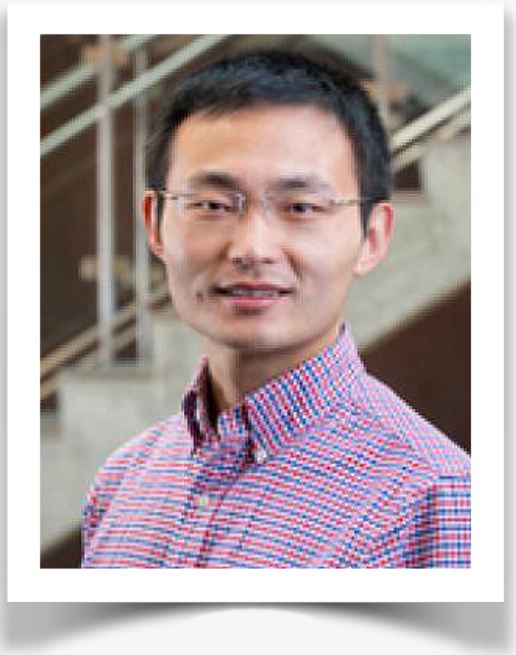
SPRING 2021 NCMN SEMINAR SERIES



CHANGJIANG LIU

APRIL 14 @ 4 P.M.

ARGONNE NATIONAL LABORATORY

Two-dimensional superconductivity at $KTaO_3$ (111) interfaces and electric-field control of magnon spin currents in Cr_2O_3

ABSTRACT

Oxide material system is an ideal playground for uncovering new physical phenomena owing to the strong interactions between electron spins, charges and lattices. In this talk, I will first present recent discovery of two-dimensional superconductivity at the $KTaO_3$ (111) interfaces. The superconducting transition temperature reaches 2.2 K, which is about one order of magnitude higher than that found in the widely studied $LaAlO_3/SrTiO_3$ system. Notably, this new interfacial superconductor shows some unusual properties, including crystallographic orientation dependent superconductivity and a spontaneous in-plane symmetry broken in transport. If time permits, I will continue to talk about the second work which shows how thermally excited magnons can be used to probe individual spin sublattices in the antiferromagnetic insulator Cr_2O_3. I will also present how the magnon spin current can be controlled by an electric field utilizing the magnetoelectric coupling in this classical antiferromagnet.

BIO

Changjiang Liu is currently a postdoctoral researcher in the materials science division at Argonne National Laboratory. He obtained his Ph.D. in physics from University of Minnesota. His research interests include superconductivity in oxide interfaces, quantum critical phenomena in correlated materials and spin transport in magnetic systems. He was a recipient of post-doctoral travel awards from American Physical Society.

Host: Xia Hong
Physics & Astronomy

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