

Khaled Al Moulla

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Positions

Since 2025 **SNSF Postdoctoral Fellow**
Center for Astrophysics at the University of Porto (CAUP), Portugal

2024 – 2024 **Postdoctoral Researcher**
University of Geneva, Switzerland

2020 – 2024 **Research and Teaching Assistant**
University of Geneva, Switzerland

Education

2020 – 2024 **PhD in Astronomy and Astrophysics**
University of Geneva, Switzerland
Supervisor: Prof. Xavier Dumusque
Thesis: Pathways Toward a Physical Understanding of Solar-type Variability in EPRVs

2018 – 2020 **MSc in Physics**
Uppsala University, Sweden
Supervisor: Prof. Nikolai Piskunov
Thesis: Advanced Characterization of Exoplanet Host Stars

2015 – 2018 **BSc in Physics**
Uppsala University, Sweden
Supervisor: Dr. Lina Hadid
Thesis: Turbulence at MHD and Sub-Ion Scales in the Magnetosheath of Saturn

Fellowships & Grants

2025 – 2027 **Swiss National Science Foundation (SNSF) Postdoc.Mobility Fellowship**
Project: Resolving and Solving Solar-type Activity with PoET
CHF 108,600 \approx USD 120,000

2024 **Swiss Society for Astrophysics and Astronomy (SSAA) Travel Grant**
CHF 1,000 \approx USD 1,100

2020 **F. O. Törnlund Foundation Scholarship**
SEK 26,000 \approx USD 3,000

2018 – 2019 **A. & A. Löfberg Foundation Scholarship**
SEK 100,000 \approx USD 11,000

Instrumentation

Consortia

Since 2025 **Paranal solar ESPRESSO Telescope (PoET)**

Member of Science Team

Since 2023 **Near-InfraRed Planet Searcher (NIRPS)**

Member of Science Team

Observations

2024 **ESO 3.6m Telescope**

Nights: 7, Instruments: HARPS & NIRPS

2021 – 2024 **Swiss Euler 1.2m Telescope**

Nights: 44, Instruments: CORALIE & NECAM

Successful Proposals

2024 **INAF AOT49**

Co-Investigator, Telescope: TNG, Time: 16.0 h

2022 **ESO P111**

Co-Investigator, Telescope: VLT, Time: 33.3 h

Services

Committees

Since 2025 **Extreme Stellar Signals Project (ESSP)**

Member of Executive Committee

Since 2025 **Institute of Astrophysics and Space Sciences (IA)**

Member of Scientific Council

2022 – 2024 **Diversity, Inclusion and Equity (DEI) Group**, Geneva Observatory

Member of Committee

Conferences

2025 **Extremely Precise Radial Velocities (EPRV) 6**, Porto, PT

Member of LOC, Participants: 200

2023 **JUnior Researchers' Assembly (JURA) IV**, Leissigen, CH

Member of SOC & LOC, Participants: 47, Budget: CHF 32,000 \approx USD 35,000

Journals

Since 2025 **Astronomy & Astrophysics (A&A)**

Referee

Teaching

Courses

2023 – 2024 **Astrophysics and Data Science**, Teaching Assistant

University of Geneva, Master's Level Course

Students

2023 – 2024 **Romain Eltschinger**, Master's Thesis

University of Geneva, co-supervised with Jeanne Davoult (University of Bern)

Talks

8 conferences, 5 science meetings, 3 invited seminars, 6 campus seminars.

Conferences

- 2024 **PoET Workshop #2**, CAUP, Porto, PT
Small-Scale Magnetic Field Proxies in the Optical and Near-Infrared
- Exoplanets 5**, Stadsgehoorzaal, Leiden, NL
Characterizing Solar-Type Activity with HELIOS
- 2023 **EPRV 5**, Hilton Beachfront Resort, Santa Barbara, US
Formation Temperature-Dependent Stellar Activity RVs Across Spectral Types
- Sun-as-a-Star Workshop**, Flatiron Institute, New York City, US
Introducing ARVE: Analyzing Radial Velocity Elements &
Which Spectral Segments are Optimal for Radial Velocity Extraction?
- PoET Workshop**, CAUP, Porto, PT
Understanding the Physics of Stellar Activity at the Spectral Level
- 2022 **JURA III**, Hotel Meielisalp, Leissigen, CH
Stellar Activity Indicators with Solar Observations
- GPRV Workshop**, All Souls College, Oxford, UK
Radial Velocity Dependence on Line Formation Temperature

Invited Seminars

- 2024 **Stockholm University**, Stockholm, SE
Roadblocks to Detect Earth-like Exoplanets: Solar-type Activity in Radial Velocities
- Uppsala University**, Uppsala, SE
Roadblocks to Detect Earth-like Exoplanets: Solar-type Activity in Radial Velocities
- 2023 **Weizmann Institute of Science**, Rehovot, IL (online)
Introducing ARVE: Analyzing Radial Velocity Elements

Posters

2 conferences, 2 science meetings.

Conferences

- 2023 **Spectral Fidelity**, Istituto degli Innocenti, Florence, IT
NIRPS Sun-as-a-Star Observations
- 2022 **Cool Stars 21**, Pierre Baudis Centre, Toulouse, FR
Dependence of Solar Activity Signals on the Formation Temperature of Spectral Lines

Publications

A complete list is available on my [ADS Public Library](#).

First Author

3. Al Moulla et al. 2024, A&A, 683, A106
Measuring precise radial velocities on individual spectral lines. IV.
Stellar activity correlation with line formation temperature
2. Al Moulla et al. 2023, A&A, 669, A39
Stellar signal components seen in HARPS and HARPS-N solar radial velocities
1. Al Moulla et al. 2022, A&A, 664, A34
Measuring precise radial velocities on individual spectral lines. III.
Dependence of stellar activity signal on line formation temperature

Second Author

1. Rescigno & Al Moulla 2025, MNRAS, 536, 3601
Gaussian process regression of temperature-dependent radial velocities

Coauthor

12. Santos et al. 2025, Messenger, 194, 21
PoET: the Paranal solar ESPRESSO Telescope
11. Doyon et al. 2025, Messenger, 194, 13
NIRPS Joins HARPS: Setting New Standards at Infrared Wavelengths
10. Zhao et al. 2025, A&A, 693, A262
Precise and efficient modeling of stellar-activity-affected solar spectra using SOAP-GPU
9. Marchenko et al. 2024, ApJ, 977, 33
Sun-as-a-Star Spectral Line Variability in the 300–2390 nm Wavelength Range
8. Bourrier et al. 2024, A&A, 691, A113
The ANTARESS workflow: I. Optimal extraction of spatially resolved stellar spectra with high-resolution transit spectroscopy
7. Siegel et al. 2024, AJ, 168, 158
Quiet Please: Detrending Radial Velocity Variations from Stellar Activity with a Physically Motivated Spot Model
6. Malo et al. 2024, SPIE, 13096, 1309646
NIRPS near-infrared spectrograph: AITV phase at ESO3.6m/La Silla
5. Artigau et al. 2024, SPIE, 13096, 130960C
NIRPS first light and early science: breaking the 1 m/s RV precision barrier at infrared wavelengths
4. Klein et al. 2024, MNRAS, 531, 4238
Investigating stellar activity through eight years of Sun-as-a-star observations
3. Palumbo et al. 2024, AJ, 168, 46
GRASS. II. Simulations of Potential Granulation Noise Mitigation Methods
2. Jones et al. 2024, A&A, 683, A192
A long-period transiting substellar companion in the super-Jupiter-to-brown-dwarf mass regime and a prototypical warm-Jupiter detected by TESS

1. Zhao et al. 2023, AJ, 166, 173
The Extreme Stellar-signals Project. III. Combining Solar Data from HARPS, HARPS-N, EXPRES, and NEID

Submitted

14. Al Moulla, submitted to A&A
ARVE: Analyzing Radial Velocity Elements. I. The Code
13. Allart et al., submitted to A&A
NIRPS detection of delayed atmospheric escape from the warm and misaligned Saturn-mass exoplanet WASP-69 b
12. Anna John et al., submitted to MNRAS
Granulation on a quiet K dwarf: HD 166620. I. Spectral signatures as a function of line-formation temperature
11. Bazinet et al., submitted to A&A
NIRPS quantifies the extent of thermal water dissociation in the dayside photosphere of the ultra-hot Jupiter WASP-121 b
10. Bouchy et al., submitted to A&A
NIRPS joining HARPS at the ESO 3.6m: On-sky performance and science objectives
9. Bourrier et al., submitted to A&A
ATREIDES I. Embarking on a trek across the exo-Neptunian landscape with the TOI-421 system
8. Gomez da Silva et al., submitted to A&A
Blind search of activity-sensitive lines in the NIR using simultaneous HARPS and NIRPS observations of Proxima and Gl 581. I. Line list catalogue
7. Klein et al., submitted to A&A
Using Doppler Imaging to model stellar activity and search for planets around Sun-like stars
6. Mercier et al., submitted to A&A
Studying the variability of the He triplet to understand the detection limits of evaporating exoplanet atmospheres
5. Parc et al., submitted to A&A
NIRPS discovers a peculiar system with a transiting sub-Neptune and a cold eccentric giant orbiting the M dwarf TOI-756
4. Silva et al., submitted to A&A
A systematic bias in template-based RV extraction algorithms
3. Suárez Mascareño et al., submitted to A&A
Diving into the planetary system of Proxima with NIRPS: Breaking the meter per second barrier in the infrared
2. Ulmer-Moll et al., submitted to A&A
TOI-2449 b: a 106-day transiting warm Jupiter uncovered with NGTS and HARPS
1. Vulato et al., submitted to A&A
Hydride ion continuum hides absorption signatures in the NIRPS near-infrared transmission spectrum of the ultra-hot gas giant WASP-189b