



# “Searching for Rare Physics Events with Rare AI”

**by Aobo Li (UC San Diego)**

**Time and Date: 13:00-15:00, April 3, 2025**

**Place: Room 745, Science Complex B (H-03) (hybrid)**

**Registration: "<https://us02web.zoom.us/meeting/register/XHA4NLqfQOGF08YV1xSh-Q>"**

Rare event searches are fundamental to our understanding of physics, including but not limited to neutrinoless double beta decay, dark matter detection, and binary black hole mergers. While artificial intelligence has revolutionized many scientific fields, its application to rare event searches presents unique challenges due to the inherent scarcity of training data. This talk presents two innovative AI solutions specifically developed for rare event searches in physics and astronomy. First, we introduce a Rare Event Surrogate Model, initially designed for optimizing neutrinoless double-beta decay detectors. Second, we discuss our AI-ready data release from a axion dark matter detector, demonstrating significant improvements in dark matter search sensitivity through AI-driven analysis. These developments showcase how carefully tailored AI approaches can overcome the challenges of limited data availability while enhancing our capability to detect and analyze rare events.

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