APR08-2008-001191

Abstract for an Invited Paper
for the APR08 Meeting of
the American Physical Society

Observed Hydrodynamical Properties of Stellar Jets[1]

PATRICK HARTIGAN, Rice University

Jets from young stars are probably the best astronomical objects for studies of supersonic fluid dynamics. These remarkable collimated flows consist of multiple bow shocks which form in response to velocity perturbations. In at least two cases, jets deflect from obstacles located along the path of the flow and produce spectacular shocked wakes and shear. The hot gas behind the shocks in stellar jets radiates optically thin forbidden lines, from which one can measure turbulent line widths, densities, ionization fractions, and temperature, and even watch how the jets and shocks evolve in real time. This talk will summarize the important properties of these flows, and present new observations from the Hubble Space Telescope and from ground-based telescopes relevant to understanding fluid dynamics of stellar jets. A variety of laboratory experiments involving the dynamics of high Mach number jets and shock waves have become increasingly relevant to our understanding of this fundamental astrophysical process.

[1]NLUF/DOE