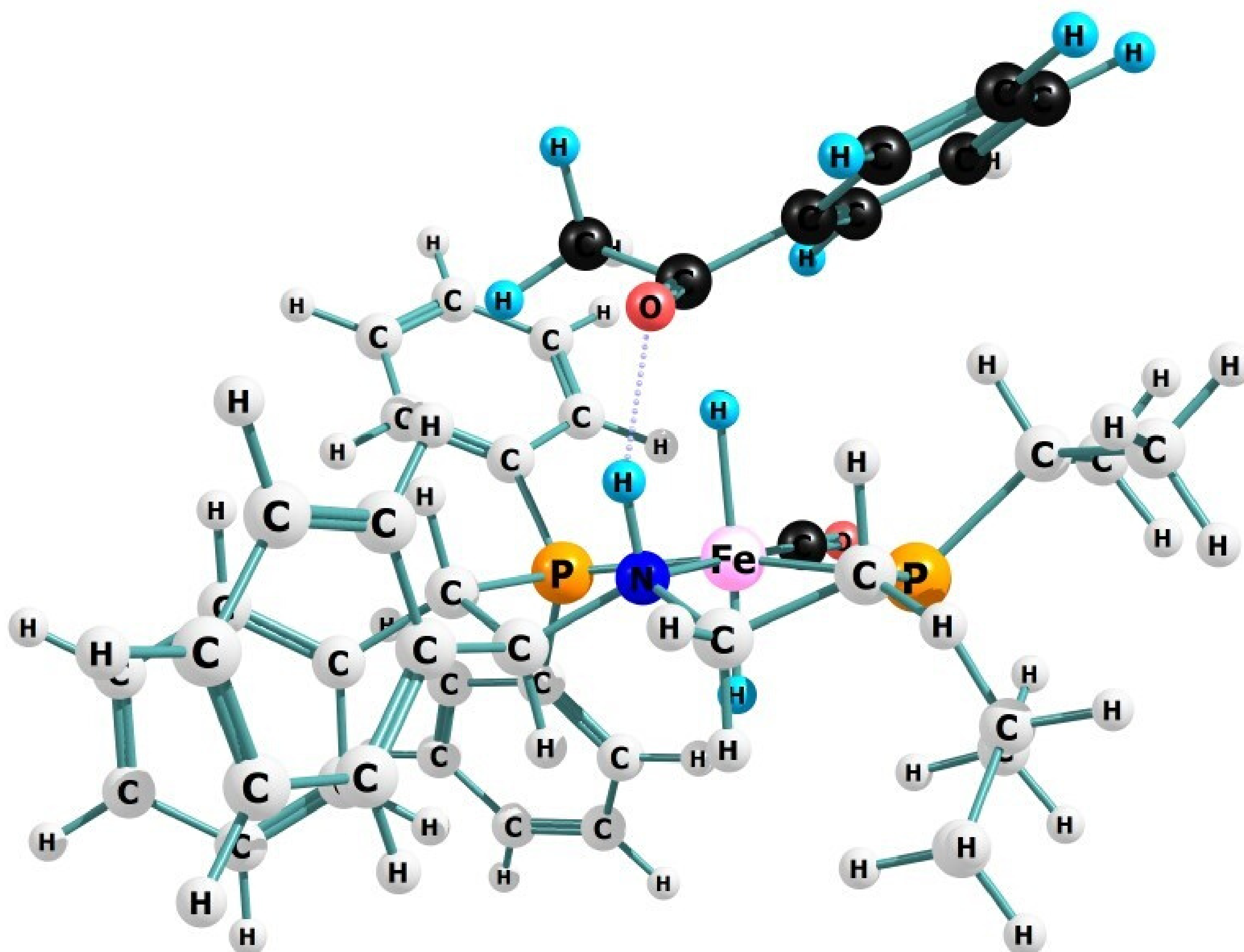




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Discovering Sustainable Catalysts



In this lecture I will present our success in finding catalysts based on iron and manganese that can be used for the synthesis of pharmaceuticals and fine chemicals. The conventional syntheses of these compounds can involve catalysts based on rhodium, ruthenium, palladium and iridium, elements that are rare and can form toxic compounds. By contrast, the naturally abundant metals iron and manganese are essential to life and provide a greener, potentially less toxic alternative in these syntheses. In fact biology's enzymes that utilize iron (and other abundant transition metals) also provide inspiration for this research. We used a mechanism-based approach, supported by computational chemistry, to discover some of the first catalysts of this type. A knowledge of the chemistry of transition metal hydrides is key to understanding how these catalysts function.