

Colloquium Notice

Frederick Walter

SUNY Stony Brook

The Novae: Thermonuclear Bombs in Space

The galactic novae are thermonuclear explosions in a degenerate hydrogen layer on the surfaces of white dwarf stars. This is inferred from energetics and plausibility arguments, but the lack of uniformity of the novae shows that they are much more complex, and interesting. Novae are highly dynamic phenomena, involving brightenings by up to 20 magnitudes, and velocities of over 5000 km/s in extreme cases. Eight years ago we initiated a project to generate a more-or-less uniform set of spectroscopy and photometry of novae accessible to the SMARTS facilities at the Cerro Tololo InterAmerican Observatory. The atlas now contains observations of over 60 novae, some observed for as long as 8 years past their eruption. Following a general description of the nova phenomenon, I shall turn to two topics that I am currently engaged in. The first is an attempt to explain the peculiar line profiles of the He-N (or recurrent) novae. These do not resemble the optically thick shells of the Fe II (or classical) novae, but can be modeled as optically-thin accretion disks. If so, this will require a change in our understanding of the inner environs of the novae. The second is an examination of the N III Bowen fluorescence lines, and their relation to the He II 4686 line. This mechanism is understood in the static case, but the novae are highly dynamic. The lightcurves of the N III and He II lines and the supersoft X-ray flux suggest an interpretation as a temperature gauge.

Monday

December 10, 2012

Starts at 12:15 PM

Coffee at 12:00 PM

Physics Conference Room, SB B326