February 2026
4:10 – 5:00 PM
Roberts 218

Computed Tomography Imaging Spectrographs and the Inversion Problem
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Abstract:

I'll review my AY 24/25 sabbatical activities, and then dive deeply into some work done while visiting NASA/MSFC and University of Alabama, Huntsville on Computed Tomography Imaging Spectrographs (CTIS). CTIS are a class of instruments for obtaining spatially resolved spectra across a 2D field of view with a single exposure. The MOSES, ESIS, and MaGIXS sounding rocket instruments are examples of CTIS applied to optically thin solar emission lines in extreme ultraviolet and soft x-ray wavelengths. Tomographic inversion is required to recover spatial and spectral information. I review how ESIS mapped Doppler shifts at high cadence in rapidly evolving solar events. Then I describe a generalization of Richardson-Lucy image deconvolution to solve the CTIS inversion problem. This technique combines tomographic inversion, deconvolution, and denoising in one algorithm.

Host: Craig Ogilvie

* Refreshments served in the Barnard Hall second floor atrium at 3:45 PM *