TIA GRADUATE SCHOOL SUMMER OPEN FESTIVAL 2019

Summer Lecture in 2019 for Nanoscience/Nanotechnology Recruitment of Participants

The Graduate School of Pure and Applied Sciences, University of Tsukuba and Institute for NanoScience Design, Osaka University will jointly hold the Summer Lecture in 2019 for Nanoscience/Nanotechnology as part of the development of human resources. Lectures will be relayed by TV conference system between Tsukuba and Osaka.
We are looking forward to your participation.

Dates July 23 to August 5, 2019 (11 days: No lecture on July 28 Sun, August 3 Sat, August 4 Sun.)

Venues B0110, Laboratory of Advanced Research, University of Tsukuba,
Suita Campus and Toyonaka Campus, Osaka University

Lecturers
- Prof. Masashi Watanabe **"Transmission Electron Microscopy-Fundamental Principle and Applications to Materials Science"** (Dept. of Mater. Sci. & Eng., Lehigh University, USA), Offered from Osaka
- Prof. Remco Havenith **"Quantum Chemistry and its Application"** (Zernike Institute, University of Groningen), Offered from Osaka
- Prof. Etienne Gheeraert and Prof. Henri Mariette **"Semiconductor Physics and Engineering, Doping, Defect, Optical Properties**, (Université Grenoble Aples and University of Tsukuba) Offered from Tsukuba
- Assistant Prof. Mukesh Kumar **"Basic of engineering materials and computational materials science"** (School of Physics & Materials Science, Thapar Institute of Engineering Technology, India), Offered from Tsukuba

Targeted Participants Graduate students and professionals interested in Nanotechnology and Nanoscience
Note: With a recommendation letter from your academic adviser, college seniors and students of technical colleges can attend this course.

Number of Positions Around 30 people (10-day attendance in principle)

Selection Process Registration form screening (In case of oversubscription, we will give priority to graduate students) **Note**: After the application deadline(June 9), a participation confirmation will be sent to all participants by e-mail (June 10).

Tuition Fee Free

Travel Expenses

■For students not from the University of Tsukuba: Transportation expenses and some assistance for accommodation fee: As assistance for accommodation, you can stay at Amakubo-accommodation, at University of Tsukuba. The first-come, first-served basis. If you would like to make a reservation, please check the box of the Registration form. If you stay at another hotels, a part of accommodation fee will be provided later.

■Others : No assistance for travel expenses or accommodation fee, *By your own expenses, you can stay at Amakubo-accommodation at University of Tsukuba, it depends on the room availability. If you would like to make a reservation, please check the box in the Registration form.

How to Apply

Access the URL (https://tia-edu.jp/summer_fes2019/) , and click the "Summer Lecture in 2019".
From the "Application", Click Here, you can access to the application form, please fill in and submit the form.
Application Deadline: July. 9. 2019

Approval of Credits

Graduate Students from outside of the University of Tsukuba

University of Tsukuba approves the class subjects (1 credit each) of this Summer School as in the regular curriculum of Graduate program; for this reason, the graduate students who wish to acquire the credits can take the classes as Exchange Students by obtaining permission from both their university and University of Tsukuba. If e-mail notice of participation confirmation received and would like to acquire the credits of the class subject, refer to the page of Summer Lecture in 2017, "Acquire the credits".

Graduate Students of University of Tsukuba

The students who received e-mail notice of participation confirmation and would like to acquire the credits, register class subjects in TWINS by your major field. The credits will be included as completion of requirements of *Graduate program. *For later period of graduate program (Docotor's course), only the students of Nanoscience/Nanotechnology major, can acquire the credits.

Majors / Classes and Lecturers	Nano-science and Nano-technology	Applied Physics	Materials Science	Physics
Advanced Nanotechnology Ⅰ **Prof. Masashi Watanabe**	02BQ207	01BF291	01BG089	01BC306
Advanced Nanotechnology Ⅱ **Prof. Remco Havenith**	02BQ210	01BF292	01BG090	01BC307
Advanced Nanotechnology Ⅲ **Prof. Etienne Gheeraert and Prof. Henri Mariette**	02BQ208	01BF293	01BG091	01BC308
Advanced Nanotechnology Ⅳ **Assistant Prof. Mukesh Kumar**	02BQ209	01BF294	01BG092	01BC309

Schedule from Registration to the last day

Date	Items
July 9 Tue.	Application deadline ※Orientation meeting will be held. The detail is to be announced.
July 10 Wed.	An e-mail notice of participation confirmation will be sent from applicants. If you are a confirmed participant, you will have the information as below: ① Application Form for Special Students (Only for Graduate students out side of University of Tsukuba) ② ＴＷＩＮＳ subjects enrollment info (Only for Graduate students of University of Tsukuba) ③ Application Form for transportation and accommodation support (Only for students) ※You pay first and we will make it up according to the RECEIPT you submit to us.
June 28 Fri.	Deadline for the request document to University of Tsukuba for Exchange Students (Only for Graduate students out side of University of Tsukuba)
July 22 Mon.	ＴＷＩＮＳ Input due date (Only for students of University of Tsukuba)
July 23 Tue.	Lectures begin
July 28 Sun, August 3 Sat, August 4 Sun.	No lectures
August 5 Mon.	Application deadline for transportation and accommodation fee support(Only for students). ※You pay first and we will make it up according to the RECEIPT you submit to us.

Contact Information

University of Tsukuba, Tsukuba Innovation Arena Promotion Office
tia-edu@un.tsukuba.ac.jp Tel. 029-853-5891
http://tia-edu.jp

■Lecture Schedule

Advanced Nanotechnology Ⅰ
Prof. Masashi Watanabe
Advanced Nanotechnology Ⅱ
Prof. Remco Havenith
Advanced Nanotechnology Ⅲ
Prof. Henri Mariette, Prof. Etienne Gheeraert
Advanced Nanotechnology Ⅳ
Dr. Mukesh Kumar

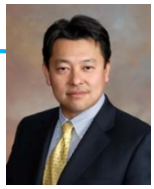
Time＼Date	7/23 Tue	24 Wed	25 Thu	26 Fri	27 Sat	28 Sun	29 Mon	30 Tue	31 Wed	8/1 Thu	2 Fri	3 Sat	4 Sun	5 Mon
9:00-10:34						OFF						OFF	OFF	
10:45-12:19														※
13:15-14:49				*										
15:00-16:34				**										

Attention!! Irregular time! ＊Start from 12:45 and end at 14:19. ＊＊Start from 14:30 and end at 16:04. ※ Extra day as final exam

■Abstract

※Program contents might be changed which please be noted. Thank you.

Transmission Electron Microscopy - Fundamental Principle and Applications to Materials Science



【web-casting：Osaka Uni.】

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

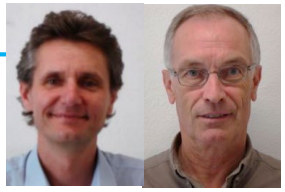
Quantum Chemistry and its Application

【web-casting：Osaka Uni.】

Prof. Remco Havenith (Zernike Institute, University of Groningen)

- Basic principles of molecular quantum chemistry
- Methods of molecular quantum chemistry
- Hartree-Fock theory, post Hartree-Fock methods, and Density Functional Theory
- Calculation of molecular properties:
- Modeling electronic properties of crystalline solids

Semiconductor Physics and Engineering, Doping, Defect, Optical Properties



【web-casting：Univ. of Tsukuba】

Prof. Etienne Gheeraert and Prof. Henri Mariette
(Université Grenoble Aples and University of Tsukuba)

- Introduction to the various semiconductor materials and general concepts
- Semiconductor doping by diffusion
- Semiconductor doping by ion implantation
- Basic phenomena in semiconductor optics
- Elementary electronic devices

Basic of engineering materials and computational materials science

【web-casting：Univ. of Tsukuba】

Assistant Prof. Mukesh Kumar(Assistant Professor of Deemed University, India)

Computational materials science involves computational tools for solving materials related problems. There exist different mathematical models for investigating problems at multiple length and time scales which help in understanding evolution of material structures and how these structures effectively control material properties. With this understanding we can select materials for specific applications and also design advanced materials for new applications. Among various levels, first-principles density Functional Theory (DFT) is a popular tool at electronic level along with Molecular Dynamics (MD) and Monte Carlo (MC) methods for atomistic simulations. The course is mostly informative, i.e. without going into mathematical details. The main aim is to inform you about rapidly growing field of computational physics and possibilities of its tools for solution materials science problems.