Title: Analyzing Blobs in Blazars' Jets

Author: Riya Mishra

Abstract:

This is a project I am doing as an extension of my astronomy class with Professor Alan Marscher and his team at Boston University involving images of blazar jets at microwave wavelengths, made with data from the Very Long Baseline Array (VLBA). Blazars are the centers of galaxies with well-fed supermassive black holes that emit jets. With the VLBA data, we analyze images and look for changes over time in the jets. Once every several months to several years, a dense "blob" of particles shoots down the jet, which emits microwaves and often has the illusion of moving faster than light due to the direction of the blobs moving nearly along our line of sight as they approach us. In this experiment we use the data to compare times when the blobs first appear to times when there are bursts of gamma rays and visible light. The scientific hypothesis we are testing is whether the bursts of visible and gamma-ray light occur in the blobs. And if so, how far from the black hole is the blob when the burst of light occurs.