Resume for JÚLIA M. SISK-REYNÉS

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Astrophysicist studying gravitationally-lensed quasars with the *Chandra* and *Hubble* telescopes. Research interests: dual and binary AGNs, AGN feedback, galaxy clusters, black holes, dark matter, axion physics.

– Employment –

Postdoctoral Research Fellow - Smithsonian Astrophysical Observatory, Cambridge, MA 2024 -
- Exploiting the sub-arcsecond angular resolution of the *Chandra X-ray Observatory* to find evidence of dual and binary AGNs. Analysing observations of strongly lensed quasars using a multi-wavelength approach.

– Education –

Ph.D. in Astronomy - Institute of Astronomy, University of Cambridge 2020 - 2024
- Thesis on using high-resolution X-ray spectra of AGNs to probe very-light axions and the spin of supermassive black holes. Supervised by Prof. Chris Reynolds and Dr. James Matthews.

MPhys Physics - The University of Manchester 2016 - 2020
- Thesis on galaxy cluster cosmology. Modelled the thermal Sunyaev-Zel'dovich effect from analytic and empirical cluster pressure profiles in cosmological simulations. Supervised by Prof. Scott Kay.

– Awards, Prizes and Recognitions –

Sponsorship at Fluid Dynamics Summer School at the Flatiron Institute 2023
- Two-week summer school at the Centre for Computational Astrophysics in New York, US.

Paul Murdin Prize, Institute of Astronomy, University of Cambridge 2022
- For the best journal paper by a current Ph.D. student.

Studentship from the UK Science and Technologies Facilities Council for a Ph.D. 2020

Stellify Award from the University of Manchester 2020
- Honorary award recognising extracurricular contributions made from 2016 to 2020.

– Invited and Contributed Talks –

23 talks (12 as invited speaker) at conferences and group meetings in the US, UK and Europe since 2022.

– Relevant Related Experience & Leadership –

University of Cambridge

◇ Lead organiser of International Women's Day at the Institute of Astronomy 2022 - 2024
◇ Invited speaker at a Lindemann Trust annual event for 160 schoolchildren, Cambridge 2023, 2024
◇ Graduate representative, Computer Users' Committee at the Institute of Astronomy 2021 - 2023
◇ Press Releases: *Chandra* X-ray Observatory and *Athena* X-ray Observatory 2022, 2023
◇ Mentor to a summer intern researching black holes at the Institute of Astronomy 2022
◇ Undergraduate supervisor for Mathematics and Astrophysical Fluid Dynamics 2021 - 2022

University of Manchester

◇ Summer research internship in WIMP dark matter detection, Particle Physics Department 2019
◇ Ogden Trust and Teach First teaching summer internships, Bury and Southampton, UK 2018, 2019

– Technical Skills –

Programming & OS	Python (including `mpi`), tcl, bash, LaTeX; Unix, macOS, Windows
Software & Codes	(Py)XSPEC, HEAsoft, ds9; AREPO, ATHENA++ (basic), ALPRO
Languages	English, Catalan and Spanish
Publications	Five peer-review publications as first-author/co-author (4/1)
Telescope time	Co-I on two accepted *Chandra* proposals (CLP + GO); scheduled 2024-26

– Publications –

3 first-author and 1 co-author published peer-reviewed journal publications available on NASA/ADS.

◇ Published journal papers as first author (most recent first):

1. "Physics Beyond the Standard Model with Future X-ray Observatories: Projected Constraints on Very-Light Axion-Like Particles with *Athena* and *AXIS*."

Sisk-Reynés, J; Reynolds, C S; Parker M L; Matthews J H; Marsh D M C.

The Astrophysical Journal, 930, 1 (2023).

2. "Evidence for a moderate spin from X-ray reflection of the high-mass supermassive black hole in the cluster-hosted quasar H1821+643."

Sisk-Reynés, J; Reynolds, C S; Matthews J H; Smith R N.

Monthly Notices of the Royal Astronomical Society, 514, 2 (2022).

3. "New constraints on light axion-like particles using Chandra transmission grating spectroscopy of the powerful cluster-hosted quasar H1821+643."

Sisk-Reynés, J; Matthews J H; Reynolds, C S; Russell H R; Marsh D M C; Smith R N.

Monthly Notices of the Royal Astronomical Society, 510, 1 (2022).

◇ Published journal papers as co-author:

4. "How Do Magnetic Field Models Affect Astrophysical Limits on Light Axion-like Particles? An X-ray Case Study with NGC 1275."

Matthews J H; Reynolds, C S; Marsh D M C; **Sisk-Reynés, J**; Rodman P E.

The Astrophysical Journal, 591, 1 (2022).

◇ Published peer-review proceedings:

5. "Current and Future constraints on Very-Light Axion-Like Particles from X-ray observations of cluster-hosted AGN."

Sisk-Reynés, J; Reynolds, C S; Matthews J H.

Memorie della Società Astronomica Italiana; arXiv: 2304.08513 (2023).

◇ Journal papers in press:

6. "A Statistically Rigorous Approach to Ultralight Boson Constraints: a Statistically Rigorous Approach to Ultralight Boson Constraints".

Hoof, S; Marsh, D J E; **Sisk-Reynés, J**; Matthews J H; Reynolds, C S.

Submitted to *Monthly Notices of the Royal Astronomical Society*; arXiv: 2406.10337.

◇ Public engagement articles:

7. "The detergent particle": An X-ray astronomer's journey to axions.

Sisk-Reynés, J.

Royal Astronomical Society's *Astronomy & Geophysics*, December 2024 issue (Link).