

# SCMS Seminar



## GEOMETRY AND ALGEBRA IN APPLIED MATHEMATICS

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**University of Chicago**

**Time:** 10:30-11:30 am., Tuesday, April 11, 2017

**Venue:** Room 2201, East Main Guanghua Tower, Handan Campus

### Abstract:

In this talk, I will introduce my work in applied algebra and geometry. On the one hand, I am interested in the application of algebra to problems related to matrices and tensors. As examples, I will present the following work:

1. Matrix decomposition problems.
2. Bilinear complexity of structured matrix-vector product.
3. Geometry of tensor network states.
4. Decomposition and rank of Hankel tensors.
5. Spectral theory of tensor eigenvalues

On the other hand, I am also interested in optimization problems and statistical inference on manifolds. For instance, my collaborators and I generalize the geodesic distance on Grassmannians to the distance between linear subspaces of different dimensions. With this distance, we establish a statistical inference on Grassmannians of affine linear subspaces. Lastly, I will introduce some of my current work and future plan.