

Call for Paper

Date: September 7, 2012

Venue: University of Orléans, France

The First International Workshop on Information Physics and Computing in Nano-scale Photonics and Materials (IPCN)

<http://ipcn.i-photonics.jp/>

Collocated with Unconventional Computation and Natural Computation 2012, September 3-7, 2012

<http://www.univ-orleans.fr/lifo/evenements/UCNC2012/>

■ Concept

Optical science and technologies have been experiencing tremendous advancements especially in scales below the wavelength of light. Technological enablers have been cultivated both in top-down approaches, such as nanoscale precision lithography, and bottom-up ones such as DNA-based self-assembly. The elemental physical processes of light and matter interactions, as well as molecular-scale biological processes, have been extensively studied as basic sciences and technologies.

From the viewpoint of information, on the other hand, novel architectures should be considered so that we can fully utilize and benefit from the potential of unique physical processes available on the nano-scale photonics and materials. There are plenty of degrees-of-freedom on the nanoscale, and a wide-variety of physical processes and technologies, as indicated above, are existing. Comprehensive view ranging from physics, materials, devices, systems, and architectures are vitally important, and will cultivate the frontier of physical and information sciences and technologies.

At the same time, such interdisciplinary and basic research area that covers both physics, or real-world, and information, or abstract functions, will pave the way for fundamental insights and critical knowledge for novel applications that are significantly important for today's and future of our lives and society; computing, information systems, network systems, sensing and imaging, health care and welfare, safety and security, environmental and energy, and among others based on nano-scale photonics and materials.

Such a research concept is represented as the title of the workshop; "*Information Physics and Computing in Nano-Scale Photonics and Materials*". The workshop aims to bring together and facilitate exchanges between explorers who have strong interests **both** in nano-scale photonics, information, and enabling technologies.

■ Scope

Potential topics include, but are not limited to:

- Architectures, systems, and devices based on nano-scale photonics and materials
- Computing, sensing, signal transformation, and other functions based on molecular and nano-scale processes
- Energy transfer and its associated fundamental topics for system applications
- Quantum and dissipative processes in computing
- Top-down and bottom-up design and fabrication technologies for nano-scale photonic systems and devices (e.g. semiconductor quantum dots, DNA-based self-assembly, etc.)
- Design, modeling and performance analysis of nano-scale systems and devices
- Theoretical fundamentals for computing and other functions based on nano-scale photonics and materials
- Low-power operation, scaling, autonomy, robustness, and other novel characters brought about nano-scale photonics and materials
- Sensing and imaging (sub-wavelength structures for intelligent imaging functions, etc.)
- Information and communication technologies based on spatio-temporal dynamics and/or autonomous behaviors and/or complex structures in the nano-scale photonics and materials
- Novel applications of nano-scale photonics and materials
- Macro/nano interface technologies for computing

Co-chairs: Makoto Naruse (NICT, Japan), Yusuke Ogura (Osaka University, Japan)

Program Committee

Masashi Aono (RIKEN, Japan)

Chris Dwyer (Duke University, USA)

Keiichiro Kagawa (Shizuoka Univ., Japan)

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Jeremy O'Brien (University of Bristol, UK)

Motoichi Ohtsu (The University of Tokyo, Japan)

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Erich Runge (Technical Univ. of Ilmenau, Germany)

Serge Huant (Institut Neel, France)

Jun Tanida (Osaka University, Japan)

Naoya Tate (The University of Tokyo, Japan)

Lars Thylen (Royal Institute of Technology, Sweden)

■ For Authors

- A camera-ready, three-page summary should be submitted no later than **May 10, 2012**.
- Notification of acceptance: June 10, 2012.
- Template file: please download from the WS web site.
- [Optional] The invited and contribute papers are encouraged to submit full papers to a single special volume dedicated to IPCN to be published in the **Nano-Optics and Nanophotonics Series** in Springer. (<http://www.springer.com/series/8765>) Its deadline will be December 31, 2012.

Invited speakers

Chris Dwyer (Duke University)

Jeremy O'Brien (University of Bristol)

Makoto Naruse (NICT)

Yusuke Ogura (Osaka University)

Serge Huant (Institut Neel, CNRS Grenoble)

Paul Prucnal (Princeton University)

Hwi Kim (Korea University)

Naoya Tate (The University of Tokyo)

Shoji Kawahito (Shizuoka University)

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