



# PHYSICS AND ASTRONOMY SEMINAR

## Dr. Adam Muzzin

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### “Understanding the Role of Environment in Galaxy Evolution up to $z \sim 1.5$ ”

#### Abstract

Galaxy clusters are high-density environments in the universe where many galaxies have their star formation strongly truncated or “quenched”. Despite years of study, the astrophysics of this quenching process remains one of the most poorly understood aspects of galaxy evolution. I will present new results on the evolution of cluster galaxies and environmental quenching up to  $z \sim 1.5$  based on data from the GCLASS survey, a 220-hour spectroscopic survey performed with Gemini/GMOS. GCLASS has allowed us to make the first measurement of the quenching timescale for galaxies in clusters at early times. I will discuss the implications of this measurement, which suggests that the physical process by which clusters quench star formation in galaxies is changing over cosmic time. Finally, I will conclude by presenting two new surveys, 1) GOGREEN, a Gemini large program designed to obtain substantially improved constraints on the environmental quenching timescale at high-redshift and 2) 3DHST-HD, an HST grism program measuring the H-alpha properties of star-forming galaxies in high-redshift clusters. These two new surveys promise to deliver exciting new data which will be key for understanding the astrophysics behind environmentally-driven quenching at high-redshift.

Friday, March 4, 2016

3:15 p.m.

Engineering Computer Science Building

Room 104