

SAN DIEGO STATE UNIVERSITY DEPARTMENT OF PHYSICS AND DEPARTMENT OF
ASTRONOMY COLLOQUIUM

Speaker: Dr. Sebastiano Cantalupo (Institute for Astronomy, ETH Zurich)

Topic: A 3D View of the Dark Universe: Illuminating Intergalactic Gas at High
Redshift with Fluorescent Lyman-Alpha Emission

Time: 3:00 PM, Friday, February 19, 2016 (refreshments served at 2:45 PM)

Place: Room 215, Physics-Astronomy Building (PA-215)

Abstract:

Gravitational collapse during the Universe's first billion years transformed a nearly homogeneous matter distribution into a network of filaments -- the Cosmic Web -- where galaxies form and evolve. Because most of this material is too diffuse to form stars, its study has been limited so far to absorption probes against background sources. In this talk, I will present the results of a new program to directly detect and study high-redshift cosmic gas in emission using bright quasars and galaxies as external illumination sources. In particular, I will show results from ultra-deep narrow-band imaging and recent integral-field-spectroscopy as a part of the MUSE Guaranteed Time of Observation program that revealed numerous giant Lyman-alpha emitting filaments around quasars and bright galaxies. Finally, I will discuss how the unexpectedly high luminosities of the giant Lyman-alpha filaments, together with the constraints from Helium and metal extended emission, present a serious challenge for our current understanding of the Intergalactic and Circumgalactic media based on hydrodynamical cosmological simulations.