Abstract Submitted
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Nuclear Physics and the Classical and Recurrent Nova Outburst[1]

SUMNER STARRFIELD, Arizona State University — Classical novae participate in the cycle of Galactic chemical evolution in which grains and metal enriched gas in their ejecta, supplementing those of supernovae, AGB stars, and Wolf-Rayet stars, are a source of heavy elements for the ISM. Once in the diffuse gas, this material is mixed with the existing gases and then incorporated into young stars and planetary systems during star formation. Infrared observations have confirmed the presence of carbon, SiC, hydrocarbons, and oxygen-rich silicate grains in nova ejecta, suggesting that some fraction of the pre-solar grains recently identified in meteoritic material may come from novae. The mean mass returned by a nova outburst to the ISM probably exceeds $\sim 2 \times 10^{-4}$ $M_\odot$. Using the observed nova rate of 35±11 per year in our Galaxy, it follows that novae introduce more than $\sim 7 \times 10^{-3}$ $M_\odot$ yr^{-1} of processed matter into the ISM. Novae are predicted to be the major source of ^{15}N and ^{17}O in the Galaxy and to contribute to the abundances of other isotopes in this atomic mass range. I will report on the effects of changes in the nuclear reaction rate libraries on the properties of the outburst and, how these changes alter the predictions.

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Sumner Starrfield
Arizona State University

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