INSD NanoScience Video Exchange Lectures (2012, Groningen-Osaka)

These lectures are held as a part of **"Fundamental and functional properties of nanomaterials"** in top Master NanoScience in Groningen and a part of **"Frontier of Nano-Scale Materials"** in Frontier Materials Science in Osaka.

The sessions start on the following Friday at 9:00 in the morning (Groningen time), that is, at 16:00 or 17:00 in the afternoon (Osaka time).
[NOTE The Netherlands switches from summer time (day light saving time) to winter time in the night between 27 and 28 October 2012.]

Friday 12. Oct. 2012
Japan time:16:00-18:00
Groningen time: 9:00-10:45

Osaka speaker: **prof. Hiroshi Miyasaka** (speaks 16:00-16:45)
(field: photochromism, luminescence correlation)
Title: Time-resolved detection and laser-gated reaction control of photochromic processes in organic molecules. - Control of photochromic processes by laser irradiations.-
Abstract: Pulsed laser excitation can induce several nonlinear responses in molecular systems such as multiphoton absorption. Some examples to expand the functionality of photochromic molecular systems by using pulsed laser excitation, multiphoton-gated reaction, one-color reversible control of reactions, and cooperative reactions, will be introduced.

Groningen speaker: **prof. Ron Tobey** (speaks 10:00-10:45)
(field: Solid state research with ultrafast lasers, generation of THz and soft X-ray pulses)
Title: X-ray techniques for imaging at the nanoscale.
Abstract: X-rays are naturally suited for imaging at the nanoscale due to their short wavelength and elemental sensitivity. In this seminar, I will present a cross section of x-ray imaging techniques based at synchrotron and free electron laser sources. Particular emphasis will be placed on 'new' imaging methodologies such as coherent diffractive imaging.

Friday 19. Oct. 2012

Japan time:15:45-18:00 (ceremony 15:45-16:15)
Groningen time: 8:45-11:00 (ceremony 8:45-9:15)

Opening ceremony for Groningen TV lecture room (15:45-16:15 / 8:45-9:15)
(VIP on Osaak side, includes **Prof. Kiyoshi Higashijima**, trustee, vice-president of OU)
(VIP on Groningen side includes **Prof. S, Poppema**, President of UG)

Regular lectures:
Osaka speaker: **prof. Yoshito Tobe** (speaks ~16:25-17:10)
(field: supra-molecule electronics)
Title: π-Conjugated Organic Compounds for Optoelectronic Materials: Molecular Self-assembly and the Consequences
Abstract: π-Conjugated organic compounds play a central role in organic optoelectronic materials such as field effect transistors (FETs), organic light emitting diodes (OLEDs), and organic photo voltaics (OPVs). Not only individual electronic characteristics of the molecules but also their self-assembling properties in crystalline, solid, or liquid crystalline state are the most important factors that generate their materials properties. After a short general introduction, a few examples that exemplify the importance of the molecular assembly and the control strategy will be given.

Groningen speaker: **prof. Caspar van der Wal** (speaks ~10:15-10:45)
(field: Single photon emission and photon correlations with solid state systems)
Title: Quantum optical properties of nano-systems and devices.
Abstract: Nanoscience offers very rich possibilities for engineering optical media and optical emitters with properties that give control over non-classical forms of light. This lecture provides and introduction into this topic, with a focus on single-photon emitters. The questions that will be addressed are: How can nano-systems and devices such as single molecules and quantum dots be turned into single-photon sources? How can we characterize their performance, and what limits their performance?

Friday 26. Oct. 2012
Japan time:16:00-18:00
Groningen time: 9:00-11:00

Osaka speaker: **prof. Yutaka Nagasawa** (speaks 16:00-16:45)
(field: four wave mixing. ultrafast spectroscopy)
Title: Femtosecond degenerate four-wave-mixing (DFWM) and photon echo experiments in the condensed phase.

Abstract: Basics of the femtosecond degenerate four-wave-mixing (DFWM) experiments, namely transient grating and three-pulse photon echo techniques, are explained and its application to ultrafast dynamics in the condensed phase is introduced. DFWM is capable of detecting solvation dynamics and chemical reaction related events by monitoring the electronic dephasing process. It can be also applied to enhance or suppress particular coherent nuclear wavepacket motions.

Groningen speaker: **prof. Thorben Cordes** (speaks 10:00-10:45)
(field: Single molecule, superresolution, FRET)
Title: From single-molecule photophysics to super-resolution and optical imaging of nano-structures.
Abstract: In this lecture the basic photophysics of single-molecule compatible fluorophores are introduced in combination with an extension of the classical Jablonski scheme. This lays the groundwork for the use of standard organic fluorophores as "photoswitches" in state-of-the-art super-resolution imaging methods. Working principles and applications of these techniques are shown. Finally, super-resolution imaging is used to characterize a novel bottom-up assembly process (single-molecule) based on the transport of DNA-oligomers with an atomic-force-microscope.
keywords: single-molecule fluorescence spectroscopy, photophysics, super-resolution microscopy, single-molecule, atomic-force-microscopy

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Friday 9. Nov. 2012
Japan time:17:00-19:00
Groningen time: 9:00-11:00

Osaka speaker: **prof. Masaaki Ashida** (17:00-17:45)
(field: Q-dots, manipulation)
Title: Optical manipulation of semiconductor nanoparticles.
Abstract: After the brief introduction of radiation force, optical tweezers, atom trap, and optical properties of semiconductor nanoparticles, recent results on optical manipulation of the nanoparticles in superfluid helium will be presented.

Groningen speaker: **prof. Maria Loi** (speaks 10:00-10:45)
(field: Supra-molecular structure for organic devices)
Title: Supramolecular organization in organic devices.
[part of the Groningen lectures on Preparation of inorganic and organic devices]

Abstract: The supra-molecular organization of organic semiconductors in thin films used as active layer of organic devices is fundamental for their performances. In these materials the electronic and optical properties are strongly anisotropic and dependent on the supramolecular arrangement. Therefore it is possible to reveal by optical techniques the supra-molecular organization in thin films of prototype organic semiconductors. Finally, the relation between the supramolecular organization in thin film and the device performances will be discussed.