

**Himanshu Bhatia**

**PhD Candidate**

**Department of Chemistry, Missouri S&T**

**Monday, 29 April 2023, 4:00 pm in 303 Schrenk Hall**

**Synthesis of Tetra-aza and Tetra-amido Macrocyclic Ligands and their Metal Complexes: Catalysts in Nitrene Transfer Chemistry**

Atom/group-transfer chemistry applicable to direct and selective functionalization of C–H and C=C bonds has a great potential towards generating a plethora of high value chemical compounds. Our work seeks to produce and expand a library of catalysts used for nitrogen group insertion chemistry by utilizing earth-abundant transition metals. Metal complexes of macrocyclic ligand have been targeted for their potential as catalysts, as they are thermodynamically more stable and oxidatively robust. Recent work involves targeting frameworks with N<sub>4</sub> coordination of the desired transition metals. Tetra-aza macrocyclic chiral agents have been previously synthesized in our lab and are currently being further explored as chelating agents of metal catalysts for nitrene-transfer chemistry vis-à-vis C–H and C=C bonds. A series of tetra-amido and tetra-aza macrocyclic ligands have been synthesized and metallated with suitable Mn, Fe, Co, and Cu precursors, resulting in anionic and cationic metal complexes, and have been further employed for the aziridination of olefins and amination of C–H bonds.