

Ting-Yun CHENG (Sunny)

鄭婷筠

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POSTDOCTORAL RESEARCHER

Centre for Extragalactic Astronomy, Durham University

Ogden Centre For Fundamental Physics West, South Road, DH1 3LE, Durham, United Kingdom

EDUCATION

University of Nottingham | School of Physics and Astronomy [United Kingdom]

PhD in Physics | October 2017 – October 2020

- **Thesis:** The Narrative of Galaxy Morphological Classification Told Through Machine Learning
- **Advisors:** Prof. Christopher J. Conselice and Prof. Alfonso Aragón-Salamanca

National Tsing Hua University | Institute of Astronomy [Taiwan]

MSc in ASTRONOMY | September 2014 – August 2016

- **Thesis:** Investigating Dark Matter Distribution in Early-Type Galaxies
- **Advisor:** Prof. Ing-Guey Jiang

National Taiwan Normal University | Department of Physics [Taiwan]

BSc in PHYSICS | September 2010 – June 2014

APPOINTMENTS

Durham University | Centre for Extragalactic Astronomy [United Kingdom]

Postdoctoral Research Associate | November 2020 – Present

PUBLICATION SUMMARY

[Google/ADS; November 2024] Total Citation: 414/351 | h-index: 7/7

- **Accepted referee publications:** 11 (including 6 *first-author papers*)
- Papers in progress: 1 (submitted) + 4 (in preparation; including 2 *first-author papers*)
- Review/Other articles: 2
- Conference proceedings: 4

GRANTS, AWARDS AND FELLOWSHIPS

Dark Energy Survey Travel Grant Fermilab [United States]	2023
Discretionary Award Durham University [United Kingdom]	2023
Specialist Discussion Meeting Organising Grant Royal Astronomical Society [United Kingdom]	2023
Physics Department Award for Excellence Durham University [United Kingdom]	2022
The Post-Doctoral Enrichment Awards The Alan Turing Institute [United Kingdom]	2022
Graduate School Travel Prize University of Nottingham [United Kingdom]	2019
Conference/Meeting Travel Grants Royal Astronomical Society [United Kingdom]	2019

Kavli Summer Program in Astrophysics Fellow UC Santa Cruz [United States]	2019
Vice-Chancellor's Scholarship for Research Excellence (International) University of Nottingham [United Kingdom]	2017—2020
ASROC Special Award for Oral Presentation ASROC [Taiwan]	2016

LEADERSHIP

Organisational Leadership

Editor Astronomy and Computing Journal, Elsevier	2024—Present
Convener: <i>Galaxy Evolution & QSO Working Group</i> Dark Energy Survey	2022—Present
Committee: <i>Education and Public Outreach</i> Dark Energy Spectroscopic Instrument	2023—2024
Early Career Researcher Editorial Board Astronomy and Computing Journal, Elsevier	2022—2024
Guest Editor of Special Edition Astronomy and Computing Journal, Elsevier → <i>Machine Learning Techniques in Modern Astronomy</i> (Published in 2024)	2022—2024
IT & Seminar Chair Taiwanese Young Researcher Association (TYRA)	2022—2023

Academic Events / Sessions

Lead Organiser: <i>Galaxy Evolution & QSO Working Group</i> DES Collaboration Meeting	2022—Present
Lead Organiser: <i>Machine Learning for DES</i> Dark Energy Survey	2022—2024
Lead Organiser: <i>Harvesting spectroscopic and time series data with ML/AI</i> Specialist Discussion Meeting, RAS	Mar 2023
Lead Organiser: <i>CAPT Seminar</i> University of Nottingham	2019—2020
Co-organiser: <i>Deep & Shallow learning in the era of large galaxy surveys and simulations</i> National Astronomy Meeting, RAS	Jul 2023
Co-organiser: <i>Machine Learning in Modern Astronomy & The Future of Machine Learning in Astronomy</i> National Astronomy Meeting, RAS	Jul 2022

Other Activities

Lead Organiser: <i>Yearly Career Event - Next Step of Career after PhD</i> Durham University	2022—2024
Co-organiser: <i>EDI Sessions</i> Durham University	2022—2024

AWARDED TELESCOPE TIME & OBSERVATIONAL SERVICE

PI: Issac Newton Telescope 2.54 m, in-person, 4 nights → <i>A Search for Extremely Metal-Poor Star-Forming Galaxies</i>	Aug 2023
PI: Issac Newton Telescope 2.54 m, in-person, 8 nights → <i>A Search for Extremely Metal-Poor Star-Forming Galaxies</i>	Feb 2024
Service: Dark Energy Spectroscopic Instrument (DESI) 4 m, remote, 3 nights	May 2024
Service: Dark Energy Spectroscopic Instrument (DESI) 4 m, remote, 3 nights	Jan 2024

ACADEMIC SERVICE

Referee for peer-review Journals: 16 (MNRAS, ApJ, A&A, RASTI, ASCOM, etc)

PRESENTATIONS

Invited Conference Talks / Lectures

Deciphering the Cosmic Code for Galaxy Formation Pontifical Catholic University of Chile	Dec 2024
→ <i>Hands-on Session: Machine Learning in Astrophysics</i>	
Machine Learning in Astronomy and Space Science Taiwan Space Union	Sep 2023
→ <i>Beyond the Hubble sequence — ML/AI for galaxy morphology</i>	
AI UK: Awardee Presentation The Alan Turing Institute	Mar 2022
→ <i>New era of galaxy studies with machine learning techniques</i>	
Artificial Intelligence for Science, Industry and Society National Autonomous University of Mexico	Oct 2021
→ <i>Beyond the Hubble Sequence — Exploring galaxy morphology with unsupervised machine learning</i>	
The 238th Meeting of the American Astronomical Society American Astronomical Society	Jun 2021
→ <i>Beyond the Hubble Sequence — Exploring galaxy morphology with unsupervised machine learning</i>	

Invited Colloquia & Seminars

Colloquium University of Edinburgh	Mar 2025
Colloquium University of Nottingham	Mar 2025
Seminar University of Edinburgh	July 2024
→ <i>Local laboratory for the first galaxies: searching for XMPs with deep learning on SDSS data</i>	
Colloquium University College London	Dec 2023
→ <i>Harvest information from galaxies with convolutional neural networks</i>	
Seminar Academia Sinica Institute of Astronomy and Astrophysics	Jun 2023
→ <i>Harvest Lyman-alpha forest with machine learning</i>	
Colloquium National Central University	Jun 2023
→ <i>Beyond the Hubble sequence — explore galaxy morphology with machine learning</i>	
Colloquium University of Bath	Mar 2023
→ <i>Beyond the Hubble sequence — explore galaxy morphology with machine learning</i>	
Seminar University of Nottingham	Feb 2023
→ <i>Harvest Lyman-alpha forest with machine learning</i>	
Seminar University of Manchester	Nov 2022
→ <i>Harvesting galaxy morphology and the Lyman alpha forest with deep learning</i>	
Seminar National Cheng Kung University	May 2022
→ <i>Beyond the Hubble sequence — what can a machine tell us?</i>	
Seminar Australia National University	Dec 2021
→ <i>Beyond the Hubble Sequence — What can a machine tell us?</i>	
Colloquium National Tsing Hua University	Feb 2021
→ <i>What a machine sees? - Galaxy morphological classification told through machine learning</i>	
Colloquium Academia Sinica Institute of Astronomy and Astrophysics	Jan 2021
→ <i>What a machine sees? - Galaxy morphological classification told through machine learning</i>	

Seminar Machine Learning Club, University of California Santa Cruz	Oct 2020
→ <i>Beyond the Hubble Sequence</i> — Exploring galaxy morphology with unsupervised machine learning	
Seminar Kavli 2019 Alumni Event, University of California Santa Cruz	Jul 2020
Seminar University College London	Oct 2019

Contributed Talks

Lurking Lions: Hidden Challenges to Solving Galaxy Formation University of the Western Cape	Aug 2024
→ <i>Hunting extremely metal-poor galaxies with deep learning</i>	
What matter(s) around galaxies 2022 University of Milan	Sep 2022
→ <i>Harvesting the Lyman alpha forest with convolutional neural networks</i>	
European Astronomical Society (EAS) Annual Meeting European Astronomical Society	Jun 2022
→ <i>Harvesting the Lyman alpha forest for low HI column density systems with convolutional neural networks</i>	
→ <i>CNN Lesson Learned from Two Largest Galaxy Morphological Classification Catalogues</i>	
Debating The Potential of ML In Astronomical Surveys Institut Astrophysique de Paris	Oct 2021
→ <i>Beyond the Hubble Sequence - Exploring galaxy morphology with unsupervised machine learning</i>	
→ <i>Predicting Physical Properties of Lyman Alpha Forest with Deep Learning</i>	
Dark Energy Survey Collaboration Meeting Dark Energy Survey	Nov 2019
Specialist Meeting: Machine Learning and AI applied to Astronomy Royal Astronomical Society	Mar 2019
Specialist Meeting: Dark Energy Survey: More than dark energy Royal Astronomical Society	Nov 2018
Machine Learning Applications for Astronomy University of Nottingham	Sep 2018
Planning for Surprises in the era of Data-Driven Astronomy University of Oxford	Jun 2018
Annual meeting of the Astronomical Society in Taiwan ASROC	May 2016

TEACHING EXPERIENCE

Durham University | Department of Physics [United Kingdom]

- **Demonstrator, 2020–2024**

- Postgraduate Module: 4-week Data Analysis workshop, 2023/2024
- Postgraduate Module: 4-week HPC/ science computing workshop, 2023/2024
- Undergraduate Module: Year 1 Discovery Physics Laboratory, 2020–2023

University of Nottingham | School of Physics and Astronomy [United Kingdom]

- **Coursework Marker, 2017–2020**

- Undergraduate Module: From Newton to Einstein
- Undergraduate Module: Quantitative Physics

National Tsing Hua University | Institute of Astronomy [Taiwan]

- **Teaching Assistant, July 2016**
 - *Summer Program in Astrophysics.* The programme included one-week lectures of General Astronomy and the tutorial of astronomical softwares, two-days observation trip at the Lulin Observatory (Taiwan), data analysis, and seminars.
- **Teaching Assistant, 2015–2016**
 - Postgraduate Module: Observational Astronomy

National Tsing Hua University | Department of Physics [Taiwan]

- **Teaching Assistant, 2014–2016**
 - Undergraduate Module: Numerical Analysis
 - Undergraduate Module: General Astronomy (I) & (II)

SUPERVISION & MENTORSHIP

- **Supervision: Year 4 / Master projects**
 - S. Howie: Durham University (Natural Sciences), 2023–2024
 - G. Renton: Durham University (Physics), 2023–2024
 - V. Desai: Durham University (Physics), 2022–2023
 - T. Hehir: Durham University (Physics), 2022–2023
 - S. William: Durham University (Physics), 2021–2022
 - A. Lowe: Durham University (Physics), 2021–2022
- **Supervision: UG projects**
 - S. Bilacz: Durham University(Physics), July–August 2023 (6 weeks summer programme)
- **Mentorship:**
 - N. Chicoine: University of Chicago (UG, Physics), 2022–2023, DES mentor-mentee programme
 - M. Herbold: The Ohio State University (PhD, Physics), 2022–2023, DESI mentor-mentee programme

COMMUNITY ENGAGEMENT & OUTREACH

Talks/ Lectures

Lecture Cleveland & Darlington Astronomical Society	Apr 2025
Lecture Sunderland Astronomical Society	Oct 2024
Lecture Newcastle Astronomical Society	Sep 2023
Talk IOP Girl Guiding Group, Sunderland	Sep 2023
Lecture Sunderland Astronomical Society	Jul 2023
Talk Space Night, Woodham Academy, Durham	Nov 2022
Seasonal Talks CUNY Baruch College Forum	2022–2023

Other Projects

Art Commission for Ogden Centre West Durham University	2024–2025
Planetarium Show Durham University	2023–Present
Science Festival Durham University	2023–Present

Durham Astronomy Girl's Day Durham University	2023—Present
Eyes to the Sky Project Ogden Centre & County Durham	2022—2023
Digital Art & Astronomy Project, Ogden@20 Ogden Centre & Durham University	Oct—Dec 2022
