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Nationality - Canadian

Date of Birth - 11.20.1995

Sex - Male

Evert Nasedkin, PhD

Curriculum Vitae

Research Interests

I study the atmospheres of exoplanets and brown dwarfs using high-contrast instrumentation, near-infrared spectroscopy, and interferometry. I am particularly interested in leveraging my expertise in both data analysis and modelling to interpret the variability and weather patterns on distant worlds.

Research Experience

Current **Postdoctoral Researcher**, Trinity College Dublin, Dublin, IR.

- Implemented open-source, GPU accelerated framework for performing time-resolved atmospheric retrievals.
- Awarded 8.2 hours observing time with the James Webb Space Telescope.
- Awarded 2500 node-hours of compute time (CPU+GPU) to evaluate the performance of `petitRADTRANS` retrievals on the Meluxina cluster.
- Produced one first author and 15 co-author publications.
- Presented findings at 3 premier international conferences, and multiple invited talks.
- Refereed publications for Nature Astronomy, The Astrophysical Journal and the Journal of Open Source Software.
- Member of the scientific organising committee for a Symposium at the European Astronomical Society meeting.
- Taught undergraduate computational lab course for using Python for scientific computing.
- Mentored two bachelor's student projects for the modelling and analysis of exoplanetary spectra.

2020-2024 **IMPRS PhD Fellow**, Max Planck Institute for Astronomy, Heidelberg, DE.

- Pioneered a novel Bayesian atmospheric retrieval framework within the open-source `petitRADTRANS` package, applying Bayesian methods to fit atmospheric models to spectroscopic data.
- Analysed high-contrast spectroscopic imaging datasets using python-based image processing tools.
- Published 3 first-author papers, presented results at 11 international conferences.
- Organised multiple workshops and seminars with an international audience.
- Served as PhD student representative, led efforts to improve onboarding processes.
- Mentored a 6 month bachelor's student project.

09-12 2019 **Semester Project**, Institute for Astronomy, ETH Zürich, Zürich, CH.

- Processed and visualised 3D hydrodynamic simulations of planet formation.

05-08 2017 **Research Assistant**, Institute for Astronomy, ETH Zürich, Zürich, CH.

- Designed and performed mechanical tests at cryogenic conditions for astronomical instrumentation.

08-12 2016 **Research Assistant**, nEXO Collaboration, McGill University, Montreal, QC.

- Simulated and assembled test source for the nEXO neutrino experiment.

2015-2016 **Research Assistant**, DEAP-3600 Dark Matter Search, SNOLAB, Sudbury, ON.

- Implemented and automated analyses for characterising detector behaviour.

Education

- 2020–2024 **Dr. Rer. Nat, Astronomy**, University of Heidelberg, Heidelberg, DE,
IMPRS-HD, Max Planck Institute for Astronomy, Heidelberg, DE.
Thesis: "Atmospheric Characterisation of Directly Imaged Exoplanets".
Supervisors: Paul Mollière & Laura Kreidberg.
Grade: Magna cum laude
- 2018–2020 **MSc, Physics**, ETH Zürich, Zürich, CH.
Master's Thesis: "Sub-Stellar Atmospheres in the Mid-Infrared".
Supervisors: Polychronis Patapis & Sascha Quanz.
- 2013–2018 **BSc, Honours Co-operative Physics**, University of Waterloo, Waterloo, ON.
Specialisation in Astrophysics
Bachelor's Thesis: "Characterising Filamentary Structure in Planck Galactic Cold Clumps with the SCOPE dataset".
Supervisor: Michel Fich.
- 2010–2013 **International Baccalaureate Diploma**, Grande Prairie Composite High School.

Publications

4 first author & 37 co-author publications, 1345 total citations. H-index = 17.
Full publication list attached, or available at:
<https://ui.adsabs.harvard.edu/user/libraries/5HVUIKfsS6W0PIX80jxe3A>

Conferences, Talks & Seminars

- 08.10.2025 **51 Pegasi b** *Observatoire de Haute-Provence, FR.*
Contributed talk: The JWST Weather Report from SIMP-0136: Temperature changes, auroral heating and constant cloud coverage measured using time-resolved atmospheric retrievals.
- 09.09.2025 **Exocoffee MPIA, Heidelberg, DE.**
Invited talk: The JWST Weather Report from SIMP-0136: Temperature changes, auroral heating and constant cloud coverage measured using time-resolved atmospheric retrievals.
- 07.07.2025 **ExoClimes VII Montreal, CA.**
Poster: The Weather Report for SIMP-0136.
- 27.06.2025 **26th Meeting of the European Astronomical Society Cork, IE.**
Contributed talk: The Weather on SIMP-0136.
- 30.02.2025 **Königstuhl Colloquium Heidelberg, DE.**
Invited Colloquium: Characterising Directly-Imaged Extrasolar Atmospheres.
- 30.08.2024 **Irish National Astronomer's Meeting Galway, IE.**
Contributed talk: Characterisation of directly imaged exoplanets and brown dwarfs.
- 24.08.2024 **Dublin-Belfast Exoplanet Meeting Belfast, IE.**
Contributed talk: Atmospheric characterisation of the directly imaged exoplanets with VLTI/GRAVITY.
- 06.07.2024 **The Great Link Heidelberg, DE.**
Contributed talk: Four-of-a-kind? Atmospheric characterisation of the HR8799 planets with VLTI/GRAVITY.
- 28.06.2024 **Towards km baseline interferometry Ringberg, DE.**
Contributed talk: Characterising exoplanet atmospheres with VLTI/GRAVITY.
- 20.06.2024 **Exoplanets V Leiden, NL.**
Contributed talk: Four-of-a-Kind? Using VLTI/GRAVITY to observe the atmospheres of HR 8799 bcde.
- 30.04.2024 **Exocoffee MPIA, Heidelberg, DE.**
Invited talk: Four-of-a-kind? Comprehensive atmospheric characterisation of the

- HR 8799 planets with VLT/IRISA.
- 12.04.2024 **Direct Imaging & Characterization of Exoplanets in the ELT Era** *Tucson, USA.*
Contributed talk: Direct Emission Spectroscopy of Young, Giant Exoplanets.
- 17.10.2023 **Exocoffee** *MPIA, Heidelberg, DE.*
Invited talk: Impacts of high-contrast image processing on atmospheric retrievals.
- 30.06.2023 **ExoClimes** *Exeter, UK.*
Poster: C/O? More like C/No! Why retrievals don't solve everything.
- 08.02.2023 **ESO Thirty-Minute-Talk.** *ESO Santiago, CL.*
Invited talk: So you found an exoplanet, now what are you going to do with it?
- 09.11.2022 **The First Six Months of Exoplanet Atmospheres with JWST.** *Ringberg Workshop, DE.*
Contributed talk: The Mid-Infrared Opportunity: Direct Imaging Spectroscopy with MIRI/MRS.
- 06.07.2022 **Hands-on Numerical Astrophysics School for Exoplanetary Sciences** *Hanau, DE*
Lecture: Exoplanetary atmosphere modelling and transit spectroscopic retrievals.
- 01.07.2022 **Spirit of Lyot.** *Leiden, NL.*
Invited talk: Four of a Kind: A Systematic Characterization of the HR8799 planets.
- 22.04.2022 **CHIANTI TOPICS: 5th International Focus Workshop.** *Florence, IT.*
Contributed talk: Four-of-a-kind: Exploring the atmospheres of the HR8799 system with GRAVITY.
- 13.09.2021 **European Planetary Science Conference.** *Virtual*
Contributed talk: Four-of-a-Kind: HR8799 - Exploring the atmospheres of the HR8799 system with VLT/IRISA.
- 23.08.2021 **Atmospheres, Atmospheres! Do I look like I care about atmospheres?** *Virtual*
Invited Lecture: How to use petitRADTRANS.
Contributed talk: Four-of-a-Kind: HR8799 - Exploring the atmospheres of the HR8799 system with VLT/IRISA.
- 10.05.2021 **IMPRS-HD Research Seminar** *Virtual*
Contributed talk: The GRAVITY of Massive Planets.
- 11.02.2020 **Tackling the Complexities of Substellar Objects: From Brown Dwarfs to Exoplanets** *Lorentz Center Workshop, Leiden, NL*
Poster: An atmospheric retrieval study using simulated MIRI MRS observations.

Schools and Workshops

- 06 2023 **ExoSLAM Summer School: Introduction to Earth Atmospheric Physics**
Exeter, UK.
- 07 2021 **Sagan Workshop: Circumstellar Disks and Young Planets**
Virtual, Caltech, Ca.
Assisted Young Planet Spectroscopy Hands on Session.
- 09 2020 **IMPRS Summer School: Planet Formation in Protoplanetary Disks**
Heidelberg, DE.
- 01 2020 **Deep Learning Meets (Astro)physics**
ETH Zürich, Zürich, CH.
- 06 2017 **5th EIROForum School on Instrumentation**
Hamburg, DE.

Press Releases

- 09 2025 Northern Lights feature in today's weather report... from a rogue planet.
- 06 2025 Silicate clouds discovered in atmosphere of distant exoplanet.

Observing Experience

Accepted

- JWST GO # 7268 *Easing the Tension: Near-Infrared Spectroscopy of HR 8799 b,c,d,e*
PI: Evert Nasedkin
JWST/NIRSpec PRISM
8.2 hours, Data to be taken December 2025.
- JWST GO # 6463 *Testing a new formation tracer for cold gas giant planets with JWST/MIRI.*
Col, PI: Polychronis Patapis
JWST/MIRI MRS
Assisting with retrieval analysis.
- JWST GO # 5765 *Two for the price of one: complete spectroscopy from 0.7 to 23 micron of the benchmark brown dwarfs Eps Ind BA and BB.*
Col, PI: Elisabeth Matthews
JWST/NIRSpec, JWST/MIRI.
Data not yet taken.
- JWST GO # 4829 *A spectroscopic exploration of a directly imaged multiplanet system in the mid infrared*
Co-I, PI Anthony Boccaletti
JWST/MIRI MRS
Mid Infrared spectroscopy of the HR 8799 system
Data not yet taken.
- JWST GO # 3375 *Dancing 1 – 14 micron spectra to solve the cloudy and chemical puzzle of brown dwarf variability.*
Col, PI: Niall Whiteford.
JWST/NIRSpec, JWST/MIRI
22 hour, broad wavelength variability study of VHS 1256 b.
Assisting with retrieval analysis.
- JWST GO # 3514 *Panchromatic view of an Adolescent and Frigid Jovian Exoplanet.*
Col, PI: Mickaël Bonnefoy.
JWST/NIRSpec, JWST/MIRI
9 hours to search for DHO in a cool, directly-imaged atmosphere, data recently taken.
- JWST GO # 3647 *GJ504 b is really cool: a new atmospheric window into Jupiter's evolution with JWST/MIRI.*
Col, PI: Polychronis Patapis.
JWST/NIRSpec, JWST/MIRI 22 hour mid-infrared study of the coldest directly imaged exoplanet.
Assisting with retrieval analysis.
- ESO VM 110.23RW *ESO SupJup Survey*
Col, PI: Ignas Snellen.
VLT/CRIRES+
Observed in visitor mode 6 nights out of 14 awarded.
- ESO *ExoGRAVITY Large Program*
Col, PI: Sylvestre Lacour, > 90 team members.
VLT/GRAVITY
Lead data analysis of HR 8799 atmospheric characterisation.
- JWST ERS # 1366 *JWST Transiting ERS Program*
Col, PI: Jacob Bean, >300 team members
JWST/NIRSpec, JWST/MIRI
Contributed significantly to model intercomparison study.

Computing & Technical Skills

Projects

petitRADTRANS

Wrote the module to perform atmospheric retrievals on directly imaged and transiting exoplanets. Codeveloper of pRT.

<https://gitlab.com/mauricemolli/petitRADTRANS>

Data reduction for IFUs

Developed post-processing pipelines to streamline the spectral extraction of high-contrast IFU data using a range of state-of-art PSF subtraction algorithms.

https://github.com/nenasedk/HCI_IFU_Analysis

PACO

Contributed a python implementation of the PATCH COvariance (PACO) PSF subtraction algorithm to the open-source VIP-HCI package.

<https://github.com/vortex-exoplanet/VIP>

Technologies

- Python** Expert – Open source design and development, extensive use of statistical and machine learning packages (numpy, JAX, pytorch, scikit-learn, pandas).
- Fortran** Intermediate – Contributed to pRT radiative transfer backend.
- C++** Intermediate – Automated analysis for DEAP-3600 detector characterisation.
- HPC** Extensive experience using the SLURM based clusters VERA (110 nodes, 72 CPUs/node) owned by MPIA and VIPER (768 nodes, 128 CPUs/node) owned by MPG.
- Tools** Use of Linux, Mac, and Windows operating systems, together with bash scripting and command line interface.
- git** Usage of git for version control, automated testing and package release through PyPI.

Teaching and Supervision

- 09-11 2025 **Supervision of fourth year capstone project**, *Trinity College Dublin*, Dublin, IE.
Supervising Dylan Colley, who is applying the BREADS high-contrast imaging pipeline to JWST NIRSpec/G235H IFU data in preparation for JWST GO 7628.
- 05-07 2025 **Supervision of SURE Summer intern**, *Trinity College Dublin*, Dublin, IE.
Supervised Quentin Carde, who calculated high-resolution correlated-k opacity tables.
- 01-04 2025 **Computational Physics Lab Instructor**, *Trinity College Dublin*, Dublin, IE.
Led a section of the second-year Computational Physics lab, teaching introductory python to physics students.
- 04-12 2022 **Supervision of Bachelor's Miniprojekt**, *MPIA*, Heidelberg, DE.
Supervised Neel Nagarajan in implementing PACO-ASDI algorithm.
- 2022-23 **Astro-lab Tutor**, *University of Heidelberg*, Heidelberg, DE.
- 07 2022 **Lecture**, *Hands-on Numerical Astrophysics School for Exoplanetary Sciences*, Hanau, DE.
Exoplanetary atmosphere models and transit spectroscopic retrieval.
- 2019 **Private Tutor**, Zürich, CH.
- 2017-18 **Teaching Assistant**, *PHYS 111*, Waterloo, ON.
- 01-04 2015 **English Second Language Teacher**, *TOBB University of Economics and Technology*, Ankara, TR.

Scientific community work

2025	Referee	Nature Astronomy
2025	Referee	The Astrophysical Journal
2024-	Referee	The Journal of Open Source Software
06 2025	SOC	EAS 2025, Symposium 14
07 2024	LOC	The Great Link, APEx Conference
11 2023	LOC	petitRADTRANS Workshop
11 2023	LOC	ExoGRAVITY Workshop
10 2023	Outreach	MPIA Open House
02 2023	Outreach	OUTer Space
2020-	Member	Astronomers for Planet Earth
2020-23	Member	MPIA Sustainability Committee
2020-23	Organiser	MPIA Exocoffee Seminar
2021-23	Student Representative	MPIA
2020-2024	Student Representative	16th IMPRS Generation

Languages

English	Native speaker
Spanish	A2
German	A2

Personal Interests

Outdoor Sports: Cycling, Skiing, Mountaineering, Climbing, Triathlon
Art: Photography, Music.