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Modeling high energy electronic excitations: From helium clusters to the next-generation of photolithography

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ABSTRACT

High energy electronic excitations (>10 eV) have unique characteristics that make them particularly challenging to model computationally. This talk will primarily focus on two projects related to application of quantum chemical methods to better understand high energy excited states and their photodegradation products. The first topic is focused on the absorption of extreme ultraviolet (EUV, ~92 eV) light by organic molecules, which is directly relevant for developing photoresist materials for the next-generation of photolithography. The other, more exotic, systems to be discussed are small helium clusters, which principally break apart when exposed to high energy radiation, but can also form stable excited states.

BIO:

Kristi Closser has been an assistant professor at California State University, Fresno since 2017. She earned her B.A. in both chemistry and mathematics from Smith College, and her Ph.D. at UC Berkeley in theoretical chemistry working with Martin Head-Gordon. As an undergraduate at Smith college she participated in research in both organic and experimental physical chemistry, but ultimately decided to pursue theoretical chemistry in graduate school. After receiving her Ph.D., Dr. Closser also did post-doctoral research at Lawrence Berkeley National Laboratory, and dabbled in theoretical condensed matter physics. Her current research focuses on computing the electronically excited states of organic molecules and their degradation mechanisms.