

## COLLOQUIUM:

# Tailoring a 2D semiconductor by electric fields



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## ABSTRACT

Van der Waals materials are a versatile testbed for exploring emergent phenomena in condensed matter physics. In a material with such a distinct 2D structure, the electric field offers a feasible knob to carefully tune its properties. In this talk, I will focus on tailoring the magnetic order of  $\text{Cr}_2\text{Ge}_2\text{Te}_6$ , a van der Waals semiconductor, employing the electrostatic field. I will show that CGT possesses a rich phase diagram formed by charge, spin, and orbital degrees of freedom. I will discuss the emergence of a carrier-induced ferromagnetic order in CGT, which exhibits enhanced Curie temperature and rotation of the easy axis. I will speculate on the tantalizing prospects of van der Waals materials and their potential for information technologies.

## BIO

Dr Ivan Verzhbitskiy received his B.Sc. and M.Sc. degrees in Physics from Saint Petersburg State University, and completed his Ph.D. at the University of Angers (CNRS, France), in 2011. Later, he was appointed a postdoctoral associate position at the Free University of Berlin, where he studied electronic and optical properties of graphene, carbon nanotubes, and graphene nanoribbons. He then moved to the National University of Singapore as a Senior Research Fellow in 2013 and later joined the Institute of Materials Research and Engineering (A\*STAR) in Singapore. His main research interests are focused on the electronic and optical signatures of collective phenomena in van der Waals materials.

**DATE:** Friday 11th February

**TIME:** 10:00-11:00

**VIA ZOOM ONLY**



**FLEET**

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