**Biography**

Our research group is broadly focused on organic and organometallic materials chemistry. The central theme of our research involves the rational design and creation of novel molecular and macromolecular structures for light emitting devices (energy to light conversion), solar cells (light to energy conversion) and molecular electronic applications. Our current goals involve investigations into achieving highly stable and luminescent triplet phosphors based on organometallic complexes by creation of new metal-ligand interactions. In the field of molecular electronics, we pursue different functionalization strategies of organic and organometallic systems to tailor their electronic properties to achieve molecular memory devices.

Our group is exposed to a broad range of topics including synthetic chemistry, organic chemistry, polymer chemistry, inorganic chemistry, organometallic chemistry and photochemistry.

The following topics are currently under investigation:

- **Organic and Organometallic Materials Chemistry**
- **Organometallic light emitting molecules**
- **Electronic materials and molecular electronics**

**Research output**

**Development of tethered dual catalysts: synergy between photo- and transition metal catalysts for enhanced catalysis**

**Towards blue emitting monocyclometalated gold(III) complexes-synthesis, characterization and photophysical investigations**

**Thermally robust and tuneable phosphorescent gold(III) complexes bearing (N^N)-type bidentate ligands as ancillary chelates**

**Nickel catalyzed synthesis of 4,4'-bichromenes/4,4'-bithiochromenes and their Atropisomerism**

**Tunable membrane potential reconstituted in giant vesicles promotes permeation of cationic Peptides at nanomolar concentrations**

**Highly stable and strongly emitting N-heterocyclic carbene platinum(II) biaryl complexes**

**Metallic nanoparticle contacts for high-yield, ambient-stable molecular-monolayer devices**
Harnessing white-light luminescence via tunable singlet-and triplet-derived emissions based on gold(III) complexes


Stable N-heterocyclic carbene (NHC) cyclometalated (C^C) gold(III) complexes as blue-blue green phosphorescence emitters


Rationally designed blue triplet emitting gold(III) complexes based on a phenylpyridine-derived framework


Smectic A mesophases from luminescent sandic platinum(II) mesogens


Charge Transport and Conductance Switching of Redox-Active Azulene Derivatives


Tunable and Efficient White Light Phosphorescent Emission Based on Single Component N-Heterocyclic Carbene Platinum(II) Complexes


Electronic communication in phosphine substituted bridged dirhenium complexes - clarifying ambiguities raised by the redox non-innocence of the C4H2- and C4-bridges


Field-induced conductance switching by charge-state alternation in organometallic single-molecule junctions


Fabrication of NEMS actuated plasmonic antenna platform for the study of optical forces and field enhancements in hot-spots


Monocyclometalated gold(III) complexes bearing κ-accepting cyanide ligands: syntheses, structural, photophysical, and electrochemical investigations


Stable and color tunable emission properties based on non-cyclometalated gold(III) complexes


Structural and electronic variations of sp/sp(2) carbon-based bridges in di- And trinuclear redox-active iron complexes bearing Fe(diphosphine)X-2 (X = I, NCS) moieties


Fabrication of bow-tie antennas with mechanically tunable gap sizes below 5 nm for single-molecule emission and Raman scattering
Organometallic Single-Molecule Electronics: Tuning Electron Transport through X(diphosphine)(2)FeC4Fe(diphosphine)(2)X Building Blocks by Varying the Fe-X-Au Anchoring Scheme from Coordinative to Covalent

High-conductive organometallic molecular wires with delocalized electron systems strongly coupled to metal electrodes

Luminescent monocyclometalated cationic gold(III) complexes: Synthesis, photophysical characterization and catalytic investigations

Metal-free triplet phosphors with high emission efficiency and high tunability

Monocyclometalated gold(III) monoaryl complexes - A new class of triplet phosphors with highly tunable and efficient emission properties

Tuning the luminescent properties of Pt(II) acetylide complexes through varying the electronic properties of N-heterocyclic carbene ligands

Anticancer profile of a series of gold(III) (2-phenyl)pyridine complexes

Impact of 2,6-connectivity in azulene: Optical properties and stimuli responsive behavior

Highly efficient deep-blue emitters based on cis and trans N-heterocyclic carbene Pt-II acetylide complexes: Synthesis, photophysical properties, and mechanistic studies

Stepwise construction of an iron-substituted rigid-rod molecular wire: targeting a tetraferra-tetracosa-decayne

beta-Iminoenamine-BF2 complexes: Aggregation-induced emission and pronounced effects of aliphatic rings on radiationless deactivation
(Benzimidazolin-2-ylidene)-Au-Alkynyl Complexes: Syntheses, structure, and photophysical properties

Syntheses and Tunable Emission properties of 2-alkynyl azulenes

Trans Bis-N-heterocyclic carbene bis-acetylide palladium(II) complexes

Dinuclear and mononuclear chromium acetylide complexes

Triptycene based luminescent metal-organic gels for chemosensing

Incorporation of active metal sites in MOFs via in situ generated ligand deficient metal-linker complexes

Syntheses and photophysical properties of luminescent mono-cyclometalated gold(III) cis-dialkynyl complexes

Synthesis and luminescent properties of cis bis-N-heterocyclic carbene platinum(II) bis-arylacetylide complexes

Stable and tunable phosphorescent neutral cyclometalated Au(III) diaryl complexes

Cumulenylidene and acetylide complexes accessed via stannylated acetylenes and butadiynes

Azulene based metal-organic frameworks for strong adsorption of H2

An iron-capped metal-organic polyyne: [{Fe}[(C≡C)2][W] ≡CC≡CC≡[W][(C≡C)2][Fe]]

Electronic communication in dinuclear C4-bridged tungsten complexes

Chemistry of chromium bis-acetylide complexes
Generation and Coupling of [Mn(dmpe)$_2$(C≡CR)(C≡C)]. Radicals Producing Redox-Active C$_4$-Bridged Rigid-Rod Complexes

A facile and novel route to unprecedented manganese C$_4$ cumulenic complexes