



*October 30 - November 4, 2017*

## Departmental Colloquium

**Synthesizing Discovery:**  
**from basic understanding to functional applications**

**Thomas Zach Ward**

Oak Ridge National Laboratory

Host: Ward Plummer

**3:30 PM Thursday, November 2, 2017**

**109 Nicholson Hall**

- **Refreshments served at 3:10 PM in 232 (Library) Nicholson Hall** •

In the field of materials physics, the grand challenge is to design materials with desired properties. In this colloquium, I will discuss how we use atomically precise synthesis techniques to create specifically tailored interfaces, generate synthetic lattice distortions not present in nature, and apply artificial confinement strategies to disentangle electronic correlations in complex oxides. This class of materials possesses a wealth of functionally promising characteristics, such as metal-insulator transitions, ferroelectricity, colossal magnetoresistance, and high temperature superconductivity. I will describe our research progression as we have moved from working to isolate and observe previously hidden mesoscopic phenomena in these materials towards designing approaches that allow tuning of each of the individual order parameters to better understand the fundamental coupling mechanisms. The ability to control these parameters locally provides a path toward writing multiple functionalities into single crystalline wafers. I will close by outlining how this work opens new materials-by-design strategies, and how this may provide the multi-stimulus/multi-response framework to put forward as a route beyond Moore's Law.

Supported by the US DOE Office of Basic Energy Sciences, Materials Sciences and Engineering Division

- ◁ Gabriela González's TED Talk: "[How LIGO discovered gravitational waves](#)"

## Events

- ◁ **Landolt Astronomical Observatory Public Observing: Saturn and the Quarter Moon**

**When:** Saturday, October 28<sup>th</sup>, 7:00-8:00pm

**Where:** Nicholson Hall Roof - Landolt Observatory

Admission is **FREE** and you need not bring anything. The Landolt Astronomical Observatory is located on the LSU campus on the roof of Nicholson Hall on Tower Dr. immediately west of the LSU Student Union (across Tower Dr.). Convenient parking is located in the lot immediately south of Nicholson Hall (this lot is between Nicholson Hall and Howe-Russell Geoscience Complex). Parking in the lot is free and open after business hours and on weekends. Entry to the building should be by the door in the middle of the south side of Nicholson Hall. People will then be directed to climb the stairs up to the roof.