

Ellis R Owen

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Academic appointments

Special Postdoctoral Research Fellow (SPDR) RIKEN Pioneering Research Institute, Astrophysical Big Bang Laboratory, Japan <i>Independent institutional fellowship</i> Host: Prof. Shigehiro Nagataki	Dec. 2024 – Present
JSPS Research Fellow Theoretical Astrophysics Group, The University of Osaka, Japan <i>Independent fellowship</i> Host: Prof. Yoshiyuki Inoue	2022 - 2024
CICA Research Fellow Institute of Astronomy, National Tsing Hua University, Taiwan <i>Institutional personal fellowship leading an independent research program</i> Host: Prof. Shih-Ping Lai	2019 – 2022

Education

PhD in Astrophysics UCL Mullard Space Science Laboratory, Surrey, UK Thesis: <i>Hadronic Processes of Energetic Particles in Star-Forming and High-Redshift Protogalactic Environments</i> Supervisor: Prof. Kinwah Wu	2014 - 2019
Research Assistant Max-Planck-Institut für Kernphysik, Heidelberg, Germany Research: <i>Diffuse γ-ray emission from the Galaxy, and CTAO analysis software development (GammaPy)</i> Supervisors: Prof. Dr. Werner Hofmann, Dr. Christoph Deil	2013 - 2014
MSc in Astrophysics - <i>Graduated with distinction</i> UCL Department of Physics & Astronomy, London, UK	2012 - 2013
BA in Natural Sciences (Astrophysics) - <i>Graduated with honours (Class II)</i> University of Cambridge, UK	2009 - 2012
Postgraduate Diploma in Education - <i>Graduated with distinction</i> University of Bath, UK (distance learning) <i>Specialism in Cross-cultural and International Education.</i> Topics include: Educational psychology, learners & learning, education in international contexts, assessment, curriculum, research methods.	2021 - 2024

Selected honours and fellowships

RIKEN SPDR Fellowship Value approx. 25M JPY, selection ratio across all science fields ~ 15%	2024
Selected Candidate: MEXT Leading Initiative for Excellent Young Researchers (LEADER) 10M JPY per year for 5 years if matched with tenure-track/permanent employment at a university in Japan	2023

JSPS Postdoctoral Research Fellowship Value approx. 12M JPY (including Grant-in-Aid of Research), selection ratio across all fields ~ 10%	2022
NCTS Postdoctoral Paper Prize National award for top postdoctoral research paper, selected across all Physical Science subjects	2022
UK Science & Technology Facilities Council PhD Scholarship Stipend, research budget and tuition fees for duration of PhD programme (2014-2019)	2014

Selected publications

Full publication list: <https://www.ellisowen.org/publications>

- **Owen, E. R.**, Wu, K., Inoue, Y., Fujiwara, T., Han, Q., Ng, H. P.-H. (2026), The “forgotten” neutrons: Implications for the Propagation of High-Energy Cosmic Rays in Magnetized Astrophysical and Cosmological Structures, *Universe*, **12**(4), 94.
- **Owen, E. R.**, Wu, K., Inoue, Y., Yang, H.-Y. K., Mitchell, A. M. W. (2023), Cosmic Ray Processes in Galactic Ecosystems, *Galaxies*, **11**(4), 86. [Invited review]
- **Owen, E. R.**, Kong, A. K. H., Lee, K.-G. (2022), The Extragalactic Gamma-Ray Background: Imprints from the Physical Properties and Evolution of Star-Forming Galaxy Populations, *Monthly Notices of the Royal Astronomical Society*, **513**(2), 2335–2348.
- **Owen, E. R.**, On, A. Y. L., Lai, S.-P., Wu, K. (2021), Observational Signatures of Cosmic Ray Interactions in Molecular Clouds, *The Astrophysical Journal*, **913**, 52.
- **Owen, E. R.**, Wu, K., Jin, X., Surajbali, P., Kataoka, N. (2019), Starburst and Post-Starburst High-Redshift Protogalaxies: the Feedback Impact of High-Energy Cosmic Rays, *Astronomy & Astrophysics*, **626**, A85.

Selected grants, observing time and HPC awards

RIKEN Incentive Research Project , FY 2026-2027 2.5 M JPY research budget Project: Probing anomalous cosmic-ray transport in magnetized molecular clouds PI: <i>E. R. Owen</i>	2026
Dunlap Institute for Astronomy & Astrophysics, University of Toronto , Visitor Funding 1,500 CA\$ grant funding towards a 1 week collaborative visit in September 2025	2025
Joint MAGIC-CTAO LST1 Observations (Cycle 20/21 - MAGIC / Cycle 3/4 - LST) 40 hours of joint LST and MAGIC observations Project: Search for TeV emission from the Globular Cluster M28 (NGC 6626) PI: <i>E. R. Owen</i> ; Co-I: <i>C.-Y. Hui (CNU)</i> , <i>M. Strzys (ICRR)</i> , <i>R. Lopez-Coto (IAA-CSIC)</i> , <i>M. Peresano (MPP)</i> , <i>A. K.-H. Kong (NTHU)</i> , <i>W. Bednarek (Lodz)</i> , <i>J. Shin (CNU)</i> , <i>K. Oh (MSU)</i> , <i>S. Kim (CNU)</i>	2026
Atacama Large Millimeter/submillimeter Array , Cycle 11 15.7 hours with receiver Band 6 and 7 (priority C) Project: Cosmic ray irradiation of a molecular cloud near a high-energy TeV source PI: <i>E. R. Owen</i> ; Co-I: <i>S.-P. Lai (NTHU)</i> , <i>S.-J. Lin (ASIAA)</i>	2024
Atacama Large Millimeter/submillimeter Array , Cycle 11 4.0 hours with receiver Band 8 and 9 (priority C) Project: Cosmic ray ionization and feedback in the HyLIRG F1437+1950 PI: <i>E. R. Owen</i> ; Co-I: <i>T. Michiyama (Shunan University)</i>	2024
Center for Computational Astrophysics , National Astronomical Observatory of Japan 364k node hours on Cray XC50; adoption category XC-B Project: MHD modeling of feedback and diffuse structures in the high energy γ -ray and neutrino sky PI: <i>E. R. Owen</i>	2023
University of Tokyo ICRR Inter-University Research Program , FY 2020-2024 1 M JPY research budget Project: GeV-TeV signatures of star-forming regions in galaxies with CTAO PI: <i>E. R. Owen</i> ; Co-I: <i>A. K.-H. Kong (NTHU)</i> , <i>M. Teshima (ICRR)</i> , <i>Y. Inoue (UOsaka)</i> , <i>M. Strzys (ICRR)</i>	2020

Invited talks

Invited Workshop & Conference Talks

- Invited talk at 'Dark Matter and Gamma-Ray Astronomy: An intersection of Astroparticle and Particle Physics'
Kavli IPMU, The University of Tokyo, Kashiwa, Chiba, Japan
Particle Propagation and the Gamma-Ray Sky: From 511 keV Science to TeV Cosmic Rays Sept. 2026
- Invited talk at 'MeV–PeV Frontiers: New Perspectives in Gamma-Ray Astronomy and Particle Acceleration'
Kavli IPMU, The University of Tokyo, Kashiwa, Chiba, Japan
*The Galactic Centre as a Multi-Messenger Laboratory:
Prospects for Astronomical Diagnostics and Cosmic-Ray Propagation Theory* Dec. 2025
- Invited talk at 'Magnetic Fields and Cosmic Rays across Diverse Scales: What's Next?'
Center for Astrophysics | Harvard & Smithsonian, Cambridge, MA, USA
Cosmic Ray Highways: Particle Transport and Confinement in Large-Scale Cosmic Filaments Sept. 2025
- Invited plenary talk at the 'IOP HEPP and APP Conference 2025'
University of Cambridge, UK
What is the status of multi-messenger astronomy? Recent updates & future prospects in the UK landscape Apr. 2025
- Invited talk at 'Theory meeting experiment: particle astroparticle and cosmology (TMEX2025)'
International Conference Center ICISE, Quy Nhon, Vietnam
Cosmic rays as a feedback agent in galaxy formation Jan. 2025
- Invited talk at 'The extreme Universe viewed in very-high-energy gamma rays 2022'
ICRR, University of Tokyo, Kashiwa, Japan
Exploring the role of cosmic rays in galaxies with high energy signatures Feb. 2023
- Director's invited talk at NCTS Post-doctoral research workshop
National Center for Theoretical Sciences, Taipei, Taiwan
Observational signatures of cosmic rays in molecular cloud environments Feb. 2023
- Invited highlight science talk at the '2nd NCTS/UCAT/NTHU International Winter School'
National Center for Theoretical Sciences (Physics division), Taipei, Taiwan
Magnetic fields, cosmic rays and star-formation in evolving galaxy ecosystems Jan. 2023
- Invited highlight science talk at the '1st NCTS/NTHU International Winter School: High Energy Astrophysics'
National Center for Theoretical Sciences (Physics division), Hsinchu, Taiwan
Exploring starburst origins of the extra-galactic gamma-ray background Jan. 2021
- Invited review talk at the workshop 'Multiscale Feedback on Galaxy Evolution: From Stellar Explosions to AGN'
National Center for Theoretical Sciences (Physics division), Hsinchu, Taiwan
Cosmic Rays: The Invisible Hand in Galaxy Evolution Oct. 2020

Invited Seminars & Colloquia (previous 3 years) - 33 invited talks

Full list available on request

Includes: UW-Madison, Ohio State U., UMilano-Bicocca, Chiba University, CNU Korea, Durham University, IAC, UOsaka, NTNU Trondheim, Ruhr U. Bochum, ECAP, Hong Kong U, CUHK, Tohoku U, UTokyo, Yunnan University, CITA/U Toronto

Contributed Talks at Conferences (previous 3 years) - 12 contributed talks

Full list available on request

Scientific service & leadership

Scientific peer review

- Referee for *Nature Astronomy*, *ApJ*, *MNRAS*, *A&A*, *Astrophysics & Space Science*, *Galaxies*, *Universe*, *Symmetry*, *Astronomy*, *Advances in Space Research*, *Cent. Eur. Astrophys. Bull.*
- Paper referee for the Speakers and Publications Office, CTAO consortium
- Scientific reviewer of postdoctoral research fellowship proposals:
(1) Dutch Research Council (NWO), Netherlands
- Observational proposal review:
(1) External scientific evaluation reviewer for the JCMT Time Allocation Committee (cycles 24A and 24B)
(2) ALMA cycles 8, 9, 10 and 11 distributed review

- Conference session co-organizer** at the 2025 UK National Astronomy Meeting in Durham 2025
Physical effects and multi-messenger signatures of energetic particles in galactic environments
- Research Topic Editor** of the journal *Frontiers in Astronomy and Space Sciences* 2026 - 2027
Cosmic Ray Dynamics and Feedback in the Era of Multi-Messenger Astronomy
 Editors: E. R. Owen, K.-H. Yuen, P. Chadwick, S. Nagataki & Y. Inoue
 Link: <https://www.frontiersin.org/research-topics/77062> 
- Guest Co-editor** of special issue of the journal *Universe* 2023 - 2026
Studying Astrophysics with High Energy Cosmic-Particles
 Editors: E. R. Owen & K. Wu
 Link: https://www.mdpi.com/journal/universe/special_issues/7683EV6AD4 
- Winter school convener and chair**
- *Magnetism in star-forming & galactic environments*, Jan 31 - Feb 4, 2023, Taipei, Taiwan. Hybrid online/on-site 1-week international winter school. **188 participants** from 34 countries; budget 400k NT\$
 - *High Energy Astrophysics*, Jan 18 - 22, 2021, Hsinchu, Taiwan. Hybrid online/on-site 1-week international winter school. **346 participants** from 48 countries; budget 210k NT\$
- Organizing committee for workshops**
- Co-convener: *New Results in X-Ray Astronomy*, 2019, Surrey, UK. National UK X-ray astronomy annual meeting with 50 participants.
 - Local Organizing Committee: *New Results in X-Ray Astronomy*, 2016, Surrey, UK. National UK X-ray astronomy annual meeting with 45 participants.

Supervision, teaching & mentoring ---

Lecturing

- Guest lecturer, The University of Osaka, Graduate School of Science, Japan
High Energy Astrophysics, M.S. Astrophysics program Semester 1, 2023
- Invited lecturer for the NCTS-TCA Summer School Introductory Workshop, online, Taiwan
An Introduction to High Energy Astrophysics July 2022

Student Mentoring & Supervision

- (1) Long-term research supervision and mentoring:
- Primary research supervisor of 2 master's and 1 undergraduate student 2020-2026
 Students enrolled at *NTHU*, *UCL* and the *CUHK*
 - Supervisory assistance for 2 Masters students 2022-2026
 Students enrolled at *The University of Osaka*
- (2) Short-term summer research students (each 2–3 months):
- Primary supervisor of 7 summer students since 2017
- (3) School students:
- Primary supervisor of 2 secondary school summer students 2016 - 2017
 - Co-supervisor of 2 secondary school summer students since 2017

Outreach & Public Engagement ---

Science Communication and Education

- JSPS Science Dialogue Program Since June 2023
Delivering outreach talks on science and astrophysics at high schools in Japan (talks in English)

Science Writing

- Astronomy & Geophysics* **invited feature article**: 'The secret agent of galaxy evolution', Volume 64, Issue 1, February 2023, pp. 29-35, <https://doi.org/10.1093/astrogeo/atac090> 

Invited Public Outreach Talks

Three invited public outreach talks in the UK

2016-2017