

# Condensed Matter Physics Seminar Series

## Dissipation in magnetic and quantum hybrid spin systems

Prof. Benedetta Flebus

*Department of Physics, Boston College*

**Tuesday, February 07, 2023 at 1:00 PM  
4-330 PAB**



Since the birth of spintronics, magnetization dynamics have been known to be inherently lossy due to the ubiquitous spin non-conserving interactions with the crystalline lattice and other degrees of freedom. However, despite their lossy character, magnetic systems have been mainly investigated within Hermitian frameworks. Only recently, the advent of non-Hermitian theories has provided a new pathway to explore the properties of open systems. In the first part of this talk, I will discuss how including dissipation in theoretical models of magnetic systems has allowed us to unveil new phenomena, such as non-hermitian magnonic topological phases, dynamical magnetic phase transitions at exceptional points, and the magnetic skin effect. In the last part of this talk, I will discuss dissipation as an engineering tool to realize cooperative quantum phenomena in quantum hybrid spin systems comprised of NV centers coupled via a magnetic bath.

Benedetta has a BS from the University of Trieste and two master' degrees, one from la Sorbonne University in applied physics and one from EPFL in theoretical physics. After completing her Ph.D. at Utrecht University with Rembert Duine, she worked as a postdoc with Yaroslav Tserkovnyak at UCLA (2017-2018) and with Allan MacDonald at UT Austin (2018-2020). Since 2020 she has been an Assistant Professor at Boston College. In 2022 she received an NSF CAREER award and the Mildred Dresselhaus Guest Professorship award.