



OptoX-NANO 2019

*Current challenges of key enabling nanomaterials for emerging technologies:
Optical, X-ray metrology and rational material design*



2nd – 5th December, 2019, Okayama Convention Center, Okayama, Japan

Submission deadline: 1 November, 2019, <http://opto-x-nano.com>

This conference series started in EMRS Spring Meeting 2003, Strasbourg, France and now it is at the 8th edition (organised for the 2nd time in Japan) aims to explore recent advances in photonic characterization of novel materials used in applications as varied as renewable energy, medical applications, and art restoration. Visible photons are very easy to produce and manipulate, and have the proper energy to characterize semiconductor materials, such as might be found in solar cells. Infrared and terahertz photons much lower energy and are harder to produce and manipulate, but give information about lattice vibrations and impurities in materials. X-rays are much higher energy, and therefore can explore material characteristics such as lattice spacing and atom identification.

OptoX-NANO 2019 conference aims at:

- giving an overview of: a) current challenges for rational material design and emerging devices modelling

and design and b) the current status and future trends of optical, THz and X-ray metrology for key enabling nanoscale material characterization for emerging technologies, with a particular emphasis for ICT, Microwave/Terahertz, Renewable Energy and Energy storage, health and heritage conservation.

- promoting and encouraging young researches and academics interaction with industry to address scientific and technological challenges associated with the improvement of standard analytical methods and qualification of newer techniques suitable for addressing the needs for the emerging technologies of the future at nanoscale.

- promoting and encouraging networking activities between Europe (*EU ERASMUS/H2020/Horizon Europe, MINATEC/GIANT*) and Japan (*JSPS, JST, Riken, AIST, Japan Delegation for EU H2020/Horizon Europe*) within all these emerging fields of science and technologies that are expected to have a significant societal impact.

Conference Organizers:

Prof. Kenji Tsuruta, Okayama University, Japan

Dr. Mircea Modreanu, Tyndall National Institute-University College Cork, Ireland

Prof. Olivier Durand, UMR FOTON, CNRS, INSA, Rennes, France

Co-operation:

Okayama University, RIKEN, Tyndall National Institute-University College Cork

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OptoX-NANO 2019 Scope:

Metrology for Novel and Advanced Materials:

Energy materials and devices (Catalysts, Nanocarbons, 2D Materials, Thermoelectrics, Ferroelectrics, β -

Ga₂O₃, Perovskites, SiC; Emerging Solar cells, Energy Harvesting,)

Bio-related materials (Proteins, Cancer Cells, in-vivo and ex-vivo characterization)

Materials for New Mobility (Batteries, Supercapacitors, 5G/6G, Fuel cells, CFRPs)

Materials and devices for Information Technology and Photonics

Novel Meteorology and Measurements Systems:

Spectroscopic Ellipsometry (from UV to THz)

High intense field (Synchrotron/High power laser)

Microwave/Terahertz Science and Applications

Raman/SERS/TERS/Nano-IR/Nano-Photoluminescence and Cathodoluminescence

Ultrafast Spectroscopy/ Optical Pump-probe techniques

High Resolution Transmission Electron Microscopy

Modeling/Simulation of Materials and Devices:

First principles methods (DFT/Hybrid DFT, TDDFT), Mesoscale/Multiscale modelling and simulation

(Hybrid FDTD-TDDFT), Machine-learning algorithms for material/device design

Metrology for Cultural Heritage:

Industrial Applications: ICT, IoT, Health, Next Generation Wireless Communication (5G/6G),

OptoX-NANO 2019 Selected Hot Topics:

- Ellipsometric techniques (Mueller Matrix, Infrared, THz, time-resolved)
- X-ray synchrotron diffuse scattering
- Time-resolved and temperature-resolved X-ray synchrotron measurements
- Ellipsometric and other studies of photovoltaic materials and solar cells
- X-ray synchrotron sources and techniques developed to explore thin-layered materials
- Spatially resolved optical (e.g. TERS, SERS, Nano-IR) and x-ray techniques.
- Real time and in-situ characterisation techniques for materials and devices
- Characterization of complex materials such as graphene, graphene oxide, 2D semiconductor materials, nanotubes and nanowires, phase change materials, nanocomposites.
- Characterization of β -Ga₂O₃, Inorganic-Organic Perovskites and SiC
- Nanostructures and metamaterials; plasmons at interfaces and in nanostructured materials.
- Dielectrics and ceramics; transparent semiconductors, ferroelectrics, ferromagnetics.
- First principles methods (DFT/Hybrid DFT, TDDFT), Mesoscale/Multiscale modelling

Invited speakers (*confirmed*):

- Sergei Kazarian, Imperial College London, UK (*Invited Plenary Speaker*)
- Alessandro Logiudice, Torino University, Italy
- Alberto Castellero, Torino University, Italy
- Dario Narducci, Milano Bicocca, Italy

- Minoru Nohara, Okayama University, Japan
- Hiroyuki Fujiwara, Gifu University, Japan
- Vanya Darakchieva, Linkoping University, Sweden
- Davide Mencarelli, Università' Politecnica delle Marche, Italy
- Takashi Teranishi, Okayama University, Japan
- Andrea Di Donato, Università' Politecnica delle Marche, Italy
- Afshin Ziaei, Thales Research and Technology, France
- Ian Povey, Tyndall National Institute, Ireland
- My Ali Khakani, INRS, Canada,
- Masayoshi Tonouchi, Osaka University, Japan
- Ozaki Tsuneyuki, INRS, Canada,
- Chiko Otani, RIKEN, Japan
- Jin Tabata, Tokyo University, Japan
- Noriaki Kida, Tokyo University, Japan
- Yutaka Kadoya, Hiroshima University, Japan
- SonJoo-Hiuk, University of Seoul, South Korea
- Fabian Rotermund, KAIST, South Korea
- JeonTae-In, Korea Maritime and Ocean University, South Korea