Louise Dyregaard Nielsen

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Born 1988 in Denmark (she/her)

Website: `https://louisedyregaard.github.io/`

Staff astronomer at LMU Munich, Germany

Staff astronomer (Akadademische Rätin auf Zeit) at LMU Munich, mitigating and modelling stellar activity in radial velocity time series of young stars harbouring transiting planets. Exoplanet observations with Wendelstein observatory. December 2023 - present.

Employment history

2021 Dec - 2023 Nov **Research fellow at ESO-Garching**, mitigating and modelling stellar activity in radial velocity time series of young stars harbouring transiting planets. 75% science time, 25% functional work supporting NIRPS and ANDES instrument development.

2021 Mar - 2021 Nov **Swiss National Science Foundation fellow at Oxford University**, United Kingdom. Working on mitigating and modelling stellar activity in radial velocity time series of young stars harbouring transiting planets as part of Suzanne Aigrain's group.

2015 Oct - 2016 Dec **Young Graduate Trainee at the European Space Agency**, ESTEC, the Netherlands. Developing an exposure time calculator dedicated to transiting exoplanet observations with NIRSpec on the James Webb Space Telescope. Supervisor: Pierre Ferruit.

2015 May - Sep **Research Intern at the Gemini Observatory**, Hawaii. Reducing and processing spectra of high redshift galaxies. Supervisor: Inger Jørgensen.

2014 Mar - 2015 May **Student support astronomer at the Nordic Optical Telescope**, Spain. Planing and performing observations, supporting visiting astronomers, software development and instrument maintenance.

Education

2017 Feb - 2021 Feb PhD in astrophysics, Geneva Observatory at Geneva university, Switzerland. Thesis: *Density of Exoplanets*. Supervisor: prof. François Bouchy.

2011 Sep - 2015 Mar Master of Science with specialisation in astrophysics, the Niels Bohr Institute at Copenhagen University, Denmark. Thesis: *Probing Kinematic and Thermal Properties of the Very Low Luminosity Object DC2742-04-IRS*, supervisor: prof. Jes Jørgensen.

2008 Sep - 2011 Jun Bachelor of Physics with specialisation in Astronomy, The Niels Bohr Institute at Copenhagen University, Denmark.

Published work

4 first author papers (+3 not peer reviewed), 83 additional publications (+14 not yet peer reviewed). H-index 30. Full list can be found at the ADS:
https://ui.adsabs.harvard.edu/public-libraries/NItFdYS2Q2OuJ_TZLSQsag
and ORCID 0000-0002-5254-2499.

Approved research projects

As principle investigator
ESO research fellowship, Dec 2021, 3 year fellowship at European Southern Observatories.

Fraunhofer fellowship, 2021, 2+3 year fellowship at Ludwig-Maximilians-Universität Munich. Declined.

SNSF Early Postdoc.Mobility, Feb 2021, 18 month fellowship, grant no. P2GEP2_200044.

Characterising a planet system around one our nearest white dwarfs
20 hr on ESPRESSO-VLT, 2023/24, prog. 112.25XY.

Exploring the transition between ice- and gas giant exoplanets
12 nights on HARPS-ESO3.6m, 2020 + 2021, prog. 105.20FX & 106.216H.

Understanding giant planet formation through precise mass measurements of TESS planets
6 nights on HARPS-ESO3.6m, 2019, prog. 0103.C-0874.

Accurate Mass Determination of Bloated Saturns from the WASP-south Survey
5 nights on HARPS-ESO3.6m, 2019, prog. 0102.C-0414.

As co-investigator
Probing the limits of giant planet formation around low-mass stars
0.5 nights on NIRPS-ESO3.6m, 2023, prog. 111.254E.

NIRPS GTO
100+ nights on NIRPS-ESO3.6m, 2023-2028.

Search for binary companions to explain the large cavities of transition disks
46 hr on ESPRESSO-VLT 2023, prog. 111.250K.

Uncovering the origin of remnant planets in the hot Neptunian Desert
628 hr on HARPS-ESO3.6m, 2021-2023, prog. 108.21YY.

Too Hot to Handle: TOI-824b, a young, highly irradiated Neptune along the edge of the desert
8 hr on ESPRESSO-VLT, 2020, prog. 106.20ZR.

SPICED: a Spectroscopic Inquiry of Close-in Exoplanets below the Desert
20 hr on ESPRESSO-VLT, 2020, prog. 106.20ZL.

Exploring the properties of warm mini-Neptunes revealed by TESS
68 hr on ESPRESSO-VLT, 2020, prog. 105.20P7.

Characterizing properties of TESS long-period giant planets
7.2 nights on HARPS-ESO3.6m, 2020, prog. 0105.C-0809.

NGTS-HARPS Program: Short, Young, and Cool
6.3 nights on HARPS-ESO3.6m, 2020, prog. 105.20G9.

Atmospheric escape in the young transiting planet DS Tuc A b

5 Orbits, STIS - Hubble Space Telescope, 2020, Cycle 27.

Naked Cores: Exploring the internal structure of planets with HARPS
72 nights on HARPS-ESO3.6m, 2018-2020, prog. 1102.C-0249.

Probing the transition between ice giants and gas giants with the NGTS Survey
16 nights on HARPS-ESO3.6m, 2017-2019, prog. 0101.C-0623, 0103.C-0719 & 0104.C-0588.

Characterising Hot Neptunes and Super-Earths from the NGTS Survey
6.1 nights on HARPS-ESO3.6m, 2017, prog. 0100.C-0474.

Talks and Seminars

- ⋆ Open Problems in the Astrophysics of Gas Giants, November 2023, Puerto Natales, Chile.
  Contributed talk: Constraining giant planet formation scenarios with sub-Saturns.
- ⋆ Mullard Space Science Laboratory seminar, April 2023, Online.
  Invited Seminar: The transition between Ice and Gas giants.
- ⋆ Extremely precise RVs V, March 2023, Santa Barbara, USA.
  Talk (winner of poster-competition): Exploring the transition between Ice and Gas giants with RVs and TESS
- ⋆ ESO-Vitacura Thirty Minute Talk, Feb 2023, Santiago de Chile.
  Invited talk: The transition between Ice and Gas giants.
- ⋆ Disks and Exoplanets across ESO facilities, November 2022, Garching.
  Invited review: Exoplanet Detection.
- ⋆ Exoplanets IV conference, May 2022, Las Vegas.
  Contributed talk: Transition between Ice and Gas giants explored with TESS and RV follow-up.
- ⋆ GPRV workshop, March 2022, Oxford.
  Invited talk + discussion: Robust RV masses of young planets.
- ⋆ TESS Science Team Meeting, Dec 2021, online.
  Talk: public data release from the vetting of TESS target with CORALIE
- ⋆ TESS Science conference II, July 2021, Pasadena/online.
  Poster: Spectroscopic vetting of TESS planet candidates with CORALIE on the Swiss 1.2 m telescope.
- ⋆ KIPAC Tea series at Stanford University, May 2021, online.
  Invited talk: Towards robust characterisation of young transiting planets.
- ⋆ SPIMAX seminar, May 2021, Oxford/online.
  Invited talk: Probing planet formation through in-depth characterisation of transiting planets.
- ⋆ UK exoplanet meeting April 2021, Birmingham/online
  Contributed pop-talk: Transition between ice and gas giants.
- ⋆ Astronomy seminar LMU, Jan 2021, Munich/online.
  Invited talk: Snapshot of planet evolution: overcoming stellar noise to characterise young systems.
- ⋆ CfA Virtual Exoplanet Pizza Lunch, Nov 2020, Harvard/online.
  Invited talk: Transition between Ice and Gas giants explored with TESS and radial velocity measurements.
- ⋆ Exoplanets III conference, July 2020, Heidelberg/online.
  Contributed talk: The transition between Ice and Gas giants.

- ⋆ Geneva observatory seminar, June 2020, Geneva.
  Seminar: Exoplanet demographics in the era of TESS.
- ⋆ Online TESS science meeting, June 2020, online.
  Contributed talk: The transition between Neptune- and Saturn-like planets.
- ⋆ Jet Propulsion Laboratory's astrophysical journal club, February 2020, Pasadena, USA.
  Invited talk: Exploring the transition between Ice and Gas giant exoplanets.
- ⋆ EPSC-DPS conference, September 2019, Geneva.
  Contributed talk: Exploring the transition between ice- and gas giant exoplanets from TESS.
- ⋆ Plato ESP workshop, September 2019, Warwick, UK.
  Contributed talk: RV-follow up of mono-transits from TESS.
- ⋆ TESS science meeting, July 2019, Cambridge, USA.
  Contributed talk: Precise mass determination of three mini-neptunes transiting TOI-125.
  Poster: Radial velocity follow-up with CORALIE on the Swiss 1.2m Euler telescope.
- ⋆ Summer school on exoplanet-demographics, May 2019, Vietri, Italy.
  Contributed talk: Exoplanet demographics in the era of TESS: results from the radial velocity follow-up from the first 9 sectors.
- ⋆ Swiss 'PlanetS' TESS workshop, May 2019, Geneva.
  Overview talk: Results from TESS sectors 1-9 and ground based follow-up observations.
- ⋆ NIRPS Science team meeting, April 2019, Geneva.
  Invited talk: Geneva activities on TESS-follow up.
- ⋆ Exoplanet II Conference, July 2018, Cambridge, UK.
  Poster: Exploring the transition between ice & gas giants through ground-based transit surveys and radial velocity measurements
- ⋆ Extremely precise RVs III, August 2017, Penn State, USA.
  Poster: Exploring the power of Fabry-Perot calibration with the spectrographs SOPHIE and CORALIE.
- ⋆ Transiting Exoplanets conference, July 2017, Keele, UK.
  Poster: Radial Velocity Follow-up of SuperWASP Candidates with the Swiss Euler Telescope.
- ⋆ Swiss JWST workshop, May 2017, Bern, Switzerland.
  Invited talk: Capabilities of NIRSPEC-JWST for exoplanet science.

Student supervision and mentoring

- ⋆ *Kate Barton*
  Research Intern: Combat stellar activity though chromatic analysis of radial velocities. ESO Summer Research programme 2023.
- ⋆ *Hannah Osborne*
  PhD student spending 1yr at ESO, co-supervised w. Vincent Van Eylen (MSSL) and Michael Sterzik (ESO). Studying small planets with archival data. May 2023 - May 2024.
- ⋆ Mentoring several PhD students at ESO-Garching. 2022 - 2023.
- ⋆ *Linn Friis-Liby*
  Research Intern: Combat stellar activity though chromatic analysis of radial velocities. ESO Summer Research programme 2022.

- ⋆ *Cebine Ragn*
  High school student: 'Junior researcher' competition in Denmark. (un)Habitability of planets around M-dwarfs. Summer 2020.
- ⋆ *Jules Dallant*
  Master student: TESS follow-up and exoplanet databases. Spring 2020.
- ⋆ *Francesco DeMarco*
  Master student: comparing methods of modeling RVs + transit light curves. Spring 2020.
- ⋆ *Maulik Bhatt*
  Master student: Optimizing TESS follow-up by identifying blended stellar binaries. Spring 2020.
- ⋆ *Maxime Zahler*
  Bsc. student: Global statistic of TESS results. Autumn 2019.
- ⋆ *Mohamed Chehih*
  Bsc. student: Caractérisation des premiers candidats exoplanètes de TESS. Autumn 2018.
- ⋆ *Carmelo Mileto*
  Bsc. student: Follow-up of NGTS planet candidates. Spring 2018.
- ⋆ *Erik Lindstrom*
  High school student: final year project. Transit analysis on WASP-47. Spring 2018.

Teaching and Outreach

- ⋆ 'Dance like the solar system planets' interactive orrery workshop at Goulash Disko Festival 2022
- ⋆ Occasional 'guest expert' on Danish radio show *Den nye Rumalder*
- ⋆ Co-creator and host of the Danish-speaking podcast *Stjerneklart* about astronomy and space exploration. 39 episodes: `https://stjerneklart.dk/`
- ⋆ Lecture on 'Exploring the building blocks of exoplanets' at ESO Summer Research Programme 2022+23.
- ⋆ Tours at ESO visitor center Supernova and ESO HQ, 2022+23.
- ⋆ Speaker at Girls day in Science, October 2021, Skive Gymnasium, Denmark.
- ⋆ Guest speaker astrophysics summer-student programme *Introduction to Exoplanet science in the era of TESS*, summer 2021, Oxford/online.
- ⋆ Speaker at recruitment event 'Be a Star in ESA's Universe'. Nov 2020, online.
- ⋆ Teacher assistant for Masters course on 'Exoplanet detection techniques' at Geneva Observatory, Spring 2020, including in-person and online teaching.
- ⋆ Tours, talks and observation nights at Geneva observatory, about 10 groups per year, 2017-2020.
- ⋆ Taught exercise- and lab classes for Bachelor students at physics at Copenhagen University, including Classical Mechanics and Electrodynamics. April 2010 - June 2014.
- ⋆ Jens Martin Knudsen award for best teaching of the year at the Niels Bohr Institute, Copenhagen University, along with the full team of instructors in 2014.

Community services & Collaborations

- ⋆ Member of the NIRPS science team, contributing to the exposure time calculator, commissioning, target selection, science operations and data analysis, 2017 - 2024.

- ⋆ Member of the NGTS consortium, coordinating radial velocity follow up of NGTS planet candidates, vetting and target selection, 2017 - present.
- ⋆ Representative for fellows and postdocs at ESO-Garching. 2022-2023.
- ⋆ Organising weekly 'Stellar Coffee and Planetary Tea' at ESO-Garching. 2022- 2023.
- ⋆ Chair of the committee selecting ESO workshops for 2023.
- ⋆ Scientific Assistant on the ESO Observing Programmes Committee 2022, 2023.
- ⋆ Reviewer for ApJ, 2020-2023, A&A 2022-2023.
- ⋆ Reviewer for NASA's Exoplanets Research Program, 2021.
- ⋆ External scientific reviewer for OPTICON (2021) and Gemini (2021, 2022).
- ⋆ External scientific reviewer for the ERC consolidator grant, 2020.
- ⋆ Reviewer for the ESO peer review experiment, 2019.
- ⋆ Member of the TESS follow-up programme (TFOP) spectroscopic steering committee, representing CORALIE-science team and Geneva observatory, 2018 - 2021.

Conference organisation

- ⋆ Local Organising Committee, Spectral Fidelity conference in Florence, Italy, 2023.
- ⋆ Session chair and discussion moderator, Disks and Exoplanets across ESO facilities, Garching, 2022
- ⋆ Discussion lead, EPRV Research Coordination Network mini-workshop, 2022
- ⋆ Co-convenor for splinter session on exoplanet characterisation at the UK National Astronomy meeting, Warwick, 2022
- ⋆ Co-organiser of the first GPRV workshop in Oxford 2022
- ⋆ Convenor for splinter session on Young Planets at TESS Science conference II, August 2021, Pasadena/online.
- ⋆ Lab assistant and moderator for hands-on session on planet spectra at Sagan Summer School July 2021, Pasadena/online.
- ⋆ Session chair at the Exoplanets Demographics Conference, Pasadena/online, November 2020.
- ⋆ Moderator for the Exoplanets III conference, Heidelberg/online, June 2020.
- ⋆ Conference assistant at EPSC-DPS joint meeting, Geneva, Switzerland, September 2019.
- ⋆ Organiser of the NGTS Science meeting in Geneva, Switzerland, May 2019 .
- ⋆ Organiser of the PlanetS TESS workshop in Geneva, Switzerland, May 2019.
- ⋆ Local organising committee for Extremely precise RV workshop IV, Grindelwald, Switzerland, Feb 2019.

Computing Experience

I am proficient in Python including the ASTROPY package, TENSORFLOW and simple machine learning, as well as Unix/Shell programming. I have experience using IRAF/PyRAF, Matlab, IDL, HTML and SQL.

Language skills

I speak English and Danish fluently.

German, French, Spanish and Dutch I can get by with in non-academic situations, as well as Swedish and Norwegian.