
Contribution ID : **31** Type : **Poster**

# Emu, the high-resolution neutron spectrometer: Its successes and challenges

*Monday, 4 November 2024 19:55 (20)*

Emu is the high-resolution neutron spectrometer installed at the OPAL reactor, ANSTO.
It is well suited to characterizing diffusion and tunneling processes, such as occurring in e.g. polymer chains, membranes, proteins, molecular crystals, with relaxation times from a few 10 ps to over 1 ns due to Emu's high energy transfer resolution (1 μeV FWHM) and accessible ±31 μeV energy transfer range. The spectral resolution is achieved by neutron backscattering from Si (111) crystals on the primary and secondary flight paths, allowing up to 1.95 Å-1 momentum transfer range [1]. Experiments are merit-based accessed and can be performed over temperatures ranging from 50 mK up to 800 K. Other sample environments such as pressure, magnetic fields, controlled gas delivery, etc. are also available.

The Emu spectrometer has been operational for seven years, effectively servicing both Australian and global users. Through continuous quality enhancement efforts, Emu now yields 4-5 high-impact papers annually. In this presentation, we will discuss instrumental challenges and successes encountered over its operational lifespan. Noteworthy studies from the Australian backscattering spectrometer, particularly in the fields of polymer science and biophysics, will be emphasized.

[1] N. R. de Souza et al., Neutron News, 27, 20 (2016).

## Topics

Neutron Instruments and Techniques

**Primary author(s) :** KLAPPROTH, Alice (ANSTO - Australian Centre for Neutron Scattering)

**Co-author(s) :** DE SOUZA, Nicolas (ANSTO - Australian Centre for Neutron Scattering)

**Presenter(s) :** KLAPPROTH, Alice (ANSTO - Australian Centre for Neutron Scattering)

**Session Classification :** Posters