SEMINAR ANNOUNCEMENT

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
COLLEGE OF DESIGN AND ENGINEERING
Website: https://cde.nus.edu.sg/ece

Area: Microelectronic Technologies & Devices

Host: Professor Yang Hyunsoo

TOPIC	:	**Magnonic Many-Body Open Quantum Systems**
SPEAKER	:	**Assistant Professor Mehrdad Elyasi** **Advanced Institute for Materials Research, Tohoku University, Sendai, Japan**
DATE	:	**Thursday, 2 March 2023**
TIME	:	**2.00PM to 3.00PM**
VENUE	:	**Block E5, E5-02-32** **College of Design and Engineering, NUS**

ABSTRACT

Magnons have recently emerged as strong candidates for quantum information. The crystalline anisotropy, as well as the dipolar and exchange interactions lead to nonlinear magnon-magnon interactions of third order and higher in a magnetic material. Decades ago, such interactions were shown to be responsible for several types of (Suhl) instabilities, as well as for channels of dissipation. More recently, experiments demonstrated a magnon condensation at the bottom of a dipolar-exchange dispersion as a result of four magnon interactions. As the research focus on spin waves has shifted towards the coherence and the possibilities in quantum information and computation, the context of nonlinearity has gained even more attention. In this seminar, I explain some recent theoretical and experimental demonstrations that have opened new avenues in implementing magnon nonlinearities useful for quantum information or stochastic computing paradigms.

BIOGRAPHY

The speaker is currently an assistant professor at Advanced Institute for Materials Research, Tohoku University, where he initially joined as a JSPS postdoctoral fellow. He did his PhD at National University of Singapore, and B.Sc. at Sharif University of Technology. His research interests span a wide range of topics in condensed matter physics, including magnetism, spintronics, metamaterials, topology, and quantum matter. His recent research focus has been on nonlinearity of spin waves and its implications in quantum information.