PHYSICS AND ASTRONOMY COLLOQUIUM

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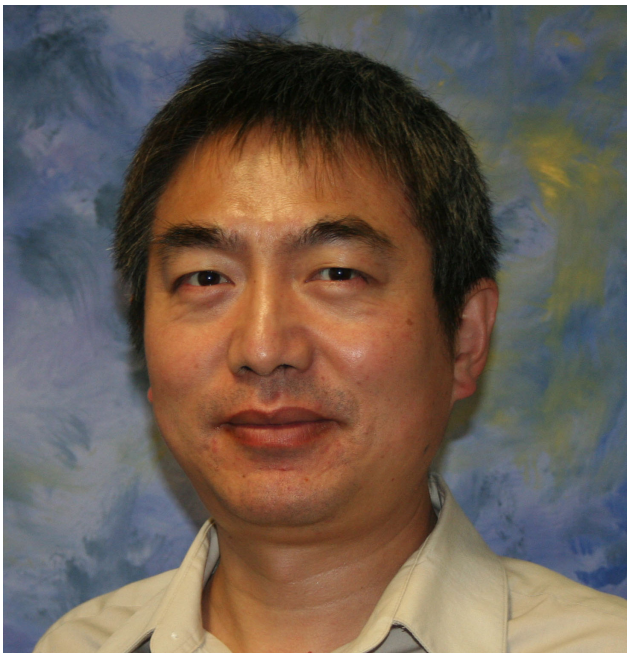
Supernova Inside Out



A major recent advance in supernova study is the realization that the supernova phenomena are intrinsically three-dimensional with significant departures from spherical symmetry. Our spectroplarimetry program has played a critical role in this advance. I will focus on studies of Type Ia supernovae. The asphericity is consistently stronger in the outer layers of Type Ia supernovae and with significant departures from axial symmetry, providing constraints on the burning process. New evidence has accumulated that the properties of Type Ia supernovae are closely related to their circumstellar environment. Our recent work suggests that there are two groups of Type Ia supernovae with substantially different progenitor systems. I will also discuss how these observations are changing our views of the complex thermonuclear deflagration/detonation of the progenitor white dwarfs, and how they may affect the cosmological application of Type Ia supernovae. I will compare various observational efforts including our program in Antarctica. To effectively beat down systematic noises, a large number of supernovae with broad wavelength coverage are needed.

THURSDAY, SEPTEMBER 12, 2013 | 4:00 PM | HAWKING AUDITORIUM

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