

Research and Knowledge Exchange Committee

First Report on School Research Activity for 2017/18

May 2017 to Sept 2017 inclusive.

School:	Mathematical & Physical Sciences
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Executive Summary¹

Proposals for Quantum Technology University Research Centre and Quantum Systems Research Programme prepared and submitted or nearly submitted to Sussex Research

No large grants awarded, but significant successes in attracting funding for innovation activity.

UK agrees £65M for Deep Underground Neutrino Experiment in US and SNO+ neutrino observatory starts taking data

Significant Public engagement activity including Science on the Buses and Quantum Computing container exhibit.

Part 1: summary of current activity²

Staffing	Number	FTE
Academic staff	64	63.8
Research only	43	43

Research students	Number	FTE
Funded	111	111
Self-funding	16	15.5
New	30	30 ***
On continuation	8	N/A
Full-time	164	N/A
Part-time	1	N/A

*** includes Sept 2017 admission.

¹ To include: goals met / achieved; challenges faced; goals set for current academic year and plan of how these will be met; summary of any interdisciplinary initiatives and collaborations

² Snapshot figures as on the day the report from the research dashboard is run. Anticipated numbers should not be included.

Part 2: Research output

		2016 Total	2017 to date
Peer-reviewed	Authored book	2	2
	Chapters	2	3
	Journal article	372	142
	Edited book	1	0
	Conference contribution	7	5
	Monograph	0	0
	Other	1	2
Total		385	154
		Number	
Non peer-reviewed (where known)	Authored books	0	0
	Chapters	0	0
	Journal article	0	0
	Book reviews	0	0
		Number	
Conferences hosted		8	8
4* publications produced		15	18 **

** 18 rated 4*, a further 8 rated 3*/4*.

Part 3: Summary of performance in 2016/17

	Number	Total amount (£)
External funding grants (for previous financial year)		5,216,000
External consultations		0
		Number
Staff / research mentions in press (where known)		
Local		
National		
International		

Part 4: Activity since last reporting period, from 01 May 2017 to 30 September 2017

Research related appointments:	<p>German Sinuco, promoted to Research Fellow B Christian Byrnes to Senior Research Fellow Mariapia Palombaro to Senior Lecturer Nicos Georgiou to Senior Lecturer Robert Smith to Senior Lecturer Filippo Cagnetti to Senior Lecturer Yuliya Kyrychko to Reader</p> <p>Dir of Doctoral Studies: Antonella De Santo has handed over to Sebastian Jaeger on 01/08/17.</p> <p>Prof. Kathy Romer replaces Prof. Peter Thomas as head of Astronomy Group</p> <p>Dr. Simon Peeters replaces Prof. Antonella De Santo as head of Experimental Particle Physics Group.</p> <p>Roberto Scipioni appointed new research support technician on 15/06/17</p> <p>Jose Verdu institutionally selected for Royal Academy of Engineering Professorship.</p> <p>Xavier Calmet institutionally selected for Royal Society Professorship.</p> <p>August: Alice King appointed Lecturer in Applied Materials Physics</p>		
Details of key research grants received (i.e. in top decile of all research grants received over last 3 academic years):	<p>Top decile in last 3Y (Physics) = > £481K No grants in Physics above that value since May 2017</p> <p>Top decile in last 3Y (Maths) = > £100.5K No grants in Mathematics above that value since May 2017</p>		
		Total (£):	
Highlighted awards and recognitions:	<p>Andrew Duncan has a secondment at the Alan Turing institute</p> <p>Anotida Madzvamuse – 2yr grant from the Commission for Developing Countries of the International Mathematical Union.</p> <p>Helena Normanton Fellowship: Benjamin Wetzel awarded fellowship; will work with Alessia Pasquazi</p>		
Highlighted areas of Knowledge Exchange:	<p>Jose Verdu – European patent for ion trap chip.</p> <p>Lily Asquith – Science on the buses project displaying particle physics and astrophysics on two Brighton buses; Launch event on September 13</p> <p>Stephen Wilkins – STFC Public Engagement Fellowship award ~£100k.</p> <p>Winni Hensinger – Quantum Computing Container exhibition</p>		

	<p>Fedja Orucevic: - Awarded an Innovate UK grant (£95,000) due to start Sept/Oct 2017.</p> <p>Max Jensen: * KTN Study Group on Electric Storage and Smart Grids is going to take place in Sussex 8-10 January, funded by the Knowledge Transfer Network and the Sussex Impact Fund.</p> <p>Jose Verdu: An Innovate UK project has started for studying the commercial feasibility of the “geonium chip” for Mass Spectrometry. Jose Verdu Galliana is working together in this project with Innovative Cryogenic Engineering Oxford.</p> <p>Max Jensen: Innovate UK grant together with Engineering and companies (Moixa and Sunamp). Postdoc interviews are this week and project should start in November. The project is a feasibility study for ‘virtual power plants’.</p> <p>Simon Peeters: Continuing on Nanopulser development. James Waterfield has been awarded an STFC/RCE fellowship to form Pulser Optics. (In order to help this, Peeters joined the Japanese JSNS2 experiment, which will look for sterile neutrinos and the proposed product is a key calibration device for this)</p> <p>Peeters/Waterfield/White: Patent filed for Pulser Optics</p> <p>Fab Salvatore: Calypso — applications of the Region of Interest concept of the ATLAS Trigger to Network Security (90K grant from STFC for Impact, PDRA employed on it Dr Yusufu Shehu)</p> <p>Istvan Kiss: Following on from the project funded by the research development fund we have now secured data from an insurance company (Avivia) and we are working on a proper data mining/ analysis project.</p> <p>Various activities in British Science Festival</p>
Key activities (not covered by the above categories):	<p>May 25: Probability Group ‘un’conference; ERA for Probability and Statistics group, Prof. Andreas Kyprianou, visited</p> <p>Completion of the Accelerator Building, Peter Kruger’s Lab</p> <p>HPC User group Meetings</p> <p>September 18-19: First Data Intensive Science Centre in SEPnet (DISCnet) training workshop event</p> <p>Significant Research outcomes: Antony Lewis: First detection of delensing of cosmic microwave background polarization.</p> <p>Konstantinos Koumatos: I have recently submitted a paper which makes use of the notion of quasiconvexity to prove a result for the evolution equations of elasticity. Quasiconvexity is known to be the correct notion and strongly utilised in the static problem. In dynamics, this has been the first time and our techniques can prove useful to tackle more problems. The paper is currently under review for a major mathematical journal.</p>

	<p>Simon Peeters: First DEAP3600 (direct dark matter detection) published (not world leading yet – it's a race - but demonstrating successful start of operation).</p> <p>Jose Verdu Galliana: "The Quantum Theory of the Penning Trap" has been accepted for publication in Journal of Modern Optics. Jose Verdu Galliana is co-author with Frances Crimin and Barry Garraway.</p> <p>Sebastian Jaeger: I have done an influential (47 cites so far) paper on the theoretical implications of a recent LHC measurement of possible lepton-universality breaking.</p> <p>Simon Peeters: SNO+ has started to talk its first data on the 4th of May. This is with water only, which will allow a world limit on nucleon decay. The experiment will move into a scintillator phase in early 2018 and in end of 2018 starts its search for neutrinoless double-beta decay to help unravel the mystery of the matter-anti-matter in the universe.</p> <p>Simon Peeters: The UK DUNE experiment has been awarded £65M by Jo Johnson</p>
Bullet point key activities to be reported to Senate (maximum of 4):	<p>Proposals for Quantum Technology University Research Centre and Quantum Systems Research Programme prepared and submitted or nearly submitted to Sussex Research</p> <p>Significant successes in attracting funding for innovation activity.</p> <p>UK agrees £65M for Deep Underground Neutrino Experiment in US and SNO+ neutrino observatory starts taking data</p> <p>Significant Public engagement activity including Science on the Buses and Quantum Computing container exhibit.</p>
Please provide a brief update on reviews of your schools' research centres (maximum of 250 words):	<p>Proposals for Quantum Technology University Research Centre and Quantum Systems Research Programme prepared and submitted or nearly submitted to Sussex Research</p>
Any other issues:	<p>Asset Register: Any equipment over £10,000 to be added to the MPS equipment register</p>

Name:	Seb Oliver	School:	MPS
		Date:	9 Oct 2017