

***Dr. Peter Johnson Brown***



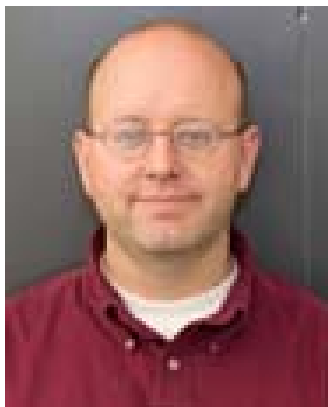
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fundamental Physics and Astronomy*

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## **Calibrating Exploding Stars for Precision Cosmology**

We live in an era where cosmological parameters are being measured to increasingly higher precision. Type Ia supernovae are one kind of "standard candle" used to measure distances and the expansion rate of the universe. With the hundreds or thousands of supernovae used in current analyses, the systematic errors now dominate over the statistical errors. Many of these systematics are poorly understood but are expected to have strong signatures at ultraviolet wavelengths. I am using the Swift Gamma-Ray Burst Explorer to observe supernovae in the ultraviolet. I will show constraints on progenitor systems and extinction derived from Swift ultraviolet observations. I will also discuss the effects expected from metallicity, asymmetry, and explosion differences. I will also show recently discovered evidence for a possible change with redshift in the supernova Ia population.

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