

**Friday, September 20th**  
**4:10 – 5:00 PM**  
**Barnard Hall 103**

## **Spintronics for Low-Energy Storage and Processing of Data**

**Dr. Hossein Taghinejad**  
**UC Berkeley**

**Abstract:** The idea of using spin, instead of charge, as the state variable for data storage and processing offers significant potential for reducing energy consumption in the next generation of microelectronic devices. This concept has sparked renewed interest in spintronics research, particularly as we move into the era of artificial intelligence, where the demand for efficient, large-scale data processing and dynamic storage continues to grow. This shift underscores the urgent need for minimizing energy consumption in electronic chips.

In this talk, I will present two key research directions we have pursued in spintronics. First, I will introduce a class of *Metallic Magnets* based on intercalated layered materials, with a focus on their potential for magnetic recording. In the second part, I will shift the focus to *Insulating Magnets* and explore how their collective excitations can be harnessed for data communication and processing via the spin degree of freedom. Throughout both sections, I will highlight the critical material parameters that are central to current spintronics research, as we aim to bridge the gap between fundamental science and real-world device applications.

Host: Dr. Amir Hasani

***\* Refreshments served in the Barnard second floor atrium at 3:45. \****