

CU Physics Department Colloquium

Monday, January 30, 2012 4:10 PM 428 Pupin Hall

Relativistic Astrophysical Jets

Collimated, relativistic outflows have been observed or inferred to originate from supermassive black holes in the centers of galaxies, solar-mass compact objects in binaries and gamma-ray bursts. A theoretical paradigm envisions that these come from rotating objects (neutron stars, black-hole ergospheres, or accretion disks) threaded by strong magnetic fields. The magnetic fields extract rotational energy from the compact objects launching jet flows. Despite recent progress in the field, we still lack a coherent connection between the jet dynamics and the electromagnetic radiation emitted by these sources. The guiding theme that I propose for such a connection is the dissipation of magnetic energy in the jet. This key process connects aspects of acceleration of jets and radiation mechanisms and may help to explain very puzzling observations of these objects. The last part of the talk deals with a novel type of transient jets from galactic centers that, I argue, are likely to come from tidal disruption of stars by a supermassive black hole.



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