

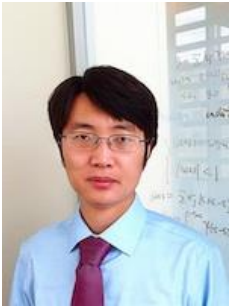


**Spring 2017 Colloquium Series**

**Tuesday, April 18, 2017**

**1:30-2:00 pm – Meet and Greet –BB340**

**2:00-3:00 – Seminar Talk – GC Metals Hall**



Dr. Gongguo Tang, Assistant Professor, Colorado School of Mines  
***Optimal Spectral Estimation via Atomic Norm Minimization***

**Abstract:**

Atomic norm minimization is a convex relaxation framework that greatly generalizes  $\ell_1$  norm for compressed sensing and nuclear norm for matrix completion. In particular, it allows one to construct convex regularizers for signals that have sparse representations with respect to continuously parameterized dictionaries. In this talk, the speaker will focus on the application of this framework to line spectral estimation, which can be viewed as a sparse recovery problem whose atoms are indexed by the continuous frequency variable. The optimality of atomic norm minimization will be highlighted: 1) it completes a signal from a minimal number of observations; 2) it denoises a signal with near minimax performance; 3) it estimates the frequencies with an accuracy approaching the Cramer-Rao bound; 4) it achieves the best possible resolution; and 5) it removes a maximal number of outliers.

**Bio:**

Dr. Gongguo Tang is an Assistant Professor in the Electrical Engineering and Computer Science Department at Colorado School of Mines (CSM) since 2014. He received his Ph.D. degree in Electrical Engineering from Washington University in St. Louis in 2011. He was a Postdoctoral Research Associate at the Department of Electrical and Computer Engineering, University of Wisconsin-Madison from 2011 to 2013, and a visiting scholar at the University of California, Berkeley in 2013. Dr. Tang's research interests are in the area of signal processing, convex optimization, machine learning, and their applications in big data analytics, optics, imaging, and networks. He is a recipient of CSM's Junior Faculty Research Award (2016) and AFOSR's Summer Faculty Fellowship (2015).