



# 2021 IBS-CALDES Seminar

✓ **Date & Time** 3:00PM, December 17 (Fri), 2021

✓ **Speaker & Title**

**3:00PM~ Prof. Myung Joon Han (KAIST)**

**Site-selective Hund's physics in  $\text{Fe}_3\text{GeTe}_2$**

**4:10PM~ Prof. Changhee Sohn (UNIST)**

**Strongly Correlated Electron Heterostructures for Quantum Magnetism**

Organized by **Prof. Jun Sung Kim** (js.kim@postech.ac.kr, 054-279-2098 )  
**Dr. Jewook Park** (jewookpark@ibs.re.kr, 054-279-9893)



■ **3:00PM~**

## Site-selective Hund's physics in $\text{Fe}_3\text{GeTe}_2$

Myung Joon Han  
Department of Physics, KAIST

Recently, magnetic property of van der Waals materials has been attracting a lot of attention. In this talk, I will report our recent progress in understanding a metallic ferromagnet  $\text{Fe}_3\text{GeTe}_2$ . In particular, I will try to argue that this representative metallic ferromagnet can be best understood as a 'site-differentiated' Hund's metal. After briefly summarizing the material properties of  $\text{Fe}_3\text{GeTe}_2$  and the intriguing characteristics of Hund's metals, I will present our DFT+DMFT calculation results showing that all salient features of Hund's metal physics are well identified in  $\text{Fe}_3\text{GeTe}_2$ . Furthermore, two different Fe sites in this material are clearly distinctive from the Hund's physics point of view. This newly suggested 'site-selective' Hund's picture provides the useful insight and information to understand the experiments including the ones that are seemingly controversial to each other.

■ 4:10PM~

# Strongly Correlated Electron Heterostructures for Quantum Magnetism

Changhee Sohn  
Department of Physics, UNIST

Magnetism with strong quantum fluctuation could possess exotic fractional excitations with potential application to spintronics and quantum computations. However, it still remains elusive to realize genuine quantum magnetic ground state with the absence of long-range ordering at zero temperature. For the case of Kitaev quantum spin liquid, there are always additional spin exchange interactions in real materials, resulting in classical magnetic ground states. Heterostructure engineering, therefore, could be a route to realize exotic quantum magnetic states as it can tune spin Hamiltonian of systems in the wide range. In this seminar, we will present our recent attempts to realize quantum magnetic ground states by using strongly correlated electron heterostructures. We will show successful growth of quantum spin liquid candidates in thin film and its basic characterization.