



第241回 OPERA研究交流セミナー
第232回 ISIT有機光エレクトロニクス研究特別室セミナー
第299回 未来化学創造センターセミナー



日時: 2024年8月23日(金) 13:00~
場所: ISI棟3階 セミナー室

「Delocalized, Asynchronous, Closed-Loop Discovery of Organic Laser Emitters」

Dr. Han Hao

Staff Scientist of the Acceleration Consortium at the University of Toronto

Contemporary materials discovery requires intricate sequences of synthesis, fabrication and functional characterization that often span multiple locations with specialized expertise and instrumentation. In our collaborative effort of the Material Accelerated Discovery of Novelty Enabled by Synthetic Systems (MADNESS) campaign, we present a cloud-based solution enabling AI-guided, asynchronous, and delocalized design–make–test–analyze cycles to integrate these workflows. We applied a building-block strategy for assembling molecular function enables automated synthesis on geographically distributed yet connected platforms, orchestrated by a central cloud platform, with the integration of an AI-based experiment planner and an in-line property characterization module to accelerate the discovery of top-performing organic solid-state laser molecules as demonstrated by the best ever thin-film device performance. Empowered by asynchronous integration of five laboratories across the globe, this workflow provides a blueprint for delocalizing – and democratizing – scientific discovery, in which we are endeavoring a global community of accelerated material discovery and self-driving laboratories based on the framework of the Acceleration Consortium at the University of Toronto. Collectively, we aim to accelerate the discovery of materials and molecules needed for a sustainable future, with the power of artificial intelligence, robotics, and advanced computing—to reduce the time and cost of bringing advanced materials to market.