An<sup>1</sup>, J. Xiong<sup>1</sup>, R. Wang<sup>1</sup>, A. Lei<sup>1</sup>, W. Pei<sup>1</sup>, and S. Fu<sup>1</sup>  
<sup>1</sup>Shanghai Institute of Laser Plasma, China

---- Break (10:30-11:00) ----

**11:00-12:30** **CLES12 : Electron Generation**

Room 418

**Chair: F. Beg**, Univ. of California at San Diego, USA

**CLES12-1**  
**11:00** **(Invited) Properties of Fast Electrons Emitted in Intense Laser-Solid Interaction Experiment**  
D. Neely<sup>1,2</sup>,

<sup>1</sup>Central Laser Facility, STFC, Rutherford Appleton Laboratory, UK, <sup>2</sup>SUPA, Department of Physics, Univ. of Strathclyde, UK

**CLES12-2**  
**11:30** **(Invited) Optimization of Electron Energy Distribution by Reducing Preformed Plasma Generation for Fast Ignition Scheme**

Y. Arikawa<sup>1</sup>, S. Kojima<sup>1</sup>, A. Morace<sup>1</sup>, M. Hata<sup>1</sup>, S. Sakata<sup>1</sup>, S. Fujioka<sup>1</sup>, T. Kawashima<sup>1</sup>, Y. Hironaka<sup>1</sup>, K. Shigemori<sup>1</sup>, Y. Abe<sup>1</sup>, X. Vaisseau<sup>1</sup>, S-H. Lee<sup>1</sup>, T. Gawa<sup>1</sup>, K. Matsuo<sup>1</sup>, K.-F. Law<sup>1</sup>, Y. Kato<sup>1</sup>, S. Matsubara<sup>1</sup>, S. Tosaki<sup>1</sup>, A. Yogo<sup>1</sup>, H. Nagatomo<sup>1</sup>, S. Tokita<sup>1</sup>, Y. Nakata<sup>1</sup>, T. Jitsuno<sup>1</sup>, N. Miyanaga<sup>1</sup>, J. Kawanaka<sup>1</sup>, Y. Fujimoto<sup>1</sup>, K. Yamanoi<sup>1</sup>, T. Norimatsu<sup>1</sup>, M. Nakai<sup>1</sup>, H. Nishimura<sup>1</sup>, H. Shiraga<sup>1</sup>, FIREX Group<sup>1</sup>, LFEEX Group<sup>1</sup>, H. Azechi<sup>1</sup>, A. Sunahara<sup>2</sup>, T. Johzaki<sup>3</sup>, T. Ozaki<sup>4</sup>, H. Sakagami<sup>4</sup> and Z. Zhang<sup>5</sup>

<sup>1</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>2</sup>Institute for Laser Technology, Japan <sup>3</sup>Hiroshima Univ., Japan, <sup>4</sup>National Institute for Fusion Science, Japan, <sup>5</sup>Key Laboratory of Optic Physics, Institute of Physics, Chinese Academy of Sciences, China

**CLES12-3**  
**12:00** **Energy Distribution of Fast Electrons Generated with Relativistic Intensity Laser**

**Depending on Pulse Duration**

S. Kojima<sup>1</sup>, Y. Arikawa<sup>1</sup>, A. Morace<sup>1</sup>, S. Fujioka<sup>1</sup>, A. Yogo<sup>1</sup>, M. Hata<sup>1</sup>, S. Sakata<sup>1</sup>, S. Tosaki<sup>1</sup>, T. Gawa<sup>1</sup>, Y. Taguchi<sup>1</sup>, S.-H. Lee<sup>1</sup>, K. Matsuo<sup>1</sup>, Y. Abe<sup>1</sup>, H. Nagatomo<sup>1</sup>, M. Nakai<sup>1</sup>, H. Nishimura<sup>1</sup>, H. Shiraga<sup>1</sup>, A. Sunahara<sup>2</sup>, T. Johzaki<sup>3</sup>, T. Ozaki<sup>4</sup>, H. Sakagami<sup>4</sup>, H. Azechi<sup>1</sup>, FIREX Group<sup>1</sup> and LFEX Group<sup>1</sup>

<sup>1</sup>Institute of Laser Engineering, Osaka Univ., Japan, <sup>2</sup>Institute of Laser Technology, Japan, <sup>3</sup>Hiroshima Univ., Japan, <sup>4</sup>National Institute for Fusion Science, Japan

**CLES12-4 12:15 Hot Electron Behavior in Targets Observed by the Electron Spectral Meter on FIREX**

T. Ozaki<sup>1</sup>, Y. Aabe<sup>2</sup>, M. Hata<sup>2</sup>, K. Matsuo<sup>2</sup>, S. Kojima<sup>2</sup>, Y. Arikawa<sup>2</sup>, S. Fujioka<sup>2</sup>, S. Sakata<sup>2</sup>, S.-H. Lee<sup>2</sup>, H. Sakagami<sup>2</sup>, A. Morace<sup>2</sup>, A. Sunahara<sup>2</sup>, H. Nagatomo<sup>2</sup>, T. Johzaki<sup>3</sup>, A. Yogo<sup>2</sup>, H. Sshiraga<sup>2</sup>, H. Nishimura<sup>2</sup>, H. Azechi<sup>2</sup>, FIREX Group<sup>2</sup> and GXII-LFEX Group<sup>2</sup>

<sup>1</sup>National Institute for Fusion Science, Japan, <sup>2</sup>Institute of Laser Engineering, Osaka Univ., Suita, Japan, <sup>3</sup>Hiroshima Univ., Japan

---- Break (12:30-13:30) ----

**13:30-15:00 CLES13 : Super Penetration and NIF Status and Prospects**

Room 418

**Chair: H. Shiraga**, Institute of Laser Engineering, Osaka Univ.

**CLES13-1 13:30 (Invited) Relativistic Laser Self-Focusing Approach toward Fast Ignition**

K. Tanaka, Osaka Univ., Japan

**CLES13-2 14:00 (Invited) Status of the Ignition Program on the National Ignition Facility**

P. Patel  
Lawrence Livermore National Laboratory, USA

**CLES13-3 14:30 (Invited) Ultrahigh, Efficiency Exawatt Technology for Full-Scale Fast Ignition**

C. Barty  
Lawrence Livermore National Laboratory, USA

---- Summary (15:00-15:30) ----

---- Break (15:30-16:00) ----

---- Summary (16:00-17:15) ----

**17:15-17:30 Closing**

Room 418

**Closing Remarks**

**17:15 H. Azechi**,  
Conference Chair of CLES2016,  
Director, Institute of Laser Engineering, Osaka Univ., Japan

# High Energy Density Sciences 2016

## HEDS 2016

Tuesday, May 17

**9:00-9:10** **Opening** Room 311+312

**Opening Remarks**

**9:00** R. Kodama, Conference Chair of HEDS 2016  
Osaka University, Japan

**9:10-10:30** **HEDS1: Plenary**  
(ImPACT Session I) Room 311+312

**Chair: T. Hosokai**, Osaka University, Japan

**HEDS1-1** (Plenary I) **High intensity laser interaction studies at BELLA**

**9:10** Eric Esarey  
Lawrence Berkeley National Laboratory, USA

**HEDS1-2** (Plenary II) **Applications for electron beams generated by Laser Wakefield Accelerators**

**9:50** Karl Krushelnick  
the University of Michigan, USA

----- **Group Photo & Break (10:30-11:00)** -----

**11:00-12:00** **HEDS2: High-Field Physics I**  
(ImPACT Session II) Room 311+312

**Chair: S. V. Bulanov**, Japan Atomic Energy Agency, Japan

**HEDS2-1** (Invited) **Evidences of new features in X-ray emission of plasma, irradiated by relativistic laser pulses**

**11:00** Anatoly Faenov  
Osaka University, Japan

**HEDS2-2** (Invited) **Database on shock-wave experiments and equations of state at high energy densities**

**11:30** K V Khishchenko  
Joint Institute for High Temperatures RAS, Russia

----- **Lunch (12:00-13:30)** -----

**13:30-15:00** **HEDS3: High-Field Physics II**  
(ImPACT Session III) Room 311+312

**Chair: A. Zhidkov**, Osaka University, Japan

**HEDS3-1** (Invited) **What can we learn from studying magnetic reconnection in laser plasmas?**

**13:30** S. V. Bulanov  
Japan Atomic Energy Agency, Japan

**HEDS3-2** **Non-equilibrium extreme radiation plasmas produced by the interaction between high power laser and heavy element materials**

**14:00** Yasuaki Kishimoto  
Kyoto University, Japan

**HEDS3-3** **X-ray spectroscopy diagnostics on supersonic astrophysically-relevant recombining plasma jets collimated by poloidal magnetic field**

**14:20** Sergei Pikuz  
RAS, Russia

**HEDS3-4** **Nearly Isolated Measurement of the Vacuum Contribution to the Scattering of  $\gamma$ -rays off Nuclei**

**14:40** James K. Koga  
Japan Atomic Energy Agency, Japan

----- **Break (15:00-15:30)** -----

**15:30-17:50** **HEDS4: Ultra-fast Imaging**  
(ImPACT Session IV) Room 311+312

**Chair: M. Kando**, Japan Atomic Energy Agency, Japan

**HEDS4-1** (Invited) **Ultrafast electron diffraction and deflectometry with laser accelerated electrons**

**15:30** Shuji Sakabe  
Kyoto University, Japan

**HEDS4-2** (Invited) **Laser-driven electron sources and their application to ultrafast electron diffraction**

**16:00** Jérôme Faure  
CNRS, France

**HEDS4-3** (Invited) **Multi-Mode Ultrafast Electron Diffraction: Probe Structural Dynamics with Atomic-scale Resolution of Space and Time**

**16:30** Wenxi Liang  
Huazhong University of Science and Technology, China

**HEDS4-4** **Progress in all-optical ultra-fast single-shot electron microscopy in MeV range**

**17:00** Alexey Zhidkov  
Osaka University, Japan

**HEDS4-5** (Invited) **Ultrafast Electron Microscopy using a relativistic-energy femtosecond electron beam**

**17:20** Jinfeng Yang  
Osaka University, Japan

Wednesday, May 18

**9:00-12:10** **OPIC2016 Plenary Session** Room 501+502

----- **Lunch (12:10-13:30)** -----

**13:30-15:30** **ALPS, XOPT, HEDS Joint Session I** Room 302

**Chairs: M. Yabashi**, SPring-8/SACLA, Japan

**T. Hosokai**, Osaka University, Japan  
**XOPTj-1** (Invited) **X-rays as a Subject for Optics Research**

**13:30** Tetsuya Ishikawa  
RIKEN SPring-8 Center, Japan

**XOPTj-2** (Invited) **LCLS-II: A High Repetition Rate X-ray Laser Facility**

**14:00** David M. Fritz  
SLAC National Accelerator Laboratory, USA

**HEDSj-1** (Invited) **Exploration of New fields of High Energy Density Science**

**14:30** Ryosuke Kodama  
Osaka University, Japan

**ALPSj-1** (Invited) **HiLASE100: a cryo-cooled 100 J, 10 Hz DPSSL System**

**15:00** Antonio Lucianetti  
HiLASE Centre, Inst. of Phys., CAS, Czech Republic

----- Break (15:30-15:45) -----

**15:45-16:45 ALPS, XOPT, HEDS Joint Session II**

Room 302

**Chair: J. Itatani**, Univ. Tokyo, Japan

**ALPSj -2 (Invited) Current status of PW laser at CoReLS and applications**

**15:45**  
Seong Ku Lee  
GIST, Korea

**HEDSj-2 (Invited) High-energy density science and plasma physics at ELI-Beamline**

**16:15**  
Georg Korn  
ELI-Beamlinesc, Czech Republic

----- OPIC Reception (18:00-20:00) -----

Room 501+502

Thursday, May 19

**9:00-10:30 HEDS5: Particle Acceleration I**

(ImPACT Session V) Room 311+312

**Chair: TBD**

**HEDS5-1 (Invited) Beam diagnostics for staged laser electron acceleration experiments**

**9:00**  
Masaki Kando  
Japan Atomic Energy Agency, Japan

**HEDS5-2 (Invited) Laser wakefield acceleration research under the ImPACT-UPL program**

**9:30**  
Tomonao Hosokai  
Osaka University, Japan

**HEDS5-3 (Invited) ImPACT: A Five-year National Program to Realize Ultra-compact XFELs by LWFA**

**10:00**  
Yuji Sano  
ImPACT program, JST, Japan

----- Break (10:30-11:00) -----

**11:00-12:00 HEDS6: Particle Acceleration II**

(ImPACT Session VI) Room 311+312

**Chair: J. Faure**, LOA, France

**HEDS6-1 (Invited) Multistage Coupling of Independent Laser Plasma Accelerators**

**11:00**  
Sven Steinke  
Lawrence Berkeley National Laboratory, USA

**HEDS6-2 (Invited) Recent progress of high quality plasma based acceleration at Tsinghua University**

**11:30**  
Wei Lu  
Tsinghua University, China

----- Lunch Break (12:00-13:00) -----

**13:00-13:30 HEDS7: Commercial Products for HEDS**

(ImPACT Session VII) Room 311+312

**Chair: J. Sasaki**, Japan Laser Corp., Japan

**HEDS7-1 Innovative Targetry for Laser Plasma Interaction**

**13:00**

Francois Sylla  
Source LAB, France

**HEDS7-2 Towards high repetition rate ultra-intense lasers, latest developments at Amplitude Technologies**

**13:15**  
Federico Canova  
Amplitude Technologies, France

**13:30-15:00 HEDS8: Radiation Sources I**

(ImPACT Session VIII) Room 311+312

**Chair: J. V. Malka**, LOA, France

**HEDS8-1 (Invited) Initial steps towards Free Electron Laser Amplification with Laser Plasma Acceleration**

**13:30**  
Marie-Emmanuelle Couprie  
Synchrotron SOLEIL, France

**HEDS8-2 (Special) Betatron x-rays from laser-wakefield accelerators: a novel probe for time-resolved HED science experiments**

**14:00**  
Felicie Albert  
Lawrence Livermore National Laboratory, USA

**HEDS8-3 (Invited) ELI-ALPS: Advanced Laser Technologies for High Peak and Average Power Systems**

**14:30**  
Mikhail Kalashnikov  
ELI-ALPS, Hungary

----- Break (15:00-15:30) -----

**15:30-16:20 HEDS9: Radiation Sources II** Room 311+312

**Chair: K. Kondo**, Japan Atomic Energy Agency, Japan

**HEDS9-1 (Special) Required Laser Properties for Efficient High-Order Harmonic Generation from Relativistic Electron Spikes**

**15:30**  
Alexander S. Pirozhkov  
Japan Atomic Energy Agency, Japan

**HEDS9-2 Current Design and Development of Gamma-ray Polarimeter for Probing Vacuum Birefringence at ELI-NP**

**16:00**  
Yoshihide Nakamiya  
Kyoto University, Japan

----- Break (16:20-16:30) -----

**16:30-17:30 HEDS10: Student Session**

Room 311+312

**Chair: A.S. Pirozhkov**, Japan Atomic Energy Agency, Japan

**HEDS10-1 Generation of strong surface waves on a metal wire using intense laser interaction with solid targets**

**16:30**  
Kensuke Teramoto  
Kyoto University, Japan

**HEDS10-2 Structure and Dynamics of electric fields produced in the interaction between a single cluster and a background gas irradiated by a high power laser**

**16:50**  
Ryutaro Matsui  
Kyoto University, Japan

**HEDS10-3 Probing Space-Time Distortion with Laser Wake Field Acceleration and X-ray Free Electron Lasers**

**17:10**  
Masahiro Yano  
Osaka University, Japan



Friday, May 20

**9:00-9:40 HEDS11: Plenary**  
(ImPACT Session IX) Room 311+312

Chair: TBD

**HEDS11-1 (Plenary III) Manipulating Electrons with Intense Laser Pulses**  
9:00 Victor Malka  
Laboratoire d'Optique Appliquée, France

**9:40-10:30 HEDS12: Particle Acceleration III**  
(ImPACT Session X) Room 311+312

Chair: K.Kurshelnick, the University of Michigan, USA

**HEDS12-1 (Invited) High charge electron acceleration from solid target**  
9:40 Liming Chen  
Chinese Academy of Sciences, China

**HEDS12-2 Quasi-monoenergetic proton beam generation from an ion-layer embedded metal foil irradiated by an intense laser pulse**  
10:10 Kyung Nam Kim  
Korea Atomic Energy Research Institute, Korea

----- Break (10:30-11:00) -----

**11:00-12:00 HEDS13: Particle Acceleration IV**  
Room 311+312

Chair: W. Lu, Tsinghua University, China

**HEDS13-1 Recent progress on laser-plasma acceleration experiments at Shanghai Jiao Tong University**  
11:00 Nasr A. M. Hafz  
Shanghai Jiao Tong University, China

**HEDS13-2 Effect of halo-intensity distribution on the propagation of high power laser pulses in underdense plasmas**  
11:20 Naveen Pathak  
Osaka University, Japan

**HEDS13-1 Progress on Capillary Discharge Waveguide and its Pulsed-power Generator Development for Laser Wakefield Acceleration**  
11:40 Toru Sasaki  
Nagaoka University of Technology, Japan

----- Lunch Break (12:00-13:00) -----

**13:00-15:00 HEDSp14 : Poster Session** Exhibition Hall A  
Chair: H. Nakamura, Osaka University, Japan

**HEDSp14-1 High-quality electron beam generation by self-truncated ionization injection (STII)**  
Song Li  
Shanghai Jiao Tong University, China

**HEDSp14-2 Characteristics of radiation from the interaction between heavy element plasma and high intensity laser**  
Daiki Kawahito  
Kyoto university, Japan

**HEDSp14-3 Generating Surface Plasmon Resonance by interacting Laser with Ag Grating**  
Takafumi Otsuki  
Osaka University, Japan

**HEDSp14-4 Construction of 1D and 2D array detectors for high-energy X-ray measurement**  
Yukio Hayashi  
JAEA Kansai Photon Science Institute, Japan

**HEDSp14-5 Study of Betatron x-ray enhancement and quasi-monoenergetic electron beam generation from ionization injection based on LWFA**  
Huang Kai  
JAEA Kansai Photon Science Institute, Japan

**HEDSp14-6 Conical Forward THz Emission From Ultra-short Pulse Laser Created Plasma**  
Tadashi Shimizu  
Electrical and Electronic Engineering, Japan

**HEDSp14-7 Terahertz Radiation from Laser-Induced Plasma by Applying a Transverse Static Electric Field**  
Takuya Fukuda  
Advanced Optical Engineering, Japan

**HEDSp14-8 Development of Capillary Discharge Waveguide with Segmented Electrodes for Laser Wakefield Acceleration**  
Yuki Ohashi  
Nagaoka University of Technology, Japan

**HEDSp14-9 Development of an optically synchronized stable pump source for OPCPA**  
Yasuhiro Miyasaka  
Japan Atomic Energy Agency, Japan

**HEDSp14-10 Neutron angular and energy distribution of Lithium Target Reaction with Laser Driven Protons**  
Koichi Ogura  
Japan Atomic Energy Agency, Japan

**HEDSp14-11 Soliton Formation in Strongly Magnetized Plasmas**  
Wu Feng  
Kyoto University, Japan

**HEDSp14-12 Numerical Analysis for MHD Dynamics produced by Capillary Discharge for Plasma Wave Guide**  
Takashi Kikuchi  
Nagaoka University of Technology, Japan

**HEDSp14-13 Development of a high repetition rate proton transverse beam profile diagnostic for laser-plasma ion sources**  
Nicholas P. Dover  
Japan Atomic Energy Agency, Japan

**HEDSp14-14 Coherent Cherenkov Terahertz Generation by Laser-plasma Accelerated Electron Beam**  
Satoshi Wakamatsu  
Osaka University, Japan

**HEDSp14-15 Development of a few-cycle laser system for efficient electron self-injection in laser-driven acceleration**  
Keiichi Sueda  
Osaka University, Japan

**HEDSp14-16 Development of a high temporal and spatial resolution plasma diagnostics system for laser wakefield acceleration**  
Junpei Ogino  
Osaka University, Japan

**HEDSp14-17 Transition of Molecular Mixture between Molecular Fluid and Ionic Fluid**

- Yohei Fujimoto  
Osaka University, Japan
- HEDSp14-18 Study and design of electron source based on laser wakefield acceleration and ultrashort electron beam transport for compact free electron laser**  
Shinichi Masuda  
Osaka University, Japan
- HEDSp14-19 Recent progress on laser plasma accelerator and Platform laser system for multistage laser wakefield acceleration at Osaka university**  
Takamitsu Otsuka  
Osaka University, Japan
- HEDSp14-20 Higher order dispersion control by using assist pulse compression for the steepness laser pulse generation**  
Michiaki Mori  
Kansai Photon Science Institute, Japan Atomic Energy Agency, Japan
- HEDSp14-21 Laser-shock exploration of phase transformation of silicates system in the high-pressure melt**  
Toyohito Nishikawa  
Osaka University, Japan
- HEDSp14-22 Spectroscopic Observation of Molecular Mixture System under Laser-driven Shock Compression**  
Ryo Hazama  
Osaka University, Japan
- HEDSp14-23 Improvement of electron transport beamline with magnetic shield**  
Koki Osako  
Osaka University, Japan
- HEDSp14-24 Characterization of proton beams for medical applications**  
Dmitri Zhidkov  
Institute for Theoretical and Experimental Physics, Russia
- HEDSp14-25 Development of soft X-ray spectrometer in water window for LAPLACIAN project**  
Yuki Taguchi  
Osaka University, Japan
- HEDSp14-26 Upgrading of X-ray measurement system for P-cube laser experiment on LAPLACIAN project**  
Hirotaka Nakamura  
Osaka University, Japan
- HEDSp14-27 Staging laser wakefield acceleration with single gasjet target and two laser pulses**  
Nobuhiko Nakanii  
JAEA Kansai Photon Science Institute, Japan
- HEDSp14-28 Indirect monitoring shock waves generation stability during visible laser pump and XFEL probe in high energy density physics experiments**  
Tatiana Pikuz  
Osaka University, Japan
- HEDSp14-29 Experimental system developments for in situ observation of laser-shock compression dynamics using the high power laser and SACLA-XFEL**  
Kenjiro Takahashi  
Osaka University, Japan
- Break (15:00-15:30) -----
- 15:30-17:10 HEDS15:**  
**Particle Acceleration V & Radiation Sources III**  
Room 311+312
- Chair:K. Koyama, Kyoto University, Japan**
- HEDS15-1 On the mismatch in stimulated scattering processes in inhomogeneous plasmas**  
15:30  
Tao Gong  
Osaka University, Japan
- HEDS15-2 (Invited) Present status of the upgrade of the J-KAREN laser system and experimental results from the first light experiment**  
15:50  
Mamiko Nishiuchi  
Japan Atomic Energy Agency, Japan
- HEDS15-3 Development of Experimental Platform for High Energy Density Sciences at SACLA X-ray Free Electron Laser Facility**  
16:20  
Toshinori Yabuuchi  
RIKEN, Japan
- HEDS15-4 (Special) Hot-Electron Refluxing in Thin Foils Irradiated by Ultraintense Laser Pulses and Highly Efficient Terahertz Radiation**  
16:40  
Zhan Jin  
Osaka University, Japan
- 17:10-17:25 Closing**  
Room 311+312
- Closing Remarks**  
17:10  
S.V. Bulanov  
Japan Atomic Energy Agency, Japan

**The 4th International Conference on  
Light-Emitting Devices and Their Industrial  
Applications '16**

**LEDIA '16**

Wednesday, May 18

**9:00-12:10 OPIC Plenary Session**

Room 501+502

---- Break Lunch (12:10-13:20) ----

**13:20-13:30 Opening**

Room 411+ 412

**Opening Remarks**

**13:20** T. Honda, Steering Committee Chair of LEDIA' 16  
Kogakuin Univ., Japan

**13:30-15:30 LED1: Special Session 1 (Industrial Applications)**

Room 411+ 412

**Chair: G. Hatakoshi, Program Committee Member of LEDIA' 16,**  
Waseda Univ., Japan

**LED1-1 (Invited) Narrow-Band LEDs for Medical Applications**  
**13:30** M. Ogasawara <sup>1</sup>, T. Hirao <sup>2</sup>, and S. Fujita <sup>2</sup>

<sup>1</sup>Mignon Belle Clinic, Japan, <sup>2</sup>Kyoto Univ., Japan

**LED1-2 (Invited) Current Status and Future Prospects of LED Lighting in Horticulture**  
**14:00** N. Hasegawa and N. Kurata

Inochio Holdings Inc., Japan

**LED1-3 (Invited) Laser Headlights**  
**14:30** Y. Nakazato, T. Tokiwa, and M. Uchida

Stanley Electric Co., Ltd., Japan

**LED1-4 (Invited) Beyond Illumination: Lighting Enabled System Applications**  
**15:00** R. F. Karlicek, Jr.

Rensselaer Polytechnic Inst., U.S.A.

---- Break (15:30-16:00) ----

**16:00-17:45 LED2: Special Session 2 (Industrial Applications)**

Room 411+412

**Chair: T. Miyajima, Program Committee Vice-Chair of LEDIA' 16,**  
Meijo Univ., Japan

**LED2-1 (Invited) To be determined**  
**16:00** B. Monemar <sup>1,2</sup>

<sup>1</sup>Linköping Univ., Sweden, <sup>2</sup>Lund Univ., Sweden

**LED2-2 Optimization Analysis of the Arrangements of LEDs for an Indoor Visible Light Communication System**  
**16:30** M. Gao, T. Lan, Z. Shen, and X. Chen

Beijing Inst. of Tech., China

**LED2-3 Design of Multi-Functional Integrated Quantum Dot Sheet to Enhance Efficiency of LED Backlight Unit**  
**16:45** S. -E. Kim, J. -Y. Lee, M. -H. Shin, and Y. -J.

Kim

Yonsei Univ., Korea

**LED2-4 GaN Light-Emitting Diode with Monolithically-Integrated Photodetector**  
**17:00**

H. T. Lu, K. H. Li, and H. W. Choi

The Univ. of Hong Kong, Hong Kong

**LED2-5 Efficient Laser Beam Coupling with a Waveguide-Type Red-Green-Blue Combiner**  
**17:15**

A. Nakao <sup>1</sup>, S. Hayashiguchi <sup>1</sup>, S. Tanaka <sup>1</sup>, S. Yokokawa <sup>1</sup>, and T. Katsuyama <sup>1,2</sup>

<sup>1</sup>Univ. of Fukui, Japan, <sup>2</sup>UF-HISAC, Univ. of Fukui, Japan

**LED2-6 A High Efficiency Laser Spotlight Illuminator**  
**17:30** T. Miwa <sup>1</sup>, A. Takamori <sup>2</sup>, and K. Morimoto <sup>3</sup>

<sup>1</sup>IDEC Corp., Japan, <sup>2</sup>Osaka Univ., Japan, <sup>3</sup>AIS company, Panasonic Corp., Japan

**18:00-20:00 OPIC Reception**

Room 501+502

Thursday, May 19

**9:00-12:00 LED3: Bulk & Epitaxy**

Room 411+412

**Co-Chairs: H. Murakami, Program Committee Member of LEDIA' 16,**

Tokyo Univ. of Agri. & Tech., Japan

**Y. Honda, Program Committee Member of LEDIA' 16,**

Nagoya Univ., Japan

**LED3-1 (Invited) Improving Growth Rate and Transparency of Basic Ammonothermal GaN Crystals**  
**9:00**

S. Pimputkar <sup>1</sup>, S. Griffiths <sup>1</sup>, T. Malkowski <sup>1</sup>, S. Suihkonen <sup>2</sup>, J. S. Speck <sup>1</sup>, and S. Nakamura <sup>1</sup>

<sup>1</sup>Univ. of California, Santa Barbara, U.S.A., <sup>2</sup>Aalto Univ., Finland

**LED3-2 Fabrication of Crack-Free Freestanding GaN Substrates by Dissolution of Sapphire Substrates using Li after the Na-Flux Growth**  
**9:30**

T. Yamada, M. Imanishi, K. Nakamura, K. Murakami, H. Imabayashi, D. Matsuo, M. Honjo, M. Maruyama, M. Imade, M. Yoshimura, and Y. Mori

Osaka Univ., Japan

**LED3-3 Detailed Study of Homoepitaxial HVPE GaN Growth in the c-Direction**  
**9:45**

B. Lucznik <sup>1,2</sup>

<sup>1</sup>Inst. of High Pressure Physics PAS, Poland, <sup>2</sup>TopGaN Sp z o.o., Poland

**LED3-4 Study of Homoepitaxial Non-polar and Semi-polar Growth of GaN by HVPE. Influence of Lateral Growth on HVPE-GaN Grown in the c-Direction.**  
**10:00**

M. Amilusik <sup>1,2</sup>, T. Sochacki <sup>1,2</sup>, M. Iwinska <sup>1</sup>, M. Fijałkowski <sup>1</sup>, B. Lucznik <sup>1,2</sup>, I. Grzegory <sup>1</sup>, and M. Bockowski <sup>1</sup>

<sup>1</sup>Inst. of High Pressure Physics PAS, Poland, <sup>2</sup>TopGaN Sp z o.o., Poland

**LED3-5 High Temperature Growth of Thick InGaN Layers using Tri-Halide Vapor Phase Epitaxy**  
**10:15**

M. Meguro<sup>1</sup>, T. Hirasaki<sup>1</sup>, T. Hasegawa<sup>1</sup>, Q. T. Thieu<sup>1</sup>, H. Murakami<sup>1</sup>, Y. Kumagai<sup>1</sup>, B. Monemar<sup>1,2</sup>, and A. Koukitsu<sup>1</sup>  
<sup>1</sup>Tokyo Univ. of Agri. & Tech., Japan, <sup>2</sup>Linköping Univ., Sweden

----- Break (10:30-11:00) -----

**LED3-6** **Influence of Growth Conditions on Transport Properties in Undoped N-polar GaN Grown by Metalorganic Vapor Phase Epitaxy**  
 T. Tanikawa, K. Prasertsuk, A. Miura, S. Kuboya, R. Katayama, and T. Matsuoka  
 Tohoku Univ., Japan

**LED3-7** **The Growth of Semi-Polar GaN on (0001) C-Plane Nano-Sized Patterned-Sapphire Substrates**  
 V. -C. Su<sup>1</sup>, Z. -H. Hung<sup>1</sup>, Y. -H. You<sup>1,2</sup>, H. -S. Wu<sup>1</sup>, P. -H. Chen<sup>1,2</sup>, H. -A. Liu<sup>1</sup>, and C. -H. Kuan<sup>1</sup>  
<sup>1</sup>National Taiwan Univ., Taiwan, <sup>2</sup>Kingwave Corp., Taiwan

**LED3-8** **Characterization of RF Plasma Nitridated  $\alpha$ -(AlGa)<sub>2</sub>O<sub>3</sub> for AlGa<sub>N</sub> Growth**  
 T. Araki<sup>1</sup>, A. Buma<sup>1</sup>, N. Masuda<sup>1</sup>, M. Oda<sup>2</sup>, T. Hitora<sup>2</sup>, and Y. Nanishi<sup>1</sup>  
<sup>1</sup>Ritsumeikan Univ., Japan, <sup>2</sup>FLOSFA, Japan

**LED3-9** **Growth of In<sub>2</sub>O<sub>3</sub> by Halide Vapor Phase Epitaxy**  
 S. Numata<sup>1</sup>, R. Togashi<sup>1</sup>, K. Goto<sup>2</sup>, H. Murakami<sup>1</sup>, A. Kuramata<sup>2</sup>, S. Yamakoshi<sup>2</sup>, and Y. Kumagai<sup>1</sup>  
<sup>1</sup>Tokyo Univ. of Agri. & Tech., Japan, <sup>2</sup>Tamura Corp., Japan

----- Lunch Break (12:00-13:00) -----

**13:00-14:45 LEDp4: Short Presentations for Poster Session**  
 Room 411+412

**Co-Chairs: Y. Honda, Program Committee Member of LEDIA' 16,**  
 Nagoya Univ., Japan

**T. Yamaguchi, Program Committee Member of LEDIA' 16,**  
 Kogakuin Univ., Japan

**H. Murakami, Program Committee Member of LEDIA' 16,**  
 Tokyo Univ. of Agri. & Tech., Japan

**R. Togashi, Program Committee Member of LEDIA' 16,**  
 Tokyo Univ. of Agri. & Tech., Japan

**Short Presentation by LEDp4-(1-33)**

**15:30-17:00 LEDp4: Poster Session** Exhibition Hall A

### Oxides & Electrodes

**LEDp4-1** **Enhanced Optoelectronic Properties on Ga-doped ZnO Thin Film by Intermittent Process**  
 K. -T. Wang<sup>1</sup>, Y. -S. Lin<sup>1</sup>, and K. -M. Chang<sup>2</sup>  
<sup>1</sup>I-Shou Univ., Taiwan, <sup>2</sup>Chiao Tung Univ., Taiwan

**LEDp4-2** **Study of Al-doped ZnO Layer Deposited on**

### **Flexible Substrate by Optimum Thermal Treatment on Buffer Layer**

H. -J. Guo and Y. -S. Lin  
 I-Shou Univ., Taiwan

**LEDp4-3** **An Ni/Ga-Doped ZnO Electrode Deposited on p-GaN Layer using RF Magnetron Sputtering for UV-LEDs**

S. Joeng<sup>1</sup>, G. -J. Yohn<sup>1</sup>, N. -W. Kang<sup>1</sup>, D. Kim<sup>1</sup>, S. -C. Shin<sup>1</sup>, and K. -K. Kim<sup>1,2</sup>

<sup>1</sup>Dept. of Advanced convergence Tech., and Research Inst. of advanced Convergence Tech., Korea Polytechnic Univ., Korea, <sup>2</sup>Dept. of Nano Optical Eng., Korea Polytechnic Univ., Korea

**LEDp4-4** **Study of Thermal Annealing Treatment on AZO/Au-NPs/AZO Transparent Conductive Electrode**

Y. -R. Wang and Y. -S. Lin  
 I-Shou Univ., Taiwan

**LEDp4-5** **Optical Properties of ZnO Films Dispersed with Ag Nanocrystals Fabricated by Molecular Precursor Method**

D. Taka<sup>1</sup>, T. Onuma<sup>1</sup>, T. Shibukawa<sup>1</sup>, H. Nagai<sup>1</sup>, T. Yamaguchi<sup>1</sup>, J. -S. Jang<sup>2</sup>, M. Sato<sup>1</sup>, and T. Honda<sup>1</sup>

**LEDp4-6** **Low Cost ZnO Wide Bandgap Semiconductors for Optoelectronic Devices**

A. H. Ramelan and S. Wahyuningasih  
 Sebelas Maret Univ., Indonesia

**LEDp4-7** **Strain Relaxation of ZnO Grown on Various Silicon Substrates**

J. -D. Lai<sup>1</sup>, Y. -S. You<sup>1</sup>, S. -W. Feng<sup>1</sup>, C. -H. Chen<sup>2</sup>, and L. -W. Tu<sup>3</sup>

<sup>1</sup>National Univ. of Kaohsiung, Taiwan, <sup>2</sup>Industrial Technology Research Inst., Taiwan, <sup>3</sup>National Sun Yat-Sen Univ., Taiwan

**LEDp4-8** **Ag-based Reflective Electrode of High Reliability using ITO Nano Particle and Ni Alloy for High Efficiency LEDs**

J. -S. Kwon<sup>1</sup>, J. -Y. Beak<sup>1</sup>, N. -W. Kang<sup>1</sup>, S. -H. Kang<sup>1</sup>, S. -C. Shin<sup>1</sup>, and K. -K. Kim<sup>1,2</sup>

<sup>1</sup>Dept. of Advanced Convergence Tech., and Research Inst. of Advanced Convergence Tech., Korea Polytechnic Univ., Korea, <sup>2</sup>Dept. of Nano Optical Eng., Korea Polytechnic Univ., Korea

**LEDp4-9** **Enhanced Output Power on GaN-based Light-Emitting Diodes by Annealing the ITO Transparent Conducting Layer**

Y. -S. Lin<sup>1</sup>, C. -L. Liu<sup>1</sup>, K. -Y. Lin<sup>1</sup>, C. -N. Li<sup>2</sup>, C. -L. Tseng<sup>2</sup>, C. -H. Shen<sup>2</sup>

**LEDp4-10** **Wide Bandgap Transparent Electrode of FTO/Ag/FTO Multilayer Structure for UV-LEDs**

G. -J. Yohn<sup>1</sup>, J. Jeong<sup>1</sup>, J. -S. Kwon<sup>1</sup>, D. Kim<sup>1</sup>, S. Jeong<sup>1</sup>, and K. -K. Kim<sup>1,2</sup>

<sup>1</sup>Dept. of Advanced convergence Tech., and Research Inst. of advanced Convergence Tech., Korea Polytechnic Univ., Korea, <sup>2</sup>Dept. of Nano Optical Eng., Korea Polytechnic Univ., Korea

**LEDp4-11** **ITO/Ga<sub>2</sub>O<sub>3</sub> Multilayer Electrodes Towards Deep UV-LEDs**

N. Kuwabara<sup>1</sup>, T. Yasuda<sup>1</sup>, S. Katsuno<sup>1</sup>, N. Koide<sup>1</sup>, T. Takeuchi<sup>1</sup>, M. Iwaya<sup>1</sup>, S. Kamiyama

<sup>1</sup>, and I. Akasaki <sup>1,2</sup>  
<sup>1</sup>Meijo Univ., Japan, <sup>2</sup> Akasaki Research Center,  
 Nagoya Univ., Japan

### Nanostructures

**LEDp4-12 The Influence on Peak Emission Intensity Ratio between Free-Exciton Recombination and Deep Defect Recombination of ZnO Morphology Evolution from Nanorods to Nanotubes**

W. -H. Tsai and S. -S. Lo  
 Feng-Chia Univ., Taiwan,

**LEDp4-13 The Effect of ZnO Seed Layer Prepared by Sputtering and Hydrothermal Method for Light Extraction Structure using ZnO Nanorods**

S. -H. Kang <sup>1</sup>, H. Cho <sup>1</sup>, G. -J. Yohn <sup>1</sup>, J. -S. Kwon <sup>1</sup>, S. Kim <sup>1</sup>, and K. -K. Kim <sup>1,2</sup>

<sup>1</sup>Dept. of Advanced convergence Tech., and Research Inst. of advanced Convergence Tech., Korea Polytechnic Univ., Korea, <sup>2</sup>Dept. of Nano Optical Eng., Korea Polytechnic Univ., Korea

**LEDp4-14 Etching to Lead the Uniform Distribution of CuO Nano-Wires on the Surface of ZnO Seed Layers**

Y. -C. Chang and Y. -S. Lin  
 I-Shou Univ., Taiwan

**LEDp4-15 Microtube Light-Emitting Diode Arrays with Metal Cores**

Y. Tchoe <sup>1</sup>, C. -H. Lee <sup>2</sup>, J. Park <sup>1</sup>, H. Baek <sup>1</sup>, K. Chung <sup>1</sup>, J. Jo <sup>3</sup>, M. Kim <sup>3</sup>, and G. -C. Yi <sup>1</sup>

<sup>1</sup>Dept. of Physics and Astronomy, Inst. of Applied Physics, and Research Inst. of Advanced Materials, Seoul National Univ., Korea

<sup>2</sup>Dept. of Nano-Bio-Information-Technology, KU-KIST Grad. School of Converging Sci. and Tech., Korea Univ., Korea

<sup>3</sup>Dept. of Material Sci. and Eng. and Research Inst. of Advanced Materials, Seoul National Univ., Korea

**LEDp4-16 Monitoring Thicknesses and Aggregation of Thin Layers during Fabrication of Plasmonic Devices using White LEDs**

K. Murai <sup>1</sup>, C. Heck <sup>1</sup>, S. Mochizuki <sup>1</sup>, K. Hattori <sup>2</sup>, M. Shiraishi <sup>2</sup>, T. Nakashio <sup>2</sup>, Y. Oshikane <sup>2</sup>, and M. Nakano <sup>2</sup>

<sup>1</sup>AIST, Japan, <sup>2</sup>Osaka Univ., Japan

### Bulk & Epitaxy

**LEDp4-17 Transparent GaN Crystals Grown by Na-Flux Method with High Temperature**

M. Hayashi, T. Sato, S. Ogawa, M. Imanishi, K. Murakami, M. Maruyama, M. Imade, M. Yoshimura, and Y. Mori  
 Osaka Univ., Japan

**LEDp4-18 Photoluminescence Wavelength Difference of InGaN/GaN Multiple Quantum Wells Grown by MOCVD under the Same Growth Temperature**

Y. Sato, H. Takahashi, and Y. Iyechika  
 NuFlare Technology, Inc., Japan

**LEDp4-19 Origin of Green Band in Photoluminescence**

### **Spectra of Heavily Doped Al<sub>x</sub>Ga<sub>1-x</sub>N:Si Layers**

I. Osinnykh <sup>1,3</sup>, T. Malin <sup>1</sup>, V. Plyusnin <sup>2,3</sup>, A. Suranov <sup>1</sup>, A. Gilinsky <sup>1</sup>, and K. Zhuravlev <sup>1,3</sup>

<sup>1</sup>Rzhanov Inst. of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences, Russia

<sup>2</sup>Voevodsky Inst. of Chemical Kinetics and Combustion of the Siberian Branch of the Russian Academy of Sciences, Russia

<sup>3</sup>Novosibirsk State Univ., Russia

**LEDp4-20 Mist CVD Growth of In<sub>2</sub>O<sub>3</sub> Films on (0001)α-Al<sub>2</sub>O<sub>3</sub> Substrates and (0001)GaN Templates**

T. Kobayashi <sup>1</sup>, K. Tanuma <sup>1</sup>, T. Yamaguchi <sup>1,2</sup>, T. Onuma <sup>1,2</sup>, and T. Honda <sup>1,2</sup>

<sup>1</sup>Electrical Eng. and Electronics, Grad. School of Eng., Kogakuin Univ., Japan, <sup>2</sup>Dept. of Applied Physics, Kogakuin University, Japan

### LEDs

**LEDp4-21 Enhanced Light Efficiency of GaN-based High Voltage LEDs Fabricated by Multi-Chip Array with Double Electrode**

N. -W. Kang <sup>1</sup>, S. -H. Kang <sup>1</sup>, S. Jeong <sup>1</sup>, H. Cho <sup>1</sup>, S. Kim <sup>1</sup>, and K. -K. Kim <sup>1,2</sup>

<sup>1</sup>Dept. of Advanced convergence Tech., and Research Inst. of advanced Convergence Tech., Korea Polytechnic Univ., Korea, <sup>2</sup>Dept. of Nano Optical Eng., Korea Polytechnic Univ., Korea

**LEDp4-22 Enhanced Optoelectronic Properties on the High-Voltage Light-Emitting Diode by Reducing the Stacking Fault Density of GaN Surface**

Y. -S. Lin <sup>1</sup>, C. -L. Liu <sup>1</sup>, S. -Y. Hsiao <sup>2</sup>, C. -L. Tseng <sup>2</sup>, C. -H. Shen <sup>2</sup>,

<sup>1</sup>I-Shou Univ., Taiwan, <sup>2</sup>EPSTAR Corp., Taiwan

**LEDp4-23 Mitigation of Quantum-Confined Stark Effect by Enlarging Post-Duty Cycle of Patterned-Sapphire Substrates**

H. -A. Liu <sup>1</sup>, V. -C. Su <sup>1</sup>, P. -H. Chen <sup>1,2</sup>, Y. -P. Chen <sup>1</sup>, Y. -H. You <sup>1,2</sup>, H. -S. Wu <sup>1</sup>, and C. -H. Kuan <sup>1</sup>

<sup>1</sup>National Taiwan Univ., Taiwan, <sup>2</sup>Kingwave Corp., Taiwan

**LEDp4-24 Improved Internal-Quantum Efficiency of GaN-Based Light-Emitting Diodes by Patterned-Sapphire Substrates with Larger Post-Duty Cycles**

H. -S. Wu <sup>1</sup>, V. -C. Su <sup>1</sup>, P. -H. Chen <sup>1,2</sup>, Y. -P. Chen <sup>1</sup>, Y. -H. You <sup>1,2</sup>, H. -A. Liu <sup>1</sup>, and C. -H. Kuan <sup>1</sup>

<sup>1</sup>National Taiwan Univ., Taiwan, <sup>2</sup>Kingwave Corp., Taiwan

**LEDp4-25 Patterned-Sapphire Substrates-Based Stress-Induced Bandgap Widening of GaN-Based Light-Emitting Diodes**

Y. -C. Liu <sup>1</sup>, V. -C. Su <sup>1</sup>, Y. -P. Chen <sup>1</sup>, P. -H. Chen <sup>1,2</sup>, Y. -H. You <sup>1,2</sup>, H. -S. Wu <sup>1</sup>, H. -A. Liu <sup>1</sup>, and C. -H. Kuan <sup>1</sup>

<sup>1</sup>National Taiwan Univ., Taiwan, <sup>2</sup>Kingwave Corp., Taiwan

**LEDp4-26 Temperature Dependence of the Nitride-based HFET Structure Photosensors**

S. Ushida <sup>1</sup>, A. Yoshikawa <sup>1,3</sup>, M. Iwaya <sup>1</sup>, T. Takeuchi <sup>1</sup>, S. Kamiyama <sup>1</sup>, and I. Akasaki <sup>1,2</sup>  
<sup>1</sup>Meijo Univ., Japan, <sup>2</sup>Akasaki Research Center, Nagoya Univ., Japan, <sup>3</sup>Asahi-Kasei, Japan

### Novel Materials

- LEDp4-27 Effects of Dwell Durations and Inter-Dot Spacings on Deposited Nano-Silver Droplets on Glass Substrates**  
 C. Y. Chan <sup>1</sup>, K. C. Shih <sup>1</sup>, and T. M. Huang <sup>2</sup>  
<sup>1</sup>Instrument Technology Research Center, National Applied Research Laboratories, Taiwan, <sup>2</sup>Kingley Rubber Industrial Co., Ltd., Taiwan
- LEDp4-28 Photophysical and Electroluminescence Properties of Polyfluorene Derivatives**  
 D. J. Liaw <sup>1</sup>, Q. Zhang <sup>1</sup>, S. H. Tan <sup>2</sup>, Z. W. Tan <sup>2</sup>, Y. H. Hii <sup>2</sup>, Y. L. Wong <sup>2</sup>, K. S. Cheah <sup>2</sup>, C. H. Nee <sup>2</sup>, and S. S. Yap <sup>2</sup>  
<sup>1</sup>National Taiwan Univ. of Sci. and Tech., Taiwan, <sup>2</sup>Multimedia Univ., Malaysia
- LEDp4-29 Band-Engineering of the TiO<sub>2</sub> Wide Bandgap Semiconductor Using Organic Chromophore Dye**  
 S. Wahyuningsih <sup>1</sup> and A. H. Ramelan <sup>2</sup>  
<sup>1</sup>Inorganic Material Research Group, Sebelas Maret Univ., Indonesia, <sup>2</sup>Electronic Materials and Energy Research Group, Sebelas Maret Univ., Indonesia

### Industrial Applications

- LEDp4-30 High Power Blue Laser Based Ceramic Phosphor for Automotive Application**  
 E. K. Ji <sup>1</sup>, Y. H. Song <sup>2</sup>, C. W. Lee <sup>2</sup>, and D. H. Yoon <sup>1,2</sup>  
<sup>1</sup>SAINT, Sungkyunkwan Univ., Korea, <sup>2</sup>School of Advanced Materials Sci. & Eng., Sungkyunkwan Univ., Korea
- LEDp4-31 Optimization of Local Illumination in Indoor Visible Light Communication Based on Simulated Annealing Hybrid Genetic Algorithm**  
 M. Gao, T. Lan, X. Chen, and G. Ni  
 Beijing Inst. of Tech., China
- LEDp4-32 LED Reliability Test Method Based on Precise Real-Time Junction Temperature Monitoring**  
 B. Ma and K. Lee  
<sup>1</sup>Korea Electronics Technology Inst., Korea
- LEDp4-33 Ambient-Light Influenced Photometric Properties of a Curved AMOLED Display by Directional Imaging Luminance Measurements**  
 T. -Y. Chung and S. -W. Hsu  
 Industrial Technology Research Inst., Taiwan

Friday, May 20

**9:00-10:30 LED5: LEDs** Room 411+412

Chair: J. Cho, Program Committee Member of LEDIA' 16, Chonbuk National Univ., Korea

**LED5-1 (Invited) Enhanced Red**

**9:00 Photo/electroluminescence from Eu-doped GaN through Optimization of Defect Environment**

Y. Fujiwara <sup>1</sup>, W. Zhu <sup>1</sup>, B. Mitchell <sup>2</sup>, D. Timmerman <sup>1</sup>, A. Uedono <sup>3</sup>, and A. Koizumi <sup>1</sup>  
<sup>1</sup>Osaka Univ., Japan, Univ. of Mt. Union, U.S.A., Univ. of Tsukuba, Japan

**LED5-2 8-inch GaN on Si MOCVD Growth of >80% WPE Blue LEDs**

J. Ramer, W. Fenwick, K. Knieriem, D. Lee, L. Ye, T. Shioda, and K. Tachibana  
 Toshiba America Electronic Components, Inc., U.S.A.

**LED5-3 Highly Uniform InGaN/GaN MQW Grown on 200 mm Si Substrate at 500 Torr by Fast Rotating Single-Wafer MOCVD**

Y. Iyechika, Y. Ishikawa, Y. Sato, and H. Takahashi  
 NuFlare Technology, Inc., Japan

**LED5-4 A InGaN-MQW Blue LED on (-2 0 1)β-Ga<sub>2</sub>O<sub>3</sub> Substrate**

Y. P. Lan <sup>1</sup>, Y. J. Shih <sup>2</sup>, T. C. Chang <sup>3</sup>, and C. Y. Chang <sup>2,4</sup>

<sup>1</sup>Microelectronic and information system research center, National Chiao Tung Univ., Taiwan, <sup>2</sup>Dept. of Electronics Eng., National Chiao Tung Univ., Taiwan, <sup>3</sup>Dept of Photonics and Inst. of Electro-Optical Eng., National Chiao Tung Univ., Taiwan, <sup>4</sup>Research Center for Applied Sciences, Academia Sinica, Taiwan

**LED5-5 Low-Temperature Grown p-Side Structure with GaInN Tunnel Junction and n-GaNsb**

K. Suzuki <sup>1</sup>, K. Takarabe <sup>1</sup>, D. Komori <sup>1</sup>, D. Takasuka <sup>1</sup>, N. Koide <sup>1</sup>, T. Takeuchi <sup>1</sup>, M. Iwaya <sup>1</sup>, S. Kamiyama <sup>1</sup>, and I. Akasaki <sup>1,2</sup>

<sup>1</sup>Meijo Univ., Japan, <sup>2</sup>Akasaki Research Center, Nagoya Univ., Japan

---- Break (10:30-11:00) ----

**11:00-12:00 LED6: Nanostructures** Room 411+412

Chair: Y. J. Kim, Program Committee Member of LEDIA' 16,

Yonsei Univ., Korea

**LED6-1 (Invited) Plasmonics toward High-Efficiency LEDs with Wide Wavelength Range**

K. Okamoto  
 Kyushu Univ., Japan

**LED6-2 Controlled Growth of Highly Elongated GaN Nanorod Arrays on AlN/Si Templates by Pulsed-Mode Metalorganic Vapor Deposition**

S.-Y. Bae <sup>1</sup>, K. Lekhal <sup>1,2</sup>, B. O. Jung <sup>1</sup>, D.-S. Lee <sup>3</sup>, M. Deki <sup>2</sup>, Y. Honda <sup>2</sup>, and H. Amano <sup>2,4</sup>

<sup>1</sup>Dept. of Electrical Eng. and Computer Sci., Nagoya Univ., Japan, <sup>2</sup>Inst. of Materials and Systems for Sustainability, Nagoya Univ., Japan, <sup>3</sup>Gwangju Inst. of Sci. and Tech., Korea, <sup>4</sup>Akasaki Research Center, Nagoya Univ., Japan

**LED6-3 Controlled Morphology of Regular GaN Microrod and Nanowire Arrays by Selective Area Growth with HVPE**

K. Lekhal <sup>1,2,3</sup>, S. Y. Bae <sup>1</sup>, H. J. Lee <sup>1</sup>, K. Nishi <sup>1</sup>,

K. Saitoh<sup>1</sup>, M. Deki<sup>2</sup>, Y. Honda<sup>2</sup>, and H. Amano<sup>2,3,4</sup>  
<sup>1</sup>Dept. of Electrical Eng. and Computer Sci., Nagoya Univ., Japan, <sup>2</sup>Inst. of Materials and Systems for Sustainability, Nagoya Univ., Japan, <sup>3</sup>VBL, Nagoya Univ., Japan, <sup>4</sup>Akasaki Research Center, Nagoya Univ., Japan

----- Lunch Break (12:00-13:15) -----

**13:15-15:00 LED7: AlGaIn & Devices** Room 411+412

**Chair: T. -C. Lu,**

National Chiao Tung Univ., Taiwan

**LED7-1 (Invited) AlGaIn-based Deep UV LEDs - from Research to Real-World Applications**

13:15

M. Kneissl<sup>1,2</sup>, J. Enslin<sup>1</sup>, M. Guttman<sup>1</sup>, C. Kuhn<sup>1</sup>, F. Mehnke<sup>1</sup>, C. Reich<sup>1</sup>, L. Sulmoni<sup>1</sup>, T. Wernicke<sup>1</sup>, J. Glaab<sup>2</sup>, S. Hagedorn<sup>2</sup>, A. Knauer<sup>2</sup>, T. Kolbe<sup>2</sup>, M. Lapeyrade<sup>2</sup>, N. Lobo-Ploch<sup>2</sup>, C. Netzel<sup>2</sup>, J. Raß<sup>2</sup>, C. Stölmacker<sup>2</sup>, U. Zeimer<sup>2</sup>, S. Einfeldt<sup>2</sup>, and M. Weyers<sup>2</sup>

<sup>1</sup>Technical Univ. Berlin, Germany,

<sup>2</sup>Leibniz-Institut für Höchstfrequenztechnik, Germany

**LED7-2 (Invited) Preferential Outcoupling of Strong in-Plane Emission from AlGaIn-based Deep-Ultraviolet Light-Emitting Diodes**

13:45

J. W. Lee<sup>1</sup>, D. Y. Kim<sup>1</sup>, J. H. Park<sup>1</sup>, E. F. Schubert<sup>2</sup>, J. Kim<sup>3</sup>, J. Lee<sup>3</sup>, Y. Kim<sup>3</sup>, Y. Park<sup>3</sup>, and J. K. Kim<sup>1</sup>

<sup>1</sup>POSTECH, Korea, <sup>2</sup>ECES Dept. Rensselaer Polytechnic Inst., U.S.A., <sup>3</sup>Samsung Electronics, Korea

**LED7-3 Strongly TE-Polarized Emission from Deep UV AlGaIn Quantum Well LEDs**

14:15

C. Reich<sup>1</sup>, M. Feneberg<sup>2</sup>, M. Guttman<sup>1</sup>, T. Wernicke<sup>1</sup>, F. Mehnke<sup>1</sup>, and M. Kneissl<sup>1</sup>

<sup>1</sup>Technical Univ. Berlin, Germany,

<sup>2</sup>Otto-von-Guericke-Univ. Magdeburg, Germany

**LED7-4 Polarization Induced Hole Accumulations in Nitride Semiconductor Heterostructures**

14:30

T. Yasuda<sup>1</sup>, S. Yoshida<sup>1</sup>, T. Takeuchi<sup>1</sup>, M. Iwaya<sup>1</sup>, S. Kamiyama<sup>1</sup>, I. Akasaki<sup>1,2</sup>, and H. Amano<sup>2,3</sup>

<sup>1</sup>Meijo Univ., Japan, <sup>2</sup>Akasaki Research Center, Nagoya Univ., Japan, <sup>3</sup>Inst. of Materials and Systems for Sustainability, Nagoya Univ., Japan

**LED7-5 Current Transport Mechanism of Graphene/AlGaIn Schottky Barrier Diodes**

14:45

B. Pandit<sup>1</sup>, T. H. Seo<sup>2</sup>, B. D. Ryu<sup>1</sup>, and J. Cho<sup>1</sup>

<sup>1</sup>Chonbuk National Univ., Korea, <sup>2</sup>Korea Inst. of Sci. and Tech., Korea

----- Break (15:00-15:30) -----

**15:30-17:00 LED8: Lasers** Room 411+412

**Chair: M. Kneissl,**

Technical Univ. Berlin, Germany

**LED8-1 (Invited) Design and Characteristics of GaN-based VCSELs**

15:30

T. C. Lu, H. C. Kuo, and S. C. Wang

National Chiao Tung Univ., Taiwan

**LED8-2 GaN-based VCSELs using Periodic Gain Structures**

16:00

K. Matsui<sup>1</sup>, K. Ikeyama<sup>1</sup>, T. Furuta<sup>1</sup>, Y. Kozuka<sup>1</sup>, T. Akagi<sup>1</sup>, T. Takeuchi<sup>1</sup>, S. Kamiyama<sup>1</sup>, M. Iwaya<sup>1</sup>, and I. Akasaki<sup>1,2</sup>

<sup>1</sup>Meijo Univ., Japan, <sup>2</sup>Akasaki Research Center, Nagoya Univ., Japan

**LED8-3 Suppressing the Incorporation of Carbon Impurity in AlGaIn:Mg for Green LDs with Low Operation Voltage**

16:15

J. Liu<sup>1,2</sup>, A. Tian<sup>1,2</sup>, M. Ikeda<sup>1,2</sup>, L. Zhang<sup>1,2</sup>, S. Zhang<sup>1,2</sup>, D. Li<sup>1,2</sup>, and H. Yang<sup>1,2</sup>

<sup>1</sup>Suzhou Inst. of Nano-tech and Nano-bionics, Chinese Academy of Sciences, China

<sup>2</sup>Key Lab. of Nanodevices and Applications, Chinese Academy of Sciences, China

**LED8-4 Opto-electrical Properties of Tapered (Al,In)GaIn Laser Diodes**

16:30

S. Stanczyk<sup>1</sup>, A. Kafar<sup>1</sup>, A. Nowakowska-Siwinska<sup>2</sup>, I. Makarowa<sup>2</sup>, M. Sarzynski<sup>1,2</sup>, J. Walczak<sup>3</sup>, R. Sarzala<sup>3</sup>, T. Suski<sup>1</sup>, and P. Perlin<sup>1,2</sup>

<sup>1</sup>Inst. of High Pressure Physics PAS., Poland,

<sup>2</sup>TopGaIn Ltd., Poland, <sup>3</sup>Inst. of Physics, Lodz Univ. of Tech., Poland

**LED8-5 Nitride Superluminescent Diodes with Broadband Emission Spectra Realized by Step-like Indium Content Profile**

16:45

A. Kafar<sup>1</sup>, S. Stanczyk<sup>1</sup>, M. Sarzynski<sup>1,2</sup>, S. Grzanka<sup>1,2</sup>, J. Goss<sup>1</sup>, T. Suski<sup>1</sup>, and P. Perlin<sup>1,2</sup>

<sup>1</sup>Inst. of High Pressure Physics PAS., Poland, <sup>2</sup>TopGaIn Ltd., Poland

**17:00-17:30 LED9: Tutorial** Room 411+412

**Chair: B. Monemar, Advisory Member of LEDIA' 16,**

Linköping Univ. & Lund Univ., Sweden

**LED9-1 (Invited) Integrated GaN-based Light-Emitting Diodes for Micro Displays**

17:00

T. Honda, T. Yamaguchi, and T. Onuma

Kogakuin Univ., Japan

**17:30-17:45 Closing** Room 411+412

**Closing Remarks**

17:30

T. Takeuchi, Program Committee Chair of LEDIA' 16

Meijo Univ., Japan

# The 4<sup>th</sup> Laser Ignition Conference 2016

## LIC'16

Wednesday, May 18

### 9:00-12:10 OPIC Plenary Session

Room 501+502

----- Lunch Break (12:10-13:30) -----

### 13:30-15:15 LIC+PLD+SLPC Joint Session 1

Room 301

Chair: K. Washio (Paradigm Laser Research, Japan)

#### 13:30 Introduction

T. Taira<sup>1</sup>, T. Jitsuno<sup>2</sup>, and Y. Okamoto<sup>3</sup>

<sup>1</sup>Inst. Mo. Sci., Japan, <sup>2</sup>Osaka Univ., Japan,

<sup>3</sup>Okayama Univ., Japan

#### SLPC5j-1 (Invited) Optimized Design and Performance of Laser Ablation Systems for Paint and Coating Removal for Manufacturing and Maintenance of Vehicles and Airplanes

13:45

Y. Kwon

Powerlase Photonics, UK

#### PLDj-1 (Invited) High Performance Interference Coatings for Near Infrared High Energy Lasers

C. Menoni

Colorado State Univ., USA

#### PLDj-2 (Invited) Modeling of Laser Induced Damage and Usage at National Ignition Facility

Z. Liao

Lawrence Livermore National Laboratory, USA

----- Break (15:15-15:45) -----

### 15:45-17:20 LIC+PLD+SLPC Joint Session 2

Room 301

Chair: K. Washio (Paradigm Laser Research, Japan)

#### SLPC6j-1 (Invited) Fiber Delivery of Ultrafast Lasers

15:45

E. Mottay

Amplitude Systemes, France

#### LICj-1 (Invited) The Latest Technology Demand of the Internal Processing Type Laser Dicing Technology

16:15

T. Takahashi, N. Uchiyama

Hamamatsu Photonics, Japan

#### LICj-2 (Invited) From analytics to material processing: the versatile microlaser and its applications

16:45

A. Kevorkian

Team Photonics, France

#### 17:15 Closing

K. Washio

Paradigm Laser Research, Japan

### 18:00-20:00 OPIC Reception

Room 501+502

Thursday, May 19

### 9:00-10:00 LIC1: LIC plenary session

Room 301

Chair: T. Taira (Inst. Mol. Sci., Japan)

#### LIC1-1 Opening remarks for LIC

9:00

T. Taira

Inst. Mol. Sci., Japan

#### LIC1-2 Message for LIC16 from OSA (tentative)

9:15

G. Quarles

OSA (The Optical Society)

#### LIC1-3 Estimating the Size of the Photonics Market

9:30

P. F. Hallett

SPIE (The International Society for Optics and Photonics)

#### LIC1-4 Message for LIC16 from SFO (tentative)

9:45

B. Boulanger

SFO (La Société Française d'Optique), France

### 10:00-12:30 LIC2: Fundamental ignition studies

Room 301

Chair: S. Gupta (Argonne National Lab, USA)

#### LIC2-1 (Invited) Laser Applications in Engine Combustion Research -Diagnostics and Ignition-

10:00

K. Akihama

Nihon Univ., Japan

----- Break (10:30-10:45) -----

#### LIC2-2 Optimizing double-pulse strategy for spray ignition

10:45

N. Beheran<sup>1</sup>, R. George<sup>1,2</sup>, M. Orain<sup>2</sup>, and L. Zimmer<sup>1</sup>

<sup>1</sup>Lab. EM2C, CNRS, CentraleSupélec, Univ. Paris-Saclay, France, <sup>2</sup>ONERA – The French Aerospace Lab. (DMPH/SLM), France

#### LIC2-3 A comparative study of spark ignitions induced by high-power laser and by high-voltage electrodes

11:00

Y. Takenaka, Y. Sako, K. Mikami, T. Johzaki, S. Namba, D. Shimokuri, and T. Endo

Dep. Mechanical Systems Eng., Hiroshima Univ., Japan

#### LIC2-4 (Invited) Temporally and spectrally resolved measurement of spark discharge in a spark ignition engine

11:15

N. Kawahara

Okayama Univ., Japan

#### LIC2-5 Laser breakdown assisted long discharge ignition (LBALDI) - Ignition behavior in lean mixture-

11:45

T. Ikemoto<sup>1</sup>, Y. Fukumi<sup>1</sup>, E. Takahashi<sup>3</sup>, H. Furutani<sup>4</sup>, O. Imamura<sup>2</sup>, and K. Akihama<sup>2</sup>

<sup>1</sup>Graduate School of Industrial Tech., Nihon Univ., Japan, <sup>2</sup>College of Industrial Tech., Nihon Univ., <sup>3</sup>Energy Technology Research Inst., AIST, Japan, <sup>4</sup>Renewable Energy Res. Center, AIST, Japan

#### LIC2-6 Comparison of Laser and Spark Ignition: Laminar Burning Velocity Measurements in Natural Gas/Air Mixtures

12:00

B. Almansour and S. S. Vasu

CATER, Mechanical and Aerospace Engineering Department, Univ. Central Florida, USA

#### LIC2-7 Influence of maximum fluence and fluence volume on energy transfer and plasma evolution during laser ignition with passively

12:15



**Q-switched laser**

M. Bärwinkel, S. Lorenz, R. Stäglich, and D. Brüggemann  
Univ. Bayreuth, Germany

----- Lunch Break (12:30-13:30) -----

**13:30-14:45 LIC3: Giant micro-photonics**

Room 301

**Chair: Y. Oki (Kyushu Univ., Japan)**

**LIC3-1 (Invited) Total design of high power VCSEL pumped passively Q-switched micro-lasers for laser ignition**

13:30 T. Suzudo<sup>1</sup>, K. Hagita<sup>1</sup>, T. Ikeo<sup>1</sup>, K. Izumiya<sup>1</sup>, N. Jikutani<sup>1</sup>, Y. Higashi<sup>1</sup>, and T. Taira<sup>2</sup>  
<sup>1</sup>Ricoh Co. Ltd., Japan, <sup>2</sup>Inst. Mol. Sci., Japan

**LIC3-2 Multi-pulse oscillation of passively Q-switched micro-laser pumped by VCSEL module**

14:00 K. Hagita<sup>1</sup>, T. Ikeo<sup>1</sup>, Y. Ishikawa<sup>1</sup>, Y. Higashi<sup>1</sup>, N. Jikutani<sup>1</sup>, T. Taira<sup>2</sup>, and T. Suzudo<sup>1</sup>  
<sup>1</sup>Ricoh Co. Ltd., Japan, <sup>2</sup>Inst. Mol. Sci., Japan

**LIC3-3 Development of a 0.3 GW Microchip-seeded Amplifier**

14:15 V. Yahia and T. Taira  
**LIC3-4 808 nm range high power (QCW 200 W) fiber coupled VCSEL pump module for laser ignition**

14:30 K. Izumiya, Y. Ohkura, M. Numata, N. Arai, K. Ikeda, Y. Sasaki, N. Jikutani, and T. Suzudo  
Ricoh Co. Ltd., Japan

**14:45-17:00 LIC4: Advanced applications of giant-pulse microchip laser systems**

Room 301

**Chair: T. Suzudo (Ricoh Co. Ltd., Japan)**

**LIC4-1 (Invited) Remote analysis technique under severe environments using LIBS**

14:45 H. Ohba<sup>1</sup>, M. Saeki<sup>1</sup>, I. Wakaida<sup>1</sup>, T. Sakka<sup>2</sup>, and B. Thornton<sup>3</sup>  
<sup>1</sup>Collaborative Lab. Advanced Decommissioning Sci., JAEA, Japan, <sup>2</sup>Graduate School of Eng., Kyoto Univ., Japan, <sup>3</sup>Inst. Industrial Sci., Univ. Tokyo

**LIC4-2 (Invited) Development of UV Microchip Lasers for Compact MALDI Spectroscopy Systems**

15:15 R. Bhandari<sup>1</sup>, K. Tojo<sup>1</sup>, and T. Taira<sup>2</sup>  
<sup>1</sup>Shimadzu Co., Japan, <sup>2</sup>Inst. Mol. Sci., Japan

----- Break (15:45-16:00) -----

**LIC4-3 (Invited) A Flange-Mounted UV Microchip Laser for Imaging Mass Spectrometry**

16:00 T. Sakamoto<sup>1</sup>, K. Ohishi<sup>1</sup>, Y. Furukawa<sup>2</sup>, L. Zheng<sup>3</sup> and T. Taira<sup>3</sup>  
<sup>1</sup>Dep. Appl. Phys., Kogakuin Univ., Japan, <sup>2</sup>Oxide Co., Japan, <sup>3</sup>Inst. Mol. Sci., Japan

**LIC4-4 (Invited) Development of Ultra-compact Pulse Lasers and Applications by Giant micro-photonics**

16:30 Y. Sano  
ImPACT, Japan

**17:00-18:00 LIC5: Laser ignition of energetic materials**

Room 301

**Chair: Z. Zhgang (Univ. Beijing, China)**

**LIC5-1 (Invited) Physical and Chemical Problems of Laser Ignition**

17:00 R. Shen, L. Wu, S. Chen, W. Zhang, J. Xu, and Y. Ye  
Dep. Appl. Chem., Nanjing Univ. Sci. Tech., China

**LIC5-2 Application of laser-ignition systems in liquid rocket engines**

17:30 S. Soller<sup>1</sup>, N. Rackemann<sup>1</sup>, and A. Preuss<sup>2</sup>  
<sup>1</sup>Airbus Safran Launchers GmbH, Germany, <sup>2</sup>Airbus Defense and Space, Germany

**LIC5-3 Laser ignition experiment of HAN-based monopropellant**

17:45 T. Katsumi, Y. Miyajima, and S. Kadowaki  
Nagaoka Univ. Tech., Japan

Friday, May 20

**9:00-10:45 LIC6: Advanced ignition systems for vehicular applications**

Room 301

**Chair: R. Bhandari (Shimadzu Co., Japan)**

**LIC6-1 (Invited) Multi-point laser ignition for in-combustion event feedback control of an automobile engine**

9:00 G. Dearden<sup>1</sup>, Z. Kuang<sup>1</sup>, E. Lyon<sup>1</sup>, H. Cheng<sup>2</sup>, V. Page<sup>2</sup>, and T. Shenton<sup>2</sup>  
<sup>1</sup>Laser Group, School of Eng., Univ. Liverpool, UK, <sup>2</sup>Powertrain Control Group, School of Eng., Univ. Liverpool, UK

**LIC6-2 The effect of laser ignition on a homogenous lean mixture of an automotive gasoline engine**

9:30 A. Birtas<sup>1</sup>, G. Croitoru (Salamu)<sup>2</sup>, M. Dinca<sup>3</sup>, T. Dascalu<sup>2</sup>, N. Boicea<sup>1</sup> and N. Pavel<sup>2</sup>  
<sup>1</sup>Renault Technologie Roumanie, Romania, <sup>2</sup>National Inst. Laser, Plasma and Radiation Phys., Lab. Solid-State Quant. Electron., Romania, <sup>3</sup>Faculty of Physics, Univ. Bucharest, Romania

**LIC6-3 (Invited) Laser Ignition Systems for Space Propulsion Applications**

9:45 C. Manfretti and M. Börner  
DLR, Inst. Space Propulsion, Germany

**LIC6-4 Laser spark ignition of kerosene in Ma 2.52 supersonic flow**

10:15 X. Li<sup>1,2</sup>, L. Yang<sup>3</sup>, Y. Yu<sup>1,2</sup>, J. Peng<sup>1,2</sup>, X. Yu<sup>1,2</sup>, and J. Liang<sup>3</sup>  
<sup>1</sup>National Key Lab. Sci. Tech. Tunable Laser, Harbin Inst. Tech., China, <sup>2</sup>Inst. Opto-electronics, Harbin Inst. Tech., China, <sup>3</sup>College of Aerospace Sci. Eng., National Univ. Defense Tech., China

**LIC6-5 Performance of an internal combustion engine using multi-point laser ignition under nitrogen dilution conditions**

10:30 T. Saito<sup>1</sup>, Y. Suzuta<sup>1</sup>, E. Takahashi<sup>2</sup>, and H. Furutani<sup>3</sup>  
<sup>1</sup>Dep. Mechanical Eng., Meisei Univ., Japan, <sup>2</sup>Research Inst. Energy Conservation, AIST, Japan, <sup>3</sup>Renewable Energy Research Center, AIST, Japan

----- Break (10:45-11:00) -----

**11:00-12:00 LICp: Poster Session**

Exhibition Hall A

**Chair: S. Lorenz (Univ. Bayreuth, Germany)**

**LICp-1 Passively Q-switched Nd:YAG/Cr<sup>4+</sup>:YAG laser with multiple-beam output**

G. Croitoru (Salamu), O. V. Grigore, T. Dascalu, and N. Pavel

National Inst. Laser, Plasma and Radiation Phys., Lab. Solid-State Quant. Electron., Romania

**LICp-2 Cryo-cooled Ho:CaF<sub>2</sub> laser pumped by Tm: fiber laser**

M. Jelínek<sup>1</sup>, J. Cvrček<sup>1</sup>, V. Kubeček<sup>1</sup>, L. Su<sup>2</sup>, D. Jiang<sup>2</sup>, and W. Ma<sup>2</sup>

<sup>1</sup>Faculty of Nuclear Sci. Phys. Eng., Czech Technical University in Prague, Czech, <sup>2</sup>Key Lab. Transparent and Opto-functional Inorganic Materials, Shanghai Inst. Ceramics, Chinese Academy of Sci., China

**LICp-3 Surface Morphology Study of Some Cu-Ni reference alloys using Laser Induced Breakdown Spectroscopy**

S. A. Sheta<sup>1</sup>, G. Di Carlo<sup>2</sup>, G. M. Ingo<sup>2</sup>, M. A. Harith<sup>1</sup>

<sup>1</sup>NILES, Cairo Univ., Egypt, <sup>2</sup>ISMN-CNR, Italy

**LICp-4 Suppression of amplitude modulation based on nonlinear absorption effect**

K. Cheng, H. Dong, J. Shen, H. Yu, B. Xu, and M. Xin

Shandong Inst. Spacecraft Electrical Tech., China

**LICp-5 1 kHz repetition rate, giant-UV-pulse generation in [100] Nd:YAG / [110] Cr:YAG micro-laser under intensive pulse pumping**

L. Zheng and T. Taira

Inst. Mol. Sci., Japan

**LICp-6 Polarization dependence of saturable absorption in Cr:YAG**

Y. Sato and T. Taira

Inst. Mol. Sci.

----- Lunch Break (12:00-13:00) -----

**13:00-14:00 LIC7: Nonlinear optics**

Room 301

**Chair: N. Pavel (INFLPR, Romania)**

**LIC7-1 (Invited) Terahertz-wave technology based on nonlinear optical effect and sub-nanosecond pulse laser**

H. Minamide

Teraphotonics Lab., RIKEN Center for Advanced Photonics, RIKEN, Japan

**LIC7-2 Compact passive Q-switched planar-waveguide laser at 355 nm with intra-cavity frequency conversion**

K. Sakai<sup>1</sup>, F. Shohda<sup>1</sup>, H. Fukahori<sup>2</sup>, and T. Yanagisawa<sup>1</sup>

<sup>1</sup>Information Technology R&D Center, Mitsubishi Electric Co., Japan, <sup>2</sup>Nagoya Works, Mitsubishi Electric Co., Japan

**LIC7-3 Temperature stable giant-pulse green micro-**

**13:45 laser**

A. Kausas<sup>1</sup>, P. Loiseau<sup>2</sup>, G. Aka<sup>2</sup>, Y. Zheng<sup>3</sup>, and T. Taira<sup>1</sup>

<sup>1</sup>Inst. Mol. Sci., Japan, <sup>2</sup>PSL Research Univ., IRCP, Chimie ParisTech., France, <sup>3</sup>Shanghai Inst. Ceram., Chinese Academy of Science, China

**14:00-16:15 LIC8: Advanced ignition systems for stationary power generation**

Room 301

**Chair: T. Saito (Meisei Univ., Japan)**

**LIC8-1 (Invited) Performance of SI and LI Spark Plugs and That of Spark Plugs Equipped With a Prechamber**

14:00 S. Gupta<sup>1</sup>, B. Bihari<sup>1</sup>, M. Biruduganti<sup>1</sup>, N. Polcyn<sup>2</sup>, J. U. Hwang<sup>2</sup>, and K. Kanehara<sup>2</sup>

<sup>1</sup>Argonne National Lab., USA, <sup>2</sup>DENSO International

**LIC8-2 Performance Benefits of Laser Ignition in a Natural Gas 6-cylinder Engine**

14:30 S. Gupta, B. Bihari, and M. Biruduganti  
Argonne National Lab., USA

**LIC8-3 (Invited) Designing the Flame Kernel Structure by the Laser Pulse Profile**

14:45 S. Lorenz and D. Brüggemann  
Univ. Bayreuth, Germany

----- Break (15:15-15:30) -----

**LIC8-4 Minimum Operating Requirements for Laser Ignition in Gas Turbines**

15:30 J. Griffiths, A. Kirk, and C. Dowding  
School of Eng., Univ. Lincoln, UK

**LIC8-5 (Invited) Characteristics of microwave-enhanced laser ignition**

15:45 J. Hayashi<sup>1</sup>, C. Liu<sup>1</sup>, F. Akamatsu<sup>1</sup>, A. Nishiyama<sup>2</sup>, A. Moon<sup>2</sup>, and Y. Ikeda<sup>2</sup>

<sup>1</sup>Osaka Univ., Japan, <sup>2</sup>Imaging, Japan

**16:15-17:45 LIC9: Micro solid state photonics**

Room 301

**Chair: Y. Oki (Kyushu Univ., Japan)**

**LIC9-1 (Invited) Magneto-optical Q-switching with magnetic garnet film**

16:15 T. Goto<sup>1</sup>, R. Morimoto<sup>1</sup>, J. W. Pritchard<sup>1</sup>, T. Yoshimoto<sup>1</sup>, H. Takagi<sup>1</sup>, Y. Nakamura<sup>1</sup>, P. B. Lim<sup>1</sup>, M. Mina<sup>1</sup>, T. Taira<sup>2</sup>, and M. Inoue<sup>1</sup>

<sup>1</sup>Toyohashi Inst. Tech., Japan, <sup>2</sup>Inst. Mol. Sci., Japan

**LIC9-2 An energy adjustable linearly polarized passively Q-switched bulk laser with a wedged diffusion bonded Nd:YAG/Cr<sup>4+</sup>:YAG crystal**

16:45 H. P. Cheng, C. Y. Cho, and Y. F. Chen  
Dep. Electrophysics, National Chiao Tung Univ., Taiwan

**LIC9-3 Minimum air-breakdown energy using giant-pulse width tunable system based on microchip laser**

17:00 H. H. Lim and T. Taira  
Inst. Mol. Sci., Japan

**LIC9-4 (Invited) Laser Ceramics for Engine Ignition (tentative)**

17:15 H. Yagi

Konoshima Chemical Co., Ltd., Japan

**17:45-18:00 Closing**

Room 301

**Award and Closing remarks**

T. Taira

Inst. Mol. Sci., Japan

# Laser Solutions for Space and the Earth 2016

## LSSE2016

Tuesday, May 17

**9:45-10:00 Opening** Room 316

**Opening Remarks**

**9:45 T. Ebisuzaki, Conference Chair of LSSE2016**  
Chief Scientist, Computational Astrophysics  
Laboratory, RIKEN, Japan

**10:00-12:00 LSSE1 : Space Debris Detection**  
**Remediation 1** Room 316

**Chair : H. Yamakawa, RISH, Kyoto University, Japan**

**LSSE1-1 (Invited) Pulsed Lasers for Clearing Debris**  
**10:00 in LEO and GEO**

C. Phipps  
Photonic Associates, LLC, USA

**LSSE1-2 (invited) Legal Aspects of Laser in Space**  
**10:40 Activities**

S. Aoki  
Keio University, Japan

**LSSE1-3 (Invited) Concept of Space Debris Deorbitor**  
**11:20 Mission for the 1-10 cm Size Space Debris**

Y. Takizawa, T. Ebisuzaki  
RIKEN, Japan

----- **Lunch (12:00-13:00)** -----

**13:00-15:00 LSSE2 : Space Debris Detection**  
**Remediation 2** Room 316

**Chair : S. Wada, RIKEN Center for Advanced Photonics,**  
RIKEN

**LSSE2-1 (invited) A Novel Laser System Based on a**  
**13:00 Massive Coherent Amplifying Network**  
**(CAN) to Mitigate Orbital Debris**

G. Mourou  
IZEST, Ecole Polytechnique, France

**LSSE2-2 Mandelstam-Brillouin Mirrors for Chirped**  
**14:00 Pulse Fiber Laser Networks**

A. Y. Okulov  
Russian Academy of Sciences, Russia

**LSSE2-3 Experimental Evaluation of Laser Ablation**  
**14:20 Impulse**

A. Sasoh, B. Wang, H. Tsuruta, Y. Katagiri,  
A. Iwakawa  
Nagoya University, Japan

**LSSE2-4 Impulse Generation by Multiple-Pulse Laser**  
**14:40 Ablation with Oblique Incidence**

B. Wang, H. Tsuruta, A. Sasoh  
Nagoya University, Japan

----- **Break (15:00-15:30)** -----

**15:30-17:10 LSSE3 : Space Debris Detection**  
**Remediation 3** Room 316

**Chair: A. Sasoh, Nagoya University, Japan**

**LSSE3-1 Space Debris Studies at Kyoto University**

**15:30** H. Yamakawa, K. Masunari, N. Iwanaga,  
N. Ikeda, T. Iwahori, T. Nishimura,  
Y. Kobayashi, T. Fukushima  
RISH, Kyoto University, Japan

**LSSE3-2 Large Debris Removal in LEO and GEO with**  
**15:50 a Spacecraft Equipped with a High Power**  
**Laser System**

N. Thiry, J. M. Romero Martin, M. Vasile  
University of Strathclyde, UK

**LSSE3-3 Development of Observational Technologies**  
**16:10 for Space Debris in JAXA**

T. Yanagisawa, H. Kurosaki  
Japan Aerospace Exploration Agency, Japan

**LSSE3-4 Application and Spatially and Temporally**  
**16:30 Resolved OES Study of Polymers Ablated**  
**in Laser Propulsion**

L. Jiao<sup>1,2,3</sup>, J. Cai<sup>2</sup>, B. Truscott<sup>3</sup>, H. Liu<sup>3</sup>,  
M. Ashford<sup>3</sup>

<sup>1</sup>Univ. of Sci. and Tech. of China, China

<sup>2</sup>Chinese Academy of Sciences, China

<sup>3</sup>University of Bristol, UK

**LSSE3-5 A PHD Filter for Tracking Mid-Course**  
**16:50 Group Targets via Space-Based Laser**

H. Yu, W. An, W. Sheng, X. Wang  
National Univ. Defence Tech., China

Wednesday, May 18

**9:00-12:10 OPIC Plenary Session** Room 501+502

----- **Lunch (12:10-13:30)** -----

**13:30-14:50 LSSE4 : Remote Sensing** Room 316

**Chair: N. Saito, RIKEN Center for Advanced Photonics,**  
RIKEN

**LSSE4-1 Precision and Relative Error Analysis of**  
**13:30 Spaceborne Multiple Wavelengths Vapor**  
**Water Range-Resolved DIAL**

T. Li, Y. Zhang, S. Chen, P. Guo, H. Chen,  
Y. Ma

Beijing Institute of Technology, China

**LSSE4-2 Lidar Monitoring of Volcanic, Terroristic**  
**13:50 and Radiological Hazards**

L. Fiorani<sup>1</sup>, A. Aiuppa<sup>2</sup>, G. Maio<sup>3,4</sup>, A. Palucci<sup>1</sup>,  
S. Parracino<sup>5,4</sup>, A. Puiu<sup>1</sup>, S. Santoro<sup>2,4</sup>

<sup>1</sup>ENEA, Italy, <sup>2</sup>University of Palermo, Italy

<sup>3</sup>ARES Consortium, Italy, <sup>4</sup>ENEA guest, Italy

<sup>5</sup>University of Rome "Tor Vergata", Italy

**LSSE4-3 Four Generations of Sodium Guide Star**  
**14:10 Lasers for Adaptive Optics in Astronomy**  
**and Space Situational Awareness**

C. d'Orgeville<sup>1</sup>, G. Fetzer<sup>2</sup>

<sup>1</sup>Australian National University, Australia

<sup>2</sup>Arete Associates, Sensors, Sources and Systems  
Division, USA

**LSSE4-4 Integrating Cavity Measurements: A New**  
**14:30 Paradigm in Spectroscopic Optical**  
**Environmental Characterization**

J. N. Bixler, J. Mason, B. H. Hokr, E. S. Fry,

V. V. Yakovlev  
Texas A&M University, USA

**18:00-20:00 OPIC Reception** Room 501+502

**Thursday, May 19**

**10:30-12:00 LSSEp5 : Poster Session** Exhibition Hall A  
**Chair: Y. Takizawa**, Computational Astrophysics Laboratory,  
RIKEN, Japan

**LSSEp5-1 NMPC Tracking Guidance Strategy for Low Earth Orbit Based on the Laser Solutions**

T. Jin, J. Cai  
Institute of Microelectronics of Chinese Academy of Science, China

**LSSEp5-2 Sodium Lidar Observations for Upper Atmospheric Research at Tromsø, Norway in Arctic**

T. T. Tsuda<sup>1</sup>, S. Nozawa<sup>2</sup>, N. Saito<sup>3</sup>,  
T. D. Kawahara<sup>4</sup>, T. Kawabata<sup>2</sup>, T. Takahashi<sup>5</sup>,  
C. M. Hall<sup>6</sup>, T. Tsukihana<sup>3</sup>, S. Wada<sup>3</sup>,  
S. Oyama<sup>2</sup>, Y. Ogawa<sup>7</sup>, K. Hosokawa<sup>1</sup>  
<sup>1</sup>Dept. of Comm. Eng. and Informatics, Univ. Electro-Comm., Japan  
<sup>2</sup>ISEE, Nagoya Univ., Japan  
<sup>3</sup>RIKEN Center for Adv. Photonics, Japan  
<sup>4</sup>Shinshu Univ., Japan  
<sup>5</sup>SSRE, Univ. Electro-Comm., Japan  
<sup>6</sup>The Arctic Univ. of Norway, Norway  
<sup>7</sup>National Inst. of Polar Research, Japan

**LSSEp5-3 Study on the data Matching of Ground-Based Radar and Laser Point Cloud**

Q. Zhiwei<sup>1,2</sup>, Y. Jianping<sup>1</sup>, Y. Shun<sup>1</sup>, X. Ying<sup>1</sup>  
<sup>1</sup>Hohai Univ., Earth Sci. and Eng., China  
<sup>2</sup>Henan Univ. Urban Construction, China

**LSSEp5-4 Optimum Design and Experimental Verification of Bipod Flexures for a Remote Sensing Instrument Mirror**

C. Y. Chan<sup>1</sup>, B. K. Huang<sup>2</sup>, Y. C. Chen<sup>2</sup>,  
T. M. Huang<sup>1</sup>  
<sup>1</sup>Inst. Tech. Res. Center, National Applied Res. Laboratories, Taiwan  
<sup>2</sup>Dept. of Mechanical Eng., National Central University, Taiwan

**LSSEp5-5 Stand-off Detection of Energetic Materials by Laser-Induced Breakdown Spectroscopy**

Y. Ueda, K. Sugiyama, Y. Yanagida  
Ammunition and Energetics Res. Section,  
Ballistics Res. Division, Grand Systems Res. Center, Acquisition, Tech. and Logistics Agency, Japan

**LSSEp5-6 Standoff Measurement of Salt Deposition on Insulator Using Laser-induced Breakdown Spectroscopy**

K. Motoki<sup>1</sup>, T. Fujii<sup>1,2</sup>, K. Yaji<sup>2</sup>, S. Eto<sup>2</sup>,  
E. Hotta<sup>1</sup>  
<sup>1</sup>Tokyo Institute of Technology, Japan  
<sup>2</sup>Central Res. Inst. of Electric Power, Japan

**LSSEp5-7 Rapid Detection of Trace Elements Using Laser Breakdown Time-of-Flight Mass Spectrometry**

A. Ikutomo<sup>1</sup>, Y. Deguchi<sup>1</sup>, S. Katsumori<sup>1</sup>,  
T. Komatsubara<sup>1</sup>, R. Liu<sup>1,2</sup>, Z. Wang<sup>2</sup>, J. Yan<sup>2</sup>,  
J. Liu<sup>2</sup>  
<sup>1</sup>Tokushima University, Japan  
<sup>2</sup>Xi'an Jiaotong University, China

----- Lunch (12:00-13:00) -----

**13:00-15:00 LSSE6 : Maintenance of Social Infrastructure 1** Room 316

**Chair : A. Nishimura**, Japan Atomic Energy Agency, Japan

**LSSE6-1 (Invited) Laser-Induced Breakdown Spectroscopy for Detection and Analysis in the Environment**

J. Yu  
Institut Lumière Matière, France

**LSSE6-2 (Invited) LIBS Applications to Thermal Power Plants and Iron and Steel Making Processes**

Y. Deguchi<sup>1</sup>, A. Ikutomo<sup>1</sup>, S. Katsumori<sup>1</sup>,  
T. Komatsubara<sup>1</sup>, R. Liu<sup>1,2</sup>, Z. Wang<sup>2</sup>, J. Yan<sup>2</sup>,  
J. Liu<sup>2</sup>  
<sup>1</sup>Tokushima University, Japan  
<sup>2</sup>Xi'an Jiaotong University, China

**LSSE6-3 The Evaluation of Limit of Detection/Quantification for Minor/Major Elements in Low-Alloy Steels by Laser-Induced Breakdown Spectroscopy**

S. Kashiwakura, K. Wagatsuma  
Inst. for Materials Res., Tohoku Univ., Japan

**LSSE6-4 Monitoring of Gaseous Trace Antimony in Syngas by LIBS**

R. Yoshiie<sup>1</sup>, R. Ishikawa<sup>1</sup>, Y. Ueki<sup>2</sup>, I. Naruse<sup>2</sup>  
<sup>1</sup>Dept. of Mechanical Sci. & Eng., Nagoya Univ., Japan  
<sup>2</sup>Inst. of Materials and Systems for Sustainability, Nagoya Univ., Japan

**LSSE6-5 Laser-Induced Breakdown Spectroscopy for Diagnosis of Concrete Infrastructure**

T. Fujii, S. Eto  
Electric Power Engineering Research Laboratory, CRIEPI, Japan

----- Break (15:00-15:30) -----

**15:30-16:30 LSSE7 : Maintenance of Social Infrastructure 2** Room 316

**Chair : T. Fujii**, Electric Power Eng. Res. Lab., CRIEPI, Japan

**LSSE7-1 Evaluation of Residual Strain in the Structural Materials of Nuclear Power Plants by Magnetic Incremental Permeability Method**

T. Uchimoto<sup>1</sup>, T. Takagi<sup>1</sup>, T. Matsumoto<sup>1</sup>,  
G. Dobmann<sup>2</sup>  
<sup>1</sup>Tohoku University, Japan  
<sup>2</sup>Saarland University, Germany

**LSSE7-2**      **In-Service Monitoring of Distortion by a Heat**  
**15:50**      **Resistant FBG Sensor for a Sodium**  
              **Circulation Loop**

A. Nishimura, T. Shimomura, Y. Takenaka,  
T. Furuyama, M. Ueda, K. Saruta, H. Daido  
Japan Atomic Energy Agency, Japan

**LSSE7-3**      **High Performance Hydrogen Storage Alloy**  
**16:10**      **Produced by Short Pulse Laser Surface**  
              **Modification**

H. Daido<sup>1,2</sup>, H. Abe<sup>3</sup>, T. Shobu<sup>4</sup>, T. Shimomura<sup>1</sup>,  
A. Nishimura<sup>1,2</sup>, H. Uchida<sup>5</sup>  
<sup>1</sup>Applied Laser Technology Institute, Japan  
Atomic Energy Agency, Japan  
<sup>2</sup>Fukushima Research Infrastructural Creation  
Center, Japan Atomic Energy Agency, Japan  
<sup>3</sup>Quantum Beam Science Center at Takasaki,  
Japan Atomic Energy Agency, Japan  
<sup>4</sup>Quantum Beam Science Center at SPring-8,  
Japan Atomic Energy Agency, Japan  
<sup>5</sup>Faculty of Engineering, Tokai University, Japan

**Friday, May 20**

**10:00-12:00**    **LSSE8 : Maintenance of**  
                      **Social Infrastructure 3**

Room 316

**Chair : Y. Shimada**, Institute of Laser Technology, Japan

**LSSE8-1**      **(Invited) Nondestructive Inspection of**  
**10:00**      **Infrastructures by Laser and Neutron Beam**  
              **Technology**

S. Wada<sup>1</sup>, N. Saito<sup>1</sup>, K. Kase<sup>1</sup>, Y. Otake<sup>1</sup>,  
Y. Ikeda<sup>1</sup>, T. Kawachi<sup>2</sup>, H. Daido<sup>3</sup>, Y. Shimada<sup>4</sup>,  
K. Midorikawa<sup>1</sup>  
<sup>1</sup>RIKEN Center for Advanced Photonics, Japan  
<sup>2</sup>Quantum Beam Science Center, Japan Atomic  
Energy Agency, Japan  
<sup>3</sup>Applied Laser Technology Institute, Japan  
Atomic Energy Agency, Japan  
<sup>4</sup>Institute for Laser Technology, Japan

----- **Break (10:30-11:00)** -----

**LSSE8-2**      **(Invited) Development of Non-Destructive**  
**11:00**      **Inspection Method for Concrete Elements in**  
              **Tunnel Linings Using Laser Remote Sensing**

N. Misaki  
West Japan Railway Company, Japan

**LSSE8-3**      **(Invited) Development of the High Speed**  
**11:30**      **Inspection System of Defects Inside Concrete**

K. Mikami<sup>1</sup>, S. Kurahashi<sup>2</sup>, T. Kitamura<sup>2</sup>,  
N. Hasegawa<sup>1</sup>, H. Okada<sup>1</sup>, S. Kondo<sup>1</sup>, K. Oleg<sup>2</sup>,  
Y. Shimada<sup>2</sup>, T. Kawachi<sup>1</sup>  
<sup>1</sup>Japan Atomic Energy Agency, Japan  
<sup>2</sup>Institute for Laser Technology, Japan

----- **Lunch (12:00-13:00)** -----

**13:00-14:50**    **LSSE9 : Maintenance of**  
                      **Social Infrastructure 4**

Room 316

**Chair : H. Daido**, Applied Laser Technology Institute, Japan

Atomic Energy Agency, Japan

**LSSE9-1**      **A Mobile Laser-Based System for Remote**  
**13:00**      **Inspection of Shinkansen Tunnels**

O. Kotyayev<sup>1</sup>, Y. Shimada<sup>1</sup>, N. Misaki<sup>2</sup>  
<sup>1</sup>Institute for Laser Technology, Japan  
<sup>2</sup>West Japan Railway Company, Japan

**LSSE9-2**      **Performance of Material Removal in Pulsed**  
**13:20**      **Laser Irradiation on Concrete**

N. P. Long<sup>1</sup>, H. Daido<sup>1</sup>, Y. Matsunaga<sup>1</sup>,  
T. Yamada<sup>1</sup>, A. Nishimura<sup>2</sup>, T. Kawach<sup>2</sup>  
<sup>1</sup>Applied Laser Technology Institute, Japan  
Atomic Energy Agency, Japan  
<sup>2</sup>Kansai Photon Institute, Japan Atomic Energy  
Agency, Japan

**LSSE9-3**      **(Invited) Development of Nuclear Emergency**  
**13:40**      **Response Robots at Naraha Remote**  
              **Technology Center Relevant to the Laser**  
              **Technology**

S. Kawatsuma, K. Kawabata  
Japan Atomic Energy Agency, Japan

**LSSE9-4**      **Development of Laser Cutting for Thick**  
**14:10**      **Steels up to 300 mm for Nuclear Plant**  
              **Decommissioning**

S. Toyama<sup>1</sup>, R. Ishigami<sup>1</sup>, K. Tamura<sup>2</sup>  
<sup>1</sup>The Wakasa Wan Energy Res. Center, Japan  
<sup>2</sup>Quantum Beam Science Center, Japan

**LSSE9-5**      **Technologies of Laser Decontamination and**  
**14:30**      **Robotics for Nuclear Reactor**  
              **Decommissioning**

E. J. Minehara<sup>1,2</sup>, R. Yamagishi<sup>1</sup>  
<sup>1</sup>The Wakasa Wan Energy Res. Center, Japan  
<sup>2</sup>LAND Corporation, Japan

**14:50-15:00**    **Closing**

Room 316

**14:50**      **Closing Remarks**

**T. Ebisuzaki**, **Conference Chair of LSSE2016**  
Chief Scientist, Computational Astrophysics  
Laboratory, RIKEN, Japan

# Optical Manipulation Conference'16

## OMC'16

| Wednesday, May 18  | Thursday, May 19  |
|--|---|
| <b>9:00-12:10 OPIC Plenary Session</b> Room 501+502  |   |
| ----- Break Lunch (12:10-13:30) -----  |   |
| <b>13:30-16:30 BISC &amp; OMC Joint Symposium</b> Room 414+415   | <b>9:00-10:30 OMC1: Optical Manipulation</b> Room 414+415   |
| Chairs: T. Omatsu (Chiba Univ., Japan)<br>O. Matoba (Kobe Univ., Japan)  | Chair: Sile Nic Chormaic, OIST Graduate University, Japan   |
| <b>BISC&amp;OMC1-1 (Invited) Direct Real Time En-face<br/>13:30 Optical Coherence Tomography</b><br>Adrian Podoleanu<br>University of Kent, UK   | <b>OMC1-1 (Invited) Optical micromanipulation in<br/>9:00 studies of motility</b><br>Halina Rubinsztein-Dunlop<br>University of Queensland, Australia   |
| <b>BISC&amp;OMC1-2 (Invited) Nanoscale localization sampling<br/>14:00 by plasmonic aperture arrays for imaging<br/>molecular events</b><br>Donghyun Kim<br>Yonsei Univ., Republic of Korea  | <b>OMC1-2 Submicron particle trapping and<br/>9:30 manipulation with plasmonic nanoring<br/>devices</b><br>Xue Han, Viet Giang Truong, Seyedeh Sahar<br>Seyed Hejazi, and Sile Nic Chormaic<br>Light-Matter Interactions Unit, Okinawa<br>Institute of Science and Technology<br>Graduate University, Japan   |
| <b>BISC&amp;OMC1-3 (Invited) Advanced light shaping for<br/>14:30 biomedical applications</b><br>Kishan Dholakia<br>University of St Andrews, UK   | <b>OMC1-3 A study of the metal particle manipulation<br/>9:45 in the glass by laser irradiation</b><br>Tatsuki Iwamoto, Jun Wada, Hirofumi Hidai,<br>Souta Matsusaka, Akira Chiba, Noboru<br>Morita<br>Chiba University, Japan  |
| ----- Break (15:00-15:30) -----  | <b>OMC1-4 Rotational dynamics and heating of<br/>10:00 trapped nanovaterite particles</b><br>Yoshihiko Arita <sup>1,2</sup> , Joseph M. Richards,<br>Michael Mazilu <sup>1</sup> , Gabriel C. Spalding <sup>3</sup> ,<br>Susan E. Skelton Spesyvtseva <sup>1</sup> , Derek<br>Craig <sup>1</sup> , Kishan Dholakia <sup>1</sup><br><sup>1</sup> SUPA, School of Physics and Astronomy,<br>University of St Andrews, United<br>Kingdom, <sup>2</sup> MCRC, Molecular Chirality<br>Research Centre, Graduate School of<br>Advanced Integration Science, Chiba<br>University, Japan, <sup>3</sup> Illinois Wesleyan<br>University, USA |
| <b>BISC&amp;OMC1-4 (Invited) Improvements and applications<br/>15:30 in "in vivo" multi-photon microscopy</b><br>Tomomi Nemoto, Ryosuke Kawakami,<br>Terumasa Hibi, Kohei Otomo, Sari<br>Ipponjima, Kazuaki Sawada, Ayano Tanabe<br>Hokkaido Univ., Japan  | <b>OMC1-5 Hydrodynamics of micro-objects near<br/>10:15 curved surfaces</b><br>S. Zhang, D. M. Carberry, T. A. Nieminen,<br>H. Rubinsztein-Dunlop<br>Department of Mathematics and Physics, the<br>University of Queensland, Australia  |
| <b>BISC&amp;OMC1-5 Full-field optical coherence tomography<br/>16:00 using ultrathin forward-imaging short<br/>multimode fiber</b><br>Manabu Sato <sup>1</sup> , Daisuke Saito <sup>1</sup> , Kou Shouji <sup>1</sup> ,<br>and Izumi Nishidate <sup>2</sup><br><sup>1</sup> Yamagata Univ., Japan, <sup>2</sup> Tokyo University<br>of Agriculture and Technology, Japan   | ----- Break (10:30-11:00) -----   |
| <b>BISC&amp;OMC1-6 Optical trapping of quantum-dot<br/>16:15 conjugated cell surface molecules of<br/>neuronal cell cultured onto a plasmonic<br/>chip</b><br>Chie Hosokawa <sup>1</sup> , Kohei Miyauchi <sup>1,2</sup> , Suguru<br>N. Kudoh <sup>2</sup> , Takahisa Taguchi <sup>3</sup> , Keiko Tawa <sup>2</sup><br><sup>1</sup> National Institute of Advanced Industrial<br>Science and Technology (AIST), Japan,<br><sup>2</sup> Kwansei Gakuin University, Japan,<br><sup>3</sup> National Institute of Information and<br>Communications Technology (NICT), Japan | <b>11:00-12:00 OMC2: OptoMechanics</b> Room 414+415   |
| <b>18:00-20:00 OPIC Reception</b> Room 501+502   | Chair: Kishan Dholakia, University of St Andrews, UK  |
|  | <b>OMC 2-1 (Invited) Nanoengineered angular<br/>11:00 optomechanics</b><br>Etinne Brasselet<br>University of Bordeaux 1, France   |
|  | <b>OMC2-2 Rotation of multiple trapped<br/>11:30 microparticles in vacuum: observation of<br/>optically mediated parametric resonances<br/>and optical binding</b>  |

Yoshihiko Arita<sup>1,2</sup>, Michael Mazilu<sup>1</sup>, Tom Vettenburg<sup>1</sup>, Ewan M. Wright<sup>1,3</sup>, Kishan Dholakia<sup>1,3</sup>  
<sup>1</sup>SUPA, School of Physics and Astronomy, University of St Andrews, United Kingdom, <sup>2</sup>MCRC, Molecular Chirality Research Centre, Graduate School of Advanced Integration Science, Chiba University, Japan, <sup>3</sup>College of Optical Sciences, The University of Arizona, USA

**OMC2-3**  
**11:45**  
**Photon-induced Force Microscopy in Heterodyne AM Technique**  
 Junsuke Yamanishi, Yoshitaka Naitoh, Yan Jun Li, and Yasuhiro Sugawara  
 Department of Applied Physics, Graduate School of Engineering, Osaka University, Japan

----- Lunch Break (12:00-13:00) -----

**13:00-15:15 OMC3: OptoMechnics & Plasmonics**

Room 414+415

Chair: Tatsuya Shoji, Osaka City University, Japan

**OMC3-1**  
**13:00**  
**(Invited) Angular momentum enabled opto-mechanical elements**  
 Saulius Juodkazis  
 Swinburne University, Australia

**OMC3-2**  
**13:30**  
**Transfer of orbital angular momentum of light to trapped particles in vacuum: a platform for new quantum tests in optomechanics**  
 Yoshihiko Arita<sup>1,2</sup>, Michael Mazilu<sup>1</sup>, Tom Vettenburg<sup>1</sup>, Juan M. Aunon<sup>1</sup>, Ewan M. Wright<sup>1,3</sup>, Kishan Dholakia<sup>1,3</sup>  
<sup>1</sup>SUPA, School of Physics & Astronomy, University of St Andrews, United Kingdom, <sup>2</sup>MCRC, Molecular Chirality Research Centre, Graduate School of Advanced Integration Science, Chiba University, Japan, <sup>3</sup>College of Optical Sciences, The University of Arizona, USA

**OMC3-3**  
**13:45**  
**Potential analysis of nano-particle plasmonic trapping using a trimer nano-structure**  
 Shutaro Ishida, Takashi Wada, and Keiji Sasaki  
 Research Institute for Electronic Science, Hokkaido University, Japan

**OMC3-4**  
**14:00**  
**(Invited) Microscopic Thermodynamics with levitated Nanoparticles: Approaching the quantum regime**  
 Jan Gieseler  
 Harvard University, Department of Physics, Cambridge, MA, United States

**OMC3-5**  
**14:30**  
**Near-field enhancements of mid-infrared femtosecond pulses upon collective plasmon excitations in metal nanorod arrays**  
 Akinobu Takegami<sup>1,2</sup>, Fumiya Kusa<sup>1,2</sup>, Satoshi Ashihara<sup>1</sup>  
<sup>1</sup>Dept. of Applied Physics, Tokyo Univ. of Agriculture and Technology, Japan, <sup>2</sup>Institute of Industrial Science, The Univ. of Tokyo, Japan

**OMC3-6**  
**14:45**  
**Generation and control of plasmonic wave packet in a single gold nanorod**  
 Yoshio Nishiyama<sup>1</sup>, Kohei Imura<sup>3</sup>, Hiromi Okamoto<sup>1,2</sup>

<sup>1</sup>Institute for Molecular Science, Japan, <sup>2</sup>The Graduate Univ. for Advanced Studies (Sokendai), Japan, <sup>3</sup>School of Advanced Science and Engineering, Waseda University, Japan

**OMC3-7**  
**15:00**  
**Selective Trapping and Fixation of DNAs at Desired Positions Using Plasmonic Optical Tweezers**

Kenta Itoh<sup>1</sup>, Tatsuya Shoji<sup>1</sup>, Kei Murakoshi<sup>2</sup>, Takahiro Yoshii<sup>2</sup>, Yasuyuki Tsuboi<sup>1</sup>  
<sup>1</sup>Graduate School of Science, Osaka City University, Japan, <sup>2</sup>Graduate School of Chemical Sciences and Engineering, Hokkaido University, Japan

----- Break (15:15-15:30) -----

**15:30-17:45 OMC4: Structured Light**

Room 414+415

Chair: Takashige Omatsu, Chiba University, Japan

**OMC4-1**  
**15:30**  
**Tuning of whispering gallery modes of microspheres during optical levitation**  
 Yosuke Minowa, Yusuke Toyota, and Masaaki Ashida  
 Osaka University, Japan

**OMC4-2**  
**15:45**  
**Topological Transformations between Integer and Fractional Optical Vortex Beams**  
 Maruthi M. Brundavanam, Satyajit Maji and Abhijit Roy  
 Department of Physics, Indian Institute of Technology Kharagpur, India

**OMC4-3**  
**16:00**  
**Plasmonic Archimedean Spiral Modes on Concentric Metal Ring Gratings**  
 Yi-Chieh Lai and Yung-Chiang Lan  
 Department of Photonics, National Cheng Kung University, Taiwan

**OMC4-4**  
**16:15**  
**Rule of selection for geometric modes in broad-area vertical cavity surface emitting lasers**  
 Yan-Ting Yu, Pi-Hui Tuan, Kai-Chi Chang, Kuan-Wei Su, and Yung-Fu Chen  
 Department of Electrophysics, National Chiao Tung University, Taiwan

**OMC4-5**  
**16:30**  
**Octave-band tunable optical vortex parametric laser**  
 Roukuya Mamuti<sup>1</sup>, Aizitiaili Abulikemu<sup>1</sup>, Katsuhiko Miyamoto<sup>1,2</sup>, Takashige Omatsu<sup>1,2</sup>  
<sup>1</sup>Graduate School of Advanced Integration Science, Chiba University, Japan, <sup>2</sup>Molecular chirality research center, Chiba University, Japan

**OMC4-6**  
**16:45**  
**Study of Surface Processing onto Photonic-crystal Lasers for Generating Optical Vortex Beam**  
 Kyoko Kitamura<sup>1,2</sup>, Miki Kitazawa<sup>1</sup>, and Susumu Noda<sup>2,3</sup>  
<sup>1</sup>Kyoto Institute of Technology, Japan, <sup>2</sup>Department of Electronic Science and Engineering, Graduate School of



- Engineering, Kyoto University, Japan,  
<sup>3</sup>Photonics and Electronics Science and Engineering, Kyoto University, Japan
- OMC4-7**  
**17:00**  
**Generation of third-harmonic vortex beams in air using nearinfrared femtosecond laser pulses**  
 Yu-Chieh Lin, Yasuo Nabekawa, Katsumi Midorikawa  
 RIKEN, Japan
- OMC4-8**  
**17:15**  
**Single-Shot Measurements of Anisotropic Excitons via Four-Wave Mixing Spectroscopy with Radially Polarized Pulses**  
 Kyohhei Shigematsu, Masato Suzuki, Keisaku Yamane, Ryuji Morita, and Yasunori Toda  
 Department of Applied Physics, Hokkaido University, Japan
- OMC4-9**  
**17:30**  
**Maxwell–Schrödinger equations for space-variant wave plates and Pancharatnam–Berry phase on the extended Poincaré sphere**  
 Masato Suzuki, Keisaku Yamane, Kazuhiko Oka, Yasunori Toda, Ryuji Morita  
 Department of Applied Physics, Hokkaido University, Japan

**Friday, May 20**

**9:00-10:45 OMC5: Structured Materials Fabrication**

Room 414+415

Chair: Masaaki Ashida, Osaka University, Japan

- OMC5-1**  
**9:00**  
**(Invited) Ultrafast lasers: as tools for micro/nanofabrication and probing surface plasmons**

Quan Sun<sup>1</sup>, Takaya Tokiwa<sup>1</sup>, Hidenori Asahi<sup>1</sup>, Han Yu<sup>1</sup>, Kosei Ueno<sup>1</sup>, Atsushi Kubo<sup>2</sup>, Yasutaka Matsuo<sup>1</sup>, and Hiroaki Misawa<sup>1</sup>

<sup>1</sup>Research Institute for Electronic Science, Hokkaido University, <sup>2</sup>Institute of Physics, University of Tsukuba

- OMC5-2**  
**9:30**  
**Optical fabrication and manipulation of semiconductor nanoparticles in superfluid helium**

Masaaki Ashida<sup>1</sup>, Yosuke Minowa<sup>1</sup>, and Hajime Ishihara<sup>2</sup>

<sup>1</sup>Osaka University, Japan, <sup>2</sup>Osaka Prefecture University, Japan

- OMC5-3**  
**9:45**  
**How does the optical angular momentum of an optical vortex shape a monocrystalline silicon needle?**

Honami Fujiwara<sup>1</sup>, Fuyuto Takahashi<sup>1</sup>, Kai Izumisawa<sup>1</sup>, Katsuhiko Miyamoto<sup>1,2</sup>, Ryuji Morita<sup>3</sup>, Takashige Omatsu<sup>1,2</sup>

<sup>1</sup>Graduate School of Advanced Integration Science, Chiba University, Japan, <sup>2</sup>Molecular chirality research center, Chiba University, Japan, <sup>3</sup>Department of Applied Physics, Hokkaido University, Japan

- OMC5-4**  
**10:00**  
**Chiral bias on circularly polarized laser-induced chiral crystallization from NaClO<sub>3</sub> solution containing plasmonic Ag**

**nanoparticles**

Hiromasa Niinomi<sup>1</sup>, Teruki Sugiyama<sup>2</sup>, Miho Tagawa<sup>3</sup>, Kenta Murayama<sup>3</sup>, Shunta Harada<sup>3</sup>, Katsuhiko Miyamoto<sup>1,4</sup>, Takashige Omatsu<sup>1,4</sup> and Toru Ujihara<sup>3</sup>

<sup>1</sup>Molecular Chirality Research Center, Chiba University, Japan, <sup>2</sup>National Chiao Tung University, Taiwan, <sup>3</sup>Nagoya University, Japan, <sup>4</sup>Graduate School of Advanced Integration Science, Chiba University, Japan

- OMC5-5**  
**10:15**  
**Imprinted single-armed chiral surface relief on soda-lime silica glass**

Guzhaliayi Juman<sup>1</sup>, Itsuki Yoshida<sup>1</sup>, Keigo Masuda<sup>1</sup>, Shogo Nakano<sup>1</sup>, Daisuke Sakai<sup>2</sup>, Kenji Harada<sup>3</sup>, Katsuhiko Miyamoto<sup>1,4</sup>, Takashige Omatsu<sup>1,4</sup>

<sup>1</sup>Graduate School of Advanced Integration Science, Chiba University, Japan,

<sup>2</sup>Department of System Engineering, Kitami Institute of Technology, Japan, <sup>3</sup>Department of Computer Science, Kitami Institute of Technology, Japan, <sup>4</sup>Molecular Chirality Research Center, Chiba University, Japan

- OMC5-6**  
**10:30**  
**Using optical vortex to form the droplets filament**

Fukutaro Shiraishi<sup>1</sup>, Yuri Nakamura<sup>1</sup>, Kai Izumisawa<sup>1</sup>, Katsuhiko Miyamoto<sup>1,2</sup>, Kazumi Suzuki<sup>3</sup>, Masaki Yoshino<sup>4</sup>, Takashige Omatsu<sup>1,2</sup>

<sup>1</sup>Graduate School of Advanced Integration Science, Chiba University, Japan, <sup>2</sup>Molecular chirality research center, Chiba University, Japan, <sup>3</sup>Chemical Technology & Products Business Group, RICOH, Japan, <sup>4</sup>Imaging Engine Development Division, RICOH, Japan

----- Break (10:45-11:00) -----

**11:00-12:00 OMC6: Advanced Optical Manipulation**

Room 414+415

Chair: Saulius Juodkazis, Swinburne University, Australia

- OMC6-1**  
**11:00**  
**(Invited) Laser Assembler - Fabrication, manipulation and assembly of microstructures with optical tools**

Sarah Isabelle Ksouri, Christoph Böttinger, Cemal Esen, Andreas Ostendorf

Ruhr-Universitaet Bochum, Germany

- OMC6-2**  
**11:30**  
**(Invited) Nanostructured optical fibres for particle trapping**

Sile Nic Chormaic

OIST Graduate University, Japan

----- Lunch Break (12:00-13:00) -----

----- Poster session (13:00-14:30) -----

Exhibition Hall A

- OMCp-1**  
**Optical gradient force in photonic crystal dual beam**

Chien-Chang Chiu, Fu-Li Hsiao  
 Institute of Photonics, National Changhua University of Education, Taiwan

- OMCp-2** **Holographic mapping of gold nanoparticles based on twilight-field holographic microscopy**  
Siti Nabilah Hassan, Kazufumi Goto, and Yoshio Hayasaki  
Center for Optical Research & Education (CORE), Utsunomiya University, Japan
- OMCp-3** **Highly flexible plasmon-assisted manipulation based on optical nonlinearity**  
Masayuki Hoshina, Nobuhiko Yokoshi and Hajime Ishihara  
Department of Physics and Electronics, Osaka Prefecture University, Japan
- OMCp-4** **LC microlens array without disclination lines by controlling pretilt angle**  
Che-Ju Hsu<sup>1</sup>, Bao-Long Chen<sup>2</sup>, and Chi-Yen Huang<sup>1,2,\*</sup>  
<sup>1</sup>Graduate Institute of Photonics, National Changhua University of Education, Taiwan, <sup>2</sup>Department of physics, National Changhua University of Education, Taiwan
- OMCp-5** **Positive-negative switchable liquid crystal lens with dual hole-patterned electrode**  
Yung-Hsiang Hsu<sup>1</sup>, Chia-Rong Sheu<sup>1</sup>  
<sup>1</sup>Department of Photonics, National Cheng Kung University, Taiwan, <sup>2</sup>Advanced Optoelectronic Technology Center, National Cheng Kung University, Taiwan
- OMCp-6** **Theoretical investigation of lateral resolution given by annular super-resolution phase plate**  
Yoshinori Iketaki<sup>1,2,\*</sup>, Hiroshi Kumagai<sup>2</sup>, Kumei Nagai<sup>3</sup> and Nandor Bokor<sup>4</sup>  
<sup>1</sup>Olympus Corporation, Japan  
<sup>2</sup>School of Allied Health Sciences Physics, Kitasato University, Japan, <sup>3</sup>NTT-AT, Japan  
<sup>4</sup>Department of Physics, Budapest University of Technology and Economics, Hungary
- OMCp-7** **Low Voltage Liquid Crystal Lens with addition of a Ring Floating Electrode**  
Jyun-Jia Jhang<sup>1</sup>, Che-Ju Hsu<sup>1</sup>, Chi-Yen Huang<sup>1,2</sup>  
<sup>1</sup>Graduate Institute of Photonics, National Changhua University of Education, Taiwan, <sup>2</sup>Department of physics, National Changhua University of Education, Taiwan
- OMCp-8** **Selective excitation towards optical size-separation for CdSe quantum dots**  
Mitsutaka Kumakura, Asuka Kinan  
University of Fukui, Japan
- OMCp-9** **Prism Compressor for dispersion compensation**  
Hongying Liu, Tian Lan, Zhenmin Shen, Xiaomei Chen, Guoqiang Ni  
Beijing Institute of Technology, China
- OMCp-10** **Monocycle THz vortex generation by using a Tsurupica spiral phase plate**  
Katsuhiko Miyamoto<sup>1,2</sup>, Bong Joo Kang<sup>3</sup>, Yuta Sasaki<sup>1</sup>, Won Tae Kim<sup>3</sup>, Takayoshi Yano<sup>1</sup>, Kazuki Sano<sup>1</sup>, Tomohito Yamasaki<sup>1</sup>, Fabian Rotermund<sup>3</sup> and Takashige Omatsu<sup>1,2</sup>  
<sup>1</sup>Graduate School of Advanced Integration Science, Chiba University, Japan, <sup>2</sup>Molecular
- chirality research center, Chiba University, Japan, <sup>3</sup>Department of Physics and Division of Energy Systems Research, Ajou University, Korea
- OMCp-11** **Selective plasmonic optical trapping of nano sized fluorescence dye aggregates**  
Ayaka Mototsuji<sup>1</sup>, Tatsuya Shoji<sup>1</sup>, Hiroshi Yao<sup>2</sup>, Takahiro Yoshii<sup>3</sup>, Kei Murakoshi<sup>3</sup>, Yasuyuki Tsuboi<sup>1</sup>  
<sup>1</sup>Graduate School of Science, Osaka City University, Japan, <sup>2</sup>Graduate School of Material Science, University of Hyogo, Japan, <sup>3</sup>Graduate School of Chemical Sciences, and Engineering, Hokkaido University, Japan
- OMCp-12** **Kinetics simulation of nano-particle two-color trapping using resonant nonlinear optical effect**  
Tatsuya Nakai and Hajime Ishihara  
Osaka Prefecture University, Japan
- OMCp-13** **Magnetic Trapping of Superconductor Micro-Particles Produced by Laser Ablation in Liquid Helium**  
Y. Takahashi<sup>1</sup>, J. Suzuki<sup>1</sup>, N. Yoneyama<sup>1</sup>, Y. Tohkawa<sup>1</sup>, N. Suzuki<sup>1</sup>, M. Kumakura<sup>2</sup>, M. Ashida<sup>3</sup>, F. Matsushima<sup>1</sup>, and Y. Moriwaki<sup>1</sup>  
<sup>1</sup>University of Toyama, Japan, <sup>2</sup>University of Fukui, Japan, <sup>3</sup>Osaka University, Japan
- OMCp-14** **High fidelity detection of single atoms trapped in holographic microtrap arrays**  
Hikaru Tamura<sup>1</sup>, Tomoyuki Unakami<sup>1</sup>, Jun He<sup>2</sup>, Yoko Miyamoto<sup>3</sup>, and Ken'ichi Nakagawa<sup>1</sup>  
<sup>1</sup>Institute for Laser Science, University of Electro-Communications, Japan, <sup>2</sup>State Key Laboratory of Quantum Optics and Quantum Optics Devices, and Institute of OptoElectronics, Shanxi University, China  
<sup>3</sup>Department of Information and Communication Engineering, University of Electro-Communications, Japan
- OMCp-15** **Topological properties of superposition of two scalar Laguerre-Gaussian beams**  
Sunil Vyas, and Yoko Miyamoto  
Department of Engineering Sciences, The University of Electro-Communications, Japan
- OMCp-16** **Ultrafast molecular dynamics by femtosecond CARS and hybrid FS/PS CARS spectroscopy**  
Yuanqin Xia<sup>1\*</sup>, Zhibin Zhang<sup>1</sup>, Yang Zhao<sup>1</sup>, Sheng Zhang<sup>2</sup>  
<sup>1</sup>National Key Laboratory of Science and Technology on Tunable Laser, Harbin Institute of Technology, China, <sup>2</sup>Department of Physics, Harbin Institute of Technology, China
- OMCp-17** **Numerical study on isotope separation of radioactive cesium by light-induced drift**  
Kenta Yuki, Leo Matsuoka, Shinichi Namba  
Hiroshima University, Japan

**14:45-15:45 OMC7: Photon Radiation Forces**

Room 414+415

Chair: Yoshihiko Arita, University of St Andrews, U.K.,

MCRC Chiba University, Japan

**OMC7-1  
14:45 Effect of optical manipulation on the  $\alpha\eta$  protocol**Vladimir V. Nikulin<sup>1</sup>, David H. Hughes<sup>2</sup>, John Malowicki<sup>2</sup><sup>1</sup>State University of New York, USA, <sup>2</sup>Air Force Research Laboratory, USA**OMC7-2  
15:00 Dependence of radiation forces on an ellipsoidal particle on the beam polarization state**

Kristine Faith J. Roque, Giovanni A. Tapang, Caesar A. Saloma

University of the Philippines, Philippines

**OMC7-3  
15:15 Polarization-inverted modes in optically trapped metallic nanoparticles for the excitation of forbidden states**

Mamoru Tamura, Takuya Iida

Department of Physical Science, Graduate School of Science, Osaka Prefecture University, Japan

**OMC7-4  
15:30 Raman Microspectroscopy for determining Polymer Concentration in an Optically Trapped Poly(N-isopropylacrylamide).**

Tatsuya Shoji, Kenta Ushiro, Mitsuhiro Matsumoto, Taka-aki Asoh, Yasuyuki Tsuboi

Division of Molecular Materials Science, Graduate School of Science, Osaka City University, Japan

---- Break (15:45-16:15) ----

**16:15-17:30 OMC8: Hydrodynamics & Plasmonics**

Room 414+415

Chair: Ryuji Morita, Hokkaido University, Japan

**OMC8-1  
16:15 (Invited) Collective motion of hydrodynamically coupled micro-objects driven by optical force**

Shogo Okubo, Shuhei Shibata, Yuriko Sassa Kawamura and Yasuyuki Kimura

Kyusyu University, Japan

**OMC8-2  
16:45 Phase tunable anisotropic metamaterials for nano-object detection and manipulation**

Marios Sergides, Viet Giang Truong, and Sile Nic Chormaic

Light-Matter Interactions Unit, OIST Graduate University, Japan

**OMC8-3  
17:00 Evolution of Surface-Enhanced Raman Scattering Intensity at Metal Surface under Electrochemical Potential Control**Kei Murakoshi<sup>1</sup>, Yumi Wakisaka<sup>1</sup>, Mai Takase<sup>1</sup>, Hiro Minamimoto<sup>1</sup>, Satoshi Yasuda<sup>1</sup>, Syoji Ito<sup>2</sup>, Hiroshi Miyasaka<sup>2</sup>, Tatsuya Shoji<sup>3</sup>, Yasuyuki Tsuboi<sup>3</sup>Department of Chemistry, Hokkaido University, Japan, <sup>1</sup>Department of Chemistry, Faculty of Science, Hokkaido University, Japan, <sup>2</sup>Division of FrontierMaterials Science and Center for Promotion of Advanced Interdisciplinary Research, Graduate School of Engineering Science, Osaka University, Japan, <sup>3</sup>Division of Molecular Materials Science, Graduate School of Science, Osaka City University, Japan**OMC8-4  
17:15 Plasmon-induced Photosensitization of Porous TiO<sub>2</sub> Electrodes with Au-Ag Alloy Nanoparticles Prepared****by Ionic Liquid/Metal Sputter Deposition**Tatsuya Kameyama<sup>1</sup>, Eisaku Kumazawa<sup>1</sup>, Susumu Kuwabata<sup>2</sup>, Tsukasa Torimoto<sup>1</sup><sup>1</sup>Nagoya University, Japan, <sup>2</sup>Osaka University, Japan**17:30- Closing**

Room 414+415

**Closing Remarks****Takashige Omatsu**, OMC'16 Chair, Chiba Univ., Japan.

## Pacific-rim Laser Damage '16

### PLD'16

Wednesday, May 18

9:00-12:10 OPIC Plenary Session

Room 501+502

---- Lunch Break (12:10-13:30) ----

13:30-15:15 LIC+PLD+SLPC Joint Session 1 (PLD1) Room 301

Chair: K. Washio, Paradigm Laser Research, Japan

Opening T. Taira, Conference Chair of LIC' 14

Remarks of Institute for Molecular Science, Japan

Joint Session T. Jitsuno, Conference Chair of PLD' 14

13:30 Institute of Laser Engineering, Osaka Univ., Japan

Y. Okamoto, Conference Chair of SLPC2016 Okayama Univ., Japan

SLPC5j-1 (Invited) Optimized design and performance of laser ablation system for paint and coating removal for manufacturing and maintenance of vehicles and airplanes

13:45

Y. Kwon

Powerlaser Photonics, UK

PLD1j-1 (Invited) High performance interference coatings for near infrared high energy lasers

14:15

C. Menoni, D. Schiltz, D. Patel, B. Reagan

Colorado State Univ., USA

PLD1j-2 (Invited) Modeling of laser induced damage and usage at National Ignition Facility

14:45

Z. M.Liao, M. Nostrand, J. Bude, T. Suratwala

Lawrence Livermore National Laboratory, USA

---- Break (15:15-15:45) ----

15:45-17:20 LIC+PLD+SLPC Joint Session 2 (PLD2) Room 301

Chair: K. Washio, Paradigm Laser Research, Japan

SLPC6j-1 Fiber delivery of ultrafast lasers

15:45

E. Mottay

Amplitude Systemes, France

LICj-1 The latest technology demand of the internal processing type laser dicing technology

16:15

N. Uchiyama

Hamamatsu Photonics K.K., Japan

LICj-2 Micro-laser based material processing (tentative)

16:45

D. Barbier

Team Photonics Co., France

17:15 Closing Remarks

K. Washio, Paradigm Laser Research, Japan

18:00-20:00 OPIC Reception

Room 501+502

Thursday, May 19

9:00-10:30 PLD3: Plenary and coatings Room 413

Chair: T. Jitsuno, Osaka Univ., Japan

PLD3-1 (Plenary) Coatings for high power laser system in China

9:00

J. Shao

Shanghai Inst. of Opt. Fine Mech., China

PLD3-2 Laser-induced damage performance of high-reflectance coatings with co-evaporated interfaces at 1064nm

9:30

H. Xing, J. Sun, Y. Chai, M. Zhu, J. Shao

Shanghai Inst. of Opt. Fine Mech., China

PLD3-3  
9:45

Non-destructive investigations to highlight first stages of fatigue effect under multiple laser irradiations

J.Y. Natoli, F. R. Wagne, A. Beaudier, L. Gallais, K. Lliopoulos  
Institut Fresnel, France

PLD3-4  
10:00

Substrate material dependence of the thin film stress and its control

H. Omatsu, M. Akimoto, T. Murakami, S. Tujimoto, T. Yasasiro, R. Nakamura<sup>a</sup>, T. Kamimura

Osaka Institute of Technology, Japan

<sup>a</sup>Osaka University, Japan

PLD3-5  
10:15

Ion-assisted coating for large-scale Bimorph deformable mirror

T. Mikami, T. Okamoto, T. Jitsuno<sup>a</sup>, S. Motokoshi<sup>b</sup>, V. Samarkin<sup>c</sup>, A. Kudryashov<sup>c</sup>, J. Kawanaka<sup>a</sup>, N. Miyanaga<sup>a</sup>

Okamoto Optics Works, Inc., <sup>a</sup>Osaka Univ.

Japan, <sup>b</sup>Japan, Inst. for Laser Tech., Japan,

<sup>c</sup>Active Optics NightN Ltd, Russia

---- Break (10:30-10:45) ----

10:45-12:00 PLD4: Nonlinear materials Room 413

Chair: J. Shao, SIOM, China

PLD4-1  
10:45

(Invited) Dielectric coatings as frequency converters - the Frequency Tripling Mirror (FTM)

W. Rudolph, C. Rodriguez, L. A. Emmert, D. Ristau<sup>a</sup>, S. Günster<sup>a</sup>, F. B. A. Aghbolagh, A. K. Oskouei

Univ of New Mexico, USA, <sup>a</sup>Laser Zentrum Hannover, Germany

PLD4-2  
11:15

Multilayer technology for terahertz pulse generation

Y. Ochi, K. Nagashima, M. Tsubouchi,

F. Yoshida, M. Maruyama

Japan Atomic Energy Agency, Japan

PLD4-3  
11:30

Real-time analysis and mitigation of laser damage initiators on the surface of DKDP crystals

G. Hu, Y. Zhao, Y. Wang, D. Li, X. Liu, Z. Cao

Shanghai Inst. of Opt. Fine Mech., China

PLD4-4  
11:45

Laser conditioning mechanism in improving damage performance of KDP

F. Wang

China Academy of Engineering Physics, China

---- Lunch Break (12:00-13:00) ----

13:00-15:15 PLD5: Short pulse phenomena Room 413

Chair: TBD

PLD5-1  
13:00

(Invited) Femtosecond laser-induced damage: lessons learned from time-resolved measurements

A. Melninkaitis

Univ. Vilnius, Lithuania

PLD5-2  
13:30

(Invited) Ultrafast carrier dynamics related to fs lasers-induced damage in optical coatings

J. Du, Z. Li, B. Xue<sup>a</sup>, T. Kobayashi<sup>a</sup>, F. Kong, Y.

Jin, Y. Zhao, Y. Leng, J. Shao

Shanghai Inst. of Opt. Fine Mech., China

**PLD5-3**  
**14:00**  
**In situ imaging and control of layer-by-layer femtosecond laser thinning of graphene**

<sup>a</sup>The Univ. of Electro-Communications, Japan  
Y. Lu, D. Li, Y. Zhou, X. Huang, L. Jiang<sup>a</sup>,  
J. F. Silvain<sup>b</sup>

<sup>a</sup>Beijing Institute of Technology, China, <sup>b</sup>Institut de Chimie de la Matière Condensée de Bordeaux, France

**LPD5-4**  
**14:15**  
**Confined Ablation on the SiO<sub>2</sub>/Si Interface with Embedded Nanoparticles**

Z. U. Rehman, L. T. Na, C. L. Tan<sup>a</sup>,  
K. A. Janulewicz  
Gwangju Inst. of Science and Tech., Korea,  
<sup>a</sup>Northwestern Univ., USA

**PLD5-5**  
**14:30**  
**Interferometric analysis of optical breakdown dynamics in bulks of transparent dielectrics induced by sub-nanosecond laser pulse**

V. H. Nguyen, N. T. Le, Z. U. Rehman, K. A. Janulewicz

Gwangju Inst. of Science and Tech., Korea

**PLD5-6**  
**14:45**  
**Plasma dynamics and phase transitions in optical breakdown of transparent dielectrics**

K. A. Janulewicz, Z. U. Rehman, N. T. Le,  
V. H. Nguyen, K. A. Tran

Gwangju Inst. of Science and Tech., Korea

**PLD5-7**  
**15:00**  
**Spatial-temporal distortions and calibration of ultrashort pulses in complex optical systems**

J. Liu, Z. Zheng, L. Zhu, S. Chang, A. Chen,  
S. Liu, F. Yuan, H. Zhang  
Zhejiang Univ., China

---- Break (15:15-15:45) ----

**15:45-17:00 PLD6: High power resistant coatings** Room 413

Chair: S. Motokoshi, Institute for Laser Technology, Japan

**PLD6-1**  
**15:45**  
**(Invited) Developments of high damage threshold meter-scale optical components for multi-PW lasers**

A. Hervy, L. Gallais<sup>a</sup>, G. Chériaux,  
D. Mouricaud, S. Djidel, A. Fréneaux,  
J. P. Chambaret<sup>b</sup>, C. Leblanc<sup>b</sup>, M. Somekh<sup>b</sup>,  
F. Mathieu<sup>b</sup>, N. Bonod<sup>a</sup>, A. Cotel<sup>c</sup>,  
F. Desserouer<sup>c</sup>, O. Utéza<sup>d</sup>, R. Clady<sup>d</sup>, M. Sentis<sup>d</sup>  
REOSC, France, <sup>a</sup>Institut Fresnel, France,  
<sup>b</sup>Laboratoire d'Utilisation des Lasers Intenses,  
Ecole Polytechnique, France, <sup>c</sup>HORIBA Jobin  
Yvon S.A.S., France, <sup>d</sup>Aix Marseille Université,  
CNRS, LP3 UMR 7341, France

**PLD6-2**  
**16:15**  
**Study on the laser induced damage of low dispersion mirrors**

J. Zhang, B. Ma, X. Cheng, Z. Wang  
Tongji Univ., China

**PLD6-3**  
**16:30**  
**The Investigation of laser induced damage threshold of multilayer mirrors under the simultaneous irradiation of two wavelengths**

M. Sugiura, K. Tamura, M. Kobiyama<sup>a</sup>,  
S. Motokoshi<sup>b</sup>, T. Jitsuno<sup>c</sup>  
Tokai Optical Co., LTD., <sup>a</sup>Tecwave Co.,  
Ltd, <sup>b</sup>Inst. Laser Tech., <sup>c</sup>Osaka Univ., Japan

**PLD-6-4**  
**16:45**  
**The damage characteristics of the high - reflection coatings irradiated from the active gain medium**

X. Liu  
Shanghai Inst. of Opt. Fine Mech., China

Friday, May 20

**9:00-10:15 PLD7: Poster session** Exhibition Hall A

**PLDp7-1**  
**Improvement of resist stripping efficiency without causing laser-induced surface damage**

K. Nuno, Y. Kuroki, S. Takagi<sup>a</sup>, T. Yamashiro, S. Tuzimoto, R. Nakamura<sup>b</sup>, T. Nishiyama<sup>a</sup>,  
T. Kamimura, H. Horibe<sup>a</sup>

Osaka Institute of Technology, Japan, <sup>a</sup>Osaka City Univ., Japan, <sup>b</sup>Osaka Univ., Japan

**PLDp7-2**  
**Laser beam holographic patterning for thin film epitaxial growth monitoring with rheed for using as mev laser compound nuclear cavity material**

M. M. Anwar

Asiatic Society of Bangladesh, Bangladesh

**PLDp7-3**  
**Effect of Laser Beam Parameters on Melt**

**Mobilization and LIBS Analysis of a Special**

**Aluminum Alloy Containing Zeolite**

O. M. Khalil, A. Nakimana<sup>a</sup>

Cairo Univ., Egypt, <sup>a</sup>Changchun Univ., China

**PLDp7-4**  
**Ultrashort pulse laser slicing of semiconductor crystal**

E. Kim, Y. Shimotsuma, M. Sakakura, K. Miura  
Kyoto Univ., Japan

**PLDp7-5**  
**Synthesis of fluorescent nanocarbons by femtosecond laser induced plasma in liquid**

N. Agatsuma, Y. Fujimatsu, Y. Shimotsuma, M. Sakakura, K. Miura

Kyoto Univ., Japan

**PLDp7-6**  
**Mitigation of BSG damage caused by upstream flaw in the final optics assembly**

Z. Jiao, M. Sun, D. Zhao, J. Zhu  
Shanghai Inst. of Opt. Fine Mech., China

**PLDp7-7**  
**Design and fabrication of random antireflective nanostructures on fused silica in the ultraviolet**

W. Zhang, J. Zhao, H. Wang, F. Tu, X. Liu, M. Zhu  
Shanghai Inst. of Opt. Fine Mech., China

**PLDp7-8**  
**Damage analysis of CMOS electro-optical imaging system by a continuous wave laser**

S. Yoon, K. Y. Jhang, W. S. Shin<sup>a</sup>  
Hanyang Univ., Korea, <sup>a</sup>Agency for Defense  
Development, Korea

**PLDp7-9**  
**Study on the data matching of Ground-based Radar and laser point cloud**

Z. Qiu, C. Wang  
Hohai Univ, China

---- Break (10:15-10:30) ----

**10:30-12:15 PLD8: Material Damage** Room 413

Chair: TBD

**PLD8-1**  
**10:30**  
**(Invited) Laser damage measurement of thick silica plates using a new laser injection scheme**

D. Penninckx, R. Diaz, O. Bonville, R. Courchinoux,  
L. Lamagnère, J. Luce  
Commissariat à l'Énergie Atomique, France

- Macquarie Univ., Australia  
**PLD8-2 11:00 (Invited) Nanosecond laser damage of optical multimode fibers**  
 J. Krueger, BAM, Berlin, Germany
- PLD8-3 11:30 (Invited) Adaptive Laser Beam Forming for Laser Shock Micro-Forming for 3D MEMS Devices Fabrication**  
 K. Chen,  
 Pittsburgh Univ. USA
- PLD8-4 12:00 A PHD filter for tracking mid-course group targets via space-based laser**  
 H. Yu, W. An, W. Sheng, X. Wang  
 National Univ. of Defense Technology, China

---- Lunch Break (12:15-13:15) ----

**13:15-15:15 PLD9: Defect, Contamination(1)** Room 413

Chair: TBD

- PLD9-1 13:15 (Invited) Refractive index change mechanisms in different glasses induced by femtosecond laser irradiation**  
 A. Fürbach, S. Gross, D. J. Little, A. A. Martiarena, A. A. Martiarena, M. Ams, P. Dekker, M. J. Withford  
 Macquarie Univ., Australia
- PLD9-2 13:45 Research on nondestructive evaluation of fused silica UV damage performance**  
 H. Liu, F. Wang, X. Jiang  
 China Academy of Engineering Physics, China
- PLD9-3 14:00 Laser-induced damage thresholds by double pulses with interval time**  
 S. Motokoshi, Y. Takemura<sup>a</sup>, T. Jitsuno<sup>b</sup>, M. Yoshida<sup>a</sup>, J. Kawanaka<sup>b</sup>  
 Institute for Laser Technology, Japan, <sup>a</sup>Kinki Univ., Japan, <sup>b</sup>Osaka Univ., Japan
- PLD9-4 14:15 Enhanced internal reflection microscopy for sub-surface damage inspection**  
 L. Xu, K. Ni<sup>a</sup>, R. H. Zhu, S. Liu<sup>a</sup>  
 Nanjing university of science and technology, China
- PLD9-5 14:30 Interferometric analysis of optical breakdown dynamics in bulks of transparent dielectrics induced by sub-nanosecond laser pulse**  
 V. H. Nguyen, N. T. Le, Z. U. Rehman,  
 K. A. Janulewicz  
 Gwangju Institute of Science and Technology, Korea
- PLD9-6 14:45 Laser damage mechanisms of different-sized substrate pits in high-reflective mirrors**  
 Y. Chai<sup>a,b</sup>, M. Zhu<sup>a</sup>, K. Yi<sup>a</sup>, H. Xing<sup>a,b</sup>, J. Sun<sup>a</sup>, J. Shao<sup>a</sup>

<sup>a</sup>Shanghai Inst. of Opt. Fine Mech., China,  
<sup>b</sup>Graduate School of Chinese Academy of Sciences, Beijing, China

**PLD9-7 15:00 Multi-modality laser scanning microscopy at 355nm for defect characterization of optical materials**

J. Chen, B. Li, J. Dong, Z. Wu  
 ZC Optoelectronic Technologies Ltd., China

---- Break (15:15-15:45) ----

**15:45-17:00 PLD10: Defect, Contamination(2)** Room 413

Chair: TBD

- PLD10-1 15:45 Effectiveness of substrate ion cleaning to improve the laser damage threshold of HfO<sub>2</sub>/SiO<sub>2</sub> optical coatings for 527 nm and 1054 nm**  
 E. S. Field, J. C. Bellum, D. E. Kletecka  
 Sandia National Labs., USA
- PLD10-2 16:00 LIC and LID considerations in the design and implementation of the MEMS laser pointing mechanism for the EUSO UV laser altimeter**  
 E. Bozzo, T. Burch<sup>a</sup>, A. Ciapponi<sup>b</sup>, C. Heese<sup>b</sup>,  
 A. Hoogerwerf, N. Lan<sup>b</sup>, A. Neronov, V. Revol<sup>a</sup>  
 ISDC Data Ctr. for Astrophysics, Switzerland  
<sup>a</sup>Ctr. Suisse d'Electronique et de Microtechnique SA, Switzerland  
<sup>b</sup>European Space Research and Technology Ctr., Netherlands
- PLD10-3 16:15 Source of contamination in damage-test sample and vacuum chamber**  
 T. Jitsuno, H. Murakami, S. Motokoshi<sup>a</sup>, T. Mikami<sup>b</sup>, T. Kawasaki, J. Kawanaka, N. Miyanaga  
 Osaka Univ., <sup>a</sup>Instit. Laser Tech., <sup>b</sup>Okamoto Optical Works
- PLD10-4 16:30 How much laser Interferometry effective in the detection of Gravitational waves Used in LIGO at India and Elsewhere**  
 U. P. Verma  
 Patna Science College, India
- Closing Remarks** Room 413
- 16:45** T. Jitsuno Steering Committee Co-Chair,  
 ILE Osaka Univ., Japan
- 16:50** J. Shao Organizing Committee Chair,  
 SIOM Shanghai, China

# Smart Laser Processing Conference 2016

## SLPC2016

Tuesday, May 17

**9:00-9:15 Opening** Room 416+417

### **Opening Remark**

**9:00** Y. Okamoto, Okayama Univ., Japan

**9:15-10:15 SLPC1: Plenary** Room 416+417

**Chairs:** R. Poprawe (Fraunhofer Institute for Laser Technology, Germany), Y. Okamoto (Okayama Univ., Japan)

**SLPC1-1 (Keynote) Advanced Smart Laser Processing Technologies for Improving Quality of Life and Environment**

**9:15** L. Li  
The Univ. of Manchester, UK

**SLPC1-2 (Keynote) The Current Status and Future Perspective of Metal Additive Manufacturing in Japan**

**9:45** H. Kyogoku  
Kindai Univ., Japan

----- Break (10:15-10:45) -----

**10:45-12:15 SLPC2: Beam Sources and Components for Smart Laser Processing**

Room 416+417

**Chairs:** E. Mottay (Amplitude Systemes, France),  
H. Nakano (Kindai Univ., Japan)

**SLPC2-1 (Invited) Ultrashort Pulse Laser Sources and Components for Precise Processing – Results of a Recent German Research Initiative**

**10:45** S. Nolte<sup>1,2</sup>  
<sup>1</sup>Friedrich Schiller Univ., Germany  
<sup>2</sup>Fraunhofer Institute for Applied Optics and Precision Engineering IOF, Germany

**SLPC2-2 (Invited) High Power CO Lasers: New Application Potential for Smart Laser Processing**

**11:15** A. Held  
Coherent, Inc., USA

**SLPC2-3 High Power, Air-Cooled, Nanosecond, Single Mode SHG Green Laser Oscillator**

**11:45** K. Inoue, M. Saito  
Laser Development Division, Amada Miyachi Co., Ltd, Japan

**SLPC2-4 Copper Nanostructures Forming During Laser-Induced Synthesis Exhibit Catalytic Activity**

**12:00** V. A. Kochemirovsky<sup>1</sup>, D. I. Gordeychuk<sup>1</sup>, L. S. Logunov<sup>1</sup>, A. G. Kuzmin<sup>2</sup>, I. A. Balova<sup>1</sup>

<sup>1</sup>Saint-Petersburg Univ., Russia,  
<sup>2</sup>Russian Academy of Sciences, Russia

----- Lunch Break (12:15-13:15) -----

**13:15-15:15 SLPC3: Additive Manufacturing**

Room 416+417

**Chairs:** H. Kyogoku (Kindai Univ., Japan),  
M. Tsukamoto (Osaka Univ., Japan)

**SLPC3-1 (Invited) Development of a Hybrid Multi-Tasking Machine Tool: Integration of Laser**

**Metal Deposition Technology with CNC Machining**

T. Yamazaki,  
Yamazaki Mazak Corp., Japan

**SLPC3-2 High Speed and High Accuracy LMD 3D Printer**

**13:45** N. Okada<sup>1</sup>, Y. Shiomi<sup>1</sup>, H. Ohno<sup>1</sup>, Y. Fukase<sup>2</sup>, S. Fujimaki<sup>2</sup>, S. Fukuyama<sup>2</sup>  
<sup>1</sup>Toshiba Corp., Japan, <sup>2</sup>Toshiba Machine Co. Ltd., Japan

**SLPC3-3 Diode Lasers in New Applications High Speed Cladding and Tailored Blank Welding**

**14:00** T. Schopphoven<sup>1</sup>, A. Gasser<sup>1</sup>, K. Wissenbach<sup>1</sup>, R. Poprawe<sup>2</sup>, A. Eltze<sup>3</sup>, M. Ruetering<sup>3</sup>

<sup>1</sup>Fraunhofer-Institute for Laser Technology, Germany, <sup>2</sup>Chair for Laser Technology, RWTH Aachen Univ., Germany, <sup>3</sup>Laserline GmbH, Germany

**SLPC3-4 Development of Center Nozzle Laser Coating System and Its Coating Characteristics**

**14:15** D. Tanigawa<sup>1</sup>, T. Nakaaze<sup>1</sup>, N. Abe<sup>2</sup>, M. Tsukamoto<sup>2</sup>, H. Yamazaki<sup>2</sup>, Y. Hayashi<sup>2</sup>, M. Sengoku<sup>3</sup>, M. Yoshida<sup>3</sup>, Y. Funada<sup>4</sup>, S. Muratani<sup>5</sup>

<sup>1</sup>Graduate School of Engineering, Osaka Univ., Japan, <sup>2</sup>Joining and Welding Research Institute, Osaka Univ., Japan, <sup>3</sup>Graduate School of Science and Engineering, Kindai Univ., Japan, <sup>4</sup>Industrial Research Institute of Ishikawa, Japan, <sup>5</sup>Muratani Machine Inc. Japan

**SLPC3-5 Sensory Properties of Copper Microstructures Obtained by Laser-Induced Deposition from Water-Based Solution**

**14:30** I. I. Tumkin, M. S. Panov, A. V. Smikhovskaya, S. S. Ermakov  
Saint-Petersburg Univ., Russia

**SLPC3-6 Spray-coating of CuO Nanoparticles for Femtosecond Laser Reduction Patterning on Nonplanar Substrates**

**14:45** Y. Ito, M. Mizoshiri, J. Sakurai, S. Hata  
Department of Micro-Nano Systems Engineering, Graduate School of Engineering, Nagoya Univ., Japan

**SLPC3-7 Cu Micropatterning on Poly (Dimethylsiloxane) Using Femtosecond Laser Reduction of CuO Nanoparticles**

**15:00** M. Mizoshiri, Y. Ito, J. Sakurai, S. Hata  
Graduate School of Engineering, Nagoya Univ., Japan

----- Break (15:15-15:45) -----

**15:45-17:45 SLPC4: Micro & Nano Processing**

Room 416+417

**Chairs:** B. Neuenschwander (Bern Univ. of Applied Science, Switzerland), M. Fujita (Institute for Laser Technology, Japan)

**SLPC4-1 (Invited) Ultrafast Lasers Interacting on Different Material Surfaces**

**15:45** E. L. Gurevich, A. Ostendorf  
Ruhr-Univ. Bochum, Germany

**SLPC4-2 Bioinspired Smart Structures Fabricated by Femtosecond Laser**

**16:15** F. Chen, Q. Yang, X. Hou,  
State Key Laboratory for Manufacturing System

Engineering & Key Laboratory of Photonics Technology for Information of Shaanxi Province, School of Electronics & Information Engineering, Xi'an Jiaotong Univ., P.R., China

**SLPC4-3  
16:30 Find Out the Best Pulse Duration to Do Effective Micro Laser Process with Ultra Fast Pulse Lasers**

Y. Nakamura<sup>1</sup>, M. Koitzsch<sup>2</sup>, B. Becker<sup>2</sup>, C. Siebert<sup>2</sup>, S. Russ<sup>3</sup>

<sup>1</sup>TRUMPF Corp., Japan, <sup>2</sup>TRUMPF Laser- und Systemtechnik GmbH, Germany, <sup>3</sup>TRUMPF Laser GmbH + Co. KG, Germany

**SLPC4-4  
16:45 Industrial Femtosecond Lasers for Micromachining Applications with Highest Quality and Efficiency**

D. Achenbach, F. Hendricks, V. Matylitsky  
Spectra-Physics, Austria

**SLPC4-5  
17:00 Structure Evolution of Metal Nanowire Gratings to Nanodots by Femtosecond Laser Irradiation**

Y. Nakajima<sup>1</sup>, N. N. Nedyalkov<sup>2</sup>, A. Takami<sup>1</sup>, M. Terakawa<sup>1</sup>

<sup>1</sup>Keio Univ., Japan, <sup>2</sup>Bulgarian Academy of Sciences, Bulgaria

**SLPC4-6  
17:15 Picosecond Laser Making High Quality Holes in Nickel Based Alloy**

X. Zhang, W. Zhang, M. Cai, L. Ji  
Beijing Aeronautical Manufacturing Technology Research Institute, China

**SLPC4-7  
17:30 Fabrication of Bi-anisotropic Optical Metamaterials for Infra-red Spectral Range by Direct Laser Write Technique**

I. Fanyaeu<sup>1,2</sup>, V. Mizeikis<sup>1</sup>

<sup>1</sup>Research Institute of Electronics, Shizuoka Univ., Japan, <sup>2</sup>Department of General Physics, Francisk Skorina Gomel State Univ., Belarus

**18:15-20:15 SLPC Reception** Room 419

**Wednesday, May 18**

**9:00-12:10 OPIC Plenary Session** Room 501+502

----- Lunch Break (12:10-13:30) -----

**13:30-15:15 LIC+PLD+SLPC Joint Session 1 (SLPC5)** Room 301

**Chair: K. Washio (Paradigm Laser Research, Japan)**

**13:30 Introduction (LIC, PLD, SLPC)**

**SLPC5j-1  
13:45 (Invited) Optimized Design and Performance of Laser Ablation Systems for Paint and Coating Removal for Manufacturing and Maintenance of Vehicles and Airplanes**

Y. Kwon

Powerlase Photonics, UK

**PLDj-1  
(Invited) High Performance Interference Coatings for Near Infrared High Energy Lasers**

C. Menoni

Colorado State Univ., USA

**PLDj-2  
(Invited) Modeling of Laser-induced Damage and Optic Usage at National Ignition Facility**

Z. Liao

Lawrence Livermore National Laboratory, USA

----- Break (15:15-15:45) -----

**15:45-17:20 LIC+PLD+SLPC Joint Session 2 (SLPC6)** Room 301

**Chair: K. Washio (Paradigm Laser Research, Japan)**

**SLPC6j-1  
15:45 (Invited) Fiber Delivery of Ultrafast Lasers**

E. Mottay

Amplitude Systemes, France

**LICj-1  
(Invited) The Latest Technology Demand of the Internal Processing Type Laser Dicing Technology**

T. Takahashi, N. Uchiyama

Hamamatsu Photonics, Japan

**LICj-2  
(Invited) Micro-laser Based Material Processing (tentative)**

D. Barbier (tentative)

Team Photonics, France

**17:15 Closing Remarks**

K. Washio, Paradigm Laser Research, Japan

**18:00-20:00 OPIC Reception** Room 501+502

**Thursday, May 19**

**8:30-10:00 SLPC7: Surface Structuring and Modification** Room 416+417

**Chairs: A. Ostendorf (Ruhl-Univ. Bochum, Germany)**

**T. Nakamura (Tohoku Univ., Japan)**

**SLPC7-1  
8:30 (Invited) Process Parameter Optimization for High Speed and High Quality Surface Structuring of Metals with 100 W of Average Power and Ultra-short Pulses**

B. Jaeggi<sup>1</sup>, M. Zimmermann<sup>1</sup>, B. Neuenschwander<sup>1</sup>, G. Hennig<sup>2</sup>, R. Streubel<sup>3</sup>, B. Goekce<sup>3</sup>, S. Barcikowski<sup>3</sup>

<sup>1</sup>Institute for Applied Laser, Photonics and Surface Technology ALPS, Bern Univ. of Applied Sciences, Switzerland, <sup>2</sup>Daetwyler Graphics AG, Switzerland, <sup>3</sup>Technical Chemistry I and Center for Nanointegration, Duisburg-Essen (CENIDE), Univ. of Duisburg-Essen, Germany

**SLPC7-2  
9:00 Shape Change of Periodic Nanostructures Produced with Ultrashort Pulsed Laser on Titanium Surface**

T. Shinonaga, S. Kinoshita, Y. Okamoto, A. Okada

Okayama Univ., Japan

**SLPC7-3  
9:15 Femtosecond Laser Peening of 2024 Aluminum Alloy Without Sacrificial Overlay under Atmospheric Conditions**

T. Sano<sup>1</sup>, T. Eimura<sup>1</sup>, R. Kashiwabara<sup>1</sup>, T. Matsuda<sup>1</sup>, A. Hirose<sup>1</sup>, S. Tsutsumi<sup>2</sup>, K. Arakawa<sup>3</sup>, K. Masaki<sup>4</sup>, Y. Sano<sup>5</sup>

<sup>1</sup>Division of Materials and Manufacturing Science, Osaka Univ., Japan, <sup>2</sup>Joining and Welding Research Institute, Osaka Univ., Japan, <sup>3</sup>Shimane Univ., Japan, <sup>4</sup>Okinawa National College of Technology, Japan, <sup>5</sup>Toshiba Corp. (Japan Science and Technology Agency - ImPACT at present), Japan

**SLPC7-4  
9:30 Effect of Laser Shock Peening (LSP) on AISI L6 Hot Work Tool Steel**

S. V. Patil<sup>1</sup>, V. V. Bhawar<sup>1</sup>, R. Sundar<sup>2</sup>, P. P. Date<sup>3</sup>, R. P. Singh<sup>1</sup>



<sup>1</sup>Bharat Forge Ltd., India, <sup>2</sup>Raja Ramanna Centre for Advanced Technology, India, <sup>3</sup>Indian Institute of Technology, India

**SLPC7-5 9:45 The effects of Laser Peening on the Fatigue Properties of Aviation Structures**

S. Zou <sup>1</sup>, S. Gong <sup>1</sup>, J. Wu <sup>2</sup>

<sup>1</sup>Beijing Aeronautical Manufacturing Technology Research Institute (BAMTRI), China, <sup>2</sup>South-east Univ., China

----- Break (10:00-10:30) -----

**10:30-12:15 SLPC8: Cutting and Welding**

Room 416+417

**Chairs: Lin Li (The Univ. of Manchester, UK)**

**Yuji Sato (Osaka Univ., Japan)**

**SLPC8-1 10:30 (Invited) High-quality Processing of CFRP with Kilowatt Average Power Short-pulse Lasers**

R. Weber, C. Freitag, M. Wiedenmann, T. Graf  
IFSW, Univ. of Stuttgart, Germany

**SLPC8-2 11:00 Wavelength and Pulsewidth Dependences of Laser Processing of CFRP**

M. Fujita <sup>1</sup>, H. Ohkawa <sup>2</sup>, T. Somekawa <sup>1</sup>, M. Otsuka <sup>2</sup>, Y. Maeda <sup>2</sup>, T. Matsutani <sup>2</sup>, N. Miyanaga <sup>3</sup>

<sup>1</sup>Institute for Laser Technology, Japan, <sup>2</sup>Kindai Univ., Japan, <sup>3</sup>Institute of Laser Engineering, Osaka Univ., Japan

**SLPC8-3 11:15 Examination of Structuring Patterns for Laser-based Polymer-metal-connections**

K. V. D. Straeten, F. Haschke, A. Olowinsky, A. Gillner

Fraunhofer Institute for Laser Technology ILT, Germany

**SLPC8-4 11:30 Influence of Spatial Power Modulation on Pore and Crack Formation in Laser Beam Welding of Aluminum**

P. Heinen <sup>1</sup>, F. Eichler <sup>2</sup>, A. Haeusler <sup>3</sup>, A. Olowinsky <sup>1</sup>, A. Gillner <sup>1</sup>, R. Poprawe <sup>3</sup>

<sup>1</sup>Fraunhofer-Institut für Lasertechnik ILT Germany, <sup>2</sup>Chair for Technology of Optical Systems TOS of RWTH Aachen Univ., Germany, <sup>3</sup>Chair for Laser Technology LLT of RWTH Aachen Univ., Germany

**SLPC8-5 11:45 Experimental Characterization of Energy Transfer from Large-diameter Kilowatt CW Laser Beams to Metal Samples**

J. Osterholz, D. Heunoske, J. Horak, B. Lexow, M. Lueck, M. Wickert

Fraunhofer EMI, Germany

**SLPC8-6 12:00 An Interactive Real-time Simulation Tool for Laser Cutting and Laser Drilling of Metals**

T. Hermanns <sup>1</sup>, W. Schulz <sup>2</sup>,

<sup>1</sup>RWTH Aachen Univ., Germany, <sup>2</sup>Fraunhofer Institute for Laser Technology ILT, Germany

----- Lunch Break (12:15-13:30) -----

**13:30-15:00 SLPC9: Poster Session**

Exhibition Hall A

**Chair: T. Shinonaga (Okayama Univ., Japan)**

**SLPC9p-1 Effective Shielding Gas Supplying Method of Wide Area in Vertical-position Laser Welding of Pure Titanium**

K. Yokohara <sup>1</sup>, Y. Okamoto <sup>1</sup>, A. Okada <sup>1</sup>, H. Ochiai <sup>2</sup>, R. Kimura <sup>2</sup>, S. Ono <sup>2</sup>, M. Akase <sup>2</sup>

<sup>1</sup>Graduate school of Natural Science and Technology, Okayama Univ., Japan, <sup>2</sup>Mitsui Engineering & Shipbuilding Co., Ltd., Japan

**SLPC9p-2 Laser Drilling Assisted by a Coaxial Discharged Plasma Torch**

J. C. Hsu <sup>1</sup>, Y. R. Jheng <sup>1</sup>, C. C. Ho <sup>1,2</sup>, Y. J. Chang <sup>1</sup>, C. L. Kuo <sup>1</sup>

<sup>1</sup>Department of Mechanical Engineering, National Yunlin Univ. of Science and Technology, Taiwan, <sup>2</sup>Department of Mechanical Engineering, National Taipei Univ. of Technology, Taiwan

**SLPC9p-3 Polymeric Materials Drilling by Longitudinally Excited CO<sub>2</sub> laser**

K. Uno <sup>1</sup>, M. Kato <sup>1</sup>, T. Akitsu <sup>1</sup>, T. Jitsuno <sup>2</sup>

<sup>1</sup>Univ. of Yamanashi, Japan, <sup>2</sup>Institute of Laser Engineering, Osaka Univ., Japan

**SLPC9p-4 Fabrication of a Miniaturized Current Transducer of Rogowski Coil Based on Femtosecond Laser Micromachining**

Q. Yang, F. Chen, X. Hou

State Key Laboratory for Manufacturing System Engineering & Key Laboratory of Photonics Technology for Information of Shaanxi Province, School of Mechanical Engineering, Xi'an Jiaotong Univ., P. R. China

**SLPC9p-5 The Investigation of Aging in Writing Inks Using Raman Spectroscopy**

K. O Gorshkova, L. A Mund, I. I. Tumkin, V. A. Kochemirovsky

Saint-Petersburg Univ., Russia

**SLPC9p-6 Sintering of Silver Nanoparticle Inks on a Polymer Substrate Using a Laser with Different Polarizations**

C. W. Cheng <sup>1</sup>, W. C. Chang <sup>1</sup>, Y. H. Chen <sup>2</sup>

<sup>1</sup>National Chiao Tung Univ., Taiwan, <sup>2</sup>Industrial Technology Research Institute, Taiwan

**SLPC9p-7 Picosecond Laser Texturing of Multi-crystalline Silicon Wafer for Solar Cells**

S. H. Ha, H. S. Kim, J. H. Kim, S. J. Park  
Department of Chemical & Biological Engineering, Gachon Univ., South Korea

**SLPC9p-8 Effects of Nitrogen Doping in 4H-SiC by Laser Ablation of a SiN<sub>x</sub> Film and Its Diffusion Mechanism**

R. Kojima, H. Ikenoue, A. Suwa, A. Ikeda, D. Nakamura, T. Asano, T. Okada

Graduate School of Information Science and Electrical Engineering, Kyushu Univ., Japan

**SLPC9p-9 UV Laser-assisted Micro-porous Patterning on the Polyimide Surface**

J. Y. Oh <sup>1</sup>, S. Z. Lee <sup>1</sup>, K. H. Oh <sup>1</sup>, M. S. Kang <sup>2</sup>, Y. W. Ma <sup>2</sup>, B. S. Shin <sup>1</sup>

<sup>1</sup>Laser Advanced System Industrialization Center, Jeonnam Technopark, South Korea,

<sup>2</sup>Department of Cogno-mechatronics Engineering, Pusan National Univ., South Korea

**SLPC9p-10 A Laser-based Method for Facile Fabrication of High-quality Carbonized Polyimide Film with a Chamber**

Y. W. Ma <sup>1</sup>, J. H. Park <sup>2</sup>, H. Kim <sup>2</sup>, D. Yun <sup>3</sup>, B. S. Shin <sup>1,2,3</sup>

- <sup>1</sup>Engineering Research Center for Net Shape and Die Manufacturing (ERC/NSDM), Pusan National Univ., Korea, <sup>2</sup>Department of Cogno-Mechatronics Engineering, Pusan National Univ., Korea, <sup>3</sup>Department of Optics and Mechatronics Engineering, Pusan National Univ., Korea
- SLPC9p-11 Fabrication of Nano-periodic Structures with Holographic Line-shaped Vector Beams**  
S. Hasegawa, Y. Hayasaki  
Center for Optical Research and Education (CORE), Utsunomiya Univ., Japan
- SLPC9p-12 In-process Debris Removal Based on Dual Polarizations with Optical Time Delay and Holographic Beam Shaping**  
T. Abe <sup>1</sup>, S. Hasegawa <sup>1</sup>, H. Takahashi <sup>2</sup>, Y. Hayasaki <sup>1</sup>  
<sup>1</sup>Center for Optical Research and Education (CORE), Utsunomiya Univ., Japan, <sup>2</sup>Aisin Seiki CO., LTD., Japan
- SLPC9p-13 Single Line Multi-layered Metal Microstructures Fabricated by Selective Laser Melting**  
C. W. Cheng <sup>1</sup>, S. Y. Wu <sup>1</sup>, Y. W. Liu <sup>1</sup>, M. C. Tsai <sup>2</sup>  
<sup>1</sup>National Chiao Tung Univ., Taiwan, <sup>2</sup>National Cheng Kung Univ., Taiwan
- SLPC9p-14 Properties of Cobalt Base Alloy Coating by Laser Cladding with Center Nozzle Powder Feeding**  
K. Asano <sup>1</sup>, D. Tanigawa <sup>1</sup>, N. Abe <sup>2</sup>, M. Tsukamoto <sup>2</sup>  
<sup>1</sup>Graduate School of Engineering, Osaka Univ., Japan, <sup>2</sup>Joining and Welding Research Institute, Osaka Univ., Japan
- SLPC9p-15 Pulsed Laser Irradiation Used to Change in Electrical Conductivity of Indium Gallium Zinc Oxide Thin Films**  
Y. Ogawa <sup>1</sup>, T. Sameshima <sup>1</sup>, M. Hasumi <sup>1</sup>, Y. Ando <sup>2</sup>, S. Kishida <sup>2</sup>, Y. Setoguchi <sup>2</sup>  
<sup>1</sup>Tokyo Univ. of Agriculture and Technology, Japan, <sup>2</sup>Nissin Electric Co., Ltd., Japan
- SLPC9p-16 Accuracy Improvement of Microparts Bending by Femtosecond Laser Peen Forming**  
Y. Sagisaka, K. Yamashita, H. Ueta  
Hamamatsu Technical Support Center, Industrial Research Institute of Shizuoka Prefecture, Japan
- SLPC9p-17 Effect of Water Flow Layer for Plasma Confinement on Laser Peening**  
N. Ehara <sup>1</sup>, D. Nishikawa <sup>1</sup>, I. Kitawaki <sup>1</sup>, M. Heya <sup>2</sup>, M. Tsuyama <sup>1</sup>, H. Nakano <sup>1</sup>  
<sup>1</sup>Faculty of Science and Engineering, Kindai Univ., Japan, <sup>2</sup>Faculty of Engineering, Osaka Sangyo Univ., Japan
- SLPC9p-18 Direct Writing of Sub-100 nm Cr Particles by Laser Induced Forward Transfer (LIFT) Using an Annular fs-laser Beam**  
T. Nakamura, K. Omachi, S. Sato  
Institute of Multidisciplinary Research for Advanced Materials, Tohoku Univ., Japan
- SLPC9p-19 Fundamental Study on Separation Method of Gallium Nitride with Internal Modified Layer by Ultrashort Pulsed Laser**  
M. Ota, Y. Okamoto, T. Shinonaga, A. Okada  
Graduate School of Natural Science and Technology, Okayama Univ., Japan
- SLPC9p-20 Insulation Characteristics and Visibility of Transparent Conductive Film Containing Silver Nanowires by Nanosecond Pulsed Laser**  
M. Oshita <sup>1</sup>, N. Nishi <sup>2</sup>, Y. Okamoto <sup>1</sup>, T. Shinonaga <sup>1</sup>, A. Okada <sup>1</sup>  
<sup>1</sup>Graduate School of Natural Science and Technology, Okayama Univ., Japan, <sup>2</sup>Kataoka Corp., Japan
- SLPC9p-21 Femtosecond Laser Processing of Poly (Lactic-co-glycolic Acid) at 800, 400, and 266 nm Wavelengths**  
A. Shibata <sup>1</sup>, S. Yada <sup>1</sup>, M. Terakawa <sup>1,2</sup>  
<sup>1</sup>School of Integrated Design Engineering, Keio Univ., Japan, <sup>2</sup>Department of Electronics and Electrical Engineering, Keio Univ., Japan
- SLPC9p-22 Cu-based Micropatterning Using Femtosecond Laser Reduction of Copper Nitrate in a Polymer**  
Y. Kondo, M. Mizoshiri, J. Sakurai, S. Hata  
Department of Micro-Nano Systems Engineering, Graduate School of Engineering, Nagoya Univ., Japan
- SLPC9p-23 Laser Micromachining of PEDOT:PSS /Graphene Thin Films by Using Beam Shaping Technology**  
S. F. Tseng <sup>1</sup>, W. T. Hsiao <sup>1</sup>, C. K. Chung <sup>1</sup>, D. Chiang <sup>1</sup>, J. A. Yeh <sup>2,3</sup>  
<sup>1</sup>Instrument Technology Research Center, National Applied Research Laboratories, Taiwan, <sup>2</sup>Institute of Nanoengineering and Microsystems, National Tsing Hua Univ., Taiwan, <sup>3</sup>Department of Power Mechanical Engineering, National Tsing Hua Univ., Taiwan
- SLPC9p-24 Properties of AgNW-ITO Hybrid Transparent Conductive Films Ablation Using Nanosecond Laser Pulses**  
W. T. Hsiao <sup>1</sup>, C. C. Yang <sup>1</sup>, S. F. Tseng <sup>1</sup>, C. K. Chung <sup>1</sup>, K. C. Huang <sup>1</sup>, K. Lin <sup>2</sup>, M. F. Chen <sup>3</sup>  
<sup>1</sup>Instrument Technology Research Center, National Applied Research Laboratories, Taiwan, R.O.C., Taiwan, <sup>2</sup>Department of Mechanical Engineering, Southern Taiwan University of Science and Technology, Taiwan, R.O.C., Taiwan, <sup>3</sup>Department of Mechatronics Engineering, National Changhua Univ. of Education, Taiwan, R.O.C., Taiwan
- SLPC9p-25 Susceptibility Determining the States and Properties of Metallic Systems at a Threshold Breakdown of the Through Holes by Power Laser Radiation**  
K. E. Vladimirovich <sup>1</sup>, B. A. Alekseevich <sup>2</sup>, K. M. Yur'evich <sup>3</sup>  
<sup>1</sup>Calculus Mathematics Department, Moscow State Regional Univ., Russia, <sup>2</sup>Applied Research Center Old Dominion Univ., USA, <sup>3</sup>Ioffe Physical Technical Institute, Russia
- SLPC9p-26 Threshold Breakdown of Through Holes in Metal Foils by Powerful Laser Radiation**  
K. E. Vladimirovich <sup>1</sup>, B. A. Alekseevich <sup>2</sup>, K. M. Yur'evich <sup>3</sup>, K. Dmitrii <sup>3</sup>, C. Andrei <sup>3</sup>  
<sup>1</sup>Calculus Mathematics Department, Moscow

- State Regional Univ., Russia, <sup>2</sup>Applied Research Center, Old Dominion Univ., USA, <sup>3</sup>Ioffe Physical Technical Institute, Russia
- SLPC9p-27** **Shape Evaluation of Microgrooves Fabricated with Laser-induced Etching Using the Optical Analysis**  
K. H. Oh <sup>1</sup>, S. Z. Lee <sup>1</sup>, S. H. Jeong <sup>2</sup>  
<sup>1</sup>Laser Center, Jeonnam Technopark, Stiftung, Republic of Korea, <sup>2</sup>Department of Mechatronics, Gwangju Institute of Science and Technology, Republic of Korea
- SLPC9p-28** **Optical Emission Spectroscopy and Pulsed Laser Deposition of Amorphous Carbon Films in Air and Oxygen**  
S. S. Yap, T. Y. Tou, C. H. Nee  
Multimedia Univ., Malaysia
- **Break (15:00-15:30)** -----
- 15:30-17:15** **SLPC10: Industrial Applications**  
Room 416+417  
**Chairs: C. Freitag (IFSW, Univ. of Stuttgart, Germany)**  
**K. Washio (Paradigm Laser Research, Japan)**
- SLPC10-1** **(Invited) Large Area Flexible Electronics Manufacture at High Speed Using an Integrated PS Fiber Laser and 3D Scanner**  
15:30 T. S. McComb, K. E. Gross, J. Small, T. L. Lowder, D. M. McCal, M. Atchley, R. J. Martinsen, J. Debartolo  
nLIGHT Corp., USA
- SLPC10-2** **Laser Cleaning Technique Using Laser-Induced Acoustic Streaming for Silicon Wafers**  
16:00 C. H. Tsai  
Department of Mechatronic Engineering, Huaan Univ., Taiwan
- SLPC10-3** **Inline Inspection of Micro and Macro Welds**  
16:15 M. Kogel-Hollacher <sup>1</sup>, M. Schönleber<sup>1</sup>, J. Schulze <sup>1</sup>, T. Bautze <sup>2</sup>  
<sup>1</sup>Precitec Optronik GmbH, Germany, <sup>2</sup>Precitec GmbH & Co. KG, Germany
- SLPC10-4** **Examples of Laser Applications in the Automotive Industry**  
16:30 A. Andreev  
TRUMPF Corp., Japan
- SLPC10-5** **(Invited) Outlook of Advanced Industrial Laser Applications for Smart Factories**  
16:45 R. Poprawe <sup>1</sup>, C. Hinke <sup>2</sup>  
<sup>1</sup>Fraunhofer-Institute for Laser Technology ILT, Germany, <sup>2</sup>Chair for Lasertechnology LLT at RWTH Aachen Univ., Germany
- 17:15-17:30** **Closing** Room 416+417  
**Closing Remark**  
17:15 M. Tsukamoto, Osaka Univ., Japan

**International Conference on X-ray Optics,  
Detectors, Sources, and their Applications  
2016**

**XOPT2016**

**Wednesday, May 18**

**9:00-12:10 OPIC Plenary Session** Room 501+502

---- Lunch (12:10-13:30) ----

**13:30-15:30 ALPS, HEDS & XOPT Joint Session I**

Room 302

**Chairs: M. Yabashi**, SPring-8/SACLA, Japan

**T. Hosokai**, Osaka University, Japan

**XOPTj-1 (Invited) X-rays as a Subject for Optics Research**  
13:30

T. Ishikawa  
RIKEN SPring-8 Center, Japan

**XOPTj-2 (Invited) LCLS-II: A High Repetition Rate X-ray Laser Facility**  
14:00

D. M. Fritz  
SLAC National Accelerator Laboratory, USA

**HEDSj-1 (Invited) Exploration of New fields of High Energy Density Science**  
14:30

R. Kodama  
Osaka University, Japan

**ALPSj-1 (Invited) HiLASE100: a cryo-cooled 100 J, 10 Hz DPSSL System**  
15:00

A. Lucianetti  
HiLASE Centre, Institute of Physics CAS, Czech Republic

---- Break (15:30-15:45) ----

**15:45-16:45 ALPS, HEDS & XOPT Joint Session II**

Room 302

**Chair: J. Itatani**, Univ. Tokyo, Japan

**ALPSj-2 (Invited) Current status of PW laser at CoReLS and applications**  
15:45

S. K. Lee  
GIST, Korea

**HEDSj-2 (Invited) High-energy Density Science and plasma physics at ELI Beamlines**  
16:15

G. Korn  
Director of ELI Beamlines, Czech Republic

---- Break / Move (16:45-18:00) ----

**18:00-20:00 OPIC Reception** Room 501+502

**Thursday, May 19**

**8:55-9:00 Opening** Room 313+314

**XOPT Opening Remarks**

**8:55** Kazuto Yamauchi  
Osaka University, Japan

**9:00-9:30 XOPT1: X-ray source** Room 313+314

**Chair: M. Yabashi**, SPring-8/SACLA, Japan

**XOPT1-1 (Invited) Frontline and future perspectives in X-ray light source development**  
9:00

H. Tanaka  
RIKEN SPring-8 Center, Japan

**9:30-12:00 XOPT2: X-ray optics for advanced light sources**

Room 313+314

**Chair: M. Yabashi**, SPring-8/SACLA, Japan

**XOPT2-1 (Invited) Nanofocusing mirror optics developments for the ESRF ID-16 beamlines**  
9:30

R. Barrett  
ESRF, France

**XOPT2-2 (Invited) X-ray mirrors at the European XFEL**  
10:00

H. Sinn  
European XFEL, Germany

---- Break (10:30-11:00) ----

**Chair: H. Sinn**, European XFEL, Germany

**XOPT2-3 (Invited) Status and Development of hard X-ray optics and diagnostics at the Linac Coherent Light Source**  
11:00

A. Robert  
SLAC National Accelerator Laboratory, USA

**XOPT2-4 (Invited) Optics for XFEL at SACLA**  
11:30

K. Tono  
SPring-8/SACLA, Japan

---- Lunch Break (12:00-13:00) ----

**13:00-15:00 XOPT3: X-ray microscopy & imaging**

Room 313+314

**Chair: H. Mimura**, The University of Tokyo, Japan

**XOPT3-1 (Invited) Ptychography for x-ray nano-optics characterization at synchrotron radiation sources and x-ray free-electron lasers**  
13:00

C. G. Schroer<sup>1,2</sup>  
<sup>1</sup>Deutsches Elektronen-Synchrotron DESY, Germany, <sup>2</sup>Universität Hamburg, Germany

**XOPT3-2 (Invited) Recent Developments in X-ray Phase Imaging**  
13:30

A. Momose<sup>1,2,3</sup>  
<sup>1</sup>Tohoku University, Japan, <sup>2</sup>ERATO, JST, Japan, <sup>3</sup>JASRI/SPring-8, Japan

**XOPT3-3 Achromatic and high-resolution full-field X-ray microscopy based on four total-reflection mirrors**  
14:00

S. Matsuyama<sup>1</sup>, S. Yasuda<sup>1</sup>, H. Okada<sup>2</sup>, Y. Kohmura<sup>3</sup>, Y. Sano<sup>1</sup>, M. Yabashi<sup>3</sup>, T. Ishikawa<sup>3</sup>, and K. Yamauchi<sup>1</sup>

<sup>1</sup>Osaka University, Japan, <sup>2</sup>JTEC Corporation, Japan, <sup>3</sup>RIKEN SPring-8 Center, Japan

**XOPT3-4 Development of a compact x-ray imaging optical system using two pairs of concave and convex mirrors**  
14:15

J. Yamada, S. Matsuyama and K. Yamauchi  
Osaka University, Japan

**XOPT3-5 Grating-Based Ultra-Small-Angle X-ray Scattering Imaging and its Application to Grazing-Incidence Case**  
14:30

W. Yashiro<sup>1,2</sup> and A. Momose<sup>1,2</sup>

<sup>1</sup>Tohoku University, Japan, <sup>2</sup>ERATO, JST, Japan

**XOPT3-6 X-ray Laser Diffraction Imaging of Samples in Solution Using Micro-Liquid Enclosure Array**  
14:45

T. Kimura<sup>1</sup>, Y. Joti<sup>2</sup>, Y. Bessho<sup>3</sup>, and Y. Nishino<sup>1</sup>  
<sup>1</sup>Hokkaido University, Japan, <sup>2</sup>JASRI, Japan, <sup>3</sup>Academia Sinica, Taiwan

----- Break (15:00-15:30) -----

**15:30-16:45 XOPT4:**

**X-ray optics (I): refractive optics & applications**

Room 313+314

**Chair: H. Yumoto, JASRI/SPring-8, Japan**

**XOPT4-1 (Invited) 20 years of X-ray refractive optics. New promising perspectives for diffraction limited X-ray sources.**

15:30 A. Snigirev  
Immanuel Kant Baltic Federal University, Russia

**XOPT4-2 Diamond refractive lenses as the breakthrough optic tool for high heat flux X-ray beams**

16:00 M.V. Polikarpov<sup>1</sup>, S.A. Terentiev<sup>2</sup>, S.N. Polyakov<sup>2</sup>, S.I. Zholudev<sup>2</sup>, V.A. Yunkin<sup>3</sup>, I.Snigireva<sup>4</sup>, Y. Shvyd'ko<sup>5</sup>, V.D. Blank<sup>2</sup>, and A. Snigirev<sup>1</sup>  
<sup>1</sup>Immanuel Kant Baltic Federal University, Russia, <sup>2</sup>FSBI TISNCM, Russia, <sup>3</sup>Institute of Microelectronics Technology RAS, Russia, <sup>4</sup>ESRF, France, <sup>5</sup>Advanced Photon Source, Argonne National Laboratory, USA

**XOPT4-3 Coherent hard X-ray microscopy for the characterization of mesoscopic materials**

16:15 I. Snigireva<sup>1</sup>, A. Snigirev<sup>2</sup>  
<sup>1</sup>ESRF, France, <sup>2</sup>Immanuel Kant Baltic Federal University, Russian Federation

**XOPT4-4 Design of quasicrystal structure for X-ray focusing**

16:30 T. Hoshino<sup>1</sup>, T. Fukamizu<sup>1</sup>, W. Li<sup>1</sup>, J. Sugisaka<sup>2</sup>, N. Watanabe<sup>1</sup>, S. Aoki<sup>1</sup>, M. Itoh<sup>1</sup>  
<sup>1</sup>University of Tsukuba, Japan, <sup>2</sup>Kitami Institute of Technology, Japan

**16:45-17:30 XOPT5: X-ray detectors** Room 313+314

**Chair: H. Yumoto, JASRI/SPring-8, Japan**

**XOPT5-1 (Invited) Requisites of X-ray Imaging Detectors for X-ray Free-electron lasers and future Synchrotron Radiation Sources**

16:45 T. Hatsui  
RIKEN SPring-8 Center, Japan

**XOPT5-2 Development of gallium nitride devices for X-ray detection**

17:15 Q. Xu<sup>1</sup>, W. Chuirazzi<sup>1</sup>, P. Mulligan<sup>1</sup>, J. Wang<sup>1,2</sup>, and L. Cao<sup>1</sup>  
<sup>1</sup>The Ohio State University, USA, <sup>2</sup>Stanford University, USA

----- Break / Move (17:30-18:30) -----

**18:30-20:30 XOPT Banquet** TBD (outside of conference center)

**Friday, May 20**

**9:00-10:30 XOPT6:**

**X-ray optics (II): reflective optics & applications**

Room 313+314

**Chair: R. Barrett, ESRF, France**

**XOPT6-1 (Invited) Progress of mirror-based optical system for X-ray nanofocusing and imaging**

9:00 K. Yamauchi  
Osaka University, Japan

**XOPT6-2 3D surface measurement of spherical mirror by nanop profiler using normal vector tracing method**

9:30 H. Shiraji<sup>1</sup>, Y. Tokuta<sup>2</sup>, T. Kitayama<sup>1</sup>, M. Nakano<sup>2</sup>, R. Kudo<sup>1</sup>, K. Yamamura<sup>1</sup>, K. Endo<sup>1</sup>  
<sup>1</sup>Osaka University Research Center for Ultra-Precision Science and Technology, Japan, <sup>2</sup>Graduate School of Osaka University, Japan

**XOPT6-3 Current status of the development of two-staged focusing system for soft x-ray lasers**

9:45 H. Motoyama<sup>1</sup>, T. Sato<sup>1</sup>, A. Iwasaki<sup>1</sup>, Y. Takeo<sup>1</sup>, Y. Senba<sup>2</sup>, H. Ohashi<sup>2</sup>, K. Yamanouchi<sup>1</sup> and H. Mimura<sup>1</sup>  
<sup>1</sup>The University of Tokyo, Japan, <sup>2</sup>JASRI/SPring-8, Japan

**XOPT6-4 (Invited) Ellipsoidal mirror for two-dimensional nanofocusing in the hard x-ray region**

10:00 H. Yumoto  
JASRI/SPring-8, Japan

----- Break (10:30-11:00) -----

**11:00-12:00 XOPT7:**

**X-ray optics (III): optics for various spectroscopic methods**

Room 313+314

**Chair: A. Robert, SLAC National Accelerator Laboratory, USA**

**XOPT7-1 Wavelength-tunable hard X-ray split-and-delay optics at SACLA**

11:00 T. Osaka<sup>1</sup>, T. Hirano<sup>1</sup>, Y. Sano<sup>1</sup>, Y. Inubushi<sup>2</sup>, S. Matsuyama<sup>1</sup>, K. Tono<sup>2</sup>, T. Ishikawa<sup>3</sup>, K. Yamauchi<sup>1</sup> and M. Yabashi<sup>3</sup>  
<sup>1</sup>Osaka University, Japan, <sup>2</sup>JASRI, Japan, <sup>3</sup>RIKEN SPring-8 Center, Japan

**XOPT7-2 Progress on the HIGH RESolution hard X-ray single shot spectrometer (HIREX spectrometer) for the European XFEL photon diagnostics**

11:15 N. G Kujala, W. Freund, and J. Grünert  
European XFEL, Germany

**XOPT7-3 A Medium-resolution, non-resonant, IXS Spectrometer at BL43LXU of SPring-8**

11:30 D. Ishikawa<sup>2,1</sup> H. Uchiyama<sup>2,1</sup> and A.Q.R Baron<sup>1</sup>  
<sup>1</sup>RIKEN SPring-8 Center, Japan, <sup>2</sup>JASRI, Japan

**XOPT7-4 An energy dispersive bent Laue monochromator for K-edge subtraction imaging**

11:45 N. Samadi<sup>1</sup>, M. Martinson<sup>1</sup>, B. Bassey<sup>1</sup>, G. Belev<sup>2</sup>, D. Chapman<sup>2</sup>  
<sup>1</sup>Univeristy of Saskatchewan, Canada, <sup>2</sup>Canadian Light Source, Canada

----- Lunch Break (12:00-13:00) -----

**13:00-14:30 XOPT8: Poster Session**

Exhibition Hall

**XOPTp8-1 Multilayer-based X-ray optics for advanced light source applications**

Q. Huang<sup>1</sup>, Z. Zhang<sup>1</sup>, Z. Wang<sup>1</sup>, F. Bijkerk<sup>2</sup>, E. Louis<sup>2</sup>, R. Kruijs<sup>2</sup>, F. Senf<sup>3</sup>, A. Erko<sup>3</sup>  
<sup>1</sup>Tongji University, Shanghai, China, <sup>2</sup>University of Twente, Netherlands, <sup>3</sup>Institut für Nanometeroptik und Technologie, Germany

- XOPTp8-2 Metrology of the parabolic profile of X-ray refractive lens**  
A. Narikovich <sup>1</sup>, I. Lyatun <sup>1</sup>, D. Zverev <sup>1</sup>, S. Savelyev <sup>1</sup>, I. Snigireva <sup>2</sup>, A. Snigirev <sup>1,2</sup>  
<sup>1</sup>Immanuel Kant Baltic Federal University, Russia, <sup>2</sup>ESRF, France
- XOPTp8-3 Optimization of the optical performance of compound refractive X-ray lens**  
D.A. Serebrennikov <sup>1</sup>, E.S. Clementyev <sup>1,2</sup>, A.A. Snigirev <sup>1</sup>  
<sup>1</sup>I .Kant Baltic Federal University, Russia, <sup>2</sup>Institute for Nuclear Research RAS, Russia
- XOPTp8-4 Wavefront measurement of sub-10-nm XFEL nanobeam produced by multilayer focusing mirrors**  
S. Kawai <sup>1</sup>, S. Matsuyama <sup>1</sup>, A. Nishihara <sup>1</sup>, H. Yumoto <sup>2</sup>, Y. Inubushi <sup>2</sup>, T. Koyama <sup>2</sup>, K. Tono <sup>2</sup>, H. Ohashi <sup>2</sup>, T. Katayama <sup>3</sup>, S. Goto <sup>2</sup>, T. Ishikawa <sup>3</sup>, M. Yabashi <sup>3</sup>, K. Yamauchi <sup>1</sup>  
<sup>1</sup>Osaka University, Japan, <sup>2</sup>JASRI, Japan, <sup>3</sup>RIKEN SPring-8 Center, Japan
- XOPTp8-5 A variable-numerical-aperture x-ray focusing system using a two-stage adaptive Kirkpatrick-Baez mirrors based on piezo electric deformable mirrors**  
H. Hayashi <sup>1</sup>, T. Goto <sup>1</sup>, H. Nakamori <sup>1,2</sup>, S. Matsuyama <sup>1</sup>, T. Kimura <sup>3</sup>, K. P. Khakure <sup>1</sup>, Y. Sano <sup>1</sup>, Y. Kohmura <sup>4</sup>, M. Yabashi <sup>4</sup>, Y. Nishino <sup>3</sup>, T. Ishikawa <sup>4</sup>, K. Yamauchi <sup>1</sup>  
<sup>1</sup>Osaka University, Japan, <sup>2</sup>JTEC Corporation, Japan, <sup>3</sup>Hokkaido University, Japan, <sup>4</sup>RIKEN SPring-8 Center, Japan
- XOPTp8-6 Size-controllable X-ray beam collimation using a two-stage adaptive Kirkpatrick-Baez mirror system based on piezoelectric deformable mirrors**  
T. Goto <sup>1</sup>, H. Nakamori <sup>1,2</sup>, S. Matsuyama <sup>1</sup>, H. Hayashi <sup>1</sup>, Y. Sano <sup>1</sup>, Y. Kohmura <sup>3</sup>, M. Yabashi <sup>3</sup>, T. Ishikawa <sup>3</sup>, K. Yamauchi <sup>1</sup>  
<sup>1</sup>Osaka University, Japan, <sup>2</sup>JTEC Corporation, Japan, <sup>3</sup>RIKEN Spring-8 Center, Japan
- XOPTp8-7 High-resolution imaging XAFS using advanced Kirkpatrick-Baez mirror optics**  
S. Yasuda <sup>1</sup>, S. Matsuyama <sup>1</sup>, H. Okada <sup>2</sup>, Y. Sano <sup>1</sup>, Y. Kohmura <sup>3</sup>, M. Yabashi <sup>3</sup>, T. Ishikawa <sup>3</sup>, K. Yamauchi <sup>1</sup>  
<sup>1</sup>Osaka University, Japan, <sup>2</sup>JTEC Corporation, Japan, <sup>3</sup>RIKEN SPring-8 Center, Japan
- XOPTp8-8 Fabrication of Strain-Free Crystal Optics for a Hard X-ray Split-and-Delay Optical System**  
T. Hirano <sup>1</sup>, T. Osaka <sup>1</sup>, Y. Sano <sup>1</sup>, Y. Inubushi <sup>2</sup>, S. Matsuyama <sup>1</sup>, K. Tono <sup>2</sup>, T. Ishikawa <sup>3</sup>, M. Yabashi <sup>3</sup>, K. Yamauchi <sup>1</sup>  
<sup>1</sup>Osaka University, Japan, <sup>2</sup>JASRI, Japan, <sup>3</sup>RIKEN SPring-8 Center, Japan
- XOPTp8-9 Electroforming process specialized for fabrication of x-ray ellipsoidal mirror**  
T. Kume, S. Egawa, Y. Takeo, H. Mimura  
The University of Tokyo, Japan
- XOPTp8-10 Development of figure correction system for master mandrel of ellipsoidal x-ray mirror**  
Y. Takei, T. Higashi and H. Mimura  
The University of Tokyo, Japan
- XOPTp8-11 Development of differential deposition system with a spatial resolution better than 100µm**  
M. Nagayama, H. Motoyama, H. Mimura  
The University of Tokyo, Japan
- XOPTp8-12 Current status of development of ultraprecise Wolter mirror for soft X-ray microscopy**  
S. Egawa, T. Kume, Y. Takei, Y. Takeo, H. Motoyama, H. Mimura  
The University of Tokyo, Japan
- XOPTp8-13 Evaluation of degree of spatial coherence at a soft X-ray beamline of SPring-8**  
Y. Takeo <sup>1</sup>, H. Motoyama <sup>1</sup>, Y. Senba <sup>2</sup>, H. Kishimoto <sup>2</sup>, H. Ohashi <sup>2</sup>, H. Mimura <sup>1</sup>  
<sup>1</sup>The University of Tokyo, Japan, <sup>2</sup>JASRI, Japan
- XOPTp8-14 Wavefront measurement using ptychographic phase retrieval for evaluating figure and alignment errors of ellipsoidal mirror**  
Y. Takeo, T. Saito, H. Mimura  
The University of Tokyo, Japan
- XOPTp8-15 X-ray Transmission Gratings Fabricated by Metallic Glass Imprinting Technique**  
W. Yashiro <sup>1</sup>, K. Kato <sup>1</sup>, S. Maryam <sup>1</sup>, A. Momose <sup>1,2</sup>, T. Shinohara <sup>3</sup>, H. Kato <sup>1</sup>  
<sup>1</sup>Tohoku University, Japan, <sup>2</sup>ERATO-JST, Japan, <sup>3</sup>JAEA, Japan
- XOPTp8-16 Measurement of the Modulation Transfer Function of X-ray scintillator via scattering from random-media**  
M. Manfreda<sup>1</sup>, M.D. Alaimo<sup>2</sup>, M. Potenza<sup>3</sup>, M.Giglio<sup>3</sup>  
<sup>1</sup>Elettra, Sincrotrone Trieste, Italy, <sup>2</sup>Politecnico di Milano, Italy, <sup>3</sup>Università degli studi di Milano, Italy
- XOPTp8-17 X-ray high resolution diffractometry based on refractive optics**  
P. Ershov <sup>1</sup>, S. Kuznetsov <sup>2</sup>, I. Snigireva <sup>3</sup>, V. Yunkin <sup>2</sup>, A. Snigirev <sup>1</sup>  
<sup>1</sup>IKBFU, Russia, <sup>2</sup>IMT RAS, Russia, <sup>3</sup>ESRF, France
- XOPTp8-18 Damage on EUV multilayer optics caused by irradiation of focused pico-second soft x-ray laser pulses**  
M. Ishino <sup>1</sup>, S. Ichimaru <sup>2</sup>, M. Nishikino <sup>1</sup>, N. Hasegawa <sup>1</sup>, M. Hatayama <sup>2</sup>, T. Kawachi <sup>1</sup>, S. Oku <sup>2</sup>  
<sup>1</sup>JAEA, Japan, <sup>2</sup>NTT Advanced Technology Corporation, Japan
- XOPTp8-19 Hard X-ray in-line interferometers fabricated by Si planar technologies**  
M. Lyubomirskiy <sup>1</sup>, I. Snigireva <sup>1</sup>, S. Kuznetsov <sup>2</sup>, V. Yunkin <sup>2</sup>, V. Kohn <sup>3</sup>, A. Snigirev <sup>4</sup>  
<sup>1</sup>ESRF, France, <sup>2</sup>Institute of Microelectronics and High purity Materials RAS, Russia, <sup>3</sup>National Research Centre "Kurchatov Institute", Russia, <sup>4</sup>Baltic Federal University, Russia
- XOPTp8-20 Ultra-fast single X-ray photon detector based on tungsten silicide**  
X. Zhang  
Universität Zürich, Switzerland

- XOPTp8-21 Focus study measuring phase effects of a double bent Laue beam expanding monochromator**  
M. Martinson<sup>1</sup>, N. Samadi<sup>1</sup>, A. Gomez<sup>2</sup>, D. Chapman<sup>2</sup>  
<sup>1</sup>University of Saskatchewan, Canada, <sup>2</sup>Canadian Light Source, Canada
- XOPTp8-22 A Phase Space Beam Position Monitor for Synchrotron Radiation**  
N. Samadi<sup>1</sup>, B. Bassey<sup>1</sup>, M. Martinson<sup>1</sup>, G. Belev<sup>2</sup>, L. Dallin<sup>2</sup>, M. Jong<sup>2</sup>, D. Chapman<sup>2</sup>  
<sup>1</sup>University of Saskatchewan, Canada, <sup>2</sup>Canadian Light Source, Canada
- XOPTp8-23 A Bent Laue Energy Dispersive Monochromator: An Example Application of Speciation Imaging at the Selenium K-edge**  
P. Qi<sup>1</sup>, N. Samadi<sup>1</sup>, M. Martinson<sup>1</sup>, B. Bassey<sup>1</sup>, D. Chapman<sup>2</sup>  
<sup>1</sup>University of Saskatchewan, Canada, <sup>2</sup>Canadian Light Source, Canada
- XOPTp8-24 Ultraviolet photodetector based on a-IGO thin film**  
C. Hsu<sup>1</sup>, H. Lu<sup>1</sup>, C. Yang<sup>1</sup>, Y. Su<sup>1,2</sup>,  
<sup>1</sup>National Cheng Kung University, Taiwan, <sup>2</sup>Kun-Shan University, Taiwan
- XOPTp8-25 Ultraviolet photodetectors with Ag Nanoparticle-Decorated ZnO Nanorods**  
C. Yang<sup>1</sup>, Z. Wang<sup>1</sup>, and Y. Su<sup>1,2</sup>  
<sup>1</sup>National Cheng Kung University, Taiwan, <sup>2</sup>Kun-Shan University, Taiwan
- XOPTp8-26 X-ray microscopy and microtomography at imaging beamline of SPring-8**  
A. Takeuchi, K. Uesugi  
JASRI, Japan
- XOPTp8-27 Spatial Oscillations of High Harmonics Generated in Noble Gas Interacting with Two-Color Laser Field**  
S. Y. Stremoukhov<sup>1,2</sup>, A. A. Pudov<sup>1</sup>, A. V. Andreev<sup>1</sup>  
<sup>1</sup>Moscow State University, Russia, <sup>2</sup>National Research Centre "Kurchatov Institute", Russia
- XOPTp8-28 The influence of beryllium microstructure on the compound refractive lenses optical properties in X-ray microscopy**  
I. Lyatun<sup>1</sup>, P. Ershov<sup>1</sup>, A. Goikhman<sup>1</sup>, I. Snigireva<sup>2</sup>, A. Snigirev<sup>1</sup>  
<sup>1</sup>Immanuel Kant Baltic Federal University, Russia, <sup>2</sup>ESRF, France
- XOPTp8-29 Formation and interferometric measurements of X-ray vortices**  
Y. Kohmura<sup>1</sup>, D. Takei<sup>1</sup>, Y. Suzuki<sup>2</sup>  
<sup>1</sup>RIKEN SPring-8 Center, Japan, <sup>2</sup>The University of Tokyo, Japan
- XOPTp8-30 Development of high spatial resolution X-ray micro-tomography system at SPring-8**  
K. Uesugi, A. Takeuchi, M. Hoshino  
JASRI, Japan
- XOPTp8-31 Development of a new method of analyzing molecular orientation by soft X-ray absorption spectroscopy (XAS)**  
E. Takahashi<sup>1</sup>, K. Imanishi<sup>1</sup>, S. Suehiro<sup>1</sup>, Y. Suzuri<sup>2</sup>, Y. Muramatsu<sup>3</sup>, E. M. Gullikson<sup>4</sup>  
<sup>1</sup>Sumika Chemical Analysis Service, Ltd., Japan, <sup>2</sup>Yamagata University, Japan, <sup>3</sup>University of Hyogo, Japan, <sup>4</sup>Lawrence Berkeley National Laboratory, USA
- XOPTp8-32 4D X-ray phase-tomography using spectrum tuned synchrotron radiation**  
H. Takano<sup>1,2</sup>, Y. Wu<sup>1,2</sup>, T. Umemoto<sup>1</sup>, M. Hoshino<sup>3</sup>, W. Yashiro<sup>1,2</sup>, A. Momose<sup>1,2,3</sup>  
<sup>1</sup>Tohoku University, Japan, <sup>2</sup>JST-ERATO, Japan, <sup>3</sup>JASRI, Japan
- XOPTp8-33 Coherent diffraction imaging of non-isolated objects with apodized illumination**  
K. P. Khakurel<sup>1</sup>, T. Kimura<sup>1</sup>, H. Nakamori<sup>2,3</sup>, T. Goto<sup>3</sup>, S. Matsuyama<sup>3</sup>, K. Yamauchi<sup>3</sup>, Y. Nishino<sup>1</sup>  
<sup>1</sup>Hokkaido University, Japan, <sup>2</sup>JTEC Corporation, Japan, <sup>3</sup>Osaka University, Japan
- XOPTp8-34 Total-electron-yield measurements in the soft X-ray region of insulating organic films using conductive substrates**  
Y. Muramatsu<sup>1</sup>, T. Ouch<sup>1</sup>, E. M. Gullikson<sup>2</sup>  
<sup>1</sup>University of Hyogo, Japan, <sup>2</sup>Lawrence Berkeley National Laboratory, USA
- XOPTp8-35 Ablation of Si and Cu with capillary discharged 46.9nm x-ray laser focused by a cylinder mirror and a toroidal mirror**  
H. Cui, Y. Zhao, W. Zhang, W. Li, S. Jiang, L. Li  
Harbin Institute of Technology, China
- Break (14:30-15:30) -----
- 15:30-15:45 XOPT9: X-ray optics for advanced light sources**  
Room 313+314  
**Chair: K. Tono**, SPring-8/SACLA, Japan
- XOPT9-1 Single crystal optics at the high repetition rate European XFEL**  
15:30  
L. Samoylova and H. Sinn  
European XFEL Facility, Germany
- 15:45-16:00 XOPT10: X-ray sources**  
Room 313+314  
**Chair: K. Tono**, SPring-8/SACLA, Japan
- XOPT10-1 Demonstration of Multibunch Operation from a Compact Laser-Compton x-ray Source**  
15:45  
D. J. Gibson<sup>1</sup>, G. G. Anderson<sup>1</sup>, Y. Hwang<sup>2</sup>, R. A. Marsh<sup>1</sup>, and C. P. J. Barty<sup>1</sup>  
<sup>1</sup>Lawrence Livermore National Laboratory, USA, <sup>2</sup>UC Irvine, USA

**16:00-17:15 XOPT11: X-ray diagnostics** Room 313+314

**Chair: K. Tono**, SPring-8/SACLA, Japan

**XOPT11-1** **Using high resolution LiF crystal X-ray detector for in situ characterization of XFEL beam intensity distribution and focusability**

**16:00**

T. Pikuz<sup>1,4</sup>, A. Faenov<sup>2,3</sup>, T. Matsuoka<sup>3</sup>, B. Albertazzi<sup>4</sup>, N. Ozaki<sup>1,4</sup>, N. Hartely<sup>4</sup>, O. Muray Ricardo Arturo<sup>1,4</sup>, T. Yabuuchi<sup>6</sup>, H. Habara<sup>4</sup>, S. Matsuyama<sup>4</sup>, K. Yamauchi<sup>4</sup>, Y. Inubushi<sup>5</sup>, T. Togashi<sup>5</sup>, H. Yumoto<sup>5</sup>, Y. Tange<sup>5</sup>, K. Tono<sup>5</sup>, Y. Sato<sup>4</sup>, M. Yabashi<sup>5,6</sup>, M. Nishikino<sup>7</sup>, T. Kawachi<sup>7</sup>, A. Mitrofanov<sup>2</sup>, D. Bleiner<sup>8</sup>, A. Grum-Grzhimailo<sup>9</sup>, N.N. Rosanov<sup>10</sup>, N.V. Vysotina<sup>10</sup>, M. Harmand<sup>11</sup>, M. Koenig<sup>4,12</sup>, K. A. Tanaka<sup>1,4</sup>, T. Ishikawa<sup>5,6</sup>, R. Kodama<sup>1,3,4</sup>

<sup>1</sup>Photon Pioneers Center, Osaka University, Japan, <sup>2</sup>Joint Institute for High Temperatures, Russian Academy of Sciences, Russia, <sup>3</sup>Institute for Academic Initiatives, Osaka University, Japan, <sup>4</sup>Graduate School of Engineering, Osaka University, Japan, <sup>5</sup>JASRI/SPring-8, Japan, <sup>6</sup>RIKEN Harima Institute, Japan, <sup>7</sup>Quantum Beam Science Center, Japan Atomic Energy Agency, Japan, <sup>8</sup>EMPA Materials Science and Technology, Switzerland, <sup>9</sup>Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Russia, <sup>10</sup>Vavilov State Optical Institute, Russia, <sup>11</sup>IMPMC, Université Pierre et Marie Curie, France, <sup>12</sup>LULI, École Polytechnique, France

**XOPT11-2** **Two-dimensional Coherence Measurements of FEL Radiation: the Heterodyne Speckle Approach**

**16:15**

M. Manfredda<sup>1,4</sup>, M.D. Alaimo<sup>2,4</sup>, M. Potenza<sup>4</sup>, M. Giglio<sup>4</sup>  
<sup>1</sup>Elettra, Italy, <sup>2</sup>Politecnico di Milano, Italy, <sup>4</sup>Università degli studi di Milano, Italy

**XOPT11-3** **Wavefront Sensor based diagnostic of FERMI FEL photon beam**

**16:30**

L. Raimondi<sup>1</sup>, N. Mahne<sup>1</sup>, M. Manfredda<sup>1</sup>, C. Svetina<sup>1,6</sup>, D. Cocco<sup>2</sup>, F. Capotondi<sup>1</sup>, E. Pedersoli<sup>1</sup>, M. Kiskinova<sup>1</sup>, and M. Zangrando<sup>1,3</sup>  
<sup>1</sup>Elettra-Sincrotrone Trieste ScpA, Italy, <sup>2</sup>SLAC National Accelerator Laboratory, USA, <sup>3</sup>CNR – Consiglio Nazionale delle Ricerche Istituto Officina dei Materiali, Italy, <sup>6</sup>University of Trieste, Italy

**XOPT11-4** **Capturing ultrafast X-ray damage processes using an X-ray–X-ray pump–probe scheme**

**16:45**

I. Inoue<sup>1</sup>, Y. Inubushi<sup>1,2</sup>, K. Tono<sup>1,2</sup>, T. Hara<sup>1</sup>, and M. Yabashi<sup>1,2</sup>

<sup>1</sup>RIKEN SPring-8 Center, Japan, <sup>2</sup>JASRI, Japan

**XOPT11-5** **First result of PSI/SACLA collaborative campaign on temporal diagnostics**

**17:00**

P. N. Juranić<sup>1</sup>, G. Ishkhan<sup>1,2</sup>, C. Erny<sup>1</sup>, R. Ischebeck<sup>1</sup>, L. Patthey<sup>1</sup>, C. Pradervand<sup>1</sup>, C. Milne<sup>1</sup>, H. Lemke<sup>1</sup>, A. Dax<sup>1</sup>, C. Hauri<sup>1,2</sup>, S. Owada<sup>3</sup>, T. Togashi<sup>3</sup>, T. Katayama<sup>3</sup>, and Makina Yabashi<sup>3</sup>

<sup>1</sup>Paul Scherrer Institut, Switzerland, <sup>2</sup>Ecole Polytechnique Federale de Lausanne, Switzerland, <sup>3</sup>RIKEN SPring-8 Center, Japan

**17:15-17:20 Closing**

Room 313+314

**XOPT Closing Remarks**

**17:15**

T. Ishikawa

RIKEN SPring-8 Center