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Status of The Facility for Experiments of Nuclear Reactions in Stars RICHARD LONGLAND, JOHN KELLEY, CALEB MARSHALL, FEDERICO PORTILLO, KIANA SETOODEHNIA, DANIEL UNDERWOOD, North Carolina State University — To make connections between observations of stellar atmospheres and the processes occurring deep inside stars, we must rely on accurate nuclear cross sections. Often, the Coulomb barrier makes these cross sections immeasurably small in the laboratory. Particle transfer reactions are one tool in our inventory that can be used to infer the necessary properties of nuclear reactions, thus opening an avenue to calculate their cross sections. Enge split-pole magnetic spectrographs are one tool in our inventory that have been used successfully to perform these experiments. However, after a rash of closures, there were no operational spectrographs of this kind in North America to provide these valuable capabilities. Over the last few years, we have revived the Enge split-pole spectrograph at TUNL. We have also upgraded much of the equipment, ranging from the data acquisition system to the control system and detector package. These upgrades have enabled a powerful, flexible, and modern facility - the Facility for Experiments of Nuclear Reactions in Stars (FENRIS). In this talk, I will present a status upgrade of FENRIS, highlighting our upgrades, capabilities, and first science results. I will also highlight future upgrade plans for the facility.

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