

Physics with the Coupled Cyclotron Facility at MSU*

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The upgrade of the NSCL to the coupled cyclotron facility (CCF) is nearing completion and the operation as a new users facility for fast radioactive beams will begin this summer. Compared to what was possible with the stand-alone K1200 cyclotron, the CCF will provide large intensity gains of intermediate-energy primary beams, from light ions up to uranium. For very heavy ions ($A \geq 150$), the CCF will also provide a significant increase in energy. Together with the increased acceptance of the new A1900 fragment separator, intensity gains by factors of 100 – 10,000 will be achieved for most fast beams of rare isotopes. These beams will be used to explore the properties of nuclei with unusual ratios of protons and neutrons, the nuclear processes that are responsible for the synthesis of the elements in the cosmos, and the isospin dependent properties of hot nuclear matter at sub- and supra-normal densities.

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