

# The 293<sup>rd</sup> MANA Special Seminar



## Fluorescence Modulation in Self-assembled $\pi$ -Gels

Chair: Dr. Masayuki Takeuchi (Organic Group)

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Self-assembly of functional molecules such as linear  $\pi$ -systems is important in the field of advanced materials for optoelectronic applications. During self-assembly the electronic interaction within the molecules induces significant changes in the properties such as absorption, fluorescence and electronic conductivity. Oligo(*p*-phenylenevinylene)s (OPVs) are a class of fluorescent linear  $\pi$ -systems that are being used for a variety of applications. For the past several years we have been investigating the self-assembly of OPVs, which form a variety of supramolecular structures leading to gelation of organic solvents. As a result, significant change occurs to the emission properties. This shift in the emission is attributed to the facile excitation energy migration within the self-assembled aggregates of different HOMO-LUMO levels as revealed by the time resolved emission studies and wavelength dependent fluorescence decay profiles. Through functional group modification and control of supramolecular interaction, we were able to tune the emission of a variety of molecular self-assemblies leading to organogels that emit at different wavelengths. These soft materials are excellent scaffolds as energy donors. Encapsulation of different acceptor molecules into the self-assembled nanostructures resulted in energy transfer in a controlled fashion resulting in emission from the acceptors. This strategy has been used to prepare organogels with tunable emission. Proper functionalization of the gelator molecules and control of their self-assembly can be exploited for designing white light emitting gels. Many of these self-assemblies can be used for the sensing of specific analytes such as explosives, pesticides etc. and also useful for imaging and document security applications. Results of these studies will be presented.

**Namiki site**

**Venue: Auditorium, 1F, WPI - MANA Bldg.**

**Date: October 24<sup>th</sup>, Wednesday Time: 15:30-16:15**

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