



UNIVERSITY of
DENVER

PHYSICS AND ASTRONOMY

Presents

Old Stellar Shells

Friday, October 23, 2015

11:00 AM

F.W. Olin Hall Room 205

2190 E. Iliff Avenue

Presented by

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Planetary nebulae along with classical, recurrent and symbiotic novae all tend towards bipolar structures yet their chemistry and underlying physical mechanisms are quite different. We explore the shapes of a variety of these objects and then concentrate on GK Persei (1901, the 'Firework Nebula'), an old but bright classical nova remnant embedded in a planetary nebula that offers a unique chance to probe the physics and kinematics of both object types. Chemistry of a developing classical nova shell is modeled with the plasma simulation code Cloudy. The kinematics in new and archival longslit optical echelle spectra is analysed using the SHAPE software. New imaging from the Aristarchos telescope continues to track the proper motion, extinction and structural evolution of the knots, which have been observed intermittently over several decades. We present for the first time, kinematical constraints on a large faint 'jet' feature that was previously detected beyond the nova shell's boundary. These observational constraints allow for the generation of models for individual knots, interactions within knot complexes, and the 'jet' feature. Put together, and taking into account dwarf-nova accelerated winds emanating from the central source a relationship between the different objects is pursued and the efficiency of the underlying shaping mechanisms explored.

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