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# TCSUH Bi-Weekly Seminar

## Data-Driven Development of Phosphors for LED Lighting

### Prof. Jakoah Brgoch

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PI, Texas Center for Superconductivity at the University of Houston

**Thursday, February 8, 2024 – 11:30 a.m.**

**In Person** – Room 102, Houston Science Center, 11:30 a.m. – 12:30 p.m.

**Sandwiches will be provided on a first-come, first-served basis.**



**ABSTRACT:** The development of new phosphors that are necessary for the next generation of high efficiency LED lighting requires a unique approach for materials discovery. Researchers often rely on chemical substitution or serendipity to identify new materials; however, this inevitably leads to slow, incremental advances in technology development. Our work has recently created a new approach using data science and synthesis in tandem to produce new materials with impressive optical properties. Using data mining techniques, we extract experimental optical properties from the peer-review literature and then use these data to predict quantum yield, thermal quenching, and excitation and emission wavelength. Following this methodology, our research has developed several materials ranging from borates to nitrides. Moreover, the complementary use of computational modeling provides additional insight into the fundamental composition, structure, and property relationship, which is necessary for the continued advanced optical materials.

**BIO:** Prof. Jakoah Brgoch is an Associate Professor in the Department of Chemistry and a Principal Investigator in the Texas Center of Superconductivity. Jakoah also has a courtesy appointment in the William A. Brookshire Department of Chemical and Biomolecular Engineering and he is a member of the Hewlett-Packard Enterprise Data Science Institute. Jakoah completed his bachelors and masters in Chemistry from Illinois State University followed by his Ph.D. from Iowa State University and Ames National Laboratory under the supervision of Gordon Miller followed by postdoctoral research at the University of California, Santa Barbara in the Materials Research Laboratory with Ram Seshadri. Jakoah is now leading a multidisciplinary research group with research topics ranging from the development of persistent luminescent materials for bio-imaging to understanding the mechanical response in superhard materials all through a combination of materials synthesis, characterization, first-principles computation, and machine learning. He has published more than 85 peer-reviewed papers, earned a 2018 NSF CAREER research award, and is a 2020 Alfred P. Sloan Research Fellow in Chemistry.

***Persons with disabilities who require special accommodations to attend this lecture should call (713) 743-8212.***

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