

THOMAS HARVEY

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EDUCATION

PhD - Jodrell Bank Center for Astrophysics, University of Manchester *September 2022 - May 2025 (est)*

Studying the first stars and galaxies with Professor Christopher Conselice.

MPhys Astrophysics with a Year Abroad - University of Southampton *September 2018 - July 2022*

Achieved a high first class degree with an average of **86.2%** - achieving a Dean's Award and selection onto a research year at the **Center for Astrophysics | Harvard and Smithsonian**.

RESEARCH EXPERIENCE

Center for Astrophysics | Harvard and Smithsonian (CfA)

Sept 2021 - May 2022

Visiting Research Fellow

- Researching AGN feedback with **Dr. W. Peter Maksym** in **Dr. P. Fabbiano's** research group. My research focuses on the role of the AGN, jets and winds in exciting x-ray emission from gas within a complex galaxy, using imaging and spectroscopy from both Chandra and the Hubble Space Telescope.
- Collaborating with other members of the research group to solve problems and advance research, including participating in weekly group meetings.
- Presenting a poster on my research to date at the AAS 239 conference in January, as well as delivering a talk to an CfA-wide colloquium in May 2022. I intend to submit the results as a paper to MNRAS by May 2022.
- Participating in the Harvard-MIT pre-doc journal club, and attending talks and colloquia given by divisions within the CfA and other related organisations such as the Black Hole Institute.

Observational Project: Mass and Electron Density of a Planetary Nebulae

March - July 2020

- Developed a flux calibration method to determine the electron density of a planetary nebula from narrowband [SII] observations.
- Conducted remote observations using the IAC-80 telescope in Tenerife, and implemented a custom data reduction pipeline in Python to analyse the results.
- Produced an academic report in LaTeX which was graded at **94.4%**.

Computational Project: Chandrasekhar Mass of White Dwarfs

Feb - May 2021

- Derived the differential equations describing the radial dependence of mass and density within a white dwarf, and solved them numerically using Python to determine the maximum mass of a white dwarf for different elemental compositions.
- Wrote a full A&A style paper on the results, which received a mark of **96%**.

PUBLICATIONS

T. Harvey, W. P. Makysm, W. Keel et al.,

2022

Signatures of Feedback in the Spectacular Extended Emission Region of NGC 5972/ Submitted MNRAS, [2208.05915](#).

C. Finlez, W. P. Makysm, T. Harvey et al.,

2022

Detailed accretion history of the supermassive black hole in NGC 5972 over the past $\gtrsim 10^4$ years through the extended emission line region. Accepted ApJ, [2208.04911](#).

RESEARCH INTERESTS

Galaxy formation and evolution, high-redshift galaxies, IR astronomy, AGN and quasars, AGN feedback, integral-field spectroscopy, optical astronomy, jets, outflows and shocks, AGN variability, multi-wavelength astronomy.

AWARDS

Dean's List Award for Outstanding Achievement	2022
Selected for flagship research year at the Harvard-Smithsonian Center for Astrophysics	2021
Inaugural Whittaker Trust Bursary Recipient	2019-2022
Elected Fellow of the Royal Astronomical Society (FRAS)	2020
University of Southampton - Best Performance in Physics Part 1 (1st Year)	2019
Guernsey Grammar School & Sixth Form R. Fulford Cup for Physics	2018

SKILLS

Key Skills: academic writing, problem solving, time-management, teamwork, and communication.

Programming and Data Analysis: Python - NumPy, SciPy, matplotlib, pandas and AstroPy, pPXF, stistools, specutils.

Chandra Tools: Experience with Ciao, Sherpa, XSPEC, ds9, ChaRT and MARX.

Academic Tools: Very experienced with L^AT_EX(Overleaf), BibTeX, Mendeley, arXiv and NASA ADS.

OUTREACH AND TEACHING

Science Communication

2018-2022

- Write and edit articles on astronomy as editor of the newsletter for La Société Guernesiaise Astronomy Section.
- Teach telescope operation and information about the night sky and planets to the public at open evenings, as well as taking solar telescopes to local schools to teach the students about the Sun.
- Present in person and online lectures on topics such as black holes, comets and Mars to members of the public, youth groups and school children. Answer questions and presented information appropriate for the audience.
- Regular appearances on local radio and TV to explain astronomical phenomena such as comets, eclipses and meteor showers to the general public and to encourage them to engage with astronomy.

RELEVANT WORK EXPERIENCE

First Central Insurance

July 2019 - August 2019

Digital Greenhouse Intern

- 6 week internship working collaboratively a full-stack developer within an agile scrum team, developing a web-based customer claims portal using C# and WCF Services for the backend and HTML, CSS, and Javascript for the front-end.
- Collaboratively developed a web-based platform for customers to view and edit vehicle insurance claim information, designed from the ground up to protect sensitive customer data.

REFERENCES

Supervisor

Dr. W. Peter Maksym
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