



# Second MIPT-UEC Joint Workshop on Optical Science

October 16-21, 2014

University of Electro-Communications  
Chofu, Tokyo, Japan

Book of Abstracts

Organized by  
The University of Electro-Communications (UEC)  
and  
Moscow Institute of Physics and Technology (MIPT)

## Preface

The second MIPT-UEC Joint Workshop on Optical Science will be held at the University of Electro-Communications on October 16-21, 2014. The first joint workshop between Moscow Institute of Physics and Technology (MIPT) and the University of Electro-Communications (UEC) was held in Moscow in October 2013 to promote the academic exchange between both universities. This time, we will discuss about the recent research topics about optical science and related fields, including atom and molecular physics, quantum optics, laser technology, and condensed matters. We hope this second workshop will stimulate further deeper mutual understanding between researchers and young students of both universities and also the future joint research and education between both universities.

Finally, we hope that the participant will enjoy this workshop and it will be a fruitful for all of us.

October 2014

### Organizing committee

Ken'ichi Nakagawa (UEC, Chair)

Masayuki Katsuragawa (UEC)

Toru Morishita (UEC)

Takashi Mukaiyama (UEC)

Hiroshi Shimada (UEC)

Mitsuru Musha (UEC)

Kohji Abe (UEC)

Inga Tolstikhina (MIPT)

# Program

Date: October 16-21, 2014

Place: The University of Electro-Communications, Building E-3, 301 (Multimedia Hall)

**Part 1 Oct. 16 (Thu) (10:00 ~ 12:10) Chair: Masayuki Katsuragawa**

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|---------------|------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| 10:00 – 10:10 | Opening Remarks                                                                                                                    | Takashi Fukuda (UEC)       |
| 10:10 – 10:20 | Introduction of MIPT                                                                                                               | Igor E. Bulyzhenkov (MIPT) |
| 10:20 – 10:40 | Round University Ranking as a traceable system for evaluation of universities performance                                          | Igor E. Bulyzhenkov (MIPT) |
| 10:40 – 11:10 | Ultrafast atomic and molecular dynamics under intense laser fields                                                                 | Toru Morishita (UEC)       |
| 11:10 – 11:40 | On the Mechanism of Angular Momentum Transfer in Electronic Excitation of Molecules by Electron Impact in a low-temperature plasma | Sergey Yu Savinov (MIPT)   |
| 11:40 – 12:10 | Control of frequency correlations between photons via spontaneous parametric down-conversion                                       | Ryosuke Shimizu (UEC)      |
| 12:10 – 14:00 | Lunch                                                                                                                              |                            |

**Part 2 Oct. 16 (Thu) (14:00 ~ 16:30) Chair: Vladimir S. Lebedev**

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|---------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------|
| 14:00 – 14:30 | Quantum hydrodynamics of ultracold atoms                                                                                 | Hiroki Saito (UEC)      |
| 14:30 – 14:50 | Dynamics of ultracold spin-polarized fermions in amplitude-modulated parabolic lattice                                   | Shun Ohgoda (UEC)       |
| 14:50 – 15:10 | Broadband high-resolution stigmatic soft-X-ray spectroscopy                                                              | Alexey Shatokhim (MIPT) |
| 15:10 – 15:30 | Break                                                                                                                    |                         |
| 15:30 – 15:50 | Studies of Highly Charged Ions at ILS/UEC                                                                                | Erina Shimizu (UEC)     |
| 15:50 – 16:10 | Multi-channel scintillation diagnostics of various radiations for extended atmospheric discharge in the erg installation | Andrey Rodionov (MIPT)  |
| 16:10 – 16:30 | Introduction of UEC                                                                                                      | Kazushi Nakano (UEC)    |

**Part 3 Oct. 17 (Fri) (10:00 ~ 12:40) Chair: Shinichi Watanabe**

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|---------------|--------------------------------------------------------------------------------------------|----------------------------|
| 10:00 – 10:30 | Resonant electron-transfer processes in collisions of Rydberg atoms with neutral particles | Vladimir S. Lebedev (MIPT) |
| 10:30 – 11:00 | Collisional properties of ultracold atoms and ions                                         | Takashi Mukaiyama (UEC)    |
| 11:00 – 11:40 | Break ( Poster )                                                                           |                            |

- 11:40 – 12:00 Destruction of circular Rydberg states in thermal collisions with atoms possessing small electron affinities Elena Mironchuk (UEC)
- 12:00 – 12:20 Near-deterministic preparation of a single atom in an optical microtrap Hikaru Tamura (UEC)
- 12:20 – 12:40 The use of optical pumping for measuring polarizabilities of rubidium atoms Dmitry Tregubov (MIPT)

12:40 – 14:00 Lunch

**Part 4** Oct. 17 (Fri) (14:00 ~ 15:40) Chair: Sergey Andreev

- 14:00 – 14:30 Diagnostics of high temperature plasmas in controlled fusion devices using x-ray spectra of highly-charged tungsten and molybdenum Inga Tolstikhina (MIPT)
- 14:30 – 15:00 Highly frequency-stabilized laser and its applications Mitsuru Musha (UEC)
- 15:00 – 15:20 Design of a page data pattern for coaxial holographic optical correlation system Kanami Ikeda (UEC)
- 15:20 – 15:40 Laser dyes for diode pumping Olga Burdukova (MIPT)
- 15:40 – 17:00 Lab tour
- 18:00 – 20:00 Banquet

**Part 5** Oct. 18 (Sat) (9:30 ~ 11:50) Chair: Ken'ichi Nakagawa

- 9:30 – 10:00 Are mass and charge point singularities or sharp energy distributions ? Igor E. Bulyzhenkov (MIPT)
- 10:00 – 10:30 Ultrahigh-accuracy optical metrology using optical frequency combs Kaoru Minoshima (UEC)
- 10:30 – 10:50 Break
- 10:50 – 11:10 Optical frequency divider and its application in ultra-broadband Raman comb generation Nurul Sheeda Suhaimi (UEC)
- 11:10 – 11:30 Towards thulium optical clock Artem Golovizin (MIPT)
- 11:30 – 11:50 Laser cooling of  $^{87}\text{Rb}$  using  $5\text{S}_{1/2}$ - $6\text{P}_{3/2}$  transition Yuta Yoshino (UEC)

**Part 6** Oct. 20 (Mon) (10:00 ~ 12:10) Chair: Inga Tolstikhina

- 10:00 – 10:30 Development of mode-locked Tm doped fiber and solid state lasers at the wavelength range of 2  $\mu\text{m}$  in ILS Masaki Tokurakawa (UEC)
- 10:30 – 11:00 Rapid passage of absorption line using the fast frequency-tuning laser: Self-media radiation Sergey Andreev (MIPT)

- 11:00 – 11:30 Rapid passage of absorption line using the fast frequency-tuning laser:  
Application for high absorption coefficient measurements  
Nikolay Pestovsky (MIPT)
- 11:30 – 12:00 Break (Poster)
- 12:00 – 12:20 Potential of ceramic materials for thin-disk lasers Hiroaki Nakao (UEC)
- 12:20 – 12:40 Methods of reference signal in the multipass laser scheme for high-sensitive  
absorption measurements in optically dense medium Alexandr Zaytsev (MIPT)
- 12:40 – 14:00 Lunch

**Part 7** Oct.20 (Mon) (14:00 ~ 15:40) Chair: Sergey Yu Savinov

- 14:00 – 14:30 Manipulating Cooper pairs by using linear arrays of small Josephson junctions  
Hiroshi Shimada (UEC)
- 14:30 – 15:00 Vortex States in Mesoscopic Superconductors Nobuhito Kokubo (UEC)
- 15:00 – 15:20 Optical vortex generation using thermal nonlinearity of nematic liquid crystal  
Dmitry Korshunov (MIPT)
- 15:20 – 15:40 Development of x-ray laser excited by XFEL Kazunori Nagamine (UEC)
- 15:40 – 17:00 Lab tour

**Part 8** Oct.21 (Tue) (10:00 ~ 17:00)

- 10:00 – 12:00 Free discussion 1
- 12:00 – 13:30 Lunch
- 13:30 – 15:00 Free discussion 2
- 15:00 – 15:30 break
- 15:30 – 17:00 Free discussion 3