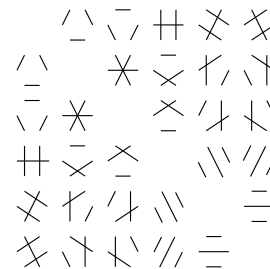


# Mathematics Seminar



## Rocky Mountain Algebraic Combinatorics Seminar

---

### **Solving $XA_i - B_iY = C_i$ , for all $i$ , in linear time.**

James Wilson  
Colorado State University

The classic Sylvester equation  $XA - BY = C$  appear across control theory and engineering which has prompted extensive study into the complexity of solving for  $(X, Y)$ . Recent work has considered multiple Sylvester equations simultaneously, i.e.  $(\forall i)(XA_i - B_iY = C_i)$ . In joint work with J. Maglione (Bielefeld) we prove a linear-time solution under reasonable nondegeneracy assumptions.

### **Tensor Isomorphism and Quantum Phases of Matter**

James Wilson  
Colorado State University

The quantum world obeys laws that appear different from larger scale objects, so how can we build materials that scale these quantum effects? One approach is to make symmetry-protected topological quantum phases of matter. At the heart of this approach is the symmetry group of tensors. We will explain the problem and what tensor isomorphism can do to help. (No prior knowledge of quantum mechanics is assumed in this talk.)

Online via Zoom

<https://zoom.us/j/95321487441?pwd=Tlp4VG9pejZCekJmeDFFb1BzeWpsdz09>, Meeting ID: 953 2148 7441, Passcode: 722523

4 pm, Friday, November 13, 2020

Talk part 1, 4.10-4.40,

Break 4.40-5.10 at <https://gather.town/HQmdvgyabpEL4qpB/RMAC>,

Talk part 2 5:10-5:40

---

This is a joint Denver U / UC Boulder / UC Denver / U of Wyoming / CSU seminar that meets biweekly.  
Anyone interested is welcome to join us at a local restaurant for dinner after the talks.



Department of Mathematics  
Fort Collins, Colorado 80523