

Department of Physics and Astronomy Colloquium Series

Tuesday, March 5th, 2024 at 2:30pm in PSE 317

Speaker: Dr. Monika Stachura

Institution: Life Sciences Division, TRIUMF

Title: Little-known ways to apply nuclear physics to chemistry and medicine

Abstract:

As humans, we are a mélange of diverse chemical elements: a fragile composition of oxygen, carbon, hydrogen, nitrogen, calcium, and others that hang in an improbable but finely tuned balance. Once this balance is disturbed, either due to a deficiency or excess of certain elements, it can lead to pathologies that have been linked to a variety of severe diseases such as cancer, Alzheimer's Disease, or Parkinson's Disease.

What if we could use our growing knowledge of different chemical elements, and the technologies applied in nuclear physics, to better understand how our bodies function, and why we get sick? How could we apply that knowledge to solve problems in our bodies?

Join me on March 5 to learn about TRIUMF's role in producing, studying, and applying isotopes of various chemical elements to understand the exact role of different metal ions in health and in disease. Delve into the little-known medical applications of nuclear physics techniques, such as beta-radiation detected nuclear magnetic resonance, and discover how an interdisciplinary approach can help us trace the origins of different diseases, as well as a synergistic endeavour to design and develop more efficient (radio)pharmaceuticals.

Short bio:

Dr. Monika Stachura is a research scientist in the Life Sciences Division at TRIUMF, Canada's particle accelerator centre. She holds two MSc degrees (in Physics and in Biophysics) and a PhD degree in Bioinorganic Chemistry and in Biophysics. In 2013 she was awarded the competitive postdoctoral research fellowship at CERN.

Dr. Stachura joined TRIUMF in 2015 as a postdoctoral fellow at the Centre for Molecular and Materials Science (CMMS) and was appointed to a research (faculty) position in 2016. Her interest lies in applying nuclear physics tools in studies of essential metal ions to understand their role in health and disease. She is the pioneer for beta-radiation detected nuclear magnetic resonance applications into biology and medicine. In 2023, Dr. Stachura was appointed as Head of Education and is now working on the development of the educational portfolio at TRIUMF.

Alongside her research, Dr. Stachura acts as a faculty liaison for graduate students and postdoctoral fellows at TRIUMF. She also has served as a founding member of TRIUMF's Equity, Diversity and Inclusion Committee since 2017.