

Abstract Submitted
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Observation of Diamond Nitrogen-Vacancy Center Photoluminescence under High Vacuum in a Magneto-Gravitational Trap¹ PENG JI, JEN-FENG HSU, CHARLES W. LEWANDOWSKI, M. V. GURUDEV DUTT, BRIAN DURSO, University of Pittsburgh — We report the observation of photoluminescence from nitrogen-vacancy (NV) centers in diamond nanocrystals levitated in a magneto-gravitational trap. The trap utilizes a combination of strong magnetic field gradients and gravity to confine diamagnetic particles in three dimensions. The well-characterized NV centers in trapped diamond nanocrystals provide an ideal built-in sensor to measure the trap magnetic field and the temperature of the trapped diamond nanocrystal. In the future, the NV center spin state could be coupled to the mechanical motion through magnetic field gradients, enabling in an ideal quantum interface between NV center spin and the mechanical motion.

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