9:00 AM - 9:15 AM (Mon. Aug 1, 2022 9:00 AM - 11:30 AM Main Hall (2/3))

[OP] Opening Remark

9:15 AM - 10:00 AM (Mon. Aug 1, 2022 9:00 AM - 11:30 AM Main Hall (2/3))

[Plenary1-C1] The Revolution of Silicon Photonics
[Presentation Style] Onsite

*Michal Lipson[1] (1. Columbia University (United States of America))

[Presentation Style] Onsite

We are now experiencing a revolution in optical technologies, where one can print and control massive optical circuits, on a microelectronic chip. This revolution is enabling a whole range of applications that are in need for scalable optical technologies and its opening the door to areas that only a decade ago were unimaginable.

10:00 AM - 10:45 AM (Mon. Aug 1, 2022 9:00 AM - 11:30 AM Main Hall (2/3))

[Plenary1-C2] Optical Communication Systems: Scaling Capacity and Energy
[Presentation Style] Online

*Peter J. Winzer[1] (1. Nubis Communications, Inc. (United States of America))

[Presentation Style] Online

We discuss the capacity scaling of optical communications from ultra-long-haul subsea cables to ultra-low-power intra-datacenter interconnects and show that massive spatial parallelism is the only sustainable option for the next decade and beyond.

10:45 AM - 11:30 AM (Mon. Aug 1, 2022 9:00 AM - 11:30 AM Main Hall (2/3))

[Plenary1-I1] Non-volatile memory for data storage and Neuromorphic Computing
[Presentation Style] Onsite

*Chong Tow Chong[1], Rong Zhao[1] (1. Singapore University of Technology and Design (Singapore))

[Presentation Style] Onsite

Non-volatile memories (NVMs) have revolutionized modern data storage systems, especially boosting the performance of latency-sensitive applications. Recently, they have also emerged as an important technical avenue for building neuromorphic computing systems. This plenary will cover recent advances of NVMs and applications in these exciting fields, and discuss opportunities and challenges.

Ultrafast Measurement and Control

Session Chairs: Satoshi Ashihara (Univ. of Tokyo), Tomoya Mizuno (Univ. of Tokyo)

Mon. Aug 1, 2022 1:30 PM - 2:30 PM Conference Hall (Oval Room) (1F)

[CMP2A-01] Spectral phase interferometry for direct electric-field reconstruction of synchrotron light

[Presentation Style] Onsite

*Takao Fuji[1], Masaki Fujimoto[2], Yasuaki Okano[2], Elham Salehi[2], Masahito Hosaka[3], Masahiro Katoh[4,2] (1. Toyota Technological Institute (Japan), 2. Institute for Molecular Science (Japan), 3. Nagoya University (Japan), 4. Hiroshima University (Japan))

1:30 PM - 1:45 PM

[CMP2A-02] Timing stabilization and diagnostic of femtosecond optical laser system for pump-probe experiments in SACLA

[Presentation Style] Onsite

*Tadashi Togashi[1,2], Yuya Kubota[2], Shigeki Owada[1,2], Tetsuo Katayama[1,2], Keiichi Sueda[2], Toshinori Yabuuchi[1,2], Kensuke Tono[1,2], Makina Yabashi[1,2] (1. Japan Synchrotron Radiation Research Inst. (Japan), 2. Riken SPring-8 Center (Japan))

1:45 PM - 2:00 PM

[CMP2A-03] CEP stabilization of a TiS CPA system to sub-100 mrad level

[Presentation Style] Onsite

*Kaito Nishimiya[1], Kento Kubomura[1], Ryoma Ishikawa[1], Akira Suda[1] (1. Tokyo University of Science (Japan))

2:00 PM - 2:15 PM

[CMP2A-04] Ultrafast snapshot imaging at sub-GHz framerate by using recirculation filtering of ultrashort optical pulses

[Presentation Style] Onsite

*Asami Honda[1], Ryota Tamemoto[1], Keisaku Yamane[1], Masato Suzuki[1], Yasunori Toda[1], Takashige Omatsu[2,3], Ryuji Morita[1] (1. Hokkaido Univ. (Japan), 2. Chiba Univ. (Japan), 3. MCRC, Chiba Univ. (Japan))

2:15 PM - 2:30 PM

1:30 PM - 1:45 PM (Mon. Aug 1, 2022 1:30 PM - 2:30 PM Conference Hall (Oval Room))

[CMP2A-01] Spectral phase interferometry for direct electric-field reconstruction of synchrotron light

[Presentation Style] Onsite

*Takao Fuji[1], Masaki Fujimoto[2], Yasuaki Okano[2], Elham Salehi[2], Masahito Hosaka[3], Masahiro Katoh[4,2] (1. Toyota Technological Institute (Japan), 2. Institute for Molecular Science (Japan), 3. Nagoya University (Japan), 4. Hiroshima University (Japan))

[Presentation Style] Onsite

Ultraviolet electric-fields produced by relativistic electrons in an undulator of a synchrotron light source is characterized by using spectral phase interferometry for direct electric-field reconstruction. A 10-cycle rectangular shaped waveform is reconstructed.

1:45 PM - 2:00 PM (Mon. Aug 1, 2022 1:30 PM - 2:30 PM Conference Hall (Oval Room))

[CMP2A-02] Timing stabilization and diagnostic of femtosecond optical laser system for pump-probe experiments in SACLA

[Presentation Style] Onsite

*Tadashi Togashi[1,2], Yuya Kubota[2], Shigeki Owada[1,2], Tetsuo Katayama[1,2], Keiichi Sueda[2], Toshinori Yabuuchi[1,2], Kensuke Tono[1,2], Makina Yabashi[1,2] (1. Japan Synchrotron Radiation Research Inst. (Japan), 2. Riken SPring-8 Center (Japan))

[Presentation Style] Onsite

A synchronized femtosecond laser system, which is controlled by a balanced optical-microwave phase detector (BOMPD), was constructed for pump-probe experiments at SACLA and has been successfully realized to reduce jitter down to 50 fs.

2:00 PM - 2:15 PM (Mon. Aug 1, 2022 1:30 PM - 2:30 PM Conference Hall (Oval Room))

[CMP2A-03] CEP stabilization of a TiS CPA system to sub-100 mrad level

[Presentation Style] Onsite

*Kaito Nishimiya[1], Kento Kubomura[1], Ryoma Ishikawa[1], Akira Suda[1] (1. Tokyo University of Science (Japan))

[Presentation Style] Onsite

We have suppressed the effects of vibration and acoustic waves on the CEP and obtained a CEP stability of 99 mrad (rms) with a pulse energy of 7 mJ at 1 kHz.

2:15 PM - 2:30 PM (Mon. Aug 1, 2022 1:30 PM - 2:30 PM Conference Hall (Oval Room))

[CMP2A-04] Ultrafast snapshot imaging at sub-GHz framerate by using recirculation filtering of ultrashort optical pulses

[Presentation Style] Onsite

*Asami Honda[1], Ryota Tamemoto[1], Keisaku Yamane[1], Masato Suzuki[1], Yasunori Toda[1], Takashige Omatsu[2,3], Ryuji Morita[1] （1. Hokkaido Univ. (Japan), 2. Chiba Univ. (Japan), 3. MCRC, Chiba Univ. (Japan)）

[Presentation Style] Onsite

We successfully demonstrated ultrafast snapshot imaging based on time-to-frequency mapping method with four frames and ~ 5.5 ns time interval (i.e. sub-GHz framerate) by using our newly-developed recirculation system without ultrafast image sensor.

Oral Session | CLEO-PR2022 | Strong Field Phenomena

Strong Field Phenomena

Session Chairs: Tadashi Togashi (JASRI), Takayuki Kurihara (Univ. of Tokyo)

Mon. Aug 1, 2022 3:30 PM - 4:15 PM Conference Hall (Oval Room) (1F)

[CMP2B-01] Optical Field Detector for Sub-Nanojoule Pulses using Insulator-Encapsulated Metal Nanostructures

*Ko Arai[1], Daiki Arai[1], Ikki Morichika[1], Satoshi Ashihara[1] （1. IIS, the University of Tokyo (Japan)）

3:30 PM - 3:45 PM

[CMP2B-02] Degenerate singularities in backward rescattering processes induced by strong infrared fields

[Presentation Style] Onsite

*Tomoya Mizuno[1], Tianqi Yang[1], Takayuki Kurihara[1], Nobuhisa Ishii[1], Teruto Kanai[1], Oleg I. Tolstikhin[2], Toru Morishita[3], Jiro Itatani[1] （1. The University of Tokyo (Japan), 2. Moscow Inst. Phys. and Tech. (Russia), 3. UEC (Japan)）

3:45 PM - 4:00 PM

[CMP2B-03] Laser wakefield acceleration driven by 1-TW laser pulse in a dense, sub-mm nitrogen gas cell

[Presentation Style] Online

*Dang Khoa Tran[1], Po- Wei Lai[1], Kun- Ni Liu[1], Xiang- Yuan Lin[2], Ming- Wei Lin[1,2], Hsu- Hsin Chu[3,4], Jyhpyng Wang[3,4,5] （1. Institute of Nuclear Engineering and Science, National Tsing Hua Univ. (Taiwan), 2. Department of Engineering and Science System, National Tsing Hua Univ. (Taiwan), 3. Department of Physics, National Central Univ. (Taiwan), 4. Center for High Energy and High Field Physics, National Central Univ. (Taiwan), 5. Institute of Atomic and Molecular Science, Academia Sinica (Taiwan)）

4:00 PM - 4:15 PM

3:30 PM - 3:45 PM (Mon. Aug 1, 2022 3:30 PM - 4:15 PM Conference Hall (Oval Room))

[CMP2B-01] Optical Field Detector for Sub-Nanojoule Pulses using Insulator-Encapsulated Metal Nanostructures

*Ko Arai[1], Daiki Arai[1], Ikki Morichika[1], Satoshi Ashihara[1] (1. IIS, the University of Tokyo (Japan))

An all-solid-state optical field detector was developed based on field-induced tunneling emission at a metal-insulator interface using plasmon enhancement. Both high photocurrent generation efficiency and high damage tolerance are achieved by completely encapsulating metal nanoantennas.

3:45 PM - 4:00 PM (Mon. Aug 1, 2022 3:30 PM - 4:15 PM Conference Hall (Oval Room))

[CMP2B-02] Degenerate singularities in backward rescattering processes induced by strong infrared fields [Presentation Style] Onsite

*Tomoya Mizuno[1], Tianqi Yang[1], Takayuki Kurihara[1], Nobuhisa Ishii[1], Teruto Kanai[1], Oleg I. Tolstikhin[2], Toru Morishita[3], Jiro Itatani[1] (1. The University of Tokyo (Japan), 2. Moscow Inst. Phys. and Tech. (Russia), 3. UEC (Japan))

[Presentation Style] Onsite

We measure carrier-envelope phase (CEP)-dependent photoelectron momentum distributions (PEMDs) of Kr and CO_2 with linearly-polarized sub-two-cycle near-infrared laser pulses, to experimentally confirm the universality around the backward rescattering caustic.

4:00 PM - 4:15 PM (Mon. Aug 1, 2022 3:30 PM - 4:15 PM Conference Hall (Oval Room))

[CMP2B-03] Laser wakefield acceleration driven by 1-TW laser pulse in a dense, sub-mm nitrogen gas cell [Presentation Style] Online

*Dang Khoa Tran[1], Po- Wei Lai[1], Kun- Ni Liu[1], Xiang- Yuan Lin[2], Ming- Wei Lin[1,2], Hsu- Hsin Chu[3,4], Jyhpyng Wang[3,4,5] (1. Institute of Nuclear Engineering and Science, National Tsing Hua Univ. (Taiwan), 2. Department of Engineering and Science System, National Tsing Hua Univ. (Taiwan), 3. Department of Physics, National Central Univ. (Taiwan), 4. Center for High Energy and High Field Physics, National Central Univ. (Taiwan), 5. Institute of Atomic and Molecular Science, Academia Sinica (Taiwan))

[Presentation Style] Online

We demonstrate the feasibility of using 1-TW, 40-fs laser pulses to generate electrons with peak energy ≈ 9.4 MeV and charge ≈ 32 pC through the laser wakefield acceleration in a dense, 450-um long nitrogen gas cell.

THz Biology and Imaging

Session Chair: Masahiko Tani (Univ. of Fukui)

Mon. Aug 1, 2022 1:30 PM - 3:00 PM Mid-sized Hall B (1F)

[CMP3A-01 (Invited)] Biological effects of MMW and THz radiation.
[Presentation Style] Online

*Vincent Wallace[1] （1. University of Western Australia (Australia)）

1:30 PM - 2:00 PM

[CMP3A-02 (Invited)] Active Demethylation of Cancer Cells using Terahertz Radiation for Potential Cancer Treatment
[Presentation Style] Online

*Joo-Hiuk Son[1] （1. University of Seoul (Korea)）

2:00 PM - 2:30 PM

[CMP3A-03] High-dynamic-range nondestructive testing promoted by 200 W peak-power backward terahertz-wave parametric oscillator
[Presentation Style] Onsite

*Kouji Nawata[1], Yuma Takida[1], Takashi Notake[1], Hiroaki Minamide[1] （1. RIKEN (Japan)）

2:30 PM - 2:45 PM

[CMP3A-04] High-resolution Spectral Imaging at ~ 6 THz
[Presentation Style] Onsite

*Cang-He Guo[1], Ming-Hsiung Wu[1], Yen-Chieh Huang[1] （1. National Tsing Hua University (Taiwan)）

2:45 PM - 3:00 PM

1:30 PM - 2:00 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Mid-sized Hall B)

[CMP3A-01 (Invited)] Biological effects of MMW and THz radiation. [Presentation Style] Online

*Vincent Wallace[1] (1. University of Western Australia (Australia))

[Presentation Style] Online

Since regular radiobroadcasts started in the 1920s, the exposure to human-made electromagnetic fields has steadily increased. These days we are not only exposed to radio waves but also other frequencies from a variety of sources, mainly from communication and security devices. Considering that nearly all biological systems interact with electromagnetic fields, understanding their affects is essential for safety and technological progress. Electromagnetic fields have been shown to affect the activity in cell membranes (sodium vs. potassium ion conductivities) and non-selective channels, transmembrane potential, and even the cell cycle. Particular attention is given to the millimeter and terahertz radiation due to their increasing utilization and hence, increasing human exposure. Millimeter waves are known to alter active transport across cell membranes, and it has been reported that terahertz radiation may interfere with DNA and cause genomic instabilities.

2:00 PM - 2:30 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Mid-sized Hall B)

[CMP3A-02 (Invited)] Active Demethylation of Cancer Cells using Terahertz Radiation for Potential Cancer Treatment [Presentation Style] Online

*Joo-Hiuk Son[1] (1. University of Seoul (Korea))

[Presentation Style] Online

Carcinogenesis involves DNA methylation which is a primary epigenetic alteration in DNA in the development of cancer before genetic mutation. The methylation has been directly observed by terahertz time-domain spectroscopy and this epigenetic chemical change could be manipulated to the state of demethylation using resonant terahertz radiation.

2:30 PM - 2:45 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Mid-sized Hall B)

[CMP3A-03] High-dynamic-range nondestructive testing promoted by 200 W peak-power backward terahertz-wave parametric oscillator [Presentation Style] Onsite

*Kouji Nawata[1], Yuma Takida[1], Takashi Notake[1], Hiroaki Minamide[1] (1. RIKEN (Japan))

[Presentation Style] Onsite

We demonstrated backward terahertz-wave parametric oscillator with a high peak-power of about 200 W at 0.3 THz via cascaded parametric down-conversion process. Terahertz-wave imaging was performed using the developed source for high-dynamic-range nondestructive testing.

2:45 PM - 3:00 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Mid-sized Hall B)

[CMP3A-04] High-resolution Spectral Imaging at ~ 6 THz

[Presentation Style] Onsite

*Cang-He Guo[1], Ming-Hsiung Wu[1], Yen-Chieh Huang[1] （1. National Tsing Hua University (Taiwan)）

[Presentation Style] Onsite

We demonstrated spectral imaging for various materials between 5.43 and 6.1 THz with a pixel dimension down to 100 μm.

THz Source and Device

Session Chair: Yen-Chieh Huang (National Tsing Hua Univ.)
Mon. Aug 1, 2022 3:30 PM - 5:30 PM Mid-sized Hall B (1F)

[CMP3B-01 (Invited)] Controlling the Non-Hermitian Graphene Dirac Plasmons and Its Application to Terahertz Laser Transistors
[Presentation Style] Onsite
*Taiichi Otsuji[1] (1. Tohoku University (Japan))
3:30 PM - 4:00 PM

[CMP3B-02 (Invited(P))] Manipulating Polarization-division Multiplexed Terahertz Signals with Four-wire Waveguides
[Presentation Style] Online
*Junliang Dong[1], Alessandro Tomasino[1], Giacomo Balistreri[1], Pei You[1], Anton Vorobiov[2], Etienne Charette[1], Boris Le Drogoff[1], Mohamed Chaker[1], Aycan Yurtsever[1], Salvatore Stivala[3], Maria A. Vincenti[4], Costantino De Angelis[4], Detlef Kip[2], Jose Azana[1], Roberto Morandotti[1] (1. Institut national de la recherche scientifique (Canada), 2. Helmut Schmidt University (Germany), 3. University of Palermo (Italy), 4. University of Brescia (Italy))
4:00 PM - 4:30 PM

[CMP3B-03] Tsurupica Axicon Lens for high-order terahertz Bessel beam generation
[Presentation Style] Onsite
*Katsuhiko Miyamoto[1,2], Riku Nomura[1], Shota Tsuji[1], Takashige Omatsu[1,2] (1. Chiba Univ. (Japan), 2. MCRC Chiba Univ. (Japan))
4:30 PM - 4:45 PM

[CMP3B-04] Fast and Low-Cost Fabrication of Large-Area Terahertz Metasurface Devices Using Laser-Induced Graphene Technology
[Presentation Style] Online
Zongyuan Wang[1], *Bin Hu[1] (1. Beijing Inst. of Tech. (China))
4:45 PM - 5:00 PM

[CMP3B-05] High-power Narrow-line far-infrared Parametric Source
[Presentation Style] Onsite
Ming-Hsiung Wu[1], *Cang-He Kuo[1], Chieh-Ru Chen[1], Yen-Chieh Huang[1] (1. National Tsing Hua University (Taiwan))
5:00 PM - 5:15 PM

[CMP3B-06] Stable optical beats in laser chaos for THz wave
[Presentation Style] Onsite
*FUMIYOSHI KUWASHIMA[1], Mona Jarrahi[2], Semih Cakmakyapan[2], Osamu Morikawa[3], Takuya Shirao[1], Kazuyuki Iwao[1], Kazuyoshi Kurihara[4], Hideaki Kitahara[5], Takash FURUYA[5], KENJI WADA[6], Makoto NAKAJIMA[7], MASAHIKO TANI[5] (1. Fukui Univ. of Tech. (Japan), 2. Electrical and Computer Engineering Department, University of California Los Angeles (United States of America), 3. Chair of Liberal Arts, Japan Coast Guard Academy (Japan), 4.

School of Education., University. of Fukui (Japan), 5. Research Center for Development of Far-Infrared Region, University of Fukui (Japan), 6. Department of Physics and Electronics, Osaka Prefecture University (Japan), 7. Institute of Laser engineering, Osaka Univ (Japan))

5:15 PM - 5:30 PM

3:30 PM - 4:00 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Mid-sized Hall B)

[CMP3B-01 (Invited)] Controlling the Non-Hermitian Graphene Dirac Plasmons and Its Application to Terahertz Laser Transistors
[Presentation Style] Onsite

*Taiichi Otsuji[1] （1. Tohoku University (Japan)）

[Presentation Style] Onsite

We introduce a new scheme of actively controlling the non-Hermitian Dirac plasmons in a graphene-channel laser transistor structure. Numerical simulation demonstrates the capability of 100-Gbit/s-class ultrafast gain-switching by electrically modulating the PT symmetry.

4:00 PM - 4:30 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Mid-sized Hall B)

[CMP3B-02 (Invited(P))] Manipulating Polarization-division Multiplexed Terahertz Signals with Four-wire Waveguides
[Presentation Style] Online

*Junliang Dong[1], Alessandro Tomasino[1], Giacomo Balistreri[1], Pei You[1], Anton Vorobiov[2], Etienne Charette[1], Boris Le Drogoff[1], Mohamed Chaker[1], Aycan Yurtsever[1], Salvatore Stivala[3], Maria A. Vincenti[4], Costantino De Angelis[4], Detlef Kip[2], Jose Azana[1], Roberto Morandotti[1] （1. Institut national de la recherche scientifique (Canada), 2. Helmut Schmidt University (Germany), 3. University of Palermo (Italy), 4. University of Brescia (Italy)）

[Presentation Style] Online

We demonstrate a new metal-wire waveguide topology, namely a four-wire waveguide, which simultaneously acts as a broadband terahertz polarization-division multiplexer and a novel platform to realize the independent manipulation of polarization-division multiplexed terahertz signals

4:30 PM - 4:45 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Mid-sized Hall B)

[CMP3B-03] Tsurupica Axicon Lens for high-order terahertz Bessel beam generation
[Presentation Style] Onsite

*Katsuhiko Miyamoto[1,2], Riku Nomura[1], Shota Tsuji[1], Takashige Omatsu[1,2] （1. Chiba Univ. (Japan), 2. MCRC Chiba Univ. (Japan)）

[Presentation Style] Onsite

We develop a Tsurupica axicon lens to generate a terahertz (THz) Bessel beam with non-zero orbital angular momentum. The higher-order THz Bessel beams were efficiently generated within the frequency range of 3-6 THz.

4:45 PM - 5:00 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Mid-sized Hall B)

[CMP3B-04] Fast and Low-Cost Fabrication of Large-Area Terahertz Metasurface Devices Using Laser-Induced Graphene Technology

[Presentation Style] Online

Zongyuan Wang[1], *Bin Hu[1] (1. Beijing Inst. of Tech. (China))

[Presentation Style] Online

Using a fabrication system with a focal spot ≤5 μm, the LIG-based terahertz metasurface with a size of 15 mm × 15 mm and a resolution of 30 μm can be fabricated in 34 seconds.

5:00 PM - 5:15 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Mid-sized Hall B)

[CMP3B-05] High-power Narrow-line far-infrared Parametric Source

[Presentation Style] Onsite

Ming-Hsiung Wu[1], *Cang-He Kuo[1], Chieh-Ru Chen[1], Yen-Chieh Huang[1] (1. National Tsing Hua University (Taiwan))

[Presentation Style] Onsite

We report the generation of narrow-line far-infrared radiation with 100-kW and 142-kW peak powers at 5.7 THz external and internal to a Si prism coupler atop a KTP crystal as a pulsed difference frequency generator.

5:15 PM - 5:30 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Mid-sized Hall B)

[CMP3B-06] Stable optical beats in laser chaos for THz wave

[Presentation Style] Onsite

*FUMIYOSHI KUWASHIMA[1], Mona Jarrahi[2], Semih Cakmakyapan[2], Osamu Morikawa[3], Takuya Shirao[1], Kazuyuki Iwao[1], Kazuyoshi Kurihara[4], Hideaki Kitahara[5], Takash FURUYA[5], KENJI WADA[6], Makoto NAKAJIMA[7], MASAHIKO TANI[5] (1. Fukui Univ. of Tech. (Japan), 2. Electrical and Computer Engineering Department, University of California Los Angeles (United States of America), 3. Chair of Liberal Arts, Japan Coast Guard Academy (Japan), 4. School of Education., University. of Fukui (Japan), 5. Research Center for Development of Far-Infrared Region, University of Fukui (Japan), 6. Department of Physics and Electronics, Osaka Prefecture University (Japan), 7. Institute of Laser engineering, Osaka Univ (Japan))

[Presentation Style] Onsite

Stability of optical beats in a chaotically oscillating laser is compared to that of a free-running continuous-wave laser using a highly efficient plasmonic photomixer. Using a chaotically oscillating laser diode, stable optical beats are observed over an operation current range of 60-90 mA.

Oral Session | CLEO-PR2022 | High Power, High Energy Lasers I

High Power, High Energy Lasers I

Session Chairs: Daniel Albach (Inst. of Radiation Physics, HZDR), Ryo Yasuhara (NIFS)
Mon. Aug 1, 2022 1:30 PM - 3:00 PM Small Hall (2F)

[CMP4A-01 (Invited(P))] Wavefront Evaluation of a 250-J Laser “HELIA” toward 10 Hz Operation
[Presentation Style] Online
*Takashi Sekine[1], Yuma Hatano[1], Yuki Muramatsu[1], Takaaki Morita[1], Masateru Kurata[1], Takashi Kurita[1], Yoshinori Tamaoki[1], Takeshi Watari[1], Takuto Iguchi[1], Ryo Yoshimura[1], Yuki Ikeya[1], Yasuki Takeuchi[1], Kazuki Kawai[1], Yujin Zheng[1], Yoshinori Kato[1], Norio Kurita[1], Toshiyuki Kawashima[1] (1. Hamamatsu Photonics K.K. (Japan))
1:30 PM - 2:00 PM

[CMP4A-02] High Energy (pulsed) Diode-pumped Multi-slab Laser Operated at 1.5kW level
[Presentation Style] Onsite
*Patricie Severova[1], Martin Divoky[1], Jan Pilar[1], Martin Hanus[1], Petr Navratil[1], Ondrej Denk[1], Paul Mason[2], Thomas Butcher[2], Saumyabrata Banerjee[2], Maria Stefania De Vido[2], Chris Edwards[2], John Collier[2], Martin Smrz[1], Tomas Mocek[1] (1. HiLASE Centre Institute of Physics of the Czech Academy of Sciences (Czech Republic), 2. Central Laser Facility STFC Rutherford Appleton Laboratory (UK))
2:00 PM - 2:15 PM

[CMP4A-03] Beam shaping in high-energy high-average-power nanosecond laser system Bivoj
[Presentation Style] Onsite
*Tomas Paliesek[1], Petr Navratil[1], Jan Pilar[1], Martin Hanus[1], Martin Divoky[1], Martin Smrz[1], Tomas Mocek[1] (1. HiLASE Centre, Institute of Physics of Czech Academy of Sciences (Czech Republic))
2:15 PM - 2:30 PM

[CMP4A-04] Generation of High Energy Green Pulse Bursts from a DPSSL Amplifier
[Presentation Style] Online
*Paul Mason[1], Hugh Barrett[1], Saumyabrata Banerjee[1], Chris Edwards[1], John Collier[1] (1. Central Laser Facility, STFC, Harwell Campus (UK))
2:30 PM - 2:45 PM

[CMP4A-05] Ozone gas optics for high energy laser applications
[Presentation Style] Onsite
*Yurina Michine[1], Hitoki Yoneda[1] (1. Univ. of Electro-Communications (Japan))
2:45 PM - 3:00 PM

1:30 PM - 2:00 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Small Hall)

[CMP4A-01 (Invited(P))] Wavefront Evaluation of a 250-J Laser “HELIA” toward 10 Hz Operation [Presentation Style] Online

*Takashi Sekine[1], Yuma Hatano[1], Yuki Muramatsu[1], Takaaki Morita[1], Masateru Kurata[1], Takashi Kurita[1], Yoshinori Tamaoki[1], Takeshi Watari[1], Takuto Iguchi[1], Ryo Yoshimura[1], Yuki Ikeya[1], Yasuki Takeuchi[1], Kazuki Kawai[1], Yujin Zheng[1], Yoshinori Kato[1], Norio Kurita[1], Toshiyuki Kawashima[1] （1. Hamamatsu Photonics K.K. (Japan)）

[Presentation Style] Online

Over 250 J pulse energy with around 30 ns pulse duration at 0.2 Hz repetition rate was demonstrated by laser diode pumped cryogenically cooled Yb:YAG ceramics laser. In this report, experimental results of wavefront deformation and energy amplification on 10 Hz repetition rate condition will be presented.

2:00 PM - 2:15 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Small Hall)

[CMP4A-02] High Energy (pulsed) Diode-pumped Multi-slab Laser Operated at 1.5kW level [Presentation Style] Onsite

*Patricie Severova[1], Martin Divoky[1], Jan Pilar[1], Martin Hanus[1], Petr Navratil[1], Ondrej Denk[1], Paul Mason[2], Thomas Butcher[2], Saumyabrata Banerjee[2], Maria Stefania De Vido[2], Chris Edwards[2], John Collier[2], Martin Smrz[1], Tomas Mocek[1] （1. HiLASE Centre Institute of Physics of the Czech Academy of Sciences (Czech Republic), 2. Central Laser Facility STFC Rutherford Appleton Laboratory (UK)）

[Presentation Style] Onsite

Abstract: Achieving output energy of 146J in 10ns at 10 Hz repetition rate from multi-Joule cryogenic gas-cooled DPSSL is presented. This is 40% energy and power increase in comparison to the most powerful multi-Joule high power laser system.

2:15 PM - 2:30 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Small Hall)

[CMP4A-03] Beam shaping in high-energy high-average-power nanosecond laser system Bivoj [Presentation Style] Onsite

*Tomas Paliesek[1], Petr Navratil[1], Jan Pilar[1], Martin Hanus[1], Martin Divoky[1], Martin Smrz[1], Tomas Mocek[1] （1. HiLASE Centre, Institute of Physics of Czech Academy of Sciences (Czech Republic)）

[Presentation Style] Onsite

We developed a fail-safe programmable beam shaping system that corrects gain non-uniformity in the laser system Bivoj (150 J, 10 Hz, 10 ns) and successfully tested it in the first power amplifier at 6 J at 10 Hz.

2:30 PM - 2:45 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Small Hall)

[CMP4A-04] Generation of High Energy Green Pulse Bursts from a DPSSL Amplifier

[Presentation Style] Online

*Paul Mason[1], Hugh Barrett[1], Saumyabrata Banerjee[1], Chris Edwards[1], John Collier[1] (1. Central Laser Facility, STFC, Harwell Campus (UK))

[Presentation Style] Online

A burst of five green (515 nm) pulses each separated by 29.4 ns (34 MHz) with 2.0 J total energy has been generated at low IR fluence as an alternative pump source for Ti:Sa amplifiers

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2:45 PM - 3:00 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Small Hall)

[CMP4A-05] Ozone gas optics for high energy laser applications

[Presentation Style] Onsite

*Yurina Michine[1], Hitoki Yoneda[1] (1. Univ. of Electro-Communications (Japan))

[Presentation Style] Onsite

New high damage threshold gas optics is proposed and demonstrated for high energy laser system. In this scheme, we use mixture ozone gas for diffraction of laser pulse. Up to now, we’ ve achieved 95% average diffraction efficiency with relatively long life time(~10ns) under high damage threshold condition.

Oral Session | CLEO-PR2022 | High Power, High Energy Lasers II

High Power, High Energy Lasers II

Session Chairs: Paul Mason (Sci. &Tech. Facilities Council), Jumpei Ogino (Osaka Univ.)

Mon. Aug 1, 2022 3:30 PM - 4:45 PM Small Hall (2F)

[CMP4B-01 (Invited)] Generation of the Highest Laser Intensity of 10^{23} W/cm^2 by Focusing PW Laser Pulses
[Presentation Style] Online

*Jin Woo Yoon[1,2], Il Woo Choi[1,2], Jae Hee Sung[1,2], Hwang Woon Lee[1], Seong Ku Lee[1,2] （1. IBS (Korea), 2. GIST (Korea)）

3:30 PM - 4:00 PM

[CMP4B-02 (Invited)] Suppression of the temporal noise in SULF-10 PW laser
[Presentation Style] Online

*Xu Yi[1], Wang Xinliang [1], Bai Peile[1], Hu Jiabing[1], Zhang Zongxin[1], Liu Yanqi[1], Yu Lianghong[1], Liang Xiaoyan[1], Leng Yuxin[1], Li Ruxin[1] （1. SIOM (China)）

4:00 PM - 4:30 PM

[CMP4B-03] High-Power Laser-Accelerated Protons for Advanced Material Science

*Patrizio Antici[1] （1. INRS (Canada)）

4:30 PM - 4:45 PM

3:30 PM - 4:00 PM (Mon. Aug 1, 2022 3:30 PM - 4:45 PM Small Hall)

[CMP4B-01 (Invited)] Generation of the Highest Laser Intensity of 10^{23} W/cm^2 by Focusing PW Laser Pulses

[Presentation Style] Online

*Jin Woo Yoon[1,2], Il Woo Choi[1,2], Jae Hee Sung[1,2], Hwang Woon Lee[1], Seong Ku Lee[1,2] (1. IBS (Korea), 2. GIST (Korea))

[Presentation Style] Online

We report a demonstration of laser intensity exceeding 10^{23} W/cm^2 by tight focusing and wavefront correction of the CoReLS petawatt laser. This achievement will enable us to explore strong-field quantum electrodynamics phenomena.

4:00 PM - 4:30 PM (Mon. Aug 1, 2022 3:30 PM - 4:45 PM Small Hall)

[CMP4B-02 (Invited)] Suppression of the temporal noise in SULF-10 PW laser

[Presentation Style] Online

*Xu Yi[1], Wang Xinliang [1], Bai Peile[1], Hu Jiabing[1], Zhang Zongxin[1], Liu Yanqi[1], Yu Lianghong[1], Liang Xiaoyan[1], Leng Yuxin[1], Li Ruxin[1] (1. SIOM (China))

[Presentation Style] Online

In SULF-10 PW laser facility, different methods are adopted to suppress different kinds of noise. Nonlinear pulse temporal filter based cascaded XPWG and fs-OPA techniques is utilized to suppress the ASE noise. While novel multi-pass amplifiers with wedged Ti:sapphire crystals are employed to suppress the pre-pulses in both nanosecond and picosecond domain. Applying these methods, temporal contrast about the ASE noise and the pre-pulses can reach 10^{-11} and 10^{-10} in SULF-10 PW laser, respectively.

4:30 PM - 4:45 PM (Mon. Aug 1, 2022 3:30 PM - 4:45 PM Small Hall)

[CMP4B-03] High-Power Laser-Accelerated Protons for Advanced Material Science

*Patrizio Antici[1] (1. INRS (Canada))

Particle and radiation sources are widely employed in manifold applications. In the last decades, the upcoming of versatile, energetic, high-brilliance laser-based sources, as produced by intense laser matter interaction, has introduced utilization of these sources in diverse areas, given their potential to complement or even outperform existing techniques. In this paper, we show that the interaction of an intense laser with a solid target produces a versatile, nondestructive, fast analysis technique This opens the route for a versatile, non destructive, and fast combined analysis technique.

High Capacity Optical Transport I

Session Chair: Takahito Tanimura (Hitachi, Ltd.)

Mon. Aug 1, 2022 2:00 PM - 3:00 PM Room 201&202 (2F)

[CMP9A-01 (Invited)] Ultra-High Symbol Rate Generation via External DAC Multiplexing
[Presentation Style] Online

*Vivian Xi Chen[1] (1. Nokia Bell labs (United States of America))

2:00 PM - 2:30 PM

[CMP9A-02] Real-time Channel Power Monitoring and Optical Layer Signaling Transmission Over 1500 km G.652.D fiber
[Presentation Style] Online

*Baoluo Yan[1,2], Qiong Wu[1,2], Hu Shi[1,2], Zhenhua Feng[1,2], Yinqiu Jia[1,2], Yan Zhao[1,2], Weizhang Chen[1,2], Mo Zhu[1,2], Yu Fang[1,2], Bing Ye[1,2], Hongbing Zou[1,2], Zhiyong Zhao[1,2], Yong Chen[1,2] (1. WDM system department of wireline product R&D institute, ZTE Corp. Beijing (China), 2. State Key Laboratory of Mobile Network and Mobile Multimedia Technology (China))

2:30 PM - 2:45 PM

[CMP9A-03] A Comparison of Linear Regression and Deep Learning Model for EVM Estimation in Coherent Optical Systems
[Presentation Style] Online

*Yuchuan Fan[1,2], Xiaodan Pang[1,2], Aleksejs Udalcovs[2], Carlos Natalino[3], Lu Zhang[4], Sandis Spolitis[5], Vjaceslavs Bobrovs[5], Richard Schatz[1], Xianbin Yu[4], Marija Furdek[3], Sergei Popov[1], Oskars Ozolins[1,2,5] (1. KTH Royal Inst. of Tech. (Sweden), 2. RISE Res. Inst. of Sweden (Sweden), 3. Chalmers Univ. of Tech. (Sweden), 4. Zhejiang Univ. (China), 5. Riga Technical Univ. (Latvia))

2:45 PM - 3:00 PM

2:00 PM - 2:30 PM (Mon. Aug 1, 2022 2:00 PM - 3:00 PM Room 201&202)

[CMP9A-01 (Invited)] Ultra-High Symbol Rate Generation via External DAC Multiplexing
[Presentation Style] Online

*Vivian Xi Chen[1] (1. Nokia Bell labs (United States of America))

[Presentation Style] Online

In this talk, we will present our latest experimental results on 200-GBaud higher order QAM experiment, and will discuss the available options for extending the symbol rate to even higher for future coherent optical transmitters.

2:30 PM - 2:45 PM (Mon. Aug 1, 2022 2:00 PM - 3:00 PM Room 201&202)

[CMP9A-02] Real-time Channel Power Monitoring and Optical Layer Signaling Transmission Over 1500 km G.652.D fiber
[Presentation Style] Online

*Baoluo Yan[1,2], Qiong Wu[1,2], Hu Shi[1,2], Zhenhua Feng[1,2], Yinqiu Jia[1,2], Yan Zhao[1,2], Weizhang Chen[1,2], Mo Zhu[1,2], Yu Fang[1,2], Bing Ye[1,2], Hongbing Zou[1,2], Zhiyong Zhao[1,2], Yong Chen[1,2] (1. WDM system department of wireline product R&D institute, ZTE Corp. Beijing (China), 2. State Key Laboratory of Mobile Network and Mobile Multimedia Technology (China))

[Presentation Style] Online

Using PT modulation, real-time channel power monitoring with 1.5 dB accuracy and optical layer signaling with receiver sensitivity less than -30 dBm after 1500 km transmission are achieved with negligible penalty to 100G/200G traffic.

2:45 PM - 3:00 PM (Mon. Aug 1, 2022 2:00 PM - 3:00 PM Room 201&202)

[CMP9A-03] A Comparison of Linear Regression and Deep Learning Model for EVM Estimation in Coherent Optical Systems
[Presentation Style] Online

*Yuchuan Fan[1,2], Xiaodan Pang[1,2], Aleksejs Udalcovs[2], Carlos Natalino[3], Lu Zhang[4], Sandis Spolitis[5], Vjaceslavs Bobrovs[5], Richard Schatz[1], Xianbin Yu[4], Marija Furdek[3], Sergei Popov[1], Oskars Ozolins[1,2,5] (1. KTH Royal Inst. of Tech. (Sweden), 2. RISE Res. Inst. of Sweden (Sweden), 3. Chalmers Univ. of Tech. (Sweden), 4. Zhejiang Univ. (China), 5. Riga Technical Univ. (Latvia))

[Presentation Style] Online

We experimentally investigate EVM estimation approaches based on linear regression and deep learning for 28 Gbaud coherent optical systems. We show that the estimation performances are comparable when the modulation format is known.

Optical Transmission in Various Media

Session Chair: Koji Igarashi (Osaka Univ.)

Mon. Aug 1, 2022 3:30 PM - 4:15 PM Room 201&202 (2F)

[CMP9B-01] Real-time UWOC Experiments in Indoor Environment Using Multipoint Real-seawater Channel under Constant Water Vibration Generated by 3 m/s Light Wind

[Presentation Style] Online

Takahiro Kodama[1], *Keita Tanaka[1], Fumiya Kobori[1], Tomoya Nakagawa[1], Momoka Masaoka[1], Ayumu Kariya[1], Tomoya Ishikawa[1], Shota Eguchi[1], Yoshiaki Inoue[2], Tomotaka Kimura[3] （1. Kagawa University (Japan), 2. Osaka University (Japan), 3. Doshisha University (Japan)）

3:30 PM - 3:45 PM

[CMP9B-02] Adaptive Power Compensation Using Cross-Gain Modulation of Saturated EDFA in Optical Relay-Assisted FSO Transmission

[Presentation Style] Onsite

*Young-Jin Hyun[1], Won-Ho Shin[1], Sang-Kook Han[1] （1. Broadband Transmission Network laboratory (Korea)）

3:45 PM - 4:00 PM

[CMP9B-03] On the Performance of High Spectral Efficiency CRIP OFDM Scheme over 15-m GI-POF

[Presentation Style] Online

*Yibin Li[1], Zixian Wei[1], Zhaoming Wang[1], Amjad Ali Amjad[2], Qian Li[2], H. Y. Fu[1] （1. Tsinghua Shenzhen International Graduate School and Tsinghua-Berkeley Shenzhen Institute, Tsinghua University. (China), 2. School of Electronic and Computer Engineering, Peking University. (China)）

4:00 PM - 4:15 PM

3:30 PM - 3:45 PM (Mon. Aug 1, 2022 3:30 PM - 4:15 PM Room 201&202)

[CMP9B-01] Real-time UWOC Experiments in Indoor Environment Using Multipoint Real-seawater Channel under Constant Water Vibration Generated by 3 m/s Light Wind
[Presentation Style] Online

Takahiro Kodama[1], *Keita Tanaka[1], Fumiya Kobori[1], Tomoya Nakagawa[1], Momoka Masaoka[1], Ayumu Kariya[1], Tomoya Ishikawa[1], Shota Eguchi[1], Yoshiaki Inoue[2], Tomotaka Kimura[3] (1. Kagawa University (Japan), 2. Osaka University (Japan), 3. Doshisha University (Japan))

[Presentation Style] Online

In an indoor environment of an underwater optical wireless communication system with six coastal, 74 cm seawater vibration channels under weak winds of 3 m/s, we experimentally achieve real-time-BER = 3.8×10^{-3} for all seawater channels.

3:45 PM - 4:00 PM (Mon. Aug 1, 2022 3:30 PM - 4:15 PM Room 201&202)

[CMP9B-02] Adaptive Power Compensation Using Cross-Gain Modulation of Saturated EDFA in Optical Relay-Assisted FSO Transmission
[Presentation Style] Onsite

*Young-Jin Hyun[1], Won-Ho Shin[1], Sang-Kook Han[1] (1. Broadband Transmission Network laboratory (Korea))

[Presentation Style] Onsite

A novel channel pre-compensation based on all-optical relaying FSO transmission system using cross gain modulation characteristic of saturated EDFA is presented and a significant increase in link performance has been experimentally demonstrated.

4:00 PM - 4:15 PM (Mon. Aug 1, 2022 3:30 PM - 4:15 PM Room 201&202)

[CMP9B-03] On the Performance of High Spectral Efficiency CRIP OFDM Scheme over 15-m GI-POF
[Presentation Style] Online

*Yibin Li[1], Zixian Wei[1], Zhaoming Wang[1], Amjad Ali Amjad[2], Qian Li[2], H. Y. Fu[1] (1. Tsinghua Shenzhen International Graduate School and Tsinghua-Berkeley Shenzhen Institute, Tsinghua University. (China), 2. School of Electronic and Computer Engineering, Peking University. (China))

[Presentation Style] Online

A combining real and imaginary parts (CRIP) OFDM is employed to a 15-m graded-index plastic optical fiber to experimentally achieve a higher spectral efficiency up to 11.7 bit/s/Hz than conventional OFDM with BER below 3.8×10^{-3}.

QD Devices and Crystal Growth Technology

Session Chair: Tomohiro Amemiya (Tokyo Tech)

Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 104&105 (1F)

[CMP11A-01] Temperature insensitivity of emission wavelength of highly-stacked quantum dot laser fabricated on InP(311)B substrate with Bi atoms irradiation

[Presentation Style] Onsite

*Kouichi Akahane[1], Atsushi Matsumoto[1], Toshimasa Umezawa[1], Naokatsu Yamamoto[1], Yoriko Tominaga[2], Satoshi Yanase[3], Tomohiro Maeda[3], Hideyuki Sotobayashi[3], Atsushi Kanno[1] (1. Natl. Inst. of Info. and Comm. Tech. (Japan), 2. Hiroshima Univ. (Japan), 3. Aoyama Gakuin Univ. (Japan))

1:30 PM - 1:45 PM

[CMP11A-02] High Optical Feedback Resistance of 1.55 um 15-Layer-Stacked Quantum Dot Laser using InP(311)B Substrate

[Presentation Style] Onsite

*Atsushi Matsumoto[1], Kouichi Akahane[1], Toshimasa Umezawa[1], Naokatsu Yamamoto[1], Kazutaka Kanno[2], Makoto Naruse[3], Atsushi Uchida[2], Atsushi Kanno[1] (1. National Institute of Information and Communications Technology (Japan), 2. Saitama Univ. (Japan), 3. The Univ. Tokyo (Japan))

1:45 PM - 2:00 PM

[CMP11A-03] Temperature Dependence of Mid-infrared Emission Process of InAs/GaSb Superlattices Grown by MOVPE

[Presentation Style] Onsite

*Masakazu Arai[1], Koji Maeda[1], Yuto Iwakiri[1], Takeshi Fujisawa[2] (1. Univ. of Miyazaki (Japan), 2. Hokkaido Univ. (Japan))

2:00 PM - 2:15 PM

[CMP11A-04] Electrode Thickness Dependence of GaAs based Photovoltaic Device Characteristics for Optical Wireless Power Transmission

[Presentation Style] Onsite

*Akira Kushiyama[1], Yuga Motomura[1], Kensuke Nishioka[1], Masakazu Arai[1] (1. University of Miyazaki (Japan))

2:15 PM - 2:30 PM

[CMP11A-05] Post Growth Annealing and InGaSb Layer Insertion Effects of Metamorphic InAsSb on GaAs Substrate

[Presentation Style] Onsite

*Koki Hombu[1], Shota Nakagawa[1], Yuto Iwakiri[1], Koji Maeda[1], Masakazu Arai[1] (1. Univ. of Miyazaki (Japan))

2:30 PM - 2:45 PM

[CMP11A-06] Near-field Analysis of VCSELs after HTOL test

[Presentation Style] Onsite

*Hao-Tien Cheng[1], Taixian Zhang[2], Yun-Cheng Yang[2], Te-Hua Liu[2], Chao-Hsin Wu[1,2] (1. Graduate Inst. of Electronics Engineering, National Taiwan Univ. (Taiwan), 2. Graduate Inst. of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan))

2:45 PM - 3:00 PM

1:30 PM - 1:45 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 104&105)

[CMP11A-01] Temperature insensitivity of emission wavelength of highly-stacked quantum dot laser fabricated on InP(311)B substrate with Bi atoms irradiation
[Presentation Style] Onsite

*Kouichi Akahane[1], Atsushi Matsumoto[1], Toshimasa Umezawa[1], Naokatsu Yamamoto[1], Yoriko Tominaga[2], Satoshi Yanase[3], Tomohiro Maeda[3], Hideyuki Sotobayashi[3], Atsushi Kanno[1] (1. Natl. Inst. of Info. and Comm. Tech. (Japan), 2. Hiroshima Univ. (Japan), 3. Aoyama Gakuin Univ. (Japan))

[Presentation Style] Onsite

The quantum dot laser diodes grown by molecular beam epitaxy with Bi irradiation exhibit a decrease in temperature dependence on the lasing wavelength.

1:45 PM - 2:00 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 104&105)

[CMP11A-02] High Optical Feedback Resistance of 1.55 um 15-Layer-Stacked Quantum Dot Laser using InP(311)B Substrate
[Presentation Style] Onsite

*Atsushi Matsumoto[1], Kouichi Akahane[1], Toshimasa Umezawa[1], Naokatsu Yamamoto[1], Kazutaka Kanno[2], Makoto Naruse[3], Atsushi Uchida[2], Atsushi Kanno[1] (1. National Institute of Information and Communications Technology (Japan), 2. Saitama Univ. (Japan), 3. The Univ. Tokyo (Japan))

[Presentation Style] Onsite

In this study, we evaluated optical feedback resistance of a 1.55-mm quantum dot (QD) laser diode (LD). Compared to a commercial MQW Fabry-Perot LD, higher feedback resistance could be obtained in the QD-LD.

2:00 PM - 2:15 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 104&105)

[CMP11A-03] Temperature Dependence of Mid-infrared Emission Process of InAs/GaSb Superlattices Grown by MOVPE
[Presentation Style] Onsite

*Masakazu Arai[1], Koji Maeda[1], Yuto Iwakiri[1], Takeshi Fujisawa[2] (1. Univ. of Miyazaki (Japan), 2. Hokkaido Univ. (Japan))

[Presentation Style] Onsite

The mid-infrared emission of InAs/GaSb superlattices grown by MOVPE was compared with the calculated spectrum by perturbation method. Above 90 K, the emission from higher energy transitions is larger than those from the lowest levels.

2:15 PM - 2:30 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 104&105)

[CMP11A-04] Electrode Thickness Dependence of GaAs based Photovoltaic Device Characteristics for Optical Wireless Power Transmission
[Presentation Style] Onsite

*Akira Kushiyama[1], Yuga Motomura[1], Kensuke Nishioka[1], Masakazu Arai[1] (1. University of Miyazaki (Japan))

[Presentation Style] Onsite

We experimentally investigated the mesh shaped electrode thickness dependence of GaAs based photovoltaic device under laser irradiation. Thick electrode was effective to increase the fill factor even under partial irradiation.

2:30 PM - 2:45 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 104&105)

[CMP11A-05] Post Growth Annealing and InGaSb Layer Insertion Effects of Metamorphic InAsSb on GaAs Substrate
[Presentation Style] Onsite

*Koki Hombu[1], Shota Nakagawa[1], Yuto Iwakiri[1], Koji Maeda[1], Masakazu Arai[1] (1. Univ. of Miyazaki (Japan))

[Presentation Style] Onsite

We investigated the effect of post-growth annealing on metamorphic InAsSb on GaAs. The mid-infrared range photoluminescence intensity was improved, however, the surface flatness was deteriorated. The photoluminescence was also improved by inserting the InGaSb layer.

2:45 PM - 3:00 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 104&105)

[CMP11A-06] Near-field Analysis of VCSELs after HTOL test
[Presentation Style] Onsite

*Hao-Tien Cheng[1], Taixian Zhang[2], Yun-Cheng Yang[2], Te-Hua Liu[2], Chao-Hsin Wu[1,2] (1. Graduate Inst. of Electronics Engineering, National Taiwan Univ. (Taiwan), 2. Graduate Inst. of Photonics and Optoelectronics, National Taiwan Univ. (Taiwan))

[Presentation Style] Onsite

Investigation on the failure mechanisms of 850 nm vertical-cavity surface-emitting laser (VCSEL) chips in the high-temperature operating life (HTOL) stress tests are presented. Selected failed chips are put into further analysis to study their early failure mechanisms.

III/V Waveguide Devices

Session Chair: Yuqing Jiao (Eindhoven Univ. of Tech.)
Mon. Aug 1, 2022 3:30 PM - 5:15 PM Room 104&105 (1F)

[CMP11B-01 (Invited)] 256-Gbit/s PAM-4 directly modulated membrane lasers on SiC substrate
[Presentation Style] Onsite
*Suguru Yamaoka[1], Nikolaos Panteleimon Diamantopoulos[1], Hidetaka Nishi[1], Takuro Fujii[1], Koji Takeda[1], Tatsurou Hiraki[1], Takuma Tsurugaya[1], Shigeru Kanazawa[2], Hiromasa Tanobe[2], Takaaki Kakitsuka[1], Tai Tsuchizawa[1], Fumio Koyama[3], Shinji Matsuo[1] (1. NTT Device Technology Labs (Japan), 2. NTT Device Innovation Center (Japan), 3. Laboratory for Future Interdisciplinary Research of Science and Technology, Tokyo Institute of Technology (Japan))
3:30 PM - 4:00 PM

[CMP11B-02] Proposal of ReLU activation function using III-V semiconductor membrane laser for optical neural network
[Presentation Style] Onsite
*Naoki Takahashi[1], Weicheng Fang[1], Ruihao Xue[1], Shunto Katsumi[1], Yoshitaka Ohiso[1], Tomohiro Amemiya[1,2], Nobuhiko Nishiyama[1,2] (1. Dept. of Electrical and Electronic Eng., Tokyo Tech (Japan), 2. Inst. of Innovative Research, Tokyo Tech (Japan))
4:00 PM - 4:15 PM

[CMP11B-03] Ultracompact and Broadband InP/InGaAsP Polarization Beam Splitter using Brewster's Law
[Presentation Style] Online
*Abdulaziz E. Elfiqi[1], Dawei Yu[2], Haifeng Shao[2], Takuo Tanemura[1], Yoshiaki Nakano[1] (1. The University of Tokyo (Japan), 2. Hisilicon OptoElectronics Co., Ltd. (China))
4:15 PM - 4:30 PM

[CMP11B-04] Al-Free GaAs Optical Phased Array for Near-Infrared Sensing
[Presentation Style] Onsite
*Chensheng Wu[1], Kento Komatsu[1], Rihoko Tsuchiya[1], Takuo Tanemura[1], Yoshiaki Nakano[1] (1. Univ. of Tokyo (Japan))
4:30 PM - 4:45 PM

[CMP11B-05 (Invited)] III-V-on-Silicon-Nitride Mode-Locked Lasers
[Presentation Style] Online
*Stijn Cuyvers[1,2], Artur Hermans[1,2,3], Stijn Poelman[1,2], Camiel Op de Beeck[1,2], Bahawal Haq[1,2], Gunther Roelkens[1,2], Kasper Van Gasse[1,2,4], Bart Kuyken[1,2] (1. Ghent University - Imec (Belgium), 2. Center for Nano- and Biophotonics (Belgium), 3. Research Lab. of Electronics, MIT (United States of America), 4. E. L. Ginzton Lab., Stanford University (United States of America))
4:45 PM - 5:15 PM

3:30 PM - 4:00 PM (Mon. Aug 1, 2022 3:30 PM - 5:15 PM Room 104&105)

[CMP11B-01 (Invited)] 256-Gbit/s PAM-4 directly modulated membrane lasers on SiC substrate

[Presentation Style] Onsite

*Suguru Yamaoka[1], Nikolaos Panteleimon Diamantopoulos[1], Hidetaka Nishi[1], Takuro Fujii[1], Koji Takeda[1], Tatsurou Hiraki[1], Takuma Tsurugaya[1], Shigeru Kanazawa[2], Hiromasa Tanobe[2], Takaaki Kakitsuka[1], Tai Tsuchizawa[1], Fumio Koyama[3], Shinji Matsuo[1] (1. NTT Device Technology Labs (Japan), 2. NTT Device Innovation Center (Japan), 3. Laboratory for Future Interdisciplinary Research of Science and Technology, Tokyo Institute of Technology (Japan))

[Presentation Style] Onsite

A membrane laser on high-thermal-conductivity SiC exhibits a 42-GHz relaxation oscillation frequency because of the large optical confinement and heat dissipation. Photon-photon resonance increases the bandwidth to 108 GHz capable of 256-Gbit/s PAM-4 signal transmission.

4:00 PM - 4:15 PM (Mon. Aug 1, 2022 3:30 PM - 5:15 PM Room 104&105)

[CMP11B-02] Proposal of ReLU activation function using III-V semiconductor membrane laser for optical neural network

[Presentation Style] Onsite

*Naoki Takahashi[1], Weicheng Fang[1], Ruihao Xue[1], Shunto Katsumi[1], Yoshitaka Ohiso[1], Tomohiro Amemiya[1,2], Nobuhiko Nishiyama[1,2] (1. Dept. of Electrical and Electronic Eng., Tokyo Tech (Japan), 2. Inst. of Innovative Research, Tokyo Tech (Japan))

[Presentation Style] Onsite

We introduced programmable low-power-consumption optical ReLU activation function for the fully optical neural network. Optical ReLU function with contrallable threshold was experimentally demonstrated using GaInAsP membrane distributed reflector laser on Si.

4:15 PM - 4:30 PM (Mon. Aug 1, 2022 3:30 PM - 5:15 PM Room 104&105)

[CMP11B-03] Ultracompact and Broadband InP/InGaAsP Polarization Beam Splitter using Brewster's Law

[Presentation Style] Online

*Abdulaziz E. Elfiqi[1], Dawei Yu[2], Haifeng Shao[2], Takuo Tanemura[1], Yoshiaki Nakano[1] (1. The University of Tokyo (Japan), 2. Hisilicon OptoElectronics Co., Ltd. (China))

[Presentation Style] Online

We propose an ultracompact InP/InGaAsP polarization beam splitter based on the Brewster's law. With a footprint of 30×35 μm^2, >20-dB polarization extinction ratio and<0.4-dB insertion loss are obtained over the *C* and *L* bands.

4:30 PM - 4:45 PM (Mon. Aug 1, 2022 3:30 PM - 5:15 PM Room 104&105)

[CMP11B-04] Al-Free GaAs Optical Phased Array for Near-Infrared Sensing

[Presentation Style] Onsite

*Chensheng Wu[1], Kento Komatsu[1], Rihoko Tsuchiya[1], Takuo Tanemura[1], Yoshiaki Nakano[1] (1. Univ. of Tokyo (Japan))

[Presentation Style] Onsite

Al-free GaAs/InGaP-based optical phased array (OPA) working at 905-nm wavelength is numerically demonstrated. Using high-mesa waveguides, large-scale OPA with 128 phase shifters can fit inside 1-mm^2 footprint generating more than 100 resolvable points.

4:45 PM - 5:15 PM (Mon. Aug 1, 2022 3:30 PM - 5:15 PM Room 104&105)

[CMP11B-05 (Invited)] III-V-on-Silicon-Nitride Mode-Locked Lasers

[Presentation Style] Online

*Stijn Cuyvers[1,2], Artur Hermans[1,2,3], Stijn Poelman[1,2], Camiel Op de Beeck[1,2], Bahawal Haq[1,2], Gunther Roelkens[1,2], Kasper Van Gasse[1,2,4], Bart Kuyken[1,2] (1. Ghent University - Imec (Belgium), 2. Center for Nano- and Biophotonics (Belgium), 3. Research Lab. of Electronics, MIT (United States of America), 4. E. L. Ginzton Lab., Stanford University (United States of America))

[Presentation Style] Online

We demonstrate heterogeneously integrated passively mode-locked lasers by microtransfer printing III-V semiconductor optical amplifiers on a silicon nitride photonic chip. A dense and low-noise optical comb is generated, enabling unparalleled precision for on-chip spectroscopy.

2D and Nanocarbon Materials I

Session Chairs: Kazunari Matsuda (Kyoto Univ.), Yuhei Miyauchi (Kyoto Univ.)
Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 206 (2F)

[CMP14A-01 (Invited)] Probing the momentum-resolved dynamics of excitons in 2D semiconductors(TBD)
[Presentation Style] Online
*Keshav Dani[1] (1. Okinawa Inst. of Sci. and Tech., Graduate Univ. (Japan))
1:30 PM - 2:00 PM

[CMP14A-02] Probing the Emission from Hexagonal Boron Nitride with 2D Magnets
[Presentation Style] Online
*Katarzyna Ludwiczak[1], Johannes Binder[1], Aleksandra Krystyna Dąbrowska[1], Joanna Sitnicka[1], Jacek Jasiński[2], Roman Stępniewski[1], Andrzej Wysmołek[1] (1. University of Warsaw (Poland), 2. University of Louisville (United States of America))
2:00 PM - 2:15 PM

[CMP14A-03 (Invited)] Natural hyperbolic plasmon polaritons in 2D materials
[Presentation Style] Online
*Hugen Yan[1] (1. Fudan University (China))
2:15 PM - 2:45 PM

[CMP14A-04] Exciton-phonon interactions in Janus WSSe
[Presentation Style] Onsite
*Ufuk Erkilic[1], Shengnan Wang[1], Yoshitaka Taniyasu[1] (1. NTT Basic Res. Labs. (Japan))
2:45 PM - 3:00 PM

1:30 PM - 2:00 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 206)

[CMP14A-01 (Invited)] Probing the momentum-resolved dynamics of excitons in 2D semiconductors(TBD)

[Presentation Style] Online

*Keshav Dani[1] (1. Okinawa Inst. of Sci. and Tech., Graduate Univ. (Japan))

[Presentation Style] Online

Using time- and angle-resolved photoemission spectroscopy of microscopic samples of two-dimensional semiconductors, we study the nature of excitonic excitations.

2:00 PM - 2:15 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 206)

[CMP14A-02] Probing the Emission from Hexagonal Boron Nitride with 2D Magnets

[Presentation Style] Online

*Katarzyna Ludwiczak[1], Johannes Binder[1], Aleksandra Krystyna Dąbrowska[1], Joanna Sitnicka[1], Jacek Jasiński[2], Roman Stępniewski[1], Andrzej Wysmołek[1] (1. University of Warsaw (Poland), 2. University of Louisville (United States of America))

[Presentation Style] Online

We found a strong correlation between the optical emission from hexagonal boron nitride and a magnetic phase transition in two-dimensional magnet. Our approach demonstrates a novel method to locally apply magnetic fields and address defects.

2:15 PM - 2:45 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 206)

[CMP14A-03 (Invited)] Natural hyperbolic plasmon polaritons in 2D materials

[Presentation Style] Online

*Hugen Yan[1] (1. Fudan University (China))

[Presentation Style] Online

In-plane hyperbolic plasmon polaritons naturally exist in some 2D materials, which promise applications in on-chip photonics. In this paper, I'll show our investigation of such plasmons in WTe_2 thin films through far-field infrared spectroscopy.

2:45 PM - 3:00 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 206)

[CMP14A-04] Exciton-phonon interactions in Janus WSSe

[Presentation Style] Onsite

*Ufuk Erkilic[1], Shengnan Wang[1], Yoshitaka Taniyasu[1] （1. NTT Basic Res. Labs. (Japan)）
[Presentation Style] Onsite
Interactions of excitons with phonons determine the exciton dynamics in semiconductors. In this work, by investigating temperature dependence of exciton transition energies and linewidths, we revealed enhanced exciton-phonon interaction in monolayer Janus WSSe.

2D and Nanocarbon Materials II

Session Chairs: Kazunari Matsuda (Kyoto Univ.), Yuhei Miyauchi (Kyoto Univ.)
Mon. Aug 1, 2022 3:30 PM - 5:30 PM Room 206 (2F)

[CMP14B-01 (Tutorial)] Raman Spectroscopy for 2-Dimensional Materials Research
[Presentation Style] Online
*Hyeonsik Cheong[1] (1. Sogang University (Korea))
3:30 PM - 4:30 PM

[CMP14B-02] Observation of Moiré Exciton Dynamics in Twisted $MoSe_2$-WSe_2 Heterstrobilayer
[Presentation Style] Onsite
*Heejun Kim[1], Kumpei Aino[1], Keisuke Shinokita[1], Wenjin Zhang[1], Kenji Watanabe[2], Takashi Taniguchi[3], Kazunari Matsuda[1] (1. Inst. of Advanced Energy, Kyoto Univ. (Japan), 2. Res. Center for Fundamental Materials, National Inst. for material science (Japan), 3. Int'l Center for Material Nanoachitecture, National Inst. for Material Science (Japan))
4:30 PM - 4:45 PM

[CMP14B-03 (Invited(P))] Comparison of Light Emission of Metallic Carbon Nanotubes under Laser- and Joule-Heating Conditions
[Presentation Style] Onsite
*Taishi Nishihara[1], Akira Takakura[1], Yuhei Miyauchi[1] (1. Institute of Advanced Energy, Kyoto University (Japan))
4:45 PM - 5:15 PM

[CMP14B-04] Nonlinear Dynamics in Optical Waveguides with CVD-Grown 2D-Material Coating
[Presentation Style] Online
*Gia Quyet Ngo[1], Emad Najafidehaghani[2], Ziyang Gan[2], Sara Khazaee[3], Malte Per Siems[1], Antony George[2], Ulf Peschel[3], Alessandro Tuniz[4], Heike Ebendorff-Heidepriem[5], Markus A. Schmidt[6], Andrey Turchanin[2], Falk Eilenberger[1,7] (1. Friedrich Schiller Univ. Jena, Inst. of Applied Physics (Germany), 2. Friedrich Schiller Univ. Jena, Inst. of Physical Chemistry (Germany), 3. Friedrich Schiller Univ. Jena, Inst. of Solid State Theory and Optics (Germany), 4. University of Sydney, School of Physics (Australia), 5. University of Adelaide, Inst. for Photonics and Advanced Sensing (Australia), 6. Leibniz Inst. of Photonic Technology (Germany), 7. Fraunhofer Inst. for Applied Optics and Precision Engineering (Germany))
5:15 PM - 5:30 PM

3:30 PM - 4:30 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Room 206)

[CMP14B-01 (Tutorial)] Raman Spectroscopy for 2-Dimensional Materials Research
[Presentation Style] Online

*Hyeonsik Cheong[1] (1. Sogang University (Korea))

[Presentation Style] Online

Raman spectroscopy is a powerful tool to study various physical properties of 2-dimensional (2D) materials. It is routinely used to determine the number of layers, polytypes, and crystallographic directions and to estimate doping or strain in various 2D materials. Its use is further expanded to investigate magnetic ordering in ferromagnetic or antiferromagnetic materials. On the other hand, strong resonance effects induce peculiarities in the Raman spectra that are often misinterpreted by non-specialists. This tutorial is intended for people who use Raman spectroscopy or interpret Raman data in their research but are not Raman specialists. I will review some typical applications of Raman spectroscopy in 2D materials research with specific examples.

4:30 PM - 4:45 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Room 206)

[CMP14B-02] Observation of Moiré Exciton Dynamics in Twisted $MoSe_2$-WSe_2 Heterstrobilayer
[Presentation Style] Onsite

*Heejun Kim[1], Kumpei Aino[1], Keisuke Shinokita[1], Wenjin Zhang[1], Kenji Watanabe[2], Takashi Taniguchi[3], Kazunari Matsuda[1] (1. Inst. of Advanced Energy, Kyoto Univ. (Japan), 2. Res. Center for Fundamental Materials, National Inst. for material science (Japan), 3. Int'l Center for Material Nanoachitecture, National Inst. for Material Science (Japan))

[Presentation Style] Onsite

We have studied the moiré excitons with bright and dark states by using a temperature-dependent and time-resolved photoluminescence spectroscopy in twisted $MoSe_2$-WSe_2 heterobilayer. The dynamics of moiré excitons has been revealed.

4:45 PM - 5:15 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Room 206)

[CMP14B-03 (Invited(P))] Comparison of Light Emission of Metallic Carbon Nanotubes under Laser- and Joule-Heating Conditions
[Presentation Style] Onsite

*Taishi Nishihara[1], Akira Takakura[1], Yuhei Miyauchi[1] (1. Institute of Advanced Energy, Kyoto University (Japan))

[Presentation Style] Onsite

We report high temperature light emission of an individual metallic single-walled carbon nanotube under laser- or Joule-heating conditions, which exhibit different spectral shape reflecting on different population of electrons and phonons.

5:15 PM - 5:30 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Room 206)

[CMP14B-04] Nonlinear Dynamics in Optical Waveguides with CVD-Grown 2D-Material Coating

[Presentation Style] Online

*Gia Quyet Ngo[1], Emad Najafidehaghani[2], Ziyang Gan[2], Sara Khazaee[3], Malte Per Siems[1], Antony George[2], Ulf Peschel[3], Alessandro Tuniz[4], Heike Ebendorff-Heidepriem[5], Markus A. Schmidt[6], Andrey Turchanin[2], Falk Eilenberger[1,7] (1. Friedrich Schiller Univ. Jena, Inst. of Applied Physics (Germany), 2. Friedrich Schiller Univ. Jena, Inst. of Physical Chemistry (Germany), 3. Friedrich Schiller Univ. Jena, Inst. of Solid State Theory and Optics (Germany), 4. University of Sydney, School of Physics (Australia), 5. University of Adelaide, Inst. for Photonics and Advanced Sensing (Australia), 6. Leibniz Inst. of Photonic Technology (Germany), 7. Fraunhofer Inst. for Applied Optics and Precision Engineering (Germany))

[Presentation Style] Online

We report a nonlinear photonics platform possessing a substantial second-order susceptibility and demonstrate the enhancement of second-harmonic generation in resonance with excitons. Here, exposed-core fibers, functionalized with MoS_2 monolayers provide a long light-matter interaction scheme.

Oral Session | CLEO-PR2022 | New Technology

New Technology

Session Chair: Takashi Katagiri (Univ. of Toyama)

Mon. Aug 1, 2022 1:30 PM - 3:00 PM Mid-sized Hall A (1F)

[CMP15A-01 (Invited)] Minimally-Invasive Lensless Computational Microendoscopy
[Presentation Style] Online

*Mark A. Foster[1] (1. Johns Hopkins University (United States of America))

1:30 PM - 2:00 PM

[CMP15A-02] Quantification of Natural Killer Cell Activation using Lens-free Shadow Imaging Technology
[Presentation Style] Onsite

*Ahyeon Lee[1], Inha Lee[1], Sanghoon Shin[1], Samir Kumar[1], Minyoung Baik[1], Hyun Sik Jun[1], Sungkyu Seo[1] (1. Korea Univ. (Korea))

2:00 PM - 2:15 PM

[CMP15A-03] Machine Learning-based Blast Cell Detection Using Lens-free Shadow Imaging Technology
[Presentation Style] Onsite

*Minyoung Baik[1], Sanghoon Shin[1], Jinyoung Kim[1], Yeonghun Chae[2], Samir Kumar[1], Ka-Won Kang[1], Byung-Soo Kim[1], Myung-Hyun Nam[1], Ahyeon Lee[1], Sungkyu Seo[1] (1. Korea Univ. (Korea), 2. Season Inc. (Korea))

2:15 PM - 2:30 PM

[CMP15A-04] Cross Detection of Biomarkers Using Electro-Chemically Controlled Photonic Crystal Nanolaser Sensor
[Presentation Style] Onsite

*Shoji Hachuda[1], Hiroya Taguchi[1], Toshihiko Baba[1] (1. Yokohama Nat'l Univ. (Japan))

2:30 PM - 2:45 PM

[CMP15A-05] Randomly localized plasmonic speckles by disordered nanoislands for super-resolution microscopy
[Presentation Style] Online

*Hajun Yoo[1], Hongki Lee[1], Woo Joong Rhee[2], Gwiyeong Moon[1], Changhun Lee[1], Jeon-Soo Shin[2], Donghyun Kim[1] (1. Yonsei Univ. (Korea), 2. Yonsei Univ. College of Medicine (Korea))

2:45 PM - 3:00 PM

1:30 PM - 2:00 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Mid-sized Hall A)

[CMP15A-01 (Invited)] Minimally-Invasive Lensless Computational Microendoscopy
[Presentation Style] Online

*Mark A. Foster[1] （1. Johns Hopkins University (United States of America)）

[Presentation Style] Online

The distal lens is the primary limitation to the invasiveness of microendoscopes. Here we demonstrate a distal lens-free microendoscope that simultaneously achieves miniaturization and exceptionally wide FOV as well as volumetric imaging with computational refocusing.

2:00 PM - 2:15 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Mid-sized Hall A)

[CMP15A-02] Quantification of Natural Killer Cell Activation using Lens-free Shadow Imaging Technology
[Presentation Style] Onsite

*Ahyeon Lee[1], Inha Lee[1], Sanghoon Shin[1], Samir Kumar[1], Minyoung Baik[1], Hyun Sik Jun[1], Sungkyu Seo[1] （1. Korea Univ. (Korea)）

[Presentation Style] Onsite

This study presents a novel method for measuring natural killer(NK) cell activity using 470 nm LED light and a CMOS sensor. By measuring the NK cell activity, we can prepare for weakened immunity and diseases.

2:15 PM - 2:30 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Mid-sized Hall A)

[CMP15A-03] Machine Learning-based Blast Cell Detection Using Lens-free Shadow Imaging Technology
[Presentation Style] Onsite

*Minyoung Baik[1], Sanghoon Shin[1], Jinyoung Kim[1], Yeonghun Chae[2], Samir Kumar[1], Ka-Won Kang[1], Byung-Soo Kim[1], Myung-Hyun Nam[1], Ahyeon Lee[1], Sungkyu Seo[1] （1. Korea Univ. (Korea), 2. Season Inc. (Korea)）

[Presentation Style] Onsite

We present a method for detecting CD34, a blast marker required for leukemia diagnosis, using a lens-free shadow imaging system based on machine learning with 96% accuracy.

2:30 PM - 2:45 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Mid-sized Hall A)

[CMP15A-04] Cross Detection of Biomarkers Using Electro-Chemically Controlled Photonic Crystal Nanolaser Sensor
[Presentation Style] Onsite

*Shoji Hachuda[1], Hiroya Taguchi[1], Toshihiko Baba[1] (1. Yokohama Nat'l Univ. (Japan))
[Presentation Style] Onsite
Using an electro-chemically controlled photonic crystal nanolaser, we succeeded in 100% cross-detection of four biomarkers and detection of COVID-19 spike protein. Both detection limits are in the range of aM to fM.

2:45 PM - 3:00 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Mid-sized Hall A)

[CMP15A-05] Randomly localized plasmonic speckles by disordered nanoislands for super-resolution microscopy
[Presentation Style] Online

*Hajun Yoo[1], Hongki Lee[1], Woo Joong Rhee[2], Gwiyeong Moon[1], Changhun Lee[1], Jeon-Soo Shin[2], Donghyun Kim[1] (1. Yonsei Univ. (Korea), 2. Yonsei Univ. College of Medicine (Korea))
[Presentation Style] Online
Temperature-annealed metallic nanoislands were used to create randomly localized plasmonic nanospeckles. Experimental studies using nanospeckle illumination microscopy (NanoSIM) confirmed that NanoSIM reconstructs images with improved peak-to-peak localization performance compared to diffraction-limited systems.

Oral Session | CLEO-PR2022 | Hardware and System

Hardware and System

Session Chair: Yuji Matsuura (Tohoku Univ.)

Mon. Aug 1, 2022 4:00 PM - 5:00 PM Mid-sized Hall A (1F)

[CMP15B-02] Rapid Three-Dimensional Imaging Using Visible Bessel Beams Eliminating Side Lobe Effects

[Presentation Style] Onsite

*Yuichi Kozawa[1], Yuuki Uesugi[1], Shunichi Sato[1] (1. IMRAM, Tohoku Univ. (Japan))

4:00 PM - 4:15 PM

[CMP15B-03] Highly Efficient Assembly of Bacteria by Portable Optical Condensation System with Multiple Compact Laser Modules

[Presentation Style] Onsite

*Takuya Iida[1,2], Kota Hayashi[1,2,3], Taichi Suehiro[1,2,3], Yasuyuki Yamamoto[1,2,3], Mamoru Tamura[2,4], Ryota Ishikura[2,3], Kenji Sakurai[2,3], Shiho Tokonami[2,3], Hirohito Washida[5], Tsutomu Yamasaki[5], Hiroki Ishikawa[5] (1. Graduate School of Science, Osaka Prefecture University (Japan), 2. Research Institute for Light-induced Acceleration System (RILACS), Osaka Prefecture University (Japan), 3. Graduate School of Engineering, Osaka Prefecture University (Japan), 4. Graduate School of Engineering Science, Osaka University (Japan), 5. Murata Manufacturing Co., Ltd., (Japan))

4:15 PM - 4:30 PM

[CMP15B-04] Biological Tissue Analysis by Mid-infrared Photoacoustic Spectroscopy Using Piezoelectric Transducer

[Presentation Style] Onsite

*Ryota Sasaki[1], Saiko Kino[1], Yuji Matsuura[1] (1. Tohoku Univ. (Japan))

4:30 PM - 4:45 PM

[CMP15B-05] A Computational Efficient Temporal Convolutional Network for Heart Rate Monitoring under Strenuous Exercising Condition using a mm-Wave FMCW Radar

[Presentation Style] Online

*Shih-Hsuan Lai[1], Chun-Chia Chen[1], Chun-Yen Chuang[1], Zai-Yuan Han[1], Kyle Cheng[2], Irwin Chen[2], Vincent Wu[2], Jyehong Chen[1] (1. National Yang Ming Chiao Tung University (Taiwan), 2. Wistron Corporation (Taiwan))

4:45 PM - 5:00 PM

4:00 PM - 4:15 PM (Mon. Aug 1, 2022 4:00 PM - 5:00 PM Mid-sized Hall A)

[CMP15B-02] Rapid Three-Dimensional Imaging Using Visible Bessel Beams Eliminating Side Lobe Effects
[Presentation Style] Onsite

*Yuichi Kozawa[1], Yuuki Uesugi[1], Shunichi Sato[1] (1. IMRAM, Tohoku Univ. (Japan))

[Presentation Style] Onsite

Axially resolved, volumetric imaging using a visible Bessel beam with wavefront modulation for fluorescence is proposed. Rapid acquisition of volumetric images without apparent side lobe effects is demonstrated even for the one-photon excitation process.

4:15 PM - 4:30 PM (Mon. Aug 1, 2022 4:00 PM - 5:00 PM Mid-sized Hall A)

[CMP15B-03] Highly Efficient Assembly of Bacteria by Portable Optical Condensation System with Multiple Compact Laser Modules
[Presentation Style] Onsite

*Takuya Iida[1,2], Kota Hayashi[1,2,3], Taichi Suehiro[1,2,3], Yasuyuki Yamamoto[1,2,3], Mamoru Tamura[2,4], Ryota Ishikura[2,3], Kenji Sakurai[2,3], Shiho Tokonami[2,3], Hirohito Washida[5], Tsutomu Yamasaki[5], Hiroki Ishikawa[5] (1. Graduate School of Science, Osaka Prefecture University (Japan), 2. Research Institute for Light-induced Acceleration System (RILACS), Osaka Prefecture University (Japan), 3. Graduate School of Engineering, Osaka Prefecture University (Japan), 4. Graduate School of Engineering Science, Osaka University (Japan), 5. Murata Manufacturing Co., Ltd., (Japan))

[Presentation Style] Onsite

We developed a portable optical condensation system with multiple compact laser modules, and demonstrated highly efficient light-induced assembly. Remarkably, we succeeded in light-induced assembly of bacteria beyond 10^5 cells within a few minutes.

4:30 PM - 4:45 PM (Mon. Aug 1, 2022 4:00 PM - 5:00 PM Mid-sized Hall A)

[CMP15B-04] Biological Tissue Analysis by Mid-infrared Photoacoustic Spectroscopy Using Piezoelectric Transducer
[Presentation Style] Onsite

*Ryota Sasaki[1], Saiko Kino[1], Yuji Matsuura[1] (1. Tohoku Univ. (Japan))

[Presentation Style] Onsite

A piezoelectric photoacoustic spectroscopy system detecting ultrasound induced by irradiation of mid-infrared laser light is developed. A photoacoustic spectrum of human skin was obtained and an investigation to improve the sensitivity is performed.

4:45 PM - 5:00 PM (Mon. Aug 1, 2022 4:00 PM - 5:00 PM Mid-sized Hall A)

[CMP15B-05] A Computational Efficient Temporal Convolutional Network for Heart Rate Monitoring under Strenuous Exercising Condition using a mm-Wave FMCW Radar [Presentation Style] Online

*Shih-Hsuan Lai[1], Chun-Chia Chen[1], Chun-Yen Chuang[1], Zai-Yuan Han[1], Kyle Cheng[2], Irwin Chen[2], Vincent Wu[2], Jyehong Chen[1] （1. National Yang Ming Chiao Tung University (Taiwan), 2. Wistron Corporation (Taiwan)）

[Presentation Style] Online

A mm-Wave FMCW radar system with a low-complexity temporal convolutional network for non-contact exercise heart-rate monitoring is demonstrated. With around 10% of original parameters, we achieve 85% average accuracy on various types of exercise equipment.

Metamaterial Devices

Session Chairs: Takuo Tanaka (RIKEN), Yu-Jung Lu (Academia Sinica)
Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 204 (2F)

[CMP16A-01 (Invited(P))] High Dimensional Optical Meta-devices: Classical to Quantum
[Presentation Style] Online
*Din Ping TSAI[1], Mu Ku Chen[1], Jingcheng Zhang[1], Xiaoyuan Liu[1] (1. City University of Hong Kong (Hong Kong))
1:30 PM - 2:00 PM

[CMP16A-02] High Transmittance Multicolor Metasurface Holograms Made of Silicon Nitride
[Presentation Style] Onsite
*Masakazu Yamaguchi[1], Hiroki Hiroki[1], Naoyuki Yamada[1], Satoshi Ikezawa[1], Kentaro Iwami[1] (1. Tokyo University of Agriculuture and Technology (Japan))
2:00 PM - 2:15 PM

[CMP16A-03] Meta-optic for Intelligent Imaging and Sensing
[Presentation Style] Online
*Xiaoyuan Liu[1], Mu Ku Chen[1], Yubin Fan[1], Jin Yao[1], Yao Liang[1], Jingcheng Zhang[1], Linshan Sun[1], Din Ping Tsai[1] (1. City University of Hong Kong (Hong Kong))
2:15 PM - 2:30 PM

[CMP16A-04] Plasmonic Color Generation by Metal Nanopillar Array
[Presentation Style] Online
*Yosuke Sugimoto[1], Mana Toma[1], Kotaro Kajikawa[1] (1. Tokyo Institute of Technology (Japan))
2:30 PM - 2:45 PM

[CMP16A-05] Metasurface measuring twisted light in turbulence
[Presentation Style] Online
Thomas Dinter[1], Lucca Kühner[2], Chenhao Li[2], Thomas Weber[2], Andreas Tittl[2], Stefan A. Maier[2,3], Judith M. Dawes[1], *Haoran Ren[1] (1. Macquarie University (Australia), 2. Ludwig-Maximilians-University Munich, Munich (Germany), 3. Imperial College London (UK))
2:45 PM - 3:00 PM

1:30 PM - 2:00 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 204)

[CMP16A-01 (Invited(P))] High Dimensional Optical Meta-devices: Classical to Quantum [Presentation Style] Online

*Din Ping TSAI[1], Mu Ku Chen[1], Jingcheng Zhang[1], Xiaoyuan Liu[1] (1. City University of Hong Kong (Hong Kong))

[Presentation Style] Online

Meta-devices are ultra-thin optical elements with artificial nanoantennas. The applications of the meta-lens array are discussed from classical to quantum optics. The imaging, sensing, edge detecting, and high-dimensional quantum entanglement light source are demonstrated.

2:00 PM - 2:15 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 204)

[CMP16A-02] High Transmittance Multicolor Metasurface Holograms Made of Silicon Nitride [Presentation Style] Onsite

*Masakazu Yamaguchi[1], Hiroki Hiroki[1], Naoyuki Yamada[1], Satoshi Ikezawa[1], Kentaro Iwami[1] (1. Tokyo University of Agriculuture and Technology (Japan))

[Presentation Style] Onsite

High transmittance multicolor metasurface holograms were fabricated using SiN. The hologram showed successful projection of color image with high brightness. The average transmittance was 97%, which was much higher than that of previous studies.

2:15 PM - 2:30 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 204)

[CMP16A-03] Meta-optic for Intelligent Imaging and Sensing [Presentation Style] Online

*Xiaoyuan Liu[1], Mu Ku Chen[1], Yubin Fan[1], Jin Yao[1], Yao Liang[1], Jingcheng Zhang[1], Linshan Sun[1], Din Ping Tsai[1] (1. City University of Hong Kong (Hong Kong))

[Presentation Style] Online

We developed a meta-lens array based light field imaging system for full-color imaging, depth perception, edge detection and intelligent sensing. We reported the design, fabrication, and applications of the intelligent meta-lens.

2:30 PM - 2:45 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 204)

[CMP16A-04] Plasmonic Color Generation by Metal Nanopillar Array [Presentation Style] Online

*Yosuke Sugimoto[1], Mana Toma[1], Kotaro Kajikawa[1] （1. Tokyo Institute of Technology (Japan)）
[Presentation Style] Online
Metal nanopillar arrays were fabricated by metal deposition on manufactured moth-eye film. They showed plasmonic colors varied by the metal thickness. The colors from metal nanopillars arrays can be applied for colorimetric plasmonic biosensors.

2:45 PM - 3:00 PM (Mon. Aug 1, 2022 1:30 PM - 3:00 PM Room 204)

[CMP16A-05] Metasurface measuring twisted light in turbulence

[Presentation Style] Online

Thomas Dinter[1], Lucca Kühner[2], Chenhao Li[2], Thomas Weber[2], Andreas Tittl[2], Stefan A. Maier[2,3], Judith M. Dawes[1], *Haoran Ren[1] （1. Macquarie University (Australia), 2. Ludwig-Maximilians-University Munich, Munich (Germany), 3. Imperial College London (UK)）
[Presentation Style] Online
Practical free-space communication systems suffer from turbulence-induced phase distortions to propagating beams, destroying the orthogonality of orbital angular momentum (OAM) modes used for space-division multiplexing and introducing modal crosstalk. Here we present the design and use of an ultrathin OAM mode-sorting metasurface for investigating the deterioration of OAM orthogonality under different turbulence conditions, offering a compact, fast and efficient way to measure the OAM spectrum.

Fabrication Technologies for Plasmonics and Metamaterials

Session Chair: Wakana Kubo (Tokyo Univ. of Agriculture and Tech.)

Mon. Aug 1, 2022 3:30 PM - 4:45 PM Room 204 (2F)

[CMP16B-01 (Invited)] 3D Laser Nanoprinting: Recent Progress
[Presentation Style] Online

*Martin Wegener[1] （1. Karlsruhe Institute of Technology (KIT) (Germany)）

3:30 PM - 4:00 PM

[CMP16B-02] Resonant laser printing of photonic metasurfaces -structural colors, metalenses and holograms

*Xiaolong Zhu[1] （1. East China Normal University (China)）

4:00 PM - 4:15 PM

[CMP16B-03] Fabrication technology of a low-loss plasmonic waveguide containing both “plasmonic- friendly” and “plasmonic-unfriendly” metals
[Presentation Style] Online

*Vadym Zayets[1], Iryna Serdeha[2], Valerii Grygoruk[2] （1. AIST (Japan), 2. Kyiv Univ. (Ukraine)）

4:15 PM - 4:30 PM

[CMP16B-04] Experimental Demonstration of Deformation Robust Flexible Flat Optics for the Visible
[Presentation Style] Online

*Arturo Burguete Lopez[1], Maksim Makaarenko[1], Fedor Getman[1], Qizhou Wang[1], Andrea Fratalocchi[1] （1. King Abdullah University of Science and Technology (Saudi Arabia)）

4:30 PM - 4:45 PM

3:30 PM - 4:00 PM (Mon. Aug 1, 2022 3:30 PM - 4:45 PM Room 204)

[CMP16B-01 (Invited)] 3D Laser Nanoprinting: Recent Progress
[Presentation Style] Online

*Martin Wegener[1] (1. Karlsruhe Institute of Technology (KIT) (Germany))

[Presentation Style] Online

Two-photon 3D printing has become a mature technology. Here, we review our efforts on using two-step absorption instead of two-photon absorption. The approach works with low-power continuous-wave laser diodes. We present one- and two-color results.

4:00 PM - 4:15 PM (Mon. Aug 1, 2022 3:30 PM - 4:45 PM Room 204)

[CMP16B-02] Resonant laser printing of photonic metasurfaces - structural colors, metalenses and holograms

*Xiaolong Zhu[1] (1. East China Normal University (China))

We introduced a resonant laser printing (RLP) technique as a feasible photo-thermal post-writing technology for mass-customization of photonic metasurfaces for use in structural color, metalens and hologram applications.

4:15 PM - 4:30 PM (Mon. Aug 1, 2022 3:30 PM - 4:45 PM Room 204)

[CMP16B-03] Fabrication technology of a low-loss plasmonic waveguide containing both “plasmonic- friendly” and “plasmonic- unfriendly” metals
[Presentation Style] Online

*Vadym Zayets[1], Iryna Serdeha[2], Valerii Grygoruk[2] (1. AIST (Japan), 2. Kyiv Univ. (Ukraine))

[Presentation Style] Online

Fabrication technology, which allows a substantial decrease of the plasmonic propagation loss for both a “plasmon- friendly” metal like Au, Cu or Al and “plasmon- unfriendly” metal like Co, Fe or Cr, have been developed and experimentally demonstrated. Optimization of the optical confinement is used to reduce the propagation loss below 1 dB per a plasmonic device.

4:30 PM - 4:45 PM (Mon. Aug 1, 2022 3:30 PM - 4:45 PM Room 204)

[CMP16B-04] Experimental Demonstration of Deformation Robust Flexible Flat Optics for the Visible
[Presentation Style] Online

*Arturo Burguete Lopez[1], Maksim Makaarenko[1], Fedor Getman[1], Qizhou Wang[1], Andrea Fratalocchi[1] (1. King Abdullah University of Science and Technology (Saudi Arabia))

[Presentation Style] Online

We present experimentally realized flexible flat optics polarizers for the visible range. We show that upon curving the devices, their polarization efficiency is maintained within 5% with an 85% maximum efficiency.

THz Transmission System

Session Chair: Shota Ishimura (KDDI Research Inc.)

Mon. Aug 1, 2022 1:30 PM - 2:45 PM Room 207 (2F)

[CMP18A-01] Output Power Enhancement in Photonic-Based RF Generation by Optical Pulse Compression: Performance Improvement of 300-GHz band 10-Gbit/s ASK system
[Presentation Style] Onsite

Keita Toichi[1], Yuta Uemura[1], Keita Ogawa[2], Wataru Tada[2], Masayuki Suzuki[2], *Hiroyuki Toda[2], Masayuki Fujita[1], Tadao Nagatsuma[1] (1. Osaka Univ. (Japan), 2. Doshisha Univ. (Japan))

1:30 PM - 1:45 PM

[CMP18A-02] Demonstration of THz wireless transmission using cost-effective directly modulated laser for real-time ultra high definition video streaming service
[Presentation Style] Onsite

*Eon-sang Kim[1], Sang-rok Moon[1], Minkyu Sung[1], Joon Ki Lee[1], Seung-hyun Cho[1] (1. Electronics and Telecommunications Research Inst. (Korea))

1:45 PM - 2:00 PM

[CMP18A-03] Photonic-Wireless Seamless Network to support 6G Radio Access Network in Terahertz Band
[Presentation Style] Online

*Minkyu Sung[1], Eon-Sang Kim[1], Sang-Rok Moon[1], Joon Ki Lee[1], Seung-Hyun Cho[1] (1. Electronics and Telecommunications Research Institute (ETRI) (Korea))

2:00 PM - 2:15 PM

[CMP18A-04 (Invited)] Multi-dimensional Multiplexed Fiber-Wireless Transmission in the THz Band
[Presentation Style] Online

*Xianbin Yu[1,2], Hongqi Zhang[1], Zuomin Yang[1], Zijie Lu[1], Shiwei Wang[1], Xiaodan Pang[3], Lu Zhang[1,2], Xianmin Zhang[1] (1. Zhejiang University (China), 2. Zhejiang Lab (China), 3. KTH Royal Institute of Technology (Sweden))

2:15 PM - 2:45 PM

1:30 PM - 1:45 PM (Mon. Aug 1, 2022 1:30 PM - 2:45 PM Room 207)

[CMP18A-01] Output Power Enhancement in Photonic-Based RF Generation by Optical Pulse Compression: Performance Improvement of 300-GHz band 10-Gbit/s ASK system [Presentation Style] Onsite

Keita Toichi[1], Yuta Uemura[1], Keita Ogawa[2], Wataru Tada[2], Masayuki Suzuki[2], *Hiroyuki Toda[2], Masayuki Fujita[1], Tadao Nagatsuma[1] (1. Osaka Univ. (Japan), 2. Doshisha Univ. (Japan))

[Presentation Style] Onsite

We experimentally demonstrate performance improvement of photonic-based 300-GHz band 10-Gbit/s ASK system by optical pulse compression in a highly nonlinear fiber. The amplitude of the received eye pattern is increased by 8.1 dB.

1:45 PM - 2:00 PM (Mon. Aug 1, 2022 1:30 PM - 2:45 PM Room 207)

[CMP18A-02] Demonstration of THz wireless transmission using cost-effective directly modulated laser for real-time ultra high definition video streaming service [Presentation Style] Onsite

*Eon-sang Kim[1], Sang-rok Moon[1], Minkyu Sung[1], Joon Ki Lee[1], Seung-hyun Cho[1] (1. Electronics and Telecommunications Research Inst. (Korea))

[Presentation Style] Onsite

We demonstrate a seamless UHD video streaming service over a cost-effective directly modulated DFB-LD-based terahertz wireless link with more than 2-m link distance. The uncompressed 4K video signals were successfully transmitted with no black frames.

2:00 PM - 2:15 PM (Mon. Aug 1, 2022 1:30 PM - 2:45 PM Room 207)

[CMP18A-03] Photonic-Wireless Seamless Network to support 6G Radio Access Network in Terahertz Band [Presentation Style] Online

*Minkyu Sung[1], Eon-Sang Kim[1], Sang-Rok Moon[1], Joon Ki Lee[1], Seung-Hyun Cho[1] (1. Electronics and Telecommunications Research Institute (ETRI) (Korea))

[Presentation Style] Online

We experimentally demonstrate the photonic-wireless network for 6G-RAN in 0.3 terahertz. Technical consideration for implementation of photonic-wireless network is discussed through noise contribution analysis.

2:15 PM - 2:45 PM (Mon. Aug 1, 2022 1:30 PM - 2:45 PM Room 207)

[CMP18A-04 (Invited)] Multi-dimensional Multiplexed Fiber-Wireless Transmission in the THz Band

[Presentation Style] Online

*Xianbin Yu[1,2], Hongqi Zhang[1], Zuomin Yang[1], Zijie Lu[1], Shiwei Wang[1], Xiaodan Pang[3], Lu Zhang[1,2], Xianmin Zhang[1] （1. Zhejiang University (China), 2. Zhejiang Lab (China), 3. KTH Royal Institute of Technology (Sweden)）

[Presentation Style] Online

We propose and experimentally demonstrate multi-dimensional multiplexed THz photonic wireless communication systems, achieving wireless net data rates of up to 510 Gbit/s and 1.059 Tbit/s in the 350 GHz band.

Oral Session | CLEO-PR2022 | Devices and Subsystems for Microwave Photonics

Devices and Subsystems for Microwave Photonics

Session Chair: Hiroyuki Toda (Doshisha Univ)

Mon. Aug 1, 2022 3:30 PM - 5:30 PM Room 207 (2F)

[CMP18B-01 (Invited)] THz and photonics convergence for future access links
[Presentation Style] Onsite
*Tetsuya Kawanishi Kawanishi[1] (1. Waseda University (Japan))
3:30 PM - 4:00 PM

[CMP18B-02] 5G Wireless-Optical Signal Converter Using Antenna-Coupled Electrode Electro-Optic Modulator and WDM Add/Drop Filters
[Presentation Style] Onsite
Hiroto Miyazaki[1], Hiroto Yokohashi[1], *Hiroshi Murata[1] (1. Mie Univ. (Japan))
4:00 PM - 4:15 PM

[CMP18B-03] Antenna-Coupled Optical Modulators Using Electro-Optic Polymer Waveguides and Non-Coplanar Patch Antennas
[Presentation Style] Onsite
*Takahiro Kaji[1], Isao Morohashi[1], Yukihiro Tominari[1], Toshiki Yamada[1], Akira Otomo[1] (1. NICT (Japan))
4:15 PM - 4:30 PM

[CMP18B-04] Spectrally Efficient THz-wave Multi-carrier Wireless Communication Using THz-domain Fourier Transformation-type Demultiplexer
[Presentation Style] Onsite
*Koichi Takiguchi[1], Nozomu Nishio[1] (1. Ritsumeikan Univ. (Japan))
4:30 PM - 4:45 PM

[CMP18B-05] Dual-comb-based Microwave Photonic Beamforming
[Presentation Style] Online
*Mian Wang[1], XiaoXiao Xue[1], Yunlu Xing[1], Shangyuan Li[1], Xiaoping Zheng[1] (1. Tsinghua Univ. (China))
4:45 PM - 5:00 PM

[CMP18B-06 (Invited)] Actuating stimulated Brillouin scattering in silicon nitride photonic circuits
[Presentation Style] Online
Kaixuan Ye[1], Roel Botter[1], Okky Daulay[1], Yvan Klaver[1], *David Marpaung[1] (1. Univ. of Twente (Netherlands))
5:00 PM - 5:30 PM

3:30 PM - 4:00 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Room 207)

[CMP18B-01 (Invited)] THz and photonics convergence for future access links

[Presentation Style] Onsite

*Tetsuya Kawanishi Kawanishi[1] (1. Waseda University (Japan))

[Presentation Style] Onsite

We review seamless networks consisting of THz radio and optical fiber links. Transmission distance of THz links is shorter than 1km, but is longer than typical radii of small cells for future mobile networks.

4:00 PM - 4:15 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Room 207)

[CMP18B-02] 5G Wireless-Optical Signal Converter Using Antenna-Coupled Electrode Electro-Optic Modulator and WDM Add/Drop Filters

[Presentation Style] Onsite

Hiroto Miyazaki[1], Hiroto Yokohashi[1], *Hiroshi Murata[1] (1. Mie Univ. (Japan))

[Presentation Style] Onsite

A 5G wireless-optical signal converter module is fabricated using an antenna-coupled electrode electro-optic modulator and WDM add/drop filters. This is suitable for a passive signal converter for up-link in mobile front-hauls in dense user environment.

4:15 PM - 4:30 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Room 207)

[CMP18B-03] Antenna-Coupled Optical Modulators Using Electro-Optic Polymer Waveguides and Non-Coplanar Patch Antennas

[Presentation Style] Onsite

*Takahiro Kaji[1], Isao Morohashi[1], Yukihiro Tominari[1], Toshiki Yamada[1], Akira Otomo[1] (1. NICT (Japan))

[Presentation Style] Onsite

We fabricated 150-GHz-band antenna-coupled optical modulators using electro-optic (EO) polymer waveguides and non-coplanar patch antennas using a transfer method of a poled EO polymer film and evaluated the device characteristics.

4:30 PM - 4:45 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Room 207)

[CMP18B-04] Spectrally Efficient THz-wave Multi-carrier Wireless Communication Using THz-domain Fourier Transformation-type Demultiplexer

[Presentation Style] Onsite

*Koichi Takiguchi[1], Nozomu Nishio[1] （1. Ritsumeikan Univ. (Japan)）

[Presentation Style] Onsite

We report on spectrally efficient multi-carrier wireless communication in the 300 GHz-band with a THz-domain Fourier transformation-based channel demultiplexer. We carried out 4 x 7.0 Gsymbol/s communication with the spectral efficiency of about 0.6 symbol/s/Hz.

4:45 PM - 5:00 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Room 207)

[CMP18B-05] Dual-comb-based Microwave Photonic Beamforming

[Presentation Style] Online

*Mian Wang[1], XiaoXiao Xue[1], Yunlu Xing[1], Shangyuan Li[1], Xiaoping Zheng[1] （1. Tsinghua Univ. (China)）

[Presentation Style] Online

A novel scheme based on heterodyning of dual optical frequency combs is proposed for wideband phased arrays. True-time-delay beam steering can be achieved without the need for complex delay lines.

5:00 PM - 5:30 PM (Mon. Aug 1, 2022 3:30 PM - 5:30 PM Room 207)

[CMP18B-06 (Invited)] Actuating stimulated Brillouin scattering in silicon nitride photonic circuits

[Presentation Style] Online

Kaixuan Ye[1], Roel Botter[1], Okky Daulay[1], Yvan Klaver[1], *David Marpaung[1] （1. Univ. of Twente (Netherlands)）

[Presentation Style] Online

Stimulated Brillouin scattering (SBS) can enable high-resolution signal processing. Here, we demonstrate advanced control of SBS in multilayer silicon nitride waveguides. We further utilize the SBS gain to demonstrate a high-rejection microwave photonic notch filter.

Oral Session | CLEO-PR2022 | CLEO-PR 2022 Post Deadline

CLEO-PR 2022 Post Deadline

Session Chair: Fumihiko Kannari (Keio Univ.)

Mon. Aug 1, 2022 6:15 PM - 9:00 PM Small Hall (2F)

[CPDP-02] Actively controlled two bit Binary Coding in Graphene assisted Terahertz Metasurface

[Presentation Style] Online

*Dhriti Maurya[1], Gagan Kumar[1] （1. Indian Institute of Technology Guwahati (India)）

6:15 PM - 6:30 PM

[CPDP-03] Low threshold plasmonic lattice laser based on $CsPbBr_3$ quantum dots with directional emission

[Presentation Style] Online

*Di Xing[1], Cheng-Chieh Lin[2,3,4], Ya-Lun Ho [1], Yang-Chun Lee[1], Mu-Hsin Chen[1], Bo-Wei Lin[1], Chun-Wei Chen[2,3,5], Jean-Jacques Delaunay[1] （1. The Univ. of Tokyo (Japan), 2. Int'l. Graduate Program of Molecular Sci. and Tech, National Taiwan Univ. and Academia Sinica, (Taiwan), 3. Department of Materials Sci. and Eng., National Taiwan Univ. (Taiwan), 4. Molecular Sci. and Tech. Program, Taiwan Int'l Graduate Program, Academia Sinica (Taiwan), 5. Center of Atomic Initiative for New Materials, National Taiwan Univ. (Taiwan)）

6:30 PM - 6:45 PM

[CPDP-04] Optical Coupling between a Single Tin-vacancy Center and a Photonic Crystal Nanocavity in Diamond

*Kazuhiro Kuruma[1], Benjamin Pingault[1,2], Cleaven Chia[1], Dylan Renaud[1], Patrick Hoffmann[3], Satoshi Iwamoto[4], Carsten Ronning[3], Marko Lončar[1] （1. Harvard Univ. (United States of America), 2. Delft Univ. of Tech. (Netherlands), 3. Friedrich Schiller Univ. of Jena (Germany), 4. The Univ. of Tokyo (Japan)）

6:45 PM - 7:00 PM

[CPDP-05] A Machine Learning-based Approach to Model Highly-thermally Robust Metasurface Absorber

[Presentation Style] Online

Sumbel Ijaz[1], Sadia Noureen[1], Bacha Rehman[2], Muhammad Zubair[1], Muhammad Qasim Mehmood[1], *Yehia Massoud[3] （1. MicroNano Lab, Electrical Engineering Department, Information Technology University of the Punjab, Lahore 54600, Pakistan (Pakistan), 2. Department of Computer Science, Namal University, Mianwali, Punjab, Pakistan (Pakistan), 3. Innovative Technologies Laboratories (ITL), Electrical and Computer Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal 23955, Saudi Arabia (Saudi Arabia)）

7:00 PM - 7:15 PM

[CPDP-06] On-chip chiral-field-enhanced Raman optical activity for biosensing

[Presentation Style] Onsite

*Tinghui Xiao[1], Zhenyi Luo[1], Kotaro Hiramatsu[1], Akihiro Isozaki[1], Tamitake Itoh[2], Zhenzhou Cheng[3], Masahiro Nomura[1], Satoshi Iwamoto[1], Keisuke Goda[1,4,5] （1. University of Tokyo (Japan), 2. National Institute of Advanced Industrial Science and Technology (Japan), 3. Tianjin University (China), 4. Wuhan University (China), 5. University of California, Los Angeles (United States of America)）

7:15 PM - 7:30 PM

[CPDP-07] Over-one-octave PM hollow-core anti-resonance fiber with ultralow polarization-mode coupling
[Presentation Style] Online

*Zhuozhao Luo[1,2,3], Jiapeng Huang[2,3], Yu Zheng[1,4], Zhiyuan Huang[2], Ruochen Yin[4], Xiaocong Wang[2], Haihu Yu[1], Xin Jiang[1,3,5], Meng Pang[2,3] （1. National Engineering Lab. for Fiber Optic Sensing Tech., Wuhan Univ. of Tech. (China), 2. State Key Lab. of High Field Laser Physics, Shanghai Inst. of Optics and Fine Mechanics (China), 3. Russell Centre for Advanced Lightwave Sci. (RCALS), Hangzhou Inst. of Optics and Fine Mechanics (China), 4. iFiber Optoelectronics Tech. Co., Ltd. (China), 5. Max-Planck-Inst. for the Sci. of Light (Germany)）

7:30 PM - 7:45 PM

[CPDP-08] Detection of PM 2.5 Particulates using a Snap-Shot Hyperspectral Imaging Technology
[Presentation Style] Online

*Arvind Mukundan[1], Hsiang -Chen Wang[1], Nguyen Hong -Thai[1] （1. National Chung Cheng University (Taiwan)）

7:45 PM - 8:00 PM

[CPDP-09] 10 J, 100 Hz, 1 kW conductive-cooled active-mirror laser
[Presentation Style] Onsite

*Jumpei Ogino[1], Koji Tsubakimoto[1], Hidetsugu Yoshida[1], Shinji Motokoshi[2], Noboru Morio[1], Keiko Matsumoto[1], Kana Fujioka[1], Shigeki Tokita[3], Noriaki Miyanaga[1,2], Ken-ichi Ueda[1,4], Ryousuke Kodama[1], Akifumi Yogo[1] （1. ILE, Osaka Univ (Japan), 2. ILT (Japan), 3. ICR, Kyoto Univ. (Japan), 4. ILS/UEC (Japan)）

8:00 PM - 8:15 PM

[CPDP-10] Observation of high-order Laguerre-Gaussian beams from a diamond Raman laser
[Presentation Style] Online

*Hui Chen[1,2], Yu Zhang[1,2], Hongwei Guo[1,2], Jiashuo An[1,2], Zhenxu Bai[1,2] （1. Hebei Univ. of Tech. (China), 2. Hebei Key Lab. of Adv. Laser Tech. and Eq. (China)）

8:15 PM - 8:30 PM

[CPDP-11] Continuously Wavelength-Tunable Coherent EUV and Soft X-ray Light for Dynamic Magnetic Imaging and Metrology
[Presentation Style] Online

Dimitar Popmintchev[2], Aref Imani[2], Roman Joris[2], Siyang Wang[1], Will Brunner[1], Jieyu Yan[1], Paolo Carpeggiani[2], Valentina Shumakova[2], Edgar Kaksis[2], Tobias Flöry[2], Elizaveta Gangrskaia[2], Audrius Pugzlys[2], Andrius Baltuska[2], *Tenio Popmintchev[1,2] （1. University of California San Diego (United States of America), 2. TU Wien (Austria)）

8:30 PM - 8:45 PM

[CPDP-12] Spin-isolated Meta-Holographic Displays at Broadband UV-VIS Regimes
[Presentation Style] Online

Aqsa Asad[1], Hafiz Saad Khaliq[1], Nasir Mahmood[1], Muhammad Qasim Mehmood[1], *Yehia Massoud[1] （1. Innovative Technologies Laboratories (ITL), King Abdullah University of Science and Technology (KAUST), Thuwal 23955, Saudi Arabia (Saudi Arabia)）

8:45 PM - 9:00 PM

6:15 PM - 6:30 PM (Mon. Aug 1, 2022 6:15 PM - 9:00 PM Small Hall)

[CPDP-02] Actively controlled two bit Binary Coding in Graphene assisted Terahertz Metasurface
[Presentation Style] Online

*Dhriti Maurya[1], Gagan Kumar[1] (1. Indian Institute of Technology Guwahati (India))

[Presentation Style] Online

A two bit binary coder based on graphene assisted terahertz (THz) metasurface is demonstrated. By tuning the Fermi energy, four different binary codes are obtained in the transmission which could be useful in THz communication.

6:30 PM - 6:45 PM (Mon. Aug 1, 2022 6:15 PM - 9:00 PM Small Hall)

[CPDP-03] Low threshold plasmonic lattice laser based on $CsPbBr_3$ quantum dots with directional emission
[Presentation Style] Online

*Di Xing[1], Cheng-Chieh Lin[2,3,4], Ya-Lun Ho [1], Yang-Chun Lee[1], Mu-Hsin Chen[1], Bo-Wei Lin[1], Chun-Wei Chen [2,3,5], Jean-Jacques Delaunay[1] (1. The Univ. of Tokyo (Japan), 2. Int'l. Graduate Program of Molecular Sci. and Tech, National Taiwan Univ. and Academia Sinica, (Taiwan), 3. Department of Materials Sci. and Eng., National Taiwan Univ. (Taiwan), 4. Molecular Sci. and Tech. Program, Taiwan Int'l Graduate Program, Academia Sinica (Taiwan), 5. Center of Atomic Initiative for New Materials, National Taiwan Univ. (Taiwan))

[Presentation Style] Online

In this work, we present a pressure-assisted recrystallization process for low-roughness and compact $CsPbBr_3$ quantum dots thin film and demonstrate a $CsPbBr_3$ quantum dots based surface lattice resonance laser with a low lasing threshold.

6:45 PM - 7:00 PM (Mon. Aug 1, 2022 6:15 PM - 9:00 PM Small Hall)

[CPDP-04] Optical Coupling between a Single Tin-vacancy Center and a Photonic Crystal Nanocavity in Diamond

*Kazuhiro Kuruma[1], Benjamin Pingault[1,2], Cleaven Chia[1], Dylan Renaud[1], Patrick Hoffmann[3], Satoshi Iwamoto [4], Carsten Ronning[3], Marko Lončar[1] (1. Harvard Univ. (United States of America), 2. Delft Univ. of Tech. (Netherlands), 3. Friedrich Schiller Univ. of Jena (Germany), 4. The Univ. of Tokyo (Japan))

We demonstrate coupling of a tin-vacancy (SnV) center and a photonic crystal nanobeam cavity in diamond. We observed a 12-hold intensity enhancement of SnV emission and a 16-hold reduction in its lifetime under resonance conditions.

7:00 PM - 7:15 PM (Mon. Aug 1, 2022 6:15 PM - 9:00 PM Small Hall)

[CPDP-05] A Machine Learning-based Approach to Model Highly-

thermally Robust Metasurface Absorber
[Presentation Style] Online

Sumbel Ijaz[1], Sadia Noureen[1], Bacha Rehman[2], Muhammad Zubair[1], Muhammad Qasim Mehmood[1], *Yehia Massoud[3] （1. MicroNano Lab, Electrical Engineering Department, Information Technology University of the Punjab, Lahore 54600, Pakistan (Pakistan), 2. Department of Computer Science, Namal University, Mianwali, Punjab, Pakistan (Pakistan), 3. Innovative Technologies Laboratories (ITL), Electrical and Computer Engineering, King Abdullah University of Science and Technology (KAUST), Thuwal 23955, Saudi Arabia (Saudi Arabia)）

[Presentation Style] Online

For accelerating design procedure of compact and efficient on-chip nano-photonics and to aid computationally expensive, time-exhaustive state-of-the-art iterative simulation schemes, regression-based machine-learning models are demonstrated that predict the optical response and structural parameters of the meta-atoms

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7:15 PM - 7:30 PM (Mon. Aug 1, 2022 6:15 PM - 9:00 PM Small Hall)

[CPDP-06] On-chip chiral-field-enhanced Raman optical activity for biosensing
[Presentation Style] Onsite

*Tinghui Xiao[1], Zhenyi Luo[1], Kotaro Hiramatsu[1], Akihiro Isozaki[1], Tamitake Itoh[2], Zhenzhou Cheng[3], Masahiro Nomura[1], Satoshi Iwamoto[1], Keisuke Goda[1,4,5] （1. University of Tokyo (Japan), 2. National Institute of Advanced Industrial Science and Technology (Japan), 3. Tianjin University (China), 4. Wuhan University (China), 5. University of California, Los Angeles (United States of America)）

[Presentation Style] Onsite

We demonstrate on-chip chiral-field-enhanced Raman optical activity (ROA) by tailoring a dark mode excited in a silicon nanodisk array. We show >100x enhanced chiral light-molecule interaction with negligible artifacts for ROA measurement of biological enantiomers.

7:30 PM - 7:45 PM (Mon. Aug 1, 2022 6:15 PM - 9:00 PM Small Hall)

[CPDP-07] Over-one-octave PM hollow-core anti-resonance fiber with ultralow polarization-mode coupling
[Presentation Style] Online

*Zhuozhao Luo[1,2,3], Jiapeng Huang[2,3], Yu Zheng[1,4], Zhiyuan Huang[2], Ruochen Yin[4], Xiaocong Wang[2], Haihu Yu[1], Xin Jiang[1,3,5], Meng Pang[2,3] （1. National Engineering Lab. for Fiber Optic Sensing Tech., Wuhan Univ. of Tech. (China), 2. State Key Lab. of High Field Laser Physics, Shanghai Inst. of Optics and Fine Mechanics (China), 3. Russell Centre for Advanced Lightwave Sci. (RCALS), Hangzhou Inst. of Optics and Fine Mechanics (China), 4. iFiber Optoelectronics Tech. Co., Ltd. (China), 5. Max-Planck-Inst. for the Sci. of Light (Germany)）

[Presentation Style] Online

A hollow-core anti-resonance fiber, featured with an elliptical-core structure, was fabricated and characterized, exhibiting broad-bandwidth (>900 nm), robust polarization-maintaining performance with ultra-low h-parameter of 10^{-8} m^{-1}.

7:45 PM - 8:00 PM (Mon. Aug 1, 2022 6:15 PM - 9:00 PM Small Hall)

[CPDP-08] Detection of PM 2.5 Particulates using a Snap-Shot Hyperspectral Imaging Technology
[Presentation Style] Online

*Arvind Mukundan[1], Hsiang -Chen Wang[1], Nguyen Hong -Thai[1] （1. National Chung Cheng University (Taiwan)）

[Presentation Style] Online

In this paper, visible light hyperspectral imaging technology combined with VGG-16 to estimate PM2.5 concentration in images captured aerially using three different methods; RGB, Principal component Analysis, and 3D-CAE, and their accuracy is compared.

8:00 PM - 8:15 PM (Mon. Aug 1, 2022 6:15 PM - 9:00 PM Small Hall)

[CPDP-09] 10 J, 100 Hz, 1 kW conductive-cooled active-mirror laser
[Presentation Style] Onsite

*Jumpei Ogino[1], Koji Tsubakimoto[1], Hidetsugu Yoshida[1], Shinji Motokoshi[2], Noboru Morio[1], Keiko Matsumoto[1], Kana Fujioka[1], Shigeki Tokita[3], Noriaki Miyanaga[1,2], Ken-ichi Ueda[1,4], Ryousuke Kodama[1], Akifumi Yogo[1] （1. ILE, Osaka Univ (Japan), 2. ILT (Japan), 3. ICR, Kyoto Univ. (Japan), 4. ILS/UEC (Japan)）

[Presentation Style] Onsite

We report a 1 kW diode-pumped laser with a Yb:YAG conductive-cooled active-mirror chain, delivering 10 J of energetic pulses at 100 Hz.

8:15 PM - 8:30 PM (Mon. Aug 1, 2022 6:15 PM - 9:00 PM Small Hall)

[CPDP-10] Observation of high-order Laguerre-Gaussian beams from a diamond Raman laser
[Presentation Style] Online

*Hui Chen[1,2], Yu Zhang[1,2], Hongwei Guo[1,2], Jiashuo An[1,2], Zhenxu Bai[1,2] （1. Hebei Univ. of Tech. (China), 2. Hebei Key Lab. of Adv. Laser Tech. and Eq. (China)）

[Presentation Style] Online

We report on the direct generation of $LG_{0,m}$ modes Stokes laser with m tunable range of 0-9, for the first time to our knowledge, in an external-cavity diamond Raman laser using Gaussian beam pumping.

8:30 PM - 8:45 PM (Mon. Aug 1, 2022 6:15 PM - 9:00 PM Small Hall)

[CPDP-11] Continuously Wavelength-Tunable Coherent EUV and Soft X-

ray Light for Dynamic Magnetic Imaging and Metrology
[Presentation Style] Online

Dimitar Popmintchev[2], Aref Imani[2], Roman Joris[2], Siyang Wang[1], Will Brunner[1], Jieyu Yan[1], Paolo Carpeggiani[2], Valentina Shumakova[2], Edgar Kaksis[2], Tobias Flöry[2], Elizaveta Gangrskaia[2], Audrius Pugzlys[2], Andrius Baltuska[2], *Tenio Popmintchev[1,2] （1. University of California San Diego (United States of America), 2. TU Wien (Austria)）

[Presentation Style] Online

We demonstrate bright, narrow-bandwidth, high order harmonics driven by VIS lasers, continuously tunable towards higher and lower EUV – X-ray photon energies, ideal for resonant, ultrafast, coherent diffractive imaging at the absorption edges of ferromagnets.

8:45 PM - 9:00 PM (Mon. Aug 1, 2022 6:15 PM - 9:00 PM Small Hall)

[CPDP-12] Spin-isolated Meta-Holographic Displays at Broadband UV-VIS Regimes
[Presentation Style] Online

Aqsa Asad[1], Hafiz Saad Khaliq[1], Nasir Mahmood[1], Muhammad Qasim Mehmood[1], *Yehia Massoud[1] （1. Innovative Technologies Laboratories (ITL), King Abdullah University of Science and Technology (KAUST), Thuwal 23955, Saudi Arabia (Saudi Arabia)）

[Presentation Style] Online

A planar multi-functional meta-surface is designed to reproduce spin-isolated meta-holographic displays at broadband wavelengths covering ultraviolet (UV) and visible (VIS) regimes. The proposed metasurface can have potential application in data-encryption, advertisement industry, sensing etc.

Poster Session | CLEO-PR2022 | Poster Session

C2. Ultrafast and Nonlinear Phenomena

Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3) (1F)

[P-CM2-01] Pump Power Optimization of Picosecond Supercontinuum Generation in Silicon-on-insulator Waveguide
[Presentation Style] Online
*Kaibin Lin[1], Qian Li[1] (1. Peking Univ. (China))

[P-CM2-02] A Compact Detector Module for Remote Characterization of Ultrashort Pulses Delivered over Dynamic Fiber-optic Links
[Presentation Style] Onsite
*Lakshmi C G[1], V R Supradeepa[1] (1. Indian Institute of Science (India))

[P-CM2-03] Broadband phase-sensitive CARS spectroscopy by using a combination of edge filters
[Presentation Style] Onsite
*Takayuki Suzuki[1], Akimasa Kubota[1], Kei Tanaka[1] (1. Meiji Univ. (Japan))

[P-CM2-04] The optical nonlinearity evolution of the graphene/Bi_2Te_3 heterostructure and application for pulsed laser therein
[Presentation Style] Onsite
*Mu-Hsuan Tsai[1], Chan-Shan Yang[3], Chun-Hu Chen[1], Cheng-Maw Cheng[2], Jia-Chi Lan[1], Chao-Kuei Lee[1] (1. National Sun Yat-sen Univ. (Taiwan), 2. National Synchrotron Radiation Research Center (Taiwan), 3. National Taiwan Normal Univ. (Taiwan))

[P-CM2-05] Novel approach for distinguishing 2H/1T-1T' molybdenum disulfide(MoS_2) optical nonlinearity
[Presentation Style] Online
*Shih-Po Su[1], Yi-Hsuan Huang[1], Jia-Qi Lan[1], Li-Wei Tu[1], Paritosh V. Wadekar[1], Hsiang-Chen Wang[2], Chao-Kuei Lee[1] (1. National Sun Yat-sen Univ. (Taiwan), 2. National Chung Cheng Univ. (Taiwan))

[P-CM2-06] Quasi-phase-matching properties of MgO:PPSLT in the oo-e, oo-o, and oe-o interactions
[Presentation Style] Onsite
*Nobuhiro Nobuhiro Umemura[1], Junji Hirohashi[2] (1. Chitose Inst. of Sci. and Tech. (Japan), 2. OXIDE Corp. (Japan))

[P-CM2-07] A Theoretical Study on Mid-Infrared Pumped Broadband Frequency Doubling Characteristics of Non-Oxide Crystals
[Presentation Style] Online
*Ilhwan Kim[1], Kwang Jo Lee[1] (1. Kyung Hee Univ. (Korea))

[P-CM2-08] Excited State Dynamics and Nonlinear Optical Responses of Metalated Porphyrin – Napthalimide Based Donor-Acceptor Systems
[Presentation Style] Onsite
*Md Soif Ahmed[1], Chinmoy Biswas[1], Botta Bhavani[2], Lingamallu Giribabu[2], Venugopal Rao Soma[3], Sai Santosh Kumar Raavi[1] (1. Indian Institute of Technology Hyderabad (India), 2. CSIR-Indian Institute of Chemical Technology (India), 3. University of Hyderabad (India))

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM2-01] Pump Power Optimization of Picosecond Supercontinuum Generation in Silicon-on-insulator Waveguide
[Presentation Style] Online

*Kaibin Lin[1], Qian Li[1] (1. Peking Univ. (China))

[Presentation Style] Online

We numerically demonstrate an active control method to optimize the pump power of picosecond pulse pumped supercontinuum generation in the silicon-on-insulator waveguide, which can obtain a broad spectrum at a lower pump power.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM2-02] A Compact Detector Module for Remote Characterization of Ultrashort Pulses Delivered over Dynamic Fiber-optic Links
[Presentation Style] Onsite

*Lakshmi C G[1], V R Supradeepa[1] (1. Indian Institute of Science (India))

[Presentation Style] Onsite

We demonstrate remote characterization and dispersion compensation of ultrashort pulses delivered over dynamic fiber-optic links using a nonlinear crystal, power detectors, and a pulse shaper-based interferometer. Measurements of sub-400fs pulses agree well with conventional measurements.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM2-03] Broadband phase-sensitive CARS spectroscopy by using a combination of edge filters
[Presentation Style] Onsite

*Takayuki Suzuki[1], Akimasa Kubota[1], Kei Tanaka[1] (1. Meiji Univ. (Japan))

[Presentation Style] Onsite

We apply a combination of edge filters instead of an optical bandpass filter for preparing a narrow band probe beam of our CARS spectroscopy. This enables us to broaden Raman spectra with variable frequency resolution.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM2-04] The optical nonlinearity evolution of the graphene/Bi_2Te_3 heterostructure and application for pulsed laser therein
[Presentation Style] Onsite

*Mu-Hsuan Tsai[1], Chan-Shan Yang[3], Chun-Hu Chen[1], Cheng-Maw Cheng[2], Jia-Chi Lan[1], Chao-Kuei Lee[1] (1. National Sun Yat-sen Univ. (Taiwan), 2. National Synchrotron Radiation Research Center (Taiwan), 3. National Taiwan Normal Univ. (Taiwan))
[Presentation Style] Onsite
The intensity-dependent of the optical nonlinearity of a graphene/Bi_2Te_3 heterostructure at 800 nm over 10 orders of magnitude were investigated by z-scan technique. The versatile nonlinear absorption behavior was discussed and applied to interpret the reported evolution of pulsed solid-state laser.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM2-05] Novel approach for distinguishing 2H/1T-1T' molybdenum disulfide(MoS_2) optical nonlinearity

[Presentation Style] Online

*Shih-Po Su[1], Yi-Hsuan Huang[1], Jia-Qi Lan[1], Li-Wei Tu[1], Paritosh V. Wadekar[1], Hsiang-Chen Wang[2], Chao-Kuei Lee[1] (1. National Sun Yat-sen Univ. (Taiwan), 2. National Chung Cheng Univ. (Taiwan))
[Presentation Style] Online
2H/1T-1T' MoS_2 is typical phase existed crystal. In this work, by controlling the atmosphere during CVD preparation, 2H/1T-1T' MoS_2 are separately growth. Additionally, by z-scan technique, the phase dependent optical nonlinearity of MoS_2 was observed.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM2-06] Quasi-phase-matching properties of MgO:PPSLT in the oo-e, oo-o, and oe-o interactions

[Presentation Style] Onsite

*Nobuhiro Nobuhiro Umemura[1], Junji Hirohashi[2] (1. Chitose Inst. of Sci. and Tech. (Japan), 2. OXIDE Corp. (Japan))
[Presentation Style] Onsite
We measured the QPM temperature for SHG at 0.5321 µm with the oo-e, oo-o, and oe-o interactions in MgO:PPSLT. The cross points of the temperature tuning curves of the QPM processes with different interactions exist around 80℃ in this QPM device.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM2-07] A Theoretical Study on Mid-Infrared Pumped Broadband Frequency Doubling Characteristics of Non-Oxide Crystals

[Presentation Style] Online

*Ilhwan Kim[1], Kwang Jo Lee[1] (1. Kyung Hee Univ. (Korea))
[Presentation Style] Online

We present a theoretical and numerical study on the broadband frequency doubling characteristics of non-oxide crystals including uniaxial chalcopyrite semiconductors and defect chalcopyrite as well as biaxial orthorhombic ternary chalcogenides.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM2-08] Excited State Dynamics and Nonlinear Optical Responses of Metalated Porphyrin – Napthalimide Based Donor-Acceptor Systems

[Presentation Style] Onsite

*Md Soif Ahmed[1], Chinmoy Biswas[1], Botta Bhavani[2], Lingamallu Giribabu[2], Venugopal Rao Soma[3], Sai Santosh Kumar Raavi[1] (1. Indian Institute of Technology Hyderabad (India), 2. CSIR-Indian Institute of Chemical Technology (India), 3. University of Hyderabad (India))

[Presentation Style] Onsite

Femtosecond transient absorption spectroscopy (fs-TAS) of two porphyrin-napthalimide molecular systems have been measured to study the excited state properties. Also
the second hyperpolarizability value of ~10-31 esu described their usefulness as a nonlinear material

C3. Infrared and Terahertz Technologies and Applications

Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3) (1F)

[P-CM3-01] Imaging identification of pharmaceutical material by using terahertz difference-frequency generation semiconductor source
[Presentation Style] Onsite

*Atsushi Nakanishi[1], Koichiro Akiyama[1], Shohei Hayashi[1], Hiroshi Satozono[1], Kazuue Fujita[1] （1. Hamamatsu Photonics K. K. (Japan)）

[P-CM3-02] "Laser-Printed Emissive Flexible Metasurface"

*Dongkyun Kang[1], Jaeyong Kim[1], Yeongseon Kim[1], Myeongkyu Lee[1] （1. Yonsei Univ. (Korea)）

[P-CM3-03] Phase noise of THz wave generated by a combination of microresonator soliton comb with uni-traveling-carrier photodiode
[Presentation Style] Onsite

*Shota Okada[1], Kenji Nishimoto[1], Yu Tokizane[2], Naoya Kuse[2,3], Takeshi Yasui[2] （1. Grad. Sch. Sci. Tech. Innov., Tokushima Univ. (Japan), 2. pLED, Tokushima Univ. (Japan), 3. JST-PRESTO (Japan)）

[P-CM3-04] Laser Printing of Thermal Emission Pattern in a Phase-Change Thin Film Cavity

*Yeongseon Kim[1], Jaeyong Kim[1], Dongkyun Kang[1], MyeongKyu Lee[1] （1. Yonsei Univ. (Korea)）

[P-CM3-05] Characterization of UV-responsive Properties of DNA:PEDOT Biomaterial by Time-Domain Terahertz Spectroscopy
[Presentation Style] Online

*Chia-hsin Huang[1], Wei-Tsung Chuang[2], Yu-Chueh Hung[1] （1. National Tsing Hua University (Taiwan), 2. National Synchrotron Radiation Research Center (NSRRC) (Taiwan)）

[P-CM3-06] Design, Fabrication, and Properties of a Terahertz Linear Polarizer made of an Organic Single Crystal
[Presentation Style] Onsite

*Takenori Tanno[1], Wataru Sasaki[1], Manabu Yamada[1], Emi Adachi[1], Shinichi Yodokawa[1], Toru Kurabayashi[1] （1. Akita Univ. (Japan)）

[P-CM3-07] Optimal optical feedback conditions for a multimode laser diode with delayed optical feedback in THz time-domain spectroscopy
[Presentation Style] Onsite

*Tokihiro Kitagawa[1], Tetsuya Matsuyama[1], Kenji Wada[1], Fumiyoshi Kuwashima[2], Koichi Okamoto[1] （1. Osaka Metropolitan Univ. (Japan), 2. Fukui Univ. of Technology (Japan)）

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM3-01] Imaging identification of pharmaceutical material by using terahertz difference-frequency generation semiconductor source

[Presentation Style] Onsite

*Atsushi Nakanishi[1], Koichiro Akiyama[1], Shohei Hayashi[1], Hiroshi Satozono[1], Kazuue Fujita[1] (1. Hamamatsu Photonics K. K. (Japan))

[Presentation Style] Onsite

We demonstrated imaging identification of pharmaceutical material using a compact ultra-broadband terahertz semiconductor source. We demonstrated the ability to distinguish the pharmaceutical materials having different crystal forms by using the THz DFG source.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM3-02] "Laser-Printed Emissive Flexible Metasurface"

*Dongkyun Kang[1], Jaeyong Kim[1], Yeongseon Kim[1], Myeongkyu Lee[1] (1. Yonsei Univ. (Korea))

A metasurface consisting of a phase-changing $Ge_2Sb_2Te_5$ layer on a metal mirror is promising as a space-selectively and dynamically control the infrared emission of the surface by a spatially modulated pulsed laser beam.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM3-03] Phase noise of THz wave generated by a combination of microresonator soliton comb with uni-traveling-carrier photodiode

[Presentation Style] Onsite

*Shota Okada[1], Kenji Nishimoto[1], Yu Tokizane[2], Naoya Kuse[2,3], Takeshi Yasui[2] (1. Grad. Sch. Sci. Tech. Innov., Tokushima Univ. (Japan), 2. pLED, Tokushima Univ. (Japan), 3. JST-PRESTO (Japan))

[Presentation Style] Onsite

We evaluated the phase noise of CW-THz wave at 560 GHz generated by optical-to-electric conversion of microresonator soliton comb with uni-traveling-carrier photodiode for wireless carrier wave of beyond 5G.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM3-04] Laser Printing of Thermal Emission Pattern in a Phase-Change Thin Film Cavity

*Yeongseon Kim[1], Jaeyong Kim[1], Dongkyun Kang[1], MyeongKyu Lee[1] (1. Yonsei Univ. (Korea))

Engineering the thermal emission that depends on emissivity(ε) and temperature of a material in the infrared(IR) range is applicable to various fields. The proposed laser-printing and annealing method can tune

the emissivity position-selectively and continuously.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM3-05] Characterization of UV-responsive Properties of DNA:PEDOT Biomaterial by Time-Domain Terahertz Spectroscopy
[Presentation Style] Online

*Chia-hsin Huang[1], Wei-Tsung Chuang[2], Yu-Chueh Hung[1] （1. National Tsing Hua University (Taiwan), 2. National Synchrotron Radiation Research Center (NSRRC) (Taiwan)）

[Presentation Style] Online

We present refractive indices, conductivities, and carrier-related parameters of newly developed DNA:PEDOT biomaterial using time-domain terahertz spectroscopy. Our results reveal UV-responsive electrical properties of the complex, which may be further utilized for biomaterial-based optoelectronic devices.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM3-06] Design, Fabrication, and Properties of a Terahertz Linear Polarizer made of an Organic Single Crystal
[Presentation Style] Onsite

*Takenori Tanno[1], Wataru Sasaki[1], Manabu Yamada[1], Emi Adachi[1], Shinichi Yodokawa[1], Toru Kurabayashi[1] （1. Akita Univ. (Japan)）

[Presentation Style] Onsite

A terahertz polarizer was developed using a single crystal of methyl 4-nitrobenzoate. The molecules are arranged in parallel in the crystal, allowing high anisotropy. A high degree of polarization, 76%, was achieved at 2.74 THz.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM3-07] Optimal optical feedback conditions for a multimode laser diode with delayed optical feedback in THz time-domain spectroscopy
[Presentation Style] Onsite

*Tokihiro Kitagawa[1], Tetsuya Matsuyama[1], Kenji Wada[1], Fumiyoshi Kuwashima[2], Koichi Okamoto[1] （1. Osaka Metropolitan Univ. (Japan), 2. Fukui Univ. of Technology (Japan)）

[Presentation Style] Onsite

Optimal optical feedback conditions for a multimode laser diode with delayed optical feedback in THz time-domain spectroscopy were found in the chaotic intermittent oscillation conditions by numerical simulations using the multimode laser diode rate equations.

Poster Session | CLEO-PR2022 | Poster Session

C9. Optical Communication Systems and Networks

Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3) (1F)

[P-CM9-01] Traffic Prediction Model for Optical Network Based on Multi-input Neural Network
[Presentation Style] Online
*Yan Liu[1], Qian Hu[1], Xiaoli Huo[1], Anxu Zhang[1] (1. China Telecom Research Institute (China))

[P-CM9-02] Evaluation of Nonlinear Phase Shift Mitigating Dispersion-Induced Fading in Radio-over-Fiber Link
[Presentation Style] Onsite
*Kento Okunushi[1], Amila Kariyawasam[1], Joji Maeda[1] (1. Tokyo Univ. of Science (Japan))

[P-CM9-03] Optical Wireless HDMI with Uncooled Violet-Blue Laser Diode
[Presentation Style] Onsite
*Chih-Hsien Cheng[2], Yi-Ze Lee[1], Yi-Chien Wu[1], Wei-Chun Wang[1], Huai-Yung Qang[1], Gong-Ru Lin[1] (1. National Taiwan Univ. (Taiwan), 2. Univ. of Tokyo (Japan))

[P-CM9-04] An Experimental Study on the Effect of Modulation Distortion on DDMZM Based OSSB+C Signal Generation
[Presentation Style] Onsite
*Yusuke Suzuki[1], Ryo Okajima[1], Amila Kariyawasam[1], Joji Maeda[1] (1. Tokyo Univ. of Sci. (Japan))

[P-CM9-05] Physical Layer Encryption Based on a Cascading Method of Inter-domain Scrambling and Phase Perturbance in CO-OFDM System
[Presentation Style] Online
Zeyu Xu[1], Tianyu Su[1], Miao Tu[1], Yankai Rong[1], Yifeng Ye[1], Yang Xiao[2], Le Liu[1], *Xianfeng Tang[1] (1. State Key Lab. of Info. Photonics and Optical Communications, Beijing Univ. of Posts and Telecommunications (China), 2. Wuhan Univ. of Science and Technology (China))

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM9-01] Traffic Prediction Model for Optical Network Based on Multi-input Neural Network
[Presentation Style] Online

*Yan Liu[1], Qian Hu[1], Xiaoli Huo[1], Anxu Zhang[1] (1. China Telecom Research Institute (China))

[Presentation Style] Online

A novel traffic prediction model for optical network is proposed based on Multi-input Neural Network. Results indicate that the proposed model shows better performances than other prediction models in this experiment.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM9-02] Evaluation of Nonlinear Phase Shift Mitigating Dispersion-Induced Fading in Radio-over-Fiber Link
[Presentation Style] Onsite

*Kento Okunushi[1], Amila Kariyawasam[1], Joji Maeda[1] (1. Tokyo Univ. of Science (Japan))

[Presentation Style] Onsite

We discuss the nonlinear phase shift induced by self-phase modulation in analogue Radio-over-Fiber link based on a small signal analytical model. The validity of the model is examined by comparing it with experimental results.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM9-03] Optical Wireless HDMI with Uncooled Violet-Blue Laser Diode
[Presentation Style] Onsite

*Chih-Hsien Cheng[2], Yi-Ze Lee[1], Yi-Chien Wu[1], Wei-Chun Wang[1], Huai-Yung Qang[1], Gong-Ru Lin[1] (1. National Taiwan Univ. (Taiwan), 2. Univ. of Tokyo (Japan))

[Presentation Style] Onsite

Optical wireless HDMI transceiver using uncooled 12-mW violet laser diode as Tx with f_{-3dB}=4GHz and p-i-n photodiode as Rx with f_{-3dB}=7GHz is demonstrated to enable 26.4-Gbit/s 64-QAM OFDM data and 2K×1K HDMI (1080P@60fps) video transmission.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM9-04] An Experimental Study on the Effect of Modulation Distortion on DDMZM Based OSSB+C Signal Generation
[Presentation Style] Onsite

*Yusuke Suzuki[1], Ryo Okajima[1], Amila Kariyawasam[1], Joji Maeda[1] （1. Tokyo Univ. of Sci. (Japan)）
[Presentation Style] Onsite
We experimentally demonstrated the impact of fiber dispersion on modulation distortion of dual-drive Mach-Zehnder modulator-based OSSB+C transmission. Unlike in single-drive Mach-Zehnder modulator-based transmitter, fiber dispersion does not compensate modulation distortion in dual-drive Mach-Zehnder modulator-based transmitter.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM9-05] Physical Layer Encryption Based on a Cascading Method of Inter-domain Scrambling and Phase Perturbance in CO-OFDM System
[Presentation Style] Online

Zeyu Xu[1], Tianyu Su[1], Miao Tu[1], Yankai Rong[1], Yifeng Ye[1], Yang Xiao[2], Le Liu[1], *Xianfeng Tang[1] （1. State Key Lab. of Info. Photonics and Optical Communications, Beijing Univ. of Posts and Telecommunications (China), 2. Wuhan Univ. of Science and Technology (China)）
[Presentation Style] Online
A physical layer encryption scheme using Arnold transform and discrete fractional Fourier transform is proposed to realize inter-domain scrambling and phase perturbance. Simulations show that security performance is enhanced with key space of 10^{96}.

Poster Session | CLEO-PR2022 | Poster Session

C11. Semiconductor and Integrated Optical Devices

Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3) (1F)

[P-CM11-01] Bandwidth Evaluation of Orthogonal Lattice Waveguide (OLW) for Circular Defect in Photonic Crystal (CirD) Lasers

[Presentation Style] Onsite

*Masaya Morita[1], Shotaro Hirata[1], Takuya Higuchi[1], Kenta Kaichi[1], Rubing Zuo[1], Hanqiao Ye[1], Hirotake Kajii[1], Masato Morifuji[1], Akihiro Maruta[1], Masahiko Kondow[1] (1. Osaka University (Japan))

[P-CM11-02] Advanced Dry Etching of GaAs/AlGaAs Multilayer Wafer for Circular Defect in Photonic Crystal (CirD) Laser

[Presentation Style] Onsite

*Hanqiao Ye[1], Yifan Xiong[1], Rubing Zuo[1], Masaya Morita[1], Kenta Kaichi[1], Akihiro Maruta[1], Hirotake Kajii[1], Masato Morifuji[1], Masahiko Kondow[1] (1. Osaka Univ. (Japan))

[P-CM11-03] A New Method for Measuring $AlGaO_x$ Oxidation Width of Circular Defect in 2D Photonic Crystal (CirD) Laser

[Presentation Style] Onsite

*Rubing Zuo[1], Shunsuke Miyazaki[1], Ryosei Kinoshita[1], Hanqiao Ye[1], Masaya Morita[1], Kenta Kaichi[1], Masato Morifuji[1], Hirotake Kajii[1], Akihiro Maruta[1], Masahiko Kondow[1] (1. Osaka Univ. (Japan))

[P-CM11-04] Operation of microscale-light-emitting diode display using GeTe-based memristor

*Seok Hee Hong[1], Kyung Rock Son[1], Ho Jin Lee[1], Minji yu[1], Jun Young Kim[1], Tae Geun Kim[1] (1. School of Electrical Engineering, Korea Univ. (Korea))

[P-CM11-05] Large wavelength offset for lateral bandgap engineering by using Quantum Well Intermixing

[Presentation Style] Online

Yi-jen Chiu[1], Lu Kuan Du[1], *Yang-Jeng Chen[1] (1. National Sun Yat-sen University (Taiwan))

[P-CM11-06] An Optical Filter Based on Sidewall Long-Period Grating in Lithium Niobate on Insulator

[Presentation Style] Online

*li jun hui[1], wang meng ke [1], chen kai xin[1] (1. University of Electronic Science and Technology of China (China))

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM11-01] Bandwidth Evaluation of Orthogonal Lattice Waveguide (OLW) for Circular Defect in Photonic Crystal (CirD) Lasers [Presentation Style] Onsite

*Masaya Morita[1], Shotaro Hirata[1], Takuya Higuchi[1], Kenta Kaichi[1], Rubing Zuo[1], Hanqiao Ye[1], Hirotake Kajii[1], Masato Morifuji[1], Akihiro Maruta[1], Masahiko Kondow[1] (1. Osaka University (Japan))

[Presentation Style] Onsite

We fabricate CirD lasers with Orthogonal Lattice Waveguides and evaluate them by optical pumping. We have experimentally confirmed that the wavelength range of OLW is 20 nm, which is about double for the conventional W1 waveguide.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM11-02] Advanced Dry Etching of GaAs/AlGaAs Multilayer Wafer for Circular Defect in Photonic Crystal (CirD) Laser [Presentation Style] Onsite

*Hanqiao Ye[1], Yifan Xiong[1], Rubing Zuo[1], Masaya Morita[1], Kenta Kaichi[1], Akihiro Maruta[1], Hirotake Kajii[1], Masato Morifuji[1], Masahiko Kondow[1] (1. Osaka Univ. (Japan))

[Presentation Style] Onsite

We improved dry etching process by introducing 3-steps etching and 3 layers of quantum dots for fabricating the CirD laser that will be used for intra-chip optical communications. Excellent lasing property was consequently obtained.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM11-03] A New Method for Measuring $AlGaO_x$ Oxidation Width of Circular Defect in 2D Photonic Crystal (CirD) Laser [Presentation Style] Onsite

*Rubing Zuo[1], Shunsuke Miyazaki[1], Ryosei Kinoshita[1], Hanqiao Ye[1], Masaya Morita[1], Kenta Kaichi[1], Masato Morifuji[1], Hirotake Kajii[1], Akihiro Maruta[1], Masahiko Kondow[1] (1. Osaka Univ. (Japan))

[Presentation Style] Onsite

To develop the CirD laser, which will be used in intra-chip optical interconnects, we investigate a new method to measure the oxidation width of AlGaOx precisely so that we can obtain the most appropriate Q factor.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM11-04] Operation of microscale-light-emitting diode display using GeTe-based memristor

*Seok Hee Hong[1], Kyung Rock Son[1], Ho Jin Lee[1], Minji yu[1], Jun Young Kim[1], Tae Geun Kim[1] （1. School of Electrical Engineering, Korea Univ. (Korea)）

A new active-matrix driving circuitry for microscale light-emitting diode display, using GeTe-based memristor with multiple resistance states, instead of conventional one-transistor and one-capacitor approach, is proposed and demonstrated.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM11-05] Large wavelength offset for lateral bandgap engineering by using Quantum Well Intermixing

[Presentation Style] Online

Yi-jen Chiu[1], Lu Kuan Du[1], *Yang-Jeng Chen[1] （1. National Sun Yat-sen University (Taiwan)）

[Presentation Style] Online

Patterned SiO_2 and Si_3N_4 thin film on top of InGaAsP-based epi-layer. Quantum well intermixing had use for lateral bandgap engineering. 85nm wavelength difference has been attained in 1550nm quantum well, showing potential for photonic integration.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM11-06] An Optical Filter Based on Sidewall Long-Period Grating in Lithium Niobate on Insulator

[Presentation Style] Online

*li jun hui[1], wang meng ke [1], chen kai xin[1] （1. University of Electronic Science and Technology of China (China)）

[Presentation Style] Online

We propose an optical filter based on sidewall long-period waveguide grating with metal absorption layer in lithium niobite-on-insulator. Our designed filter achieves an extinction ratio >30 dB at 1550 nm wavelength and a 3-dB bandwidth of 78 nm.

Poster Session | CLEO-PR2022 | Poster Session

C15. Biophotonics and Applications

Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3) (1F)

[P-CM15-01] Design of dual-wavelength waveplate made of single crystal for coherent anti-Stokes Raman endoscopy
[Presentation Style] Onsite
*Yuuka Kawasaki[1], Mamoru Hashimoto[1] (1. Hokkaido University (Japan))

[P-CM15-02] Label free isomeric metabolism measurement with multiplex coherent anti-Stokes Raman scattering microspectroscopy
[Presentation Style] Onsite
*Soichiro Homma[1], Mamoru Hashimoto[1] (1. Hokkaido university (Japan))

[P-CM15-03] Fabrication of Flexible Artificial Compound Eyes for Real-time Focal Length Tuning
[Presentation Style] Online
*Jihyun Jung[1], Heesang Ahn[1], Hyerin Song[1], Taerim Yoon[1], Seunghun Lee[1], Taeyeon Kim[1], Soojung Kim[1], Kyujung Kim[1] (1. Pusan Nat'l Univ. (Korea))

[P-CM15-04] Measurement of Scattered Fluorescence Light by TIE-based 3D Fluorescence Imaging Technique
[Presentation Style] Onsite
*Marin Shoda[1], Xiangyu Quan[1], Takashi Murata[3], Yasuhiro Awatsuji[2], Osamu Matoba[1] (1. Kobe Univ. (Japan), 2. Kyoto Inst. Tech. (Japan), 3. Kanagawa Inst. Tech. (Japan))

[P-CM15-05] Multi-photon activation of fluorescent proteins using visible wavelength for high-resolution imaging
[Presentation Style] Onsite
*Toshiki Kubo[1], Kenta Temma[1], Kazunori Sugiura[1], Hajime Shinoda[1], Kai Lu[1], Nicholas I. Smith[1], Tomoki Matsuda[1], Takeharu Nagai[1], Katsumasa Fujita[1] (1. Osaka Univ. (Japan))

[P-CM15-06] Development of rigid-endoscope optical coherence tomography system with KTN optical scanner
[Presentation Style] Onsite
*Masato Ohmi[1], Kentaro Wada[1], Shogo Yagi[2] (1. Osaka Univ. (Japan), 2. NTT Advanced Technology Corp. (Japan))

[P-CM15-07] Second-harmonic generation arthroscope with integrated femtosecond Yb fiber laser
[Presentation Style] Onsite
Yoshitada Kashimura[1], Riku Matsuda[1], *Naoki Yamato[1], Mamoru Hashimoto[1] (1. Hokkaido University (Japan))

[P-CM15-08] Assessing role of sensor directivity in the photoacoustic tomography
[Presentation Style] Onsite
*Pankaj Warbal[1], Ratan K Saha[1] (1. Indian Institute of Information Technology Allahabad (India))

[P-CM15-09] Photoacoustic image reconstruction with polynomial based interpolation algorithms
[Presentation Style] Onsite
Avijit Paul[1], *Pankaj Warbal[1], Amrita Mukherjee[1], Subhadip Paul[1], Ratan K Saha[1] (1. Indian

Institute of Information Technology Allahabad (India))

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM15-01] Design of dual-wavelength waveplate made of single crystal for coherent anti-Stokes Raman endoscopy
[Presentation Style] Onsite

*Yuuka Kawasaki[1], Mamoru Hashimoto[1] (1. Hokkaido University (Japan))

[Presentation Style] Onsite

We have determined the quartz crystal thickness for dual-wavelength waveplate to maximize the intensity of coherent anti-Stokes Raman scattering (CARS). The CARS intensity with incident orthogonally polarized beams was 99.0% when excited with parallel polarization.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM15-02] Label free isomeric metabolism measurement with multiplex coherent anti-Stokes Raman scattering microspectroscopy
[Presentation Style] Onsite

*Soichiro Homma[1], Mamoru Hashimoto[1] (1. Hokkaido university (Japan))

[Presentation Style] Onsite

We observed beta-oxidation of *trans*-fatty acid for human hepatocarcinoma cell line HepG2 with multiplex coherent anti-Stokes Raman scattering microspectroscopy under time-series and found the isomerization of unsaturated fatty acid without staining.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM15-03] Fabrication of Flexible Artificial Compound Eyes for Real-time Focal Length Tuning
[Presentation Style] Online

*Jihyun Jung[1], Heesang Ahn[1], Hyerin Song[1], Taerim Yoon[1], Seunghun Lee[1], Taeyeon Kim[1], Soojung Kim[1], Kyujung Kim[1] (1. Pusan Nat'l Univ. (Korea))

[Presentation Style] Online

We present a microlens arrays (MLAs) based artificial compound eye for tuning a focal length. The flexible MLAs-patterned poly (dimetylsiloxane) (PDMS) film was deformed from planar to curved shape with the increase of the fluid injection, acting as a focus-tunable lens. With a designed optical system, we compared focused beam intensity depending on the radius of curvature of the fabricated lens.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM15-04] Measurement of Scattered Fluorescence Light by TIE-

based 3D Fluorescence Imaging Technique
[Presentation Style] Onsite

*Marin Shoda[1], Xiangyu Quan[1], Takashi Murata[3], Yasuhiro Awatsuji[2], Osamu Matoba[1] (1. Kobe Univ. (Japan), 2. Kyoto Inst. Tech. (Japan), 3. Kanagawa Inst. Tech. (Japan))

[Presentation Style] Onsite

Complex amplitude distribution of scattered fluorescence light is measured by TIE-based 3D fluorescence imaging technique. We present a preliminary experiment in tobacco cultured cells expressing GFP with tubulin covered by a diffused medium.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM15-05] Multi-photon activation of fluorescent proteins using visible wavelength for high-resolution imaging
[Presentation Style] Onsite

*Toshiki Kubo[1], Kenta Temma[1], Kazunori Sugiura[1], Hajime Shinoda[1], Kai Lu[1], Nicholas I. Smith[1], Tomoki Matsuda[1], Takeharu Nagai[1], Katsumasa Fujita[1] (1. Osaka Univ. (Japan))

[Presentation Style] Onsite

We experimentally demonstrated the photo-activation of reversibly photo-switchable fluorescent proteins by visible-wavelength two-photon excitation and applied the activation technique in confocal imaging of biological cells. Higher spatial resolution than conventional confocal microscopy was confirmed.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM15-06] Development of rigid-endoscope optical coherence tomography system with KTN optical scanner
[Presentation Style] Onsite

*Masato Ohmi[1], Kentaro Wada[1], Shogo Yagi[2] (1. Osaka Univ. (Japan), 2. NTT Advanced Technology Corp. (Japan))

[Presentation Style] Onsite

We developed novel rigid-endoscope OCT system with KTN optical probe for a diagnosis in the orthopedic surgery fields. The present system demonstrates that biological image was measured by using KTN optical scanner for having degree of freedom in sample arm as OCT. The system was shown to have a resolution 14.2μm for biological tissue in few mm depth. The 3D-OCT image of human fingerprint was obtained using this OCT system.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM15-07] Second-harmonic generation arthroscope with integrated femtosecond Yb fiber laser

[Presentation Style] Onsite

Yoshitada Kashimura[1], Riku Matsuda[1], *Naoki Yamato[1], Mamoru Hashimoto[1] （1. Hokkaido University (Japan)）

[Presentation Style] Onsite

We have developed a second-harmonic generation arthroscope with integrated a femtosecond Yb fiber laser. The head of the arthroscope is covered with a stainless-steel cylinder of 4 mm in diameter and 180 mm in length.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM15-08] Assessing role of sensor directivity in the photoacoustic tomography

[Presentation Style] Onsite

*Pankaj Warbal[1], Ratan K Saha[1] （1. Indian Institute of Information Technology Allahabad (India)）

[Presentation Style] Onsite

Sensor directivity in photoacoustic tomography (PAT) imaging is investigated. The photoacoustic (PA) signals with directivity effect were used to construct the system matrix needed for the Tikhonov regularization. This method provides improved PAT images.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM15-09] Photoacoustic image reconstruction with polynomial based interpolation algorithms

[Presentation Style] Onsite

Avijit Paul[1], *Pankaj Warbal[1], Amrita Mukherjee[1], Subhadip Paul[1], Ratan K Saha[1] （1. Indian Institute of Information Technology Allahabad (India)）

[Presentation Style] Onsite

We employ the polynomial-based interpolation methods for photoacoustic tomography (PAT). The nearest-neighbour, bilinear, bicubic, and biquintic interpolation algorithms were utilized to construct the model matrix. The performance of these interpolation techniques was studied.

Poster Session | CLEO-PR2022 | Poster Session

C16. Plasmonics and Metamaterials

Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3) (1F)

[P-CM16-01] Surface scattering in periodic metamaterials
[Presentation Style] Online
*Tieyan Zhang[1], Jiachen Yu[1], Qiqige Wulan[1], Zhe Li[1], Zhijun Liu[1] (1. Univ. of Electronic Sci. and Tech. of China (China))

[P-CM16-02] Performance Estimation of EO-Polymer Plasmonic Optical Phased Array
[Presentation Style] Onsite
*Yuji Kuwamura[1], Kyosuke Hibata[1] (1. Kanazawa Univ. (Japan))

[P-CM16-04] Dynamic refractive index analysis by focused surface plasmon for continuous evaluation of evaporation of saliva
[Presentation Style] Onsite
*Ipsita Chakraborty[1], Akinari Abe[1], Daiki Matsubayashi[1], Hiroshi Kano[1] (1. Muroran Institute of Technology (Japan))

[P-CM16-05] Metal-Insulator-Metal Structured Surface Plasmon Polariton Waveguide with Improved Gain
[Presentation Style] Online
*RISHITEJA CHAPARALA[1], Sreenivasulu Tupakula[1] (1. SRM Univ. (India))

[P-CM16-06] Plasmon resonance wavelength controlled by SiO_2 layer thickness on a silver surface and nanoantenna effect at a center of Bull' s eye pattern
[Presentation Style] Onsite
*Takeha Shinohara[1], Keiko Tawa[1] (1. Kwansei Gakuin Univ. (Japan))

[P-CM16-07] Novel Plasmonic Metamaterials based on Ag Nano-Hemispheres and Metal/Dielectric Multilayer Structures
[Presentation Style] Onsite
*Rei Niguma[1], Sayako Maeda[1], Tetsuya Matsuyama[1], Kenji Wada[1], Koichi Okamoto[1] (1. Osaka Prefecture Univ. (Japan))

[P-CM16-08] Plasmonic colorimetric sensor using Ag-NHoM structures
[Presentation Style] Onsite
*Sayako Maeda[1], Koki Matsuda[1], Rei Niguma[1], Tetsuya Matsuyama[1], Kenji Wada[1], Koichi Okamoto[1] (1. Osaka Metropolitan University (Japan))

[P-CM16-09] New Sensitive Biosensor Platform by Plasmon Field Enhanced Photoreaction and Fluorescence
[Presentation Style] Onsite
*Shohei Horio[1], Koji Mizutani[1], Hirobumi Sunayama[2], Toshihumi Takeuchi[3], Keiko Tawa[1] (1. Kwansei Gakuin University (Japan), 2. Graduate School of Engineering, Kobe Universit (Japan), 3. Innovation Commercialization Division, Kobe University (Japan))

[P-CM16-10] Surface-enhanced Low-frequency Raman Spectroscopy
[Presentation Style] Onsite
*Ryosuke Morisaki[1], Takayuki Umakoshi[1], Prabhat Verma[1] (1. Osaka University (Japan))

[P-CM16-11] Multiple Anapole State in Free-standing Silicon Nanodisk
[Presentation Style] Onsite

Monica Pradhan[1], Shubhanshi Sharma[1], Shivakiran B N Bhaktha[1], *Shailendra Kumar Varshney[1] （1. Indian Institute of Technology, Kharagpur (India)）

[P-CM16-12] Near-field spectral properties and ultrafast dynamics of coupled plasmonic nanostructures
[Presentation Style] Onsite

*Hiroki Takeuchi[1], Junfeng Yue[1], Keisuke Imaeda[2], Kosei Ueno[2] （1. Graduate School of Chemical Sciences and Engineering, Hokkaido University (Japan), 2. Department of Chemistry, Faculty of Science, Hokkaido University (Japan)）

[P-CM16-13] Plasmon-Enhanced Solar-Driven Hydrogen Evolution Using Plasmonic Metasurface Broadband Absorbers
[Presentation Style] Onsite

*Tzu Yu Peng[1,2], Meng-Ju Yu[1], Chih-Li Chang[3], Hao-Yu Lan[1], Zong-Yi Chiao[1,2], Yu-Chia Chen[1], Ho Wai Howard Lee[4], Yia-Chung Chang[1], Shu-Wei Chang[1], Takuo Tanaka[5,6,7], Vincent Tung[8], Ho-Hsiu Chou[4], Yu-Jung Lu[1,2] （1. Research Center for Applied Sciences, Academia Sinica (Taiwan), 2. Department of Physics, National Taiwan University (Taiwan), 3. Department of Chemical Engineering, National Tsing Hua University (Taiwan), 4. Department of Physics and Astronomy, University of California (United States of America), 5. Metamaterials Laboratory, RIKEN Cluster for Pioneering Research (Japan), 6. Innovative Photon Manipulation Research Team, RIKEN Center for Advanced Photonics (Japan), 7. Institute of Post-LED Photonics, Tokushima University (Japan), 8. Physical Science and Engineering (PSE) Division, King Abdullah University of Science and Technology (KAUST) (Saudi Arabia)）

[P-CM16-14] Plasmon-Enhanced Upconversion Luminescence in Two-Dimensional Halide Perovskite Film
[Presentation Style] Onsite

*Yen-Yu Wang[1,2], Tzu-Yu Peng[1,3], Jia-Wern Chen[1], Fang-Zhou Liu[4], Tik-Lun Leung[4], Chih-Wei Chu[1], Aleksandra B. Djurišic[4], Yu-Jung Lu[1] （1. Research Center for Applied Sciences, Academia Sinica (Taiwan), 2. Department of Physics, National Taiwan Univ. (Taiwan), 3. Graduate Institute of Applied Physics, National Taiwan Univ. (Taiwan), 4. Department of Physics, The Univ. of Hong Kong (Hong Kong)）

[P-CM16-16] Fabrication of Wavelength-Selective Visible-Absorbing Filter for 405-nm by Surface Plasmon Resonance
[Presentation Style] Online

*Atsushi Motogaito[1], Seigi Shimizu[1], Karen Akatsuka[1], Kazumasa Hiramatsu[1] （1. Mie Univ. (Japan)）

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-01] Surface scattering in periodic metamaterials
[Presentation Style] Online

*Tieyan Zhang[1], Jiachen Yu[1], Qiqige Wulan[1], Zhe Li[1], Zhijun Liu[1] (1. Univ. of Electronic Sci. and Tech. of China (China))

[Presentation Style] Online

Surface light scattering in periodic metamaterials is characterized. Diffuse reflection is shown to occur at wavelengths less than that of the first order Rayleigh anomaly as dominated by grating diffractions from structural periodicity

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-02] Performance Estimation of EO-Polymer Plasmonic Optical Phased Array
[Presentation Style] Onsite

*Yuji Kuwamura[1], Kyosuke Hibata[1] (1. Kanazawa Univ. (Japan))

[Presentation Style] Onsite

We proposed a new type of plasmonic optical phased array consisting of an array of plasmonic phase modulators based on electro-optic polymers. The proposed device has only one optical peak at a wavelength of 1.55um, and the output light can be deflected and scanned over a range of more than 100 degrees by voltage control, which is confirmed by numerical calculation using the two-dimensional FDTD method. A Small-sized (70*26um^2), low-voltage (Less than 10V), high-speed and low-power optical phased array could be designed.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-04] Dynamic refractive index analysis by focused surface plasmon for continuous evaluation of evaporation of saliva
[Presentation Style] Onsite

*Ipsita Chakraborty[1], Akinari Abe[1], Daiki Matsubayashi[1], Hiroshi Kano[1] (1. Muroran Institute of Technology (Japan))

[Presentation Style] Onsite

Analyzing evaporation of liquid containing multiple substances from liquid state, semi-dried state to completely dried state with focused surface plasmon. Quantitative dynamic refractive index analysis of saliva at various temperatures was performed.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-05] Metal-Insulator-Metal Structured Surface Plasmon

Polariton Waveguide with Improved Gain
[Presentation Style] Online

*RISHITEJA CHAPARALA[1], Sreenivasulu Tupakula[1] （1. SRM Univ. (India)）

[Presentation Style] Online

Design and analysis of spoof surface plasmon polariton waveguide is presented in this work. The novel structure exhibits an improved gain of 6.973dBi with an increment of 0.83dBi compared to the existing designs.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-06] Plasmon resonance wavelength controlled by SiO_2 layer thickness on a silver surface and nanoantenna effect at a center of Bull’ s eye pattern
[Presentation Style] Onsite

*Takeha Shinohara[1], Keiko Tawa[1] （1. Kwansei Gakuin Univ. (Japan)）

[Presentation Style] Onsite

Resonance wavelength was controlled by SiO_2 film thickness deposited on a thin Ag film and the excitation and emission enhancement was individually evaluated by microscope to clarify the cause of the nanoantenna effect.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-07] Novel Plasmonic Metamaterials based on Ag Nano-Hemispheres and Metal/Dielectric Multilayer Structures
[Presentation Style] Onsite

*Rei Niguma[1], Sayako Maeda[1], Tetsuya Matsuyama[1], Kenji Wada[1], Koichi Okamoto[1] （1. Osaka Prefecture Univ. (Japan)）

[Presentation Style] Onsite

We have devised a novel plasmonic metamaterial based on Ag Nano-hemispheres and Ag/SiO_2 multilayer structures. This structure enables the propagation of near-field light and is expected to be observed beyond the diffraction limit.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-08] Plasmonic colorimetric sensor using Ag-NHoM structures
[Presentation Style] Onsite

*Sayako Maeda[1], Koki Matsuda[1], Rei Niguma[1], Tetsuya Matsuyama[1], Kenji Wada[1], Koichi Okamoto[1] （1. Osaka Metropolitan University (Japan)）

[Presentation Style] Onsite
We demonstrated that random structures formed by heat-treatment on mirrored substrates through spacers layer can control the plasmonic color in the visible wavelength range and can be applied to highly sensitive colorimetric sensors.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-09] New Sensitive Biosensor Platform by Plasmon Field Enhanced Photoreaction and Fluorescence [Presentation Style] Onsite

*Shohei Horio[1], Koji Mizutani[1], Hirobumi Sunayama[2], Toshihumi Takeuchi[3], Keiko Tawa[1] (1. Kwansei Gakuin University (Japan), 2. Graduate School of Engineering, Kobe Universit (Japan), 3. Innovation Commercialization Division, Kobe University (Japan))
[Presentation Style] Onsite
We used the plasmon-enhanced electric field not only as an excitation enhancement field for fluorescence but also as a photochemical reaction field, aiming to create a biosensor platform with sensitive detection in the controlled area.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-10] Surface-enhanced Low-frequency Raman Spectroscopy [Presentation Style] Onsite

*Ryosuke Morisaki[1], Takayuki Umakoshi[1], Prabhat Verma[1] (1. Osaka University (Japan))
[Presentation Style] Onsite
In this research, we for the first time demonstrated surface-enhanced low-frequency Raman spectroscopy. Low-frequency Raman scattering from a thin layered MoS_2, which arises from inter-layer interaction, was highly enhanced by silver nanoparticles.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-11] Multiple Anapole State in Free-standing Silicon Nanodisk [Presentation Style] Onsite

Monica Pradhan[1], Shubhanshi Sharma[1], Shivakiran B N Bhaktha[1], *Shailendra Kumar Varshney[1] (1. Indian Institute of Technology, Kharagpur (India))
[Presentation Style] Onsite
Through finite-element 3D simulations, we achieve the multiple anapole states, in a single silicon nanodisk at 522 nm (pseudo-anapole) and 815 nm (higher-order anapole) wavelengths which can be used for multitude applications.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-12] Near-field spectral properties and ultrafast dynamics of coupled plasmonic nanostructures
[Presentation Style] Onsite

*Hiroki Takeuchi[1], Junfeng Yue[1], Keisuke Imaeda[2], Kosei Ueno[2] (1. Graduate School of Chemical Sciences and Engineering, Hokkaido University (Japan), 2. Department of Chemistry, Faculty of Science, Hokkaido University (Japan))

[Presentation Style] Onsite

We have successfully elucidated the near-field spectral properties and phase relaxation dynamics of coupled plasmonic nanostructures as well as the effect of plasmon dephasing dynamics on near-field enhancement.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-13] Plasmon-Enhanced Solar-Driven Hydrogen Evolution Using Plasmonic Metasurface Broadband Absorbers
[Presentation Style] Onsite

*Tzu Yu Peng[1,2], Meng-Ju Yu[1], Chih-Li Chang[3], Hao-Yu Lan[1], Zong-Yi Chiao[1,2], Yu-Chia Chen[1], Ho Wai Howard Lee[4], Yia-Chung Chang[1], Shu-Wei Chang[1], Takuo Tanaka[5,6,7], Vincent Tung[8], Ho-Hsiu Chou[4], Yu-Jung Lu[1,2] (1. Research Center for Applied Sciences, Academia Sinica (Taiwan), 2. Department of Physics, National Taiwan University (Taiwan), 3. Department of Chemical Engineering, National Tsing Hua University (Taiwan), 4. Department of Physics and Astronomy, University of California (United States of America), 5. Metamaterials Laboratory, RIKEN Cluster for Pioneering Research (Japan), 6. Innovative Photon Manipulation Research Team, RIKEN Center for Advanced Photonics (Japan), 7. Institute of Post-LED Photonics, Tokushima University (Japan), 8. Physical Science and Engineering (PSE) Division, King Abdullah University of Science and Technology (KAUST) (Saudi Arabia))

[Presentation Style] Onsite

We report that plasmonic metasurface exhibits broadband absorption with an average absorption of more than 92% over visible range, achieving 300% increase in the hydrogen evolution rate due to the LSPR that enhances the rates of light absorption.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-14] Plasmon-Enhanced Upconversion Luminescence in Two-Dimensional Halide Perovskite Film
[Presentation Style] Onsite

*Yen-Yu Wang[1,2], Tzu-Yu Peng[1,3], Jia-Wern Chen[1], Fang-Zhou Liu[4], Tik-Lun Leung[4], Chih-Wei Chu[1], Aleksandra B. Djurišic[4], Yu-Jung Lu[1] (1. Research Center for Applied Sciences, Academia Sinica (Taiwan), 2. Department of Physics, National Taiwan Univ. (Taiwan), 3. Graduate Institute of Applied Physics, National Taiwan Univ. (Taiwan), 4. Department of Physics, The Univ. of Hong Kong (Hong Kong))

[Presentation Style] Onsite

We achieve Upconversion Luminescence Enhancement on 2D perovskite by using alternative plasmonic material (HfN) bowtie structure.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM16-16] Fabrication of Wavelength-Selective Visible-Absorbing Filter for 405-nm by Surface Plasmon Resonance [Presentation Style] Online

*Atsushi Motogaito[1], Seigi Shimizu[1], Karen Akatsuka[1], Kazumasa Hiramatsu[1] （1. Mie Univ. (Japan)）

[Presentation Style] Online

Herein, the fabrication of the wavelength-selective visible-absorbing filter for 405-nm by surface plasmon resonance was performed. Using the double-layer wire grid structure of Ag and Al, the peak absorptance was observed experimentally.

Poster Session | CLEO-PR2022 | Poster Session

C18. Microwave Photonics

Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3) (1F)

[P-CM18-01] Photonic Generation of Multi-Carrier Chirped Waveform using a Dual-Drive Mach Zehnder Modulator

[Presentation Style] Online

*Rajveer Dhawan[1], Reena Parihar[1], Amol Choudhary[1] (1. UFO-CHIP group, Indian Inst. of Tech. (IIT), Delhi (India))

[P-CM18-02] Optical Filter-less Photonic Dechirping of a Frequency-Modulated Continuous-Wave Radar

[Presentation Style] Online

Kartik Moyal[1], *Rajveer Dhawan[1], Amol Choudhary[1] (1. UFO-CHIP group, Indian Inst. of Tech. (IIT), Delhi (India) (India))

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM18-01] Photonic Generation of Multi-Carrier Chirped Waveform using a Dual-Drive Mach Zehnder Modulator [Presentation Style] Online

*Rajveer Dhawan[1], Reena Parihar[1], Amol Choudhary[1] (1. UFO-CHIP group, Indian Inst. of Tech. (IIT), Delhi (India))

[Presentation Style] Online

Frequency multiplication of the RF frequency of linear frequency modulated waveforms by 4X using a dual-drive Mach Zehnder modulator is demonstrated. A chirp bandwidth of 1GHz, time-bandwidth product of 10000, range-resolution of 0.15m is achieved.

(Mon. Aug 1, 2022 6:00 PM - 8:00 PM Main Hall (1/3))

[P-CM18-02] Optical Filter-less Photonic Dechirping of a Frequency-Modulated Continuous-Wave Radar [Presentation Style] Online

Kartik Moyal[1], *Rajveer Dhawan[1], Amol Choudhary[1] (1. UFO-CHIP group, Indian Inst. of Tech. (IIT), Delhi (India) (India))

[Presentation Style] Online

Optical filter-less photonic dechirping of signals from a Frequency-Modulated Continuous Wave (FMCW) radar using a dual-drive Mach Zehnder modulator is demonstrated for three different targets at 300m, 450m, and 750m with an error of <1.4m.