

ELLIS R. OWEN

erowen@astro-osaka.jp \diamond <https://www.ellisowen.org>

Theoretical Astrophysics Group \diamond Osaka University

1-1 Machikaneyamacho · Toyonaka City · Osaka · 560-0043 · Japan

ACADEMIC APPOINTMENTS

RIKEN Special Postdoctoral Researcher (SPDR) , Wako-shi, Saitama, Japan <i>Independent fellowship hosted by the Astrophysical Big Bang Laboratory</i>	From Dec. 2024
JSPS Research Fellow , Theoretical Astrophysics Group, Osaka University, Japan <i>Independent fellowship</i>	2022-2024
CICA Research Fellow , Institute of Astronomy, National Tsing Hua University, Taiwan <i>Institutional personal fellowship leading an independent research program</i>	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 Thesis: <i>Modified Gravity as an alternative to Dark Energy</i> Supervisors: Prof. Ofer Lahav, Dr. Donnacha Kirk	2012-2013
BA (Hons) in Natural Sciences (Astrophysics) University of Cambridge, UK	2009-2012
Postgraduate Diploma in Education University of Bath, UK (distance learning) <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</i>	2021-2024

AWARDS, SCHOLARSHIPS & FELLOWSHIPS

RIKEN SPDR Fellowship Value approx. 20M JPY	2024
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)	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	2014-2019

COMPETITIVELY AWARDED FUNDING, COMPUTING AND OBSERVING TIME

University of Tokyo ICRR Inter-University Research Program <i>Investigating the γ-ray signatures of feedback microphysics in star-forming environments</i> PI: E. R. Owen; Co-I: M. Strzys (ICRR, University of Tokyo), Y. Inoue (Osaka University)	2023-2024
University of Tokyo ICRR Inter-University Research Program <i>Understanding the GeV-TeV signatures of star-forming galaxies in the extra-galactic γ-ray background with CTA</i>	2020-2024

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

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

182k 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*
- Scientific reviewer of research applications:
 - (1) Dutch Research Council (NWO), Netherlands
- Observational proposal review:
 - (1) External scientific evaluation reviewer for the JCMT Time Allocation Committee
 - (2) ALMA cycles 8, 9 and 10 distributed review

Guest Co-editor of special issue of the journal *Universe*

2023-2025

Studying Astrophysics with High Energy Cosmic-Particles

Co-chair and convener

Feb. 2023

2nd NCTS/UCAT/NTHU Winter School: Magnetism in star-forming & galactic environments

Hybrid online/on-site 1-week international winter school

188 participants from 34 countries; budget 400k NT\$

Chair and convener

Jan. 2021

1st NTHU/NCTS Winter School: High Energy Astrophysics

Hybrid online/on-site 1-week international winter school

346 participants from 48 countries; budget 210k NT\$

Co-convener and Local Organizer, *New Results in X-Ray Astronomy*

Sept. 2019

National X-ray astronomy annual meeting

50 attendees from across the UK

Local Organizing Committee, *New Results in X-Ray Astronomy*

Sept. 2016

National X-ray astronomy annual meeting

45 attendees from across the UK

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 2 undergraduate students and 2 MSc students since 2021
- Primary supervisor of 7 summer students since 2017

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 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, Tokyo, 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 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 extreme Universe viewed in very-high-energy gamma rays 2023, Kashiwa, Japan Feb. 2024
- Theoretical Astronomy and Astrophysics Symposium (Rironkon), Hirosaki, 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

- Radiative Transfer Summer School, St. Andrews, UK Aug. 2015
Monte Carlo radiation transfer techniques
- 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

PROFESSIONAL MEMBERSHIP

- Astronomical Society of Japan - member since 2023
- Royal Astronomical Society, UK - fellow since 2014
- Institute of Physics, UK - since 2009; elected as MInstP in 2022
- European Astronomical Society - member since 2017
- American Astronomical Society - member since 2020