



ASTROPHYSICS SEMINAR SERIES

"Dust Reddened Quasars: A Transitional Phase in Quasar/Galaxy Co-Evolution"

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Refreshments at 3:30pm in CAS 500
Talk begins at 4:00pm in CAS 502

Abstract:

Quasars are extremely luminous sources, powered by accretion of gas onto a supermassive black hole in the nucleus of some galaxies. Most of the >100,000 quasars identified in the literature have been selected using optical surveys through the "ultraviolet excess" (UVX) method. However, these samples are known to be incomplete and biased because of obscuration and anisotropic radiation. Furthermore, a population of dust-obscured, red quasars is predicted by merger-driven models of quasar/galaxy co-evolution. To test these models, I have conducted a survey for a large population of dust-reddened quasars identified by matching radio sources from the FIRST 1.4 GHz survey with the 2MASS near-infrared survey and selecting objects with red optical-to-near-infrared colors. Follow up spectroscopy of these candidates in the optical and/or near-infrared has identified 120 red quasars, defined as having at least one broad emission line and a reddening of $E(B-V) > 0.1$. The sample spans a wide redshift range, $0.1 < z < 3$ and reaches a reddening of $E(B-V) < 1.5$. When corrected for extinction, red quasars are the most luminous objects at every redshift and the fraction of red quasars increases with luminosity. The properties of red quasars suggest that they are revealing a transitional phase where the heavily obscured quasar is emerging from its dusty environment prior to becoming a "normal" blue quasar. Based on the fraction of quasars that are in this red phase, I determine that its duration is 20% as long as the unobscured quasar's phase: a few million years.

I will also present future and ongoing work to expand this sample to fainter flux limits and longer wavelengths. And I will describe additional observations focused on subsamples of these red quasars to better understand their role in the co-evolution of supermassive black holes and their host galaxies.