

MPS Research Update

August, September 2018

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Staff mentions in the press, Public Engagement

Chris Byrnes received a brief mention in the Physics journal article, *Controversy Continues over Black Holes as Dark Matter*. <https://physics.aps.org/articles/v11/99>

Kate Shaw & Lily Asquith were part of a team running the Physics Pavillion at WOMAD. <https://www.bbc.co.uk/news/science-environment-36943937>

Awards and Recognitions

Simon Peeters was selected by the UK collaboration management to be Project Manager for the DAQ (Data Acquisition) of the 7-year DUNE construction grant.

Areas of Knowledge Exchange

Nothing to report this period.

Talks delivered (outside own research groups)

An invited plenary talk was given by **Lily Asquith** at the XIII Quark Confinement & Hadron Spectrum conference in Maynooth, Ireland, 31 July - 06 August 2018, entitled "Advances in Machine Learning and applications to QCD".

An invited presentation was delivered by **Chandrasekhar Venkataraman** at the meeting "Differential Equations arising from Organising Principles in Biology" at Oberwolfach, Germany, 23-29 September 2018.

Chandrasekhar was also an invited speaker representing Mathematical Biology at the LMS Prospects in Mathematics Meeting 2018, Warwick, UK, September 2018.

German Sinuco presented at the PHOTON 18 conference, Aston University, Birmingham, UK, 05 September 2018, "Manipulating ultracold atoms with low-frequency radiation".

Bertram During delivered a seminar talk "High-order compact finite difference methods for parabolic problems with mixed derivative terms and applications in computational finance", Scientific Computing division of Uppsala University, 27/09/18

http://user.it.uu.se/~maya/seminar_abstracts/sem_fall18/BDuring.html

Bertram was also co-organiser of a five day workshop at International Center of Mathematical Sciences, Edinburgh, on "Gradient flows: challenges and new directions", with funding from EPSRC, London Mathematical Society, The Alan Turing Institute, and Institute of Mathematics and its Applications

<http://www.icms.org.uk/gradientflows.php>

Impact

Istvan Kiss (Impact Lead, Mathematics) reports:

- The University of Sussex has signed a Software Licence Agreement with TissueGnostics GmbH for using Software developed by Prof Anotida Madzvamuse.
- Konstantin Blyuss's research result have been used to provide input for controlled lab experiments in Ukraine, where new crop protection methods based on RNA silencing are developed.
- Mathematics has successfully submitted 4 updated case studies for the University's next round of mock assessment.
- Nicos Georgiou has put in a new impact case studies based on "Research-led public engagement and outreach captures public interest in mathematics"

Nicos Georgiou & Istvan Kiss wrote a piece for "The conversation", "Game theory can prevent disease outbreaks", 12 September 2018. This has had over 3200 reads. Details are here <https://analytics.theconversation.com/uk/institutions/university-of-sussex-1218/articles/show/102934/dates/20180902/20181002>

Lily Asquith has now completed her secondment to the Foreign and Commonwealth office under the Royal Society Policy Secondment Scheme:

https://www.theguardian.com/science/life-and-physics/2018/jul/09/a-particle-physicist-in-whitehall?utm_source=hootsuite&utm_medium=social&utm_campaign=standard

Significant Research outcomes – results

Simon Peeters reports on DEAP: *the first full-scale single phase liquid argon detector. The detector paper, describing the uniquely low-background construction: <https://arxiv.org/pdf/1712.01982.pdf>, has been accepted by Astroparticle Physics. The first physics results are in Phys.Rev.Lett. 121 (2018) no.7, 071801.*

Lily Asquith informs on publication of the ATLAS ttH observation paper. (This was made available on SRO in October 2018.).
<http://sro.sussex.ac.uk/79448/>

Jeff Hartnell reports “We hit a major milestone for the DUNE neutrino experiment. Our PhD student, Alex Booth, is out at CERN working on ProtoDUNE.
<http://news.fnal.gov/2018/09/first-tracks-in-prototype-for-neutrino-experiment/>

Other Research news

Max Jensen informs: “I got 105 Nodes for 30 days on Google’s computing cluster TFRC for machine learning. That is more than 10% of their research cluster, and would cost $\$4.5 \times 24 \times 105 \times 30 = \$340,200$ if bought at the *commercial* rate. (That is with the current *promotional* price). Cost would have been $\$6.5 \times 24 \times 105 \times 30 = \$491,400$ at the full commercial price.

Max Jensen hosted Prof Jose Julio Pedrosa Filho (<http://www.sussex.ac.uk/maths/people/peoplelists/person/442583>) in August to work with him on mean field games. Prof Pedrosa Filho is Visiting Lecturer in the Sussex mathematics department for one year and is associate professor at UERJ in Brazil.

Chandrasekhar Venkataraman completed an invited research visit to the Institut Mittag Leffler, Sweden, September 2018.

Bertram Duering acted as Faculty opponent in a PhD defense at the Scientific Computing division of Uppsala University, 28 September 2018.

Department of Mathematics. Publications deposited in SRO in August & September 2018.

To view the paper enter the SRO ID number as <http://sro.sussex.ac.uk/nnnnn>

Sussex Author	SRO ID	Status	Author(s)	Output Title	Volume Title
Barnard, Rosanna C	78267	Published	Barnard, Rosanna C; Kiss, Istvan Z; Berthouze, Luc; Miller, Joel C	Edge-based compartmental modelling of an SIR epidemic on a dual-layer static-dynamic multiplex network with tunable clustering	Bulletin of Mathematical Biology
Bond, S	77666	Published	Bond, Stuart; Taheri, Ali	Operators of Laplace transform type and a new class of hypergeometric coefficients	Advances in Operator Theory
Bond, Stuart	77666	Published	Bond, Stuart; Taheri, Ali	Operators of Laplace transform type and a new class of hypergeometric coefficients	Advances in Operator Theory
Campillo-Funollet, E	78048	Accepted	Campillo-Funollet, Eduard; Venkataraman, Chandrasekhar; Madzvamuse, Anotida	Bayesian parameter identification for Turing systems on stationary and evolving domains	Bulletin of Mathematical Biology
Campillo-Funollet, E	78048	Accepted	Campillo-Funollet, Eduard; Venkataraman, Chandrasekhar; Madzvamuse, Anotida	Bayesian parameter identification for Turing systems on stationary and evolving domains	Bulletin of Mathematical Biology
Cusseddu, D	78785	Published	Cusseddu, D; Edelstein-Keshet, L; Mackenzie, J A; Portet, S; Madzvamuse, A	A coupled bulk-surface model for cell polarisation	Journal of Theoretical Biology
During, Bertram	77755	Accepted	During, Bertram; Pareschi, Lorenzo; Toscani, Giuseppe	Kinetic models for optimal control of wealth inequalities	European Physical Journal B: Condensed Matter and Complex Systems
Georgiou, Nicos	77529	Published	Georgiou, Nicos; Ortmann, Janosch	Optimality regions and fluctuations for Bernoulli last passage models	Mathematical Physics, Analysis and Geometry
Georgiou, Nicos	77530	Accepted	Georgiou, Nicos; Khoshnevisan, Davar; Kim, Kunwoo; Ramos, Alex	The dimension of the range of a transient random walk	Electronic Journal of Probability
Giesl, Peter A	77752	Accepted	Giesl, Peter; Wendland, Holger	Construction of a contraction metric by meshless collocation	Discrete and Continuous Dynamical Systems - Series B
Giesl, Peter A	79058	Accepted	Giesl, Peter; Wendland, Holger	Kernel-based discretisation for solving matrix-valued PDEs	SIAM Journal on Numerical Analysis

Karaoglu, Fatma	78533	Published	Karaoglu, Fatma	The cubic surfaces with twenty-seven lines over finite fields	
Trott, L	77757	Published	Trott, L; Hafezparast, M; Madzvamuse, A	A mathematical understanding of how cytoplasmic dynein walks on microtubules	Royal Society Open Science

Department of Physics & Astronomy. Publications deposited in SRO in August & September 2018.

To view the paper enter the SRO ID number as <http://sro.sussex.ac.uk/nnnnn>

Sussex Author	SRO ID	Status	Author(s)	Output Title	Volume Title
Bao, Hualong	77485	Published	Bao, Hualong; Cooper, Andrew; Chu, Sai T; Moss, Dave J; Morandotti, Roberto; Little, Brent E; Peccianti, Marco; Pasquazi, Alessia	Type-II micro-comb generation in a filter-driven four wave mixing laser [Invited]	Photonics Research
Bao, Hualong	77485	Published	Bao, Hualong; Cooper, Andrew; Chu, Sai T; Moss, Dave J; Morandotti, Roberto; Little, Brent E; Peccianti, Marco; Pasquazi, Alessia	Type-II micro-comb generation in a filter-driven four wave mixing laser [Invited]	Photonics Research
Bason, Mark G	77745	Published	Bason, Mark; Heck, Robert; Napolitano, Mario; Eliasson, Ottó; Müller, Romain; Thorsen, Aske; Zhang, Wen-Zhuo; Arlt, Jan J; Sherson, Jacob F	Measurement-enhanced determination of BEC phase transitions	Journal of Physics B: Atomic, Molecular and Optical Physics
Calmet, Xavier	78904	Accepted	Calmet, Xavier; El-Menoufi, Basem; Latosh, Boris; Mohapatra, Sonali	Gravitational radiation in quantum gravity	The European Physical Journal C - Particles and Fields
Calmet, Xavier	78904	Accepted	Calmet, Xavier; El-Menoufi, Basem; Latosh, Boris; Mohapatra, Sonali	Gravitational radiation in quantum gravity	The European Physical Journal C - Particles and Fields
Calmet, Xavier	78904	Accepted	Calmet, Xavier; El-Menoufi, Basem; Latosh, Boris; Mohapatra, Sonali	Gravitational radiation in quantum gravity	The European Physical Journal C - Particles and Fields
Dunningham, Jacob A	78162	Accepted	Kritsotakis, Michail; Szigeti, Stuart S; Dunningham, Jacob A; Haine, Simon A	Optimal matterwave gravimetry	Physical Review A (PRA)
Hartnell, Jeff J	78388	Published	Alion, T; Baird, M; Blackburn, T; Davies, J P; Hartnell, J; Mendez Mendez, D; Vinton, L; Zamorano, B; NOva Collaboration,	New constraints on oscillation parameters from ν_e appearance and ν_μ disappearance in the NOvA experiment	Physical Review D
Hayes, Anthony J	78385	Published	Hayes, Anthony	Quantum enhanced metrology: quantum mechanical correlations and uncertainty relations	
King, Alice AK	78685	Published	Simon, Thomas; Pinioti, Sotiria; Schellenberger, Pascale; Rajeeve, Vinothini; Wendler, Franz; Cutillas, Pedro R; King, Alice; Stebbing, Justin; Giamas, Georgios	[Letter to editor] Shedding of bevacizumab in tumour cells derived extracellular vesicles as a new therapeutic escape mechanism in glioblastoma	Molecular Cancer
Nirkko, Martti C	78538	Published	Nirkko, Martti; Hagino, Kouichi	Branching ratios for deexcitation processes of daughter nuclei following invisible dinucleon decays in ^{16}O	Journal of Physics G: Nuclear and Particle Physics

Pasquazi, Alessia	78041	Published	Pasquazi, Alessia; Peccianti, Marco; Razzari, Luca; Moss, David J; Coen, Stéphane; Erkintalo, Miro; Chembo, Yanne K; Hansson, Tobias; Wabnitz, Stefan; Del'Haye, Pascal; and 2 other(s)	Micro-combs: a novel generation of optical sources	Physics Reports
Peccianti, Marco	77479	Published	Zografopoulos, Dimitrios C; Prokopidis, Konstantinos P; Ferraro, Antonio; Peters, Luke; Peccianti, Marco; Beccherelli, Romeo	Numerical and experimental time-domain characterization of terahertz conducting polymers	IEEE Photonics Technology Letters
Peccianti, Marco	77485	Published	Bao, Hualong; Cooper, Andrew; Chu, Sai T; Moss, Dave J; Morandotti, Roberto; Little, Brent E; Peccianti, Marco; Pasquazi, Alessia	Type-II micro-comb generation in a filter-driven four wave mixing laser [Invited]	Photonics Research
Peeters, Simon JM	77756	Accepted	Amaudruz, P A; Baldwin, M; Batygov, M; Beltran, B; Bina, C E; Bishop, D; Bonatt, J; Boorman, G; Boulay, M G; Broerman, B; and 2 other(s)	First results from the DEAP-3600 dark matter search with argon at SNOLAB	Physical Review Letters
Peters, Luke	77479	Published	Zografopoulos, Dimitrios C; Prokopidis, Konstantinos P; Ferraro, Antonio; Peters, Luke; Peccianti, Marco; Beccherelli, Romeo	Numerical and experimental time-domain characterization of terahertz conducting polymers	IEEE Photonics Technology Letters
Romer, Kathy K	78908	Published	Tarsitano, F; Hartley, W G; Armara, A; Bluck, A; Bruderer, C; Carollo, M; Conselice, C; Melchior, P; Moraes, B; Refregier, A; and 0 other(s)	A catalogue of structural and morphological measurements for DES Y1	Royal Astronomical Society
Romer, Kathy K	78909	Published	Zuntz, J; Sheldon, E; Samuroff, S; Troxel, M A; Jarvis, M; MacCrann, N; Gruen, D; Prat, J; Sánchez, C; Choi, A; and 1 other(s)	Dark energy survey year 1 results: weak lensing shape catalogues	Royal Astronomical Society
Romer, Kathy K	78910	Published	Treu, T; Agnello, A; Baumer, M A; Birrer, S; Buckley-Geer, E J; Courbin, F; Kim, Y J; Lin, H; Marshall, P J; Nord, B; and 0 other(s)	The STRong lensing Insights into the Dark Energy Survey (STRIDES) 2016 follow-up campaign – I. Overview and classification of candidates selected by two techniques	Royal Astronomical Society
Romer, Kathy K	78911	Published	Mudd, D; Martini, P; Zu, Y; Kochanek, C; Peterson, B M; Kessler, R; Davis, T M; Hoormann, J K; King, A; Lidman, C; and 1 other(s)	Quasar accretion disk sizes from continuum reverberation mapping from the Dark Energy Survey	Astrophysical Journal
Romer, Kathy K	78912	Published	Shipp, N; Drilca-Wagner, A; Balbinot, E; Ferguson, D; Li, T S; Bechtol, K; Belokurov, V; Buncher, B; Carollo, D; Carrasco Kind, M; and 1 other(s)	Stellar streams discovered in the Dark Energy Survey	The Astronomical Journal
Sargent, Mark	78218	Published	Strazzullo, V; Coogan, R T; Daddi, E; Sargent, M T; Gobat, R; Valentino, F; Berthermin, M; Pannella, M; Dickinson, M; Renzini, A; and 5 other(s)	Deciphering the activity and quiescence of high-redshift cluster environments: ALMA observations of Cl J1449+0856 at $z = 2$	The Astrophysical Journal
Sargent, Mark	78219	Accepted	Pavesi, Riccardo; Sharon, Chelsea E; Riechers, Dominik A; Hodge, Jacqueline A; Decarli, Roberto; Walter, Fabian; Carilli, Chris L; Daddi, Emanuele; Smail, Ian; Dickinson, Mark; and 8 other(s)	The CO luminosity density at high- z (COLDz) survey: a sensitive, large area blind search for low-J CO emission from cold gas in the early universe with the Karl G. Jansky very large array	The Astrophysical Journal
Sargent, Mark	78220	Accepted	Jin, Shuowen; Daddi, Emanuele; Liu, Daizhong; Smolcic, Vernesa; Schinnerer, Eva; Calabró, Antonello; Gu, Qiusheng; Delhaize, Jacinta; Delvecchio, Ivan; Gao, Yu; and 9 other(s)	"Super-deblended" dust emission in galaxies: II. Far-IR to (sub)millimeter photometry and high redshift galaxy candidates in the full COSMOS field	The Astrophysical Journal

Sargent, Mark	78221	Accepted	Franco, M; Elbaz, D; Béthermin, M; Magnelli, B; Schreiber, C; Ciesla, L; Dickinson, M; Nagar, N; Silverman, J; Daddi, E; and 28 other(s)	GOODS-ALMA: 1.1 mm galaxy survey - I. Source catalogue and optically dark galaxies	Astronomy & Astrophysics
Sargent, Mark	78222	Accepted	Perna, M; Sargent, M T; Bursa, M; Daddi, E; Ferglio, C; Cresci, G; Lanzuisi, G; Lusso, E; Comastri, A; Coogan, R T; and 3 other(s)	The molecular gas content in obscured AGN at $z > 1$	Astronomy & Astrophysics
Thomas, Peter A	78044	Published	Asquith, Rachel; Pearce, Frazer R; Almaini, Omar; Knebe, Alexander; Gonzalez-Perez, Violeta; Benson, Andrew; Blaizot, Jeremy; Carretero, Jorge; Castander, Francisco J; Cattaneo, Andrea; and 16 other(s)	Cosmic CARNage II: the evolution of the galaxy stellar mass function in observations and galaxy formation models	Monthly Notices of the Royal Astronomical Society
Thomas, Peter A	78045	Published	Knebe, Alexander; Pearce, Frazer R; Gonzalez-Perez, Violeta; Thomas, Peter A; Benson, Andrew; Asquith, Rachel; Blaizot, Jeremy; Bower, Richard; Carretero, Jorge; Castander, Francisco J; and 23 other(s)	Cosmic CARNage I: on the calibration of galaxy formation models	Monthly Notices of the Royal Astronomical Society
Totero Gongora, Juan Sebastian S	78990	Published	Favraud, Gael; Totero Gongora, Juan Sebastian; Fratalocchi, Andrea	Evolutionary photonics for renewable energy, nanomedicine, and advanced material engineering	Lasers & Photonics Reviews
Totero Gongora, Juan Sebastian S	78991	Published	Totero Gongora, Juan Sebastian; Fratalocchi, Andrea	Ab-initio techniques for light matter interaction at the nanoscale	Computational Chemistry Methodology in Structural Biology and Materials Sciences
Tripathi, Manoj	78473	Published	Tripathi, Manoj; Mahmood, Haroon; Novel, David; Iacob, Erica; Vanzetti, Lia; Bartali, Ruben; Speranza, Giorgio; Pegoretti, Alessandro; Pugno, Nicola	Nanoscale friction of graphene oxide over glass-fibre and polystyrene	Composites Part B: Engineering
Tripathi, Manoj	78474	Published	Awaja, Firas; Tripathi, Manoj; Wong, Tsz-Ting; O'Brien, Timothy; Speranza, Giorgio	The chemistry and topography of stabilized and functionalized graphene oxide coatings	Plasma Process Polymers

GRANTS. Submitted, Forecasted, and Awarded

August & September 2018

Principal Investigator	Principal Funder	Programme	Title	£ Value	Notes
SUBMITTED					
Banfi, Andrea	Royal Society	URF	From Higgs physics to dark matter searches: the quest for precision [External]	635,861	
Banfi, Andrea	Royal Society	URF	Multiple Partonic Scattering at the Large Hadron Collider and Beyond (External)	620,081	
Banfi, Andrea	STFC	Ernest Rutherford Fellowship	From Higgs physics to dark matter searches: a quest for precision [External]	509,503	
Blyuss, Konstantin	BBSRC	Agri-systems research to enhance livelihoods in developing countries (GCRF)	Innovative approach to growing crops using new microbial bioregulators to improve productivity and sustainable development of agriculture in Ukraine	553,077	
Byrnes, Christian	Royal Society	URF	Early Universe Cosmology on Large and Small Scales [External]	572,787	
Byrnes, Christian	Royal Society	URF	Pushing the boundaries of the cosmological model [External]	733,600	
Byrnes, Christian	STFC	Ernest Rutherford Fellowship	Pushing the boundaries of the cosmological model [External]	509,503	
Dalton/Krueger/Subramanian	Research England	RE England (E3) Fund	Sussex Centre for Computational and Advanced Functional Materials	7,500,000	
Dunningham, Jacob	Royal Society	URF	Quantum enhancing the eEDM measurement [External]	732,100	
Hartnell, Jeff	Royal Society	URF	Hunting extra-galactic neutrinos in Antarctica [External]	760,679	
Hartnell, Jeff	STFC	Standard Research Grant	DUNE UK Production Project	1,380,467	
Hensinger, Winnie	Royal Academy of Engineering	Chair of Emerging Technologies	Developing quantum computers for practical applications	2,687,000	
Iliev, Ilian	STFC	Ernest Rutherford Fellowship	Shining Light into the Cosmic Dark Ages (External Candidate)	471,989	
Iliev, Ilian	EU	ERC Advanced Grant	Understanding Cosmic Reionization through the power of Petascale Computing and Machine Learning	1,944,205	
Lewis, Antony	Royal Society	URF	A next era of precision cosmology with galaxy surveys [External]	728,457	
Loveday, Jonathan	EU	ERC Advanced Grant	Cosmology from Southern Sky Survey Synergies (CoSyn)	1,530,292	
Keller, Matthias	EPSRC	Standard Research Grant	Molecular Spectroscopy for Fundamental Physics	1,147,591	
Krueger, Peter	National Multiple Sclerosis Society	NMSS Pilot Research Grants	Combining neurophysiology with myelin and sodium MRI to explain MS symptoms	17,880	
Krueger, Peter	Wolfson Foundation	Donation Research	Exploiting quantum sensors to revolutionise our understanding of biological systems	2,850,500	
Madzvamuse, Anotida	EPSRC	Standard Research Grant	Rho GTPase spatiotemporal dynamics: Data-driven mathematical modelling	407,048	PI- Mara Cercignani (NEUROIM)
Oliver, Seb	Leverhulme Trust	Leverhulme Research Centres	The Leverhulme Centre for the Future of the Archive	3,580,725	14% share in Tim Hitchcock's multi-school bid
Oliver, Seb	Royal Society	URF	Changing the status quo in galaxy evolution [External]	713,899	

Oliver, Seb	STFC	GCRF Global Challenges Research Fund Call 2018	SA-Discnet 2: Expanding our data science training network for African students	0	
Oliver, Seb	STFC	GCRF Global Challenges Research Fund Call 2018	AstroCast2: Applying Astronomy Data Analysis to enhance disaster forecasting (Implementation)	0	
Sanz, Veronica	EU	ERC Advanced Grant	Heavy axions and axion-like particles (HAXIONS)	1,530,292	
Sanz, Veronica	STFC	GCRF Global Challenges Research Fund Call 2018	Supporting early X-Ray diagnostic in remote areas using Machine Learning techniques deployed in a mobile phone app	270,441	
Thomas, Peter	Royal Society	URF	Rousing the monsters: elucidating the critical role of AGN in cluster cosmology [External]	637,861	
Totero, Juan	EU	H2020 - Marie Skłodowska-Curie actions	harnessing COMplexity in microresoNators For Integrated Eurocomputing Applications (CONFINE)	1,790,348	
Tripathi, Manoj	EU	H2020 - Marie Skłodowska-Curie actions	Suspended single layer of 2D material based as electrochemical and electromechanical based actuators (2D_HSAct)	179,948	
Venkataraman, Chandrasekhar	BBSRC	UKRI JSPS Joint Call	Integrating experiments and modelling to develop an in silico framework for studying pigment pattern formation	219,571	
Vivarelli, Iacopo	Royal Society	URF	Probing the unknown with multi-top events [External]	725,100	
Vivarelli, Iacopo	EU	H2020 - Marie Skłodowska-Curie actions	Are taus the key to Dark Matter? (DMwithTauLeptons) [External]	179,948	
Vivarelli, Iacopo	STFC	Ernest Rutherford Fellowship	Probing the unknown with multi-top events	515,665	
Peeters, Simon	STFC	GCRF Global Challenges Research Fund Call 2018	The Latin America - UK Neutrino Initiative: Strengtening The Links	0	

FORECASTED

Iliev, Ilian	Royal Society	Enhancement Grant	Traces of Primordial Star Formation in the 21-cm Signal [External]	220,539	Fellow: Anastasia Fialkov
Oliver, Seb	STFC	Innovation Partnership Fellowship	Innovation Partnership Fellow at University of Sussex	28,192	
Simm, Nicholas	Royal Society	Enhancement Grant	Log-correlated Gaussian fields and symmetry classes in random matrix theory	199,618	

AWARDED

Davies, Michael (Alan Dalton + Subramanian)	EPSRC	Capital Project	Sussex EPSRC Capital Award in Support of Early Career Researchers	100,000	
DeSanto, Antonella	STFC	Project Peer Review Panel - Large Projects	ATLAS Phase-2 Upgrade 2018-2024 (Sussex Component)	456,659	
Keller, Matthias	EPSRC	Standard Research Grant	Ultra-High Vacuum Fibre Feedthroughs for Quantum Technologies	107,204	
Krueger, Peter	Innovate UK	TSB Faraday Battery Challenge: Innovation feasibility challenge	Current Density Imaging in EV battery modules	114,194	
Krueger, Peter	DSTL	Studentship	Experimental Demonstration of an Ultracold atom magnetic microscope	46,308	
Krueger, Peter	EPSRC	UK Quantum Technology Hub for Sensors	UK Quantum Technology Hub for Sensors and Metrology	246,796	