

Abstract Submitted
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Electronic structure and magnetism in EuN¹ BEN RUCK, The MacDiarmid Institute for Advanced Materials and Nanotechnology, JOE TRODAHL, JAN RICHTER, ANDREW PRESTON, FRANCK NATALI, NATALI PLANK, CLAIRE MEYER, JULIO CEZAR, LAURENT RANNO — The rare-earth nitrides exhibit unusually strong coupling between their spin and charge degrees of freedom. Some rare-earth nitrides, such as GdN, have been shown to be ferromagnetic semiconductors, in agreement with band structure calculations. However, similar calculations are far less clear regarding the electronic structure of EuN, mainly due to the propensity of Eu to exist in either 2+ or 3+ charge states. Here we present the first evidence that EuN is ferromagnetic with a Curie temperature of about 30 K, and it is metallic, likely half-metallic. X-ray magnetic circular dichroism experiments indicate the Eu ions are predominantly in the 3+ charge state, but a small fraction are in the 2+ state. The nature of the exchange interaction remains unclear.

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