

Louise Dyregaard Nielsen

Geneva Observatory
Ch. des Maillettes 51
1290 Versoix, Switzerland

Phone: +41 (0)22 379 24 04

E-mail: Louise.Nielsen at unige.ch

Born 1988 in Denmark

Website: <https://louisedyregaard.github.io/>

PhD student at Geneva Observatory

Density of exoplanets, supervisor: Prof. François Bouchy. Working on mass characterisation of transiting exoplanets through radial velocity observations with the high resolution spectrographs CORALIE on the Swiss 1.2m telescope and HARPS on the 3.6m ESO at La Silla Observatory, Chile. Special focus on Sub-saturn planets with radii between that of Neptune and Saturn to address open questions on giant planet formation.

Education

- 2017 Feb - present - PhD student, Geneva Observatory at Geneva university, Switzerland. Thesis: *Density of Exoplanets*. Supervisor: prof. François Bouchy. Defence scheduled in January 2021.
- 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.

Employment history

- 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.
- 2013 Aug - 2014 Mar - Research assistant at the Detector Group, University of Copenhagen, Denmark. Testing and characterizing CCDs and overall camera performance for astronomical use.
- 2010 Apr - 2014 Jun - Laboratory instructor and teaching assistant at The University of Copenhagen. Taught Classical Mechanics and Electrodynamics.
- 2010 Sep - 2014 Mar - Instructor and coordinator at the Physics Youth Laboratory at The University of Copenhagen, Denmark. Supervisor: Prof. Ian Bearden
- 2011 Sep - 2012 Jun - Physics and maths teacher at Niels Steensens Gymnasium, Denmark. Part time teaching the equivalent to year 10-12.

Approved research projects

I have successfully lead and participated in several observations programmes, mainly through the European Southern Observatories, ESO:

As principle investigator

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

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

- ★ 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

Supervised students working on independent research projects at Geneva University:

- ★ *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.
- ★ *Mohamed Chehik*
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

- ★ Co-creator and host of the Danish-speaking podcast *Stjerneklart* about astronomy and space exploration. 33 episodes: <https://stjerneklart.dk/>
- ★ 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 06/2014.

Community services & Collaborations

- ★ 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 - present.
- ★ Member of the NIRPS science team, contributing to the exposure time calculator, commissioning and target selection, 2017 - present.
- ★ Member of the NGTS consortium, coordinating radial velocity follow up of NGTS planet candidates, vetting and target selection, 2017 - present.

Conference organisation

- ★ Moderator for the Exoplanets III online conference, 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.