INSD Summer School 2023, Osaka-Tsukuba
(Summer Lectures in 2023 on Nanotechnology/Nanoscience)

Two lectures: Live-hybrid (on site and on line) and other one lecture: On-demand
Open during July 18th and August 2nd
Live final exam. (student presentation) at the end

Let's participate in the graduate-level lectures on nanoscience and nanotechnology by top foreign scientists!

R^3 Institute for Newly-Emerging Science Design, Osaka University, opens the INSD Summer School 2023 on Nanoscience and Nanotechnology, where three lectures are provided by live-hybrid (two of the three) and on-demand styles. This summer school is aimed for fostering international young talent on nanoscience and nanotechnology. Each set of lectures is composed of seven or eight classes during July 18th and August 2nd, 2023. For on-demand style lectures, students should finish to view a series of lectures during the specified period and are requested, just after each lecture, to submit the answer to the short question raised during each of lectures to ensure the attendance. Final examination of all the three lectures will be executed, as a face-to-face style and/or live-hybrid style with the participation of the lecturers. ZOOM or Webex system will be used for hybrid and on-demand lectures.

The lecture documents and recorded lectures will be uploaded on
URL（Japanese）： http://www.insd.osaka-u.ac.jp/nano/index.html
URL（English） ： http://www.insd.osaka-u.ac.jp/nano/Homepage(Eng)/index.htm

■ **Lecturers:** Following lecturers will offer three topics.
Osaka University: **Dr. Michel Sliwa** (CNRS Research Director, Univ. Lille, France),
Prof. Marie D'angelo (Institute for NanoSciences of Paris, Sorbonne University, France)
University of Tsukuba: **Dr. Jacek Kasprzak**（Institute Nēel CNRS Grenoble, France）
*Schedule and abstracts of lectures are shown on the second page.

■ **Lecture Room:** (Toyonaka Campus, capacity: 20) R.N. 305, INSD Seminar Room, 3rd floor of Interdisciplinary Research Building.

■ **Applicants:** Although the priority is given to graduate-school students who take "Graduate Minor Program or Graduate Program for Advanced Interdisciplinary Studies for Education, Research and Training on Nanoscience and Nanotechnology" (hereafter, nano-program), "Interactive Material Science Cadet Program", "Multidisciplinary PhD Program for Quantum Beam", and "Honors Program in Science, Engineering and Informatics", there is plenty of room for other domestic and foreign graduate and undergraduate students and staff members to be welcome. Homework exercises and final test (student presentation) will be imposed on graduate students who need credits. They are also requested to reply to short questions in case of on-demand lectures for the evidence of the viewing.

■ **Maximum number of topics and units of credit:** One unit of credit for "International Exchange Lecture on Nano-science and Nano-engineering B or C" is given to graduate students who complete a series of lectures on one topic. Graduate students can get up to two units of credit. Especially, foreign students desiring to take the nano- program, but being not good at Japanese, are requested to complete these two topics in order to transfer two units of credit to the otherwise required module, "Nanotechnology Career-up Lectures for Social, Legal, Ethical Relationship".

■ **Deadline and method of application:** Deadline depends on the lecturers. Send the following information either in Japanese or in English to the INSD staff who is in charge. E-mail address: nano-program@insd.osaka-u.ac.jp
Registration deadline: Dr.Michel and Prof. D'angelo: Monday, July 17th
Dr.Kaspzak : Friday, July 14th

Full name, student registration code, affiliation (graduate school/school, department, D/M/B, school year, affiliated research laboratory), E-mail address, specify whether one takes nanoprogram or not, chosen lecturer's name(s).
You will receive the information how to access to the website for the lecture documents and recorded lectures.

■Lecture Schedule (about 90 minutes per one lecture)

	Dr. Michel Sliwa	On-demand Live-hybrid (on site and on line)	Lecture from Osaka
	Prof. Marie D'angelo	On-demand & Oral Exam(on-line)	
	Dr. Jacek Kasprzak	Live-hybrid (on site and on line)	Lecture from Tsukuba

Lecturer	From July 18th to30th (On-demand Lectures)							
Dr. Michel SLIWA	1	2						

Time/Date	7/18	7/19	7/20	7/21	7/24	7/25	7/26	7/27	7/28	7/31	8/1
10:45-12:19										3	6
13:30-15:04	1	2	3	4	5	6	7	8	Oral	4	7
15:15-16:49									Exam	5	Exam

Lecturer	Guidance (Live)	From July 18th to August 1th (On-demand Lectures) Reply to short question for the evidence of every viewing								Final Test Oral Exam (On-line)
Prof. Marie D'angelo	July 18th 4p.m-5p.m(JST)	1	2	3	4	5	6	7	*	August 2nd 4p.m-6p.m(JST)

■Lecturers, and Titles and Abstracts of Lectures

Lectures from Osaka

Light & Nanoscience: Fabrication, Manipulation and Characterization

Dr. Michel Sliwa
(CNRS Research Director, Univ. Lille, France)

-Introduction to light in nanoscience: history and applications
-Fabrication of nanoparticles and nanostructures with unique photonics properties
-Basic physical properties and characterization
-Light interaction with nano-objects: quantum mechanical effect and plasmonics.
-Advanced characterization: nanoimaging and ultrafast photodynamics
-Development of new nanotechnologies for photocatalysis, photonics materials, bio-technology, bio-imaging

Introduction to Photoelectron Spectroscopy and Synchrotron Radiation

Prof. Marie D'angelo
(Institute for NanoSciences of Paris, Sorbonne University, France)

–Generalities & technical aspects of photoemission
-Interaction Hamiltonian & transition probability
-Transitions from localized states: core level photoemission
-Band dispersion: Angle-Resolved Photoemission
-X-ray production: comparison of X-ray tubes, synchrotron radiation and Free Electron Laser
-Basics and theory of synchrotron radiation
-New developments in photoemission: time-resolved and near ambient pressure photoemission

Lectures from Tsukuba

Opto-Electronics of Semiconductor Nanostructures: from Fundamentals to Modern Spectroscopies

Dr. Jacek Kansprzak
(Institut Neel CNRS Grenoble,France)

-Fundamentals of semiconductors
-Electronic properties
-Nanostructures and excitons
-Enhancing light-matter interaction with photonic devices
-Optical properties and conventional spectroscopy
-Notions of coherence and nonlinear spectroscopy in excitonic systems

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