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Kookaburra, the ultra-small-angle neutron scattering instrument at ANSTO: design and recent applications

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The double-crystal ultra-small-angle neutron scattering (USANS) diffractometer KOOKABURRA at ANSTO was made available for user experiments in 2014. KOOKABURRA allows the characterisation of microstructures covering length scales in the range of 0.1–20 μm. Use of the first- and second-order reflections coming off a doubly curved highly oriented mosaic pyrolytic graphite pre-monochromator at a fixed Bragg angle, in conjunction with two interchangeable pairs of Si(111) and Si(311) quintuple-reflection channel-cut crystals, permits operation of the instrument at two individual wavelengths, 4.74 and 2.37 Å (see more details https://www.ansto.gov.au/our-facilities/australian-centre-for-neutron-scattering/neutron-scattering-instruments/kookaburra). This unique feature among reactor-based USANS instruments allows optimal accommodation of a broad range of samples, both weakly and strongly scattering, in one sample setup [1,2]. The versatility and capabilities of KOOKABURRA have already resulted in a number of research papers, including studies on hard matter systems like rocks and coal [3,4], as well as soft matter systems like hydrogels or milk [5,6]. This clearly demonstrates that this instrument has a major impact in the field of large-scale structure determination. Some of the recent examples will be presented here.

References:
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[6] Li, Z. et al, Food Hydrocolloid, 2018, 79, 170-178.

Level of Expertise

Expert

Presenter Gender

Man

Pronouns

He/Him

Which facility did you use for your research

Australian Centre for Neutron Scattering

Students Only - Are you interested in AINSE student funding

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Yes

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