

ASTROPHYSICS SEMINAR SERIES



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Tuesday, October 15 12:30 pm - Rm 184 NSH

The Multiply Imaged Supernova Refsdal

In 1964, Sjur Refsdal first considered the possibility that the light from a background supernova (SN) could traverse multiple paths around a strong gravitational lens towards us. He showed that the arrival times of the SN's light would depend on the cosmic expansion rate, as well as the distribution of matter in the lens. I will discuss a detailed analysis of the first-known example of such multiply imaged SN, which exploded behind the MACS J1149.6+2223 galaxy cluster. We have used Hubble Space Telescope to measure the time delay of its final appearance relative to its 2014 appearance with $\sim 1.6\%$ precision, and constructed a high-cadence light curve of the Supernova (SN) 1987A-like SN by combining photometry of the five observed images. I will also describe a microlensing analysis using a simulated SN 1987A-like SN photosphere. Finally, I will talk about a connection between the blue supergiant progenitor of SN Refsdal and an individual, highly magnified individual star in the same host galaxy at redshift $z=1.49$.



PHYSICS