

# International Symposium on Physics and Applications of Laser Dynamics 2014

## Objective and Scope

The Symposium provides an opportunity to learn advances in physics and applications of laser dynamics through invited talks by renowned scholars and through contributed presentations, both oral and poster, by active researchers. Meanwhile, the Symposium creates an environment for extensive discussion and potential collaboration with researchers worldwide.

Two areas of laser dynamics are covered in the Symposium:

**Ultrafast Laser Dynamics**, the topics of which include but are not limited to

- (1) Physics and engineering of ultra-short and/or high-energy pulsed lasers
- (2) Generation, shaping, and processing of ultra-short and/or high-energy laser pulses
- (3) Detection and characterization of ultra-short and/or high-energy laser pulses
- (4) Applications of ultra-short and/or high-energy laser pulses

**Nonlinear Laser Dynamics**, the topics of which include but are not limited to

- (1) Physics and engineering of nonlinear laser dynamics, including stability, bistability, periodic and aperiodic dynamics, and chaos
- (2) Generation, measurement, shaping, and processing of diverse waveforms based on nonlinear laser dynamics
- (3) Characterization, control, and synchronization of nonlinear laser dynamics
- (4) Applications of nonlinear laser dynamics and their waveforms

## Time and Location

The Symposium will be held at the National Chiao Tung University, Hsinchu, Taiwan in the Science Building III (Department of Electrophysics) International Conference Hall (B1) from September 2 to September 5, 2014.

## Organizing Committee

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Kuan-Wei Su (National Chiao Tung University, Taiwan)

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## Main Sponsors:

Ministry of Science and Technology of Taiwan

The Optical Society of America

Department of Electrophysics of National Chiao Tung University

## Symposium Contacts

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International Symposium on Physics  
and Applications of Laser Dynamics

# IS-PALD 2014 - Program

September 2, 2014 (Tuesday)		
11:00 – 13:25	Symposium Registration	
13:25 – 13:30	Opening Remarks of Tutorial Course	
13:30 – 15:20	Invited Tutorial Course 1: <b>Philippe Gallion</b> Fundamental noise mechanisms in semiconductor oscillators and amplifiers	
15:20 – 15:40	Coffee Break	
15:40 – 16:10	Tutorial Course 2 : Spatial and temporal dynamics in VCSELs & crystalline lasers	Talk 2-1: <b>Yan-Ting Yu</b>
16:10 – 16:40		Talk 2-2: <b>Yu-Chieh Lin</b>
16:40 – 16:50		Coffee Break
16:50 – 17:20		Talk 2-3: <b>Yu-Jen Huang</b>
17:20 – 17:40	Contributed Talk: <b>Weidong Chen</b> Manipulation of polarized azimuths in a diode-pumped YAG/Tm:YAG/YAG bulk laser	

Physics of Laser Dynamics

September 3, 2014 (Wednesday)			
08:00 – 08:45		Symposium Registration	
08:45 – 09:00		Symposium Opening Remarks	
Frequency Combs & Ultrafast Light Source	09:00 – 09:50	Session Chair: <b>Yin-Chieh Lai</b>	Plenary Talk: <b>Steven Cundiff</b> Quantum limits to femtosecond frequency combs
	09:50 – 10:20		Invited Talk: <b>Pavlos Lagoudakis</b> Single mode, single exciton lasing from colloidal quantum dots
	10:20 – 10:50		Coffee Break
	10:50 – 11:20	Session Chair: <b>Chih-Wei Luo</b>	Invited Talk: <b>Guoqing Chang</b> 3 GHz, ultrafast Yb-fiber laser sources: filling spectral gap
	11:20 – 11:50		Invited Talk: <b>Ming-Chang Chen</b> Bright Isolated Attosecond Soft X-Ray Pulses
	11:50 – 12:20		Invited Talk: <b>Wang-Yau Cheng</b> Comb laser based high-resolution atomic spectrum and a compact dual-Ti:sapphire comb system
	12:20 -- 13:40		Lunch
Nonlinear Dynamics	13:40 – 14:10	Session Chair: <b>Fan-Yi Lin</b>	Invited Talk: <b>Dimitris Syvridis</b> Lasers operating in the Chaotic Regime
	14:10 – 14:30		Contributed Talk: <b>Kun-Lin Hsieh</b> Stable Locking Dynamics of Semiconductor Lasers for Microwave Amplification
	14:30 – 14:50		Contributed Talk: <b>Yu-Han Hung</b> Multiplication of Microwave Frequency Utilizing Period-One Dynamics of Optically Injected Semiconductor Lasers
14:50 -- 15:10		Coffee Break	
Ultrafast Nonlinear Optics	15:10 – 15:40	Session Chair: <b>Kung-Hsuan Lin</b>	Invited Talk: <b>Takayoshi Kobayashi</b> Stable Sub-10 Femtosecond Deep Ultraviolet Laser Source for Ultrafast Spectroscopy
	15:40 – 16:10		Invited Talk: <b>Sunao KURIMURA</b> Designable nonlinear optical devices for ultrashort laser pulses
	16:10 – 16:40		Invited Talk: <b>Xingyu Zhang</b> Terahertz parametric sources based on some new crystals
16:40 – 17:00		Coffee Break (1F)	
17:00 – 17:30		Poster Session – students award competition (1F)	
17:40 – 19:00		Welcome Reception (1F)      Poster Session (1F)	

September 4, 2014 (Thursday)

08:00 – 08:30

Symposium Registration

Phys. & Appl. of Spatial Laser Dynamics

08:30 –  
09:20

Session Chair:  
**Wen-Feng  
Hsieh**

Plenary Talk: **Takashige Omatsu**  
[Vortex Laser Technologies toward Chiral Materials Science](#)

09:20 –  
09:50

Invited Talk: **Enrique J Galvez**  
[Space-Variant Polarization Modes of Light Beams](#)

09:50 – 10:10

Coffee Break

10:10 –  
10:40

Session Chair:  
**Kuan-Wei Su**

Invited Talk: **Ting-Hua Lu**  
[Generation of Superposed Laguerre-Gaussian Beams from a Hemi-cylindrical Cavity](#)

10:40 –  
11:10

Invited Talk: **Ray-Kuang Lee**  
[Lasing on Tamm states in Vertical Cavity Surface Emission Lasers](#)

11:25 – 12:05

Transportation

Science of Life & Culture

12:20 – 19:40

Lunch in Green World  
Mua Chee & Ground Tea DIY

Tours of Green World  
and Hakka Culture

Free time in Green World

Beipu Old Street

Dinner

19:40 – 20:00

Transportation (back to NCTU)

September 5, 2014 (Friday)		
08:00 – 08:30		Symposium Registration
Novel Semiconductor Lasers	08:30 – 09:00	Invited Talk: <b>Takunori Taira</b> VCSEL-pumped Giant-pulse Microchip Lasers
	09:00 – 09:30	Invited Talk: <b>Jin-Wei Shi</b> High-Speed and Low-Power Consumption 850 nm Vertical-Cavity Surface-Emitting Lasers for Optical Interconnect
	09:30 – 10:00	Invited Talk: <b>Hao-chung Kuo</b> Room temperature lasing characteristics in metal-coated GaN spiral and grating structures
	10:00 – 10:30	Invited Talk: <b>Martin D Charlton</b> Compact, low cost, ultrafast Lasers and optical sensors based on Tantalum Pentoxide
10:30 – 11:00		Coffee Break
Dynamics of Semiconductor Laser	11:00 – 11:30	Invited Talk: <b>Sheng-Kwang Hwang</b> Nonlinear Dynamics of Semiconductor Lasers for Photonic Microwave Applications
	11:30 – 11:50	Contributed Talk: <b>Louise Jumpertz</b> Regimes of Feedback Effects in Mid-Infrared Distributed Feedback Quantum Cascade Lasers
	11:50 – 12:10	Contributed Talk: <b>J.-M. Sarraute</b> Bandwidth Enhancement in Optically-Injected Quantum Dot Gain Lever Semiconductor Lasers
12:10 – 13:20		Lunch
Ultrafast Fiber Lasers	13:20 – 13:50	Invited Talk: <b>Daniele Brida</b> Ultrabroadband Fiber Laser Technology
	13:50 – 14:20	Invited Talk: <b>Deyuan Shen</b> Above 100-nJ solitons from a passively mode-locked thulium-doped fiber oscillator
	14:20 – 14:50	Invited Talk: <b>Jungwon Kim</b> Progress in ultralow timing jitter mode-locked fiber lasers
14:50 – 14:55		Announcement of IS-PALD 2015 in France
14:55 – 15:05		Closing Remarks

## List of invited speakers

Name	Classification	Affiliation
Steven Cundiff	Plenary Talk	NIST, USA / Univ. of Colorado, USA
Takashige Omatsu	2	Chiba Univ., Japan
Philippe Gallion	Tutorial Course	Telecom ParisTech, France
Daniele Brida	Invited Talk	Univ. of Konstanz, Germany
Guo-Qing Chang.	2	MIT, USA / DESY, Germany
Martin D Charlton	3	Univ. of Southampton, UK
Ming-Chang Chen	4	National Tsing Hua University, Taiwan
Wang-Yau Cheng	5	National Central University, Taiwan
Enrique J. Galvez	6	Colgate Univ., USA
Sheng-Kwang Hwang	7	National Cheng Kung University, Taiwan
Jungwon Kim	8	KAIST, South Korea
Takayoshi Kobayashi	9	NCTU, Taiwan / UEC, Japan
Hao-chung Kuo	10	National Chiao Tung University, Taiwan
Sunao KURIMURA	11	NIMS, Japan / Waseda Univ., Japan
Pavlos Lagoudakis	12	Univ. of Southampton, UK
Ray-Kuang Lee	13	National Tsing Hua University, Taiwan
Ting-Hua Lu	14	National Taiwan Normal U., Taiwan
De-Yuan Shen	15	Fudan Univ. / Jiangsu Normal Univ., China
Jin-Wei Shi	16	National Central University, Taiwan
Dimitris Syvridis	17	Univ. of Athens, Greece
Takunori Taira	18	IMS, Japan /NINS, Japan
Xing-Yu Zhang	19	Shandong Univ., China



## List of contributed speakers

Name	Classification	Affiliation
Weidong Chen, Haifeng Lin, Yanying Li, Ge Zhang	Contributed Talk	Fujian Institute of research on the Structure of Matter, Chinese Academy of Sciences, China
Kun-Lin Hsieh, Sheng-Kwang Hwang	2	National Cheng Kung University, Taiwan
Yu-Han Hung, Sheng-Kwang Hwang	3	National Cheng Kung University, Taiwan
Louise Jumpertz, Mathieu Carras, Kevin Schires, Frédéric Grillot	4	Telecom ParisTech / Alcatel Thales III-V Lab, Campus de Polytechnique, France
J.-M. Sarraute, K. Schires and, F. Grillot	5	Telecom ParisTech, France
Yen-Ting Yu	Tutorial Course	National Chiao Tung University, Taiwan
Yu-Chieh Lin	2	National Chiao Tung University, Taiwan
Yu-Jen Huang	3	National Chiao Tung University, Taiwan

## List of session chairs

Name	Session	Affiliation
Yin-Chieh Lai	Sep.3-1	Photonics, NCTU, Taiwan
Chih-Wei Luo	Sep.3-2	Electrophysics, NCTU, Taiwan
Fan-Yi Lin	Sep.3-3	Photonics, NTHU, Taiwan
Kung-Hsuan Lin	Sep.3-4	Physics, Academia Sinica, Taiwan
Wen-Feng Hsieh	Sep.4-1	Photonics, NCTU, Taiwan
Kuan-Wei Su	Sep.4-2	Electrophysics, NCTU, Taiwan
Kai-Feng Huang	Sep.5-1	Electrophysics, NCTU, Taiwan
Wen-Hao Chang	Sep.5-2	Electrophysics, NCTU, Taiwan
Nan-Kuang Chen	Sep.5-3	Electro-Optical Engineering, NUU, Taiwan

## List of Posters

**P1 - Frequency comb expansion in a monolithic self-mode-locked laser concurrent with stimulated Raman scattering**

*Chen-Yeh Lee, Chuan-Ching Chang, Hsing-Chih Liang, and Yung-Fu Chen*

**P2 - Nondiffracting Superlattice Beams**

*Chia-Han Tsou, Pi-Hui Tuan, Tai-Wei Wu, Jung-Chen Tung, Hsing-Chih Liang, and Yung-Fu Chen*

**P3 - Generation of the flower-type mode using the spatial light modulator**

*J. G. Wang, Y. W. Tsai, and T. H. Lu*

**P4 - Tsurupica spiral phase plate for terahertz vortex generation**

*Katsuhiko Miyamoto, Koji Suizu, Takuya Akiba, and Takashige Omatsu*

**P5 - Generation of harmonically self-mode-locked Nd:YVO<sub>4</sub> 1.34 $\mu$ m laser with a coupled cavity**

*T. W. Wu, C. H. Tsou, C.Y. Tang, H. C. Liang, and Y. F. Chen*

**P6 - Room temperature lasing characteristics in metal-coated GaN spiral and grating structures**

*Wei-Chun Liao, Shu-Wei Liao, Kuo-Ju Chen, Min-Hsiung Shih, Tsung-Sheng Kao, Tien-Chang Lu, and Hao-Chung Kuo*

**P7 - Fiber pumped dual Ti:sapphire comb lasers and a hand-sized optical frequency reference**

*Tze-Wei Liu, Chien-Ming Wu, Po-Cheng Chang, and Wang-Yau Cheng*

**P8 - Tunable, pulsed multiline intracavity optical parametric oscillator using two-dimensional MgO:PP-APPLN**

*W. K. Chang, H. P. Chung, B. Z. Liu, C. H. Tseng, J. W. Chang, and Y. H. Chen*

**P9 - Wavelength Variation Reduction Characteristics of a Narrow-Linewidth PM Brillouin Fiber Laser**

*Yi-Ping Wang, Cheng-Jhih Luo, and Yinchieh Lai*

**P10 - All-Fiber All-Normal-Dispersion P-APM Mode-locked Yb-doped Fiber Laser**

*Yen-Hsu Chou, Shang-Ying Wu, and Yinchieh Lai*

**P11 - 30 fs Ultrashort Pulse Generation at 400 nm by Self-Phase Modulation**

*Ying-Kuan Ko, Atsushi Yabushita, Chih-Wei Luo, Takayoshi Kobayashi, Chih-Chang Hung, and Chih-Hsien Kao*

**P12 - Laser pulse shortening from spectrally filtered optical parametric generation**

*Yu-Chung Chiu, Yen-Chieh Huang, and Chia-Hsiang Chen*