Large-scale Inference Problems in Astronomy: Building a 3D Galactic Dust Map[1] DOUGLAS FINKBEINER, Harvard University — The term "Big Data" has become trite, as modern technology has made data sets of terabytes or even petabytes easy to store. Such data sets provide a sandbox in which to develop new statistical inference techniques that can extract interesting results from increasingly rich (and large) databases. I will give an example from my work on mapping the interstellar dust of the Milky Way. 2D emission-based maps have been used for decades to estimate the reddening and emission from interstellar dust, with applications from CMB foregrounds to surveys of large-scale structure. For studies within the Milky Way, however, the third dimension is required. I will present our work on a 3D dust map based on Pan-STARRS1 and 2MASS over 3/4 of the sky (http://arxiv.org/abs/1507.01005), assess its usefulness relative to other dust maps, and discuss future work.

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