Title: Ceramic Plasmonic Materials for Solar-Driven Water Evaporation

Abstract: In the past few decades, there have been many advances in the development of plasmonic nanomaterials and their application in chemical sensing, photothermal therapy, enhancement of photovoltaic device performance, catalysis, solar-driven desalination, among others. To date, nano-sized metals such as gold, silver, and copper have been well-explored for plasmonic applications, however gold is expensive, and silver and copper succumb to oxidation which dampens their plasmonic response. In a quest to develop plasmonic nanomaterials that are low cost and chemically stable, transition metal nitrides and carbides have emerged as strong contenders based on computational studies performed in the last decade. However, the experimental evidence of this remains scarce. This presentation will highlight some of our research group's recent progress on the synthesis of free-standing plasmonic transition metal nitride and carbide nanoparticles. The chemical stability, photothermal properties, and their application for water evaporation will also be discussed.

Plasmonic group 4 metal nitride nanoparticles

Bio

Dr. Mita Dasog is an Associate Professor and Izaak Walton Killam Memorial Research Chair in the Department of Chemistry at Dalhousie University. She obtained her bachelor's degree in chemistry from the University of Saskatchewan, and then moved to the University of Alberta to begin her PhD studies with Prof. Jonathan Veinot where she focused on the syntheses, properties, and applications of silicon quantum dots. After a short stay at the Technical University of Munich as a Green Talents visiting scholar, Dr. Dasog went on to hold an NSERC postdoctoral position with Prof. Nathan Lewis at the California Institute of Technology, where she studied light-material interactions.

Her research group focuses on the development of photocatalysts, electrocatalysts, porous nanomaterials, and ceramic plasmonic nanostructures using solid-state synthetic methods. Dr. Dasog has received the Dalhousie University President's Research Excellence Award for Emerging Investigators and a Nova Scotia Discovery Center Emerging Professional Award. In 2020 she was appointment as a member of the Global Young Academy and more recently to the Royal Society of Canada College of New Scholars.