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John W. White (1937–2023)

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Figure 1
Award of the 2015 Asia–Oceania Neutron Scattering Association Prize (photograph courtesy of the family of John White).

John White was born in 1937 in Newcastle, Australia. He attended the University of Sydney, receiving the Dixon Prize for Chemistry, a first-class honours degree and then an MSc. It was his supervisor, Professor Laurie Lyons, who encouraged him to travel overseas in an era when PhDs in Australia were uncommon. He won a Royal Commission for the Exhibition of 1851 award which took him to Oxford University in 1959 and, under the tutelage of Rex Richards, worked on the new technique of nuclear magnetic resonance (NMR), which was being pioneered for chemistry. He was elected an ICI Fellow in Lincoln College even before finishing his DPhil, and in 1963 a fellow of St John's College Oxford, where he remained for 26 years.

He was drawn to neutron scattering through a chance meeting over dinner in 1963 with Peter Egelstaff, who was working on the scattering from liquid hydrogen at low temperatures. Particularly interested in *para*-hydrogen, he asked John: 'you're a chemist so you must know about *ortho*- and *para*-hydrogen . . . ' (White, 2015). There began a long conversation and, within weeks, John had visited him at Harwell and began to understand the spectroscopic potential of cold neutron scattering.

Together with his first PhD student, Julia Higgins (née Downes), they began work looking for molecular excitations with incoherent neutron scattering, but understood that the scattering law had to be simplified using contrast to distinguish the individual molecular vibrations. An interest at that time in localized modes led to their first paper with Peter on the dynamics of trapped molecules inside quinol clathrates, where the host material was fully deuterated, allowing contrast for the hydrogenous trapped molecules

(Downes *et al.*, 1966). This work at Harwell would soon be the basis for groundbreaking work with John's students, using deuterium substitution to separate the motions of different parts of the chemical groups in a molecular liquid (Aldred *et al.*, 1967). This was soon followed by a paper on trapped molecules in zeolite catalytic materials of industrial interest (Egelstaff *et al.*, 1968). It was during this time that John met Ailsa Vise, a microbiologist who had also won a research scholarship to Oxford, and they married in 1966; this was to be an enduring lifelong partnership.

John's work progressed to investigating lattice dynamics across a range of molecular crystals and crystalline polymers (Reynolds *et al.*, 1972) and then to the structure and dynamics of adsorbed molecules (White *et al.*, 1978; Rayment *et al.*, 1981). In a natural extension of John's background in NMR, he explored the potential of the diffraction of polarized neutrons from dynamically oriented proton spins, with his postdoctoral fellow John Hayter, as a means of developing selective contrast (Hayter *et al.*, 1974).

Following on from John's service as Neutron Beam Coordinator at Harwell, his reputation was such that, at the relatively young age of 36, he became Assistant Director of the Institut Laue–Langevin (ILL) in Grenoble, France, in 1974, and subsequently the first British Director from 1977 to 1980. He proposed and led the 'deuxième souffle' renewal program from 1978, including a cold-source upgrade, as well as the planning for a second cold source with a new guide hall.

In 1985, he returned to Australia and was appointed Professor of Chemistry at the Australian National University in Canberra. His return greatly benefited Australia, as he was largely responsible for introducing small-angle scattering – an experimental technique he had first used during a three-month sabbatical at ILL in 1973 to study both highly oriented collagen fibres and the tobacco mosaic virus (Hecht & White, 1976; White, 2023) – and then later reflectometry – a technique that was just developing under John's ILL directorship (Penfold, 2016) – to Australian scientists.

During this period at the Australian National University, a broad range of topics were investigated by a steady stream of researchers under his supervision, all underpinned by the opportunities available from neutron–X-ray complementarity and contrast with molecular templates and molecular adsorption continuing to feature (Edler *et al.*, 1996; Brown *et al.*, 1997). Other fields of study included microphase separation in paraffins (Gilbert *et al.*, 1999), industrial emulsions (Reynolds *et al.*, 2000), food science (Perriman *et al.*, 2007) and nanotoxicology (White *et al.*, 2009).

John was a strong advocate for neutron scattering in Australia through his roles on many international committees. Under the banner of the 1990 'Small Country, Big Science' Report, he organized access for Australian scientists to ISIS in the United Kingdom and subsequently promoted planning and partial funding by Australia of the SURF neutron reflectometer at ISIS. The growth of new scientific and engineering uses of neutrons in Australia through ISIS access provided a sound basis for a replacement research reactor at ANSTO, with OPAL commencing operations in 2006. He was also a major driver in the formation of the Asia–Oceania Neutron Scattering Association to the mutual benefit of all its member countries, as well as providing advice as advisory committee chair for J-PARC.

John's life intersected and enriched the lives of many people. Through a combination of his exemplary science and his promotion of scattering techniques, John was responsible for launching the careers of many scientists across the globe. Many in the community have vivid memories of his enthusiasm for experiments. Colin Carlile remembers the time they prepared ammonia potassium intercalated graphite in the yard outside the IRIS spectrometer (at ISIS)! The results were spectacular: simultaneous spectroscopy and diffraction that revealed exactly what was going on. Colin adds: 'John was an enthusiast who did not allow lesser mortals, bureaucratically minded people in authority over him, to get in his way. Over all the years that I knew him I never heard him raise his voice once. He had natural authority.'

He was awarded fellowships of the Royal Society of Chemistry (1982), the Royal Australian Chemical Institute (1986), the Australian Institute of Physics (1986), the Royal Society of London (1993) and the Australian Academy of Science (1991). He was a visiting Fellow at Argonne National Laboratory in 1984. He received the Smith Medal (1997), the Craig Medal (2005), the Leighton Medal (2005) and the AONSA Prize (2015) (Fig. 1). He was awarded the Centenary Medal in 2001 and appointed an Officer of the Order of

Figure 2
John White with the Award of Order of Australia in 2016 (photograph courtesy of the family of John White).

Australia in 2016 (Fig. 2) for 'distinguished service to science globally in the field of chemistry, as an academic, mentor and researcher, and through leadership of synchrotron and neutron science projects in Australia and the Asia–Oceania region'.

John White passed away on 16 August 2023 in Canberra, Australia. He is survived by his wife of 57 years, Ailsa, children Sarah, Catherine, David and Rachel, and seven grandchildren Caspar, Allegra, Elliot, Molly, Holly, Amanda and Adam. He will be greatly missed.

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