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The 14th Annual Hans & Marlies

Zimmer

International Scholar Program

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Honoring

Lutz Gade

University of Heidelberg, Germany
Friday, April 15, 2016

UNIVERSITY OF Cincinnati

Prof. Lutz H. Gade

University of Heidelberg, Germany

The 2016 Hans and Marlies Zimmer International Scholar is Professor Lutz Gade, who holds a chair of inorganic chemistry at the University of Heidelberg in Germany and is a director of the Institute of Inorganic Chemistry. After completing his undergraduate studies at the University of Bonn and the Technische Universität München, he went to Cambridge University in UK to pursue his doctoral study under the guidance of Professor Jack Lewis. Upon receiving his Ph.D. degree in 1991, Professor Gade returned to Germany and joined the Chemistry Department at the University of Würzburg, where he finished his habilitation in 1996 and subsequently worked as a lecturer. In 1998, he moved to the Université Louis Pasteur – Strasbourg in France to take a full professorship in inorganic chemistry and became the Head of the Laboratory of Organometallic Chemistry and Catalysis. In 2003, he moved to his present position in Heidelberg, where he has also been the Dean of the Faculty and Chairman of the collaborative research center on molecular catalysis. Professor Gade is an internationally known and highly respected inorganic chemist. His research areas are broad, covering coordination chemistry of early transition and p-block metals, asymmetric catalysis, mechanistic studies of catalytic processes, organic semiconductors and surface chemistry of polycyclic aromatics. He has published more than 260 papers, 2 patents and 3 books, and has given *ca.* 250 invited talks including many named lectures. He has served on the editorial or advisory board of many journals such as *Polyhedron*, *European Journal of Inorganic Chemistry*, *Structure and Bonding*, *Dalton Transactions* and *Chemical Communications*. Professor Gade is a Fellow of the Royal Society of Chemistry and a member of the Heidelberg Academy of Sciences and Humanities.

"Enantioselective Catalysis with 3d Transition Metal Complexes: Chiral Pincers as Stereodirecting Ligands"

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Meridionally coordinating chiral tridentate ligands, frequently referred to as "pincers", provide the structural platform for the construction of efficient stereodirecting molecular environments. Whilst many of the known chiral systems of the "pincer" type perform relatively poorly in enantioselective catalysis due to certain lack of control of substrate orientation, their assembly from rigid heterocyclic units recently has given rise to several highly enantioselective catalysts which have been proven to be efficient in a variety of applications in organic synthesis.

Recently, we developed bis(oxazolinylmethylidene)isoindoline ("Boxmi") ligands which have been used in a variety of enantioselective transformations including alkylations of β-ketoesters and their subsequent cyclization to spirolactones, as well as the trifluoromethylation, trifluoromethylthiolation and azidation of β-ketoesters as well as oxindoles. The proved equally efficient in the enantioselective Ni-catalyzed hydrodehalogenation of prochiral geminal dihalides and their iron(II) complexes match the activity and selectivity of the most efficient noble metal catalysts for the hydrosilylation of ketones.

The focus of the lecture will be the elucidation of the catalytic reaction mechanisms and the identification and characterization of the (frequently) paramagnetic species involved.