

**Department of Chemistry, IIT Madras**  
**RESEARCH PROPOSAL SEMINAR**

Name: Alphy Sebastian P (CY16D012)

Date: 23/09/2019

Venue: CB352, TLC Room

Time: 03.00 pm

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**Design Rationale for Luminescent Supramolecular Metallogels and their Applications**

Luminescent materials are well known for a long time for their application in various fields including solid state lighting, light emitting diodes, display devices, solar cell, sensing and bioimaging.<sup>1</sup> The recent advances and future prospects of these luminescent materials in diverse applications inspired the researchers to come up with novel materials with improved luminescence properties. Supramolecular metallogels which combine the dynamic and reversible properties of supramolecular chemistry and the good processability of polymers, are regarded as efficient alternatives. Compared with conventional inorganic luminescent materials, luminescent supramolecular metallogels exhibit advantageous properties including excellent optoelectronic properties, multiple stimuli-responsiveness, good reversibility and processability.<sup>1</sup> Especially, the non-covalent interactions in the assembly can further tune the luminescent properties, as their state of aggregation and energy transfer can be regulated by the self-assembly process. The emission properties of luminescent metallogels can stem from either chromophoric low molecular weight gelator or metal ions.<sup>2</sup> This seminar will give an overview about the design strategies employed for the fabrication of both categories of luminescent metallogels and their important applications. Finally, design rationale and synthetic approaches to prepare a novel luminescent metallogel based on mixed ligand approach will be discussed. Also, mechanistic aspects of the white light emission and environmental sensing applications using the metallogel will be discussed in detail.<sup>3</sup>

**References**

- (1) Zheng, B.; Hou, Y.; Gao, L.; Zhang, M. Luminescent Metallo-Supramolecular Polymers. *Chinese J. Chem.* **2019**, *37*, 843–854.
- (2) Sutar, P.; Maji, T. K. Coordination Polymer Gels: Soft Metal-Organic Supramolecular Materials and Versatile Applications. *Chem. Commun.* **2016**, *52*, 8055–8074.
- (3) Sebastian, A.; Mahato, M. K.; Prasad, E. A Mixed Ligand Approach towards Lanthanide-Based Gels Using Citric Acid as Assembler Ligand: White Light Emission and Environmental Sensing. *Soft Matter* **2019**, *15*, 3407–3417.

Signature of the guide

Signature of coordinator

Signature of HOD