

Fall 2018 Joint Colloquium

Materials Department & Materials Research Laboratory

Professor Taylor Sparks
Materials Science & Engineering
University of Utah

Friday, October 12th, 2018
11:00 am, ESB 1001



Data Science + Materials: Artificial Intelligence to Develop Materials Twice as Fast at a Fraction of the Cost

Over 7 years ago the White House announced the Materials Genome Initiative (MGI) asking computational materials scientists and experimentalists to find ways to “discover, develop, manufacture, and deploy materials twice as fast at a fraction of the cost.” High throughput computation and experiments have made some progress but we are still far from the MGI goal. However, the emerging field of Materials Informatics offers a completely new and under-utilized approach via machine learning and big data approaches to materials problems. In this talk, I’ll describe the promise, challenges, and opportunities that this new approach affords materials scientists. Specifically, I describe some of the new data-driven tools we are developing in our group as well as tools developed in conjunction with Citrine Informatics such as the “Materials Recommendation Engine.” These tools allow us to reduce the risk associated with exploring chemical whitespace for new, interesting materials and enable rapid material discovery. I’ll demonstrate the utility of machine learning with specific examples in thermoelectrics, superhard materials, crystal structure prediction and more.

Bio

Dr. Sparks joined the Materials Science and Engineering Department at the University of Utah as an Assistant Professor in 2013. He is originally from Utah and an alumni of the department he now teaches in. Before graduate school he worked at Ceramtec Inc. He did his MS in Materials at UCSB and his PhD in Applied Physics at Harvard University in David Clarke’s laboratory and then did a postdoc with Ram Seshadri in the Materials Research Laboratory at UCSB. He is currently the Director of the Materials Characterization Lab at the University of Utah and teaches classes on ceramics, materials science, characterization, and technology commercialization. His current research centers on the discovery, synthesis, characterization, and properties of new materials for energy applications. He is a pioneer in the emerging field of materials informatics whereby big data, data mining, and machine learning are leveraged to solve challenges in materials science.

<http://www.eng.utah.edu/~sparks/>

Hosted by Ram Seshadri.