

BI-C



Elizabeth Newman  
Emory University

## **"Tensor Linear Algebra: The Next Dimension"**

**Monday, December 9, 2019**

**Talk at 4:00 – Hilles 109**

**Tea at 3:30 – Hilles 208, Math Lounge**

### **Abstract:**

As data have become more complex and high-dimensional to reflect the real world (e.g., image and video data), there has been great interest in extending linear algebra to handle these multidimensional data (i.e., tensors) efficiently. However, this extension to multilinear algebra is non-trivial because many fundamental matrix concepts break down when adding new dimensions. After introducing the singular value decomposition, we'll outline some popular methods to extend this concept to tensors, highlighting the inconsistencies with traditional linear algebra that can arise. The main focus of the talk will be discussing a matrix-mimetic, tensor algebra based on a class of tensor-tensor products, showing how this can outperform traditional matrix approaches through some numerical examples. This talk should be understandable to anyone who has taken linear algebra.

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