GIRLS IN PHYSICS

BREAKFAST

BALLARAT 2025

VicPhys

FOR STUDENTS IN YEARS 10,11 & 12 INTERESTED IN A CAREER IN STEM

Meet like-minded students and women who have a career in Physics and Engineering. Ask questions and explore different pathways that might work for you!

MOLECULAR MOVIES WITH X-RAY LASERS

Associate Professor Nadia Zatsepin
Physicist, Swinburne University of Technology

Wednesday March 26th
Prospects Restaurant
SMB Campus, Ballarat

$15 per student
(Max. 12 Students per school)
Breakfast 8.30am to 11.00am

SCAN FOR MORE INFO

Speak to your science teacher about attending the breakfast

"I was talking to a guest at my table and her career sounded so amazing. Then I realised that in eight years that could be me. I got so excited!" - Year 10 Student

SPONSORED BY

VicPhys
Vicphysics Teachers' Network Inc.

The INVERGOWRIE Foundation

GIRLS IN PHYSICS

BREAKFAST

BALLARAT 2025

MOLECULAR MOVIES WITH X-RAY LASERS

Speaker Bio: Associate Professor Nadia Zatsepin, Physicist, Swinburne University of Technology
Nadia's research at Swinburne uses X-ray lasers to study the structure and dynamics of biological molecules.

She received her PhD in X-ray physics from Monash University in 2011, then moved to Arizona State University (ASU) as a postdoctoral fellow to get a chance to play with a newly opened X-ray laser at SLAC National Accelerator Laboratory. She started a research group at ASU in 2016 and helped pioneer a new approach to studying biomolecules.

In mid 2019 she returned to Melbourne to join the Centre of Excellence in Advanced Molecular Imaging, while based at La Trobe University.

Her research is focused on crystallography at the Australian Synchrotron in Clayton and new types of X-ray lasers and discovering the molecular mechanics of a bacterial protein that could be used to help fight antimicrobial resistance.

She's also a folk/jazz singer, classical pianist, and sleep-deprived mum of two toddler girls.

Abstract: Nature is dynamic. To understand how something works, you need to see it in action. To understand biology at the molecular level, and to be able to control and improve it, we need to see biological molecules in action. X-ray crystallography is a way to make molecular movies of biomolecules (e.g. proteins) undergoing reactions.

This talk will describe a new era in molecular imaging: using X-ray free-electron lasers - the most powerful X-ray sources on Earth - to probe the fastest reactions in biology.

This technique (serial crystallography) allows us to reconstruct atomic-resolution movie snapshots of proteins responsible for mammalian vision, photosynthesis, or proteins in bacteria responsible for antibiotic resistance, to name a few.

This work lies at the interface of physics, mathematics, chemistry, biology and engineering, bringing together large, diverse teams to answer important fundamental biological questions.

SPONSORED BY

VicPhys
Vicphysics Teachers' Network Inc.

The INVERGOWRIE Foundation