



**PHYSICS**  
**COLORADO STATE UNIVERSITY**



## **CSU Condensed Matter Physics Seminar**

Geometrical Frustration in Two and Three Dimensional

Tb-based Magnets

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312 Lory Student Center

### **Abstract**

Trivalent terbium possesses eight 4f electrons and is a non-Kramers ion. This typically engenders it with a complicated crystalline electric field (CEF) spectrum when incorporated into solids, and it can appear as either magnetic or non-magnetic, depending on its precise environment within the material. Nonetheless, much interest has focused on frustrated Tb-based magnets, and, for example, Tb<sub>2</sub>Ti<sub>2</sub>O<sub>7</sub> was the first magnet proposed as a quantum spin ice candidate, based on virtual CEF transitions. I'll discuss our recent neutron scattering work on Tb in a two dimensional triangular architecture in TbInO<sub>3</sub> as well as in a three dimensional pyrochlore architecture in cubic Tb<sub>2</sub>Ge<sub>2</sub>O<sub>7</sub>, which display novel spin liquid and spin ice states at low temperature.