SUPERNOVA SHRAPNEL: INTERPRETING THE PIECES OF A NEARBY STAR. B. J. Fry[1], B. D. Fields[2], and J. Ellis[3]. [1]Department of Astronomy, University of Illinois, [2]Departments of Astronomy and of Physics, University of Illinois, [3]Theoretical Physics and Cosmology Group, Department of Physics, King's College London, London WC2R 2LS, UK, and Theory Division, Physics Department, CERN, CH-1211 Geneva 23, Switzerland

Supernovae occur at a rate of ~1-3 per century in the Milky Way. It is reasonable to expect that in the lifetime of Earth, at least one (if not several) supernovae have occurred within 100 pc of Earth, presenting an opportunity for a supernova to produce measureable effects on Earth. We will discuss terrestrial iron-60 evidence for such a nearby event and examine possible sources for the iron-60 signal to include not only Core-Collapse Supernovae, but also Electron-Capture Supernovae, Thermonuclear/Type Ia Supernovae, Kilonovae/Neutron-Star Mergers, and Super-Asymptotic Giant Branch stars. We will also present a number of factors that influence the signal from an extra-solar source to include uptake and dust filtering, and we will identify constraints to apply to each possible source in order to identify the most likely progenitor of the iron-60 signal. With identification of a likely progenitor, it is possible to calculate the expected biological impacts from such a nearby explosion.

This talk will highlight recent work by our group and references therein.

[1] Fry, B. J., Fields, B. D., and Ellis, J. (2015) Astrophys. J. 800, 71.