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New Measurements of the Astrophysically Important ^{44}Ti Radionuclide Through the ^{40}Ca(α,γ)^{44}Ti Reaction DANIEL ROBERTSON, University of Notre Dame, HANS-WERNER BECKER, University of Bochum, PHILIPPE COLLON, JOACHIM GOERRES, MICHAEL WIESCHER, University of Notre Dame — The relatively short-lived radionuclide ^{44}Ti ($t_{1/2}$=58.9 $\pm$ 0.3 yrs), is of considerable importance in the study of nucleosynthesis in explosive stellar environments. It's production predominantly through the ^{40}Ca(α,γ)^{44}Ti reaction, takes place during α-rich freeze-out, in the inner most layers of a core-collapse supernova. A number of experimental studies have been previously performed to determine the stellar reaction rate. These studies included prompt γ-ray measurements from in-beam experiments, atom counting techniques utilizing accelerator mass spectrometry (AMS) and multi energy step measurements at the DRAGON recoil mass separator. The resulting calculated reaction rates show drastic disagreement. New results from experiments at the DTL, Bochum and NSL, Notre Dame, used both gamma spectroscopy and AMS techniques to measure the reaction, and investigate the discrepancies in both the experimental and predicted results. Final results of the experiments and their impact on the reaction rate will be discussed.

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