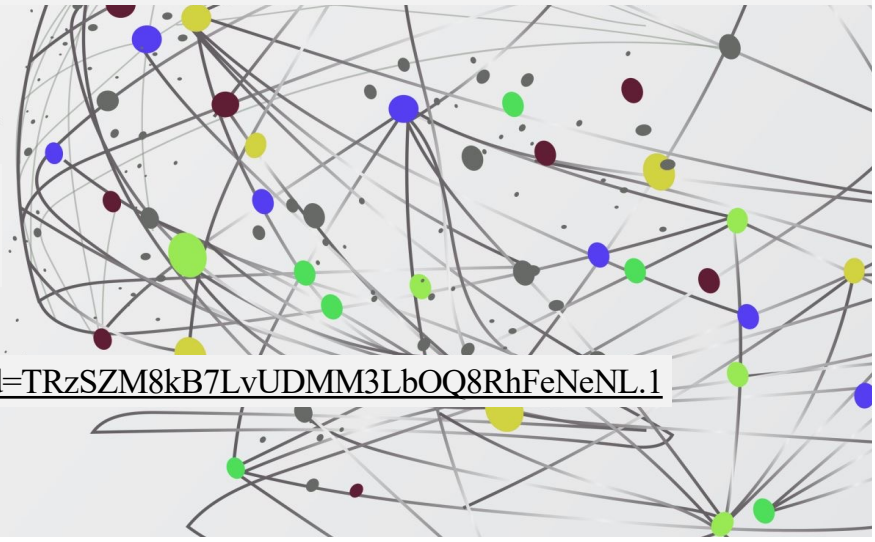
# 2st RPI-HU Joint Seminar on Advanced Semiconductor and Related Technologies for Future Communication and Computing



***Date and Place***

**Friday, Feb. 14,**
**8:30am-9:30am in Japan**

Zoom meeting
https://zoom.us/j/92004125967?pwd=TRzSZM8kB7LvUDMM3LbOQ8RhFeNeNL.1

Meeting ID: 920 0412 5967
Pass Code: 600825

## *Speakers' Information*

## "Solid-state electrochemical thermal transistors"

Prof. Hiromichi Ohta, *Hokkaido University, JAPAN*

**Abstract:** Thermal transistors (or thermal switches) are devices that can electrically switch "heat flow" on and off, like a semiconductor field effect transistor that switches "electric current" on and off. We can reuse waste heat exhausted to the environment using devices composed of thermal transistors such as thermal displays. Although several thermal transistors have been demonstrated thus far, the use of liquid electrolytes (or ionic liquids or ion gels) may limit the application from the viewpoint of reliability or liquid leakage. Recently, we developed oxide-based solid-state electrochemical thermal transistors that were fabricated on single crystal YSZ plate used as a solid electrolyte.

## "Accelerating the design and discovery of quantum materials"

Prof. Trevor David Rhone, *Rensselaer Polytechnic Institute, USA*

**Abstract:** Advances in materials drive technological innovation. The rise of nanomaterials has led to increased interest in harnessing the quantum properties of materials for advancing science and technology. However, designing materials to have a desirable property is challenging and traditionally requires costly first-principles calculations and experiments. In this talk we describe how artificial intelligence (AI) can be harnessed to accelerate the design and discovery of quantum materials for technological applications. We will focus on the discovery of (i) two-dimensional (2D) magnets for magnetic memories, (ii) topological materials with applications in dissipationless electronics and (iii) 2D materials with nonlinear optical properties with applications in quantum communication.

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Zoom link