

783rd ASRC Seminar

Date: Mar. 3 (Tue), 15:30~16:30

Location: Meeting room 302, ASRC bldg.

Speaker: Dr. Shin-ichi Shamoto

(R.G for Nanoscale Structure and Function
of Advanced Materials, ASRC)

Title: Richness of complexity (複雑さの豊かさ)

Abstract:

Complexity is a fertile forest in solid state science to be explored. Many functional and industrial materials are composed of combinations of chemical elements and/or structures ranging from bulk, film, to nanomaterial. The complexity of materials is always accompanied with various interactions including their cross correlations. A phase diagram of a chemical element has vapor, liquid, and solid states. In a molecule case, a liquid crystal state appears in the phase diagram due to the complexity of the molecule. The more complex structures and interactions are, the more states appear in-betweens. The middle state or the critical state between liquid and solid states is industrially important because of the large response to an external field. One typical example is an electrode of a Li-ion battery. This concept can be extended to various electronic and magnetic states [1]. As an example, high-temperature partial order of conduction electrons in Mn_3RhSi will be discussed [2].

[1] S. Shamoto, *J. Phys. Soc. Jpn.* 88, 081008 (2019).

[2] H. Yamauchi, D. P. Sari, I. Watanabe, Y. Yasui, L.-J. Chang, K. Kondo, T. U. Ito, M. Ishikado *et al.*, submitted to *Communications Materials*.

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