

MPS Research Update

October 2019

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Staff mentions in the press, public engagement

University of Sussex

Anotida Madzvamuse, Chandrasekhar Venkataraman, Vanessa Styles: 'Sussex mathematicians model how rice blast disease kills enough crops to feed 60 million people yearly' – "A team of Mathematicians from Sussex have co-written a paper which has been published in the international science journal "Nature"
(<http://www.sussex.ac.uk/staff/newsandevents/?id=49998>)

Awards & Recognitions

Enrico Scalas has been a Visiting Professor at the University of Turin from 30th September 2019 to 25th October 2019.

Areas of Knowledge Exchange

No news reported in this area.

Talks Delivered

Bertram Duering was invited to talk at the workshop "*Recent Progress and Challenges in Quantum & Kinetic Problems*", Institute for Mathematics, NUS, Singapore, 3rd October 2019.

Bertram was also invited to talk at the workshop "*The future of structure-preserving algorithms*", International Centre for Mathematical Sciences (ICMS), Edinburgh, UK, 15th October 2019.

Enrico Scalas has presented a seminar on "*Functional and Thermodynamic Limits of a Simple Coagulation-Fragmentation Markov Chain*" at the Department of Mathematics "G. Peano" of the University of Turin on 15th October 2019.

Prof Istvan Kiss delivered a Keynote Presentation and a Contributed talk at the 19th International Symposium on Mathematical and Computational Biology, Bolyai Institute, University of Szeged/Hungarian Academy of Sciences, Hungary, 21st – 25th October 2019.

Impact

No news reported in this area.

Significant Research Outcomes

No news reported in this area.

Other news**University of Sussex**

'New 'fuzzy' dark matter research disrupts conventional thinking' – “New research conducted at the University of Sussex has simulated dark matter in a new way for the first time, disrupting conventional thinking about the make-up of the universe. The research, published in [Physical Review Letters](#), was done alongside Princeton, Harvard, Cambridge and MIT universities and others” (<http://www.sussex.ac.uk/staff/newsandevents/?id=49838>)

Grant Report

Unfortunately, due to system problems some grants may be missing from the information below. If this is so, please could you contact mpsresearchsupport@sussex.ac.uk and the report will be amended.

Submitted

PI/Co-I	Principal Funder	Funder Programme	Project Title	Overall Applied Amount £
Boland, Conor	EU	H2020 - ERC Starting Grant	SENSE — Selectively Engineering Nano Systems in Electromechanics	£1,190,475
Byrnes, Chris	Royal Astronomical Society	RAS Sir Norman Lockyer Fellowship	Black holes, dark matter, and the beginning of the Universe [External]	£163,256
Jaeger, Seb	STFC	STFC Ernest Rutherford Fellowship	Searching for New Physics Effectively [External]	£509,641
Jensen, Max	Leverhulme Trust	H2020 - Marie Curie Individual Fellowships: European Fellowship	Two-dimensional stochastically perturbed shallow water equations	£18,113
Oliver, Seb	Agriculture and horticulture development board	Studentship	An empirical, data-driven, model for wheat cultivars and optimisation for future climate scenarios	£74,100
Smith, Robert	STFC	STFC Ernest Rutherford Fellowship	Fundamental Physics from Galaxy Surveys [External]	£565,893
Venkataraman, Chandrasekhar	Leverhulme Trust	Leverhulme Trust Visiting Professorship	Visiting Professorship - Professor Shigeru Kondo	£21,095
Shaw, Kate	STFC	STFC Ernest Rutherford Fellowship	Higgs Boson as a Probe in the Search for New Physics	£509,641
Wilkins, Stephen	Research England	Public Engagement	DISCUS: The Next Generation	£21,298
Wilkins, Stephen	STFC	STFC Public Engagement Spark Award	Happy Birthday Hubble: Celebrating the 30 year Legacy of the Hubble Space Telescope	£14,999

Forecasted

Vivarelli, Iacopo	European Union	H2020 - Marie Curie Research and Innovation Staff Exchange (RISE)	Future Experiments seek Smart Technologies (FEST)	£16,355
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Awarded

Dalton, Alan	Beford Industries	Consultancy	Mechanical Properties of Graphene Based Elastomeric composites	£10,400
Hartnell, Jeff	STFC	Research Grant	DUNE UK Production Project	£875,023
Huber, Stefan	STFC	STFC 2019 Particle Physics Review of Theory Consolidated Grants	South-Eastern Particle Theory Alliance Sussex - RHUL - UCL 2020-2023 - Sussex node	£862,409
Kruger, Peter	EPSRC through Birmingham Quantum Hub	UOB UK QT Hub SU: New Academic Collaborations	Current-density imaging on an electric vehicle battery cell	£7,240
Lakkis, Omar	Ambiental Technical Solutions Ltd	Case Studentship	Two-dimensional stochastically perturbed shallow water equations	£25,200
Madzvamuse, Anotida	EPSRC	GCRF - Building capacity to tackle global development challenges through mathematical sciences research	UK-Africa Postgraduate Advanced Study Institute in Mathematical Sciences (UK-APASI)	£156,090
Oliver, Seb	STFC	STFC Food Innovation Network	Remote sensing led monitoring and forecasting of global banana production	£1,195

Department of Mathematics. Publications deposited in SRO during October 2019						
To view the publication, enter the five-digit SRO ID number as http://sro.sussex.ac.uk/nnnnn						
Sussex Author	SRO ID	Status	Author(s)	Output Title	Volume Title	
Madzvamuse, Anotida	86862	Accepted	Madzvamuse, Anotida; Sarfaraz, Wakil	Stability analysis and parameter classification of a reaction-diffusion model on an annulus	Journal of Applied Nonlinear Dynamics	
Wilkinson, Reece	87179	Published	Farahi, A; Chen, X; Evrard, A E; Hollowood, D L; Wilkinson, R; Bhargava, S; Giles, P; Romer, A K; Jeltema, T; Hilton, M; and 17 other(s)	Mass variance from archival X-ray properties of dark energy survey year-1 galaxy clusters	Monthly Notices of the Royal Astronomical Society	

Department of Physics. Publications deposited in SRO during October 2019					
To view the publication, enter the five-digit SRO ID number as http://sro.sussex.ac.uk/nnnnn					
Sussex Author	SRO ID	Status	Author(s)	Output Title	Volume Title
Abraham, Nicola L	87619	Published	Abraham, N L; Allbrooke, B M M; Asquith, L; Cerri, A; Chavez Barajas, C A; DeSanto, A; Jones, S D; Lerner, G; Miano, F; Salvatore, F; and 10 other(s)	Measurement of the ttZ and ttW cross sections in proton-proton collisions at $s = 13$ TeV with the ATLAS detector	Physical Review D
Bhargava, Sunayana	87171	Published	Constanzi, M; Rozo, E; Simet, M; Zhang, Y; Evrard, A E; Mantz, A; Rykoff, E S; Jeltema, T; Gruen, D; Allen, S; and 12 other(s)	Methods for cluster cosmology and application to the SDSS in preparation for DES Year 1 release	Monthly Notices Of The Royal Astronomical Society
Bhargava, Sunayana	87179	Published	Farahi, A; Chen, X; Evrard, A E; Hollowood, D L; Wilkinson, R; Bhargava, S; Giles, P; Romer, A K; Jeltema, T; Hilton, M; and 17 other(s)	Mass variance from archival X-ray properties of dark energy survey year-1 galaxy clusters	Monthly Notices of the Royal Astronomical Society
Calmet, Xavier	86612	Published	Calmet, Xavier; Casadio, Roberto; Kuipers, Folkert	Quantum gravitational corrections to a star metric and the black hole limit	Physical Review D
Calmet, Xavier	86710	Accepted	Calmet, Xavier	Cosmological time evolution of the Higgs mass and gravitational waves	International Journal of Modern Physics A
Fabbian, Giulio	86861	Published	Namikawaw, T; Chinone, Y; Miyatake, H; Oguri, M; Takahashi, R; Kusaka, A; Katayama, N; Adachi, S; Aguilar, M; Aihara, H; and 6 other(s)	Evidence for the cross-correlation between cosmic icrowave background polarization lensing from Polarbear and cosmic shear from Subaru Hyper Suprime-Cam	Astrophysical Journal

Fabbian, Giulio	87616	Published	Fabbian, Giulio; Lewis, Alex; Beck, Dominic	CMB lensing reconstruction biases in cross-correlation with large-scale structure probes	Journal of Cosmology and Astroparticle Physics
Giles, Paul A	87178	Published	Hollowood, Devon L; Jelterna, Telsa; Chen, Xinyi; Farahi, Arya; Evrard, August; Everett, Spencer; Rozo, Eduardo; Rykoff, Eli; Bernstein, Rebecca; Bermeo-Hernandez, Alberto; and 7 other(s)	Chandra follow-up of the SDSS DR8 Redmapper catalog using the MATCha pipeline	Astrophysical Journal Supplement Series
Hensinger, Winfried K	86611	Published	Bergmann, K; Nägerl, H-C; Panda, C; Gabrielse, G; Miloglyadov, E; Quack, M; Seyfang, G; Wichmann, G; Ospelkaus, S; Kuhn, A; and 23 other(s)	Roadmap on STIRAP applications	Journal of Physics B: Atomic, Molecular and Optical Physics
Iliev, Ilian T	86364	Published	Gehlot, B K; Mertens, F G; Koopmans, L V E; Brentjens, M A; Zaroubi, S; Ciardi, B; Ghosh, A; Hatef, M; Iliev, Ilian T; Jelic, V; and 11 other(s)	The first power spectrum limit on the 21-cm signal of neutral hydrogen during the Cosmic Dawn at $z = 20-25$ from LOFAR	Monthly Notices of the Royal Astronomical Society
Iliev, Ilian T	87240	Published	Giri, S K; Mellema, G; Aldheimer, T; Dixon, Keri L; Iliev, Ilian T	Neutral island statistics during reionization from 21-cm tomography	Monthly Notices of the Royal Astronomical Society
Iliev, Ilian T	87320	Published	Ross, Hannah E; Dixon, Keri L; Ghara, Rughunath; Iliev, Ilian T; Mellema, Garrelt	Evaluating the QSO contribution to the 21-cm signal from the Cosmic Dawn	Monthly Notices of the Royal Astronomical Society
Iliev, Ilian T	87321	Published	Watkinson, Catherine A; Giri, Sambit K; Ross, Hannah E; Dixon, Keri L; Iliev, Ilian T; Mellema, Garrelt; Pritchard, Jonathan R	The 21-cm bispectrum as a probe of non-Gaussianities due to X-ray heating	Monthly Notices of the Royal Astronomical Society
Loveday, Jonathan N	87615	Accepted	Mahajan, Smriti; Kamal Gupta, Kriti; Rana, Rahul; Brown, M J I; Phillips, S; Bland-Hawthorn, Joss; Bremer, M N; Brough, S; Holwerda, B W; Hopkins, A M; and 2 other(s)	Galaxy And Mass Assembly (GAMA): Properties and evolution of red spiral galaxies	Monthly Notices Of The Royal Astronomical Society

Peeters, Simon JM	86976	Accepted	Ajaj, R; Araujo, G R; Batygov, M; Beltran, B; Bina, C E; Boulay, M G; Broerman, B; Bueno, J F; Burghardt, P M; Butcher, A; and 6 other(s)	Electromagnetic backgrounds and potassium-42 activity in the DEAP-3600 dark matter detector	Physical Review D
Romer, Kathy K	87175	Published	Salvador, A I; Sánchez, F J; Pagul, A; García-Bellido, J; Sanchez, E; Pujol, A; Frieman, J; Gaztanaga, E; Ross, A J; Sevilla-Noarbe, I; and 4 other(s)	Measuring linear and non-linear galaxy bias using counts-in cells in the Dark Energy Survey Science Verification data	Monthly Notices Of The Royal Astronomical Society
Romer, Kathy K	87176	Published	Varga, T N; DeRose, J; Gruen, D; McClintock, T; Seitz, S; Rozo, E; Constanzi, M; Hoyle, B; MacCrann, N; Plazas, A A; and 6 other(s)	Dark Energy Survey Year 1 results: validation of weak lensing cluster member contamination estimates from P(z) decomposition	Monthly Notices Of The Royal Astronomical Society
Romer, Kathy K	87180	Published	Gruen, D; Zhang, Y; Palmese, A; Yanny, B; Busti, V; Hoyle, B; Melchior, P; Miller, C J; Rozo, E; Rykoff, E S; and 4 other(s) (2019)	Dark Energy Survey Year 1 results: the effect of intracluster light on photometric redshifts for weak gravitational lensing	Monthly Notices Of The Royal Astronomical Society
Romer, Kathy K	87182	Published	Omori, Y; Baxter, E J; Chang, C; Kirk, D; Alarcon, A; Bernstein, G M; Bleem, L E; Cawthorn, R; Choi, A; Chown, R; and 4 other(s)	Dark Energy Survey Year 1 results: Cross-correlation between Dark Energy Survey Y1 galaxy weak lensing and South Pole Telescope+Planck CMB weak lensing	Physical Review D
Romer, Kathy K	87183	Published	Omori, Y; Giannantonio, T; Porredon, A; Baxter, E J; Chang, C; Crocce, M; Fosalba, P; Alarcon, A; Banik, N; Blazek, J; and 4 other(s)	Dark Energy Survey Year 1 results: tomographic cross-correlations between Dark Energy Survey galaxies and CMB lensing from South Pole Telescope+Planck	Physical Review D
Romer, Kathy K	87389	Published	Romer, Kathy; DES Collaboration	Cosmological constraints from multiple probes in the dark energy survey	Physical Review Letters
Romer, Kathy K	87391	Published	Zhang, Y; Yanny, B; Palmese, A; Gruen, D; To, C; Rykoff, E S; Leung, Y; Collins, C; Hilton, M; Romer, Kathy	Dark energy survey year 1 results: detection of intracluster light at redshift ~ 0.25	The Astrophysical Journal

Sutton, Mark R	87612	Published	Britzger, D; Currie, J; Gehrmann-De Ridder, A; Glover, E W N; Gwenlan, C; Huss, A; Morgan, T; Niehues, J; Pires, J; Rabbertz, K	Calculations for deep inelastic scattering using fast interpolation grid techniques at NNLO in QCD and the extraction of α_s from HERA data	European Physical Journal C: Particles and Fields
Sutton, Mark R	87621	Published	Sutton, M R	Determination of the strong coupling constant $\alpha_s(m_Z)$ in next-to-next-to-leading order QCD using H1 jet cross section measurements	European Physical Journal C: Particles and Fields
Sutton, Mark R	87622	Published	Sutton, M R	Calculations for deep inelastic scattering using fast interpolation grid techniques at NNLO in QCD and the extraction of α_s from HERA data	European Physical Journal C: Particles and Fields
Thomas, Peter A	87174	Published	Lovell, Christopher C; Acquaviva, Viviana; Thomas, Peter; Iyer, Kartheik G; Gawiser, Eric; Wilkins, Stephen M	Learning the relationship between galaxies spectra and their star formation histories using convolutional neural networks and cosmological simulations	Monthly Notices Of The Royal Astronomical Society