

Abstract Submitted
for the TSF09 Meeting of
The American Physical Society

Elemental Distributions in a Supernova Remnant¹ TIMOTHY SATERFIELD, ANDREA KATZ, GORDON MACALPINE, Trinity University — Numerical photoionization models, created to match numerous observed spectra, are allowing us to study consistent elemental abundances and associated nuclear processing stages for gas in the Crab Nebula supernova remnant. In order to provide a better understanding of nucleosynthesis in the star that exploded, and also to provide insights into the explosive event, we are mapping spatial distributions for the important elements helium, nitrogen, oxygen, and sulfur over the observed nebular structure. We obtained and calibrated new emission-line images from the McDonald Observatory, and we developed accurate procedures involving grids of photoionization models to map the element mass fractions. These maps illustrate widely distributed and localized evidence of nuclear processing stages, such as the CNO cycle, helium burning, and oxygen burning. Each element map is uniquely different and contains important information about stellar nucleosynthesis and the explosive distribution of elements.

¹This work was supported by Trinity University and an endowment from Mr. Gilbert Denman.

Dennis Ugolini
Trinity University

Date submitted: 25 Sep 2009

Electronic form version 1.4