

# Physics Department Seminar

Apr. 25, Friday at 2 PM in Science

## An Undergraduate Approach to Magnetic Field Mapping



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This project explores the use of a low-cost analog Hall-effect sensor to map the magnetic field of an unknown source in three dimensions. Using a disc magnet as the field source, the collected data reveal an inverse-cube relationship between field strength and distance—behavior consistent with that of a magnetic dipole. The setup provides an accessible, hands-on approach for investigating electromagnetic phenomena in undergraduate labs. In addition to highlighting physical principles, the project offers students the opportunity to build advanced data analysis skills through real-world experimentation.

This color map shows the magnetic field strength surrounding a small disc magnet, as measured using a student-built analog Hall-effect sensor system. Each point represents

real data collected during the experiment, highlighting how accessible tools can produce clear, structured visualizations of complex electromagnetic fields. This seminar explores how such methods enable hands-on engagement with fundamental physics concepts.

