Small Angle Scattering Workshop

Online Workshop

1 - 3 December 2021

Host - Christina Kamma-Lorger
Australian Synchrotron

www.ansto.gov.au

ANSTO

Welcome

The organising committee are keen to welcome you to the 2nd ANSTO Small-Angle Scattering Workshop.

Jointly hosted by the SAXS/WAXS and BioSAXS groups at the Australian Synchrotron and the SANS group at the Australian Centre for Neutron Scattering. Due to the impacts of COVID the workshop is being run entirely as a virtual meeting for the second time around.

This has its drawbacks, but it also presents a range of new opportunities, including a diverse range of national and international speakers, and the potential to reach a much wider audience.

On behalf of the organising committee:

- Anna Sokolova
- Jitendra Mata
- Nigel Kirby
- Christina Kamma-Lorger

Code of Conduct

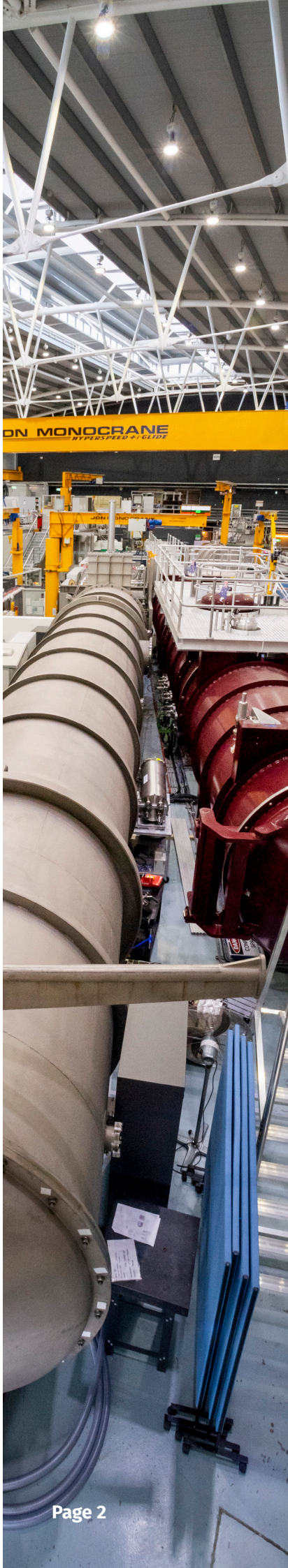
Recording, taking photography, or screenshots of the lectures without the explicit permission from the individual delivering them is not permitted.

All participants should treat each other with respect and consideration. Personal attacks directed toward other participants, harassment, intimidation, or discrimination in any form will not be tolerated. Disruption of oral presentations will also not be tolerated.

Examples of unacceptable conduct include, but are not limited to, verbal comments related to gender, sexual orientation, disability, physical appearance, body size, race, religion, national origin, inappropriate use of nudity and/or sexual images in Zoom meetings or in presentations, or threatening or stalking any participant.

Consequences for Violating the Code of Conduct: Anyone requested to cease unacceptable behaviour will be expected to comply immediately. The workshop organizers may take any action deemed necessary and appropriate, including immediate removal from the course. ANSTO SAS workshop organizers may also prohibit attendance by anyone violating this code of conduct at any future meetings.

Reporting Violations of the Code of Conduct: If you are the subject of unacceptable behaviour or have witnessed any such behaviour, please immediately notify us. This can be done through the Chat function on Zoom, or by writing to sasworkshop@ansto.gov.au



Aims of SAS2021

This workshop is aimed at honours and PhD students, as well as early-career researchers, who have used, or are planning to use, ANSTO small-angle scattering instrumentation for their research. The material will cover theoretical and practical aspects of small-angle scattering, including: scattering theory, data collection, data processing, data analysis and modelling, applying for beam time, and the application of small-angle scattering to specialised areas of research.
Those selected to participate in the practical analysis sessions of the course will be involved in analysis and modelling of small-angle X-ray and neutron scattering data. As the experience and research interests of the participants is diverse, the practical sessions may not appear entirely relevant to everyone, however, the intent is to explore different types of small-angle scattering data, to see what kind of information can be extracted from small-angle scattering data, and to gain familiarity with common modelling packages.

Zoom links

The school will be hosted on Zoom's webinar platform – which you can access via either the zoom app or via your internet browser.

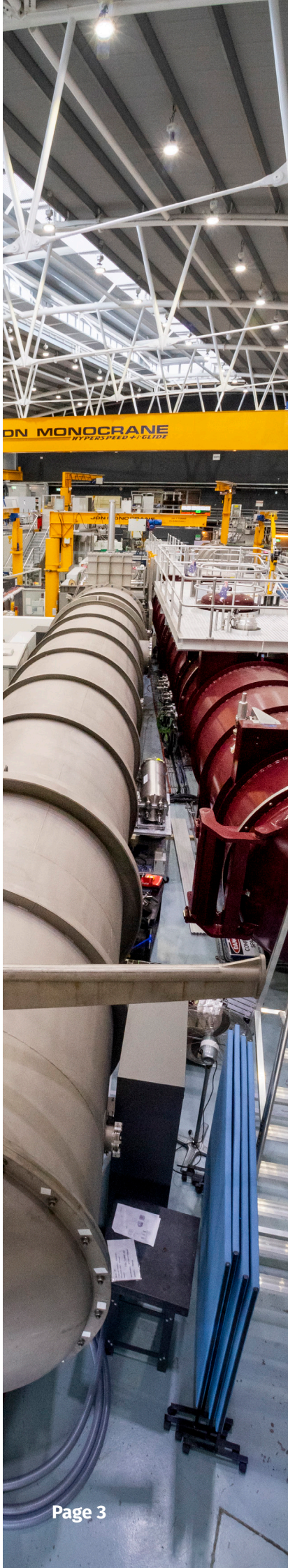
Please click the link below to join the webinar:
https://ansto.zoom.us/j/84674515669
Webinar ID: 846 7451 5669
Passcode: sasansto

Those selected to attend the analysis practical session will be separately emailed Zoom links to these, we will be using the break out room function for these sessions.

Slack

We have set up a Slack channel for discussion and for seeking help during the school, a link will be provided in the zoom chat function .

The idea is that this is a further place to ask questions, discuss small angle scattering analysis issues and seek help from the rest of the schools participants. Please note that the code of conduct also applies for discussion on the slack channel.



Access to Resources

Practical participants have received information on how to access the practical material via email.

Feedback

We will be conducting a post-course survey, but if you have any other comments you would like to make, we welcome constructive feedback to: sasworkshop@ansto.gov.au

Small-angle scattering analysis software

Each practical session will utilise a different package for data modelling. For those undertaking the practical sessions, these software packages must be installed prior to practical sessions.

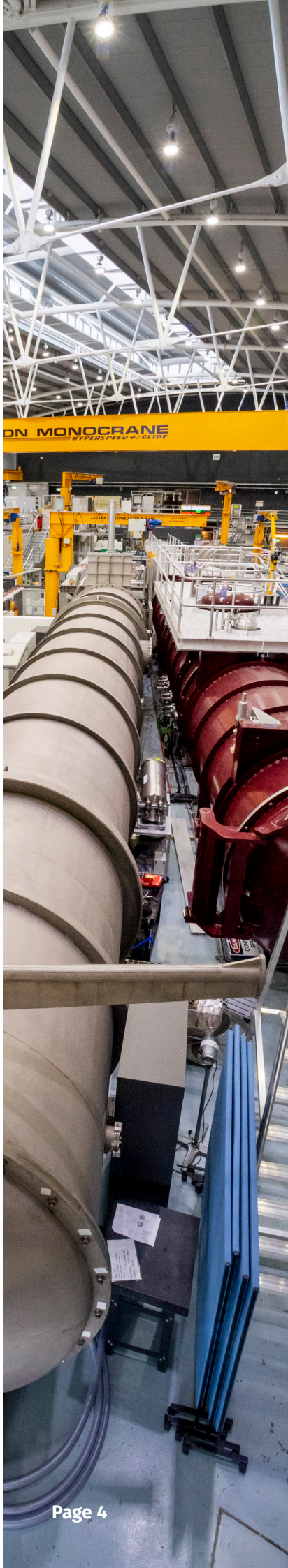
scatterBrain is a software package for Small Angle Scattering data reduction (and instrument control) developed at the Australian Synchrotron. It can be downloaded form http://archive.synchrotron.org.au/aussyncbeamlines/saxswaxs/software-saxswaxs

SASView is a small-angle scattering analysis package that contains a diverse range of models. For the practical sessions, we would prefer that participants used version 4.2.2 (which can be downloaded at no cost and without registration for Mac or PC from https://github.com/SasView/sasview/releases/tag/v4.2.2)
Please note: Version 4 is preferred for SANS practicals and version 5 for SAXS

ATSAS is a suite of software designed for the analysis and modelling of small-angle scattering data from biological molecules. For the practical sessions, we would prefer that participants used version 3.0.4-2 (which can be downloaded at no cost for Mac or PC from https://www.embl-hamburg.de/biosaxs/atsas-online/login.php?location=download.php). Unlike SASView, you will need to register for a free academic login to be able to download the ATSAS package.

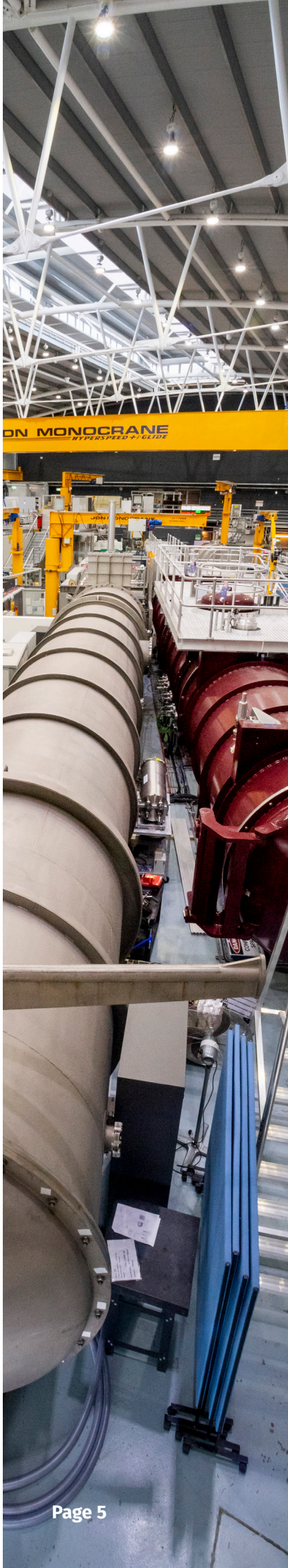
Other software
Visualisation software for protein data bank (PDB) structures would be advantageous. If you already have any proprietary or free software installed that views PDB files, this should be fine. For those who don't have a PDB viewer installed, there are a range of free options, include RasMol (Windows only- http://www.bernstein-plus-sons.com/software/rasmol/), Swiss PDB Viewer (PC or Mac OSX 10.14 or earlier- https://spdbv.vital-it.ch/disclaim.html), or VMD (http://www.ks.uiuc.edu/Research/vmd/). RasMol is probably the easiest to use of the packages listed, but unfortunately is not available for those using a Mac.

Excel (or similar) will be required for plotting and performing data manipulations on columns of data.



Program

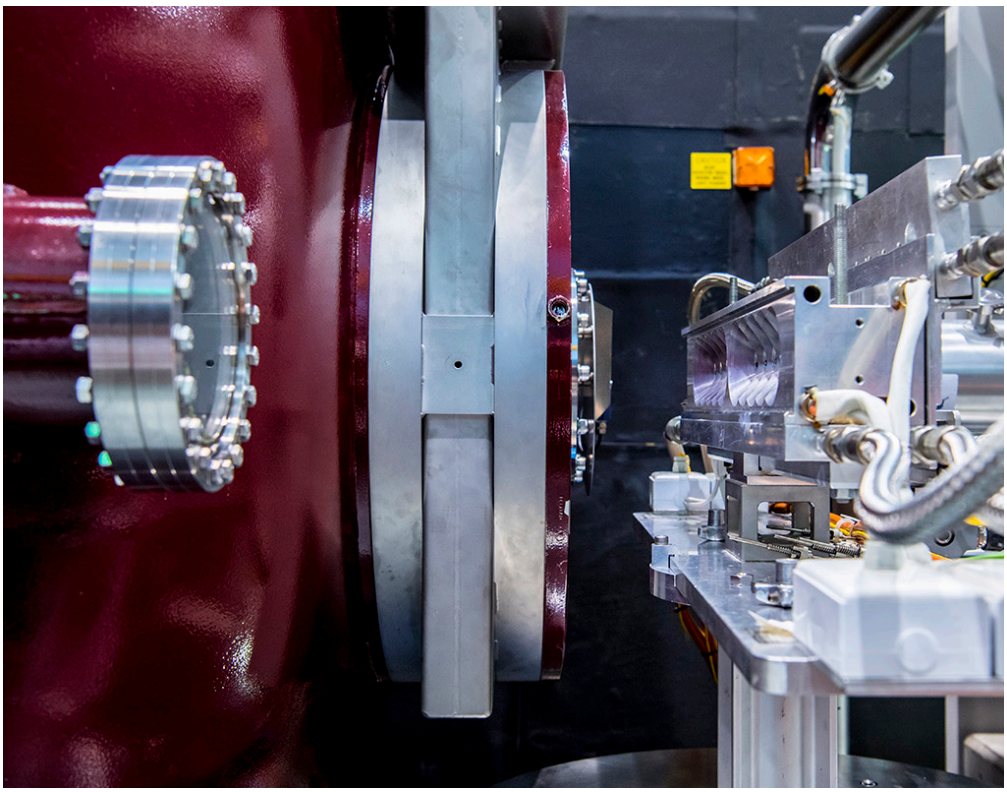
Day 1 - Wednesday 1 December 2021	
10:00 – 10.15	**Welcome address & general introduction to SAS2021** Prof. Michael James | ANSTO
10:15 - 10:30	**Housekeeping instructions** Dr. Christina Kamma-Lorger | ANSTO
10.30 – 11.30	**Scattering theory** Dr. Nigel Kirby | ANSTO
11:30 - 12:00	**SAXS / BioSAXS instrumentation** Dr. Christina Kamma-Lorger | ANSTO
12.00 – 13.00	**Lunch Break**
13.00 - 13:30	**SANS / USANS instrumentation** Dr. Jitendra Mata | ANSTO
13:30 - 14:15	**Sample environment for SANS** Dr. Norman Booth | ANSTO
14:15 - 15:15	**Sample environment for SAXS** Dr. Susi Seibt , Dr. Tim Ryan & Dr. Andrew Clulow| ANSTO
15:15 – 15:30	**Coffee Break**
15:30 – 17:00	**Practical session 1** **Split group on breakout sessions** • **SAXS data collection and reduction** Dr. Stephen Mudie & Dr. Andrew Clulow | ANSTO • **SANS data collection and reduction** Dr. Anna Sokolova | ANSTO
Day 2 - Thursday 2 December 2021	
10:00 – 11:00	**Modelling Part I: Shape independent modelling** Dr. Paul Fitzgerald | University of Sydney
11:00 - 12:00	**GI-SAS theory** Prof. Chris McNeill | Monash University
12:00 - 13:00	**Lunch Break**
13:00 - 13:45	**Modelling Part II: Shape dependent modelling** Dr. Andrew Whitten | ANSTO
13:45 - 14:15	**Molecular Deuteration for Small Angle Neutron Scattering** Dr Anthony Duff | ANSTO
14:15 - 14:45	**SAS Proposal writing** Dr. Cathy Harland | ANSTO Australian Synchrotron
14:45 - 15:30	**Coffee Break & Beamline tour videos**
15:30 - 17:00	**Practical Session 2** **Split group on breakout session** • **SAXS data analysis for solution scattering** Dr. Andy Clulow & Dr. Lester Barnsley | ANSTO • **SANS/USANS data analysis - SLD calculation, Shape independent analysis, SASview tutorial** Dr. Jitendra Mata | ANSTO

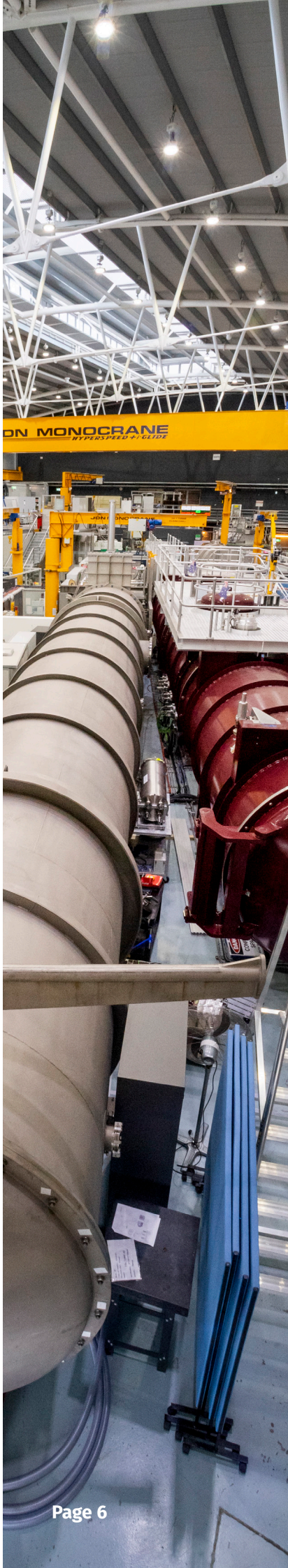


Program

Day 3 - Friday 3 December 2021	
10:00 - 10:30	**Model-free 3D density reconstructions of soft matter using small angle scattering** Dr. Thomas Grant | University at Buffalo
10:30 - 11:00	**Chemistry** Prof. Namita Chowdhury | RMIT
11.00 - 11:30	**Structural Biology** Dr. Agata Rekas | ANSTO
11:30 - 12:00	**Membranes** Dr. Khay Fong | University of Newcastle
12:00 - 13:00	**Lunch Break**
13:00 - 13:30	**Food and food colloids** Dr. Elliot Gilbert | ANSTO
13:30 - 14:00	**Hard Matter** Dr. Anna Sokolova | ANSTO
14.00 - 15:00	**Coffee break and Quiz competition**
15:00 - 16:30	**Practical session 3** **Split group on breakout sessions** • **SAXS data analysis for material sciences** Dr. Susi Seibt & Dr. Tim Ryan | ANSTO • **SANS/USANS data analysis - SASview, USANS, desmeared vs smeared data** Dr. Liliana de Campo | ANSTO
16:30 - 17:00	**Quiz awards and closing remarks**

****Please note all times quoted are Australian Eastern Daylight Time (AEDT)**

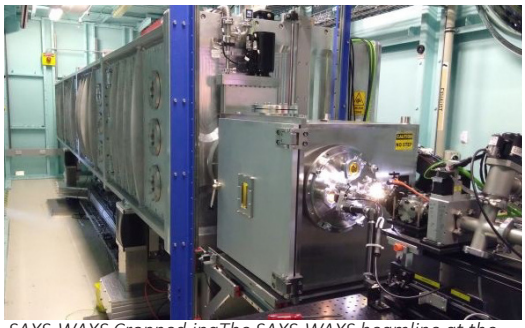




ANSTO small-angle scattering facilities

ANSTO operates a number of small-angle scattering facilities located at both the Australian Centre for Neutron Scattering (Lucas Heights Campus, Sydney) and at the Australian Synchrotron (Clayton Campus, Melbourne). The instrumentation are available to both scientific and industrial users, and if you are interested in using the facilities you should contact the instrument teams to discuss further.

The **Small-angle X-ray and Wide-angle Scattering (SAXS/WAXS) beamline, Australian Synchrotron**, operating since mid-2009, is a versatile X-ray scattering instrument. Transmission SAXS and vertical dispersion WAXS are the primary roles of the beamline. A bounce-down vertical focusing mirror also permits grazing incidence (GISAXS) experiments also. A flexible sample stage is used to support many sample types and sample environments. A recent upgrade to an in vacuum Pilatus 2M detector has improved the versatility of the instrument, allowing fast, simple and continuous variation of the detector position. More information can be found at

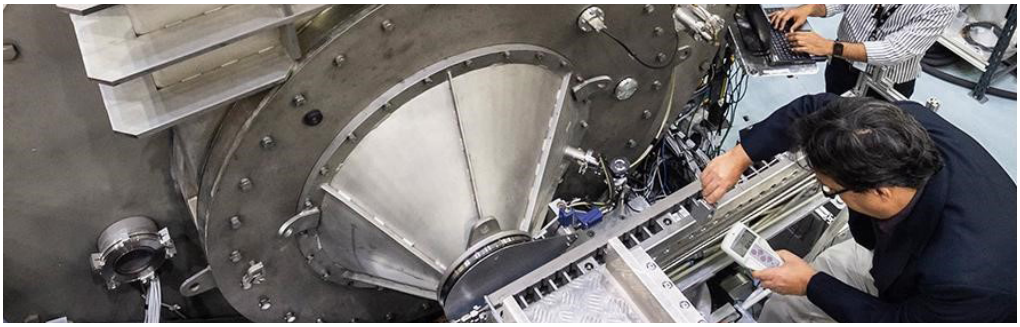


SAXS-WAXS Cropped.jpgThe SAXS-WAXS beamline at the Australian Synchrotron showing the new detector vessel

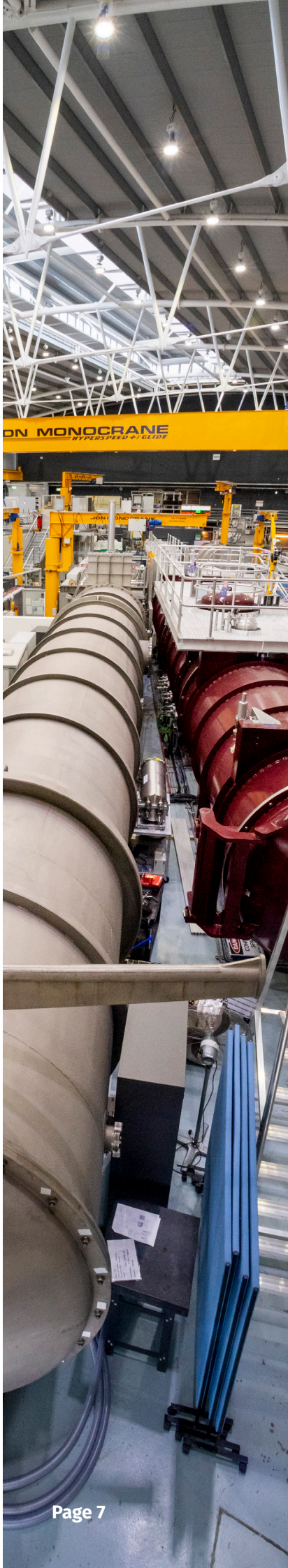
https://www.ansto.gov.au/user-access/instruments/australian-synchrotron-beamlines/saxs-waxs.

The **BioSAXS beamline** is a small-angle X-ray scattering beamline under construction at the Australian Synchrotron. The beamline will offer high-throughput and excellent data quality, for all liquid phase scattering experiments, allowing measurement of new and novel samples, and experiments that otherwise would not be possible. The BioSAXS beamline will offer a wide q-range and low instrument background. More information can be found at https://www.ansto.gov.au/biological-small-angle-xray-scattering-beamline

Quokka is a monochromatic small-angle neutron scattering (SANS) instrument. It is a versatile instrument, that can yield important structural information on length scales in the range 1-100 nm from materials such as polymers, colloids, biological materials, magnetic materials, and geological samples. More information can be found at https://www.ansto.gov.au/our-facilities/australian-centre-for-neutron-scattering/neutron-scattering-instruments/quokka-small.



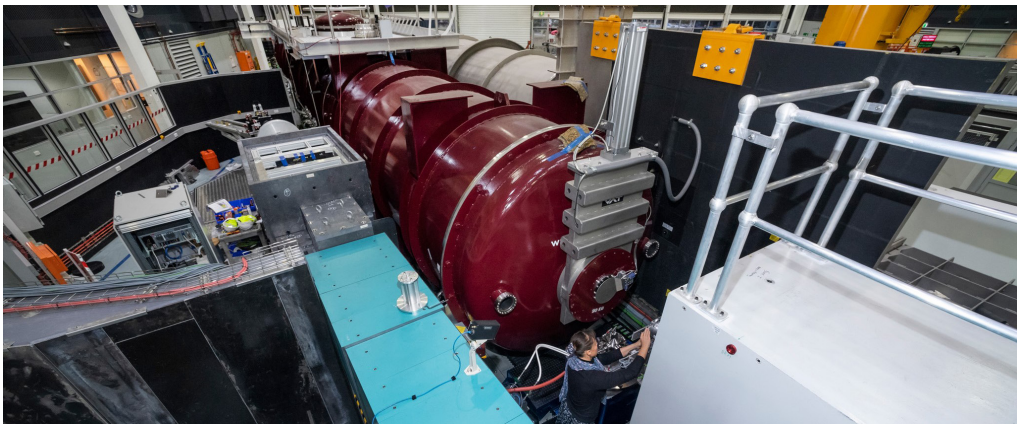
The sample area of the Quokka SANS instrument



ANSTO small-angle scattering facilities

The **Bruker Nanaostar** lab-based SAXS instrument is located at the Lucas Heights campus is operated to complement the neutron scattering research performed at ACNS, and to provide users with access to small-angle X-ray scattering facilities. The instrument possesses a large evacuated sample area to allow space for specialised sample environment. More information can be found at https://www.ansto.gov.au/user-access/instruments/other-instruments-and-services/small-angle-x-ray-scattering-instruments

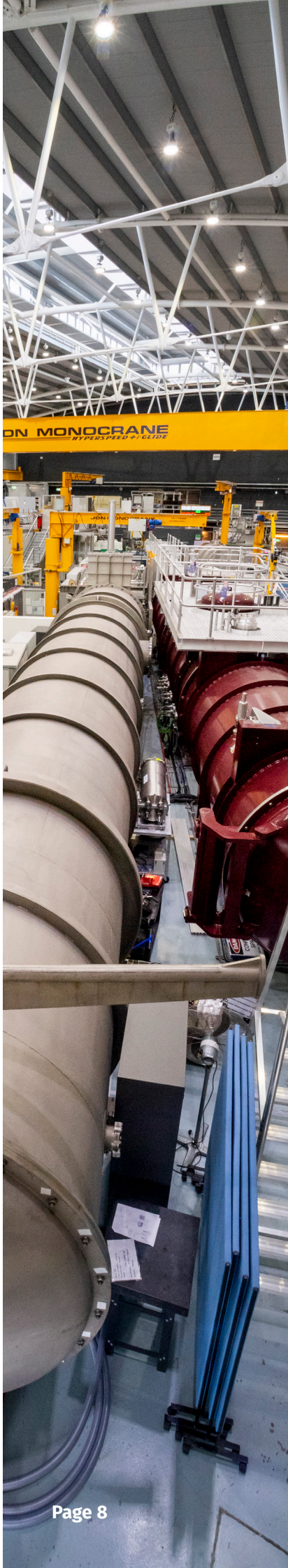
Bilby is a time-of-flight small-angle neutron scattering (SANS) instrument that has been in operation for user experiments since 2015. It uses a set of choppers to create pulses of neutrons with wavelengths between 2 – 20 Å, with a tuneable wavelength resolution. The use of a neutron pulse with a large wavelength range allows a large q-range to be covered in a single measurement, and the tuneable wavelength resolution allows measurement of, for example, closely spaced peaks in a liquid crystal sample. More information can be found at https://www.ansto.gov.au/our-facilities/australian-centre-for-neutron-scattering/neutron-scattering-instruments/bilby-small.



The detector tank and sample area of the Bilby SANS instrument

Kookaburra is an ultra-small-angle neutron scattering (USANS) instrument, extending the range of experimentally measurable length scales currently accessible through the already existing SANS instruments by two orders of magnitude, into the micrometre regime. More information can be found at https://www.ansto.gov.au/our-facilities/australian-centre-for-neutron-scattering/neutron-scattering-instruments/kookaburra.

The Kookaburra USANS instrument enclosure



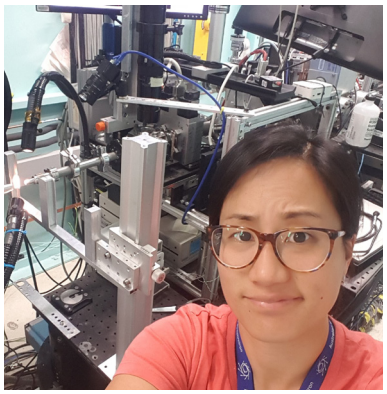
Speakers

Christina Kamma-Lorger

Dr Christina Kamma-Lorger is the Lead Scientist for the BioSAXS beamline at the Australian Synchrotron. BioSAXS is one of the new beamlines that will be constructed within the BRIGHT program. Christina leads the design, procurement, installation and commission of BioSAXS. She engages with stakeholders and the user community in order to provide technical and scientific direction to the construction of the beamline.

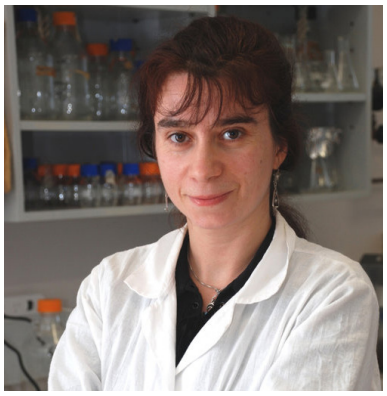
Her expertise is in the use of biophysical methods to biomedical research. She completed her PhD and a 5-year MRC-UK funded post doc at Cardiff University, where she gained valuable experience as a regular user at most of the major synchrotrons in Europe. She joined ANSTO after spending 7,5 years in ALBA Synchrotron in Spain as a beamline scientist at the NCD-SWEET beamline. Her research interests involve the study of fibrillar proteins in situ and in solution using synchrotron SAXS/WAXS, FTIR as well as confocal and electron microscopy. She has a keen interest in the development of skin cancer diagnostics and therapeutic approaches as well as developing methods for tissue engineering.

Khay Fong

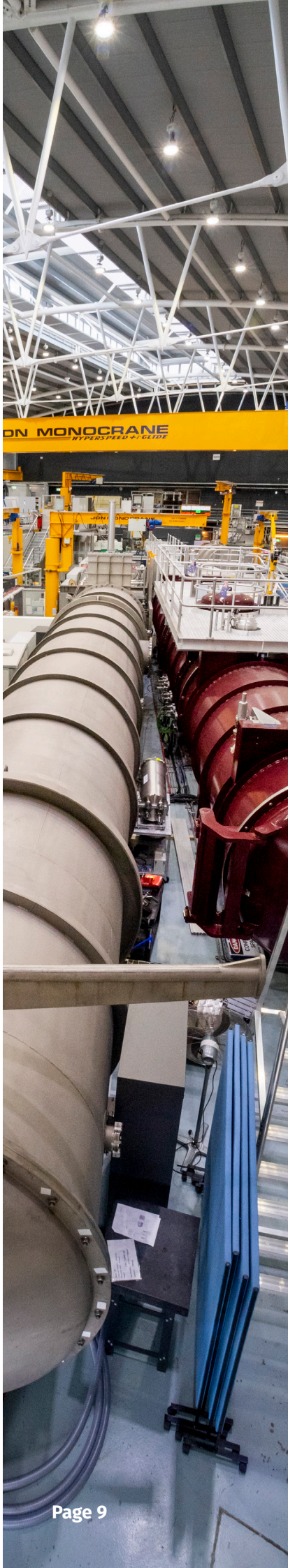


Dr Fong is a lecturer and an E/MCR researcher in the Discipline of Chemistry at the University of Newcastle. Her research is centred upon the fundamental understanding and creation of novel lipid-based nanomedicines that can be controlled after administration. Towards this, she has studied the effect of both physiological and external stimuli upon the self-assembly of lipid based nanostructures, where synchrotron SAXS has been the key to success.

Agata Rekas



Aga works as a Protein Chemist with the National Deuteration Facility, ANSTO, responsible for protein deuteration and characterization. As a biologist, she has experience in biochemistry and cell biology research, including several years of using NMR in cell biology, medicine and protein biochemistry. She used NMR, X-ray crystallography, and more recently small-angle scattering techniques for structural and functional characterization of proteins. Her research interests involve the role of macromolecules in human conformational diseases, and their prevention



Speakers

Thomas Grant

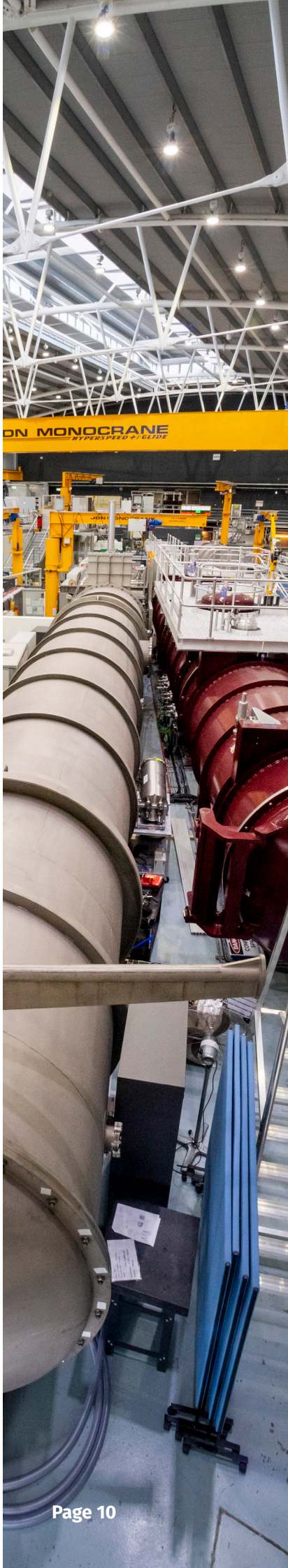
My research focus is the development of new methods of analysis in structural biology. My lab uses X-ray crystallography and solution scattering to probe the structure and dynamics of biological macromolecules. Our approaches include developing new computational algorithms to analyze and interpret data from X-rays and neutrons, including cutting edge technologies such as X-ray free electron lasers (XFELs) to collect data on ultrafast time-scales. By developing these tools, we can build pictures and movies of biological molecules to help understand how they perform their functions in the cell. These insights not only help drive advancements in basic science but also help in the design of new drugs for treating diseases. I am the creator and lead developer of DENSS, a tool for generating ab initio electron density maps from solution scattering data. I am also a developer of the OM online analysis software for serial crystallography and solution scattering experiments at XFELs.

I graduated from the University at Buffalo with my PhD in Structural Biology in 2013 at the Hauptman-Woodward Institute in Buffalo. After a short postdoc I joined the BioXFEL Center as a Staff Scientist where I developed algorithms for data analysis and supported many groups both within and outside the Center with XFEL beamtimes. In 2020 I was appointed as an Assistant Professor in the Department of Structural Biology at UB. I am the recipient of multiple federal awards to support aims including the development of algorithms combining crystallography with SWAXS to aid in drug discovery, utilizing synchrotron and XFEL sources for time-resolved scattering, and the study of various SARS-CoV-2 proteins. I also collaborate with many groups around the world to perform and interpret solution scattering experiments, and to develop new compact XFEL sources.

Andrew Whitten

Dr Andrew Whitten is an instrument scientist on the time-of-flight small-angle neutron scattering instrument BILBY time-of-flight small-angle neutron scattering instrument. He brings expertise in the area of small-angle scattering and neutron contrast variation from biological macromolecules. He has published widely in the area of low-resolution structure of proteins and protein complexes. His current primary research focus is on a class of proteins involved in trafficking vesicles to the cell membrane.

Dr Whitten undertook his PhD studies at the University of New England with Prof. Mark Spackman, where his research focused on the determination of the charge density distribution of molecular crystals using X-ray and neutron diffraction. Following this, Dr Whitten undertook a Post-Doctoral position at ANSTO working with Prof. Jill Trewhella, where he utilised small-angle scattering to study the structure of proteins involved in a range of biological processes. In 2009, Dr Whitten was awarded a prestigious NHMRC Peter Doherty Fellowship to work with Prof. Jenny Martin at the Institute for Molecular Bioscience at the University of Queensland. This research aimed to better understand the regulatory mechanisms of vesicle fusion through the use of a range of biophysical techniques including small-angle X-ray and neutron scattering.



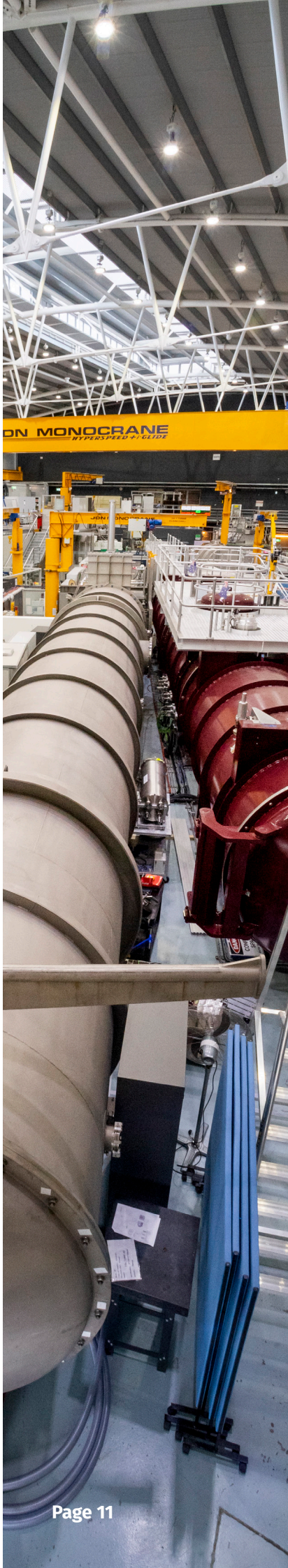
Speakers

Andy Clulow

Andy Clulow is a beamline scientist on the BioSAXS beamline currently under commissioning at the Australian Synchrotron (ANSTO). Andy has worked in the field of physical materials chemistry since completing his PhD at UQ in 2013. He has worked across a number of fields including explosives sensing, thin film organic electronics, milk lipid self-assembly during digestion and drug/nutrient delivery. The common thread in his career to date has been the use of neutron and X-ray scattering techniques to study how underlying nanoscale structure drives the function of applied materials. Andy has been an active member of the research community having served on the Australian Neutron Beam User Group executive committee, the Australian Synchrotron User's Advisory Committee and the 2019 conference committee for the Australasian Colloid and Interface Society. Before joining ANSTO, Andy was an ARC DECRA fellow at the Monash Institute of Pharmaceutical Sciences studying the self-assembly of complex lipid mixtures designed to replicate breast milk during digestion. His work as part of the Pharmaceutical Milkshake Team in Ben Boyd's lab contributed to their being awarded the team Eureka Prize for innovative use of technology in 2020.

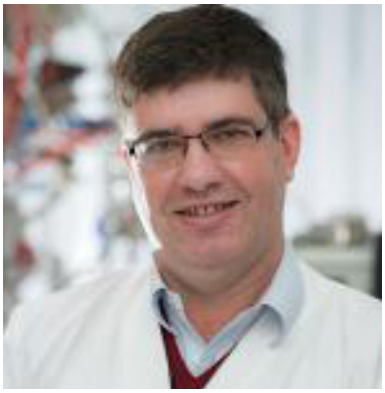
Anna Sokolva

Dr Anna Sokolova was a Project Leader for the design, construction and commissioning of BILBY, the new time-of-flight small-angle neutron scattering instrument at the Australian Centre for Neutron Scattering and is now an Instrument Scientist on the Bilby team.
Anna is a physicist from the Small Angle Scattering Laboratory at the Institute of Crystallography of the Russian Academy of Sciences (RAS). During her PhD and in the following years, she worked extensively in the European Molecular Biology Laboratory (EMBL, Hamburg outstation c/o Deutsche Electronen Synchrotron).
She has a Masters in Physics/Biophysics from the Faculty of Physics, M V Lomonosov Moscow State University (Diploma Cum laude), and a PhD in Condensed Matter Physics from the Institute of Crystallography RAS (Moscow, Russia). Both areas of study were focused on the development of new methods for small-angle scattering data analysis and interpretation, as well as, on the application of the SAXS technique to protein structure studies. She also trained at the Institute of Bioorganic Chemistry RAS (Moscow, Russia) in basic biochemistry techniques for protein sample preparation. Also, Anna has experience in some programming and mathematical methods in structural research.
Her interest and experience expanded significantly into the area of design, building and commissioning of SANS instrumentation and data reduction procedures. Anna is chair of the Scientific and Technical Advisory Panel for SANS instruments at the ESS (European Spallation Source).
Anna's scientific interests have grown far from the original theme of complex biological structures. In recent years, she has worked with various users groups on projects to study a wide range of materials, from surfactants to vortex line lattices and skyrmions, often using complex sample environments.



Speakers

Anthony Duff



Anthony Duff is a structural biologist interested in the structure and function of biological macromolecules, with a view to understands the mechanism of life at the molecular level. He has personal expertise in protein crystallography, small angle scattering, and protein production and purification. In the National Deuteration Facility, Anthony promotes the use of deuteration and other isotopic labelled, with a particular interest in integrative structural biology, meaning the combination of the dominant methods of macromolecular crystallography (MX), cryo electron microscopy (cryo-EM), nuclear magnetic resonance (NMR) with complementing methods, especially small angle scattering, neutron reflectometry, and neutron crystallography.

Lester Barnsley

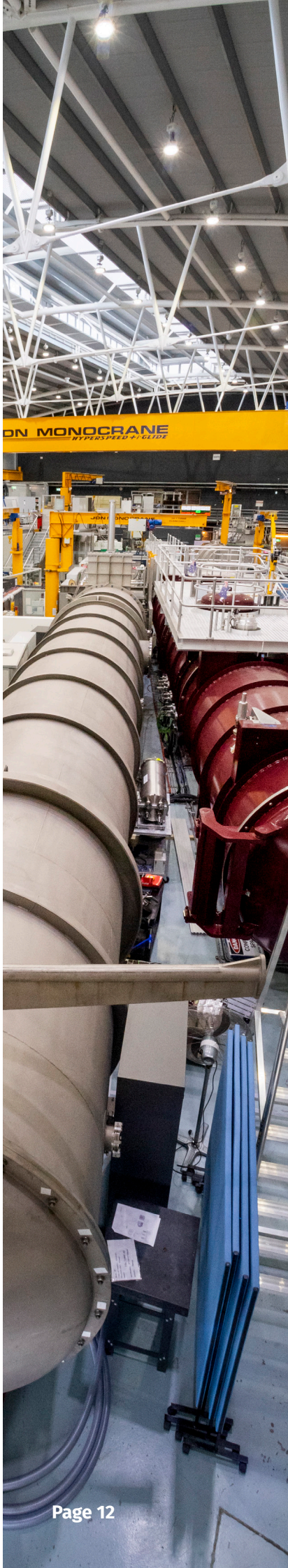
Dr Lester Barnsley is a beamline scientist for the BioSAXS beamline to be built as part of the BRIGHT project at the Australian Synchrotron. He currently assists with the design of the beamline and will help with the commissioning of the beamline and supporting user experiments once the beamline is active. His research interests are in studying the self-assembly of magnetic nanoparticles for drug delivery applications. Previously, he was instrument scientist on the KWS-1 small-angle neutron scattering instrument, operated by the Jülich Centre for Neutron Science (JCNS) at Heinz Maier-Liebnitz Zentrum (MLZ) in Garching, Germany.

Cathy Harland

Before taking up her appointment at the Australian Synchrotron, Dr Cathy Harland was the ASRP (Australian Synchrotron Research Program) beamline scientist at XOR at the Advanced Photon Source in Chicago.

Cathy's previous positions include a postdoctoral appointment at Brookhaven National Laboratory. She also worked for the American Physical Society as a senior editorial assistant for Physical Review B.

Cathy began her career at Wollongong University with a BEng (I) and then worked for BHP Research before completing a PhD at the University of Sheffield, UK, on rare earth/iron/boron (REFeB) based hard magnetic alloys.



Speakers

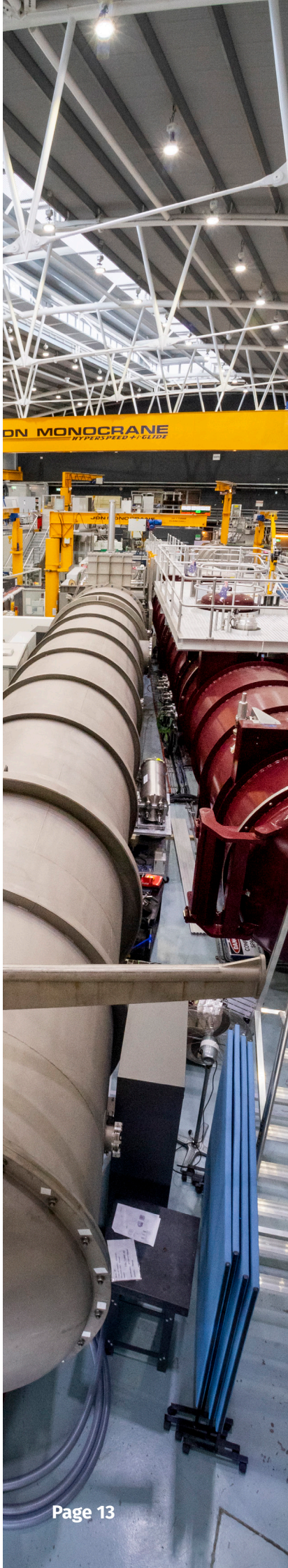
Chris McNeill

Chris McNeill is a professor of materials science and engineering at Monash University. He has a background in condensed matter physics having completed a PhD in experimental physics at Newcastle University, Australia. He spent nearly 6 years at the Cavendish Laboratory, Cambridge University as a post-doc and research fellow before returning to Australia to Monash University in 2011. His research interests lie at the intersection of the materials science and device physics of organic semiconductor devices. He is an avid synchrotron user and regularly conducts measurements at the Australian Synchrotron as well as at overseas light sources.

Elliot Gilbert

Professor Elliot Gilbert devised, initiated and leads ANSTO's research activities in the application of scattering to investigate fundamental and industrial problems of national significance in food materials science. With an international network of collaborators covering academia, industry and national research organisations, the group has investigated examples from all classes of macronutrients underpinned by materials science methods with the aim to understand, control and predict functionality in food ingredients and whole food systems. In addition to writing the first review detailing the application of neutron scattering to food, he initiated the biennial international 'Neutrons and Food' conference series, chaired the meetings in 2010 and 2018 and was a member of the scientific committees for 2012 and 2014. Beyond several book chapters and numerous peer-reviewed publications, the outputs have resulted in multiple reports in the international and domestic media including SBS (Australia) television news. Elliot also led the project for the design, construction and commissioning of the QUOKKA small-angle neutron scattering instrument at the OPAL facility and is currently instrument-responsible. He received his PhD in chemistry from the Australian National University in 1998. Following an Australian Research Council Industrial Postdoctoral Fellowship, he joined the Small-Angle Scattering Group at the Intense Pulsed Neutron Source at Argonne National Laboratory in the United States where he provided scientific and technical assistance to users of the small-angle scattering prgramme. Elliot's interests lie in both soft and hard condensed matter and, beyond food materials, has investigated a diverse array of systems from phase separation in paraffin blends to skyrmions. He has also sought to develop unique and specialised sample environments to extend the use of scattering instrumentation into new scientific areas; such devices include the first differential scanning calorimeter capable of enabling the simultaneous measurement of SANS and a Rapid ViscoAnalyser that enables SANS to be measured during a small-scale emulated food process. He is a member of the IUCr Commission on Small-Angle Scattering, chaired the international conference on small-angle scattering in Sydney (2012) and served on the International Advisory Committees for the conferences in 2009, 2015 and 2018. He is an Honorary Professor at the Australian Institute for Bioengineering and Nanotechnology, and the Centre for Nutrition and Food Sciences, at the University of Queensland. He is also on the Editorial Boards of the Journal of Applied Crystallography and Food Structure (Elsevier).

More Information: https://www.ansto.gov.au/people/professor-elliot-gilbert



Speakers

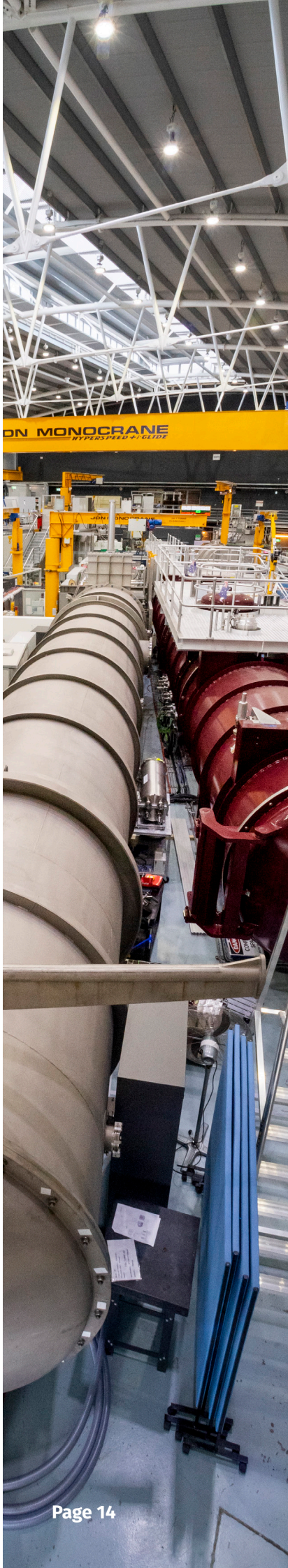
Jitendra Mata

Dr Jitendra Mata is a senior instrument scientist for the Kookaburra an Ultra Small Angle Neutron Scattering (USANS) instrument (since March 2017) and an instrument associate for the Quokka a Small Angle Neutron Scattering (SANS) instrument (since July 2018) at Australian Centre for Neutron Scattering (ACNS), Australian Nuclear Science and Technology Organisation (ANSTO), Australia. Dr Mata has been at ANSTO for > 13 years; working as an instrument scientist for the Quokka for 4 years, a research leader at ANSTO Minerals for 3 years, and as a postdoctoral research fellow at the ACNS for 2 years. He also worked as a postdoctoral research fellow at The Australian National University with Prof. John White for 3 years.
Dr Mata's research concerns complex soft materials and has had industrial relevance since his PhD. He has investigated several areas of soft condensed matter science, such as surfactant and block copolymer solutions, emulsions, food proteins, hydrogels, and mineral. Dr Mata's has co-authored more than 90 peered review articles including 2 book chapters: all in high impact international journals. He has also published several scientific reports.

More information:
https://www.ansto.gov.au/people/dr-jitendra-mata
https://scholar.google.com.au/citations?user=_tFPHuEAAAAJ&hl=en

Prof Namita Chowdhury

Prof Choudhury, a Polymer Scientist by training, has an international research profile in the areas of macromolecular science, physical chemistry, materials engineering and nanotechnology, and has conducted high quality fundamental research and industrially-important inventions for over 20 years. Research into advanced functional materials, biomimetic materials and renewable energy materials (energy conversion and storage), and advanced manufacturing are the major pillars of her current research activities. In last 20 years, she has played a major leadership role in attracting and conducting large research projects/programs, industrial projects/consultancy, IP generation, and supervising high quality HDR (higher degree research) students and early/mid-career researchers in the areas of nanostructured polymers, membrane and biomimetic materials, ionic gels and hybrid coating funded by the ARC, industries and government agencies. Prof Choudhury's specialisation in soft and hybrid materials has underpinned sustained strategic collaborations and research partnerships between university and industries.



Speakers

Norman Booth

Prior to joining Bragg Norman had worked at the University of Technology, Sydney for 19 years (2 months off 20). Norman started at UTS as a Scientific Services Officer in the Materials Science Department and ended up as a Professional Officer in the Microstructural Analysis Unit. His main responsibilities were looking after the Mechanical Testing lab and setting up a new Electrical Characterisation Lab.Norman was awarded his PhD in 2000 during which he worked on a combined ultrasonic and electrical sensor to detect partial discharges in large high voltage distribution transformers. Norman carried out work on conducting polymers, piezoelectric ceramics (in particular PZT/Epoxy composites), nano-cobalt composites and the mechanical properties of porous ceramics.
Norman did his undergraduate course part time and worked for Johnson Matthey Ltd (precious metal refinery) a in various positions from QA, Analytical Chemist, Bullion Room attendant, Metallurgist and Process Chemist.

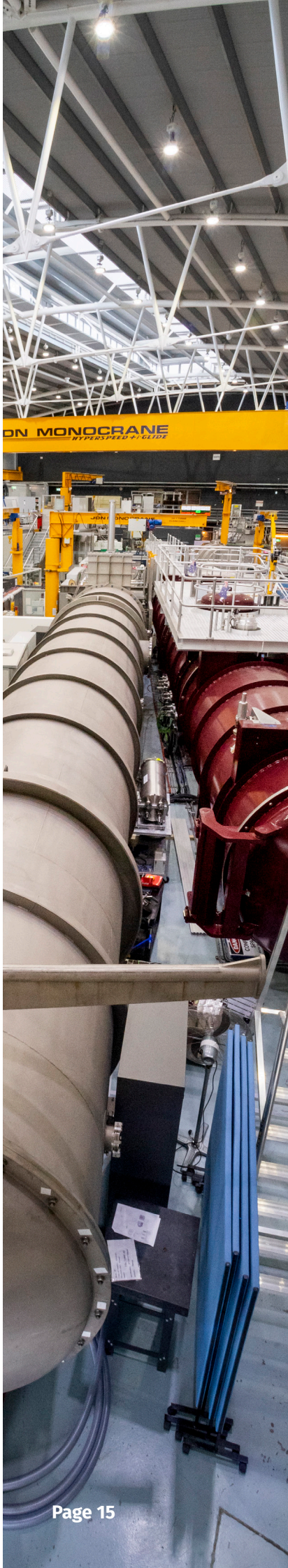
Paul Fitzgerald

Paul is currently a professional officer in charge of small angle X-ray scattering and particle characterisation in the Sydney Analytical Core Research Facility at the University of Sydney. Prior to this he was in the School of Chemistry where he worked on a range of industrial and academic projects using both neutron and X-ray scattering for a wide range of soft mater such as surfactant micelles, polymers, emulsions and gels. He has experience in research and scattering facilities both here in Australia at the ACNS and the Australian Synchrotron, and internationally in Japan, Korea and the United States.

Susi Seibt

Dr Susi Seibt is a beamline scientist on the Australian Synchrotron Small and Wide Angle X-ray Scattering (SAXS/WAXS) Beamline, ANSTO. She completed her PhD in Physical Chemistry / Nanoscience in 2018 as the first joint PhD between the University of Melbourne, Australia and the University of Bayreuth, Germany, working on in situ studies of the nucleation and growth of nanoparticles and the self-assembly of anisotropic molecules.

Susi helps to support the many scientists using the facility, and in particular enjoys designing and implementing experiments that use the beamline in novel ways. Her main research interests and expertise is in the combination of scattering techniques with microfluidics and soft matter.



Speakers

Stephen Mudie

Dr Stephen Mudie is the senior scientist on the Australian Synchrotron Small and Wide Angle X-ray Scattering (SAXS/WAXS) Beamline, ANSTO. He has worked on the SAXS/WAXS beamline since 2008, with a focus on developing the beamline to be a world leading facility. His particular interest is software development for SAXS data reduction and experimental control.

Stephen also helps to support the many scientists using the facility, and in particular enjoys designing and implementing experiments that use the beamline in novel ways.

Tim Ryan

Dr Tim Ryan is one of the instrument scientists responsible for the operation and development of the SAXS/WAXS beamline at the Australian Synchrotron (ANSTO). He completed his PhD in Biochemistry in 2009 at the University of Melbourne, working on the biophysics of protein self-association and aggregation and the effects of lipids. He then worked as a post-doctoral scientist at the Mental Health research institute, and later at the Florey Institute of Neuroscience and Mental Health, continuing biophysics focused studies into pathological protein aggregation and intrinsically disordered protein structures involved in Alzheimer's and Parkinson's diseases. Throughout his post-doctoral studies, Dr Ryan used a range of biophysical approaches, with a focus on small angle X-ray scattering to understand protein dynamics and aggregation.

Dr Ryan joined the SAXS/WAXS team in 2015, initially as a post-doctoral researcher then transitioning to beamline scientist. He has worked on many of the recent developments at the beamline, in particular the improvements to the solution scattering instrumentation. As a member of the SAXS/WAXS team Dr Ryan appreciates being involved in the vast array of scientific endeavours that access the beamline, and the further development of the quality and capability of the beamline itself.

Nigel Kirby

Nigel Kirby is the Principal Scientist for the SAXS/WAXS beamline at the Australian Synchrotron. Starting in 2006, I did the full optical design of the beamline and was responsible for much of the conceptual and detailed design of the endstation. The beamline was primarily constructed in 2008 and 2009 and has remained under continual development ever since. An expert team of beamline scientists and engineers works continually to maximise the function and performance of the beamline and the quality of User support. Not surprisingly, the beamline has grown into one of the most productive and innovative x-ray facilities worldwide. My research interests are in x-ray optics, beamline automation, and rapid development and deployment of new capabilities needed by Users. Prior to working at the Australian Synchrotron, I was an ASRP Research Fellow based at Curtin University and spent considerable time at the APS and NSLS. My PhD was also at Curtin University on high temperature corrosion resistant ceramics.