

School of Physics & Astronomy Center for Detectors Seminar

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Mapping the Large Scale Structure of the Cosmos from the Big Bang to the Present

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Bio: Michael Zemcov earned his PhD at Cardiff University in the UK studying the polarization of the cosmic microwave background radiation. Following this, he was a NASA Postdoctoral Fellow at the NASA Jet Propulsion Laboratory working on a variety of infra-red, sub-mm, and mm instruments. He is currently a Senior Postdoctoral Fellow in Physics at the California Institute of Technology, and leads experimental programs focused on applying innovative detector technology and data analysis methods to perform precision cosmological observations. <http://www.astro.caltech.edu/~zemcov/>

Abstract: Understanding the structure of the universe on the largest and most distant scales is one of the central topics in observational astrophysics. Successful measurements of cosmological structures require precise and sensitive instruments both on the ground and in space. Enabled by modern detector technologies and carefully designed experiments, exciting new observational and data analysis techniques are beginning to yield dramatic new results at a variety of wavelengths. In particular, results using Intensity Mapping methods from optical to radio wavelengths are in the process of revolutionizing our understanding of the large scale structure of the cosmos. I will review Intensity Mapping (and related) methods to show that they provide a holistic view of cosmic structure, and highlight recent results emerging from a variety of experiments which highlight the need for specialized instruments deploying cutting-edge detectors to help build an overall picture of the evolution of the universe on the largest scales.