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SEMINAR ABSTRACT

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Prebiotic origins of DNA&RNA, more questions than answers: the search for answer through computational modeling

Abstract:
Novel approaches to the design and applications of P-chiral Brønsted acids in the asymmetric transfer hydrogenation of quinolines will be discussed. Among the evaluated substrates, the asymmetric transfer hydrogenation of deactivated quinolines was investigated for the first time. These novel approaches were also applied in the first enantiospecific phosphonylation of imidazoles via a solvent-switchable, site-selective, 1,4-Pd migration/C-H activation cascade. Via the stereoretentive reduction of a model product, the first reported P-chiral phosphinyl imidazole ligand was achieved. This ligand was found to induce high enantioselectivity in an atropisomeric Suzuki-Miyaura cross-coupling reaction of two sterically demanding substrates. Furthermore, the utility of these approaches was showcased in the design and applications of novel P-chiral, phosphine oxide-based NHC-Au(I) catalysts in asymmetric hydroamination.

Biography:
Ifenna graduated *summa cum laude* from SMU with a B.Sc. honors in chemistry and a major in biology. As an honors student, he worked under the supervision of Prof. Kai Ylijoki, and contributed to the investigation of the mechanism of a multicomponent Rh-catalyzed cycloaddition. Ifenna received various awards at SMU including the Jack Ginsburg Memorial Scholarship, the ACENET Research Fellowship and the Dean's List awards. Subsequently, Ifenna completed his Ph.D. at McGill University under the supervision of Prof. Youla Tsantrizos. During his time as a graduate student, Ifenna contributed to the design and applications of novel P-chiral Brønsted acids, ligands and NHC-carbenes in asymmetric transformations. Among his awards, Ifenna received the Fonds de recherche du Québec – Nature et technologies (FRQNT) Ph.D. fellowship and the Sterry Hunt Teaching award. Currently, Ifenna is a postdoctoral fellow at the Max-Planck-Institut für Kohlenforschung, Mülheim, where he works on phosphorus-mediated asymmetric catalysis under the supervision of Prof. Benjamin List.