



SPRING '08 Colloquia

Refreshments at 3:15 PM, Talks at 3:30 PM in the John N. Bahcall Auditorium

www.stsci.edu/institute/sd/talks/Colloquia for updates

Wednesday March 12, 2008

Alice Quillen, U. Rochester

When is Star Formation Episodic?

I will report on the recent discovery of a 500 pc bipolar-shaped dust shell and an extended ionization cone (bright in [NeV]) in the heart of nearby radio galaxy Centaurus A (NGC 5128) with observations from the Spitzer Space Telescope. The shell contains warm molecular hydrogen, is most similar in physical properties to slow moving Galactic supernova remnants and is likely a result of a recent burst of star formation near the nucleus. Cen A represents an additional example of a system that has experienced nuclear bursts of star formation.

I will introduce a delay differential equation model, similar to biological population dynamics models, that illustrates both self-limiting steady star formation rates and episodic or cyclic star formation rates, depending upon 2 feedback ratios. One of these characterizes the strength of the feedback. The second ratio characterizes the delay timescale for the feedback. From these two ratios alone solutions can be classified and if cyclic the amplitude and period of the oscillations are predicted. I will discuss proposed feedback mechanisms in different galactic settings that could account for inferred star formation events and the estimated timescales separating them.