

## Frontier and New Prospects in Optical Science

March 18-19, 2010

Tokai University Shonan Campus, Kanagawa, Japan

**March 18, 9:25 a.m. - 5:35 p.m.**

Hiromasa Ito (RIKEN)

Introductory Talk

### Plenary Talk



**Koichi Shimoda (Professor Emeritus at Univ. Tokyo)**  
"How I was involved in Masers, Lasers, and Atomic Frequency Standards"

### Quantum Optics and Atomic Optics



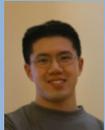
**Toshiya Kinoshita (Kyoto Univ.)**  
"Development of devices for atomtronics in optical lattices."



**Kazuki Koshino (Tokyo Medical and Dental Univ.)**  
"Spatio-temporal control of number-state photon pulses "



**Takao Aoki (Kyoto Univ.)**  
"Quantum manipulation of atoms and photons with cavity QED "



**Darrick Chang (Caltech)**  
"A single-photon transistor using nanoscale surface plasmons"

### Presentation by JST

Atsushi Senda (Japan Science and Technology Agency (JST))  
"Outline of JST Basic Research Program (PRESTO)"

**March 19, 9:00 a.m. - 12:30 p.m.**

### Short Presentation & Poster Session

Masaaki Ashida (Osaka Univ.)  
"Direct detection of the electric field in optical frequency region using photoconductive antenna"

Kenichi L. Ishikawa (Univ. Tokyo)  
"Atomic and molecular dynamics in ultrashort intense laser pulses"

Tetsuya Ido (NICT)  
"Precision atomic spectroscopy with phase-coherent VUV pulses"

Hideki Ohmura (AIST)  
"Quantum control of molecular process by using phase-controlled lights and its application to instrumentation frontier"

Takashige Omatsu (Chiba Univ.)  
"Topological light-wave synthesis"

Masayuki Katuragawa (UEC)  
"Generation of a train of ultrahigh-repetition-rate, ultrashort pulses by means of molecular light modulation"

Atsushi Kubo (Univ. Tsukuba)  
"Femtosecond imaging of surface plasmon dynamics in nano-optics"

Mitsutaka Kumakura (Fukui Univ.)  
"Optical control of matter-wave solitons in an atom-wave circuit"

Muneaki Hase (Univ. Tsukuba)  
"Manipulation of electrons and photons by controlling coherent lattice vibrations"

### <Discussion>

"Evolution of Light Generation and Manipulation" has been launched as a JST SAKIGAKE program. Now, its 6 Term-2 scientists are finalizing their projects. At this time, a symposium "Frontier and New Prospects in Optical Sciences" will be held, inviting world-renowned scientists in this field such as Dr. Koichi Shimoda (Professor Emeritus, Univ. Tokyo), Dr. Darrick Chang (Caltech), Dr. J. Chon (Swinburne Univ. of Tech), Dr. Rupert Huber (Univ. of Konstanz), Dr. Seemantini Nadkarni (MGH, Harvard Med. Sch.), and Dr. Min Yao (MGH, Harvard Med. Sch., Shanghai Jiao Tong Univ.) as the guest speakers. The symposium aims to discuss a new paradigm that is expected to prevail in a future founded on optical sciences.

### Plasmonics and Nanophotonics



**James Chon (Swinburne Univ. of Tech.)**  
"Photothermal properties of single gold nanorods and their application to five dimensional optical storage"



**Takuo Tanaka (RIKEN)**  
"Plasmonic metamaterials"

### Ultrafast infrared/terahertz science



**Rupert Huber (Univ. of Konstanz)**  
"Intense electric and magnetic terahertz fields: new light for basic science"



**Satoshi Ashihara (Tokyo Univ. of Agri.&Tech.)**  
"Investigation of molecular vibrational dynamics by short optical pulses in the infrared"

### Biomedical Optics and Photomedicine



**Seemantini Nadkarni (MGH, Harvard Med. Sch.)**  
"Optical imaging of atherosclerosis: a multi-factorial perspective"



**Min Yao (MGH, Harvard Med. Sch., Shanghai Jiao Tong Univ.)**  
"Photochemical Tissue Bonding (PTB) for wound repairs"



**Toshihiro Kushibiki (Osaka Univ.)**  
"Regulation of cells differentiation by light technology"

Akiyoshi Hishikawa (IMS)  
"Real-time probing of molecular reactions in laser fields by photoelectron holography"

Jiro Itatani (Univ. Tokyo)  
"Coherent dynamic molecular imaging using high-order harmonics of ultrashort laser pulses"

Ryosuke Shimizu (JST)  
"Nonlinear optical response by a multi-photon wavepacket"

Masaya Nagai (Kyoto Univ.)  
"Ultrafast spin manipulation with THz radiation"

Junko Ishi-Hayase (UEC)  
"Implementation of quantum dot based optical/quantum memory by increasing nonlinearity"

Haruka Maeda (Aoyama Gakuin Univ.)  
"Study of nondispersing wave packets and their application to quantum control"

Fumiaki Miyamaru (Shinsyu Univ.)  
"Development of optical devices by controlling light with fractals"

Shinji Miyoki (Univ. Tokyo)  
"Super-macroscopic quantum mechanical phenomena actualized by gravitational wave detection techniques"

Toru Morishita (UEC)  
"Ultra high resolution 4-D spatio-temporal imaging using intense laser pulses"

