Mechanical and Aerospace Engineering Seminar

Dr. Arzu Çolak
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Will present a talk titled:

Dry Yet Slippery – Achieving Superlubricity with Ti3C2T*x* MXene Nanosheets

Abstract: Two-dimensional (2D) materials like graphene, and MoS2 have unique friction properties unlike their bulk (3D) counterparts. With their layered 2D structural property, and excellent mechanical strength, early transition metal carbides, carbonitrides, and nitrides (i.e., MXenes) also offer promising solid lubrication properties theoretically. Nevertheless, since the first titanium carbide MXene, Ti3C2Tx, was synthesized in 2011, only one report has been presented the possibility to achieve superlubricity (that is almost vanishing friction) with Ti3C2Tx MXene in an inert atmosphere. In this talk, I will present results of atomic-force-microscopy-based nanoscale friction experiments from our lab, which demonstrate the occurrence of superlubricity for Ti3C2Tx MXene nanoflakes not only in a controlled environment but also in ambient conditions by revealing long-term stability of the material.

Date: December 2, 2022
Location: CAMP 176
Time: 11:00 am
ZOOM Link for virtual attendance
https://clarkson.zoom.us/j/99234191973?pwd=MkcvM1ZKYW85cWZrN0FOM3lTc3VxQT09

Bio: Arzu Çolak is an Assistant Professor of Physics at Clarkson University. She received her Ph.D. degree in Physics from the University of Twente (the Netherlands) in 2013. Upon completion of her Ph.D., she had postdoctoral appointments at the University of Pierre and Marie Curie (France), the INM – Leibniz Institute for New Materials (Germany), and the University of California, Merced (U.S.A.). Since July 2020 at Clarkson University, Dr. Çolak has been conducting research in the field of surface and interface physics with atomic force microscopy-based methods.