Room E (107)

Session Title 26E1 / [T05] Plasmonics and Metamaterials Ⅳ
Date & Time Wednesday, 26 August, 09:00 ~ 10:30
Session Chair Zhaowei Liu (University of California, San Diego, USA)

[26E1-1] 09:00~09:30 Invited Talk

Parity-time Optical Metamaterials

Zi Jing Wong, Liang Feng, Ren-Min Ma, Yuan Wang, and Xiang Zhang

University of California, Berkeley, USA

Exploration of the interplay between gain and loss in optical materials can lead to novel device functionalities. Here we demonstrated a single-mode laser based on paritytime symmetry breaking.

[26E1-2] 09:30~09:45

Chiral light-matter Interactions in Resonant Metamaterials

Seok Jae Yoo and Q-Han Park

Korea University, Korea

We present a theory of the chiral Purcell effect to describe the cavity-modified differential decay rate of chiral molecules to left and right circular-polarized modes. We also show negative-index metamaterials support the chiral Purcell effect.

[26E1-3] 09:45~10:00

Dual-band Optical Response Based on Plasmonic Metamaterial

Wudeng Wang, Yudong Li, Mingsi Zhang, Jingjun Xu, and Qian Sun

Nankai University, China

We investigated transmission of metematerial composed of stacked double semicircular-arcs structures with an angular offset. Optical response is observed simultaneously at visible and near-infrared band. Circular dichroism of ~0.47 within the near-infrared band is achieved.

[26E1-4] 10:00~10:15

Quantum Dot Nano Gap Metamaterial Terahertz Resonators

Laxmi Narayan Tripathi, Taehee Kang, Young-Mi Bahk, Sanghoon Han, Geunchang Choi, Jiyeah Rhie, Jeeyoon Jeong, and Dai-Sik Kim

Seoul National University, Korea

We present CdSe quantum dots nanogap metamaterial fabrication over large scale, resonant funneling of terahertz waves across 10 nm gap with giant terahertz intensity enhancements and quenching of photoluminescence of QDs inside the gap.

[26E1-5] 10:15~10:30

Microscopic Origin of Metal-to-Insulator Transition in Tightly-Coupled Metamaterials

Ji-Hun Kang[1,2], Seo-Joo Lee[2], and Q-Han Park[2]

[1]University of California, Berkeley, USA, [2]Korea University, Korea

We present a microscopic origin of metal-to-insulator transition (MIT) in tightly-coupled metamaterials. Like Mott transition in crystal solid, MIT in metamaterial is shown to arise when the distance between unit resonators passes the critical gap-size.

Room F (108)

Session Title 26F1 / [T07] Optical Metrology and Sensing Ⅳ
Date & Time Wednesday, 26 August, 09:00 ~ 10:15
Session Chair Hyug-Gyo Rhee (KRISS, Korea)

[26F1-1] 09:00~09:30 Invited Talk

Extremely Large Freeform Optics Manufacturing and Testing

Dae Wook Kim, Peng Su, Chang Jin Oh, and James H. Burge

University of Arizona, USA

The 4.2 m Daniel K. Inouye Solar Telescope (DKIST) primary mirror has about 9 mm freeform aspheric departure. Actively controlled stressed lap and infrared deflectometry system have been developed to manufacture the extremely large freeform optics.

[26F1-2] 09:30~09:45

The Study of High Precision MIR Lens Back Focal Length Measurement System

Feng-Ming Yeh[1], Der-Chin Chen[2], Siak-Lim Lee[2], Shih-Chieh Lee[1], and Wen-Te Hsieh[2]

[1]Da Yeh University, Taiwan, [2]Feng Chia University, Taiwan

This paper presents a new method of measuring the back focal length of middle infrared (MIR) lens that uses MIR pulse collimated beam and thermopile sensor. The experiment results state that the measurement accuracy of the back focal length of MIR lens is up to 2% at 5~25 mm range EFL. The advantages of this testing system are low costs, fast measurement speed, high precision, less complicated system and replacements of light source and detector of different IR spectrum for measuring BFL of lens.

[26F1-3] 09:45~10:00

The Study for Gigapixel Image Utilizing Robot Panoramic Head and Image Stitching Technique

Seung-Jo Noh, Yeon-Chan Choi, Hee-Joon Moon, Ho-Kwan Kang, and Cheon-Seog Rim

Hannam University, Korea

Currently, while the technology related to gigapixel image might not be well known to the general masses of people, leading edge enterprises like Google and BAE Systems are successively reporting for achieving the progress of gigapixel application and camera system. Even though conventional camera technology is limited to the class of megapixel image, we can obtain gigapixel image readily by means of robot panoramic head and image stitching technique. In this paper, we investigate the total process of creating gigapixel image which will be expected to make the chance of a multibillion dollar business in the industrial area related to vision technology and surveillance. From the experience of this research, we can also utilize the knowledge to devise and develop new types of gigapixel camera system such as AWARE camera of Duke University and ARGUS IS camera of BAE Systems. Meanwhile, we try to report very important issue realized from the process of creating gigapixel images, that is, visibility problem and how to correct.

[26F1-4] 10:00~10:15

Snapshot Spectroscopic Polarimeter Based on Polarized Dual Spectra

Daesuk Kim[1], Yonghee Yoon[1], Yoonho Seo[1], Hyunsuk Kim[1], and Robert Magnusson[2]

[1]Chonbuk National University, Korea, [2]University of Texas at Arlington, USA

This paper describes a snapshot spectroscopic polarimeter which can measure an accurate spectral Stokes vector of a transmissive object in a wide spectral domain within tens of msec.