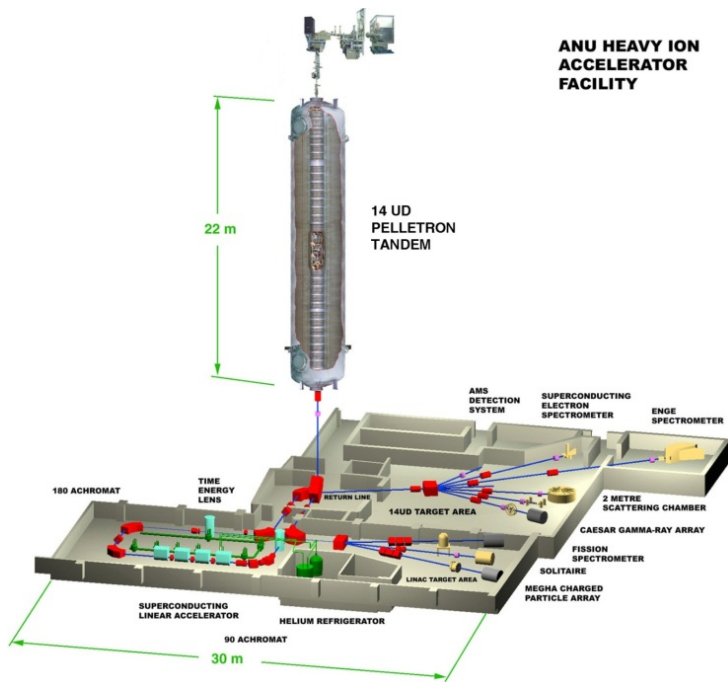




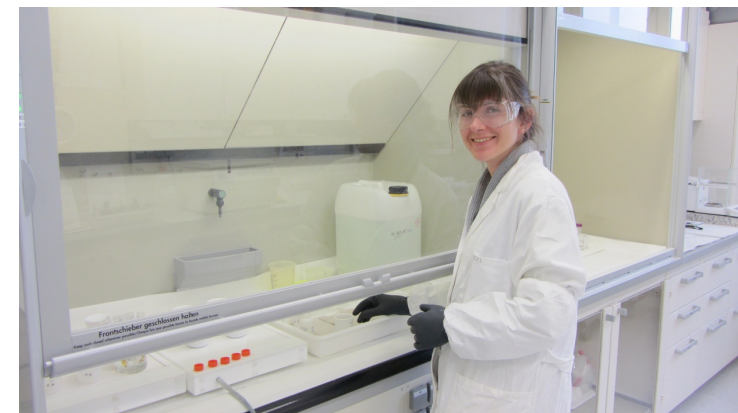
Introduction & Research Interests



**ANU HEAVY ION
ACCELERATOR
FACILITY**

Dr Michaela Froehlich

Accelerator Mass Spectrometry Group
Department of Nuclear Physics
Australian National University



Introduction

Educational background

PhD in Chemistry (2011; University of Vienna, Austria)

Expertise

Development & implementation of new chemical separation methods for trace analysis of natural and anthropogenic radionuclides (esp. actinides).

Experience with Accelerator Mass Spectrometry, Alpha and Gamma Spectrometry, Liquid Scintillation Counting and Inductively Coupled Plasma Mass Spectrometry.

Research Interests

Environmental chemistry

- Dispersion of actinides through the environment
- Biological uptake (vegetation and higher mammals)

Nuclear physics

- SABRE - in collaboration with Dr Hotchkis (ANSTO)
- Cross-section measurements (^{92}Zr , ^{235}U)

Astrophysics

- Nuclearsynthesis (e.g. ^{60}Fe , ^{182}Hf , ^{244}Pu)
-

Contribution to ARC CoE DMPP

Research Theme: Metrology (ANU)

Measure contaminant isotope ratios through Accelerator Mass Spectrometry (AMS), an **atom counting** technique.

- Ultrasensitive
- Unstable/stable atom ratio **sensitivity** of $10^{-12} - 10^{-17}$ → requires chemistry

Radioimpurities in detector material:
e.g. ^{129}I , ^{210}Pb , ^{238}U , ^{232}Th , ^{40}K , ...



Steve Tims

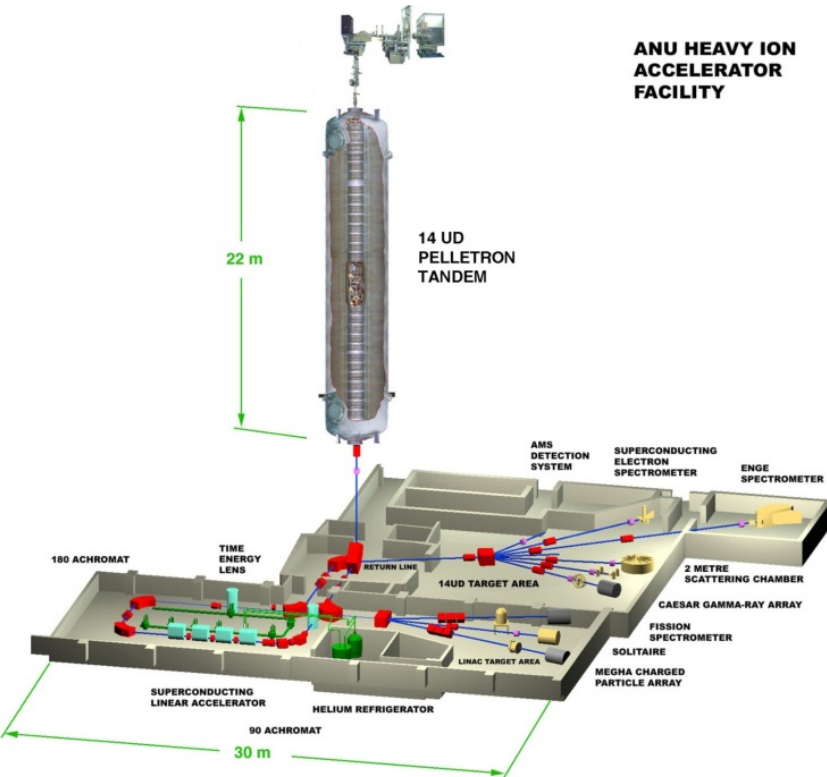


Michaela



Zuzana Slavkovská

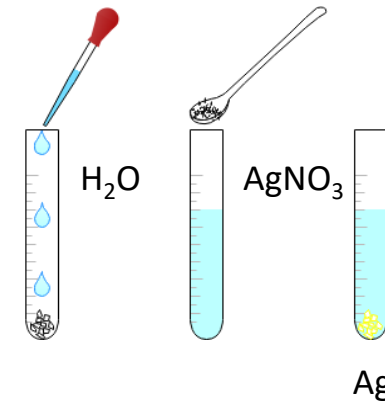
ANU HEAVY ION
ACCELERATOR
FACILITY



^{129}I , $T_{1/2} = 15.7 \text{ Myr}$

- ^{129}I routine AMS isotope: isotope ratio $^{129}\text{I}/\text{I}$
- No isobaric interference
- AMS background at ANU: $^{129}\text{I}/\text{I} < 10^{-14}$

Iodide compound	Name	$^{129}\text{I}/\text{I}$ ($\times 10^{-15}$)
NaI	sodium iodide	154 ± 14
NaI (Growth Grade)		189 ± 13
NaI (Astro Grade)		161 ± 11



AgI : Ag \rightarrow AMS target

- $^{129}\text{I}/\text{I}$ in Growth- & Astro-grade NaI (2016): 1 mBq/kg

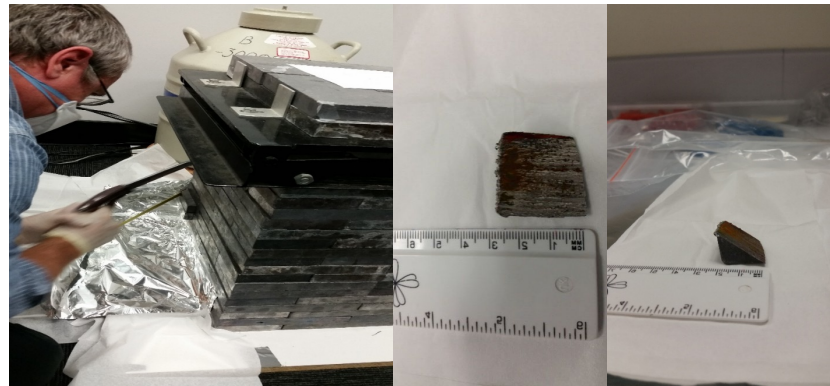


^{210}Pb , $T_{1/2} = 22.2 \text{ yr}$

- Important background
- ^{210}Pb no routine AMS isotope: isotope ratio $^{210}\text{Pb}/^{206,208}\text{Pb}$
- No isobaric interference
- Collaboration with Dr Hotchkis (ANSTO)
- Need Pb carrier with as less ^{210}Pb as possible



Church roof



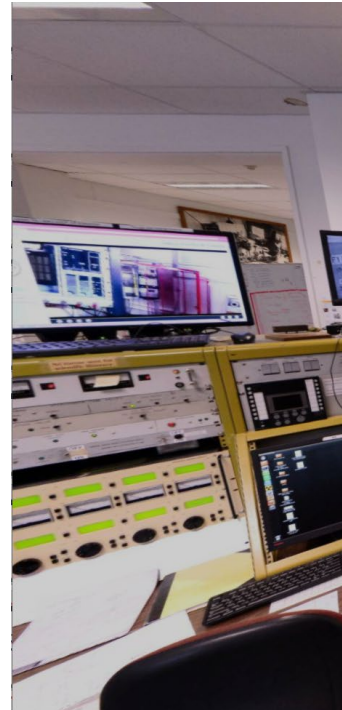
Shielding

Please take a tour: physics.anu.edu.au/tour


✉ michaela.froehlich@anu.edu.au

Mentoring and Careers Portfolio

Equity and Diversity Portfolio








WELCOME





 **Ed Simpson**
Fellow

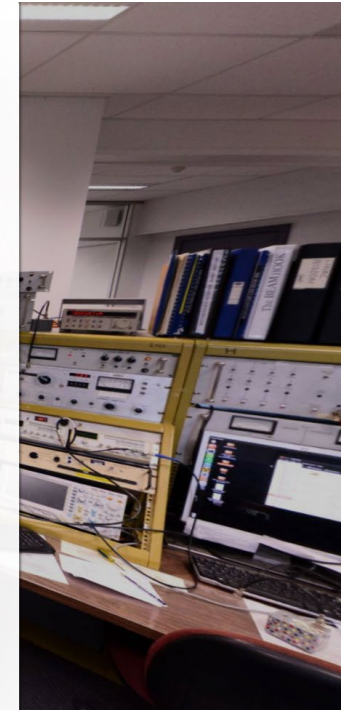
Welcome to Australia's Heavy Ion Accelerator Facility!

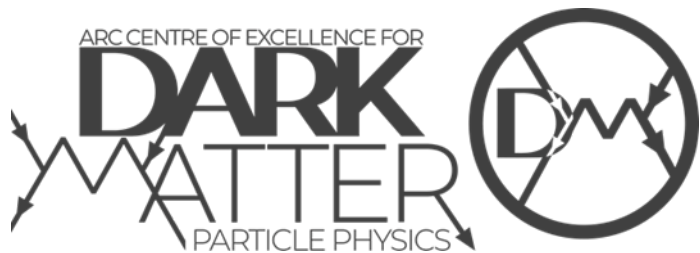
Here you can learn about our accelerators and the exciting experiments that we perform with them. Navigating the lab using the icons located at the top of the screen and the links shown within the lab.

-  See the list of locations
-  View the laboratory map
-  Toggle full screen
-  View this help text
-  Close the current information page

Around the lab you will also see various links that will give more information or allow you to move from one location to another. They look like this:

-  More information
-  Pictures of the lab
-  Watch a video
-  Move around the lab





NATIONAL PARTNER ORGANISATIONS:



INTERNATIONAL PARTNER ORGANISATIONS:

