

Nicola J. Miller

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Research Profile

Astronomer with interests in observational stellar astrophysics and machine learning. My research interests share a common theme of characterising the physical and atmospheric properties of solar to late-type stars in order to provide extremely precise constraints on the processes in stars as they evolve through the main sequence. During my PhD, I developed a new method to measure fundamental effective temperatures for solar-type stars in detached eclipsing binaries, laying the foundations to build a homogeneous catalogue of benchmark stars with extremely precise model-independent masses, radii and temperatures.

Education & Employment

- 2024 –  **Postdoctoral Researcher**, Uppsala University, Sweden.
- 2023 – 2024  **Postdoctoral Researcher**, Nicolaus Copernicus Astronomical Center, Warsaw, Poland.
- 2018 – 2022  **PhD in Astrophysics**, Keele University, UK.
Thesis: “*Fundamental Effective Temperature Measurements for Eclipsing Binary Stars*”
Supervisors: Dr. Pierre Maxted and Dr. John Taylor.
- 2014 – 2018  **B.Sc. M.Phys. (Hons)**, University of Warwick, UK.
First Class Honours. Thesis: “*The X-ray Irradiation and Evaporation of Exoplanets*”
Supervisor: Prof. Peter Wheatley.

Publications

First author

- 1 **Miller, N. J.**, Maxted, P. F. L., Hahlin, A., & Graczyk, D. (2025). Fundamental effective temperature measurements for eclipsing binary stars – VI. The solar twin in LL Aquarii. *MNRAS*, *Submitted*.
- 2 **Miller, N. J.**, Maxted, P. F. L., Graczyk, D., Tan, T. G., & Southworth, J. (2022). Fundamental effective temperature measurements for eclipsing binary stars – II. The detached F-type binary CPD-54 810. *MNRAS*, *517*(4), 5129–5143.
- 3 **Miller, N. J.**, Maxted, P. F. L., & Smalley, B. (2020). Fundamental effective temperature measurements for eclipsing binary stars – I. Development of the method and application to AI Phoenicis. *MNRAS*, *497*(3), 2899–2909.

Co-author

- 1 Olander, T., Gent, M. R., Heiter, U., Kochukhov, O., Bergemann, M., et al. (2025). Performance of the Stellar Abundances and atmospheric Parameters Pipeline adapted for M dwarfs: I. Atmospheric parameters from the spectroscopic module. *A&A*, *696*, A62.
- 2 Graczyk, D., Pietrzyński, G., Gałan, C., **Miller, N. J.** et al. (2025). Surface brightness-colour relations of dwarf stars from detached eclipsing binaries: II. Extension of the calibrating sample. *A&A*, *694*, A65.
- 3 Rojas García, G., Graczyk, D., Pietrzyński, G., Gałan, C., et al. (2024). Precise physical parameters of three late-type eclipsing binary giant stars in the Large Magellanic Cloud. *A&A*, *692*, A110.
- 4 Fortier, A., Simon, A. E., Broeg, C., Olofsson, G., et al. (2024). CHEOPS in-flight performance. A comprehensive look at the first 3.5 yr of operations. *A&A*, *687*, A302.
- 5 Maxted, P. F. L., **Miller, N. J.**, Sebastian, D., Triaud, A. H. M. J., et al. (2024). Fundamental effective temperature measurements for eclipsing binary stars – V. The circumbinary planet system EBLM J0608-59. *MNRAS*, *531*(4), 4577–4583.
- 6 Swayne, M. I., Maxted, P. F. L., Triaud, A. H. M. J., Sousa, S. G., et al. (2024). The EBLM Project– XI. Mass, radius, and effective temperature measurements for 23 M-dwarf companions to solar-type stars observed with CHEOPS. *MNRAS*, *528*(4), 5703–5722.
- 7 Standing, M. R., Sairam, L., Martin, D. V., Triaud, A. H. M. J., et al. (2023). Radial-velocity discovery of a second planet in the TOI-1338/BEBOP-1 circumbinary system. *Nature Astronomy*, *7*, 702–714.

- 8 Sebastian, D., Swayne, M. I., Maxted, P. F. L., Triaud, A. H. M. J., et al. (2023). The EBLM project – IX. Five fully convective M-dwarfs, precisely measured with CHEOPS and TESS light curves. *MNRAS*, 519(3), 3546–3563.
- 9 Maxted, P. F. L., **Miller, N. J.**, Hoyer, S., Adibekyan, V., et al. (2022). Fundamental effective temperature measurements for eclipsing binary stars – III. SPIRou near-infrared spectroscopy and CHEOPS photometry of the benchmark G0V star EBLM J0113+31. *MNRAS*, 513(4), 6042–6057.
- 10 King, G. W., Wheatley, P. J., Fawcett, V. A., **Miller, N. J.**, Corrales, L. R., & Agüeros, M. A. (2022). The strongly irradiated planets in Praesepe. *MNRAS*, 512(1), 41–55.
- 11 Triaud, A. H. M. J., Standing, M. R., Heidari, N., Martin, D. V., et al. (2022). BEBOP III. Observations and an independent mass measurement of Kepler-16 (AB) b – the first circumbinary planet detected with radial velocities. *MNRAS*, 511(3), 3561–3570.
- 12 Martin, D. V., El-Badry, K., Hodžić, V. K., Triaud, A. H. M. J., et al. (2021). TOI-1259Ab – a gas giant planet with 2.7 per cent deep transits and a bound white dwarf companion. *MNRAS*, 507(3), 4132–4148.
- 13 Swayne, M. I., Maxted, P. F. L., Triaud, A. H. M. J., Sousa, S. G., et al. (2021). The EBLM project – VIII. First results for M-dwarf mass, radius, and effective temperature measurements using CHEOPS light curves. *MNRAS*, 506(1), 306–322.

Observing Experience

Successful Proposals

- 2023
 - ESO/3.6/NIRPS, 112.25UD, 4 nights, Co-I.
 - ESO/UT3/CRIRES+, 111.2523, 26 h, Co-I.
- 2022
 - NASA/Swift/UVOT, 1821102, 19 ks, P.I.
- 2020
 - ESO/VLT/UVES, 106.2138, 0.125 nights, Co-I.
 - ESO/3.6/HARPS, 106.212H, 71.5 nights, Co-I.

Executed Observations

- 2024
 - Cerro Murphy Observatory/ZB08, 20 nights.
- 2020
 - ESO/VLT/UVES, 0.125 nights, remote.
 - OHP/1.93/SOPHIE, 5 nights.
- 2019
 - OHP/1.93/SOPHIE, 6 nights.

Selected Presentations

- 2025
 - Exploring Star-Planet-Disk Connections, Tartu, Estonia – *talk, upcoming*
 - Binary Stars in the Space Era, Keele, UK – *invited review talk*
 - PLATO WP122 Workshop #8, Liège, Belgium – *talk*
 - PLATO Sweden Meeting, Stockholm, Sweden – *talk*
 - Stockholm University, Stockholm, Sweden – *seminar*
- 2024
 - Astronomdagarna, Lund, Sweden – *poster and flash talk*
 - Uppsala University, Uppsala, Sweden – *seminar*
 - European Astronomical Society Meeting (S8), Padova, Italy – *invited talk*
 - CAMK PAN Annual Meeting, Warsaw, Poland – *talk*
- 2023
 - Nicolaus Copernicus Astronomical Center, Toruń, Poland – *seminar*
- 2022
 - PLATO GOP Workshop, online – *talk*
 - Istanbul University, online – *seminar*
- 2021
 - Physics behind the primary distance indicators, Sopot, Poland – *invited talk*
 - TESS Science Conference II, online – *poster and flash talk*

Selected Presentations (continued)

- Keele Postgraduate Conference, online – *talk*
- Keele Faculty of Natural Sciences Postgraduate Symposium, online – *talk*
- Cool Stars 20.5, Virtually Cool, online – *poster*
- 2019 ○ PLATO STESCI Workshop III, Barcelona, Spain – *talk*
- Keele Faculty of Natural Sciences Postgraduate Symposium, Keele, UK – *poster*
- 2018 ○ Conference of Astronomy and Physics Students, Newcastle, UK – *talk*

Supervision & Teaching

- 2025 ○ Masters project supervisor (15 credits), María Garcia Freire, Uppsala University, Sweden.
- 2024 ○ Summer project supervisor (9 students), International Astronomical Youth Camp (IAYC), Germany.
- 2022 ○ Summer project supervisor (9 students), IAYC, Germany.
- 2021 ○ Teaching assistant in PHY-30029: **Quantum Mechanics II**, Keele University, UK.
- 2019 – 2022 ○ Teaching assistant in PHY-10028: **Scientific Programming**, Keele University, UK.
- 2019 – 2021 ○ Lab demonstrator in PHY-10024: **Nature of Matter**, Keele University, UK.
- 2019 ○ Summer project supervisor (10 students), IAYC, Germany.
- 2018 – 2021 ○ Lab demonstrator in PHY-20027: **Optics and Thermodynamics**, Keele University, UK.
- 2018 ○ Teaching assistant in PHY-30006: **Astrophysics Group Project**, Keele University, UK.
- Summer project supervisor (8 students), IAYC, UK.

Professional Responsibilities

- 2025 ○ Binary Stars in the Space Era conference, SOC member.
- 2024 – ○ Uppsala Division of Astronomy and Space Physics weekly meetings, organiser and chair.
- PLATO WP122300 “Non seismic diagnostics and model atmospheres”, lead pipeline developer.
- 2023 – 2024 ○ Araucaria Project, contributing member and observer.
- 2022 ○ National Astronomy Meeting 2022, co-organiser of parallel session “ED&I in Astronomy”
- 2019 – ○ PLATO WP125500 “Benchmark Stars”, contributing member.

Honours & Awards

- 2021 ○ *Honorable Mention*, for poster at TESS Science Conference II.
- *People’s Prize (2nd Place)*, Three Minute Thesis Competition, Keele University, UK.
- *Best Oral Presentation*, Faculty of Natural Science PGR Symposium, Keele University, UK – **£50**.
- 2018 ○ *Best Presentation*, Conference of Astronomy and Physics Students, Newcastle, UK – **£100**.
- 2017 ○ *Best New Society Award* for University of Warwick Astronomy Society, Warwick Student Union, Coventry, UK.

Workshops Attended

- 2025 ○ PLATO Benchmark Stars workshop, Nice, France
- 2024 ○ ESO-GPT, ESO Garching, online
- Accurate Flux Calibration in the era of Space Astronomy and All-Sky Surveys, online
- 2021 ○ Reference stars for all-sky surveys, Lund University, online
- COST: MW-Gaia: Stellar spectroscopy with Gaia, INAF, online

Outreach, Public Engagement & Volunteering

Longer Term Initiatives

- 2023 – 2024 ○ **President**, International Workshop for Astronomy e.V. (IWA), Germany.
- 2017 – 2024 ○ **Leader**, International Astronomical Youth Camp (IAYC), Germany.
- 2021 – 2023 ○ **Vice President**, International Workshop for Astronomy e.V. (IWA), Germany.
- 2019 – 2022 ○ **Outreach volunteer**, Keele Observatory and Keele University Stardome.
- 2019 – 2020 ○ **Organiser**, Pint of Science Stoke-on-Trent, UK.
- 2016 – 2018 ○ **Founder and President**, University of Warwick Astronomy Society, Coventry, UK.
- 2017 – 2018 ○ **Outreach volunteer**, University of Warwick Department of Physics, UK.
- 2016 – 2018 ○ **STEM Ambassador**, STEMNET, West Midlands, UK.

Standalone Events

- 2022 ○ **Ardingly College International Women's Day event**, online – *panel*
- 2021 ○ **eIAYC Seminar Series**, online – *talk*
 - **Ardingly College Physics Careers event**, online – *talk*
 - **Astro Radio**, online – *interview*
- 2020 ○ **Wirral & Merseyside Women's Engineering Society**, online – *talk*
 - **Global Science Show LGBT+ STEM day event**, online – *short-form*
- 2019 ○ **Pint of Science**, Stoke-on-Trent, UK – *talk*
 - **Keele University International Day of Women and Girls in Science event**, Keele, UK – *panel*
 - **University of Warwick Astronomy Society**, Coventry, UK – *talk*
- 2018 ○ **ESO Astronomy Camp**, St Barthelemy, Italy – *event*
 - **Stoking Curiosity**, Stoke-on-Trent, UK – *talk*
 - **Kings High School**, Warwick, UK – *talk*
- 2017 ○ **ESO Astronomy Camp**, St Barthelemy, Italy – *event*

Memberships

- 2023 – ○ **International Astronomical Union**, Junior Member, Divisions B & G
- 2020 – ○ **European Astronomical Society**, Member
- 2016 – ○ **Royal Astronomical Society**, Fellow

Skills

- Programming </> Python (expert), R, C.
- Tools </> Git/Github (advanced), L^AT_EX (advanced), bash, SQL.
- Languages </> English (native), German (A2/B1), French (A1/A2), Polish (beginner), Swedish (beginner)