

ELLIS R. OWEN

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ACADEMIC APPOINTMENTS

RIKEN Special Postdoctoral Research Fellow (SPDR) , Wakō, Saitama, Japan <i>Independent institutional fellowship</i> Host researcher: Prof. Shigehiro Nagataki (Astrophysical Big Bang Laboratory)	From Dec. 2024
JSPS Research Fellow , Theoretical Astrophysics Group, Osaka University, Japan <i>Independent fellowship</i> Host researcher: 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 researcher: Prof. Shih-Ping Lai	2019-2022

EDUCATION

PhD in Astrophysics UCL Mullard Space Science Laboratory, 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, Germany Research: Diffuse γ -ray emission from the Galaxy & CTA analysis software development Supervisors: Prof. Werner Hofmann, Dr. Christoph Deil	2013-2014
MSc in Astrophysics UCL Department of Physics & Astronomy, UK <i>Graduated with distinction</i> Thesis: <i>Modified Gravity as an alternative to Dark Energy</i> Supervisors: Prof. Ofer Lahav, Dr. Donnacha Kirk	2012-2013
BA in Natural Sciences (Astrophysics) University of Cambridge, UK <i>Graduated with honours (Class II)</i>	2009-2012
Postgraduate Diploma in Education University of Bath, UK (distance learning) <i>Graduated with distinction</i> Topics include: Educational psychology, learners and learning, education in international contexts, assessment, curriculum design, research methods in education and critical self-reflection on teaching/supervision practice	2021-2024

AWARDS, SCHOLARSHIPS & FELLOWSHIPS

RIKEN SPDR Fellowship Value approx. 25M JPY, selection ratio across all science fields \sim 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 \sim 10%	2022
NCTS Postdoctoral Paper Prize One of two awards for top postdoctoral research paper, selected across all Physical Science subjects in Taiwan	2022
UK Science & Technology Facilities Council PhD Scholarship Stipend, research budget and tuition fees for duration of PhD programme (2014-2019)	2014

COMPETITIVELY AWARDED FUNDING, COMPUTING AND OBSERVING TIME

Atacama Large Millimeter/submillimeter Array (ALMA) Cycle 11 (2024)

Cosmic ray irradiation of a molecular cloud near a high-energy TeV source

PI: E. R. Owen; Co-I: S.-P. Lai (National Tsing Hua University), S.-J. Lin (Academia Sinica IAA)

15.7 hours in receiver Band 6 and 7 (priority C)

Atacama Large Millimeter/submillimeter Array (ALMA) Cycle 11 (2024)

Cosmic ray ionization and feedback in the HyLIRG F1437+1950

PI: E. R. Owen; Co-I: T. Michiyama (Shunan University)

4.0 hours in receiver Band 8 and 9 (priority C)

University of Tokyo ICRR Inter-University Research Program 2023-2024

Investigating the γ -ray signatures of feedback microphysics in star-forming environments

Value: 300k JPY

PI: E. R. Owen; Co-I: M. Strzys (ICRR, University of Tokyo), Y. Inoue (Osaka University)

University of Tokyo ICRR Inter-University Research Program 2020-2024

Understanding the GeV-TeV signatures of star-forming galaxies in the extra-galactic γ -ray background with CTA

Value: 710k JPY

PI: E. R. Owen; Co-I: A. K.-H. Kong (National Tsing Hua University), M. Teshima (ICRR, University of Tokyo)

Center for Computational Astrophysics, National Astronomical Observatory of Japan FY 2023A - 2024A

Magnetohydrodynamical modeling of feedback and diffuse structures in the high energy γ -ray and neutrino sky

364k node hours on Cray XC50; adoption category XC-B

PI: E. R. Owen

Cybermedia High Performance Computing Center, Osaka University 2023-HPC-A02

Simulating the macroscopic impacts of cosmic ray microphysics in diffuse jet-remnant structures around galaxies

190k node hours

PI: E. R. Owen

James Clerk Maxwell Telescope (JCMT) Cycle 2023B

Mapping magnetic fields of a molecular cloud complex near the high-energy TeV source HESS J1809-193 with POL-2

9.3 hours with SCUBA-2 + POL-2 (weather band 2)

PI: E. R. Owen; Co-I: S.-J. Lin (Academia Sinica IAA), S.-P. Lai (National Tsing Hua University), M. Strzys (ICRR, University of Tokyo), S.-T. Chen (National Tsing Hua University)

Atacama Large Millimeter/submillimeter Array (ALMA) Cycle 9 (2022)

Resolving the feedback action of cosmic rays in distant star-forming galaxies

7.0 hours in receiver Band 6 and 7 (priority B)

PI: E. R. Owen; Co-I: S.-P. Lai (National Tsing Hua University), I. Ferreras (IAC), Q. Han (UCL)

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*
- Reviewer for the Speakers and Publications Office, Cherenkov Telescope Array Observatory 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

Guest Co-editor of special issue of the journal <i>Universe Studying Astrophysics with High Energy Cosmic-Particles</i>	2023-2025
Co-chair and convener <i>2nd NCTS/UCAT/NTHU Winter School: Magnetism in star-forming & galactic environments</i> Hybrid online/on-site 1-week international winter school 188 participants from 34 countries; budget 400k NT\$	Feb. 2023
Chair and convener <i>1st NTHU/NCTS Winter School: High Energy Astrophysics</i> Hybrid online/on-site 1-week international winter school 346 participants from 48 countries; budget 210k NT\$	Jan. 2021
Co-convener and Local Organizer , <i>New Results in X-Ray Astronomy</i> National X-ray astronomy annual meeting 50 attendees from across the UK	Sept. 2019
Local Organizing Committee , <i>New Results in X-Ray Astronomy</i> National X-ray astronomy annual meeting 45 attendees from across the UK	Sept. 2016

TEACHING, SUPERVISION & MENTORSHIP

LECTURING

- Guest lecturer, Osaka University, 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

- Mentoring and research supervision of 3 undergraduate students and 2 MSc students since 2021
- Primary supervisor of 7 summer students since 2017
- Primary supervisor of 2 secondary school summer students since 2016 (Nuffield summer student programme)

SCIENTIFIC TALKS & PRESENTATIONS

Invited Workshop/Conference Talks and lectures

- 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 Active Galactic Nuclei’, 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)

- Colloquium at Chungnam National University, Dept. of Astronomy & Space Science, Korea Oct. 2024
The Influence and Fate of Cosmic Rays: tracing the hidden architects of galaxies and beyond
- Seminar at the Center for Extragalactic Astronomy, University of Durham, United Kingdom Oct. 2024
Cosmic rays in galaxies and beyond: from local impacts to their cosmic journey
- Seminar at the Instituto de Astrofísica de Canarias (IAC), Tenerife, Spain Sept. 2024
Cosmic rays in galaxies and beyond: from local impacts to their cosmic journey
- Special Seminar in the Theoretical Astrophysics Group, IAC, Tenerife, Spain Sept. 2024
Cosmic rays: Modeling approaches, physical effects, and observational prospects
- Special Seminar, Astrophysics Unit, Physics Department, University of Milano Bicocca, Italy Sept. 2024
Cosmic rays in galaxies and beyond
- Seminar at Graduate School of Engineering, Osaka University, Suita, Japan June. 2024
Cosmic rays in astrophysical and cosmological structures
- Seminar at UCL Mullard Space Science Laboratory, Surrey, UK Mar. 2024
Exploring the signatures of cosmic ray feedback effects in galaxy ecosystems
- Astroparticle Physics Colloquium, Norwegian U. of Science and Technology, Trondheim, Norway Mar. 2024
Exploring the signatures of cosmic ray feedback effects in galaxy ecosystems
- Colloquium at Ruhr University Bochum Astronomical Institute, Bochum, Germany Mar. 2024
Exploring the signatures of cosmic ray feedback effects in galaxy ecosystems
- Seminar at Erlangen Center for Astroparticle Physics, Erlangen, Germany Mar. 2024
Exploring the signatures of cosmic ray feedback effects in galaxy ecosystems
- Seminar at the University of Hong Kong, Department of Physics, Hong Kong Mar. 2024
Exploring the signatures of cosmic ray feedback effects in galaxy ecosystems
- Colloquium at the Chinese University of Hong Kong, Hong Kong Dec. 2023
Cosmic magnetism and its effects on the observed properties of ultra high-energy cosmic rays
- Astronomical Institute Colloquium at Tohoku University, Sendai, Japan Oct. 2023
Exploring the signatures of cosmic ray feedback effects in galaxy ecosystems
- Department of Astronomy Colloquium at the University of Tokyo, Hongo, Tokyo, Japan Sept. 2023
Exploring the signatures of cosmic ray feedback effects in galaxy ecosystems
- Lunchtime seminar at SWIFAR, Yunnan University, PR China Mar. 2023
Cosmic magnetism and its effects on the observed properties of ultra high-energy cosmic rays
- ABBL-iTHEMS joint seminar at RIKEN, Wakō-shi, Saitama, Japan Mar. 2023
Cosmic magnetism and its effects on the observed properties of ultra high-energy cosmic rays
- Seminar at ICRR, University of Tokyo, Kashiwa, Japan Dec. 2022
High energy signatures of cosmic rays in and around galaxies
- Colloquium at National Tsing Hua University, Hsinchu, Taiwan Sept. 2022
Cosmic magnetism and the origins of the isotropic ultra high-energy cosmic ray background
- Colloquium at Chungnam National University, Daejeon, Korea June 2022
Cosmic rays in and around star-forming galaxies: observational signatures and physical effects
- Colloquium at Osaka University, Theoretical Astrophysics Group, Osaka, Japan May 2022
The effects and signatures of cosmic rays in star-forming galaxy ecosystems
- Colloquium at Korea Astronomy and Space Science Institute, Daejeon, Korea April 2022
Cosmic rays in and around star-forming galaxies: observational signatures and physical effects
- Colloquium at the Chinese University of Hong Kong, Hong Kong April 2022
Cosmic rays in and around star-forming galaxies: observational signatures and physical effects
- HEP Seminar at Academia Sinica Institute of Physics, Taipei, Taiwan Mar. 2022
The signatures and physical effects of cosmic rays in and around star-forming galaxies
- Colloquium at LMU Observatory, Munich, Germany Jan. 2022
Observational signatures and physical effects of cosmic rays in and around galaxies
- Colloquium at NAOJ Division of Science, Mitaka, Japan Nov. 2021
Cosmic rays as active players in star-formation in and around galaxies
- Seminar at UCL Mullard Space Science Laboratory, Surrey, UK Oct. 2021
Signatures of cosmic ray processes in the high-energy sky
- Colloquium at NCTS Physics Division, Hsinchu/Taipei & online, Taiwan Oct. 2021
The Universe at high energies: cosmic rays as active players in astrophysics

- Special seminar at Hong Kong University, Hong Kong Oct. 2021
Signatures of star-forming galaxies in the gamma-ray background
- Colloquium at CITA, Toronto, Canada June 2021
De-coding signals in the extragalactic gamma-ray background
- Colloquium at OAA, Florence, Italy Mar. 2021
De-coding signals in the extragalactic gamma-ray background

Contributed Talks at Conferences (previous 3 years)

- The 28th European Cosmic Ray Symposium, Hvar, Croatia Sept. 2024
- 8th Heidelberg International Symposium on High-Energy Gamma-Ray Astronomy, Milan, Italy Sept. 2024
- Cosmic Magnetism in the Pre-SKA Era, Kagoshima, Japan May 2024
- The extreme Universe viewed in very-high-energy gamma rays 2023, Kashiwa, Japan Feb. 2024
- Theoretical Astronomy and Astrophysics Symposium (Rironkon), Hiroasaki, Japan Dec. 2023
- International Cosmic Ray Conference, Nagoya, Japan July 2023
- The 9th Galaxy Evolution Workshop, Kyoto, Japan Feb. 2023
- Cosmic Rays II: The salt of the star-formation recipe, Florence, Italy Nov. 2022
- COSPAR 44th Scientific Assembly, Athens, Greece (online), 2 talks July 2022
- 27th European Cosmic Ray Symposium, Nijmegen, Netherlands (online) July 2022
- International Cosmic Ray Conference, Berlin, Germany (online), 3 talks July 2021

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. 29-25, <https://doi.org/10.1093/astrogeo/atac090>

Invited Public Outreach Talks

- Croydon Astronomical Society talk, London, UK Sept. 2017
The Birth of Stars Throughout the Universe
- Vectis Astronomical Society, Isle of Wight, UK: July. 2016
Cosmic Rays in a Violent Universe
- Croydon Astronomical Society talk, London, UK: April. 2016
The Epoch of Cosmic Reionization

WORKSHOPS & TRAINING

- **Invited:** Munich Institute for Astro- and Particle Physics (MIAPP), Germany Oct. 2022
Star-Forming Clumps and Starbursts across Cosmic Time
- 46th Saas-Fee Advanced Course, Les Diablerets, Switzerland Mar. 2016
Lyman- α as an astrophysical and cosmological tool
- ICTP Advanced Workshop, Trieste, Italy Mar. 2015
Cosmological Structures from Reionisation to Galaxies: Combining efforts from analytical and numerical methods
- ARCHER Workshop on parallel and high performance computing, London, UK Mar. 2015
Hands-On Introduction to High Performance Computing

SKILLS & EXPERIENCE

- **Programming languages:** Fortran 77/90 (including parallel computing experience with OpenMP and MPI), Python, Numerical simulations with FLASH4
- **Observing experience:** 28 nights, H.E.S.S. Array, Namibia
- **Languages:** Native: English; Basic conversational: Mandarin Chinese, German & French