

Colloquium

Hiroshima Univ



Dr. Tomoyasu Mani
Professor,
University of Connecticut,
Connecticut, USA

Friday, October 23, 2026

Time: 16:30-17:30

Venue: C101, School of Science

**Title: Synthetic Spin Chemistry for
Magnetic Control of Molecular Emission**

Abstract: Photogenerated spin-correlated radical pairs (SCRPs) provide a molecular platform for manipulating spin states, reactivity, and emission under weak magnetic fields.¹ This talk will describe how synthetic design of donor–bridge–acceptor molecules enables magnetic control of excited-state dynamics, producing large room-temperature magnetic field effects on fluorescence intensity and lifetime.² I will also discuss how SCRPs can act as molecular magnetic switches in triplet–triplet annihilation upconversion³ and spin-selective triplet–triplet energy transfer, enabling magnetic control of phosphorescence and NIR lanthanide emission.^{4,5} Together, these results establish a framework for synthetic quantum control of molecular excited states toward optically addressable spin systems and quantum sensors.

References:

- [1] Chemical Physics Review, 3, 021301 (2022)
- [2] Journal of the American Chemical Society. 147, 13, 11062–11071 (2025)
- [3] Journal of the American Chemical Society. 147, 9, 7187–7190 (2025)
- [4] J. Phys. Chem. Lett. 16, 27, 6983–6987 (2025)
- [5] ChemRxiv (2026), DOI: 10.26434/chemrxiv.15008632/v1.