CHEMISTRY & CHEMICAL BIOLOGY SEMINAR:
Cyclic (alkyl)(amino)carbenes: from Replacing Metals to Metal Replacement

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Postdoctoral Fellow, Chemistry
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Date:
4/16/2021

Time:
2:30 PM-4:00 PM

Link:
Please contact snsgradstaff@ucmerced.edu for the Zoom link and passcode.

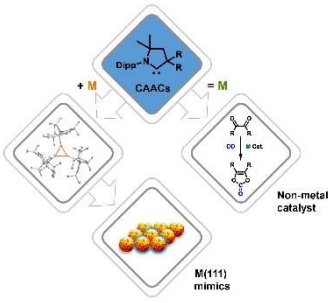
About the Speaker:

Jesse grew up in Bellevue, Washington. Afterward, he received his B.A. at Dartmouth College where he double majored in chemistry and Native American Studies. While there, he worked with Prof. David Glueck. He then attended the University of California, San Diego where he pursued his Ph.D. in the group of Prof. Guy Bertrand. He studied the use of carbenes to advance both the frontiers of copper chemistry and organocatalytic small molecule transfer. During this period, he received several awards including an NSF GRFP and the American Indian Science & Engineering Society (AISES) Lighting the Pathway to Faculty Careers for Natives in STEM. He was also inducted into the Bouchet Graduate Honor Society. In October of 2020, he became a UC President's Postdoctoral Fellow working in the lab of Prof. Jeffrey Long at the University of California, Berkeley where he is currently interested in designing hydrogen storage materials. Recently, he was awarded a Ford Foundation Postdoctoral fellowship to continue this type of research.

Abstract:

Stable singlet carbenes are flourishing with a diversity of applications: from ligands in catalysis to the stabilization of otherwise unisolable chemical species. Here, I will showcase the diverse and rich chemistry of cyclic (alkyl)(amino)carbenes (CAACs), a class of stable singlet carbenes known for their high ambiphilic character.

Deviating from typical carbene-organocatalysis, which is still dominated by Lewis basic carbenes, I will demonstrate that CAACs allow for catalytic processes so far restricted to transition metals. Afterward, I will illustrate how CAACs' ambiphilicity can be further exploited to stabilize highly reactive coinage metal clusters which enabled the absolute templating of the clusters by means of galvanic metal replacement. Going a step further, I will discuss how these molecular models allowed us to better understand the reactivity of M(111) surfaces.



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