Shankar Dutt

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Profile

I am a biomedical engineer and a nanobiotechnologist pioneering AI-integrated point-of-care diagnostics at the intersection of nanotechnology, machine learning, and clinical medicine. My research program develops solid-state nanopore biosensors for early detection of neurodegenerative diseases and cancer, achieving label-free protein identification with high accuracy through innovative fusion of single-molecule sensing and machine learning; work featured in over 100 international media outlets. With demonstrated success in translational research (including partnerships with Thaum Pty Ltd for early diagnostics of Alzheimer's and collaborations with ACT Health and Rio-Tinto on environmental health monitoring), I bridge fundamental biophysics and nanoscience with biomedical applications.

As an educator committed to innovative pedagogies, I have trained 24 students across all levels (5 PhD, 3 Honours, 16 undergraduate/masters) while delivering research-led physics laboratories to 350+ students annually. My translational research portfolio includes 21 publications in top-tier journals (38.1% in top 10% by CiteScore), 2 patent applications, and over $500K secured in competitive funding (multiple as Lead Investigator). With established cross-institutional collaborations spanning JCSMR (ANU), Ohio State University (USA), GSI (Germany), Australian Synchrotron (Australia) and more, I am positioned to establish a world-class research group advancing personalized medicine through next-generation biomedical sensing technologies.

Employment

Research Fellow (Started as Level A, promoted to Level B)

Dec. 2023 - PRESENT

The Australian National University — *Canberra, Australia*

- **Clinical Diagnostics Development:** Lead the development of solid-state nanopore biosensors for point-of-care diagnostics, achieving 88.7% accuracy in label-free protein identification for disease biomarker detection.
- **Research Funding:** Secured >$500,000 in competitive funding including AEA Ignite ($198,767) for Alzheimer's early detection with industry partner Thaum Pty Ltd, demonstrating strong translational impact.
- **Research Training & Mentorship:** Trained 24 students (5 PhD, 3 Honours, 16 undergraduate) in biomedical sensing technologies, with one Honours student receiving the ANU University Medal for nanopore-AI integration research.
- **Cross-disciplinary Infrastructure:** Co-established and managed cross-college nanopore facilities enabling biomedical research for 20+ researchers, facilitating collaborations between physics, medicine (JCSMR), and engineering.
- **Research Translation:** Led commercialisation of silicon based membrane technologies.
- **Health Systems Collaboration:** Partnered with ACT Health and Rio-Tinto on environmental health monitoring using nanopore sensors for heavy metal detection in water.

Research Officer 5/6 (0.4 FTE)

Nov. 2022 - Aug. 2023 & Oct. 2023 - Nov. 2023

The Australian National University — *Canberra, Australia*

- Led technology transfer of silicon-based diagnostic membranes from laboratory to clinical applications.
- Developed biocompatible membrane platforms (SiO_2, Si_3N_4) optimized for medical device integration.

Selected Academic Awards & Honors

2025	**AINSE Early Career Researcher Grant (ECRG)**	*Australia*
2025	**AI Academic/Researcher of the Year** (Finalist), Australian AI Awards 2025	*Australia*
2024	**Neville Fletcher Early Career Research Award** (RSPhys DMP/EME Award, The Australian National University)	*Australia*
2023	**Elsevier NIMB Young Researcher Award**	*Japan*
2022	**The Jak Kelly Award** by the Royal Society of New South Wales	*Australia*
2022	**Award for Postgraduate Excellence in Physics** by the Australian Institute of Physics	*Australia*
2022	**John Carver Prize** by Research School of Physics, Australian National University	*Australia*
2019	**AINSE Postgraduate Research Award**	*Australia*
2019	**Australian Government Research Training Program** International Scholarship	*Australia*
2018	**University Gold Medallist(Rank-1)** in M.Sc. (Physics Hons.)	*India*
2017	**Charpak Master's Scholarship** by Embassy of France in India	*France*
2016	**University Gold Medallist(Rank-1)** in B.Sc. (Physics Hons.)	*India*

Education

Doctor of Philosophy
Sept. 2018 - Oct. 2024

The Australian National University
Canberra, Australia

Thesis: Development and investigation of functional solid-state nanopore membranes

M.Sc. Physics Honours
July 2016 - June 2018

Guru Nanak Dev University
Amritsar, India

- University Gold Medallist (Rank - 1)
- GPA - 9.75/10

B.Sc. Physics Honours
July 2013 - June 2016

Guru Nanak Dev University
Amritsar, India

- University Gold Medallist (Rank - 1)
- GPA - 9.92/10

Research Supervision

Total Students Supervised: 24

PhD	Honours	FRT	3rd Year	PhB ASC
5	**3**	**5**	**5**	**6**

PhD Students

Xiang Lian — Primary Supervisor
Project: Development of nanofluidic devices for biomolecular sensing

Sai Vinnakota — Primary Supervisor
Project: Nanopore sensing of heavy metal ions using DNAzymes

Lakshmi Raja — Associate Supervisor
Project: Detection of blood-based biomarkers of Alzheimer's disease using solid state nanopore sensing

Nahid Afrin — Associate Supervisor
Project: Development of conical nanopores for molecular separation and biosensing

Taleb Alwadi — Associate Supervisor
Project: Semiconductor nano-foams for sensor and energy applications

Honours Students

Ben Gast (Currently Supervising)	Physics Honours 2025/2026
Hancheng Shao	Engineering Honours 2022
(ANU University Medal)	
Tianshi Zhou	Physics Honours 2022/2023

FRT Students

Prakash Kumbakar (Current)	2025
Lakshya Sankhla (Current)	2025
Lakshmi Raja	2024
(Maitri PhD Scholarship)	
Shishir Shetty	2024
Rudradeep Chakraborty	2022

PhB ASC Students

Aratrik Samanta (Current)	S2 2025
Srestha Roy	S2 2024
Julius Clegg	S2 2024
Ben Gast	S1 2024
Daniel Martin	S1 2024
Marion Halas	Sum 2024

3rd Year Project Students

Ayush Adhikari	S1 2025
Aditya Singh Tejas	S2 2024
James Arnott	S2 2024
Bianca Hodges	Sum 2024
Suzanna Percival	Win 2020

Teaching

Current Teaching

Academic in-charge • First Year Physics Labs (PHYS1101) • 2024–Present

• Lead delivery of 2 core laboratory modules to 350+ students annually
• Two years of experience connecting fundamental physics experiments to research applications

Research Highlights

Google Scholar: scholar.google.com/citations?user=Zn0kP-cAAAAJ

ORCID: 0000-0002-6814-070X

Publications: 21

38.1% publications in Top 10% journal percentiles (by CiteScore)

H-index: 10 (Google Scholar)

Citations: 294 (Google Scholar)

Top 6 Publications

S. Dutt, H. Shao, B.I. Karawdeniya, Y.M. Bandara, E. Daskalaki, H. Suominen, P. Kluth. "High Accuracy Protein Identification: Fusion of solid-state nanopore sensing and machine learning", *Small Methods* 7, 11:2300676, 2023.

Impact Factor (5Y): 11.3 **Citations** (Google Scholar): 30

Importance of the Work: This study advances label-free protein sensing by combining high-bandwidth solid-state nanopore measurements with machine learning, enabling accurate identification of similarly sized proteins, solving a long-standing challenge in the field. Achieving F-values up to 88.7% and specificity of 96.4%, this approach opens new possibilities for rapid, single-molecule, label-free protein diagnostics. This work was highlighted in over 100 news stories, reaching millions worldwide, and featured on platforms such as the ABC and 2GB radio, as well as numerous news outlets in the US, UK and China (ANU media report).

S. Dutt, H. Shao, B.I. Karawdeniya, Y.M. Bandara, E. Daskalaki, H. Suominen, P. Kluth. "High Accuracy Protein Identification: Fusion of solid-state nanopore sensing and machine learning", *Nucleic Acids Research* Accepted: Nov. 2025.

Impact Factor (5Y): 19.2 **Citations** (Google Scholar): N/A

Importance of the Work: This study is the first demonstration of solid-state nanopore sensing for analyzing disease-relevant RNA conformational dynamics. Using a neuron-specific tRNA whose mutation causes neurodegeneration in mice, we achieved real-time, single-molecule detection of metastable conformers invisible to ensemble methods. This label-free approach establishes a new paradigm for studying biomolecular structural changes underlying neurodegenerative diseases, with direct implications for RNA-targeted therapeutics.

S. Dutt, P. Apel, N. Lizunov, C. Notthoff, Q. Wen, C. Trautmann, P. Mota-Santiago, N. Kirby, P. Kluth. "Shape of nanopores in track-etched polycarbonate membranes", *Journal of Membrane Science* 638 (2021): 119681.

Impact Factor (5Y): 10.7 (#1 in Filtration) **Citations** (Google Scholar): 67

Importance of the Work: First study to quantitatively characterize the shape of nanopores in PC membranes, addressing a 40-year-old challenge. This work has significant implications for transport, filtration, and sensing applications.

S. Dutt, B.I. Karawdeniya, Y.M. Bandara, N. Afrin, P. Kluth. "Ultra-Thin, High-Lifetime Silicon Nitride Membranes for Nanopore Sensing", *Analytical Chemistry* 95, 13 (2023): 5754-5763.

Impact Factor (5Y): 6.9 **Citations** (Google Scholar): 18

Importance of the Work: This work shows a scalable method to fabricate stable ultra-thin membranes (effective thickness $\sim$ 3 nm) for solid-state nanopore sensing, enabling over 500,000 DNA translocations and 1.8 million protein translocations from a single pore.

Y.M. Bandara, **S. Dutt**, B. Karawdeniya, J. Saharia, P. Kluth and A. Tricoli. "A Robust Parallel Computing Data Extraction Framework for Nanopore Experiments", *Small Methods* 8 (12) 2400045, 2024.

Impact Factor (5Y): 11.3 **Citations** (Google Scholar): 3

Importance of the Work: This work significantly advances nanopore data analysis by introducing a high-performance, scalable event extraction framework that enables rapid, multi-core processing of large datasets—achieving up to 1120× speed improvements over existing tools.

A. Kiy, **S. Dutt**, C. Notthoff, M.E. Toimil-Molares, N. Kirby, P. Kluth. "Highly Rectifying Conical Nanopores in Amorphous SiO_2 Membranes for Nanofluidic Osmotic Power Generation and Electroosmotic Pumps", *ACS Applied Nano Materials* 6, 10 (2023): 8564-8573.

Impact Factor (5Y): 5.9 **Citations** (Google Scholar): 12

Importance of the Work: This work demonstrates a scalable method for fabricating conical nanopores in amorphous SiO_2 membranes with finely tunable surface charge and strong ionic rectification.

Patents

- **S. Dutt**, P. Kluth, C. Notthoff. "A method of fabricating nanopores", P117449.AU (2021)
  International Phase: USA, Europe, China, Japan, and Australia
- **S. Dutt**, P. Kluth, C. Notthoff. "A method of fabricating membranes", P116401.AU (2021)
  PCT Phase

Grants

Total Research Funding Secured

Cash Funding	In-Kind
>AUD $500,000	**>AUD $1,000,000**

Australia's Economic Accelerator
Ignite Grant
AUD $198,767
2025

LEAD ENTREPRENEUR

S. Dutt, P. Kluth, R. Palchaudhuri and P. Reddy, "A solid state nanopore sensor for rapid, inexpensive, and non-invasive early-stage detection of Alzheimer's disease."

Australian Institute of Nuclear Science and Engineering
Early Career Researcher Grant
AUD $10,000
2025

LEAD INVESTIGATOR

S. Dutt, "Highly Tunable Conical Nanopores for Biomolecular Sensing"

Australia's Economic Accelerator
Seed Grant
AUD $192,872
2024

COLLABORATING ENTREPRENEUR

S. Legge, R. Thomas, **S. Dutt**, P. Kluth, K. Bechta-Metti, J. Close, G. Guccione, J. Rabeau and J. Rock, "MiniGrav: a drone-deployable miniaturised absolute gravimeter for subsurface mapping."

ANU Connect Ventures
Discovery Translation Fund
AUD $75,000
2022

CO-INVESTIGATOR

P. Kluth, **S. Dutt** and C. Notthoff, "Versatile solid-state membranes."

Australian National University
Research Translation and Engagement Primer
AUD $24,200
2022

CO-INVESTIGATOR

P. Kluth, **S. Dutt**, B. Karawdeniya, N. Bandara, and A. Bruestle, "Development of advanced nanopore biosensors."

NVIDIA Corporation
GPU Grant
AUD $16,000
2022

LEAD INVESTIGATOR

S. Dutt, "A novel nanopore sensor for early detection of Alzheimer's and MS disease." Hardware support for machine learning model development.

Google
Cloud Research Credits
AUD $8,564
2022

LEAD INVESTIGATOR

S. Dutt, Cloud computation resources awarded to advance nanopore sensing research and data analysis pipelines.
[In-kind contribution]

Australian National University
Vice-Chancellor's HDR Travel Grant

AUD $1,500
2022

LEAD INVESTIGATOR

S. Dutt, Competitive travel grant for presenting research at SHIM 2022 conference in Finland.

Australian Institute of Nuclear Science and Engineering
AINSE Travel Grant

AUD $1,000
2022

LEAD INVESTIGATOR

S. Dutt, Travel support for attending SHIM 2022 conference in Finland.

Deutscher Akademischer Austauschdienst (DAAD)
Short Term Research Grant

€7,000
2021

LEAD INVESTIGATOR

S. Dutt, "Functionalization of solid-state nanopore membranes using atomic layer deposition."

Australian Institute of Nuclear Science and Engineering
Postgraduate Research Award (PGRA)

AUD $30,000
2019

LEAD INVESTIGATOR

S. Dutt, P. Kluth, "Investigation of hybrid solid-state nanopore membranes fabricated using ion track technology."

ANSTO-Australian Synchrotron
SAXS Beamtime Grants (13 successful proposals)

AUD $1,049,088
2018-2025

CO and LEAD PROPOSER

Awarded competitive beamtime access for Small Angle X-ray Scattering experiments supporting multiple research projects in nanopore characterization.
[In-kind contribution: beamtime value as listed in ANSTO award letter]

Service

Editorial and Review Service

Guest Editor (2024–2025)
Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, Elsevier

Peer Reviewer
Reviewed manuscripts for leading journals including:

- *Nature Communications* : 2
- *Physical Review B* : 1
- *ACS Applied Nano Materials*: 1
- *Biotechnology Progress*: 1
- *Measurement Science and Technology*: 1
- *Radiation Effects and Defects in Solids*: 1
- *Vacuum*: 4
- *STAR Protocols*: 2
- *RSC Advances*: 2
- *Sensing and bio-sensing research*: 1
- *Journal of Applied Crystallography*: 1

Departmental Service

Early and Mid Career Researcher's Committee Member (2025-Present)
Research School of Physics, Australian National University

First Aid Officer (2020–Present)
Research School of Physics, Australian National University

Conference Organization

Co-chair and Secretary (2024)
30th International Conference on Atomic Collisions in Solids & 12th International Symposium on Swift Heavy Ions in Matter, Australia

Co-chair (2024)
Workshop on "Advances in Ion Track Physics and Related Applications", Australia

Secretary (2023)
ANZCOP-AIP Summer Meeting
The largest Physics conference in Australia/New Zealand

Technical Organisation Committee (2021)
7th IUPAP International Conference on Women in Physics, Australia

Outreach Activities

Marker (2019)
20th Asian Physics Olympiad, Australia

Invited Talks

Invited Talk
Fukuoka, Japan
Registration waived ($850 AUD)

S. Dutt, C. Notthoff, X. Wang, C. Trautmann, P. Mota-Santiago, P. Kluth. "Annealing of swift heavy ion tracks in amorphous silicon dioxide", ***21st International Conference on Radiation Effects in Insulators*** *2023*

Invited Talk
Helsinki, Finland
Registration waived ($1000 AUD)

S. Dutt, C. Notthoff, A. Kiy, P. Apel, N. Lizunov, P. Mota-Santiago, N. Kirby, M.E. Toimil-Molares, C. Trautmann, I. Korolkov, M. Zdorovets, P. Kluth. "Exploring ion tracks and nanopores using small-angle X-ray scattering", ***29th International Conference on Atomic Collisions in Solids & 11th International Symposium on Swift Heavy Ions in Matter*** *2022*

Invited Talk
Darmstadt, Germany
Virtual presentation

S. Dutt, C. Notthoff, X. Wang, A. Kiy, P. Apel, N. Lizunov, P. Mota-Santiago, N. Kirby, M.E. Toimil-Molares, C. Trautmann, I. Korolkov, M. Zdorovets, P. Kluth. "Versatile solid-state nanopore membranes", ***GSI MAT Seminar*** *2022*

Engagement and Impact

Industry and Government Partnerships

Thaum Pty Ltd
Collaboration on solid state nanopore sensing and machine learning for Alzheimer biomarker detection
Outcome: Successful AEA Ignite Grant (Round 1).

ACT Office of Water, Icon Water, and ACT Health
Partnership to understand metal release in water due to natural disasters (bushfires and floods)
Outcome: Grant proposal submitted to Disaster Ready Fund Round 3.

Rio Tinto
Collaboration investigating heavy metal ion sensing using solid state nanopore technology
Outcome: A Grant proposal submitted to AEA Ignite Program (Round 2).

New Frontier Technologies
Collaboration on development of thin coatings for carbon composites to protect against radiation and atomic oxygen in space environments
Outcome: R&D of high-performance carbon composites for space applications.

Other Elements of Research Practice

Laboratory Management

Co-Manager of Three Research Laboratories
Biosensing Laboratory, Solid State Nanopore Laboratory, and Thin Film Deposition and Characterisation Laboratory

Digital Infrastructure Development

Electronic Lab Notebook Implementation
Responsible for implementing digital laboratory management system across research facilities

Online Inventory System
Developed and deployed comprehensive inventory management system for laboratory resources

Software Development

</> Solid State Nanopore Data Analysis Software
Developed custom analysis software currently used by members of the Advanced Materials Group, Research School of Physics
Public release planned for coming months

Publication List

Journal Articles

[21] **S. Dutt**, L. Lai, B.I. Karawdeniya, Y.M. Bandara, A. J. Clulow, V. Gopalan , P. Kluth. "Solid-state nanopore sensing reveals conformational changes induced by a mutation in a neuron-specific $tRNA^{Arg}$", Nucleic Acids Research (2025). *2025*

[20] **S. Dutt**, R. Chakraborty, C. Notthoff, P. Mota-Santiago, C. Trautmann, P. Kluth. "Characterization of ion track etched conical nanopores in thermal and PECVD SiO_2 using small angle X-ray scattering", Beilstein Journal of Nanotechnology 16.1 (2025): 899-909. *2025*

[19] N. Afrin, **S. Dutt**, A. Kiy, V. Craig, M.E. Toimil-Molares, P. Kluth. "Charge-based molecular separation using conical nanopores in SiO_2 membranes", *ACS Applied Nano Materials* (2025) *2025*

[18] A.Kiy, **S. Dutt**, K. Gregory, C.Notthoff, M.E. Toimil-Molares , P. Kluth. "The Effect of Electrolyte Properties on Ionic Transport through Solid-State Nanopores: Experiment and Simulation", *Langmuir* 40(40), 20888-2896. *2024*

[17] Y. M. Bandara, **S. Dutt**, B. Karawdeniya, J. Saharia, P. Kluth and A. Tricoli. "A Robust Parallel Computing Data Extraction Framework for Nanopore Experiments", *Small Methods* 8 (12) 2400045. *2024*

[16] Y. M. Bandara, B. Karawdeniya, **S. Dutt**,P. Kluth and A. Tricoli. "Nanopore Fabrication Made Easy: A Portable, Affordable Microcontroller-Assisted Approach for Tailored Pore Formation via Controlled Breakdown", *Analytical Chemistry* 96 (5), 2124-2134. *2024*

[15] **S. Dutt**, B. Karawdeniya, Y. M. N. D. Y. Bandara, and P. Kluth. "Nanopore sensing and machine learning: Future of biomarker analysis and disease detection," *Future Science OA*, 10 (1), 2340882. *2024*

[14] T. Alwadi, C. Notthoff, **S. Dutt**, J. Wierbik, N. Afrin, A. Kiy, and P. Kluth. "Ion track formation and porosity in InSb induced by swift heavy ion irradiation," *Journal of Vacuum Science & Technology A*, 41, no. 6, p. 063 404, 2023. *2023*

[13] **S. Dutt**, H. Shao, B.I. Karawdeniya, Y.M. Bandara, E. Daskalaki, H. Suominen, P. Kluth. "High Accuracy Protein Identification: Fusion of solid-state nanopore sensing and machine learning", *Small Methods* 7, 11:2300676, 2023. *2023*

[12] B. R. Pauw, G. J. Smales, A. S. Anker, ... **S. Dutt**, ... and J. Wuttke. " The human factor: results of a small-angle scattering data analysis round robin", *Journal of Applied Crystallography* 56, 6:1618-1629, 2023. *2023*

[11] **S. Dutt**, P. Apel, O. Polezhaeva, N. Kirby, P. Kluth. "Role of antioxidants in swift heavy ion tracks in polypropylene", *Polymer* 282 (2023): 126133. *2023*

[10] **S. Dutt**, C. Notthoff, X. Wang, C. Trautmann, P. Mota-Santiago, P. Kluth. "Annealing of high energy ion irradiation damage in amorphous silicon dioxide", *Applied Surface Science* 628 (2023): 157370. *2023*

[9] **S. Dutt**, B.I. Karawdeniya, Y.M. Bandara, N. Afrin, P. Kluth. "Ultra-Thin, High-Lifetime Silicon Nitride Membranes for Nanopore Sensing", *Analytical Chemistry* 95, 13 (2023): 5754-5763. *2023*

[8] A. Kiy, **S. Dutt**, C. Notthoff, M. E. Toimil-Molares, N. Kirby, P. Kluth. "Highly Rectifying Conical Nanopores in Amorphous SiO_2 Membranes for Nanofluidic Osmotic Power Generation and Electroosmotic Pumps", *ACS Applied Nano Materials* 6, 10 (2023): 8564-8573. *2021*

[7] X. Wang, **S. Dutt**, C. Notthoff, A. Kiy, P. Mota-Santiago, S. T. Mudie, M.E. Toimil-Molares, F. Liu,Y. Wang, P. Kluth. "SAXS data modelling for the characterisation of ion tracks in polymers", *Physical Chemistry Chemical Physics* (2022). *2022*

[6] **S. Dutt**, P. Apel, N. Lizunov, C. Notthoff, Q. Wen, C. Trautmann, P. Mota-Santiago, N. Kirby, P. Kluth. "Shape of nanopores in track-etched polycarbonate membranes", *Journal of Membrane Science* 638 (2021): 119681. *2021*

[5] A. Kiy, C. Notthoff, **S. Dutt**, M. Grigg, A. Hadley, P. Mota-Santiago, N. Kirby, C. Trautmann, M.E. Toimil-Molares, P. Kluth "Ion track etching of polycarbonate membranes monitored by in situ small angle X-ray scattering.", *Physical Chemistry Chemical Physics* 23 (2021): 14231-14241. *2021*

[4] **S. Dutt**, S. Singh, A. Mahajan, B. Arora, B.K. Sahoo. "van der Waals coefficients of the multi-layered MoS_2 with alkali metals", *Physica Scripta* 95.9 (2020): 095506. *2020*

[3] A. Hadley, C. Notthoff, P. Mota-Santiago, **S. Dutt**, S Mudie, MA Carrillo-Solano, ME Toimil-Molares, C Trautmann, P Kluth. "Analysis of nanometer-sized aligned conical pores using small-angle X-ray scattering", *Physical Review Materials* 4.5 (2020): 056003. *2020*

[2] N. Kaur, A. Khanna, M. Fabian, **S. Dutt**. "Structural and electrical characterization of semiconducting xCuO-(100-x)TeO_2 glasses", *Journal of Non-Crystalline Solids* (2020): 119884. *2020*

[1] D. Gustas, D. Guenot, A. Vernier, **S. Dutt**, F. Bohle, R. Lopez-Martens, A. Lifschitz, J. Faure. "High-Charge relativistic electron bunches from a kHz laser-plasma accelerator", *Physical Review Accelerators and Beams* 21.1 (2018): 013401. *2018*

Other Articles

[2] **S. Dutt**, C. Notthoff, A. Kiy, Q. Wen, M.E. Toimil-Molares, C. Trautmann, N. Kirby, P. Kluth. "Highly tunable nanopores in silicon dioxide and silicon oxynitride membranes", *AINSE Annual Report* (2022): 37-40. *2023*

[1] **S. Dutt**, C. Notthoff, A. Hadley, N. Lizunov, M.E. Toimil-Molares, C. Trautmann, P. Mota-Santiago, P. Apel, N. Kirby, P. Kluth. "Investigating track-etched nanopore membranes", *AINSE Annual Report* (2021): 51-54. *2022*

Conference Presentations

Note: *Invited talks mentioned earlier are not included again in this list.*

Oral Presentation Canberra, Australia	**S. Dutt**, H. Shao, B.I. Karawdeniya, Y.M. Bandara, E. Daskalaki, H. Suominen, P. Kluth. "High Accuracy Protein Identification: Fusion of solid-state nanopore sensing and machine learning", ***ANZCOP-AIP Summer Meeting 2023***	*2023*
Oral Presentation Dehradun, India	**S. Dutt**, C. Notthoff, X. Wang, C. Trautmann, P. Mota-Santiago, P. Kluth. "Annealing of swift heavy ion tracks in amorphous silicon dioxide", ***7th International Conference on Nanostructuring by Ion Beams***	*2023*
Oral Presentation San Diego, USA	**S. Dutt**, B.I. Karawdeniya, Y.M. Bandara, N. Afrin, P. Kluth. "Ultra-thin, high-lifetime silicon nitride nanopore membranes for biosensing", ***67th Biophysical Society Annual Meeting***	*2023*
Oral Presentation Taipei, Taiwan	**S. Dutt**, C. Notthoff, Q. Wen, A. Kiy, M.E. Toimil-Molares, I. Korolkov, M. Zdorovets, N. Kirby, P. Kluth. "Fabrication of highly tunable silicon dioxide and silicon oxynitride nanopore membranes", ***16th International Conference on Inorganic Membranes***	*2022*
Oral Presentation Melbourne, Australia	**S. Dutt**, P. Apel, O. Polezhaeva, A. Kiy, N. Afrin, C. Notthoff, N. Kirby, P. Kluth, "Role of antioxidants in swift heavy ion tracks in polypropylene", ***ANSTO User Meeting 2022***	*2022*
Oral Presentation Melbourne, Australia	**S. Dutt**, P. Apel, C. Notthoff, A. Kiy, N. Lizunov, Q. Wen, C. Trautmann, P. Mota-Santiago, N. Kirby, P. Kluth. "Shape of track-etched nanopores characterized by small-angle X-ray scattering", ***ANSTO User Meeting 2021***	*2021*
Oral Presentation Online Symposium	**S. Dutt**, C. Notthoff, A. Kiy , C. Trautmann, P. Mota-Santiago, N. Kirby, P. Kluth. "Fabrication, Characterisation and Application of solid-state nanopore membrane", ***8th MSA Early Career Researcher Online Membrane Symposium***	*2021*
Poster Presentation Oxfordshire, United Kingdom	**S. Dutt**, P. Apel, N. Lizunov, C. Notthoff, Q. Wen, C. Trautmann, P. Mota-Santiago, N. Kirby, P. Kluth. "Shape of nanopores in track-etched polycarbonate membranes", ***S4SAS Conference 2021***	*2021*

Oral Presentation Canberra, Australia	**S. Dutt**, A. Kiy, B.I. Karawdeniya, K. Murugappan, C. Notthoff, N. Kirby, M.E. Toimil-Molares, C. Trautmann, A. Tricoli, P. Kluth. "Versatile nanoporous silicon dioxide membranes: fabrication, characterisation and applicaton ", ***Our health in our hands symposium***	*2020*
Poster Presentation Melbourne, Australia	**S. Dutt**, C. Notthoff,A. Hadley, A. Kiy, N. Kirby, M.E. Toimil-Molares, C. Trautmann, P. Kluth. "Investigation of etched ion-tracks in SiO_2 membranes ", ***Australian Synchrotron User Meeting 2020***	*2020*
Oral Presentation Brisbane, Australia	**S. Dutt**, C. Notthoff,A. Hadley, A. Kiy, N. Kirby, M.E. Toimil-Molares, C. Trautmann, P. Kluth. "Fabrication of solid-state nano-pore graphene composite membranes ", ***International conference on nanoscience and nanotechnology (ICONN-2020)***	*2020*
Poster Presentation Nur-Sultan, Kazakhstan	**S. Dutt**, A. Hadley, C. Notthoff, N. Kirby, M.E. Toimil-Molares, C. Trautmann, P. Kluth. "Fabrication of solid-state nano-pore membranes ", ***20th International conference on radiation effects in insulators***	*2019*