DEPARTMENT OF PHYSICS AND ASTRONOMY

COLLOQUIUM IN-PERSON ONLY EVENT

Converging Physics and Machine Learning for Accelerated Materials Research and Development

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Physics-based experimental and computational approaches are essential for the research and development of functional and sustainable materials throughout history. In the past 15-20 years, advanced machine-learning (ML) techniques, partly driven by the Materials Genome Initiative, have been developed into valuable complements to traditional methods. The emergence of Materials Informatics, a new paradigm involving the ML approaches, relies on two key factors, including (1) the creation of large, diverse, and reliable material databases and (2) the development of advanced ML techniques for learning material data and searching for materials with targeted properties. Recent concerted efforts integrating ML, computational, and experimental approaches have led to the development of many new materials, potentially impacting society. In this talk, I will summarize some of my efforts in the last decade. My works, heavily driven by synergistic collaborations with scientists of different expertise and backgrounds, have made some contributions to the understanding and development of several classes of functional materials, e.g., polymers for energy storage and conversion. I will then outline my plans to address some open problems in the field, aiming to advance the discipline and train the future workforce.

Thursday, November 14, at 3:55 PM

IN-PERSON EVENT ROOM 202

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