SUPA Annual Gathering

Wednesday 28 May 2025

Dalhousie Building
University of Dundee

10:00	Coffee, set up Posters and Exhibition
10:25	Welcome, Linda Hadfield
10:30 -11:30	**Keynote, Dr Devang Naik, Quantum Technologies: From Kelvin to the Clinic**
	Lecture Theatre 3
11:30	Break
11:40 – 1:00	Session 1, Research Presentations
	Parallel Theme Meetings
	4 presentations of 15 minutes followed by Q & A
1:00 – 2:20	Lunch, Poster Session and Exhibition
	Posters should be size A1, oriented vertically
2:20 – 3:40	Session 2, Research Presentations
	Parallel Theme Meetings
	4 presentations of 15 minutes followed by Q & A
3:50 – 4:40	**Keynote, Emmanuel Saridakis, *Astrophysics and Cosmology in the 21st century: Are we approaching a new scientific revolution?***
	Lecture Theatre 3
4:40 – 4:50	Feedback
4:50	Boarding Buses

Astronomy and Space Sciences, Room 2G12

11:40 – 1:00, Research Presentations Session 1, Chair: Aurora Sicilia Aguilar

11:40 Ferdinand Hollauf, *A multicadence study of the variable stars in Tr37: accretion stability, inner disk properties, and activity}*

12:00 Yingjie Luo, *Observing the Sun with MeerKAT: Pioneering Solar Radio Physics in the SKA Era*

12:20 Kieran Stuart, *Modelling the emergence and evolution of the rotation–activity relation*

12:40 Rowan Smith, *How do stars form within galaxies?*

1:20 – 2:20 Posters

1. Aurora Sicilia-Aguilar, "Using time to map space" and the North-PHASE Legacy Survey,
2. Ernesto Giulio Mustienes Rando, Variability in the star-forming Perseus clusters,
3. Lucy Arditi, Dynamics of Tidally Perturbed, Rotating Stellar Systems
4. Hexuan Zhao,

2:20 – 3:40, Research Presentations Session 2, Chair: Aurora Sicilia Aguilar

2:20 Ruhee Kahar, *What Time Can Tell Us About Space: A Study of Variability in Young Stellar Objects*

2:40 Debesh Battacharjee, *Time Evolution of Flare-accelerated Electrons using X-Ray Observations and Warm-Target Model*

3:00 Ernesto Giulio Mustienes Rando, *Stellar clusters, variability and evolution during the planet-forming era in Perseus*

3:20 Sandip George, *Embracing the chaos : The nonlinear dynamics of close binary stars*

Condensed Matter and Material Science, Room 2F14

11:40 – 1:00, Research Presentations Session 1, Chair: Trevor Almeida

11:40 Julian Mayr

12:00 Michael McKinlay, *Development and Characterisation of Tribophotonic Devices for Optical Modulation*

12:20 Connor Steward Inglis, *Frustrated under pressure: solid-state refrigerants for environmentally friendly cooling*

12:40 Harry Mullineaux Sanders, *Topological classification of one-dimensional chiral symmetric interfaces*

1:20 – 2:20 Posters

5. David A. Lewis, *Ice Giant Interiors: Phases of the H_2O-NH_3 system*
6. Kirstin Saunders, *Optical and Mechanical Properties of Non-Stoichiometric Silicon Nitride Thin Films Deposited by a PECVD Method*
7. Jiaqi Zong, *Electrospinning of Piezoelectric Nanofibers Embedded with Nanoparticles for Enhanced Energy Generation*
8. Mohammad Mogri, *Statistical properties of the Edward-Wilkinson model in networks*
9. Julian Mayr, *Dynamical phases, bistability and density-wave resonances in BECs in a transversely pumped optical cavity.*
10. Evgenia Georgiadou, *Proximity effects in normal/superconductor heterostructures*
11. Lorenzo Carfora, *Bose-Hubbard model on ladder lattices*
12. Max Pelly, *Nanocalorimetry of CeRh2As2*
13. Tereza Prokopová, *Investigating the Effect of Extrusion on Semi-solid Cream Formulations*

2:20 – 3:40, Research Presentations Session 2, Chair: Trevor Almeida

2:20 Luke C. Rhodes, *Influence of Higher-order van hove singularities on unconventional superconductors.*

2:40 Henry Legg, *Theory of nonlinear Shubnikov-de Haas oscillations in planar germanium heterostructures*

3:00 Aryaveer Singh, *Vacancy defect identification in metal halide perovskites using positron annihilation spectroscopy*

3:20 David Keeble, *Vacancy defects in photovoltaic antimony selenide*

Energy, Talk combined in the Plasma Physics session Room 1G06

1:20 – 2:20 Posters,

14. Prof Amir Hussain
15. Jonathan Whyte, *Investigating Redox Mechanisms in Na-ion Cathodes*

Nuclear Physics, Talk combined in the Particle Physics session Room 2S14

1:20 – 2:20 Posters

16. Kellie-Anna Byrne, Measurement of hypoxia within cancerous tumours using electrons

Particle Physics, Room 2S14

This session is a combination of Particle and Nuclear Physics.

11:40 – 12:40, Research Presentations Session 1, Chair: Cheryl Patrick

11:40 Bowen Wang, *Near-infrared fluorescent glutathione capped gold nanoclusters: impact of synthesis conditions and hairpinDNA functionalization*

12:00 Sam Pratt, *Overview of The SuperNEMO Neutrino Experiment*

12:20 Cheryl Patrick, *An introduction to Quark Quest,*

12:40 Nuclear Physics, Chair: David O'Donnell

12:40 Emmanuel Odusina, *Cross section measurement of the 26Al (n,a) and (n,p) reactions at CERN n_TOF*

1:20 – 2:20 Posters

17. Quratulain Zahoor, *Quality control testing of Type-1 power services for ATLAS ITk Outer endcap*

2:20 – 3:40, Session 2, Experience Quark Quest! Chair: Cheryl Patrick

All welcome! Try this board game about particle and nuclear physics. The game has been used at outreach events and presented at the Sterling teachers' meeting. It will go into production later this year but you can try it here in advance. The target audience is Highers students but it is fun for everyone.

Photonics, Room 2S13

11:40 – 1:00, Research Presentations Session 1, Chair: Tom Vettenburg

11:40 Liam King, *TADF OLEDs for high-speed visible light communication*

12:00 Rebecca Meehan, *Evaluating Photoprotective Properties of UK Garments with Integrating-Sphere Spectrophotometry*

12:20 Saban Tosun, *Effects of Sub-Wavelength Photonic Nanostructures on Thermally Activated Delayed Fluorescence*

12:40 Christopher Leburn, Technology Exploitation Director

1:20 – 2:20 Posters

18. Graham Bruce, *Detecting Arsenic in 19th Century Books Using Light*
19. Edward Appleton, *Raman spectroscopy using shaped laser light for through-bottle whisky detection*
20. Albert de Dios Carbajal, *Single-photon depth imaging for underwater target discrimination*
21. Sahar Alshammari, *Fluorescence studies of protein aggregation in heterogenous media*
22. Ghulam Yaseen, *Cavity Optomechanics, the study of localised optical and mechanical fields*.
23. Sarah-Jane Twigg, *Photonic Metasurfaces for Biophotonics Applications*
24. Deepjyoti Satpathy, *Tuneable few-femtosecond far-ultraviolet laser pulses generated by Yb-laser-driven resonant dispersive wave emission*
25. Dr. Salam Nazhan AL Zaidi, *Investigation of a Vertical Cavity Surface Emitting Laser (VCSEL) polarization near and below-threshold lasing under external optical feedback*
26. Bibi Mary Francis, *Optical Signatures of Quantum Crystallisation in WSe2 Monolayer and MoSe2/WSe2 Hetero-bilayer*

2:20 – 3:40, Research Presentations Session 2, Chair: Tom Vettenburg

2:20 Morgan Facchin, *Detecting arsenic in 19th century books using reflectance spectroscopy*

2:40 Adetunmise Dada, *Quantum Enhanced Time-Domain Spectroscopy*

3:20 Hammad Ahmed, *Flat Optics for generating and manipulating unusual optical vortex beams*

3:40 Shoaib Soomro*, Adaptive Optics in a Compact Wearable for Vision Evaluation and Correction*

Physics and Life Sciences, Room 1S05

11:40 – 1:00, Research Presentations Session 1, Chair: Robert Cameron

11:40 Karlin Ross, Imaging the beating heart: Light Sheet Microscopy using an Airy Beam for in-vivo Imaging of Zebrafish Hearts

12:00 Laura Mazon Maldonado, *On the rapid thermal annealing of AlN for wireless power transmission in brain implantable devices*

12:20 Isla Barnard, Volumetric thermal dosimetry for subablative neuromodulation in Magnetic Resonance guided Focused Ultrasound

12:40 Marks and Clerk

1:20 – 2:20 Posters

27. Antonio Iorio, Tension-dependent kinetochore-microtubule interactions
28. Isabelle S. Haque-Bousquet, *Human Activity Recognition with a Neural Network*,
29. Daniel Olesker, FLIM-FRET Force Measurement in the Beating Embryonic Zebrafish Heart

2:20 – 3:40, Research Presentations Session 2, Chair: Robert Cameron

2:20 Euan Mackay, *Modelling Actomyosin Oscillations in Morphogenetic Dynamics Using an Active Elastomer Framework*

2:40 Nicolás Rubido, *Small worldness favours network inference in synthetic neural networks*

3:00 Rastko Sknepnek, *Cell-level modelling of gastrulation in embryos*

Physics Education Research Room 2F13

11:40 – 1:00, Research Presentations Session 1, Chair: Nic Labrosse

11:40 Anna Wood, *Understanding Students' Experiences of a Flipped Physics Class through the lens of transactional distance theory*

12:00 Iain Moore, *Physics in Higher Education – the impact of what comes before*

12:20 Morgiane Richard, *Student-Staff Partnership: An Example of Curriculum Co-Creation in Mathematics*

12:40 Rajesh Kumar Plamthottathil, TrackGenesis, *The Future of Physics Education in the Metaverse*

1:20 – 2:20 Posters

30. Fiarusy Haryani, *Transforming STEM Learning in Higher Education Through Generative AI: A Literature Review*

2:20 – 3:40, Research Presentations Session 2, Chair: Nic Labrosse

2:20 Ross Galloway, will host a discussion on, *The objective of human physics students in the age of generative AI: some unrefined thoughts*

2:40 Rosaria Lena, *Students' Evaluation of Interactive E-books in Physics and Astronomy*

3:00 Drew Rosen, *Understanding the role of a salient distracting feature in a friction force question*

3:20 Bonnie Steves, *Building Bridges in Celestial Mechanics and Astronomy: a Scottish-Global tale of friendship and community*

Plasma Physics, Room 1G06,

1:20 – 2:20 Posters

31. Zhadyra Gani, *From Water to Power: Green Hydrogen Generation via Plasma-Enhanced Electrolysis*
32. Leonardo Costa de Souza, *Dynamical Traps in Toroidal Plasmas*

2:20 – 3:40, Research Presentations Session 2, Room 1G06, Chair: Declan Diver

2:20 Sidney Pauly, *How to create faster numerical solvers through C extensions for python: show cased on Newton-Raphson powerflow*

2:40 Scott Doyle, *Toroidal Wave-Heated Electrothermal Plasma Propulsion*

3:00 Craig Stark, *The magnetodynamics of substellar atmospheric zonal flows and zonal band formation*

3:20 Declan Diver, *Spontaneous emergence of magnetic structure*

Quantum Technologies, Room 2S12

11:40 – 1:00, Research Presentations Session 1, Chair: Sonja Franke-Arnold

11:40 Max Wells-Pestell, *Quench Dynamics in Rydberg Atom Arrays*

12:00 Roosmarijn de Wit, *Extracting coupling-mode spectral densities with 2D electronic spectroscopy*

12:20 Paul Griffin, *Compact and high-performance atomic clocks for resilient timing*

12:40 Jack Brennan, *Quantum ARC Introduction*

1:20 – 2:20 Posters

33. Kuntal Samanta, *Realisation of an atomic state interferometer with Vector Light*
34. Eilidh Maclennan, *Building a Two-Photon Rb Optical Clock Using Microfabricated MEMS Vapour Cells*
35. Cris Paunica, *Exploring Molecular Tunability Through Diazapentacene Coherence Simulations*
36. Courtney Dyer, *Ultra-Precise Quantum Magnetometry of Earth's Magnetic Field*
37. Mairi Gilmour, *Singularimetry for Non-Homogenous Magnetic Surfaces*
38. Veronika Vohníková, *Frequency-stable laser for practical Doppler Broadening thermometry*
39. Finlay Scott, *Guided Light-Atom Solitons using Structured Light*
40. Rajnandan Choudhury Das, *Reducing light shift in atomic clock with off-resonant light*
41. Alex Jones, *Scalable registration of single quantum emitters within solid immersion lenses through femtosecond laser writing*
42. Henry Jindrich Hajek, *Stochastic learning of models for noisy quantum devices with memory effects*
43. Kian Damezin, *Numerically Exact Methods for Modelling Open Quantum Systems: The Tensor Network Approach*

2:20 – 3:40, Research Presentations Session 2, Chair: Sonja Franke-Arnold

2:20 Rajnandan Choudhury Das, *Reducing Light shift in Atomic Clock with Off-resonant Light*

2:40 Anna Podlasek, *Photon Counting Detection Scanner*

3:00 Ignazio Pallocchini, *Cryptography with chaos and symbolic dynamics*

3:20 Sphinx J. Svensson, *Driving an atomic transition with longitudinally polarised light*