BOSTON UNIVERSITY

Boston University College of Arts & Sciences
Institute for Astrophysical Research

2018 - 2019 ASTROPHYSICS SEMINAR SERIES

How AGN Jets Shine: Particle Acceleration by Current-driven Instabilities

AGN jets are relativistic plasma outflows emanating from the centers of massive galaxies. These jets shine across the electromagnetic spectrum, and are among the most prolific particle accelerators in the cosmos. However, the mechanism of this acceleration has been a long-standing mystery. I will give a brief overview of the evolution of particle acceleration theory, from internal shocks to magnetic reconnection. Then I will present recent numerical simulations, which reveal that a well-known instability of the magnetic field in these jets (the helical kink instability) leads to the efficient conversion of their magnetic energy into non-thermal plasma particles. This mechanism might also be applicable to solar flares, and outbursts from highly magnetized neutron stars.

Monday, March 18th
3:30 - 4:30 p.m.
725 Commonwealth Avenue | Room 502

Jonathan Zrake
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