Fergus Donnan

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Research Interests

Galaxy Evolution, Dust Obscuration/Evolution, SMBH Growth, AGN/Star-formation, PAHs, Molecules, AGN Outflows, Accretion Disks

Education

2021–2025 **DPhil (PhD) Astrophysics**, *University of Oxford*, Oxford, UK
"The Obscured Universe: Tracing Star Formation and AGN activity across cosmic time."
Supervisors: Dimitra Rigopoulou, Ismael García-Bernete.

2016–2021 **MPhys (Hons) Astrophysics**, *University of St Andrews*, St Andrews, UK, 1st class
"Echo Mapping of AGN Accretion."
Supervisors: Keith Horne, Juan Hernandez Santisteban.

Research Positions

2025 - present **Postdoc**, *University of California San Diego*, San Diego, USA

2025 **Postdoc**, *University of Oxford*, Oxford, UK

2023 **Visiting Graduate Student**, *CAB ESAC*, Madrid, Spain

2020 **LEAPS Research Student**, *Leiden Observatory*, Leiden, Netherlands

2019 **Summer Research Project**, *University of St Andrews*, St Andrews, UK

Awards & Scholarships

2021 **Principal's Scholarship for Academic Excellence**, Awarded annually to the fifty final-year students, at the University of St Andrews, whose academic performances are the highest in their respective faculties.

2020 **Scott Lang Prize**, Most outstanding student in the Senior Honours class in Astronomy and Astrophysics.

2016-2021 **Deans List**, For averaging a 1st class across the academic year.

2020 **Medal (Astrophysics Fourth level)**

2019 **Medal (Astrophysics Third level)**

2019 **Carnegie Trust Vacation Scholarship**, Awarded to fund a place on an undergraduate research internship programme.

2018 **Medal (Astrophysics Second level)**

Presentations

2025 **IAC Galaxy Coffee**, Tenerife, Spain, Invited Talk
Spatially resolved PAH spectroscopy in the era of JWST: From kinematics of PAHs to resolved maps at cosmic noon.

2025 **CAB Extragalactic Meeting**, Madrid, Spain, Invited Talk
The Dust Obscured Universe: Unveiling Star-formation and AGN activity across cosmic time with mid-infrared spectroscopy.

2025 **PanDust 2025**, Tucson, USA, Contributed Poster
Spatially resolved PAH Spectroscopy in the era of JWST: From kinematics of PAHs to resolved maps at cosmic noon.

2025 **UCSD Astrophysics Colloquium**, San Diego, USA, Invited Talk
The Dust Obscured Universe: Unveiling Star-formation and AGN activity across cosmic time with mid-infrared spectroscopy.

2025 **Oxford Galaxy Evolution Seminar**, Oxford, UK, Invited Talk
The Obscured Growth of SMBHs: Revealing the nature of the most obscured galaxy nuclei in the mid-infrared.

2025 **Dusting Off the Secrets of the Cosmos with PRIMA Space IR Telescope**, Marseille, France, Contributed Talk
A Census of the Most Obscured Galaxy Nuclei over Cosmic Time to be revealed by PRIMA.

2025 **Behind a curtain of dust, V**, Kiruna, Sweden, Contributed Talk
Peeling Back the Layers of Extinction of the Most Obscured Nuclei in the Era of JWST: What is their nature and evolution?

2024 **Cyprus Astrophysics Workshop 2024: Luminous Infrared galaxies in the JWST era**, Nicosia, Cyprus, Invited Talk
Peeling Back the Layers of Extinction of the Most Obscured Galaxy Nuclei in the Era of JWST.

2024 **Oxford Astrophysics Colloquium**, Oxford, UK, Early Career Showcase
The Obscured Growth of SMBHs: Peeling Back the Layers of Extinction of the Most Obscured Galaxy Nuclei in the Era of JWST.

2024 **Cosmic Odysseys**, Crete, Greece, Invited Talk
Peeling back the layers of extinction of dusty galaxies in the era of JWST.

2023 **European Astronomical Society (EAS)**, Krakow, Poland, Contributed Talk
Revealing the most obscured galaxy nuclei in the mid-infrared: JWST/MIRI Spectroscopy of VV 114.

2023 **National Astronomy Meeting (NAM)**, Cardiff, UK, Contributed Talk
The most obscured galaxy nuclei with JWST/MIRI: the hidden growth of SMBHs?

2023 **The Restless Nature of AGN: 10 Years Later**, Naples, Italy, Contributed Poster
Reverberation mapping of PG 1119+120: Testing Super-Eddington Accretion.

2023 **National Observatory of Athens, AHEAD2020**, Athens, Greece (virtual), Invited Talk
The most obscured Galactic Nuclei in the mid-iR.

2022 **RAS Meeting: JWST commissioning and first science from a UK perspective**, London UK, Contributed Talk
The Obscured Nucleus of VV 114E with JWST/MIRI Spectroscopy.

2022 **Behind a curtain of dust, IV**, Sesto, Italy, Contributed Talk
Detecting Compact Obscured Nuclei in the Mid-Infrared.

Observing Proposals

2025 **CO-I**, *Unraveling Effects of Different Modes of AGN Feedback via PAH Features* , JWST (MIRI + NIRSpec). Cycle 4, 12.2 hours, PI: L. Zhang

2024 **CO-I**, *AGN and their outflows: probing fragmentation and survival of polycyclic aromatic hydrocarbons*, JWST (NIRSpec). Cycle 3, 18.7 hours, PI: I. García-Bernete

2024 **CO-I**, *Pinpointing a VLA- invisible, bright SMG in the JWST-IRAC Deep Field*, NOEMA, Grade B, 6 hours, PI: D. Rigopoulou

2023 **CO-I**, *Unveiling the AGN-host connection with PAH molecules.*, JWST (MIRI + NIRSpec). Cycle 2, 14.3 hours, PI: I. García-Bernete

2023 **CO-I**, *A JWST high-definition view of an extremely metal-poor interstellar medium.*, JWST (MIRI). Cycle 2, 31.2 hours, PI: A. Aloisi

2022 **CO-I**, *NOEMA and JWST unveil compact obscured nuclei in the Universe*, NOEMA, Grade C, 12.2 hours, PI: I. García-Bernete

2022 **CO-I**, *NOEMA and JWST unveil compact obscured nuclei in the Universe*, NOEMA, Grade B, 26.1 hours, PI: I. García-Bernete

2022 **CO-I**, *Pinpointing a Bright SMG for JWST Monitoring of Dusty Supernovae*, NOEMA, Grade C, 12.0 hours, PI: D. Rigopoulou

2021 **CO-I**, *ALMA and JWST unveil compact obscured nuclei in the Universe*, ALMA, Grade C, 30.9 hours, PI: I. García-Bernete

Other Positions

2024-2025 **Journal Club Organiser**, *Galaxies Journal Club*, Department of Physics, University of Oxford

2022-2024 **Lab Demonstrator**, *Part B Astrophysics Practicals*, Department of Physics, University of Oxford

Publications (31, 9 First Author, h-index: 16, 607 citations)

First Author

1. **Donnan, F. R.**, Sandstrom, K., Shivaei, I., et al., (2026), in. prep.
   PAHSPECS: Spatially Resolved PAH Spectroscopy at cosmic noon with JWST MIRI MRS.
2. **Donnan, F. R.**, García-Bernete, I., Rigoupoulou, D., et al., (2026), in. prep.
   GATOS N: Direct kinematic evidence of dusty outflows from AGN through PAH kinematics of local Seyfert galaxies with JWST
3. **Donnan, F. R.**, Rigoupoulou, D., García-Bernete, I., et al., (2025), JATIS, 11, 031606
   Census of the most obscured galaxy nuclei over cosmic time to be revealed by PRIMA.
4. **Donnan, F. R.**, Rigoupoulou, D., García-Bernete, I., (2024), MNRAS, 532, 75
   The kinematics of Polycyclic Aromatic Hydrocarbons (PAHs) in Galaxies revealed by Principal Component Analysis (PCA) tomography with JWST/NIRSpec.
5. **Donnan, F. R.**, García-Bernete I., Rigopoulou D., et al., (2024), MNRAS, 529, 1386
   Peeling back the layers of extinction of dusty galaxies in the era of JWST: modelling joint NIRSpec + MIRI spectra at rest-frame 1.5-28 μm
6. **Donnan, F. R.**, Hernández Santisteban J. V., Horne K., et al., (2023), MNRAS, 523, 545
   Testing super-eddington accretion on to a supermassive black hole: reverberation mapping of PG 1119+120.
7. **Donnan, F. R.**, García-Bernete I., Rigopoulou D., et al., (2023), MNRAS, 519, 3691
   The obscured nucleus and shocked environment of VV 114E revealed by JWST/MIRI spectroscopy.
8. **Donnan, F. R.**, Rigopoulou D., García-Bernete I., et al., (2023), A&A, 669, A87
   A detailed look at the most obscured galactic nuclei in the mid-infrared.
9. **Donnan, F. R.**, Horne K., Hernández Santisteban J. V., (2021), MNRAS, 508, 5449
   Bayesian analysis of quasar light curves with a running optimal average: new time delay measurements of COSMOGRAIL gravitationally lensed quasars.

Second/Third Author

10. Thatte, N., Rigopoulou D., **Donnan, F. R.**, et al., (2025), MNRAS, 545, 2047
    The PAH 3.4 micron feature as a tracer of shielding in the Orion Bar and NGC 6240
11. García-Bernete I., **Donnan, F. R.**, Rigopoulou D., et al., (2025), A&A, 696, A135
    On unveiling Buried Nuclei with JWST: a technique for hunting the most obscured galaxy nuclei from local to high redshift.
12. García-Bernete I., Rigopoulou D., **Donnan F. R.**, , et al., (2024), A&A, 691, A162
    The Galaxy Activity, Torus, and Outflow Survey (GATOS). V: Unveiling PAH survival and resilience in the circumnuclear regions of AGN with JWST
13. Rigopoulou D., **Donnan F. R.**, García-Bernete I., et al., (2024), MNRAS, 532, 1598
    Polycyclic aromatic hydrocarbon emission in galaxies as seen with JWST

Co-Author

14. Ramos Almeida C., Asensio Ramos A., Westerdorp Plaza C., et al., (2025), A&A, preprint
    Silicate emission in a type-2 quasar: JWST/MIRI constraints on torus geometry and radiative feedback.
15. Veenema O., Thatte N., Rigopoulou D., et al., (2025), MNRAS, 544, 3361
    Shock-driven heating in the circumnuclear star-forming regions of NGC 7582: insights from JWST NIRSpec and MIRI/MRS spectroscopy.
16. Hunt L. K., Draine B. T., Navarro M. G., et al., (2025), ApJ, 993, 84
    The Interstellar Medium in I Zw 18 Seen with JWST/MIRI. II. Warm Molecular Hydrogen and Warm Dust.
17. Riffel R. A., Colina L. Costa-Souza J. H., et al., (2025), A&A, preprint
    Impact of AGN and nuclear star formation on the ISM turbulence of galaxies: Insights from JWST/MIRI spectroscopy.
18. Hunt L. K., Aloisi A.., Navarro M. G., et al., (2025), ApJ, 992, 48
    The Interstellar Medium in I Zw 18 Seen with JWST/MIRI. I. Highly Ionized Gas .
19. Prince R., Hernández Santisteban J. V., Horne K., et al., (2025), MNRAS, 541, 642
    Echo mapping of the black hole accretion flow in NGC 7469.
21. Hermosa Muñoz L., Alonso-Herrero A., Labiano A., et al., (2024), A&A, 693, A321
    MICONIC: dual AGN, star formation, and ionised gas outflows in NGC 6240 seen with MIRI/JWST.
22. Zhang L, García-Bernete I., Packham C, et al., (2024), ApJL, 975, L2.
    Polycyclic Aromatic Hydrocarbon Emission in the Central Regions of Three Seyferts the Implication for Underlying Feedback Mechanisms
23. Pereira-Santaella,M., González-Alfonso E., García-Bernete I., et al., (2024), A&A, 689, L12
    H_3^+ absorption and emission in local U/LIRGs with JWST/NIRSpec: Evidence for high H_2 ionization rates
24. Haidar H., Rosario D. J., Alonso-Herrero A., et al., (2024), MNRAS, 532, 4645
    Dust beyond the torus: Revealing the mid-infrared heart of local Seyfert ESO 428-G14 with JWST/MIRI
25. Shen Y., Grier C. J., Horne K., et al., (2024), ApJS, 272, 26
    The Sloan Digital Sky Survey Reverberation Mapping Project: Key Results
26. García-Bernete I., Pereira-Santaella M., González-Alfonso E., et al., (2024), A&A, 682, L5
    Structures Of Dust and gAs (SODA): Constraining the innermost dust properties of II Zw96 with JWST observations of H_2O and CO
27. González-Alfonso E., García-Bernete I., Pereira-Santaella M., et al., (2024), A&A, 682, A182
    JWST detection of extremely excited outflowing CO and H_2O in VV 114 E SW: A possible rapidly accreting IMBH
28. García-Bernete I., Alonso-Herrero A., Rigopoulou D., et al., (2024), A&A, 681, L7
    The Galaxy Activity, Torus, and Outflow Survey (GATOS). III. Revealing the inner icy structure in local active galactic nuclei

29. Cackett E. M., Gelbord J., Barth A. J., et al., (2023), ApJ, 958, 195
AGN STORM 2. IV. Swift X-Ray and Ultraviolet/Optical Monitoring of Mrk 817
30. García-Bernete I., Rigopoulou D., Alonso-Herrero A., et al., (2022), A&A, 666, L5
A high angular resolution view of the PAH emission in Seyfert galaxies using JWST/MRS data
31. Varga J., Hogerheijde M., van Boekel R., et al., (2021), A&A, 647, A56
The asymmetric inner disk of the Herbig Ae star HD 163296 in the eyes of VLTI/MATISSE: evidence for a vortex?