

Jason D. McEwen

Curriculum Vitae

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Professional History

Oct 2020 – present **Professor**, Mullard Space Science Laboratory (MSSL), Department of Space and Climate Physics, **University College London (UCL)**
 Apr 2025 – present **ARC Academic Fellow**, Advanced Research Computing (ARC) Centre, **UCL**
 Sep 2021 – present **Director of Research**, Centre for Data Intensive Science & Industry (DISI), **UCL**
 Sep 2016 – present **Director of Research**, Centre for Doctoral Training (CDT) in Data Intensive Science (DIS), **UCL**
 Apr 2017 – present **Founder and CEO**, Kagenova/CopernicAI
 Oct 2017 – Sep 2020 **University Reader** (Associate Professor), Mullard Space Science Laboratory (MSSL), Department of Space and Climate Physics, **UCL**
 Jul 2013 – Sep 2017 **University Lecturer** (Assistant Professor), Mullard Space Science Laboratory (MSSL), Department of Space and Climate Physics, **UCL**
 Jan 2012 – Jun 2013 **Royal Society Newton International Fellowship**, held at **UCL**
 Sep 2011 – Jan 2012 **Leverhulme Early Career Fellowship**, held at **UCL**
 Jul 2011 – Aug 2011 Visiting Researcher, Victoria University, New Zealand (awaiting UK visa)
 Oct 2010 – Apr 2015 Consultant, Saxon Cambridge Algorithm Research, Cambridge
 Jun 2010 – May 2011 Scientist, Ecole Polytechnique Fédérale de Lausanne (**EPFL**)
 Oct 2008 – May 2010 Quantitative Analyst, Credit Suisse, London
 Oct 2007 – Sep 2008 **Junior Research Fellowship**, Clare College, **University of Cambridge**
 Oct 2006 – Sep 2007 Postdoctoral Research Associate, Cavendish Laboratory, **University of Cambridge**
 Oct 2006 – Sep 2007 Postdoctoral Teaching Associate, King's College, **University of Cambridge**
 Feb 2006 – Mar 2006 Consultant, Geomerics, Cambridge
 Dec 2001 – Jul 2002 Industry Fellow, Applied Research Associates NZ

Education

2007 Doctor of Philosophy (**PhD**), *Astrophysics*, **University of Cambridge**
 Title: Analysis of cosmological observations on the celestial sphere
 Advisor: Prof. Michael P. Hobson; Awarded: 21 July 2007
 2002 Bachelor of Engineering (**BE**) with Honours, *Information Engineering*, 1st Class Honours, **University of Canterbury**, New Zealand (NZ)
 Specialising in Information Engineering with additional Mathematics (GPA 8.9/9.0)

Other Appointments, Affiliations & Service

Science Collaborations

Jan 2012 – Jul 2018 Planck Satellite Mission Core Team Member, European Space Agency (ESA)
 Sep 2013 – present LSST Informatics and Statistics Science Collaboration (ISSC) UK point of contact
 Nov 2013 – Mar 2018 SKA Science Data Processor (SDP) working group
 Mar 2014 – present Euclid satellite Science Consortium, European Space Agency (ESA)
 Jun 2014 – present LSST:UK Board Member
 Oct 2014 – present LSST Dark Energy Science Collaboration (DESC)
 Feb 2017 – Mar 2020 LSST DESC Membership Committee

Institutional Fellowships & Professional Societies

Oct 2021 – Sep 2023 Turing Fellow, Alan Turing Institute
 Jun 2011 – present Fellow of the Royal Astronomical Society (RAS)
 May 2012 – present Member of the Institute of Electrical and Electronic Engineers (IEEE)

Jan 2013 – present Member of the International Astrostatistics Association (IAA)

Nov 2015 – present Fellow of the Higher Education Academy (HEA)

Departmental Administration

Oct 2017 – present Departmental Computing Services Steering Committee

Oct 2020 – Oct 2022, Departmental Awards Committee

Oct 2024

Feb 2019 – Jan 2020 Departmental STFC PhD Extension Committee

Sep 2015 – Sep 2019 Chair of Departmental Extenuating Circumstances Committee

Advisory Roles

Nov 2024 Advisor to Tony Blair Institute on AI for Science

May 2017 Advisor to UCL President & Provost and Vice Provost (Research) on interdisciplinary research

Peer Reviewing

- Editor for Astroinformatics and Astrostatistics section of Universe (2022–)
- Referee for journal and conference articles:
 - International Conference on Learning Representations (ICLR)
 - International Conference on Machine Learning (ICML)
 - Neural Information Processing Systems (NeurIPS)
 - Neural Information Processing Systems (NeurIPS) Machine Learning & the Physical Sciences workshop
 - Monthly Notices of the Royal Astronomical Society
 - Royal Astronomical Society Techniques & Instruments
 - Astronomy & Astrophysics
 - Astrophysical Journal
 - Physical Review D
 - Physical Review E
 - Astronomy & Computing
 - Proceedings of the Royal Society A
 - Publications of the Astronomical Society of Japan
 - European Journal of Physics
 - IEEE Transactions on Signal Processing
 - IEEE Transactions on Image Processing
 - IEEE Signal Processing Letters
 - IEEE Journal of Selected Topics in Signal Processing
 - IEEE Transactions on Aerospace and Electronic Systems
 - Applied and Computational Harmonic Analysis
 - Annals of Statistics
 - Entropy
 - Journal of Applied and Computational Mathematics
 - Journal of Mathematical Analysis and Applications
 - Electronic Journal of Statistics
 - Signal Image and Video Processing
 - Mathematics and Computers in Simulation
 - International Conference on Sampling Theory and Applications
 - European Signal Processing Conference
 - Measurement Science and Technology
 - Optics and Lasers in Engineering
 - Cogent Engineering
 - IEEE International Conference on Data Mining
 - International Journal on Geomathematics
- Referee for grant proposals:
 - Referee for US National Science Foundation (NSF) panel to allocate 40 million USD
 - Referee for Royal Society University Research Fellowships (URFs)

- Referee for STFC Consolidated Grant
- Referee for STFC Impact Acceleration Account (IAA)
- Referee for South African National Research Foundation (NRF)
- Referee for Netherlands eScience Center (NLeSC)
- Referee for German Research Foundation (DFG)
- Referee for Swiss National Science Foundation (SNSF)
- Referee for workshops:
 - Royal Society
- Referee for book submissions:
 - Referee for Birkhäuser Springer-Verlag on *Applied and Numerical Harmonic Analysis*

External Funding Awarded

Total grant funding awarded: **13.3 million GBP fEC**.

Broken down as **3.6 million GBP fEC on grants as PI** and **9.7 million GBP fEC on grants as Co-I**. All costings are quoted as full Economic Costing (fEC).

- Apr 2025 – present *Magnetised atmosphere code for the astrophysical community (MACACO)*, Science and Technology Facilities Council
Co-I, 667k GBP (PI: Zane; Co-I: **McEwen**, Wu)
- Sep 2024 – present *Accelerated and differentiable spherical transforms, Archer2*
PI, 477k GBP (PI: **McEwen**; Co-I: Graham, Price)
- Sep 2024 – present *GLASS: A GPU-enabled ecosystem for simulating the universe, Archer2*
PI, 355k GBP (PI: Tessore; Co-I: **McEwen**, Roddy, Jeffrey, Loureiro, Joachimi, Spurio Mancini)
- Oct 2022 – Feb 2023 *SAX: Accelerated and differentiable spherical transforms in JAX*, Open Source Software Sustainability Funding, UCL Advanced Research Computing Centre (PI: Price; Co-I: **McEwen**)
- Oct 2022 – present *UCL Centre for Doctoral Training in Data Intensive Science and Technologies*, Science and Technology Facilities Council (PI: Konstantinidis; Co-I: Lahav, **McEwen**, Scanlon, Tennyson, Nikolaou, Waldmann, Aruliah, van Eylen, Facini, Malik, Joachimi)
- Apr 2022 – present *UCL-MSSL Astrophysics Consolidated Grant*, Science and Technology Facilities Council (PI: Page; Co-I: Kitching, **McEwen**, Van Eylen)
- Aug 2021 – present Engineering and Physical Sciences Research Council (PI: **McEwen**; Co-I: Betcke, Pereyra, Yates)
- Jul 2020 – Dec 2020 *Unlocking 360° Virtual Reality (VR) by Spherical Deep Learning Continuity*, Innovate UK (PI: **McEwen**; Co-I: None)
- Jun 2020 – May 2021 *Unlocking 360° Virtual Reality (VR) by Spherical Deep Learning*, Innovate UK (PI: **McEwen**; Co-I: None)
- Sep 2019 – Mar 2021 *Capacity building in Data Intensive Science (DIS) in the Middle East*, Science and Technology Facilities Council (PI: Lahav; Co-I: Tennyson, Konstantinidis, **McEwen**, Facini, Saintonge, Scanlon, Yates, Viti, Azzam)
- May 2018 – Apr 2019 *Next-generation virtual reality with artificial intelligence*, Innovate UK (PI: **McEwen**; Co-I: None)
- Jul 2018 *Summer school in Data Intensive Science and Technologies (DIST)*, Science and Technology Facilities Council (PI: Tennyson; Co-I: Hetherington, Konstantinidis, Lahav, **McEwen**, Scanlon, Yates, Viti)
- Jan 2018 – Dec 2021 *Fundamental physics from cosmological surveys*, Swedish Research Council (PI: Peiris; Co-I: **McEwen**, Mortlock)

- Oct 2017 – Sep 2023 *UCL Centre for Doctoral Training in Data Intensive Science and Technologies*,
Co-I, 2,114k GBP Science and Technology Facilities Council (PI: Konstantinidis; Co-I: Lahav, McEwen, Scanlon, Yates, Tennyson, Gryce, Viti)
- Aug 2017 – Jul 2020 *Illuminating the dark Universe with novel 3D spherical informatics methods*,
PI, 323k GBP Leverhulme Trust (PI: McEwen; Co-I: Kitching)
- Apr 2016 – Mar 2019 *UCL-MSSL Astrophysics Consolidated Grant*, Science and Technology Facilities
Co-I, 1,423k GBP Council (PI: Cropper; Co-I: Hepburn, Kawata, Kitching, McEwen, Page)
- Jan 2016 – Dec 2016 *DiRAC Resource Allocation*, Science and Technology Facilities Council (PI: Kawata;
Co-I, 1.47M hours Co-I: Branduardi-Raymont, Cropper, Ferreras, Kitching, McEwen, Wu, Zane)
- Sep 2015 – Sep 2016 *Signal Analysis on the Sphere*, Engineering and Physical Sciences Research Council
PI, 120k GBP (PI: McEwen; Co-I: None)
- Jun 2015 – Mar 2019 *Big-Data Compressive Sensing: Fast, Parallelised and Distributed Algorithms*,
PI, 928k GBP Engineering and Physical Sciences Research Council (PI: McEwen; Co-I: Hetherington, Jackson, Wiaux)
- Jun 2015 – Mar 2018 *UK Involvement in LSST: Phase A*, Science and Technology Facilities Council
Co-I, 186k GBP (PI: Peiris; Co-I: Kitching, McEwen)
- Apr 2015 – Feb 2018 *Compressive Imaging for Radio Interferometry*, Engineering and Physical Sciences
Co-I, 650k GBP Research Council (PI: Wiaux; Co-I: Davies, McEwen)
- Apr 2015 – Mar 2017 *Next-Generation Radio Interferometric Imaging*, Science and Technology Facilities
Co-I, 47k GBP Council (PI: McEwen; Co-I: None)
- Mar 2015 – Feb 2018 *Harnessing Spherical Geometry in Scientific and Engineering Data Processing*,
Co-I, 263k GBP Australian Research Council (PI: Kennedy; Co-I: Durrani, McEwen)
- Nov 2013 – Oct 2016 *Square Kilometre Array (SKA) Science Data Processor (SDP)*, Science and
Co-I, 593k GBP Technology Facilities Council (PI: Abdalla; Co-I: McEwen, Yates)
- Sep 2013 – Mar 2015 Research Software Development Grant, UCL Research IT Service (PI: McEwen;
PI, 18k GBP Co-I: None)
- Sep 2011 – Sep 2017 Various travel grants and conference support from the Royal Society,
PI, 24.5k GBP Royal Astronomical Society (RAS) and Winton Capital (PI: McEwen; Co-I: None, 8 grants)

Prizes & Awards

2023	UCL Mathematical and Physical Science Faculty Education Award
2019	European Physical Society Giuseppe and Vanna Cocconi Prize as part of the Planck Team
2018	Gruber Cosmology Prize as part of the Planck Team
2018	RAS Group Achievement Award as part of the Planck Team
2011	URSI General Assembly and Scientific Symposium Young Researcher Award
2006	Lundgren Research Award, University of Cambridge
2005	Cambridge Philosophical Society Research Studentship
2005	Cambridge Philosophical Society Travel Award
2002 – 2006	Commonwealth Scholarship to support PhD at University of Cambridge
2002	FRST Technology in Industry Fellowship (declined)
2002	Canterbury Doctoral Scholarship (declined)
2001	Canterbury University Prize
2000	Ian McMillan Prize for Engineering
1999	Bishop Julius Scholarship
1998	John P Good Memorial University Prize for Mathematics
1998	Bruce Dall University Prize for Physics
1998	Makower McBeath University Prize for Microeconomics

1998	School of Economics and Finance University Prize
1998 – 2001	Tower Scholarship to support undergraduate degree
1997	National Bank Scholarship for highest grade in NZ for final-year high school Economics

Academic Supervision

Postdoctoral Fellows Supervised

- Dr Tobias Liaudat (2022 – 2023), funded by EPSRC (*Learned Exascale Computational Imaging; LEXCI*), followed by **Faculty Position** at CEA Saclay.
- Dr Alessio Spurio Mancini (2020 - 2023), funded by Leverhulme Trust (*Illuminating the dark Universe with novel 3D spherical informatics methods*) and then STFC (*UCL-MSSL Astrophysics Consolidated Grant*), followed by **Faculty Position** at Royal Holloway University
- Dr Xiaohao Cai (2015 – 2020), funded by EPSRC (*Big-Data Compressive Sensing: Fast, Parallelised and Distributed Algorithms*) and then Leverhulme (*Illuminating the dark Universe with novel 3D spherical informatics methods*), followed by **Faculty Position** at University of Southampton
- Dr Dipak Munshi (2017 – 2021), funded by Leverhulme Trust (*Illuminating the dark Universe with novel 3D spherical informatics methods*), followed by Postdoctoral Fellow at Imperial College
- Dr Chris Wallis (2015 – 2017), funded by EPSRC (*Signal Analysis on the Sphere*), followed by Data Scientist at Resolver, **Chief Data Scientist** at Kagenova
- Dr Michelle Lochner (2014 – 2016), funded by STFC (*UK Involvement in LSST: Phase A*), followed by **Faculty Position** at University of the Western Cape

Postdoctoral Fellows Currently Supervising

- Dr Kiyam Lin (2024 – present), funded by STFC (*UCL-MSSL Astrophysics Consolidated Grant*)
- Dr Kevin Mulder (2023 – present), funded by EPSRC (*Learned Exascale Computational Imaging; LEXCI*)
- Dr Matt Price (2021 – present), funded by EPSRC (*Learned Exascale Computational Imaging; LEXCI*)

PhD Students Graduated

- Dr Kiyam Lin, *Joint primary PhD student supervisor* (2020 – 2024), funded by STFC-funded CosmoParticle Initiative, followed by **Postdoctoral Fellow** at UCL
- Dr Matthew Price, *Primary PhD student supervisor* (2017 – 2021), funded by STFC Studentship, followed by **Postdoctoral Fellow** at UCL
 - won **Royal Astronomical Society (RAS) Michael Penston Thesis Prize runner-up**
 - won **UCL Maths and Physical Sciences (MAPS) Postgraduate Prize**
 - won **MSSL Alan Johnstone Award 2021 for Outstanding Scientific Achievement by Research Student**
- Dr Catarina Alves, *Primary PhD student supervisor* (2018 – 2022), funded by STFC-funded CosmoParticle Initiative, followed by Associate at **JPMorgan Chase**
 - won **Jon Darius Memorial Prize for Outstanding Postgraduate Research in Astrophysics**,
- Dr Tarek Allam, *Primary PhD student supervisor* (2017 – 2022), funded by STFC-funded UCL CDT in DIS, followed by **Research Software Engineer** at the **Alan Turing Institute**
 - won **UCL Perren Prize for best DIS CDT PhD thesis**
- Dr Patrick Roddy, *Primary PhD student supervisor* (2017 – 2022), funded by STFC-funded UCL CDT in DIS, followed by **Research Software Engineer** at UCL Advanced Research Computing (ARC) Centre
- Dr Jennifer Chan, *Primary PhD student supervisor* (2014 – 2020), funded by Graduate Research Scholarship (GRS), followed by **Canadian Institute for Theoretical Astrophysics (CITA) Fellow** and **Arts & Science Postdoctoral Fellow** at University of Toronto
 - won **Royal Astronomical Society (RAS) Michael Penston Thesis Prize**

- Dr Luke Pratley, *Primary PhD student supervisor* (2015 – 2019), funded by Graduate Research Scholarship (GRS) and William Georgetti Scholarship, followed by **Dunlap Fellow** at University of Toronto
 - won Royal Astronomical Society (RAS) Michael Penston Thesis Prize
 - won International Astronomical Union (IAU) Thesis Prize (Division B Facilities, Technologies and Data Science)
 - won UCL Maths and Physical Sciences (MAPS) Postgraduate Prize
 - won MSSL Alan Johnstone Award 2019 for Outstanding Scientific Achievement by Research Student
- Dr Peter Taylor, *Secondary PhD student supervisor* (2016 – 2019), funded by STFC Studentship, won UCL Maths and Physical Sciences (MAPS) Deans Commendations, followed by **NASA Postdoctoral Fellow** at JPL
 - won MSSL Alan Johnstone Award 2018 for Outstanding Scientific Achievement by Research Student
- Dr William Jennings, *Secondary PhD student supervisor* (2014 – 2019), funded by STFC Studentship, followed by **Data Scientist** at Monolith AI
- Dr Zoe Vallis, *Secondary PhD student supervisor* (2015 – 2019), funded by STFC Studentship, followed by **Software Developer** at VividQ
- Dr Yu Tao, *Secondary PhD student supervisor* (2014 – 2022)
- Dr Ellis Owen, *Secondary PhD student supervisor* (2014 – 2019), funded by STFC Studentship, followed by **Postdoctoral Researcher** at National Tsing Hua University (NTHU), Taiwan
- Dr Laura Wolz, *Secondary PhD student supervisor* (2011 – 2014), funded by STFC Studentship, was Postdoctoral Researcher at University of Melbourne, followed by Postdoctoral Researcher at University of Melbourne, **Presidential Fellow** at University of Manchester

Masters & Internship Student Supervision

- Jonatan Kawalek, *Primary masters student supervisor* (2021)
- Kaiyuan Hu, *Primary masters student supervisor* (2021)
- Tarek Allam, *Primary masters student supervisor* (2016), now PhD student at UCL
- Antoine Plouviez, *Primary internship student supervisor* (2016), now Masters student at Ecole Normale Supérieure
- Nathan Zerbib, *Primary masters student supervisor* (2015 – 2016)
- Mathieu Issartel, *Secondary masters student supervisor* (2014 – 2015)
- Remy Joseph, *Secondary masters student supervisor* (2013 – 2014), was PhD student at Ecole Polytechnique Fédérale de Lausanne (EPFL), now Postdoctoral Researchers at Princeton University
- Isabella Soldner-Rembold, *Primary masters student supervisor* (2012 – 2013), was PhD student at Max Planck Institute for Extraterrestrial Physics, now Data Scientist at Carbon Tracker
- Vlad Margarint, *Primary internship student supervisor* (2012)
- Thibaut Josset, *Primary internship student supervisor* (2012), now PhD student at Aix-Marseille University
- Athamos Stradis, *Primary masters student supervisor* (2011 – 2012)
- Tom Heritage, *Primary masters student supervisor* (2007 – 2008)

Teaching & Admissions Activities

2018 – present	Module Creator, Organiser, and Lecturer for <i>SPCE0038: Machine Learning with Big-Data</i> of MSc in Scientific Computing
2014 – 2017	Module Organiser and Lecturer for <i>SPCEG007: Space-Based Communication Systems</i> of MSc in Space Science & Engineering
2014 – 2017	Lecturer for <i>SPCEGC03: Space Data Systems and Processing</i> of MSc in Space Science & Engineering
2013 – present	Interviewer for PhD, postdoctoral and faculty positions (UCL)

2011	Guest lecturer for Masters in Information Engineering (EPFL)
2008	Admissions interviewer in Physics (Clare College, University of Cambridge)
2007 – 2008	Supervisor for Part IA Physics (University of Cambridge)
2005 – 2007	Supervisor for Part IA Engineering Mathematics (University of Cambridge)
2004 – 2007	Supervisor for Part IB Engineering Mathematics (University of Cambridge)
2003 – 2004	Demonstrator for Part IA and IB Engineering Computer Programming (University of Cambridge)
2002	Primary School Student Mentor (Golden Key mentoring program)
2002	Supervisor for Circuits and Systems (University of Canterbury, NZ)
1999 - 2000	Supervisor for first year Mathematics (University of Canterbury, NZ)

Organisation of Summer Schools, Scientific Meetings & Discussion Forums

Summer School Organisation

- STFC Summer School in Artificial Intelligence and Machine Learning, 2018, London, *Co-Chair* (<https://indico.cern.ch/event/702529/overview>). National summer school for cohort of 129 PhD students throughout the country on STFC CDT PhD programmes in Data Intensive Science.

Conference & Workshop Organisation

- Biomedical and Astrophysical Signal Processing (BASP) Frontiers 2019, Switzerland, *Co-Chair* (<http://www.basppfrontiers.org>). Multi-disciplinary conference bringing together the biomedical, astrophysics and signal processing/applied mathematics communities.
- UCL Centre for Doctoral Training (CDT) in Data Intensive Science (DIS) Research Festival, 2017, London, *Co-Chair*. Multi-disciplinary conference highlighting research projects of the CDT.
- Biomedical and Astrophysical Signal Processing (BASP) Frontiers 2017, Switzerland, *Co-Chair* (<http://www.basppfrontiers.org>). Multi-disciplinary conference bringing together the biomedical, astrophysics and signal processing/applied mathematics communities.
- Big Data in the Physical Sciences, Alan Turing Institute (ATI) Summit, 2016, Royal Society, UK, *Scientific Organising Committee* (<https://indico.cern.ch/event/449964/overview>). Scoping meeting to address the role of physical sciences in the ATI.
- Cosmostatistics Initiative (COIN) Residence Programme, 2015, UK, *Scientific Organising Committee* (<http://iaacoin.wix.com/crp2015>). Inter-disciplinary unconference focusing on statistics and cosmology.
- Next-Generation Radio Interferometric Imaging for the SKA, Royal Society South Africa-UK Scientific Seminar, 2015, South Africa, *Chair* (<https://sites.google.com/site/royalsocradioimg2015>). Multi-disciplinary unconference focusing on radio interferometry and advanced imaging techniques (*e.g.* compressed sensing, Bayesian inference).
- Biomedical and Astrophysical Signal Processing (BASP) Frontiers 2015, Switzerland, *Co-Chair* (<http://www.basppfrontiers.org>). Multi-disciplinary conference bringing together the biomedical, astrophysics and signal processing/applied mathematics communities.
- Science on the Sphere, Royal Society International Scientific Seminar, 2014, UK, *Co-Chair* (<http://lateuniverse.wordpress.com/2014/05/13/science-on-the-sphere>). Multi-disciplinary conference bringing together the physical sciences and signal processing/applied mathematics communities.
- Biomedical Imaging and Astronomy: Shared Algorithms and Analyses, UCL, 2014, UK, *Co-Organiser*. Multi-disciplinary conference bringing together the biomedical imaging and astronomy communities.
- IEEE International Conference on Data Mining (ICDM) Astroinformatics Workshop 2013, USA, *Scientific Organising Committee* (<http://www2.cs.uh.edu/~vilalta/workshops/astro-icdm2013/index.html>). Multi-disciplinary conference bringing together the statistics, machine learning and astrophysics communities.
- Biomedical and Astrophysical Signal Processing (BASP) Frontiers 2013, Switzerland, *Co-Chair* (<http://www.basppfrontiers.org>). Multi-disciplinary conference bringing together the biomedical, astrophysics and signal processing/applied mathematics communities.
- Biomedical and Astrophysical Signal Processing (BASP) Frontiers 2011, Switzerland, *Scientific Organising Committee* (<http://www.basppfrontiers.org>). Multi-disciplinary conference bringing together the biomedical, astrophysics and signal processing/applied mathematics communities.

Discussion Forums

- Led discussion forum at Big Data in the Physical Sciences, Alan Turing Institute Summit on *Extracting meaning from big-data*.
- Led discussion forum at UK Dark Energy Strategy 2020 meeting on *Methodological and algorithmic synergies in astronomy and multi-disciplinary connections*.
- Led discussion forum at Crick Institute Biomedical Imaging and Astronomy: Shared Algorithms and Analyses meeting on *Methodologies for analysing big-data*.

Scientific Talks

Invited Talks

- Towards learned exascale computational imaging (LEXCI) for radio astronomy
Mar 2025, Image Reconstruction at Scale: Challenges and Collaboration workshop, University of Cambridge, UK
- Bayesian model comparison with data-driven priors: learned proximal nested sampling
Feb 2025, Recent Advances in Learned Regularisation workshop, Mathematics for Deep Learning (M4DL), UCL, London, UK
- Scientific AI in cosmology and beyond
Dec 2024, International School for Advanced Studies (SISSA) symposium, Trieste, Italy
- Bayesian model comparison in the era of AI
Dec 2024, Computational Statistics and Machine Learning in Science workshop, London Mathematical Society, London, UK
- Scientific AI for imaging
Sep 2024, Collaborative Computational Modelling at the Interface (CCMI), UCL, London, UK
- Learned Exascale Computational Imaging (LEXCI)
Oct 2024, ExCALIBUR Programme Workshop, Leicester, UK
- Towards learned exascale computational imaging for the exascale
Sep 2024, Towards exascale-ready astrophysics (TERA) workshop, Virtual, Germany
- Scientific AI for the physical sciences
Jul 2024, ICML @ London, London, UK
- Statistical characterization and generative modelling of cosmological fields
Jul 2024, Connecting the Dots: Pattern Recognition in the Physical Sciences, London, UK
- Wide-field, field-level compression for simulation-based inference (SBI) for Euclid cosmic shear
Jun 2024, Euclid Collaboration meeting, Rome, Italy
- Proximal nested sampling with data-driven priors for inverse imaging
May 2024, SIAM Imaging 2024, Atlanta, US
- Scientific machine learning in astrophysics: machine learning for physics; physics for machine learning
Oct 2023, Rubin Observatory Legacy Survey of Space and Time (LSST), Informatics and Statistical Science Collaboration (ISSC) Seminar
- Learned Exascale Computational Imaging (LEXCI): Update
Oct 2023, ExCALIBUR Programme Workshop, Bristol, UK
- Machine learning in astrophysics: machine learning for physics; physics for machine learning
Sep 2023, Alan Turing Institute, Space Science Interest Group Seminar, London, UK
- Scientific machine learning in astrophysics: machine learning for physics; physics for machine learning
Sep 2023, Rutherford Appleton Laboratory (RAL) Scientific Machine Learning Seminar, Harwell, UK
- Machine learning for physics; physics for machine learning
Jul 2023, European Astronomical Society (EAS) Annual Meeting, Krakow, Poland
- Proximal nested sampling for high-dimensional Bayesian model selection
Jul 2023, Frontiers of Nested Sampling, Maximum Entropy Workshop, Max-Planck-Institut für Plasma-physik, Garching, Germany
- Geometric deep learning on the sphere for the physical sciences
Jul 2023, Maths4DL: Conference on Deep Learning for Computational Physics, London, UK
- Learned Exascale Computational Imaging (LEXCI)
May 2023, Blueprinting AI for Science At Exascale (BASE-II) Workshop, University of Leicester, UK
- Scalable and equivariant spherical CNNs by discrete-continuous (DISCO) convolutions

- May 2023, International Conference on Learning Representations (ICLR), Virtual
- Geometric deep learning on the sphere: scalable and equivariant spherical CNNs
Oct 2022, CosmoStat seminar, CEA Saclay, France
- Bayesian model selection for likelihood-based and simulation-based inference
Oct 2022, IAU International Astrostatistics Association, Astrostats & Astroinfo seminar
- Geometric deep learning on the sphere: scalable and equivariant spherical CNNs
Sep 2022, REACH Seminar, University of Cambridge, UK
- Learned Exascale Computational Imaging (LEXCI) overview
Jul 2022, ExCALIBUR Programme Workshop, Met Office, Exeter, UK
- A brief introduction to geometric deep learning
May 2022, Physics-Astro Data (PAD) talk, UCL, London, UK
- Bayesian model selection in cosmology and astrophysics
May 2022, 3rd IMA Conference on Inverse Problems from Theory to Application, Edinburgh, UK
- Learned Exascale Computational Imaging (LEXCI) overview
Apr 2022, UCL ExCALIBUR meetup, London, UK
- Geometric deep learning on the sphere: spherical CNNs and scattering networks
Apr 2022, STFC Scientific Machine Learning Seminar, Harwell (Remote), UK
- Bayesian uncertainty quantification for radio interferometry and beyond
Apr 2022, Bayesian Astronomers Anonymous, Capetown, South Africa
- Geometric deep learning on the sphere: efficient generalized spherical CNNs
Apr 2021, Centre for Medical Image Computing (CMIC) Seminar, University College London (UCL), UK
- Geometric deep learning on the sphere: efficient generalized spherical CNNs
Mar 2021, Centre for Doctoral Training (CDT) in Data Intensive Science (DIS) Seminar, University College London (UCL), UK
- Deep learning on the celestial sphere
Dec 2020, European Space Agency (ESA) AI Workshop, Virtual
- UCL Centre for Doctoral Training (CDT) in Data Intensive Science (DIS)
Dec 2020, European Space Agency (ESA) AI Workshop, Virtual
- Geometric deep learning on the sphere: efficient generalized spherical CNNs
Nov 2020, Centre for Inverse Problems (CIP) Seminar, University College London (UCL), UK
- Geometric deep learning on the sphere: efficient generalized spherical CNNs
Oct 2020, AI Centre Seminar, University College London (UCL), UK
- Denoising and related inverse problems in astrophysics
Sep 2020, Benchmarking for AI for Science at Exascale (BASE) Workshop, Virtual
- Machine learning assisted Bayesian evidence computation
Jun 2019, IMA Conference on Inverse Problems from Theory to Application (IPTA), University College London (UCL), UK
- Sparse image reconstruction for the SPIDER optical interferometric telescope
Jun 2019, Electrical and Computer Engineering Seminar, UC Davis, USA
- Wavelet localisation of isotropic random fields on the sphere and cosmological implications: searching for primordial gravitational waves
Mar 2019, Mathematical Models and Methods in Earth and Space Sciences, University of Rome Tor Vergata, Rome, Italy
- High-dimensional uncertainty quantification in astrophysics
Dec 2018, Astrophysics Seminar, Imperial College, London, UK
- AstroStatistics & AstroInformatics in the context of the SKA and LSST
Sep 2018, AI for CERN and SKA, Alan Turing Institute, UK
- High-dimensional uncertainty quantification for radio interferometric imaging
Apr 2018, Workshop on Uncertainty Quantification and Computational Imaging, International Centre for Mathematical Sciences (ICMS), Edinburgh, UK
- Euclid big data: data science for science
Apr 2018, UCL Space Week, University College London (UCL), UK

- High-dimensional uncertainty quantification with sparsity-promoting priors and application to radio interferometric imaging
Jan 2018, Centre for Inverse Problems (CIP) Seminar, University College London (UCL), UK
- High-dimensional uncertainty estimation with sparse priors for radio interferometric imaging
Jun 2017, Statistical Foundations of Uncertainty Quantification for Inverse Problems, University of Cambridge, UK
- LSST Informatics and Statistics Science Collaboration (ISSC)
May 2017, Specialist Discussion Session on LSST, Royal Astronomical Society (RAS), UK
- Next-generation radio interferometric imaging for the SKA era
Mar 2017, School of Physics and Astronomy, University of Manchester, UK
- Sampling and geometry
Jul 2017, 12th International Conference on Sampling Theory and Applications (SampTA), Tallinn, Estonia
- Topic: Computational harmonic analysis on manifolds and graphs with application to astrophysics and machine learning (declined)
Dec 2016, Neural Information Processing Systems (NIPS), Barcelona, Spain
- Statistical approaches for sparse radio interferometric imaging
Oct 2016, 3GC4 Workshop, Port Alfred, South Africa
- Statistical approaches for sparse radio interferometric imaging
Oct 2016, CALIM 2016, Socorro, USA
- LSST Informatics and Statistics Science Collaboration (ISSC)
June 2016, National Astronomy Meeting (NAM), University of Nottingham, Nottingham, UK
- Wavelet reconstruction of E- and B-modes for weak lensing mass mapping and CMB polarisation
June 2016, Mapping the Cosmic Web, Royal Astronomical Society (RAS), London, UK
- Radio interferometry in the big-data era of the Square Kilometre Array (SKA)
Apr 2016, Mathematical & Physical Sciences (MAPS) Faculty Research Festival, University College London, London, UK
- Big-data in astronomy and astrophysics: extracting meaning from big-data
Feb 2016, Connecting the Dots, Institute of High Energy Physics, Vienna, Austria
- Astrostatistics and astroinformatics: big-data in astronomy and astrophysics
Jan 2016, UK Dark Energy Strategy 2020, Royal Astronomical Society, London, UK
- Sparsity in astrophysics: astrostatistics meets astroinformatics
Dec 2015, ERCIM International Conference on Computational and Methodological Statistics, London, UK
- Imaging data from next-generation radio interferometric telescopes with compressive sensing
Oct 2015, Department of Applied Mathematics & Theoretical Physics (DAMTP), University of Cambridge, UK
- Radio interferometric imaging with compressive sensing
Aug 2015, School of Information Science and Engineering, Australian National University (ANU), Australia
- Optimising radio interferometric imaging with compressive sensing
May 2015, Experimental Design and Big Data, Warwick Data Science Institute, University of Warwick, UK
- Sparsity in astrophysics: astrostatistics meets astroinformatics
Dec 2014, SuSTaIn EdgeCutter Workshop on Astrostatistics, Royal Statistical Society, London, UK
- Spin scale-discretised wavelets on the sphere for the analysis of CMB polarisation
Dec 2014, ERCIM International Conference on Computational and Methodological Statistics, Pisa, Italy
- Spin scale-discretised wavelets on the sphere for the analysis of CMB polarisation
Sep 2014, Sparsity and Cosmology, Nice, France
- Sparsity in astrophysics: astrostatistics meets astroinformatics
Sep 2014, Royal Statistical Society International Conference, Sheffield, UK
- Radio interferometric imaging with compressive sensing

- Aug 2014, Inverse Problems - from Theory to Application (IPTA), Bristol, UK
- Spherical signal analysis
 - Jul 2014, Science on the Sphere, Royal Society International Scientific Seminar, Kavli Royal Society International Centre, Buckinghamshire, UK
- Imaging observations from next-generation radio interferometric telescopes
 - Jun 2014, Research IT Services Annual Forum, University College London (UCL), UK
- Astronomical imaging initiatives
 - Jun 2014, Bioluminescence Imaging UK, London, UK
- Cosmoinformatics
 - Mar 2014, Mullard Space Science Laboratory (MSSL), University College London (UCL), UK
- Primordial gravitational waves detected by BICEP2?
 - Mar 2014, School of Chemical & Physical Sciences, Victoria University, NZ
- Cosmological signal and image processing
 - Mar 2014, School of Information Science and Engineering, Australian National University (ANU), Australia
- Revisiting the spread spectrum effect in radio interferometric imaging
 - Mar 2014, CALIM 2014, Kiama, Australia
- Cosmological image processing
 - Dec 2013, Auckland University of Technology (AUT) Seminar, Auckland, NZ
- Next-generation radio interferometric imaging with compressive sensing
 - Dec 2013, Auckland University of Technology (AUT) Seminar, Auckland, NZ
- Cosmological image processing
 - Nov 2013, Image and Vision Computing New Zealand 2013, Wellington, NZ
- Next-generation radio interferometric imaging with compressive sensing
 - Nov 2013, IEEE NZ Central Section AGM, Wellington, NZ
- Scale-discretised wavelets on the sphere
 - Aug 2013, Wavelets XV, SPIE Optics and Photonics, San Diego, USA
- Fourier-Laguerre transform, convolution and wavelets on the ball
 - Jul 2013, 10th International Conference on Sampling Theory and Applications (SampTA), Bremen, Germany
- Signal processing on spherical manifolds
 - Jun 2013, Probabilistic And Statistical techniques for Cosmological AnaLysis (PASCAL) workshop, Rome, Italy
- Exploiting sparsity for CMB data analysis
 - Apr 2013, London Cosmology Discussion Meeting, Royal Astronomical Society, London, UK
- Sparsity: CosmoStats meets Cosmoinformatics
 - Mar 2013, CosmoStats 2013, Banff, Canada
- Signal processing on spherical manifolds
 - Mar 2013, School of Information Science and Engineering, Australian National University (ANU), Australia
- Towards realistic radio interferometric imaging with compressive sensing
 - Mar 2013, Astronomy and Astrophysics, Victoria University, NZ
- Radio interferometric imaging with compressive sensing
 - Jan 2013, London Cosmology Discussion Meeting, Royal Astronomical Society, London, UK
- Towards compressive sensing imaging of real radio interferometric observations
 - Dec 2012, CALIM 2012, Cape Town, South Africa
- Cosmological signal processing
 - Oct 2012, Institute of Cosmology and Gravitation, University of Portsmouth, UK
- Cosmological signal processing
 - Oct 2012, Department of Physics and Astronomy, University of Southampton, UK
- Implications of a new sampling theorem for sparse signal reconstruction on the sphere
 - May 2012, Astronomical Data Analysis (ADA), Cargese, Corsica
- Spherical signal processing for cosmology

- Mar 2012, Signal Processing for the Physical Sciences, Kavli Royal Society International Centre, Buckinghamshire, UK
- Spherical signal processing and the Multiverse
Jan 2012, IFCA Seminar, University of Cantabria, Santander, Spain
- Sampling theorems and compressed sensing on the sphere
Jan 2012, BASP Seminar, Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland
- Spherical signal processing for cosmology
Oct 2011, Astrophysics Seminar, University College London (UCL), London, UK
- Compressed sensing for radio interferometric imaging: review and future direction
Sep 2011, IEEE International Conference on Image Processing (ICIP), Brussels, Belgium
- A novel sampling theorem on the sphere with implications for compressive sensing
Sep 2011, Biomedical and Astrophysical Signal Processing (BASP) Frontiers, Villars, Switzerland
- Radio interferometric imaging with compressed sensing
Sep 2011, Biomedical and Astrophysical Signal Processing (BASP) Frontiers, Villars, Switzerland
- Signal processing on the sphere and applications
Aug 2011, CaSP Seminar, Victoria University, Wellington, New Zealand
- Wavelets on the sphere and cosmological applications
Nov 2010, Guest Lecture for Advanced Signal Processing, Master in Information Technology, Ecole Polytechnique Federale de Lausanne (EPFL), Lausanne, Switzerland
- Simulating full-sky interferometric observations with wavelets
Sep 2010, Astrophysics Seminar, Cavendish Laboratory, University of Cambridge, UK
- Compressed sensing for radio interferometric imaging on wide fields of view
Aug 2010, CALIM 2010, ASTRON, Dwingeloo, Netherlands
- Simulating full-sky interferometric observations
Apr 2008, CALIM 2008, Deep Surveys of the Radio Universe with SKA Pathfinders, Perth, Australia
- Detecting dark energy with wavelets on the sphere
Aug 2007, Wavelets XII, SPIE Optics and Photonics, San Diego, USA
- Wavelets on the sphere: new methodologies and cosmological applications
Jun 2007, Cosmology lunch talk, Department of Applied Mathematics & Theoretical Physics (DAMTP), University of Cambridge, UK
- Bianchi VII_h signatures and WMAP
Nov 2006, School of Physics and Astronomy, University of Nottingham, UK
- Large-scale anomalies in WMAP data: Deviations from isotropy
Oct 2006, CMB workshop, Institute of Astronomy, University of Cambridge, UK
- Detection of the ISW effect and corresponding dark energy constraints
Jun 2006, Institute of Astronomy, University of Cambridge, UK
- Detection of the ISW effect and corresponding dark energy constraints
Dec 2005, Astrophysics Seminar, Cavendish Laboratory, University of Cambridge, UK
- Planck workshop on non-Gaussianity: Fast directional spherical wavelets
Sep 2005, Planck workshop on non-Gaussianity, Instituto de Fisica de Cantabria, Santander, Spain
- Fast directional spherical wavelets for cosmology (Abstract)
Feb 2005, Cosmology lunch talk, Department of Applied Mathematics & Theoretical Physics (DAMTP), University of Cambridge, UK

Contributed Talks

- Towards wide-field, field-level simulation-based inference (SBI) for Euclid cosmic shear
Jul 2024, National Astronomy Meeting (NAM), University of Hull, Hull, UK
- Scientific AI in cosmology
May 2024, Statistical Challenges in 21st Century, Chania, Crete
- Physical machine learning for astrophysics: differentiable spherical harmonics; harmonic Bayesian evidence; spherical scattering networks
Nov 2023, Debating the Potential of Machine Learning in Astronomical Surveys, Paris, France
- Scalable and equivariant spherical CNNs by discrete-continuous (DISCO) convolutions
May 2023, International Conference on Learning Representations (ICLR), Virtual

- Efficient generalized spherical CNNs
May 2021, International Conference on Learning Representations (ICLR), Virtual
- Scattering networks on the sphere for scalable and rotationally equivariant spherical CNNs
Apr 2022, International Conference on Learning Representations (ICLR), Virtual
- Machine learning assisted Bayesian evidence computation
Sep 2019, IMA Conference on Inverse Problems from Theory to Application, University College London (UCL), UK
- Machine learning assisted Bayesian evidence computation
May 2018, Statistical Challenges in 21st Century Cosmology, Valencia, Spain
- LSST 3D Data Compression (3DDC) Taskforce
July 2016, LSST DESC collaboration meeting, University of Oxford, Oxford, UK
- Wavelet reconstruction of E- and B-modes for CMB polarisation and cosmic shear
May 2016, Statistical Challenges in 21st Century Cosmology, Chania, Crete
- Spin scale-discretised wavelets on the sphere for the analysis of CMB polarisation
May 2014, IAU Symposium on Statistical Challenges in 21st Century Cosmology, Lisbon, Portugal
- Sparsity, Euclid and the SKA
Sep 2013, Synergistic Science with Euclid and the Square Kilometre Array, Oxford, UK
- Background geometry and topology of the Universe: Bianchi VII_h cosmologies and Planck
Apr 2013, The Universe as seen by Planck, ESLAB Symposium, ESA/ESTEC, The Netherlands
- Spherical wavelet-Bayesian cosmic string tension estimation
Sep 2012, Big 3 (Big Bang, Big Data, Big Computing), Paris, France
- Detecting cosmic bubble collisions with optimal filters
Mar 2012, Recontres de Moriond, La Thuile, Italy
- Intrinsic advantages of the w component and spherical imaging for wide-field radio interferometry
Aug 2011, XXXth General Assembly and Scientific Symposium of the International Union of Radio Science, Istanbul, Turkey
- Wavelet-based data compression on the sphere
May 2008, ADA 5, Heraklion, Crete
- Detection of the ISW effect and corresponding dark energy constraints
Mar 2006, Recontres de Moriond, La Thuile, Italy
- Fast directional spherical wavelets for CMB analysis
Apr 2005, National Astronomy Meeting, University of Birmingham, UK
- A high sigma detection of non-Gaussianity in the WMAP 1-year data
Jul 2004, 20th IAP Colloquium – CMB Physics and Observations, Paris, France
- A fast directional continuous spherical wavelet transform for the analysis of cosmological data
Mar 2004, Recontres de Moriond, La Thuile, Italy

Publications

203 Articles

H-index: 51; Citations: 42,000+ (Google Citations)

Google Citations profile (<http://scholar.google.co.uk/citations?user=V19kdRg7j1Y>)

arXiv profile (http://arxiv.org/a/mcewen_j_1)

- [1] Khorashadizadehand, Liaudat, Liu, **McEwen**, and Dokmanić. LoFi: Neural local fields for scalable image reconstruction. *IEEE Trans. Comput. Imaging*, submitted, 2024, [arXiv:2411.04995](https://arxiv.org/abs/2411.04995).
- [2] Whitney, Liaudat, Price, Mars, and **McEwen**. Generative modelling for mass-mapping with fast uncertainty quantification. *Mon. Not. Roy. Astron. Soc.*, submitted, 2024, [arXiv:2410.24197](https://arxiv.org/abs/2410.24197).
- [3] Spurio Mancini, Lin, and **McEwen**. Field-level cosmological model selection: simulation-based inference for Stage IV cosmic shear can distinguish dynamical dark energy. *Phys. Rev. D.*, submitted, 2024, [arXiv:2410.10616](https://arxiv.org/abs/2410.10616).
- [4] Lin, Joachimi, and **McEwen**. Simulation-based inference with scattering representations: scattering is all you need. In *Proceedings of the Machine Learning and Physical Sciences Workshop as part*

- of the 38th International Conference on Neural Information Processing Systems (NeurIPS), 2024, [arXiv:2410.11883](#).
- [5] Polanska, Wouters, Pang, Wong, and **McEwen**. Accelerated bayesian parameter estimation and model selection for gravitational waves with normalizing flows. In *Proceedings of the Machine Learning and Physical Sciences Workshop as part of the 38th International Conference on Neural Information Processing Systems (NeurIPS)*, 2024, [arXiv:2410.21076](#).
- [6] Euclid Collaboration: Tessore et al. Euclid preparation. Angular power spectra from discrete observations. *Astron. & Astrophys.*, submitted, 2024, [arXiv:2408.16903](#).
- [7] Mousset, Allys, Price, Aumont, Delouis, Montier, and **McEwen**. Generative models of astrophysical fields with scattering transforms on the sphere. *Astron. & Astrophys.*, in press, 2024, [arXiv:2407.07007](#).
- [8] Whitney, Liaudat, Price, Mars, and **McEwen**. Using conditional GANs for convergence map reconstruction with uncertainties. In *58th Rencontres de Moriond*, 2024, [arXiv:2406.15424](#).
- [9] Mousset, Allys, Price, Aumont, Delouis, Montier, and **McEwen**. Scattering transforms on the sphere: application to large scale structure modelling. In *58th Rencontres de Moriond*, 2024, [arXiv:2407.08687](#).
- [10] Euclid Collaboration: Mellier et al. Euclid. I. Overview of the Euclid mission. *Astron. & Astrophys.*, in press, 2024, [arXiv:2405.13491](#).
- [11] Piras, Polanska, Mancini, Price, and **McEwen**. The future of cosmological likelihood-based inference: accelerated high-dimensional parameter estimation and model comparison. *Open J. Astrophys.*, 7, 2024, [arXiv:2405.12965](#), [DOI:10.33232/001c.123368](#).
- [12] Mars, Betcke, and **McEwen**. Learned radio interferometric imaging for varying visibility coverage. *Roy. Astron. Soc. Tech. & Instrum.*, submitted, 2024, [arXiv:2405.08958](#).
- [13] Polanska, Price, Piras, Mancini, and **McEwen**. Learned harmonic mean estimation of the Bayesian evidence with normalizing flows. *Open J. Astrophys.*, submitted, 2024, [arXiv:2405.05969](#).
- [14] Chan, Han, Wu, and **McEwen**. A covariant formulation for cosmological radiative transfer of the 21-cm line. *Mon. Not. Roy. Astron. Soc.*, 531(1), 2024, [arXiv:2404.14407](#), [DOI:10.1093/mnras/stae1101](#).
- [15] Price, Polanska, Whitney, and **McEwen**. Differentiable and accelerated wavelet transforms on the sphere and ball. *Journal of Computational Physics*, submitted, 2024, [arXiv:2402.01282](#).
- [16] Price and **McEwen**. Differentiable and accelerated spherical harmonic and Wigner transforms. *Journal of Computational Physics*, 510:113109, 2024, [arXiv:2311.14670](#), [DOI:10.1016/j.jcp.2024.113109](#).
- [17] Liaudat, Mars, Price, Pereyra, Betcke, and **McEwen**. Scalable Bayesian uncertainty quantification with data-driven priors for radio interferometric imaging. *Roy. Astron. Soc. Tech. & Instrum.*, 3(1):505—534, 2023, [arXiv:2312.00125](#), [DOI:10.1093/rasti/rzae030](#).
- [18] Price, Mars, Docherty, Mancini, Marignier, and **McEwen**. Fast emulation of anisotropies induced in the cosmic microwave background by cosmic strings. *Open J. Astrophys.*, 6, 2023, [arXiv:2307.04798](#), [DOI:10.21105/astro.2307.04798](#).
- [19] Polanska, Price, Mancini, and **McEwen**. Learned harmonic mean estimation of the marginal likelihood with normalizing flows. In *International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering*, 2023, [arXiv:2307.00048](#), [DOI:10.3390/psf2023009010](#).
- [20] **McEwen**, Liaudat, Price, Cai, and Pereyra. Proximal nested sampling with data-driven priors for physical scientists. In *International Workshop on Bayesian Inference and Maximum Entropy Methods in Science and Engineering*, 2023, [arXiv:2307.00056](#), [DOI:10.3390/psf2023009013](#).

- [21] Ocampo, Price, and **McEwen**. Scalable and equivariant spherical CNNs by discrete-continuous (DISCO) convolutions. In *International Conference on Learning Representations (ICLR)*, 2023, [arXiv:2209.13603](#).
- [22] Allam Jr. and **McEwen**. The tiny time-series Transformer: low-latency high-throughput classification of astronomical transients using deep model compression. *Roy. Astron. Soc. Tech. & Instrum.*, *submitted*, 2023, [arXiv:2303.08951](#).
- [23] Mars, Betcke, and **McEwen**. Learned interferometric imaging for the SPIDER instrument. *Roy. Astron. Soc. Tech. & Instrum.*, 2:760–778, 2023, [arXiv:2301.10260](#), [DOI:10.1093/rasti/rzad054](#).
- [24] Alves, Peiris, Lochner, **McEwen**, and Kessler. Impact of Rubin Observatory cadence choices on supernovae photometric classification. *Astrophys. J. Supp.*, 265(2):43, 2023, [arXiv:2210.15690](#), [DOI:10.3847/1538-4365/acbb09](#).
- [25] Munshi, Jung, Kitching, **McEwen**, Liguori, Namikawa, and Heavens. Position-dependent correlation function of weak lensing convergence. *Astrophys. J.*, 107:043516, 2023, [arXiv:2104.01185](#), [DOI:10.1103/PhysRevD.107.043516](#).
- [26] Spurio Mancini, Docherty, Price, and **McEwen**. Bayesian model comparison for simulation-based inference. *Roy. Astron. Soc. Tech. & Instrum.*, 2:710–722, 2023, [arXiv:2207.04037](#), [DOI:10.1093/rasti/rzad051](#).
- [27] Marignier, Kitching, **McEwen**, and Ferreira. Sparse Bayesian mass-mapping using trans-dimensional MCMC. *Open J. Astrophys.*, 6, 2023, [arXiv:2211.13963](#), [DOI:10.21105/astro.2211.13963](#).
- [28] **McEwen**, Wallis, and Mavor-Parker. Scattering networks on the sphere for scalable and rotationally equivariant spherical CNNs. In *International Conference on Learning Representations (ICLR)*, 2022, [arXiv:2102.02828](#).
- [29] Goodwin-Allcock, **McEwen**, and R. Gray, P. Nachev. How can spherical CNNs benefit ML-based diffusion MRI parameter estimation? In *Computational Diffusion MRI*, 2022, [arXiv:2207.00572](#), [DOI:10.1007/978-3-031-21206-2_9](#).
- [30] Cai, **McEwen**, and Pereyra. Proximal nested sampling for high-dimensional Bayesian model selection. *Statistics & Computing*, 32(87), 2022, [arXiv:2106.03646](#), [DOI:10.1007/s11222-022-10152-9](#).
- [31] Munshi, Takahashi, and **McEwen**. On weak lensing response functions. *J. Cosmol. Astropart. P.*, (10):22, 2022, [arXiv:2207.03410](#), [DOI:10.1088/1475-7516/2022/10/022](#).
- [32] Alves, Peiris, Lochner, **McEwen**, Allam Jr., and Biswas. Considerations for optimizing photometric classification of supernovae from the Rubin observatory. *Astrophys. J. Supp.*, 258(2):23, 2022, [arXiv:2107.07531](#), [DOI:10.3847/1538-4365/ac3479](#).
- [33] **McEwen**, Wallis, Price, and Spurio Mancini. Machine learning assisted Bayesian model comparison: learnt harmonic mean estimator. *Statistics & Computing*, *submitted*, 2022, [arXiv:2111.12720](#).
- [34] Munshi, Lee, Dvorkin, and **McEwen**. Weak lensing trispectrum and kurt-spectra. *J. Cosmol. Astropart. P.*, (11):20, 2022, [arXiv:2112.05155](#), [DOI:10.1088/1475-7516/2022/11/020](#).
- [35] Munshi, Takahashi, **McEwen**, Kitching, and Bouchet. A new estimator for phase statistics. *J. Cosmol. Astropart. P.*, 2022(5), 2022, [arXiv:2109.08047](#), [DOI:10.1088/1475-7516/2022/05/006](#).
- [36] Wallis, Price, **McEwen**, Kitching, Leistedt, and Plouviez. Mapping dark matter on the celestial sphere with weak gravitational lensing. *Mon. Not. Roy. Astron. Soc.*, 509(3):4480–4497, 2022, [arXiv:1703.09233](#), [DOI:10.1093/mnras/stab3235](#).
- [37] Marignier, **McEwen**, Ferreira, and Kitching. Posterior sampling for inverse imaging problems on the sphere in seismology and cosmology. *Roy. Astron. Soc. Tech. & Instrum.*, 2(1):20–32, 2022, [arXiv:2107.06500](#), [DOI:10.1093/rasti/rzac010](#).

- [38] Roddy and **McEwen**. Slepian scale-discretised wavelets on the sphere. *IEEE Trans. Sig. Proc.*, 70:6142–6153, 2022, [arXiv:2106.02023](#), [DOI:10.1109/TSP.2022.3233309](#).
- [39] Allam Jr. and **McEwen**. Paying attention to astronomical transients: Introducing the time-series Transformer for photometric classification. *Roy. Astron. Soc. Tech. & Instrum.*, 3(1):209–223, 2024, [arXiv:2105.06178](#), [DOI:10.1093/rasti/rzad046](#).
- [40] Price and **McEwen**. Bayesian variational regularization on the ball. *IEEE Sig. Proc. Let.*, submitted, 2021, [arXiv:2105.05518](#).
- [41] Price, Pratley, and **McEwen**. Sparse image reconstruction on the sphere: a general approach with uncertainty quantification. *IEEE Trans. Image Proc.*, submitted, 2021, [arXiv:2105.04935](#).
- [42] Cobb, Wallis, Mavor-Parker, Marignier, Price, d’Avezac, and **McEwen**. Efficient generalized spherical CNNs. In *International Conference on Learning Representations (ICLR)*, 2021, [arXiv:2010.11661](#).
- [43] Pratley and **McEwen**. Sparse image reconstruction for the spider optical interferometric telescope. In *9th International Conference on Photonics, Optics and Laser Technology*, pages 104–109, 2021, [arXiv:1903.05638](#), [DOI:10.5220/0010322601040109](#).
- [44] Arshad, Mello, Ender, **McEwen**, and Ferré. Reducing cybersickness in 360-degree virtual reality. *Multisensory Research*, 35:203–219, 2021, [arXiv:2103.03898](#), [DOI:10.1163/22134808-bja10066](#).
- [45] Munshi, Namikawa, **McEwen**, Kitching, and Bouchet. Morphology of weak lensing convergence maps. *Mon. Not. Roy. Astron. Soc.*, 507(1):1421–1433, 2021, [arXiv:2010.05669](#), [DOI:10.1093/mnras/stab2101](#).
- [46] Price, **McEwen**, Pratley, and Kitching. Sparse Bayesian mass-mapping with uncertainties: full-sky observations on the celestial sphere. *Mon. Not. Roy. Astron. Soc.*, 500(4):5436–5452, 2021, [arXiv:2004.07855](#), [DOI:10.1093/mnras/staa3563](#).
- [47] Aslam, Khalid, and **McEwen**. Multiscale optimal filtering on the sphere. *IEEE Sig. Proc. Let.*, 28:394–398, 2021, [arXiv:2010.07809](#), [DOI:10.1109/LSP.2021.3056236](#).
- [48] Roddy and **McEwen**. Sifting convolution on the sphere. *IEEE Sig. Proc. Let.*, 28:304–308, 2021, [arXiv:2007.12153](#), [DOI:10.1093/mnras/staa2769](#).
- [49] Pratley, Johnston-Hollitt, and **McEwen**. Novel perspectives gained from new reconstruction algorithms. In *XXXIVth General Assembly and Scientific Symposium of the International Union of Radio Science*, 2020, [arXiv:2009.12661](#).
- [50] Cai, Pratley, and **McEwen**. Offline and online reconstruction for radio interferometric imaging. In *XXXIVth General Assembly and Scientific Symposium of the International Union of Radio Science*, 2020, [arXiv:2004.06478](#).
- [51] Munshi, Namikawa, Kitching, **McEwen**, and Bouchet. Weak lensing skew-spectrum. *Mon. Not. Roy. Astron. Soc.*, 498(4):6057–6068, 2020, [arXiv:2006.12832](#), [DOI:10.1093/mnras/staa2769](#).
- [52] Munshi and **McEwen**. Higher-order spectra of weak lensing convergence maps in parameterized theories of modified gravity. *Mon. Not. Roy. Astron. Soc.*, 498(4):5299–5316, 2020, [arXiv:2004.07021](#), [DOI:10.1093/mnras/staa2706](#).
- [53] Munshi, Namikawa, Kitching, **McEwen**, Takahashi, Bouchet, Taruya, and Bose. The weak lensing bispectrum induced by gravity. *Mon. Not. Roy. Astron. Soc.*, 493(3):3985–3995, 2020, [arXiv:1910.04627](#), [DOI:10.1093/mnras/staa296](#).
- [54] Pratley and **McEwen**. Load balancing for distributed interferometric image reconstruction. *Mon. Not. Roy. Astron. Soc.*, submitted, 2019, [arXiv:1903.07621](#).

- [55] Pratley, Johnston-Hollitt, and **McEwen**. w -stacking w -projection hybrid algorithm for wide-field interferometric imaging: implementation details and improvements. *P. Astron. Soc. Aust.*, 37, 2020, [arXiv:1903.06555](#), [DOI:doi:10.1017/pasa.2020.28](#).
- [56] Pratley, **McEwen**, d’Avezac, Cai, Perez-Suarez, Christidi, and Guichard. Distributed and parallel sparse convex optimization for radio interferometry with PURIFY. *Astron. Comput.*, *submitted*, 2019, [arXiv:1903.04502](#).
- [57] Munshi, **McEwen**, Kitching, Fosalba, Teyssier, and Stadel. Estimating the integrated bispectrum from weak lensing maps. *J. Cosmol. Astropart. P.*, 2020(5), 2020, [arXiv:1902.04877](#), [DOI:10.1088/1475-7516/2020/05/043](#).
- [58] Taylor, Kitching, Alsing, Wandelt, Feeney, and **McEwen**. Cosmic shear: inference from forward models. *Phys. Rev. D.*, 100(2), 2019, [arXiv:1904.05364](#), [DOI:10.1103/PhysRevD.100.023519](#).
- [59] Price, **McEwen**, Cai, and Kitching. Sparse Bayesian mass-mapping with uncertainties: peak statistics and feature locations. *Mon. Not. Roy. Astron. Soc.*, 489(3):3236–3250, 2019, [arXiv:1812.04018](#), [DOI:10.1093/mnras/stz2373](#).
- [60] Price, Cai, **McEwen**, Pereyra, and Kitching. Sparse Bayesian mass-mapping with uncertainties: local credible intervals. *Mon. Not. Roy. Astron. Soc.*, 492(1):394–404, 2019, [arXiv:1812.04017](#), [DOI:10.1093/mnras/stz3453](#).
- [61] Price, **McEwen**, Cai, Kitching, and Wallis. Sparse Bayesian mass-mapping with uncertainties: hypothesis testing of structure. *Mon. Not. Roy. Astron. Soc.*, 506(3):3678–3690, 2021, [arXiv:1812.04014](#), [DOI:10.1093/mnras/stab1983](#).
- [62] Cai, Pereyra, and **McEwen**. Quantifying uncertainty in high dimensional inverse problems by convex optimisation. In *27th European Signal Processing Conference (EUSIPCO)*, 2019, [arXiv:1811.02514](#).
- [63] **McEwen** and Price. Scale-discretised ridgelet transform on the sphere. In *27th European Signal Processing Conference (EUSIPCO)*, 2019, [arXiv:1510.01595](#), [DOI:10.23919/EUSIPCO.2019.8903034](#).
- [64] Allam Jr, Biswas, Hložek, Lochner, **McEwen**, Peiris, and Setzer. Optimising the LSST observing strategy for supernova light curve classification with machine learning. In *Biomedical and Astronomical Signal Processing Frontiers (BASP)*, 2019.
- [65] Cai, Pereyra, and **McEwen**. Radio interferometric imaging with uncertainties. In *Biomedical and Astronomical Signal Processing Frontiers (BASP)*, 2019.
- [66] Pratley, Johnston-Hollitt, and **McEwen**. Wide-field interferometric imaging via distributed sparse image reconstruction. In *Biomedical and Astronomical Signal Processing Frontiers (BASP)*, 2019.
- [67] Price, **McEwen**, Cai, Kitching, Wallis, and Pereyra. Sparse Bayesian mass-mapping with uncertainties. In *Biomedical and Astronomical Signal Processing Frontiers (BASP)*, 2019.
- [68] Malyali, Rivi, Abdalla, and **McEwen**. Radio galaxy detection in the visibility domain. *Mon. Not. Roy. Astron. Soc.*, 486(2):2695–2704, 2019, [arXiv:1810.12930](#), [DOI:10.1093/mnras/stz977](#).
- [69] Taylor, Kitching, and **McEwen**. Non-parametric cosmology with cosmic shear. *Phys. Rev. D.*, 99(043532), 2019, [arXiv:1810.10552](#), [DOI:10.1103/PhysRevD.99.043532](#).
- [70] Skipper, Scaife, and **McEwen**. Cleaning radio interferometric images using a spherical wavelet decomposition. *Astron. Comput.*, 29(100327), 2019, [arXiv:1909.03956](#), [DOI:10.1016/j.ascom.2019.100327](#).
- [71] Chan, Wu, On, Barnes, **McEwen**, and Kitching. Polarised radiative transfer on cosmological scales for investigating large-scale magnetic field structures. *Mon. Not. Roy. Astron. Soc.*, 484(2):1427–1455, 2019, [arXiv:1901.04581](#), [DOI:10.1093/mnras/sty3498](#).

- [72] Pratley, Johnston-Hollitt, and **McEwen**. A fast and exact w -stacking and w -projection hybrid algorithm for wide-field interferometric imaging. *Astrophys. J.*, 874(2):174–188, 2019, [arXiv:1807.09239](#), [DOI:10.3847/1538-4357/ab0a05](#).
- [73] Cai, Pratley, and **McEwen**. Online radio interferometric imaging: assimilating and discarding visibilities on arrival. *Mon. Not. Roy. Astron. Soc.*, 485(4):4559–4572, 2019, [arXiv:1712.04462](#), [DOI:10.1093/mnras/stz704](#).
- [74] Sooknunan, Lochner, Bassett, Peiris, Fender, Stewart, Pietka, Woudt, **McEwen**, and Lahav. Classification of multiwavelength transients with machine learning. *Mon. Not. Roy. Astron. Soc.*, 502(1):206–224, 2021, [arXiv:1811.08446](#), [DOI:10.1093/mnras/staa3873](#).
- [75] Lochner, Scolnic, Awan, Regnault, Gris, Mandelbaum, Gawiser, Almoubayyed, Setzer, Huber, Graham, Hložek, Biswas, Eifler, Rothchild, Jr, Blazek, Chang, Collett, Goobar, Hook, Jarvis, Jha, Kim, Marshall, **McEwen**, Moniez, Newman, Peiris, Rhodes, Sevilla-Noarbe, Slosar, Suyu, Tyson, and LSST Dark Energy Science Collaboration). Optimizing the LSST Observing Strategy for Dark Energy Science: DESC Recommendations for the Wide-Fast-Deep Survey. *arXiv*, 2018, [arXiv:1812.00515](#).
- [76] Scolnic, Lochner, Gris, Regnault, Hložek, Aldering, Jr, Awan, Biswas, Blazek, Chang, Gawiser, Goobar, Hook, Jha, **McEwen**, Mandelbaum, Marshall, Neilsen, Rhodes, Rothchild, Noarbe, Slosar, and LSST Dark Energy Science Collaboration). Optimizing the LSST Observing Strategy for Dark Energy Science: DESC Recommendations for the Deep Drilling Fields and other Special Programs. *arXiv*, 2018, [arXiv:1812.00516](#).
- [77] Hložek, Ponder, Malz, Dai, Narayan, Ishida, T. Allam Jr, Bahmanyar, Biswas, Galbany, Jha, Jones, Kessler, Lochner, Mahabal, Mandel, Martínez-Galarza, **McEwen**, Muthukrishna, Peiris, Peters, and Setzer. Results of the Photometric LSST Astronomical Time-series Classification Challenge (PLAsTiCC). *Astrophys. J. Supp.*, 267(2):25, 2023, [arXiv:2012.12392](#), [DOI:10.3847/1538-4365/accd6a](#).
- [78] Malz, Hložek, Jr, Bahmanyar, Biswas, Dai, Galbany, Ishida, Jha, Jones, Kessler, Lochner, Mahabal, Mandel, Martínez-Galarza, **McEwen**, Muthukrishna, Narayan, Peiris, Peters, Setzer, Collaboration, and Collaboration. The Photometric LSST Astronomical Time-series Classification Challenge (PLAsTiCC): Selection of a performance metric for classification probabilities balancing diverse science goals. *Astron. J.*, 158(5):171, 2019, [arXiv:1809.11145](#), [DOI:10.3847/1538-3881/ab3a2f](#).
- [79] The PLAsTiCC Team, T. Allam Jr, Bahmanyar, Biswas, Dai, Galbany, Hložek, Ishida, Jha, Jones, Kessler, Lochner, Mahabal, Malz, Mandel, Martínez-Galarza, **McEwen**, Muthukrishna, Narayan, Peiris, Peters, Ponder, Setzer, Collaboration, Transients, and Collaboration. The Photometric LSST Astronomical Time-series Classification Challenge (PLAsTiCC): Data set. *arXiv*, 2018, [arXiv:1810.00001](#).
- [80] Jennings, Watkinson, Abdalla, and **McEwen**. Evaluating machine learning techniques for predicting power spectra from reionization simulations. *Mon. Not. Roy. Astron. Soc.*, 483(3):2907–2922, 2018, [arXiv:1811.09141](#), [DOI:10.1093/mnras/sty3168](#).
- [81] Elahi, Khalid, Kennedy, and **McEwen**. An optimal-dimensionality sampling for spin- s functions on the sphere. *IEEE Sig. Proc. Let.*, 25(10):1470–1474, 2018, [arXiv:1809.01321](#), [DOI:10.1109/LSP.2018.2865676](#).
- [82] Bates, Khalid, **McEwen**, Kennedy, Daducci, and Canales-Rodríguez. Optimal-dimensionality sampling and robust 3d diffusion signal reconstruction. *IEEE Trans. Sig. Proc.*, *submitted*, 2018, [arXiv:1807.09637](#).
- [83] Planck Collaboration LVII. Planck intermediate results. LVII. Joint Planck LFI and HFI data processing. *Astron. & Astrophys.*, 643(A42), 2020, [arXiv:2007.04997](#), [DOI:10.1051/0004-6361/202038073](#).
- [84] Planck Collaboration LVI. Planck intermediate results. LVI. Detection of the CMB dipole through modulation of the thermal Sunyaev-Zeldovich effect: Eppur si muove II. *Astron. & Astrophys.*, 644(A100), 2020, [arXiv:2003.12646](#), [DOI:10.1051/0004-6361/202038053](#).

- [85] Planck Collaboration LV. Planck intermediate results. LV. Reliability and thermal properties of high-frequency sources in the Second Planck Catalogue of Compact Sources. *Astron. & Astrophys.*, 644(A99), 2020, [arXiv:2009.06333](https://arxiv.org/abs/2009.06333), DOI:10.1051/0004-6361/201936794.
- [86] Planck Collaboration I. Planck 2018 results. I. Overview, and the cosmological legacy of Planck. *Astron. & Astrophys.*, 641(A1), 2020, [1807.06205](https://arxiv.org/abs/1807.06205), DOI:10.1051/0004-6361/201833880.
- [87] Planck Collaboration II. Planck 2018 results. II. Low Frequency Instrument data processing. *Astron. & Astrophys.*, 641(A2), 2020, [1807.06206](https://arxiv.org/abs/1807.06206), DOI:10.1051/0004-6361/201833293.
- [88] Planck Collaboration III. Planck 2018 results. III. High Frequency Instrument data processing. *Astron. & Astrophys.*, 641(A3), 2020, [1807.06207](https://arxiv.org/abs/1807.06207), DOI:10.1051/0004-6361/201832909.
- [89] Planck Collaboration IV. Planck 2018 results. IV. Diffuse component separation. *Astron. & Astrophys.*, 641(A4), 2020, [1807.06208](https://arxiv.org/abs/1807.06208), DOI:10.1051/0004-6361/201833881.
- [90] Planck Collaboration V. Planck 2018 results. V. Power spectra and likelihoods. *Astron. & Astrophys.*, 641(A5), 2020, [1907.12875](https://arxiv.org/abs/1907.12875), DOI:10.1051/0004-6361/201936386.
- [91] Planck Collaboration VI. Planck 2018 results. VI. Cosmological parameters. *Astron. & Astrophys.*, 641(A6), 2020, [1807.06209](https://arxiv.org/abs/1807.06209), DOI:10.1051/0004-6361/201833910.
- [92] Planck Collaboration VII. Planck 2018 results. VII. Isotropy and statistics. *Astron. & Astrophys.*, 641(A7), 2020, [1906.02552](https://arxiv.org/abs/1906.02552), DOI:10.1051/0004-6361/201935201.
- [93] Planck Collaboration VIII. Planck 2018 results. VIII. Gravitational lensing. *Astron. & Astrophys.*, 641(A8), 2020, [1807.06210](https://arxiv.org/abs/1807.06210), DOI:10.1051/0004-6361/201833886.
- [94] Planck Collaboration IX. Planck 2018 results. IX. Constraints on primordial non-Gaussianity. *Astron. & Astrophys.*, 641(A9), 2020, [1905.05697](https://arxiv.org/abs/1905.05697), DOI:10.1051/0004-6361/201935891.
- [95] Planck Collaboration X. Planck 2018 results. X. Constraints on inflation. *Astron. & Astrophys.*, 641(A10), 2020, [1807.06211](https://arxiv.org/abs/1807.06211), DOI:10.1051/0004-6361/201833887.
- [96] Planck Collaboration XI. Planck 2018 results. XI. Polarized dust foregrounds. *Astron. & Astrophys.*, 641(A11), 2020, [1801.04945](https://arxiv.org/abs/1801.04945), DOI:10.1051/0004-6361/201832618.
- [97] Planck Collaboration XII. Planck 2018 results. XII. Galactic astrophysics using polarized dust emission. *Astron. & Astrophys.*, 641(A12), 2020, [1807.06212](https://arxiv.org/abs/1807.06212), DOI:10.1051/0004-6361/201833885.
- [98] Taylor, Kitching, **McEwen**, and Tram. Testing the cosmic shear spatially-flat universe approximation with GLaSS. *Phys. Rev. D.*, 98(023522), 2018, [arXiv:1804.03668](https://arxiv.org/abs/1804.03668), DOI:10.1103/PhysRevD.98.023522.
- [99] Taylor, Kitching, and **McEwen**. Preparing for the cosmic shear data flood: optimal data extraction and simulation requirements for stage iv dark energy experiments. *Phys. Rev. D.*, 98(043532), 2018, [arXiv:1804.03667](https://arxiv.org/abs/1804.03667), DOI:10.1103/PhysRevD.98.043532.
- [100] Planck Collaboration LIV. Planck intermediate results. LIV. The Planck multi-frequency catalogue of non-thermal sources. *Astron. & Astrophys.*, 619(A94), 2018, [arXiv:1802.08649](https://arxiv.org/abs/1802.08649), DOI:10.1051/0004-6361/201832888.
- [101] Cai, Pereyra, and **McEwen**. Uncertainty quantification for radio interferometric imaging: II. MAP estimation. *Mon. Not. Roy. Astron. Soc.*, 480(3):4170–4182, 2018, [arXiv:1711.04819](https://arxiv.org/abs/1711.04819), DOI:10.1093/mnras/sty2015.
- [102] Cai, Pereyra, and **McEwen**. Uncertainty quantification for radio interferometric imaging: I. proximal mcmc methods. *Mon. Not. Roy. Astron. Soc.*, 480(3):4154–4169, 2018, [arXiv:1711.04818](https://arxiv.org/abs/1711.04818), DOI:10.1093/mnras/sty2004.

- [103] **McEwen**, Durastanti, and Wiaux. Localisation of directional scale-discretised wavelets on the sphere. *Applied Comput. Harm. Anal.*, 44(1):59–88, 2018, [arXiv:1509.06767](#), [DOI:10.1016/j.acha.2016.03.009](#).
- [104] Planck Collaboration LIII. Planck intermediate results. LIII. Detection of velocity dispersion from the kinetic Sunyaev-Zeldovich effect. *Astron. & Astrophys.*, 617(A48), 2018, [arXiv:1707.00132](#), [DOI:10.1051/0004-6361/201731489](#).
- [105] Pratley, **McEwen**, d’Avezac, Carrillo, Onose, and Wiaux. Robust sparse image reconstruction of radio interferometric observations with PURIFY. *Mon. Not. Roy. Astron. Soc.*, 473(1):1038–1058, 2018, [arXiv:1610.02400](#), [DOI:10.1093/mnras/stx2237](#).
- [106] Nafees, Khalid, Kennedy, and **McEwen**. Optimal-dimensionality sampling on the sphere: improvements and variations. In *12th International Conference on Sampling Theory and Applications (SampTA)*, invited contribution, 2017, [arXiv:1709.02497](#), [DOI:10.1109/SAMP.TA.2017.8024464](#).
- [107] Elahi, Khalid, Kennedy, and **McEwen**. Iterative residual fitting for spherical harmonic transform of band-limited signals on the sphere: generalization and analysis. In *12th International Conference on Sampling Theory and Applications (SampTA)*, 2017, [arXiv:1709.02503](#), [DOI:10.1109/SAMP.TA.2017.8024463](#).
- [108] Bates, Khalid, **McEwen**, and Kennedy. An optimal dimensionality multi-shell sampling scheme with accurate and efficient transforms for diffusion mri. In *IEEE International Symposium on Biomedical Imaging (ISBI)*, 2017, [arXiv:1705.04336](#).
- [109] LSST Science Collaborations. Science-driven optimization of the lsst observing strategy. *arXiv*, 2017, [arXiv:1708.04058](#).
- [110] Robitaille, Scaife, Carretti, Gaensler, **McEwen**, Leistedt, Haverkorn, Bernardi, Kesteven, Poppi, and Staveley-Smith. A new perspective on turbulent galactic magnetic fields through comparison of linear polarisation decomposition techniques. *Mon. Not. Roy. Astron. Soc.*, 468(3):2957–2974, 2017, [arXiv:1703.04469](#), [DOI:10.1093/mnras/stx642](#).
- [111] Cai, Wallis, Chan, and **McEwen**. Wavelet-based segmentation method for spherical images. In *Biomedical and Astronomical Signal Processing Frontiers (BASP)*, 2017.
- [112] Pratley, **McEwen**, d’Avezac, Carrillo, Onose, and Wiaux. PURIFYing real radio interferometric observations. In *Biomedical and Astronomical Signal Processing Frontiers (BASP)*, 2017, [arXiv:1702.06800](#).
- [113] Bates, Khalid, Kennedy, and **McEwen**. Multi-shell sampling scheme with accurate and efficient transforms for diffusion mri. In *Biomedical and Astronomical Signal Processing Frontiers (BASP)*, 2017, [arXiv:1702.07056](#).
- [114] Dabbech, Wolz, Pratley, **McEwen**, and Wiaux. The w -effect in interferometric imaging: from a fast sparse measurement operator to super-resolution. *Mon. Not. Roy. Astron. Soc.*, 471(4):4300–4313, 2017, [arXiv:1702.05009](#), [DOI:10.1093/mnras/stx1775](#).
- [115] Planck Collaboration LII. Planck intermediate results. LII. Planet flux densities. *Astron. & Astrophys.*, 607(A122), 2017, [1612.07151](#), [DOI:10.1051/0004-6361/201630311](#).
- [116] **McEwen**, Feeney, Peiris, Wiaux, Ringeval, and Bouchet. Wavelet-Bayesian inference of cosmic strings embedded in the cosmic microwave background. *Mon. Not. Roy. Astron. Soc.*, 472(4):4081–4098, 2017, [arXiv:1611.10347](#), [DOI:10.1093/mnras/stx2268](#).
- [117] Kitching, Alsing, Heavens, Jimenez, **McEwen**, and Verde. The limits of cosmic shear. *Mon. Not. Roy. Astron. Soc.*, 469(3):2737–2749, 2017, [arXiv:1611.04954](#), [DOI:10.1093/mnras/stx1039](#).
- [118] Onose, Carrillo, **McEwen**, and Wiaux. A randomised primal-dual algorithm for distributed radio-interferometric imaging. In *24th European Signal Processing Conference (EUSIPCO)*, 2016, [arXiv:1610.08895](#).

- [119] Cai, Wallis, Chan, and **McEwen**. Wavelet-based segmentation on the sphere. *Pattern Recognition*, 100(107081), 2020, [arXiv:1609.06500](#), [DOI:10.1016/j.patcog.2019.107081](#).
- [120] Wallis, Wiaux, and **McEwen**. Sparse image reconstruction on the sphere: analysis vs synthesis. *IEEE Trans. Image Proc.*, 26(11):5176–5187, 2017, [arXiv:1608.00553](#), [DOI:10.1109/TIP.2017.2716824](#).
- [121] Planck Collaboration LI. Planck intermediate results. LI. Features in the cosmic microwave background temperature power spectrum and shifts in cosmological parameters. *Astron. & Astrophys.*, 607(A95), 2017, [1608.02487](#), [DOI:10.1051/0004-6361/201629504](#).
- [122] Planck Collaboration L. Planck intermediate results. L. Evidence of spatial variation of the polarized thermal dust spectral energy distribution and implications for CMB B-mode analysis. *Astron. & Astrophys.*, 599(A51), 2017, [1606.07335](#), [DOI:10.1051/0004-6361/201629164](#).
- [123] Leistedt, **McEwen**, Büttner, and Peiris. Wavelet reconstruction of E and B modes for CMB polarisation and cosmic shear analyses. *Mon. Not. Roy. Astron. Soc.*, 466(3):3728–3740, 2017, [arXiv:1605.01414](#), [DOI:10.1093/mnras/stw3176](#).
- [124] Planck Collaboration XLVIII. Planck intermediate results. XLVIII. Disentangling Galactic dust emission and cosmic infrared background anisotropies. *Astron. & Astrophys.*, 596(A109), 2016, [1605.09387](#), [DOI:10.1051/0004-6361/201629022](#).
- [125] Planck Collaboration XLIX. Planck intermediate results. XLIX. Parity-violation constraints from polarization data. *Astron. & Astrophys.*, 596(A110), 2016, [1605.08633](#), [DOI:10.1051/0004-6361/201629018](#).
- [126] Saadeh, Feeney, Pontzen, Peiris, and **McEwen**. How isotropic is the universe? *Phys. Rev. Lett.*, 117(13):131302, 2016, [arXiv:1605.07178](#), [DOI:10.1103/PhysRevLett.117.131302](#).
- [127] Rogers, Peiris, Leistedt, **McEwen**, and Pontzen. Spin-SILC: CMB polarisation component separation with spin wavelets. *Mon. Not. Roy. Astron. Soc.*, 462(3):2310–2322, 2016, [arXiv:1605.01417](#), [DOI:10.1093/mnras/stw2128](#).
- [128] Planck Collaboration XLVII. Planck intermediate results. XLVII. Planck constraints on reionization history. *Astron. & Astrophys.*, 596(A108), 2016, [1605.03507](#), [DOI:10.1051/0004-6361/201628897](#).
- [129] Planck Collaboration XLVI. Planck intermediate results. XLVI. Reduction of large-scale systematic effects in HFI polarization maps and estimation of the reionization optical depth. *Astron. & Astrophys.*, 596(A107), 2016, [1605.02985](#), [DOI:10.1051/0004-6361/201628890](#).
- [130] Planck Collaboration XLIV. Planck intermediate results. XLIV. Structure of the Galactic magnetic field from dust polarization maps of the southern Galactic cap. *Astron. & Astrophys.*, 596(A105), 2016, [1604.01029](#), [DOI:10.1051/0004-6361/201628636](#).
- [131] Saadeh, Feeney, Pontzen, Peiris, and **McEwen**. A framework for testing isotropy with the cosmic microwave background. *Mon. Not. Roy. Astron. Soc.*, 462(2):1802–1811, 2016, [arXiv:1604.01024](#), [DOI:10.1093/mnras/stw1731](#).
- [132] Lochner, **McEwen**, Peiris, Lahav, and Winter. Photometric supernova classification with machine learning. *Astrophys. J. Supp.*, 225(2):31, 2016, [arXiv:1603.00882](#), [DOI:10.3847/0067-0049/225/2/31](#).
- [133] Onose, Carrillo, Repetti, **McEwen**, Thiran, Pesquet, and Wiaux. Scalable splitting algorithms for big-data interferometric imaging in the ska era. *Mon. Not. Roy. Astron. Soc.*, 462(4):4314–4335, 2016, [arXiv:1601.04026](#), [DOI:10.1093/mnras/stw1859](#).
- [134] Rogers, Peiris, Leistedt, **McEwen**, and Pontzen. SILC: a new Planck Internal Linear Combination CMB temperature map using directional wavelets. *Mon. Not. Roy. Astron. Soc.*, 460(3):3014–3028, 2016, [arXiv:1601.01322](#), [DOI:10.1093/mnras/stw1121](#).

- [135] Chan, Leistedt, Kitching, and **McEwen**. Second-generation curvelets on the sphere. *IEEE Trans. Sig. Proc.*, 65(1):5–14, 2017, [arXiv:1511.05578](#), [DOI:10.1109/TSP.2016.2600506](#).
- [136] **McEwen**, Leistedt, Büttner, Peiris, and Wiaux. Directional spin wavelets on the sphere. *IEEE Trans. Sig. Proc.*, submitted, 2015, [arXiv:1509.06749](#).
- [137] Khalid, Durrani, Kennedy, Wiaux, and **McEwen**. Gauss-legendre sampling on the rotation group. *IEEE Sig. Proc. Lett.*, 23(2):207–211, 2016, [arXiv:1508.03353](#), [DOI:10.1109/LSP.2015.2503295](#).
- [138] Khalid, Kennedy, and **McEwen**. Slepian spatial-spectral concentration on the ball. *Applied Comput. Harm. Anal.*, 40(3):470–504, 2016, [arXiv:1403.5553](#), [DOI:10.1016/j.acha.2015.03.008](#).
- [139] Planck Collaboration XVIII. Planck 2015 results. XVIII. Background geometry and topology of the Universe. *Astron. & Astrophys.*, 594(A18), 2016, [arXiv:1502.01593](#), [DOI:10.1117/12.2026126](#).
- [140] Planck Collaboration I. Planck 2015 results. I. Overview of products and results. *Astron. & Astrophys.*, 594(A1), 2016, [arXiv:1502.01582](#), [DOI:10.1051/0004-6361/201527101](#).
- [141] Clarke, Coveney, Heavens, Jäykkä, Joachimi, Karastergiou, Konstantinidis, Korn, Mann, McEwen, Ridder, Roberts, Scanlon, Shellard, and Yates. Big data in the physical sciences: challenges and opportunities. *ATI Scoping Report*, 2016.
- [142] Leistedt, **McEwen**, Kitching, and Peiris. 3D weak lensing with spin wavelets on the ball. *Phys. Rev. D.*, 92:123010, 2015, [arXiv:1509.06750](#), [DOI:10.1103/PhysRevD.92.123010](#).
- [143] **McEwen**, Büttner, Leistedt, Peiris, and Wiaux. A novel sampling theorem on the rotation group. *IEEE Sig. Proc. Lett.*, 22(12):2425–2429, 2015, [arXiv:1508.03101](#), [DOI:10.1109/LSP.2015.2490676](#).
- [144] Leistedt, **McEwen**, Büttner, Peiris, Vanderghenst, and Wiaux. Analysing the polarisation of the cmb with spin scale-discretised wavelets. In *Biomedical and Astronomical Signal Processing Frontiers (BASP)*, 2015, [arXiv:1502.03120](#).
- [145] Carrillo, **McEwen**, and Wiaux. Why clean when you can purify? a new approach for next-generation radio interferometric imaging. In *Biomedical and Astronomical Signal Processing Frontiers (BASP)*, 2015, [arXiv:1502.05037](#).
- [146] Kitching, Bacon, Brown, Bull, **McEwen**, Oguri, Scaramella, Takahashi, Wu, and Yamauchi. Euclid & ska synergies. *SKA Synergies Chapter, Advancing Astrophysics with the SKA*, 2015, [arXiv:1501.03978](#).
- [147] Bacon, Bridle, Abdalla, Brown, Bull, Camera, Fender, Grainge, Ivezic, Jarvis, Jackson, Kirk, Mann, **McEwen**, McKean, Newman, Raccañelli, Sahlen, Santos, Tyson, and Zhao. Synergy between the large synoptic survey telescope and the square kilometre array. *SKA Synergies Chapter, Advancing Astrophysics with the SKA*, 2015, [arXiv:1501.03977](#).
- [148] **McEwen**, Büttner, Leistedt, Peiris, Vanderghenst, and Wiaux. On spin scale-discretised wavelets on the sphere for the analysis of cmb polarisation. In *Proceedings IAU Symposium No. 306, 2014*, 2014, [arXiv:1412.1340](#).
- [149] Carrillo, **McEwen**, and Wiaux. PURIFY: a new algorithmic framework for next-generation radio-interferometric imaging. In *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), invited contribution*, 2014, [arXiv:1406.0359](#).
- [150] Kennedy, Sadeghi, Khalid, and **McEwen**. Classification and construction of closed-form kernels for signal representation on the 2-sphere. In *Wavelets and Sparsity XV, SPIE international symposium on optics and photonics, invited contribution*, volume 8858, 2013, [arXiv:1308.6566](#), [DOI:10.1117/12.2026126](#).
- [151] Leistedt, Peiris, and **McEwen**. Flaglets for studying the large-scale structure of the universe. In *Wavelets and Sparsity XV, SPIE international symposium on optics and photonics, invited contribution*, volume 8858, 2013, [arXiv:1308.5480](#), [DOI:10.1117/12.2022869](#).

- [152] **McEwen**, Vandergheynst, and Wiaux. On the computation of directional scale-discretized wavelet transforms on the sphere. In *Wavelets and Sparsity XV, SPIE international symposium on optics and photonics, invited contribution*, volume 8858, 2013, [arXiv:1308.5706](#), [DOI:10.1117/12.2022889](#).
- [153] Khalid, Kennedy, and **McEwen**. An optimal-dimensionality sampling scheme on the sphere with fast spherical harmonic transforms. *IEEE Trans. Sig. Proc.*, 62(17):4597–4610, 2014, [arXiv:1403.4661](#), [DOI:10.1109/TSP.2014.2337278](#).
- [154] Planck Collaboration XXVI. Planck 2013 results. XXVI. Background geometry and topology of the Universe. *Astron. & Astrophys.*, 571(A26), 2014, [arXiv:1303.5086](#), [DOI:10.1051/0004-6361/201321546](#).
- [155] Planck Collaboration XXV. Planck 2013 results. XXV. Searches for cosmic strings and other topological defects. *Astron. & Astrophys.*, 571(A25), 2014, [arXiv:1303.5085](#), [DOI:10.1051/0004-6361/201321621](#).
- [156] Planck Collaboration XXIII. Planck 2013 results. XXIII. Isotropy and statistics of the CMB. *Astron. & Astrophys.*, 571(A23), 2014, [arXiv:1303.5083](#), [DOI:10.1051/0004-6361/201321534](#).
- [157] Planck Collaboration I. Planck 2013 results. I. Overview of products and scientific results. *Astron. & Astrophys.*, 571(A1), 2014, [arXiv:1303.5062](#), [DOI:10.1051/0004-6361/201321529](#).
- [158] Feeney, Marinucci, **McEwen**, Peiris, Wandelt, and Cammarota. Sparse inpainting and isotropy. *J. Cosmol. Astropart. P.*, 2014(1):050, 2014, [arXiv:1308.0602](#), [DOI:10.1088/1475-7516/2014/01/050](#).
- [159] Carrillo, **McEwen**, and Wiaux. PURIFY: a new approach to radio-interferometric imaging. *Mon. Not. Roy. Astron. Soc.*, 439(4):3591–3604, 2014, [arXiv:1307.4370](#), [DOI:10.1093/mnras/stu202](#).
- [160] Sutter, Wandelt, **McEwen**, Bunn, Karakci, Korotkov, Timbie, Tucker, and Zhang. Probabilistic image reconstruction for radio interferometers. *Mon. Not. Roy. Astron. Soc.*, 438(1):768–778, 2014, [arXiv:1309.1469](#), [DOI:10.1093/mnras/stt2244](#).
- [161] Wolz, **McEwen**, Abdalla, Carrillo, and Wiaux. Revisiting the spread spectrum effect in radio interferometric imaging: a sparse variant of the w -projection algorithm. *Mon. Not. Roy. Astron. Soc.*, 436(3):1993–2003, 2013, [arXiv:1307.3424](#), [DOI:10.1093/mnras/stt1707](#).
- [162] **McEwen**, Josset, Feeney, Peiris, and Lasenby. Bayesian analysis of anisotropic cosmologies: Bianchi VII_b and WMAP. *Mon. Not. Roy. Astron. Soc.*, 436(4):3680–3694, 2013, [arXiv:1303.3409](#), [DOI:10.1093/mnras/stt1855](#).
- [163] **McEwen** and Leistedt. Fourier-Laguerre transform, convolution and wavelets on the ball. In *10th International Conference on Sampling Theory and Applications (SampTA), invited contribution*, pages 329–333, 2013, [arXiv:1307.1307](#).
- [164] Carrillo, **McEwen**, and Wiaux. On sparsity averaging. In *10th International Conference on Sampling Theory and Applications (SampTA), invited contribution*, pages 368–371, 2013, [arXiv:1307.1360](#).
- [165] Wolz, Abdallah, Carrillo, Wiaux, and **McEwen**. The varying- w spread spectrum effect for radio interferometric imaging. In *Biomedical and Astronomical Signal Processing Frontiers (BASP)*, 2013, [arXiv:1301.7259](#).
- [166] Leistedt and **McEwen**. Flaglets: Exact wavelets on the ball. In *Biomedical and Astronomical Signal Processing Frontiers (BASP)*, 2013, [arXiv:1301.6125](#).
- [167] Carrillo, **McEwen**, and Wiaux. Sparsity averaging for radio interferometric imaging. In *Biomedical and Astronomical Signal Processing Frontiers (BASP)*, 2013, [arXiv:1402.2335](#).
- [168] Leistedt, **McEwen**, Vandergheynst, and Wiaux. S2LET: A code to perform fast wavelet analysis on the sphere. *Astron. & Astrophys.*, 558(A128):1–9, 2013, [arXiv:1211.1680](#), [DOI:10.1051/0004-6361/201220729](#).

- [169] Feeney, Johnson, **McEwen**, Mortlock, and Peiris. Hierarchical Bayesian detection algorithm for early-Universe relics in the cosmic microwave background. *Phys. Rev. D.*, 88(4):043012, 2013, [arXiv:1210.2725](#), [DOI:10.1103/PhysRevD.88.043012](#).
- [170] Carrillo, **McEwen**, Ville, Thiran, and Wiaux. Sparsity averaging for compressive imaging. *IEEE Sig. Proc. Let.*, 20(6):591–594, 2013, [arXiv:1208.2330](#), [DOI:10.1109/LSP.2013.2259813](#).
- [171] Khalid, Kennedy, Durrani, Sadeghi, Wiaux, and **McEwen**. Fast directional spatially localized spherical harmonic transform. *IEEE Trans. Sig. Proc.*, 61(9):2192–2203, 2013, [arXiv:1207.5558](#), [DOI:10.1109/TSP.2013.2247601](#).
- [172] **McEwen**, Puy, Thiran, Vandergheynst, Ville, and Wiaux. Sparse image reconstruction on the sphere: implications of a new sampling theorem. *IEEE Trans. Image Proc.*, 22(6):2275–2285, 2013, [arXiv:1205.1013](#), [DOI:10.1109/TIP.2013.2249079](#).
- [173] Leistedt and **McEwen**. Exact wavelets on the ball. *IEEE Trans. Sig. Proc.*, 60(12):6257–6269, 2012, [arXiv:1205.0792](#), [DOI:10.1109/TSP.2012.2215030](#).
- [174] Carrillo, **McEwen**, and Wiaux. Sparsity averaging reweighted analysis (SARA): a novel algorithm for radio-interferometric imaging. *Mon. Not. Roy. Astron. Soc.*, 426(2):1223–1234, 2012, [arXiv:1205.3123](#), [DOI:10.1111/j.1365-2966.2012.21605.x](#).
- [175] **McEwen**, Feeney, Johnson, and Peiris. Optimal filters for detecting cosmic bubble collisions. *Phys. Rev. D.*, 85(10):103502, 2012, [arXiv:1202.2861](#), [DOI:10.1103/PhysRevD.85.103502](#).
- [176] **McEwen**, Feeney, Johnson, and Peiris. Detecting candidate cosmic bubble collisions with optimal filters. In *47th Rencontres de Moriond*, 2012, [arXiv:1206.5035](#).
- [177] **McEwen** and Wiaux. A novel sampling theorem on the sphere. *IEEE Trans. Sig. Proc.*, 59(12):5876–5887, 2011, [arXiv:1110.6298](#), [DOI:10.1109/TSP.2011.2166394](#).
- [178] **McEwen** and Wiaux. Compressed sensing for radio interferometric imaging: review and future direction. In *18th IEEE International Conference on Image Processing (ICIP), invited contribution*, 2011, [arXiv:1110.6137](#).
- [179] **McEwen**, Puy, Thiran, Vandergheynst, Ville, and Wiaux. Sampling theorems and compressive sensing on the sphere. In *Wavelets and Sparsity XIV, SPIE international symposium on optics and photonics, invited contribution*, volume 8138, 2011, [arXiv:1110.6297](#), [DOI:10.1117/12.893481](#).
- [180] **McEwen** and Wiaux. Intrinsic advantages of the w component and spherical imaging for wide-field radio interferometry. In *XXXth General Assembly and Scientific Symposium of the International Union of Radio Science*, 2011, [arXiv:1108.5233](#).
- [181] **McEwen**, Puy, Thiran, Vandergheynst, Ville, and Wiaux. Implications for compressed sensing of a new sampling theorem on the sphere. In *Signal Processing with Adaptive Sparse Structured Representations (SPARS)*, 2011, [arXiv:1110.6296](#).
- [182] Daducci, **McEwen**, Ville, Thiran, and Wiaux. Harmonic analysis of spherical sampling in diffusion MRI. In *19th Annual Meeting of the International Society for Magnetic Resonance in Medicine*, 2011, [arXiv:1106.0269](#).
- [183] **McEwen** and Wiaux. Compressed sensing for wide-field radio interferometric imaging. *Mon. Not. Roy. Astron. Soc.*, 413(2):1318–1332, 2011, [arXiv:1010.3658](#), [DOI:10.1111/j.1365-2966.2011.18217.x](#).
- [184] **McEwen**, Wiaux, and Ewers. Data compression on the sphere. *Astron. & Astrophys.*, 531(A98):1–13, 2011, [arXiv:1108.3900](#), [DOI:10.1051/0004-6361/201015728](#).
- [185] **McEwen**. Fast, exact (but unstable) spin spherical harmonic transforms. *All Res. J. Phys.*, 1(1), 2011, [arXiv:0807.4494](#).

- [186] **McEwen** and Scaife. Simulating full-sky interferometric observations. *Mon. Not. Roy. Astron. Soc.*, 389(3):1163–1178, 2008, [arXiv:0803.2165](#), [DOI:10.1111/j.1365-2966.2008.13690.x](#).
- [187] **McEwen**, Hobson, Lasenby, and Mortlock. A high-significance detection of non-Gaussianity in the WMAP 5-year data using directional spherical wavelets. *Mon. Not. Roy. Astron. Soc.*, 388(2):659–662, 2008, [arXiv:0803.2157](#), [DOI:10.1111/j.1365-2966.2008.13406.x](#).
- [188] Wiaux, **McEwen**, Vandergheynst, and Blanc. Exact reconstruction with directional wavelets on the sphere. *Mon. Not. Roy. Astron. Soc.*, 388(2):770–788, 2008, [arXiv:0712.3519](#), [DOI:10.1111/j.1365-2966.2008.13448.x](#).
- [189] Bridges, **McEwen**, Cruz, Hobson, Lasenby, Vielva, and Martínez-González. Bianchi vii_h signatures and the cold spot texture. *Mon. Not. Roy. Astron. Soc.*, 390(4):1372–1376, 2008, [arXiv:0712.1789](#), [DOI:10.1111/j.1365-2966.2008.13835.x](#).
- [190] **McEwen**, Wiaux, Hobson, Vandergheynst, and Lasenby. Probing dark energy with steerable wavelets through correlation of wmap and nvss local morphological measures. *Mon. Not. Roy. Astron. Soc.*, 384(4):1289–1300, 2008, [arXiv:0704.0626](#), [DOI:10.1111/j.1365-2966.2007.12776.x](#).
- [191] **McEwen**, Hobson, and Lasenby. Optimal filters on the sphere. *IEEE Trans. Sig. Proc.*, 56(8):3813–3823, 2008, [astro-ph/0612688](#), [DOI:10.1109/TSP.2008.923198](#).
- [192] **McEwen**, Vielva, Wiaux, Barreiro, Cayón, Hobson, Lasenby, Martínez-González., and Sanz. Cosmological applications of a wavelet analysis on the sphere. *J. Fourier Anal. and Appl.*, invited contribution, 13(4):495–510, 2007, [arXiv:0704.3158](#), [DOI:10.1007/s00041-006-6918-8](#).
- [193] Wiaux, **McEwen**, and Vielva. Complex data processing: fast wavelet analysis on the sphere. *J. Fourier Anal. and Appl.*, invited contribution, 13(4):477–493, 2007, [arXiv:0704.3144](#), [DOI:10.1007/s00041-006-6917-9](#).
- [194] **McEwen**, Hobson, and Lasenby. A directional continuous wavelet transform on the sphere. *ArXiv*, 2006, [astro-ph/0609159](#).
- [195] **McEwen**, Vielva, Hobson, Martínez-González, and Lasenby. Detection of the ISW effect and corresponding dark energy constraints made with directional spherical wavelets. *Mon. Not. Roy. Astron. Soc.*, 376(3):1211–1226, 2007, [astro-ph/0602398](#), [DOI:10.1111/j.1365-2966.2007.11505.x](#).
- [196] **McEwen**, Hobson, Mortlock, and Lasenby. Fast directional continuous spherical wavelet transform algorithms. *IEEE Trans. Sig. Proc.*, 55(2):520–529, 2007, [astro-ph/0506308](#), [DOI:10.1109/TSP.2006.887148](#).
- [197] **McEwen**. Detecting dark energy with wavelets on the sphere. In *Wavelets XII, SPIE international symposium on optics and photonics*, invited contribution, volume 6701, 2007, [arXiv:0708.3874](#), [DOI:10.1117/12.734282](#).
- [198] Bridges, **McEwen**, Lasenby, and Hobson. Markov chain Monte Carlo analysis of Bianchi VII_h models. *Mon. Not. Roy. Astron. Soc.*, 377(4):1473–1480, 2007, [astro-ph/0605325](#), [DOI:10.1111/j.1365-2966.2007.11616.x](#).
- [199] **McEwen**, Hobson, Lasenby, and Mortlock. Non-Gaussianity detections in the Bianchi VII_h corrected WMAP 1-year data made with directional spherical wavelets. *Mon. Not. Roy. Astron. Soc.*, 369(4):1858–1868, 2006, [astro-ph/0510349](#), [DOI:10.1111/j.1365-2966.2006.10434.x](#).
- [200] **McEwen**, Hobson, Lasenby, and Mortlock. A high-significance detection of non-Gaussianity in the WMAP 3-year data using directional spherical wavelets. *Mon. Not. Roy. Astron. Soc.*, 371(1):L50–L54, 2006, [astro-ph/0604305](#), [DOI:10.1111/j.1745-3933.2006.00206.x](#).
- [201] **McEwen**, Vielva, Hobson, Martínez-González, and Lasenby. Detection of the ISW effect and corresponding dark energy constraints. In *XLIst Rencontres de Moriond*, 2006, [astro-ph/0605122](#).

- [202] **McEwen**, Hobson, Lasenby, and Mortlock. A high-significance detection of non-Gaussianity in the WMAP 1-year data using directional spherical wavelets. *Mon. Not. Roy. Astron. Soc.*, 359(4):1583–1596, 2005, [astro-ph/0406604](#), DOI:10.1111/j.1365-2966.2005.09007.x.
- [203] **McEwen**, Hobson, Lasenby, and Mortlock. A fast directional continuous spherical wavelet transform. In *XXXIXth Rencontres de Moriond*, 2004, [astro-ph/0409288](#).