PHYSICS AND ASTRONOMY
COLLOQUIUM

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"Feedback and Galaxy Formation"

Abstract

Feedback from young stars plays a critical role in shaping the galaxy mass function, particularly at the low mass end, while feedback from supermassive black holes appears to shape the high mass end, statements supported by both numerical and semi-analytic models of galaxy formation. However, the exact form of the feedback is not certain. I will describe recent work shedding light on tis problem, including three dimensional radiative magnetohydrodynamics calculations of the effects of young stars on giant molecular clouds, showing that supernovae play only a minor role. Next I will describe high resolution (~1 parsec) simulations of star forming galaxies employing stellar (radiative and other) momentum feedback, and heating from supernovae, O star winds, and HII regions; all these forms of feedback have a role to play, with different forms of feedback coming to the fore in different galaxies. These simulations naturally produce galactic scale superwinds, with mass loss rates from 1-10 times the star formation rate, exactly what is needed to explain the low mass end of the galaxy mass function. Finally, I will briefly describe recent results on quasar feedback, including observational constraints on the launching mechanism of BAL winds, one of the more promising forms of "quasar mode" feedback.

Wednesday, November 21, 2012
3:30 p.m.
Bob Wright Centre
Room A104