

Photoactive Organometallic Complexes for Luminescence, Sensing, and Photoredox Catalysis

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This talk describes complementary synthetic strategies to enhance the luminescence and photoredox properties of organometallic complexes. Bis-cyclometalated iridium complexes have emerged as champion compounds in a number of applications requiring efficient phosphorescence and excited-state redox chemistry, but as successful as they have been there are some limitations in their performance, which our research looks to address. Our efforts have resulted in new designs for efficient, stable blue-emitting complexes, using strongly σ -donating acyclic diaminecarbene supporting ligands. These complexes are prepared by unconventional routes relying on the electrophilic reactivity of coordinated isocyanides. Using a different design, we have employed nitrogen-containing, π -donating ancillary ligands in the development of new bis-cyclometalated iridium complexes which are efficient red and near-infrared phosphors or potent photoreductants for applications in photoredox catalysis. And finally, a more recent effort in our group has produced a modular self-assembly strategy to prepare multi-chromophore arrays featuring cyclometalated iridium, providing easy access to new classes of luminescent supramolecular constructs, some of which are rich platforms for studying fundamental aspects of excited-state dynamics and others which function as ratiometric oxygen sensors in hypoxic environments.

Date: Wed, Jan. 9, 2019
Time: 4:30-5:30 pm
Location: 208 Clark Hall

Students, meet the speaker over coffee and cookies in the Bennett Conference room at 3:30 pm