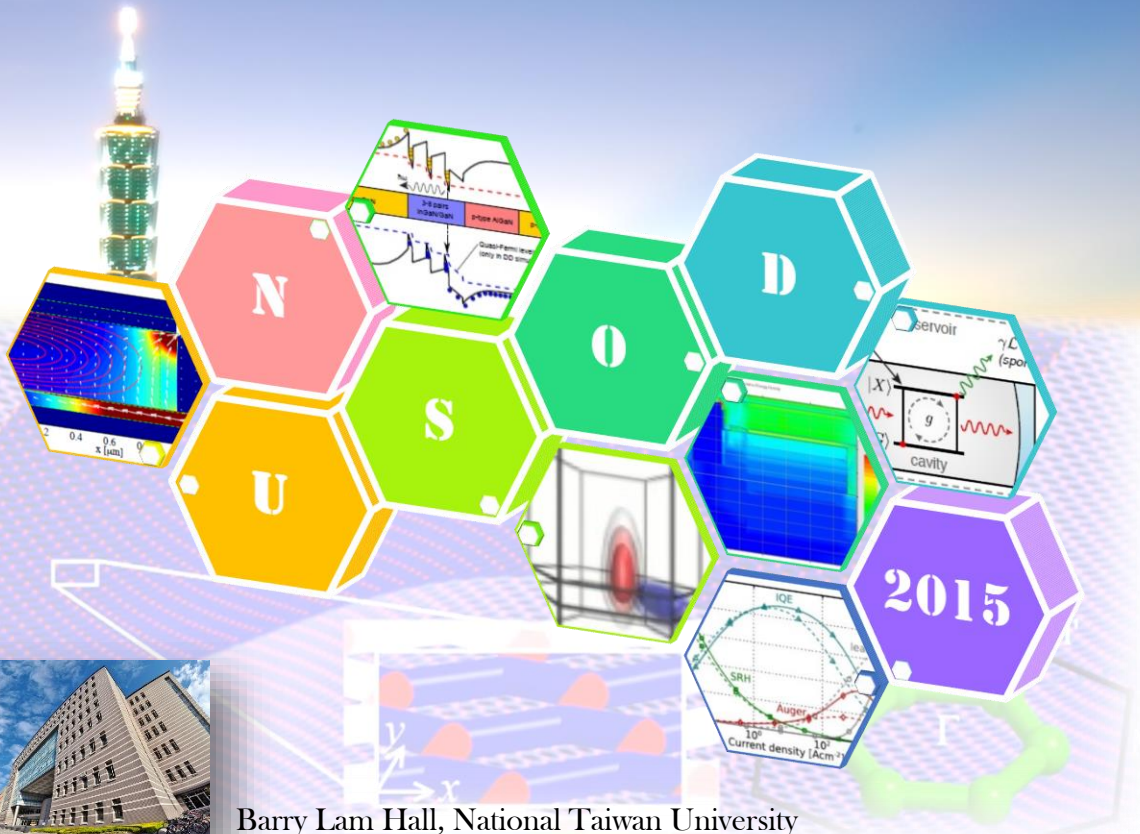


NUSOD 2015

Brochure of the 15th International Conference on Numerical Simulation of Optoelectronic Devices

September 7-11, 2015 | Taipei



Barry Lam Hall, National Taiwan University

NUSOD
Institute



<http://www.nusod.org/2015/>

Welcome to NUSOD 2015 !

The 15th International NUSOD Conference welcomes researchers from four continents who present more than 90 papers, including 8 invited talks. The conference sessions cover a wide range of topics, such as nanostructures, light-emitting diodes, laser diodes, photodetectors, solar cells, and others.

The NUSOD Conference was started at the University of California at Santa Barbara in 2001 and the participation was far beyond expectations – which provided the motivation to make this meeting an annual event, rotating between North America, Europe, and Asia. Subsequent NUSOD Conferences took place in Zurich, Tokyo, Berlin, Singapore, Newark, Nottingham, Gwangju, Atlanta, Rome, Shanghai, Vancouver, and Palma de Mallorca, and they keep underscoring the continuing need for exchange and collaboration in this diverse field. NUSOD is now firmly established as one of the key conference fixtures in optoelectronics to network and discuss the latest challenges and developments in device simulation and design.

The NUSOD Institute was established in 2004 to serve as organizational umbrella of the NUSOD Conference and to provide related educational and technical services. Its web site (www.nusod.org) also offers a growing directory of software tools. Researchers and software developers are encouraged to list their tools and to make them available to other users.

We wish you a stimulating and enjoyable experience at NUSOD 2015 !



Yuh-Renn Wu
Co-Chair



Joachim Piprek
Co-Chair

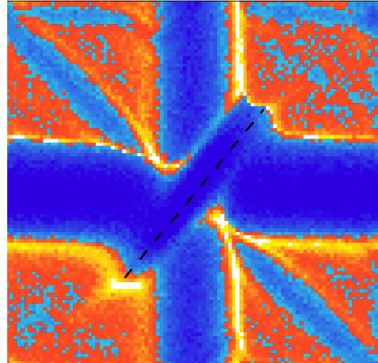


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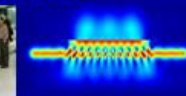
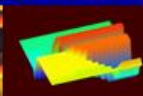
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Sponsors

Connecting Theory and Application of Optoelectronic Devices

NUSOD



NUSOD 2015

15th International Conference on Numerical Simulation of Optoelectronic Devices

Date: September 7-11, 2015

Place: Barry Lam Hall, National Taiwan University, Taipei, Taiwan

Scope and Topics:

The NUSOD conference intends to connect theory and practice in optoelectronics. Papers are solicited on the modeling, simulation, and analysis of optoelectronic devices including materials, fabrication, and application. Academic researchers, device engineers, and software developers are invited to discuss the advancement and the practical use of numerical methods in photonics and electronics.

Devices of interest include:

- Semiconductor lasers
- Light emitting diodes
- Optical modulators
- Optical amplifiers
- Photodetectors
- Solar Cells
- Photonic Devices and Circuits
- Optoelectronic Integrated Circuits

Topics of interest include but are not limited to

- Novel materials, devices, and simulation tools
- Design and optimization of optoelectronic devices
- Analysis of device performance and internal processes
- Electron-photon interaction and plasmonics
- Physics and theory of nanostructures
- Polariton lasing in microcavities
- Photonic crystal structures and devices
- Material properties incl. metamaterials
- Organic materials and devices
- Fabrication process theory and simulation
- Packaging and integration issues
- Photonic integrated circuits and systems
- Terahertz photonics
- Noise modeling and simulation
- Ultrafast effects and dynamical phenomena
- High-speed devices and photonic links
- Coupling of electronic, optical, and thermal simulations
- Mathematical models and numerical methods
- Calibration and validation of models and material parameters

Chairs

Yuh-Renn Wu, National Taiwan University, Taiwan

Joachim Piprek, NUSOD Institute, United States

Program Committee

Urs Aeberhard, Research Center Juelich, Germany

Matthias Auf der Maur, University of Rome "Tor Vergata", Italy

Eugene Avrutin, University of York, UK

Uwe Bandelow, Weierstrass Institute, Germany

Prasanta Basu, University of Calcutta, India

Enrico Bellotti, Boston University, USA

Lukas Chrostowski, University of British Columbia, Canada

Weng W. Chow, Sandia National Labs, USA

Silvano Donati, University of Pavia, Italy

Aleksandra Djuricic, University of Hong Kong, China

Weida Hu, Shanghai Institute of Technical Physics, China

Julien Javaloyes, Balearic Islands University, Spain

Boris Kuhlmeier, University of Sydney, Australia

Tsong-Sheng Lay, National Chung Hsing University, Taiwan

Max Migliorato, University of Manchester, UK

Wei-Choon Ng, Synopsys, USA

Seoung-Hwan Park, Catholic University of Daegu, Korea

Mauro Pereira, Sheffield Hallam University, UK

Christopher Poulton, University of Technology Sydney, Australia

Han-Youl Ryu, Inha University, Korea

Angela Thränhardt, University of Chemnitz, Germany

Stanko Tomic, University of Salford, UK

Shyh-Lin Tsao, Cherry Tree Consulting Co., Taiwan

Eoin O'Reilly, Tyndall National Institute, Ireland

Jayanta Sarma, University of Bath, UK

Michael Steel, Macquarie University, Australia

Slawek Sujecki, University of Nottingham, UK

Mohamed Swillam, American University in Cairo, Egypt

Hans Wenzel, Ferdinand-Braun Institute, Germany

Morten Willatzen, Technical University of Denmark

Kaikai Xu, University of Electronic Science and Technology, China

Siu-Fung Yu, Hong Kong Polytechnic University, China

Steering Committee

Aldo Di Carlo, University of Rome "Tor Vergata", Italy

Martijn de Sterke, University of Sydney, Australia

Eric Larkins, University of Nottingham, UK

Simon Li, Crosslight Software, Canada

Wei Lu, Shanghai Institute of Technical Physics, China

Joachim Piprek, NUSOD Institute, USA

Berthold Schmidt, Trumpf Laser Systems, Switzerland

Bernd Witzigmann, University of Kassel, Germany

Invited Talks

- MA1** **Simulation Study on Surface Plasmon Coupled Light-emitting Diode;**
Yang Kuo, Wen-Yen Chang, Chu-An Huang, Yean-Woei Kiang, and Chih-Chung (C. C.) Yang ; National Taiwan University
- TuA1** **Heterogeneous III-V/Si Photonic Integration: Configuration and Optical Coupling ;** *Qian Wang, Jing Pu, Doris Ng, Chee Wei Lee, Vivek Krishnamurthy, Ter Hoe Loh, Kim Peng Lim, Min Ren* ; Data Storage Institute, Agency for Science, Technology and Research , Singapore
- TuB1** **Impact of random composition fluctuations on electron and hole states in InAlN and InGaN alloys and heterostructures ;** *E.P. O'Reilly (1), S. Schulz (1), D. Tanner (2), C. Coughlan (1), M.A. Caro (2)* ; (1) Tyndall National Institute, Ireland ; (2) Aalto University, Finland
- TuC1** **High-level dynamics in semiconductor lasers: regimes and applications;**
Sheng-Kwang Hwang (1), Yu-Han Hung (1), Kai-Hung Lo (1), and Silvano Donati (2) ; (1) National Cheng Kung University, Taiwan; (2) University of Pavia, Italy
- WA1** **Numerical Analysis of Nano-scale Solar Cells with Surface States ;**
Chien-chung Lin, Shih-Li Lin, Hung-Ruei Tseng, Shun-Chieh Hsu, Yin-Han Chen, Po-Ching Wu, Yun-han Jheng ; National Chiao Tung University, Taiwan
- WB1** **Reflective Plasmonic Metasurface and Metahologram ;**
Yao-Wei Huang (1), Wei Ting Chen (1), Kuang-Yu Yang (2), Wei-Yi Tsai (1), Pin Chieh Wu (1), I-Da Chiang (1), Chun Yen Liao (1), Wei-Lun Hsu (1), Hao Tsun Lin (1), Shulin Sun (3), Lei Zhou (4), Ai Qun Liu (5), Chih-Ming Wang (6), Greg Sun (7), and Din Ping Tsai (1) (2) ; (1) National Taiwan University; (2) Academia Sinica, Taiwan; (3,4) Fudan University, China; (5) Nanyang Technological University, Singapore; (6) National Dong Hwa University, Taiwan; (7) University of Massachusetts Boston, USA
- ThA1** **Reduced basis methods for optimization of nano-photonic devices ;**
S. Burger (1,2), M. Hammerschmidt (1), S. Herrmann (1), J. Pomplun (2), F. Schmidt (1,2) ; (1) Zuse Institute Berlin; (2) JCMwave GmbH, Germany
- ThB1** **Perfect absorption in uniform and nanostructured media ;**
C. Martijn de Sterke (1), Björn C.P. Sturmberg (1), Lindsay C. Botten (2,3), Christopher G. Poulton (3), Kokou B. Dossou (3), Ross C. McPhedran (1) ; (1) University of Sydney; (2) Australian National University; (3) University of Technology Sydney; Australia

Program

Date	Time	Session	Topic	Place
Monday, Sept. 7	13:00-15:00	MA	Light-Emitting Diodes I (<i>Kivisaari</i>)	BL101
	15:00~15:30		Break Time (Poster Preparation)	1F (2F)
	15:30-16:50	MB	Light-Emitting Diodes II (<i>Yang</i>)	BL101
	16:50~17:00		Group Photo Taking	Entrance
	17:00-19:00	MP	Poster Session & Welcome Reception (<i>Wu</i>)	2F
Tuesday, Sept. 8	08:50-10:00	TuA	Circuits and Systems (<i>Connelly</i>)	BL101
	10:30-12:20	TuB	Nanosstructures (<i>Lingnau</i>)	BL101
	13:30-15:00	TuC	Laser Diodes I (<i>Hong</i>)	BL101
	15:30-17:30	TuD	Laser Diodes II (<i>Hwang</i>)	BL101
	19:00-21:00	TuR	Rump Session (<i>Piprek</i>)	BL103
Wednesday, Sept. 9	08:30-10:00	WA	Solar Cells (<i>Martyniuk</i>)	BL101
	10:30-12:20	WB	Novel Devices (<i>Migliorato</i>)	BL101
	12:20-21:00	WED	Conference Excursion & Dinner	BL101
Thursday, Sept. 10	08:30-10:00	ThA	Photonics (<i>Chang</i>)	BL101
	10:30-12:00	ThB	Nano- and Fiber-Optics (<i>Hammerschmidt</i>)	BL101
	13:00-14:40	ThC	Photodetectors (<i>Hu</i>)	BL101
	15:00-16:30	ThPD	Postdeadline Session (<i>de Sterke</i>)	BL101
Friday, Sept. 11	09:00-13:00	FS1	<i>Crosslight Software Tutorial</i>	BL201

NOTE :

- The presentation time limit is:
 - 25 min for invited papers (plus 5 min discussion)
 - 15 min for regular papers (plus 5 min discussion)
 - 10 min for postdeadline papers (plus 5 min discussion)
- To avoid delays during your session, please copy your presentation file from your USB memory stick to the conference computer before your session starts and use your paper number as file name, e.g., TuA7.ppt.
- Posters must be attached to the assigned poster board during the break time
- Please show up for group photo taking.

Monday, September 7, 2015

10:00	Registration Desk opens
13:00-13:10	Welcome Address
13:10-15:00	Light-Emitting Diodes I (Session Chair: Pyry Kivisaari , Lund University, Sweden)
13:10~13:40	MA1 Simulation Study on Surface Plasmon Coupled Light-emitting Diode ; <i>Yang Kuo</i> , Wen-Yen Chang, Chu-An Huang, Yean-Woei Kiang, and <i>Chih-Chung (C. C.) Yang</i> ; National Taiwan University (invited)
13:40~14:00	MA2 Effect of Doping and Impurities on the Efficiency of III-Nitride Light Emitting Diodes ; <i>F. Roemer</i> and B. Witzigmann ; University of Kassel, Germany
14:00~14:20	MA3 Investigation of Carrier Transport in Nitride Based LED by Considering the Random Alloy Fluctuation ; <i>Chen-Kuo Wu</i> , Chi-Kang Li, and <i>Yuh-Renn Wu</i> ; National Taiwan University, Taiwan
14:20~14:40	MA4 3D Finite Element Strain Analysis of V-Shaped Pits in Light Emitting Diodes ; <i>Chung-Cheng Hsu</i> (1), <i>Chen-Kuo Wu</i> (1), <i>Chi-Kang Li</i> (1), <i>Tien-Chang Lu</i> (2), and <i>Yuh-Renn Wu</i> (1) ; (1) National Taiwan University, Taiwan; (2) National Chiao-Tung University, Hsinchu, Taiwan
14:40~15:00	MA5 Enhance Infrared Light Emitting Diodes Efficiency Using Surface Plasmonic Effect and Photonic Crystals ; <i>M.Y. Li</i> , Y.L. Jing, L. Li, H. Wang, N. Li, H. L. Zhen ; Shanghai Institute of Technical Physics, China
15:00-15:30	Coffee Break
15:30-16:50	Light-Emitting Diodes II (Session Chair: Chih-Chung Yang , National Taiwan University, Taiwan)
15:30~15:50	MB1 Bipolar Monte Carlo simulation of hot carriers in III-N LEDs ; <i>Pyry Kivisaari</i> (1), <i>Toufik Sadi</i> (2), <i>Jingrui Li</i> (3), <i>Jani Oksanen</i> (3), <i>Patrick Rinke</i> (3), and <i>Jukka Tulkki</i> (3) ; (1) Lund University, Sweden; (2) University of Glasgow, UK; (3) Aalto University, Finland
15:50~16:10	MB2 Impact of Mesh-Like Top p-Electrode on Output Performance of Light-Emitting Diode: Numerical Study ; <i>Y. Nishidate</i> (1), <i>J. Kholopova</i> (2), <i>E. Polushkin</i> (2), <i>I. Khmyrova</i> (1), and <i>S. Shapoval</i> (2) ; (1) University of Aizu, Japan; (2) IMT RAS, Russia
16:10~16:30	MB3 Greatly Improved Efficiency Droop for InGaN-Based Green LEDs by Quaternary Content Superlattice EBL ; <i>D.-W. Lin</i> , <i>A.-J. Tzou</i> , <i>J.-K. Huang</i> , <i>B.-C. Lin</i> , <i>C.-Y. Chang</i> , and <i>H.-C. Kuo</i> ; National Chiao Tung University, Taiwan
16:30~16:50	MB4 Modeling for Carrier Transportation in Organic Light-emitting Diode by Considering Effective Tail States ; <i>I-Hsin Lu</i> and <i>Yuh-Renn Wu</i> ; National Taiwan University, Taiwan

17:00-19:00

Poster Session & Welcome Reception

(Session Chair: **Yuh-Renn Wu**, National Taiwan University, Taiwan)

- MP01 Opto-electrical characteristics of Si-based blocked-impurity-band detector: Experiment and simulation** ; *Xiaodong Wang* (1), Bingbing Wang (1), Liwei Hou (1), Wei Xie (1), Xiaoyao Chen (2), and Ming Pan (1) ; (1) China Electronics Technology Group Corporation, China; (2) Fudan University, China
- MP02 Electronic properties of polar and semi-polar dot-in-a-well heterostructures** ; *S. Schulz* (1) and *O. Marquardt* (2) ; (1) Tyndall National Institute, Ireland; (2) Paul-Drude-Institute, Germany
- MP03 Development of Quantum Transport Simulation Model by Considering Phonon Scattering in Nanowire Device** ; *Hung Lin*, Chi-kang Li and Yuh-Renn Wu ; National Taiwan University, Taiwan
- MP04 Injection Inhomogeneity and Lasing Threshold in III-Nitride Multi-QW Deep-UV Laser Diodes** ; *Mikhail V. Kisin*, Denis V. Mamedov, Chih-Li Chuang, and Hussein S. El-Ghoroury ; Ostendo Technologies Inc., Carlsbad, CA, USA
- MP05 Designing of p-AlGa_N super lattice structure as the p-contact and transparent layer in AlGa_N UVLEDs** ; *Xinhui Chen* and Yuh-Renn Wu ; National Taiwan University
- MP06 Plasmon coupling in vertical split-ring resonator magnetic metamolecules** ; *Mu Ku Chen*(1), Pin Chieh Wu(1), Wei-Lun Hsu(1) Wei Ting Chen(1), Yao-Wei Huang(1), Chun Yen Liao(1), Ai Qun Liu(2), Nikolay I. Zheludev(3), Greg Sun(4) and Din Ping Tsai(1,5) ; (1) National Taiwan University, Taiwan; (2) Nanyang Technological University, Singapore; (3) University of Southampton, UK; (4) University of Massachusetts Boston, USA; (5) Academia Sinica, Taiwan
- MP07 Effect of V-shaped pit density on quantum efficiency of blue InGa_N/Ga_N multiple-quantum well light-emitting diodes: Simulation** ; *Z. J. Quan*, J. L. Liu, F. Fang, and F. Y. Jiang ; Nanchang University, China
- MP08 The Design of Asymmetrical TIR Optics with Micro-Structure for Museum Exhibition Lighting** ; *Ke-Fang Hsu*, *Mei-Wen Chen*, Chih-Wei Lin, Jung-Min Hwang and Li-Ling Lee ; Industrial Technology Research Institute (ITRI), Taiwan
- MP09 Theoretical modeling of subwavelength structure integrated LEDs for enhanced extraction efficiency and uniform field distribution** ; *G. J. Lee*, *J. H. Lee*, and *Y. M. Song* ; Pusan National University, Republic of Korea.
- MP10 Light enhancement by Metal-Insulator-Metal Plasmonic Focusing Cavity** ; *J. Wen* (1,2) , *W. J. Wang* (1,3), *N. Li* (1), *Z.F. Li* (1), *W. Lu* (1) ; (1) Shanghai Institute of Technical Physics, China; (2) University of Chinese Academy of Sciences, China; (3) University of Science and Technology of China
- MP11 Reflective Semiconductor Optical Amplifier Electrode Voltage based Phase Shifter Model** ; *M.J. Connelly* ; University of Limerick, Ireland
- MP13 Pumping of 7-Core Erbium-Doped Double-Clad Fiber Amplifier Based on Higher-Order Mode Coupling** ; *Ryoichiro Nakamura* (1), *Tatsuya Koike* (1), *Moriya Nakamura* (1), *Werner Klaus* (2), *Yoshinari Awaji* (2), and *Naoya Wada* (2) ; (1) Meiji Univ., Japan; (2) National Institute of Information and Communications Technology, Japan
- MP14 Infrared tunable dual-band polarization filter based on compound asymmetrical cross-shaped resonator** ; *B. Ni* (1), *X. Y. Chen* (2), *B. Chen* (2), *D. B. Zhang* (3), *X. D. Wang*(4), *H. Liu* (1), *G. H. Hua* (1) and *H. Zhou* (1) ; (1) Nanjing University of Information Science & Technology, China;

(2) Fujian Normal University, China; (3) Changshu Institute of Technology, China; (4) China Electronics Technology Group Corporation, China

- MP15 The Dependence of Dark Current on Temperature in Epitaxial Si:P BIB Detector** ; Bingbing Wang (1), *Xiaodong Wang* (1), Liwei Hou (1), Wei Xie (1), Xiaoyao Chen (2), and Ming Pan (1) ; (1) China Electronics Technology Group Corporation, China; (2) Fudan University, China
- MP16 Rear Located Hemispherical Silver Nanoparticles for Light Trapping in Thin Film Solar Cells** ; *Debao Zhang*, Xifeng Yang, Xuekun Hong, Yushen Liu, Jinfu Feng ; Changshu Institute of Technology, China
- MP17 Surface Plasmon Coupling in a Deep-UV Light-emitting Diode with an Embedded Al Nanoparticle** ; *Y. Kuo* (1), C. C. Yang (2), and *Y. W. Kiang* (2) ; (1) Tung Nan University, Taiwan; (2) National Taiwan University, Taiwan
- MP18 All-Optical Switch Based on the Local Nonlinear Plasmonic Mach-Zehnder Interferometer Waveguides** ; *Yaw-Dong Wu*, Chia-Ling Liu and Guan-Yu Jhan ; National Kaohsiung University of Applied Sciences, Taiwan
- MP20 Study on GaN-based light-emitting diodes with graded-thickness quantum barriers** ; Liwen Cheng (1), Daoren Gong (2), and *Weida Hu* (3) ; (1) Yangzhou University, China; (2) Yangzhou Opto-electrical Products Testing Institute, China; (3) Shanghai Institute of Technical Physics, China
- MP21 Characteristics of Plasmon Coupling Mode in SPR Based LPFG** ; *Zhengtian Gu* (1), Jinlong Lan (1), Kan Gao (2) ; (1) College of Science, Uni. of Shanghai for Sci. and Tech.; (2) No.23 Research Inst. of China Electronics Tech. Group; China
- MP22 All Optical Switch Based on Surface Plasmon Polaritons and Multimode Interference Microcavities** ; *Yaw-Dong Wu*, Jui-Hong Hsu and Show-Jun Huang ; National Kaohsiung University of Applied Sciences, Taiwan
- MP23 Processing window broadened by a barrier structure in dual-band HgCdTe IRFPAs**; Yiyu Chen, Zhenhua Ye, Peng Zhang, *Weida Hu*, C. Lin, X. N. Hu, R. J. Ding, L. He ; Shanghai Institute of Technical Physics, China
- MP24 Dependence of Cd Composition on Transient Photovoltage Characteristics in HgCdTe Photodiode** ; *Haoyang Cui*, Xiang Li, Kaiyun Pi, Zhong Tang ; Shanghai University of Electric Power, China
- MP25 Simulation of Metallic Photonic Crystal Triangular Arrays Embedded in GaN Light Emitting Diodes** ; S. Y. Hsu, C. C. *Chen*, G. M. Wu ; Chang Gung University, Taiwan
- MP27 Analysis of FDTD Cloaking in the Visible Frequency Spectrum** ; *N. Anam*, E.Zahir ; American International University, Bangladesh
- MP28 Modeling of Mach-Zehnder and Electroabsorption Modulator Pulse Generators and Extraction of the Chirp Factor** ; *M.J. Connelly*, J. Romero-Vivas, A. Meehan, L. Krzcanowicz ; University of Limerick, Ireland
- MP29 Design and Simulation of Silicon Micro-ring for Optical Mode Converter** ; Saika Muntaha Bari, Mainul Haque, Nur-E- Mohammad Rifat, M. Raquib Ehsan, and *Intekhab Alam* ; United International University, Bangladesh
- MP30 Simulation of a Resonance-shifted DFB-LD for High Efficiency Operation** ; K. Ichikawa and *T. Numai* ; Ritsumeikan University, Japan
- MP31 Design of hollow silica nanospheres for high efficiency optical devices applications** ; Y. J. Yoo, *J. H. Lee*, and Y. M. Song ; Pusan National University, Republic of Korea

- MP32 Stepless Tunable Four-Chip LED Lighting Control on the Black Body Radiation Curve with Generalized Reduced Gradient Method ;**
C. W. Lin, K. F. Hsu, C.M. Kung, S.Y. Yang, and J.M. Hwang ; Industrial Technology Research Institute (ITRI), Taiwan
- MP33 Design and Optimization of Surface Plasmon Resonance Fiber Sensor Based on Gold Square Nano-rod Array ;** Chaoying Chen, Yunhan Luo , Peiling Mao, Shuihua Peng , Jun Zhang, Jieyuan Tang, Huihui Lu, Jianhui Yu, Zhe Chen, *Yuan Wang, Heyuan Guan* ; Jinan University, China
- MP34 Simulation and design of a photonic crystal triple waveguide directional coupler switch ;** *M. Ghomashi* (1), H. Kaatuzian(1), and M. Danaie(2) ; (1) Amirkabir University of Technology, Iran;(2) Semnan University, Iran
- MP35 Injection Efficiency of DI and CTIA Readout Integrated Circuit ;** Pengyun Song, Zhenhua Ye, *Weida Hu*, Xiaoning Hu ; Shanghai Institute of Technical Physics, China
- MP36 All-Optical Decision Gate Circuits Using Cascaded Periodically Poled Lithium Niobate Devices ;** *Yutaka Fukuchi*, Daiki Minamide, and Masaru Yamamoto ; Tokyo University of Science, Japan
- MP37 Resonant Tunneling Effect of InAs Quantum Dots Grown on InAlAs/InP ;** B. Zhang, W. G. Ning, *F. M. Guo* ; East China Normal University, China
- MP38 Simulation of mode deflection and reshaping in lithium niobate planar waveguide with serrated array electrodes ;** *Yuan Wang*, Huihui LU, Jianhui Yu, Yingxin Zeng, Yunhan Luo, Jun Zhang, Jieyuan Tang, Zhe Chen ; Jinan University, China
- MP39 Output Waveform Stability Analysis Integrated with Auto-Regressive Model in Two-Section DFB Self-Sustaining-Pulsation Lasers ;** *JerShien Chen* ; Intellectual Property Office, Ministry of Economic Affairs, Taiwan
- MP40 Selecting Conversion Phosphors for White Light-Emitting Diodes Package by Generalized Reduced Gradient Method in Dispensing Application ;**
Ke-Fang Hsu, Chih-Wei Lin, Jung-Min Hwang ; Green Energy and Environment Research Laboratories, Taiwan
- MP41 Space Harmonic Distribution at Bragg Condition in Periodical Dielectric Waveguides ;** *Nai-Hsiang Sun*, Yu-Wei Liu, Min-Yu Tsai, Li-Ti Kung, Jung-Sheng Chiang ; I-Shou University, Taiwan
- MP42 Tolerance Analysis of Optical Interconnection Based on Image Motion ;** *Young-Gu Ju* ; Kyungpook National University, Korea
- MP43 Modeling of Current Dependent Microwave Behavior of a Two-Section DFB Laser ;** Yi-Chia Hwang, Yao-Zhong Dong, Shun-Chieh Hsu, *Chien-Chung Lin* ; National Chiao-Tung University, Taiwan
- MP44 Double-sided Hemispherical Pattern Design on Patterned Sapphire Substrate of GaN-based LEDs ;** Zhen Che, Jun Zhang, Xinyu Yu, Mengyuan Xie, Jianhui Yu, Huihui Lu, Yunhan Luo, Zhe Chen, *Yuan Wang* ; Jinan University, China
- MP45 Simulation of InAlAs/InGaAs/InAs Quantum Dots - Quantum Well Near-infrared Detector ;** *W. W. Wang and F. M. Guo* ; East China Normal University, China
- MP46 Three-barrier, two-well Resonant Tunneling Structure: Photoinduced Voltage Shift Behavior ;** *W. W. Wang and F. M. Guo* ; East China Normal University, China
- MPDP1 Design and Simulation of All-Polymeric Reconfigurable Optical Node ;** Anish Dhiman and *Rahul Singhal* ; Birla Institute of Technology and Science, India

Tuesday, September 8, 2015

8:00	Registration Desk opens
8:50-10:00	Circuits and Systems (Session Chair: Michael Connelly , University of Limerick, Ireland)
8:50~9:20	TuA1 Heterogeneous III-V/Si Photonic Integration: Configuration and Optical Coupling ; <i>Qian Wang</i> , Jing Pu, Doris Ng, Chee Wei Lee, Vivek Krishnamurthy, Ter Hoe Loh, Kim Peng Lim, Min Ren ; Data Storage Institute, Agency for Science, Technology and Research , Singapore (invited)
9:20~9:40	TuA3 Thermal analysis of an SOA integrated in SG-DBR laser module ; <i>X. M. Han</i> , J. W. Gao, H. Wang, <i>Y. L. Yu</i> ; Wuhan National Laboratory for Optoelectronics, China
9:40~10:00	TuA4 Numerical Analyses of All-Optical Retiming Switches Employing the Cascaded Second-Order Nonlinear Effect in Quasi-Phase Matched Lithium Niobate Devices: Effects of Device Fabrication Errors ; <i>Yutaka Fukuchi</i> , Kazuhiro Ohnaka, and Daiki Minamide ; Tokyo University of Science, Japan
10:00-10:30	Coffee Break
10:30-12:20	Nanostructures (Session Chair: Benjamin Lingnau , Technical University Berlin, Germany)
10:30~11:00	TuB1 Impact of random composition fluctuations on electron and hole states in InAlN and InGaN alloys and heterostructures ; Eoin O'Reilly (1), <i>S. Schulz</i> (1), D. Tanner (1), C. Coughlan (1), and M. A. Caro (2) ; (1) Tyndall National Institute, Ireland; (2) Aalto University, Finland ; Tyndall National Institute, Ireland (invited)
11:00~11:20	TuB2 Impact of individual dopants on the electronic properties of axial (In,Ga)N/GaN nanowire heterostructures ; <i>O. Marquardt</i> , L. Geelhaar, and O. Brandt ; Paul-Drude-Institute, Germany
11:20~11:40	TuB3 Ripples, Phonons and Bandgap in Strained Graphene ; U Monteverde, J Pal, O M Dawood, Z L Li, R J Young, H-Y Kim, M. Missous, L. Britnell, <i>MA Migliorato</i> ; University of Manchester, UK
11:40~12:00	TuB4 Diffusion-driven current transport to near-surface nanostructures ; <i>Pyry Kivisaari</i> (1), Lauri Riuttanen (2), Sami Suihkonen (2), and Jani Oksanen (2) ; (1) Lund University, Sweden; (2) Aalto University, Finland
12:00~12:20	TuB5 Fundamental properties of GaN(0001) films grown directly on Gd₂O₃(0001) platforms: ab initio structural simulations ; Kuo-Cheng Liao, <i>Po-Liang Liu</i> , Huan-Chen Wang, and Yu-Hsien Wang ; National Chung Hsing University, Taiwan
12:20-13:30	Lunch Break

13:30-15:00	Laser Diodes I (Session Chair: Kuo-Bin Hong , National Chiao-Tung University, Taiwan)
13:30~14:00	TuC1 High-level dynamics in semiconductor lasers: regimes and applications ; <i>Sheng-Kwang Hwang</i> (1), Yu-Han Hung (1), Kai-Hung Lo (1), and Silvano Donati (2) ; (1) National Cheng Kung University, Taiwan; (2) University of Pavia, Italy (invited)
14:00~14:20	TuC2 Advanced Control Schemes for Passively Mode-Locked Lasers: Coupled Lasers and Dual-Feedback Approaches ; Lina Jaurigue (1), <i>Benjamin Lingnau</i> (1), Kathy Lüdge (1,2) ; (1) Technical University Berlin, Germany; (2) Free University Berlin, Germany
14:20~14:40	TuC3 Modulation response of nanolasers: What rate equation approaches miss ; R. Aust (1), T. Kaul (1), <i>Benjamin Lingnau</i> (1), and K. Lüdge (2) ; (1) Technical University Berlin, Germany; (2) Free University Berlin, Germany
14:40~15:00	TuC4 Enhanced Modulation Bandwidth by Exploiting Photon Resonance in Push-Pull Modulated DFB lasers ; Junqiu Qi, <i>Yanping Xi</i> , Xun Li ; Wuhan National Laboratory for Optoelectronics, China
15:00-15:30	Coffee Break
15:30-17:30	Laser Diodes II (Session Chair: <i>Sheng-Kwang Hwang</i> , National Cheng Kung University, Taiwan)
15:30~15:50	TuD1 On device concepts for CMOS-compatible edge-emitters based on strained germanium ; D. Peschka (1), M. Thomas (1), A. Glitzky (1), R. Nuernberg (1), K. Gaertner (2), M. Virgilio (3), S. Guha (4), Th. Schroeder (4), G. Capellini (4), <i>Th. Koprucki</i> (1) ; (1) WIAS Berlin, Germany; (2) Università della Svizzera italiana, Switzerland; (3) Uni Pisa, Italy; (4) IHP, Germany
15:50~16:10	TuD2 Numerical Simulations of n-Type Optoelectronic Devices with Single-Band Effective Mass Hamiltonian ; <i>A. Kolek</i> ; Rzeszów University of Technology, Poland
16:10~16:30	TuD3 Simulation and analysis of 1.55 quantum dot lasers designed for ultra-narrow spectral linewidth ; <i>M. Bjelica</i> and B. Witzigmann ; University of Kassel, Germany
16:30~16:50	TuD5 Metallic subwavelength grating on GaN-based edge emitting lasers ; <i>Shen-Che Huang</i> , Kuo-Bin Hong, Heng Li, and Tien-Chang Lu ; National Chiao-Tung University, Taiwan
16:50~17:10	TuD6 Numerical Analysis on V-shape Gratings for III-V/Silicon Hybrid Lasers ; Jen-Hung Huang, Bai-Ci Chen, Yu-Chang Wu, and <i>Chien-Chung Lin</i> ; National Chiao Tung University, Taiwan
17:10~17:30	TuD7 Greatly Improved Carrier Injection in GaN-based VCSEL by Multiple Quantum Barrier Electron Blocking Layer ; <i>Dan-Hua Hsieh</i> , An-Jye Tzou, Da-Wei Lin, Tsung-Sheng Kao, Chien-Chung Lin, Chun-Yen Chang and Hao-Chung Kuo ; National Chiao Tung University, Taiwan

Wednesday, September 9, 2015

8:00	Registration Desk opens
8:30-10:00	Solar Cells (Session Chair: Piotr Martyniuk , Military University of Technology, Poland)
8:30~9:00	WA1 Numerical Analysis of Nano-scale Solar Cells with Surface States ; <i>Chien-Chung Lin</i> , Shih-Li Lin, Hung-Ruei Tseng, Shun-Chieh Hsu, Yin-Han Chen, Po-Ching Wu, Yun-han Jheng ; National Chiao Tung University, Taiwan (invited)
9:00~9:20	WA2 Optimization of All-Back-Contact GaAs Solar Cells ; <i>Kuan-Ying Ho</i> (1), Chung-Yu Hong (2,3), Peichen Yu (2) and Yuh-Renn Wu (1) ; (1) National Taiwan University, (2) National Chiao-Tung University, (3) Arima Photovoltaic & Optical Corp. Taiwan
9:20~9:40	WA3 Antireflection of Nano-sized SiO Sphere Arrays on Crystalline Silicon Solar Cells ; <i>C.-T. Lu</i> (1) and C. W. Liu (1,2) ; (1) National Taiwan University; (2) National Nano Device Laboratories, Taiwan
9:40~10:00	WA4 Simulation of the Optimized Performance of Thin-Film Silicon Solar Cell with Nano-holes Surface Structures ; Chia-Min Chang, Wen-Jeng Ho, <i>Yu-Tang Shen</i> , Sheng-Kai Feng, and Wei-Chen Laio ; National Taipei University of Technology, Taiwan
10:00-10:30	Coffee Break
10:30-12:20	Novel Devices (Session Chair: Max Migliorato , University of Manchester, United Kingdom)
10:30~11:00	WB1 Reflective Plasmonic Metasurface and Metahologram ; Yao-Wei Huang (1), Wei Ting Chen (1), Kuang-Yu Yang (2), Wei-Yi Tsai (1), Pin Chieh Wu (1), I-Da Chiang (1), Chun Yen Liao (1), Wei-Lun Hsu (1), Hao Tsun Lin (1), Shulin Sun (3), Lei Zhou (4), Ai Qun Liu (5), Chih-Ming Wang (6), Greg Sun (7), and <i>Din Ping Tsai</i> (1) (2) ; (1) National Taiwan University; (2) Academia Sinica, Taiwan; (3,4) Fudan University, China; (5) Nanyang Technological University, Singapore; (6) National Dong Hwa University, Taiwan; (7) University of Massachusetts Boston, USA (invited)
11:00~11:20	WB2 Modeling and numerical simulation of electrically pumped single-photon emitters ; <i>Markus Kantner</i> , Uwe Bandelow, Thomas Koprucki, and Hans-Juergen Wuensche ; Weierstrass Institute for Applied Analysis and Stochastics, Germany
11:20~11:40	WB3 Aharonov-Bohm Magneto-Optical Spectroscopy and Photoluminescence of Spinor Excitons in Semiconductor Nano Rings ; <i>Han-Hsun Chiang</i> , Wen-Hsuan Kuan and Kuei-Huei Lin ; University of Taipei, Taiwan
11:40~12:00	WB4 Integrated Dual-Mode Waveguide Interferometer ; <i>N. Hoppe</i> (1), T. Föhn (1), M. Félix Rosa (1), W. Vogel (1), W. Sfar Zaoui (1), M. Kaschel (2), J. Butschke (2), F. Letzkus (2), and M. Berroth (1) ; (1) INT, University of Stuttgart, Germany; (2) Institute for Microelectronics Stuttgart, Germany
12:00~12:20	WB5 Design of Square Microlasers for Dual-Transverse-Mode Lasing With Tunable Wavelength Intervals ; Heng Long, <i>Yong-Zhen Huang</i> , Yue-De Yang, Jin-Long Xiao, and Yun Du ; State Key Laboratory on Integrated Optoelectronics, Institute of Semiconductors, China

12:20-21:00	Excursion & Dinner
12:20-12:30	Get on the bus
12:30~13:00	Lunch
13:00-16:00	National Palace Museum
16:30-18:00	Taipei 101
18:00-18:30	Footbridge to Restaurant
18:30-20:30	Dinner
21:00	Go Home

The National Palace Museum is an antique museum in Shilin, Taipei, Taiwan. It has a permanent collection of more than 696,000 pieces of ancient Chinese imperial artifacts and artworks, making it one of the largest in the world. The collection encompasses over 10,000 years of Chinese history from the Neolithic age to the late Qing Dynasty. Most of the collection are high quality pieces collected by China's ancient emperors.



國立故宮博物院
NATIONAL PALACE MUSEUM



Taipei 101, formerly known as the Taipei World Financial Center, is a landmark supertall skyscraper in Xinyi District, Taipei, Taiwan. The building was officially classified as the world's tallest in 2004, and remained such until 2010. In 2011, the building was awarded the LEED platinum certification, the highest award according the Leadership in Energy and Environmental Design (LEED) rating system, and became the tallest and largest green building in the world.



TAIPEI 101



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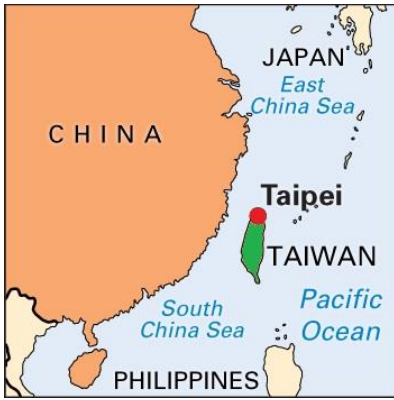
Thursday, September 10, 2015

8:00	Registration Desk opens
8:30-10:00	Photonics (Session Chair: Hung-Chun Chang , National Taiwan University, Taiwan)
8:30~9:00	ThA1 Reduced basis methods for optimization of nano-photonic devices ; S. Burger (1,2), <i>M. Hammerschmidt</i> (1), S. Herrmann (1), J. Pomplun (2), F. Schmidt (1,2) ; (1) Zuse Institute Berlin; (2) JCMwave GmbH, Germany (invited)
9:00~9:20	ThA2 Investigation of Defect Cavities Formed in Inverse Three-Dimensional Rod-Connected Diamond Photonic Crystals ; Mike P.C. Taverne, Lifeng Chen, Xu Zheng, Martin Lopez-Garcia, <i>Ying-Lung D. Ho</i> , and John G. Rarity ; University of Bristol, UK
9:20~9:40	ThA3 Performance analysis of polarization transformation waveguide structures for planar light circuits ; <i>P. Samadian</i> , D. Sun, T. J. Hall ; University of Ottawa, Canada
9:40~10:00	ThA4 An effective design method for trapezoidal pulse compression metal multilayer dielectric gratings ; <i>Heyuan Guan</i> (1), Zhe Chen (1), Yunxia Jin (2), Kui Yi (2), and Jianda Shao (2) ; (1) Jinan University, China; (2) Shanghai Institute of Optics and Fine Mechanics, China
10:00-10:30	Coffee Break
10:30-12:00	Nano- and Fiber-Optics (Session Chair: Martin Hammerschmidt , Zuse Institute Berlin, Germany)
10:30~11:00	ThB1 Perfect absorption in uniform and nanostructured media ; <i>C. Martijn de Sterke</i> (1), Björn C.P. Sturmberg (1), Lindsay C. Botten (2,3), Christopher G. Poulton (3), Kokou B. Dossou (3), Ross C. McPhedran (1) ; (1) University of Sydney; (2) Australian National University; (3) University of Technology Sydney; Australia (invited)
11:00~11:20	ThB2 Highly Sensitive Surface Plasmon Resonance Fiber Sensor Based On Triangle Gold Nano-rod Array ; Shuihua Peng , Yunhan Luo , Peiling Mao, Chaoying Chen, Jun Zhang, Jieyuan Tang, Huihui Lu, Jianhui Yu, Zhe Chen, <i>Heyuan Guan</i> ; Jinan University, China
11:20~11:40	ThB4 A Study of Signal Integrity in Multimode Fiber Links with Vortex Phase Launches ; <i>Jiajie Wu</i> ; Finisar Cooperation, USA
11:40~12:00	ThB5 Characteristics of All-Optical Retiming Switches Using Periodically Poled Lithium Niobate Waveguides: Effects of Input Timing of Data Signal ; <i>Yutaka Fukuchi</i> , Akihiro Enda, and Taku Sekine ; Tokyo University of Science, Japan
12:00-13:00	Lunch Break

13:00-14:40	Photodetectors (Session Chair: Weida Hu , Shanghai Institute of Technical Physics, China)
13:00~13:20	ThC1 3D Modeling of CMOS Image: Comparison between Front- and Back-illumination ; Y. G. Xiao, <i>K. Uehara</i> , S. Gao, Y. Fu, M. Lestrade, Z.Q. Li, Y.J. Zhou, and Z.M. Simon Li ; Crosslight Software, Canada
13:20~13:40	ThC2 Measured and 3D modelled quantum efficiency of an oxide-charge induced junction photodiode at room temperature ; <i>C.K. Tang</i> (1), J. Gran (1), I. Muller (2), U. Linke (2) and L. Werner (2) ; (1) Justervesenet, Norway; (2) Physikalisch-Technische Bundesanstalt, Germany
13:40~14:00	ThC3 nBn HgCdTe infrared detector with HgTe/CdTe SLs barrier ; Jalal Benyaya, <i>P. Martyniuk</i> , M. Kopytko, J. Antoszewski, W. Gawron, P. Madejczyk ; Military University of Technology, Poland
14:00~14:20	ThC4 Boundary conditions in characterizing InxGa1-xAs /GaAs quantum well infrared photodetector ; X .Tong, N. Lan, X. Q. Lu, <i>D. Y. Xiong</i> ; East China Normal University, China
14:20~14:40	ThC5 Photoresponse Characteristics from Computationally Efficient Dynamic Model of Uni-traveling Carrier Photodiode ; <i>S. Khanra</i> and A. D. Barman ; Calcutta University, India
14:40-15:00	Coffee Break
15:00-16:30	Post-Deadline Session (Session Chair: Martijn de Sterke , University of Sydney, Australia)
15:00~15:15	ThPD1 How to Identify the Primary Cause of the GaN-LED Efficiency Droop ; <i>Joachim Piprek</i> ; NUSOD Institute, US
15:15~15:30	ThPD2 On the Leaky Modes for Silver Nanowires on a Silica Substrate ; Hsiang-Peng Chen, Hsuan-Hao Liu, and <i>Hung-Chun Chang</i> ; National Taiwan University, Taiwan
15:30~15:45	ThPD3 Design and Simulation of Two Dimensional Hole Array for Surface Plasmon Enhancement of InAsSb Based Infrared Photodetectors ; Shupeng Qiu, Landobasa Y. M. Tobing, Yiyang Xie, Zhengji Xu, Jinchao Tong, Peinan Ni, <i>Dao-Hua Zhang</i> ; Nanyang Technological University, Singapore
15:45~16:00	ThPD4 Theoretical Estimation of Optical Gain in Tin-incorporated Group IV Transistor Laser ; <i>Mukul K Das</i> , Ravi Ranjan ; Indian School of Mines, India
16:00~16:15	ThPD5 Theoretical Analysis of Direct Transition in SiGeSn/GeSn Strain Balanced QWIP ; <i>Mukul K Das</i> , Prakash Pareek ; Indian School of Mines, India
	<i>(Post-deadline papers are only listed after the presenter has registered.)</i>

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Taipei is the political, economic, educational, and cultural center of Taiwan, and one of the major hubs of the Chinese-speaking world. Considered to be a global city, Taipei is part of a major high-tech industrial area. Railways, high-speed rail, highways, airports, and bus lines connect Taipei with all parts of the island. The city is served by two airports – Taipei Songshan and Taiwan Taoyuan. Taipei is home to various world-famous architectural or cultural landmarks which include Taipei 101, Chiang Kai-shek Memorial Hall, Dalongdong Baoan Temple, Hsing Tian Kong, Mengjia Longshan Temple, National Palace Museum, Presidential Office Building, Ximending, and several Night markets dispersing over the city. Its natural features such as Maokong, Yangmingshan, and hot springs are also well known to international visitors.



國立臺灣大學
National Taiwan University

National Taiwan University (NTU) is a national co-educational research university located in Taipei,

Taiwan. Its main campus is located in Taipei's Da'an District. In addition, the university has 6 other campuses in Taipei and elsewhere. The University consists of 11 colleges, 54 departments, 103 graduate institutes and 4 research centers.

The university was founded in 1928 by the Japanese administration during the Japanese colonial era and was then known as the Taihoku (Taipei) Imperial University. After World War II, the government of the Republic of China resumed the administration of Taihoku University and reorganized and renamed it National Taiwan University on November 15, 1945. NTU is often considered to be one of the most prestigious universities in Taiwan. It also has strong ties with the Academia Sinica in Taiwan in the form of research and teaching collaborations and a joint program office.



Conference Venue - Barry Lam Hall

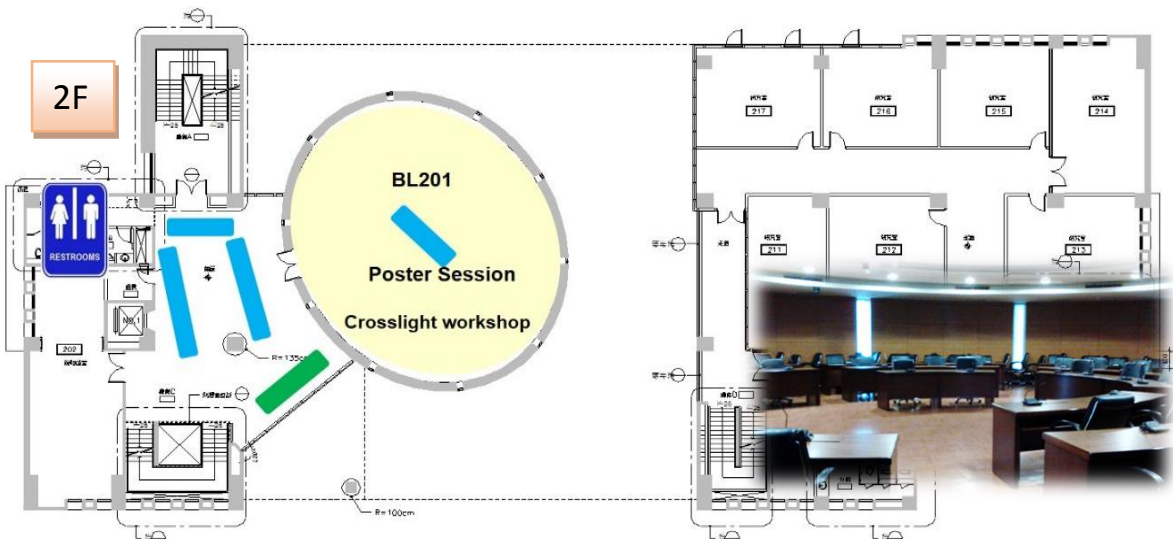
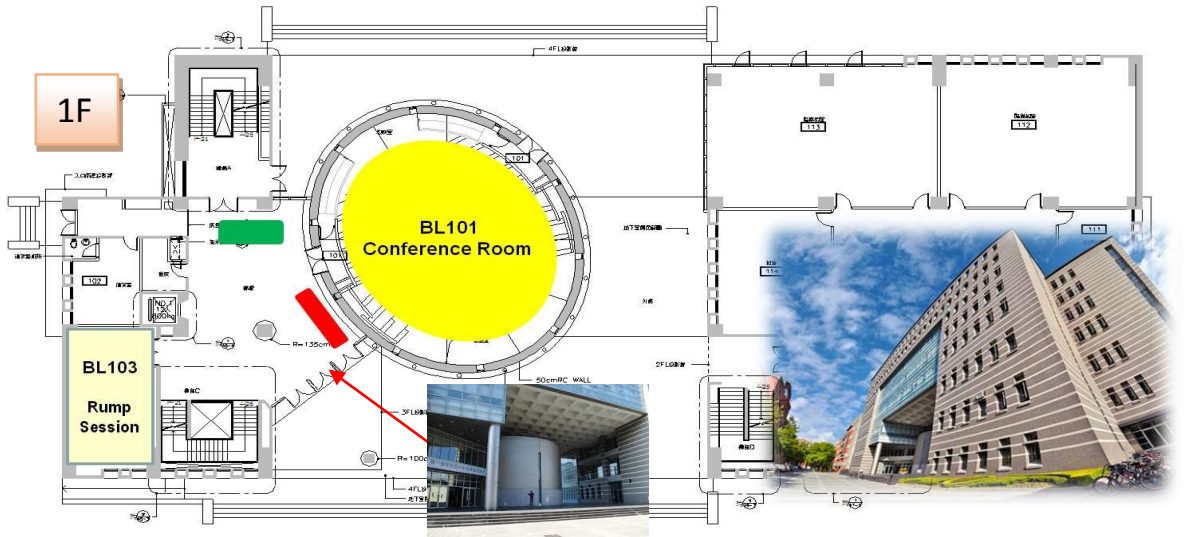
Registration Desks

Conference Room

Poster Exhibition

Food Station




Restroom



Transportation

Airport to city

Most international flights land at Taoyuan International Airport (TPE). The journey from Taoyuan International Airport to central Taipei is about 40 kilometers.

From	Option	Route	Time	Fare (estimate)
Taiwan Taoyuan International Airport (TPE)		Taxis operating by shifts are located at the west side of Terminal 1's and 2's Arrivals Lobby.	1h	TWD 1,300
		Take bus (Kuo-kuang Line 1819 or CitiAir Bus 1961) directed to Taipei Main Station (臺北車站), and then take a taxi.	1h30	TWD 350
		Take bus (Kuo-kuang Line 1819 or CitiAir Bus 1961) directed to Taipei Main Station (臺北車站), and transfer to MRT Line 3 (Xindian Line 新店線), get off at Gongguan station (公館站).	1h30	TWD 220

Directions - MRT Station to Conference Venue -Barry Lam Hall

MRT **Technology Building** Station: (10~15-minute walk)

1. Walk out of the station and turn left.
2. Go straight on Fuxing South Rd. to the entrance of NTU.
3. Walk into the campus and go straight to the end.
4. Turn right to the bicycle parking area. Barry Lam Hall in on your right hand side.

MRT **Gongguan** Station: (15-minute walk)

1. Walk out of Exit 2 and turn left to walk into the campus.
2. Go straight on Zhoushan Rd. (舟山路)
 - Route a. Walk to the intersection of the bike parking area and turn left.
Walk along the road to the left. Barry Lam Hall is on the right.
 - Route b. Turn left behind the library. Walk between two buildings and then turn right.
Barry Lam Hall is on your left.

Parking: Car parking fee is NT\$40-60/h. To receive a 50% discount, please have your parking tickets stamped at Office 601, Barry Lam Hall.

Map of NTU Main Campus



Taipei Metro Map



Legend

- 1** Wenhu Line
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- 3** Songshan-Xindian Line
- 4** Zhonghe-Xinlu Line
- 5** Bannan Line

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- TRA
- Regular Station
- Transfer Station
- Terminal Station











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	National Taiwan University (NTU)	109、643、642、668、675、0 South、280、311、207、Songjiang Main Line、Dunhua Main Line、0、505、907、253、284、52、676、208、5、1501 Zhinan Temple via Taishan、1550 Keelung-Taipei
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	Youth Activity Center	237、295、298、298 Shuttle、949
	Taipei Water Department	907、909、1550 Keelung-Taipei、Xindian-Taipei、1032 Keelung-Banqiao、905、906、906 Sub、BR12、Dunhua Main Line、673、275、1、650、207、672
	NTU Hospital -Gongguan Branch	207、1、1550 Keelung-Taipei、672、650、275、1032 Keelung-Banqiao、905、909、906、906 Sub
	National Taiwan University of Science and Technology	1、207、275、650、1032 Keelung-Banqiao、9009 Taoyuan-Tapei City Hall、1550 Keelung-Taipei、Taipei-Longtan、Xindian-Keelung、672、673、907、G11、Dunhua Main Line、BR12
	Gongguan	5、1550 Keelung-Taipei, 1501 Zhinan Temple via TaiShan、1、207、254、650、672、672 Shuttle、673、907、BR12、BR22、Dunhua Main Line、G11、NK-Shuanghe、S30
	MRT Gongguan Station	0South、1、109、1501、1505、207、208、208Shuttle、236、236Night、236Shuttle、251、251Shuttle、252、253、254、254Shuttle、278、280、280Express、284、284Express、290、311、505、52、530、606、642、643、644、648、660、668、671、672、672Shuttle、673、675、676、74、907、BL28、BR11、BR12、BR22、Dunhua Main Line、G11、Jingmei-T.V.G.H Express、S31

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– See more at <http://www.easycard.com.tw/english/index.asp>.



YouBike



The Department of Transportation, Taipei City Government encourages citizens to use bikes as short-distance transit vehicles, so environmental pollution and energy loss in the city will be improved. The Taipei City Government, in collaboration with Giant Taiwan, initiated the Taipei Bike Sharing System Service Plan, also known as “YouBike”.

For YouBike members, it costs 5 NTD for the first 30 minutes, and 10 NTD per 30 minutes within the first 4 hours.

–See more at <https://taipei.youbike.com.tw/en/index.php>.

Dining Options: Coffee Shop / Set Meal, Students Cafeteria, Commissary / Snack, Restaurant (<http://map.ntu.edu.tw/ntu-eng.html>) (<http://life.ntu.edu.tw/>)

- **On campus:** Lu-Ming Square, Biggie’s Bakery & Bistro, 2nd Student Activity Center, Siaoфу Building, Ming-Da Hall, Tsun-Hsien Hall, and Family Mart.
- **Around NTU:** Restaurants are on the street blocks near MRT Gongguan Station and there are many food stands and snacks in the night market.

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Ministry of Science and Technology

Taiwanese Ministry of Science and Technology was established in March 2014. It was converted from the National Science Council (NSC), a government agency set up in 1959 to support research in Taiwan. The ministry is responsible for promoting the development of science and technology. Its responsibilities include supporting academic research, funding grants for educational and research institutions as well as promoting international cooperation in science and technology. Polish-Taiwanese Agreement on Scientific Cooperation was signed in September 2012.

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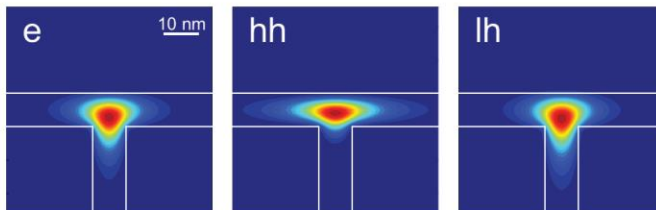
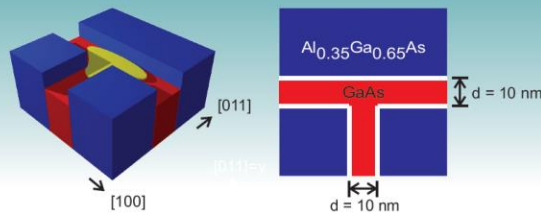
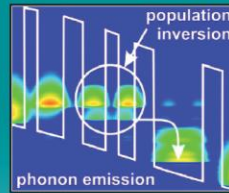
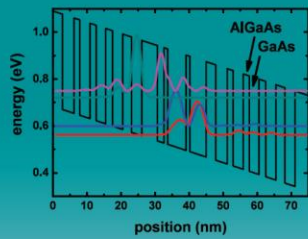
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