Alexis Lavail

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Research expertise

- **High-resolution stellar spectroscopy and spectropolarimetry** with CRIRES+/VLT, ESPaDOnS/CFHT, (NEO-)NARVAL/TBL, GIANO-B/TNG, FIES/NOT
- **Stellar magnetic fields**: Zeeman broadening and Zeeman Doppler Imaging
- **Instrumentation** (design, testing, AIT/AIV, commissioning). I worked on CRIRES+/VLT, ANDES/ELT, and the Exomars 2016 descent camera
- **Data reduction and analysis**: pipeline writing, reduction of echelle spectra (e.g CRIRES+, HARPS, HARPSpol), spectrum extraction, stellar spectrum synthesis, parameter inference, MCMC, telluric line modelling

Research experience

Feb 2023- **Postdoc** at Institut de Recherche en Astrophysique et Planétologie (IRAP), CNRS – Université Paul Sabatier – CNES, Toulouse

2020–2022 **Thunberg fellow** at Uppsala University (Sweden) and the Swedish Collegium for Advanced Study. **9-month parental leave**

2013–2020 **PhD student in astronomy** at Uppsala University (Sweden) and the European Southern Observatory (Germany)

2013 **ESA Stagiaire** at the European Space Agency ESTEC (Netherlands)

Education

2020 PhD in astronomy at Uppsala University. PhD thesis : *Magnetic fields of cool stars from near-infrared spectropolarimetry*

2013 Master degree in space-engineering at Observatoire de Paris (France)

2011 Bachelor degree in physics, Université Aix-Marseille-3, Marseille (France)

Computer skills

- Programming: python, bash, IDL/GDL, C
- Misc: version control (mostly git), markdown, LaTeX

Languages

French: native; **English**: fluent; **Swedish**: fluent; **Spanish**: conversational

Observing experience

Observations done with CRIRES+/VLT, ESPaDOnS/CFHT, GIANO-B/TNG, FIES/NOT

Duties

- Postdoc representative at the IRAP lab council starting Feb 2023
- Representative at the astronomy division council at Uppsala University 2015–2017 & 2022
- Webmaster of the Uppsala University astronomy webpages [www.astro.uu.se].
- Organization of conferences and workshop (Cool Stars 19, *Astronomdagarna*, *Rencontres OSAE*, Uppsala/Stockholm astronomy PhD workshops, CRIRES+ consortium meeting)
- Logotype design : Programme National de Physique Stellaire, ELT/ANDES spectrograph, Uppsala University doctoral board.

Popular science activities

- Design and presentation of posters at popular science events
- Member of the organizing committee for the “Plage aux Étoiles” festival, Collioure (FR)

Student (co)supervision

- Jonas Zbinden. Master thesis: *Planning observations of terrestrial exoplanets around M type stars with CRIRES+*, 2021
  Isabella Rudengren and Julia Dahlberg. *Experimental characterization of focal ratio degradation of optical fibers due to various coupling technologies*. Bachelor thesis, 2020
- Candice Durandet. Internship on the CRIRES+ spectropolarimeter, 2017
- Milan Rozel. Internship: *Assembly and characterisation of the spectropolarimetric unit of the CRIRES+ spectrometer*, 2017

Hobbies

Hiking, bouldering, beer-brewing & fermentations of every kind, cross-country skiing, baking, urban gardening, permaculture, climate justice, world literature and music

Publication list

Full list: https://ui.adsabs.harvard.edu/public-libraries/Qpt21CAPTS-852OAEIYcVg
Metrics (from ADS) :

- 10 peer-reviewed articles (4 first-authored)
- Number of citations : 147
- h-index : 6

Refeered publications

1. Lesjak, F., et al.: Retrieval of the dayside atmosphere of WASP-43b with CRIRES+, 2023, A&A, 678, A23

2. Bellotti, S., et al.: Monitoring the large-scale magnetic field of AD Leo with SPIRou, ESPaDOnS, and Narval. Towards a magnetic polarity reversal?, 2023, A&A, 676, A56
3. Hahlin, A., et al.: Determination of small-scale magnetic fields on Sun-like stars in the near-infrared using CRIRES+, 2023, A&A, 675, A91
4. Dorn, R. J., et al.: CRIRES+ on sky at the ESO Very Large Telescope. Observing the Universe at infrared wavelengths and high spectral resolution, A&A, 2023, 671, A24
5. Yan, F., et al.: CRIRES+ detection of CO emissions lines and temperature inversions on the dayside of WASP-18b and WASP-76b, 2023, A&A, 672, A107
6. **Lavail, A.**, et al.: The large-scale magnetic field of the eccentric pre-main-sequence binary system V1878 Ori, MNRAS, 2020, 497, 632
7. **Lavail, A.**, Kochukhov, O., Hussain, G. A. J.: Characterising the surface magnetic fields of T Tauri stars with high-resolution near-infrared spectroscopy, A&A, 2019, 630, A99
8. **Lavail, A.**, Kochukhov, O., Wade, G. A.: A sudden change of the global magnetic field of the active M dwarf AD Leo revealed by full Stokes spectropolarimetric observations, MNRAS, 2018, 479, 4836
9. **Lavail, A.**, et al.: Magnetic fields of intermediate mass T Tauri stars, A&A, 2017, 608, A77
10. Kochukhov, O., **Lavail, A.**: The Global and Small-scale Magnetic Fields of Fully Convective, Rapidly Spinning M Dwarf Pair GJ65 A and B, ApJL, 2017, 835, L4

SPIE proceedings

- Marconi, A., et al.: ANDES, the high resolution spectrograph for the ELT: science case, baseline design and path to construction, SPIE, 2022, 12184, 1218424
- Dorn, R. J., et al.: CRIRES+ on sky: high spectral resolution at infrared wavelength enabling better science at the ESO VLT, SPIE, 2022, 12184, 121841F
- Brucalassi, A., et al.: Full system test and early preliminary acceptance Europe results for CRIRES+, SPIE, 2018, 10702, 1070239
- Piskunov, N., et al.: A unique infrared spectropolarimetric unit for CRIRES+, SPIE, 2018, 10702, 1070234
- Follert, R., et al.: Characterizing the cross dispersion reflection gratings of CRIRES+, SPIE, 2016, 9912, 99122B
- Dorn, R. J., et al.: The "+" for CRIRES: enabling better science at infrared wavelength and high spectral resolution at the ESO VLT, SPIE, 2016, 9908, 99080I