

# INSD Summer School 2017, Osaka-Tsukuba

(Summer Lectures in 2017 on Nanotechnology/Nanoscience)

Schedule: Monday, July 24<sup>th</sup> - Thursday, August 3<sup>rd</sup> except on Sunday

Let's participate in the original graduate-level lectures on nanoscience and nanoengineering delivered live by four lecturers from top foreign universities!

The Institute for NanoScience Design, Osaka University will invite foreign lecturers from abroad and hold the INSD summer school 2017 on nano science and technology, composed of four topics each having eight lectures that are usually taught in topmost European or US Universities. The summer school is aimed at fostering international young talent on nanoscience and nanoengineering. This program is shared with University of Tsukuba and connects three campuses, Toyonaka, Suita, and Tsukuba, via video conferencing systems. The lecture documents will be uploaded on URL: <http://www.insd.osaka-u.ac.jp/nano/>.

■**Lecturers:** This year the following four lectures will offer four topics, two from Osaka and two from Tsukuba.

Prof. Masashi Watanabe (Dept. of Mater. Sci. & Eng., Lehigh University, USA), at Toyonaka

Dr. Catherine Gourdon (CNRS/Institute for NanoSciences of Paris, UPMC (University of Paris VI), France), at Toyonaka

Prof. Etienne Gheeraert (Néel Institute, CNRS and University of Grenoble-Alpes, France), at Tsukuba

Prof. Henri Mariette (Néel Institute, CNRS and University of Grenoble-Alpes, France), at Tsukuba

\*Schedule and abstracts of lectures are on the reverse side. Pay attention to the change of the order and time of each topics.

■**Lecture rooms:** (Toyonaka Campus, capacity: 40) R.N. 305, INSD Seminar Room, 3<sup>rd</sup> floor of Interdisciplinary Research Building; (Suita Campus, capacity 12) R.N. F390, INSD Satellite Room, 3<sup>rd</sup> floor of the first research building of Institute of Scientific and Industrial Research. Prof. Watanabe and Dr. Gourdon will give lectures at Toyonaka.

■**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) and "Interactive Material Science Cadet Program", there is plenty of room for other domestic and foreign graduate and undergraduate students and staff members to be welcome. Homework and, possibly, a final exam are imposed on those students who desire credits. If possible, the attendants are requested to reply to some questionnaire which would be helpful in improving the summer school.

■**Maximum number of topics and units of credit:** One unit of credit for "International Exchange Lecture on Nanoscience and Nanoengineering B or C" is given to those students who complete a series of lectures on one topic. Graduate students can take 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 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:** Deadlines are Friday, July 14<sup>th</sup>. 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](mailto:nano-program@insd.osaka-u.ac.jp)  
On-site registration is also possible for those who do not desire credits.

Students: full name, 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), place of attendance (Toyonaka/Suita).

Other members: full name, affiliation (institution, affiliated research laboratory, position), E-mail address, chosen lecturer's name(s), place of attendance (Toyonaka/Suita).

\*If one cannot attend some classes during the series of lectures, please specify the date of absence.

## ■ Lecture Schedule (94 minutes per lecture)

Prof. Masashi Watanabe
Dr. Catherine Gourdon
Prof. Etienne Gheeraert
Prof. Henri Mariette

Time/Date	7/24	7/25	7/26	7/27	7/28	7/29	7/30	7/31	8/1	8/2	8/3
9:00-10:34							OFF				
10:45-12:19											
13:15-14:49					12:45~						
15:00-16:34					14:30~						16:10~

Please note that the starting times of some lectures are irregular on 7/28, 8/2 and 8/3.

## ■ Lecturers, and Titles and Abstracts of Lectures

### Lectures from Tsukuba

#### Ion Implantation in Solids



##### **Prof. Etienne Gheeraert**

(Néel Institute, CNRS and University of Grenoble-Alpes, France)

- Physics of ion stopping
- Nuclear and electronic stopping
- Implantation profile
- Implantation defects, annealing
- Transient Enhanced Diffusion
- Phenomena appearing in fabrication and processing of electronic devices

#### Wide Bandgap Semiconductors and Low dimensional Nanostructures



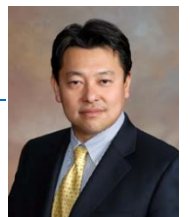
##### **Prof. Henri Mariette**

(Néel Institute, CNRS and University of Grenoble-Alpes, France)

- Introduction to the various semiconductor materials
- Peculiarities of wide bandgap semiconductors
- Basic phenomena in optics
- III –Nitrides polaritonics in microcavity
- Light Emitting Diodes with nitrides
- Nucleation and growth
- Application to epitaxy of low dimensional structures

### Lectures from Toyonaka, Osaka

#### Transmission Electron Microscopy -Fundamental Principle and Applications to Materials Science



##### **Prof. Masashi Watanabe**

(Dept. of Mater. Sci. & Eng., Lehigh University, USA)

- Basic concepts of TEM instrumentation
- Electron scattering and diffraction
- Image formation in TEM
- Analysis in TEM
- Advanced topics and applications of TEM

#### Nanophotonics and Spintronics



##### **Dr. Catherine Gourdon**

(CNRS/Institute for NanoSciences of Paris, UPMC (University of Paris VI), France)

- Magneto-optical effects: Kerr, Faraday and Voigt
- Magnetism: basics, magnetic domains, domain walls, periodic patterns, spin waves
- Magneto-optical imaging
- Spin dynamics probed by time-resolved magneto-optical effects
- Brillouin light scattering and spin waves

\*The programs are subject to change according to the schedule of foreign lecturers.

## ■ Organized by the Institute for Nanoscience Design (INSD), Osaka University

Nano-program Office : R.N.303, 3<sup>rd</sup> floor of Interdisciplinary Research Building, Tel: 06-6850-6398

E-mail: nano-program@insd.osaka-u.ac.jp, Website: <http://www.insd.osaka-u.ac.jp/nano/>