

IAC Meeting
RCP Edinburgh, 11th May 2017

CEO Report to the SUPA International Advisory Committee 11th May 2017

Prof Alan Miller

FRSE, FIEEE, FInstP, FOSA

CEO, Scottish Universities Physics Alliance

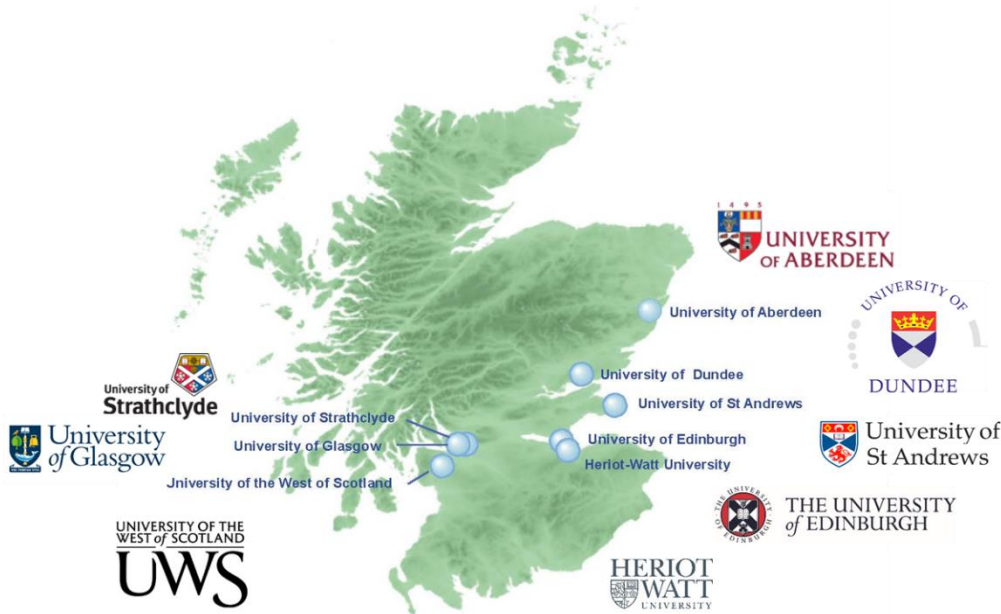
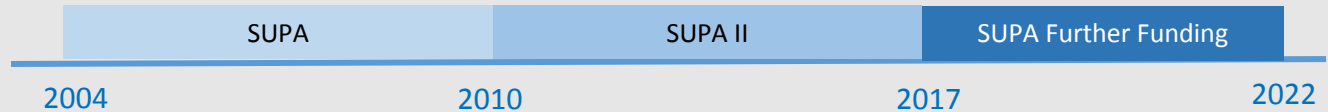
Director, SUPA Graduate School

<http://www.supa.ac.uk/>



What is SUPA?

Scottish Universities Physics Alliance (established 2004)



Strategic Research Partnership

- 8 HEI Partners
- 7 Research Themes
- SUPA Graduate School
- SUSSP
- Associate Members

SUPA will:

- pool and enhance Scotland's strongest physics research to develop international leadership,
- provide a magnet for researchers and sponsors worldwide.

SUPA Associate Members:



Sub-Discipline:

- Astronomy & Space Science
- Condensed Matter and Materials Physics
- Nuclear and Plasma Physics
- Particle Physics
- Photonics

Impact:

- Energy
- Physics and Life Science

SUPA Astronomy and Space Science Theme

UK's largest astronomy and space science research facility in the UK, the University of Exeter, Exeter, Devon & Cornwall.

Advances our space science research in the UK and beyond, including the development of new instruments and the design of new missions, including the design of the ExoMars Trace Gas Orbiter (TGO) and the ESA's Jupiter Icy Moon Explorer (JIMO).

World leaders in the design and development of space science instruments, including the design of the ExoMars TGO and the ESA's JIMO.

Research Focus:

- Space exploration: study of the solar system and the search for habitable planets.
- Space science: study of the Sun, planets, moons, and comets.
- Space technology: development of new instruments and spacecraft.
- Space science: study of the solar system and the search for habitable planets.

Thematic Leader:

Senior Researchers:

- Professor John Goldsmith
- Professor David Bower
- Professor David Bower
- Professor David Bower

Other Areas of Interest:

- Space science: study of the solar system and the search for habitable planets.
- Space technology: development of new instruments and spacecraft.
- Space science: study of the solar system and the search for habitable planets.

www.supa.ac.uk | supa@ex.ac.uk | www.supa.ac.uk

SUPA Condensed Matter & Materials Theme

UK's largest condensed matter and materials research facility in the UK, the University of Exeter, Exeter, Devon & Cornwall.

Advances our condensed matter and materials research in the UK and beyond, including the development of new materials and the design of new devices.

World leaders in the design and development of condensed matter and materials research instruments, including the design of the ExoMars TGO and the ESA's JIMO.

Research Focus:

- Materials science: study of the properties of materials and the design of new materials.
- Condensed matter physics: study of the properties of condensed matter systems.
- Materials science: study of the properties of materials and the design of new materials.

Thematic Leader:

Senior Researchers:

- Professor John Goldsmith
- Professor David Bower
- Professor David Bower
- Professor David Bower

Other Areas of Interest:

- Materials science: study of the properties of materials and the design of new materials.
- Condensed matter physics: study of the properties of condensed matter systems.
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SUPA Nuclear and Plasma Physics Theme

UK's largest nuclear and plasma physics research facility in the UK, the University of Exeter, Exeter, Devon & Cornwall.

Advances our nuclear and plasma physics research in the UK and beyond, including the development of new nuclear reactors and the design of new plasma devices.

World leaders in the design and development of nuclear and plasma physics research instruments, including the design of the ExoMars TGO and the ESA's JIMO.

Research Focus:

- Nuclear physics: study of the properties of nuclei and the design of new nuclear reactors.
- Plasma physics: study of the properties of plasmas and the design of new plasma devices.
- Nuclear physics: study of the properties of nuclei and the design of new nuclear reactors.

Thematic Leader:

Senior Researchers:

- Professor John Goldsmith
- Professor David Bower
- Professor David Bower
- Professor David Bower

Other Areas of Interest:

- Nuclear physics: study of the properties of nuclei and the design of new nuclear reactors.
- Plasma physics: study of the properties of plasmas and the design of new plasma devices.
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SUPA Particle Physics Theme

UK's largest particle physics research facility in the UK, the University of Exeter, Exeter, Devon & Cornwall.

Advances our particle physics research in the UK and beyond, including the development of new particle accelerators and the design of new particle detectors.

World leaders in the design and development of particle physics research instruments, including the design of the ExoMars TGO and the ESA's JIMO.

Research Focus:

- Particle physics: study of the properties of particles and the design of new particle accelerators.
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Thematic Leader:

Senior Researchers:

- Professor John Goldsmith
- Professor David Bower
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Other Areas of Interest:

- Particle physics: study of the properties of particles and the design of new particle accelerators.
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SUPA Photonics Theme

UK's largest photonics research facility in the UK, the University of Exeter, Exeter, Devon & Cornwall.

Advances our photonics research in the UK and beyond, including the development of new photonics devices and the design of new photonics systems.

World leaders in the design and development of photonics research instruments, including the design of the ExoMars TGO and the ESA's JIMO.

Research Focus:

- Photonics: study of the properties of photons and the design of new photonics devices.
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Thematic Leader:

Senior Researchers:

- Professor John Goldsmith
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Other Areas of Interest:

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SUPA Energy Theme

UK's largest energy research facility in the UK, the University of Exeter, Exeter, Devon & Cornwall.

Advances our energy research in the UK and beyond, including the development of new energy technologies and the design of new energy systems.

World leaders in the design and development of energy research instruments, including the design of the ExoMars TGO and the ESA's JIMO.

Research Focus:

- Energy: study of the properties of energy and the design of new energy technologies.
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Thematic Leader:

Senior Researchers:

- Professor John Goldsmith
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Other Areas of Interest:

- Energy: study of the properties of energy and the design of new energy technologies.
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Headline Facts

Network of over 1200 physics researchers:

- > 300 Principal Investigators*
- > 400 Post Doctoral Research Staff*

Fellowships: (including Emeritus)

- 11 Fellows of the Royal Society*
- 64 Fellows of the Royal Society of Edinburgh*
- 18 RSE Young Academy / Global Academy Members*
- 123 Personal Research Fellowships:*
 - 29 Royal Society*
 - 6 Royal Society of Edinburgh*
 - 17 Marie Curie*
 - 21 Chancellor's / Leadership Fellowships*
 - 50 Other*

Major Awards:

- 2013 Nobel Prize: Peter Higgs*
- 2016 RSE Royal Medal: Jim Hough*

Research Performance:

- 36 European Research Council grants*
- £348.3M of collaborative grant income since 2010*
- £195.5M of non-collaborative grant income since 2010*
- >1200 journal articles per annum*
- "SUPA" included in all publication addresses*

SUPA Graduate School:

- >600 registered PGR students*
- 143 prize studentship awards since 2005*
- 8 state-of-the-art video classrooms*
- 50+ advanced courses*
- EPSRC/STFC Doctoral Training Centres*
- SUSSP summer schools*

Science Policy:

- Chief Scientific Advisor to Scot Gov: Sheila Rowan*
- STFC Council: Richard Kenway*
- STFC Science Board: Peter Clarke, Christine Davies, Rory Duncan*
- EPSRC Strategic Advisory Group: Ifor Samuel*
- Chief Scientific Advisor to Food Standards Scotland: Norval Strachan*



IoP & RSE Awards

(since May 2016)

IoP Awards:

Honorary Fellowship:

- Professor James Hough (Glasgow)
- Professor Wilson Sibbett (St Andrews)

Paterson Medal:

- Professor Malte Gather (St Andrews)

Gabor Medal & Prize:

- Professor Martin Dawson (Strathclyde)

Hoyle Medal & Prize:

- Professor Sheila Rowan (Glasgow)

Education & Outreach Award:

- Stuart Farmer (Robert Gordon's College)

Teachers of Physics Award:

- Jennie Hargeaves (Locherbie Academy)

Swan Medal:

- Dr Graeme Malcolm (Msquared Lasers)

RSE Awards:

2016 RSE Royal Medal

- Jim Hough (Glasgow),

President's Medal of the RSE

- Gravitational Wave Scientists (Glasgow, Strathclyde, Edinburgh, West of Scotland, CalTech)

2017 RSE Public Engagement Senior Prize

- Daniele Faccio (Heriot-Watt),

Cormack Postgraduate Research Prizes 2016:

- Graham Lee (St Andrews)
- Shefy Parsa (Edinburgh).

Fellows elected in 2017:

- Daniele Faccio (Heriot-Watt)
- Lyndsay Fletcher (Glasgow).
- Derryck Reid (Heriot-Watt)

Honorary Fellow elected 2017:

- Anneila Sargent (CalTech, SUPA IAC)

Corresponding Fellow elected 2017:

- Thomas Baer (Stanford, SU2P Board)



Other Awards & Distinctions

(since May 2016)

LISA Pathfinder Team (Glasgow), ***Sir Arthur Clarke Award***

Sheila Rowan (Glasgow), ***WIRED Magazine's Scientific Breakthrough Award***

Ifor Samuel (St Andrews) ***Royal Society of Chemistry, Chemical Dynamics Award 2016***

John Brown (Glasgow, Astronomer Royal for Scotland), ***OBE***

Celso Grebogi (Aberdeen), ***2016 Citation Laureate Award***

Jim Scott (St Andrews), ***2016 UNESCO Medal***

Stephen Barnett (Glasgow), ***2016 Royal Society Research Professorship***

Sheila Rowan & Lyndsay Fletcher (Glasgow) ***2017 Suffrage Science Awards***

Miles Padgett (Glasgow), ***2017 Max Born Award, Optical Society of America***

Allan Phelps (Strathclyde), ***2017 IEEE Plasma & Science Applications Award***

Catherine Heymans (Edinburgh), ***2017 George Darwin Lectureship by the Royal Astronomical Society***

Peter Higgs (Edinburgh), ***2017 Royal Commission for the 1851 Exhibition Medal***

Annette Ferguson (Edinburgh), ***2017 Alexander von Humboldt Foundation Award***

Christine Davies (Glasgow), ***Fellowship of the American Physical Society***

Gerald Buller & Ajoy Kar (Heriot-Watt), ***Fellowship of the Optical Society of America (OSA)***

Press & TV Coverage

“Unique Centre for Designer Quantum Materials opened by Minister”



8th December 2016

The Minister for Further Education, Higher Education and Science Shirley-Anne Somerville officially opened a state-of-the-art centre for Designer Quantum Materials at the University of St Andrews.

The centre, the first of its kind in the UK, is aimed at the creation of new materials which do not exist in nature.



SUPA II Funded Facilities

- SUPAscopes 1m Robotic telescope (Global network)
- The HARPS-N Spectrograph (La Palma)
- Low Vibration Facility / Clean Room (St Andrews)
- SCAPA - Scottish Centre for the Application of Plasma-based Accelerators (Strathclyde)
- MagTEM microscope (Glasgow)
- Electron beam writer, lithography, plasma reactive ion etcher systems & clean room (Heriot-Watt)
- Biophotonics Laboratory (Dundee)

- *SUPA Public Engagement Network - launch event*
8th Sep 2016, Heriot-Watt University, Edinburgh
- *SUPA Graduate School Welcome / Induction:*
28th Oct 2016, Dynamic Earth, Edinburgh
~100 incoming PhD students
- *Science & the Parliament:*
9th Nov 2016, Dynamic Earth, Edinburgh
SUPA table top exhibit
- *SUPA Careers Event:*
6th Dec 2016, Dynamic Earth, Edinburgh
~80 student participants engaging with ~12 physicist speakers from a range of industries
- *SU2P Annual Symposium:*
5th / 6th Apr 2017, Heriot-Watt University
Table top exhibit + SUPA sponsorship of student prizes (talks and posters)
- *DigiFest*
15th March 2017, Birmingham
SUPA presentation by CK joint with Ajenta on SUPA Vidyo classroom network
- *SUPA IoP Resilient Researcher Event:*
21st Apr 2017: University of Edinburgh
Launch of IoP "Resilience Toolkit"



Collaborative Initiatives

- *SFC Research Pooling Directors Meetings:*
 - 15th Sept 2016: AM gave talk on SUPA Graduate School
 - 20th April 2017: Shirley-Anne Summerville, Cabinet Secretary for FE, HE and Science; “Brexit”
- *ScotChem Graduate School Committee:*
 - 15th Dec 2016: AM gave talk on SUPA Graduate School / discussions on joint course & shared moodle site
- *Energy Technology Partnership (ETP):*
 - 13th & 27th Feb 2017: planning of joint pool Energy Emporium Event, 30th May 2017;
 - SUPA now represented on ETP Board
- *SULSA & SERPe:*
 - Number of meetings to discuss joint advanced courses using SUPA Vidyo Network
- *ATC & Higgs Innovation Centre :*
 - 23rd Mar 2017: Moving forward on MoU, including marketing of HIC, extension of SUPA Vidyo system to ATC; planned joint workshops on ‘Data’ and ‘Astrobiology with Cubesats’
- *National Physical Laboratory (Teddington):*
 - 7th Nov 2016: Guest at 1st Annual NPL Post-Graduate Institute conference; pilot CPD lectures transmitted from Vidyo Classrooms to NPL in collaboration with SM-CDT (Edin/Glas).
- *SSERC & Education Scotland*
 - 2nd Dec 2016: Guest at SEERC Annual Conference; presentation by Sheila Rowan; planning of cooperation on producing teacher CPD videos.
- *Institute of Physics - Scotland*
 - 18th Jan 2017: SUPA cooperation on event at Scottish Parliament: “Physics: Key to a Thriving Scottish Economy”; joint session at the 2017 SUPA Annual Gathering



SUPA Support

INPC2019: International Nuclear Physics Conference
led by Glasgow

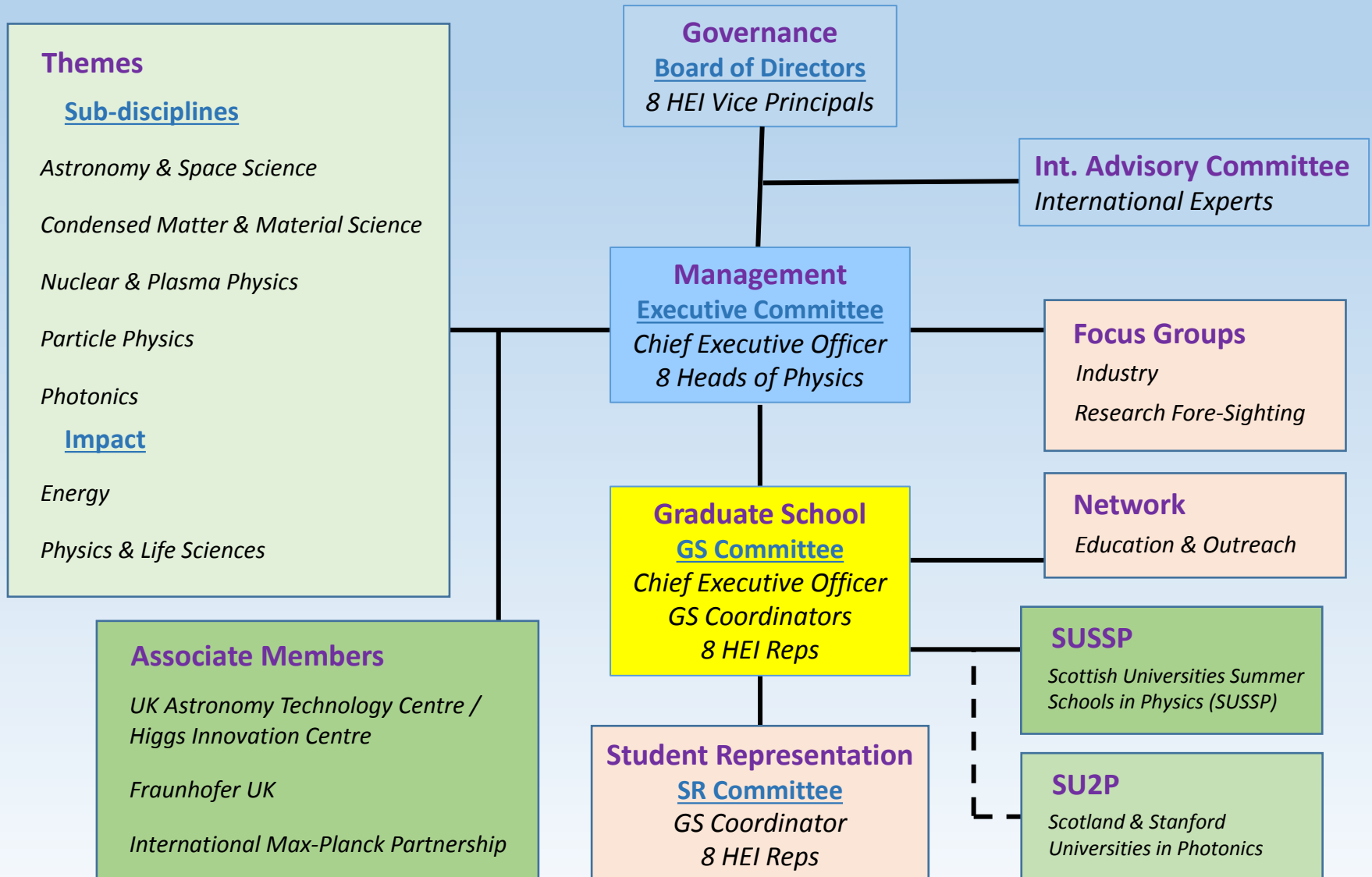
EPSRC proposal:
"Strategic Equipment"
led by Strathclyde and the SCAPA facility

EPSRC proposal:
"Underpinning Multi-User Equipment"
led by St Andrews

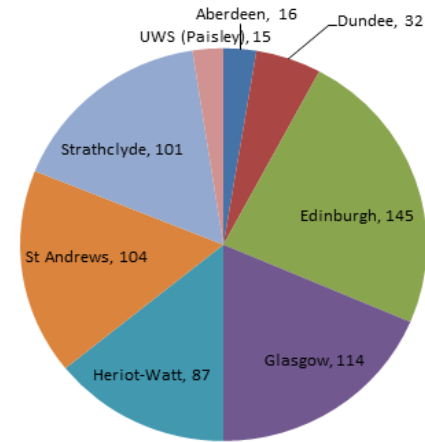
STFC proposal:
"CDT in Data Intensive Science"
led by Edinburgh

Wellcome Trust proposal:
"Edinburgh super-resolution consortium upgrade (ESRIC)"
led by Heriot-Watt

Structure

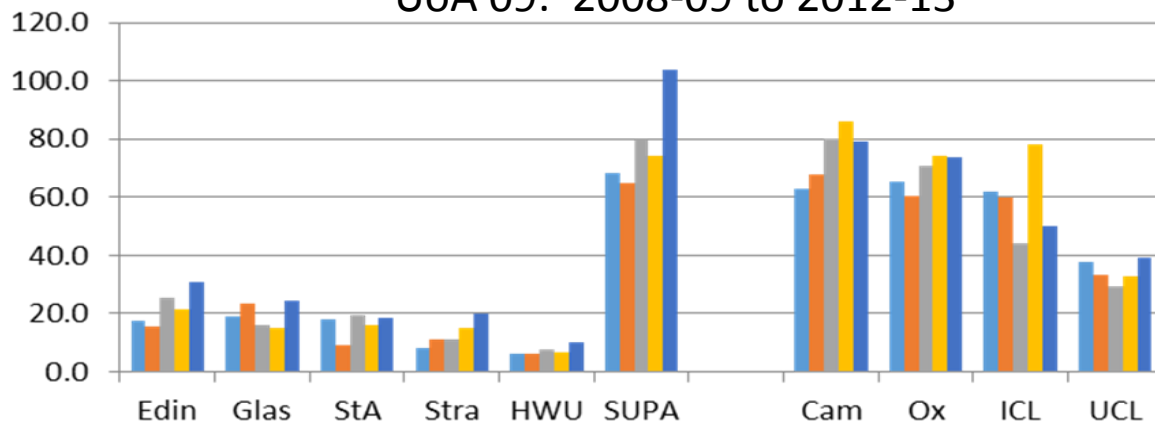


- 626 PGR students registered with the SUPA Graduate School in 2016-17
- 248 Applications for SUPA Prize Studentships for 2017-18 entry



REF2014: Annual PhD Graduations

UoA 09: 2008-09 to 2012-13





Components of SUPA GS

- **Advanced courses delivered via upgraded video-linked training rooms in each of the partner institutions,**
 - 50+ courses (over 800 hours of lectures) delivered annually,
 - all courses recorded; access provided to all SUPA students,
 - working closely with physics-based CDTs,
 - hardware & software upgrade of the SUPA video classroom network completed in summer 2016.

- **Prize studentships**
 - 248 applications for 2016-17

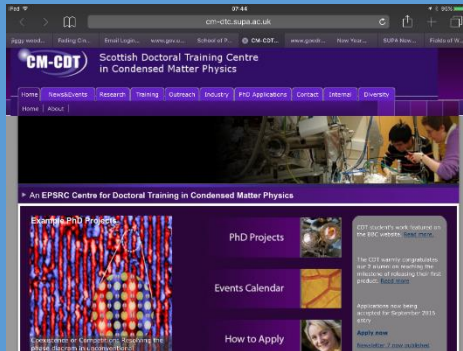
- **“My.SUPA” web portal for all SUPA PGR students,**
 - includes a recruitment site, “Expert Tank”.

- **Cooperation/support for EPSRC & STFC CDTs**

- **SUSSP Summer Schools**

- **Careers Events**

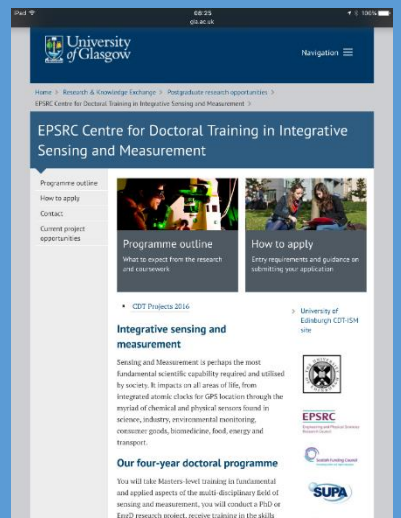
Condensed Matter Physics



Applied Photonics



Integrated Sensing & Measurement



- Use of SUPA PS application system
- Student access to My.SUPA
- Courses via SUPA video classrooms
- Recording / storage / archive of lectures
- CPD lectures to industry from VC rooms
- SUPA funding of industry placements
- Partnering in career events
- Registration on SUPA Expert Tank
- SUSSP summer school support.

SUSSP – now part of SUPA

Scottish Universities Summer Schools in Physics (SUSSP)

Aberdeen, Dundee, Edinburgh, Glasgow, Glasgow Caledonian, Heriot-Watt, St Andrews, Strathclyde, West of Scotland

Established in 1960 by the 4 “ancients” ...

“to contribute to the dissemination of advanced knowledge and the formation of contacts among scientists from different countries”

SUSSP 1 (1960): Dispersion Relations

...

SUSSP 70 (2014): Neutrinos

SUSSP 71 (2015): Frontiers of Quantum Dynamics & Quantum Optics

SUSSP 72 (2016): Photonics Systems for Sensing and Measurement (EPSRC/AP-CDT)

- Schools of the highest international standing
- 1 to 2 weeks in duration including a social programme
- Top researchers from around the world provide 3 or 4 lecturers each
- Typically 80 to 100 research students and PDRAs (NATO ASI style)
- Normally >50% of ‘students’ from abroad



- ❑ SUSSP was granted charitable status in 1973 and is a registered charity with OSCR
- ❑ From March 2017, the SUPA EC became the Trustees (Board) of SUSSP

➤ Opportunity for SUPA to develop the international reputation of SUSSP

Distinguished visitors, events, researcher visits (PECRE)

4 Distinguished Visitors

- Prof Edward Brash visited D. Hamilton and D. Watts (GLA/EDI)
- Dr Crystal Brogan and Dr Todd Hunter visited C Cyganowski (St. A)
- Prof David Miller visited D Reid (HW)

14 Researcher Visits (see map)

- 12 academic exchanges
- 2 industrial placements

7 Events

- STFC Intro Solar Systems Plasmas
- International Conference IPELS 2015
- Young Theorists' Forum
- Conference of Astro & Physics Students (CAPS)
- Research Frontiers in Decommissioning & Radioactive Waste Management Conference 2015
- SUPA Cormack Astronomy Meeting 2015



➤ Re-launch of SUPA Web site

Up-to-date information on SUPA:

- News Items
- Events
- Themes
- My.SUPA / archive of lectures
- Expert Tank

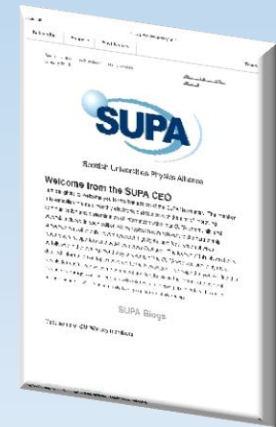


<http://www.supa.ac.uk>

➤ SUPA Newsletters

Features on:

- People, Facilities and Themes
- Research Highlights
- Events & Visitors
- Funding opportunities



➤ SUPA information leaflets



<http://www.supa.ac.uk/newsletter>

➤ Social Media

twitter: @physicsscotland



- Associate Memberships of SUPA formalised in 2016/17:
 - UK Astronomy Technology Centre (incl. Higgs Innovation Centre)
 - Fraunhofer UK / Centre for Applied Photonics
 - International Max-Planck Partnership

- Developing relationships:
 - Other research pools (SRPE, ScotChem, SULSA...)
 - NPL Postgraduate Institute & NPL Scottish Hub
 - Technology Scotland
 - SU2P
 - Innovation Centres, e.g. Censis
 - Education Scotland & Scottish Schools Education Research Centre
 - QuantIC

- Institute of Physics in Scotland:
 - Joint meetings; joint lecture at the SUPA Annual Gathering
 - Shared presence at exhibitions (e.g. Science and the Parliament...)
 - Contact with the Scottish Teachers Network



Developments – funding

➤ Further Funding of SUPA from SFC + institutional support

- £562,500 over 5 years (AY2017/18 – AY2021/22)
- Institutional contribution: £200k per annum
- Purpose is to maintain the central function and administration of SUPA

SFC Expectation:

Outcome 1: a Scottish physics research base that is internationally competitive and improving its reputation in the world,

Outcome 2: access to an excellent learning experience and support for students and early career researchers,

Outcome 3: value created for the Scottish economy and society.

➤ SFC PEER & PECRE funding renewed

- £39,383 over 1 year (AY2017/18)

Areas of support:

Pools Engagement with European Research (PEER) and/or,
Postgraduate & Early Career Research Exchanges (PECRE) with
Europe, North America, China & India

➤ Staff Changes since May 2016:

- Oct 2016: Matthew Wasley (KE Coord.) moved to KTN Photonics (Innovate UK)
- Dec 2016: Phillipa Cheron (admin support) departed - exploring the world
- Jan 2017: Jamie McIntyre (admin support) joined SUPA
- Jan 2017: Iain Ross commenced consultancy to identify external opportunities
- May 2017: Valerie Evans (GS admin support) moved to Industrial Biotech IC
- May 2017: Sean Farrell joined as Learning Technologist / IT support (50% FTE)
- June 2017: Christian Killow (50% GS Coord.) returning to full time research
- June 2017: Dawn Beddard (40% GS Coord.) will provide GS cover for 3 months
- June 2017: Yen-Fu (IT support) returning to Taiwan
- July 2017: Anne Pawsey (50% GS Coord.) returning to full time research

➤ Beyond 1st August (new funding period):

- CEO (50% FTE)
- GS Coordinator (100% FTE; could be job share)
- Learning Technologist (50% FTE)
- Admin Support



Developments – strategy

- “Sustainability Plan” for SUPA approved by BoD in 2014
 - “All alliance partners are committed to SUPA as a permanent feature of the Scottish Physics landscape”.
 - SUPA Graduate School set as the highest priority
- SUPA “Strategic Plan 2016-2021” agreed by BoD in Feb 2016; key components:
 - Continue to build collaborative Physics research capacity in Scotland of the highest quality, benchmarked against global competitors.
 - Continue to develop the SUPA Graduate School with the aim of offering the best training in the world, attracting top research students globally.
 - Continue to expand international links, relationships, collaborations and alliances.
 - Create a supportive environment for PDRAs to maximise expectations for career achievement.
 - Encourage women in development and advancement in careers in physics.
 - Facilitate interdisciplinary cooperation and collaborations via other Scottish research pools, whilst not diminishing the importance of physics as a discipline.
 - Expand SUPA’s industry engagement via the Graduate School and other mechanisms.
 - Support impact creation, development and tracking.
 - Grow coordinated school, public and policy engagement.
 - Provide a basis for collaboration on preparation for REF2020/21.
- Review of SUPA strategy
 - Joint meeting of EC and BoD planned to review opportunities, priorities and overall direction of SUPA, given the uncertain political and financial environment