

Graduate School Event

Tuning the Catalytic Reactivity of Ni(I) through Ligand Design

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Transition-metal catalysis has transformed modern organic synthesis, enabling the efficient and selective formation of chemical bonds. The success of this field largely depended on the development of tailored ligands that can tune the reactivity of the metal center. Nickel catalysis has emerged as a particularly versatile platform for cross-coupling reactions, thanks to its ability to access multiple oxidation states. However, the instability of paramagnetic nickel species can make these reactions difficult to control. Despite the central role of ligands in transition-metal catalysis, their use in tuning the reactivity of such nickel intermediates remains comparatively underexplored. Modular amino-functionalized bipyridine ligands were developed to control the reactivity of Ni(I) intermediates and facilitate challenging elementary steps in cross-coupling catalysis. This approach facilitated carbon-carbon and carbon-heteroatom bond formation via Ni(I)/Ni(III) catalytic pathways. Notably, a new ligand-design facilitated visible-light induced C(sp^2)-heteroatom cross-coupling reactions, eliminating the need for an additional photocatalyst and enabling the coupling of a broad range of nitrogen-, oxygen-, sulfur- and phosphorus-based nucleophiles with challenging aryl electrophiles, using unprecedented low catalyst loadings.

Friday, December 4, 2026 10:00am - 11:00am

Sunstone Bldg / Ground floor / Big Seminar Room B (I23.EG.102)

This invitation is valid as a ticket for the ISTA Shuttle from and to Heiligenstadt Station. Please find a schedule of the ISTA Shuttle on our webpage: https://ista.ac.at/en/campus/how-to-get-here/ The ISTA Shuttle bus is marked ISTA Shuttle (#142) and has the Institute Logo printed on the side.