

# Curriculum Vitae – Ylva Götberg

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My name is Ylva Götberg and I am a stellar astrophysicist currently working as a NASA Hubble postdoctoral fellow at Carnegie Observatories in Pasadena, USA. My expertise is the physics of interacting massive binary stars and their impact on the surroundings. I conduct a combination of theoretical, computational and observational work.

## ACADEMIC BACKGROUND, DEGREES & EDUCATION

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2020–present	NASA Hubble Postdoctoral Fellow, Carnegie Observatories, Pasadena, USA.
2019–2020	Alvin E. Nashman postdoctoral fellow in Theoretical Astrophysics, Carnegie Observatories, Pasadena, USA.
2014–2019	PhD studies in Astrophysics, University of Amsterdam, The Netherlands. PhD degree obtained 7th of February 2019 with PhD thesis entitled “The properties and impact of stars stripped in binaries”. <i>Supervisor:</i> Dr. S.E. de Mink. [PhD thesis]
2012–2014	MSc studies in Astrophysics, Lund Observatory, Sweden. MSc degree obtained 28th of April 2014 with MSc thesis entitled “What Gaia can reveal about the matter distribution in the Milky Way”. <i>Supervisors:</i> Prof. L. Lindgren and Dr. D. Hobbs. [MSc thesis]
2013–2014	Summer student research position, Lund Observatory, Sweden. Dynamics of the wide-orbit planetary system HR 8799 leading to publication in <i>A&amp;A</i> . <i>Supervisors:</i> Prof. M. B. Davies & Prof. A. Johansen
2011–2012	MSc studies in Astronomy & Astrophysics, Institut de Planétologie et d’Astrophysique de Grenoble, Université Joseph Fourier, France. MSc thesis entitled “CH <sub>3</sub> CN, its isotopologues and isomers in the solar-type protostar IRAS 16293-2422”. <i>Supervisors:</i> Prof. C. Ceccarelli and Prof. C. Kahane.
2008–2014	Engineering Physics, Faculty of Engineering, Lund University, Sweden. Specialization in atomic and sub-atomic physics. MSc degree obtained 28th of April 2014.

## PUBLICATIONS (see attached publication list)

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H-index: 21

Total citations: 1,365

Journal publications: 6 published first author (2 accepted), 25 Nth author

Other publications: 3 white papers

[[Link to ADS](#)]

## AWARDS & GRANTS

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Since 2019, I have been granted a total of ~ \$775,000.

- Chandra X-ray Observatory, “Confirmation of the First Helium Star Stripped by a Black Hole” (CXC 24400430, 50ks, Cycle 24), 2022, PI: Ludwig, cost-PI: Götberg (**\$ 25,029**)
- HST/COS, “Characterizing four massive post-interaction binaries with HST/COS” (GO-17123, 9 orbits, Cycle 30), 2022, PI & cost-PI: Götberg (**\$ 139,474**).
- The 2022 Thacher Award for outstanding postdoctoral research, the Telescope Allocation Committee and Director of Carnegie Observatories (**\$ 5,000**).

- HST/COS, “From Supernova Progenitors to Ionizing Radiation - HST/COS Spectroscopy of Stripped Helium Stars” (GO-16755, 17 orbits, Cycle 29), 2021, PI: Drout, cost-PI: Göteborg (\$ **124,210**).
- Chandra X-ray Observatory, “Confirmation of the First Helium Star Stripped by a Black Hole” (CXC 23400459, 50ks, Cycle 23), 2021, PI: Ludwig, cost-PI: Göteborg (\$ **25,488**).
- NASA Hubble Fellowship, “Finding and characterizing the missing stars stripped in binaries – from gravitational wave events to the high redshift Universe” (\$ **233,759**).
- Carnegie-Canada grant for collaborations with Canadian institutions, 2019 (\$ **16,500**).
- The Alvin E. Nashman fellowship for Theoretical Astrophysics, Carnegie Observatories (\$ **207,000**).

## SELECTED INVITED PRESENTATIONS

26 invited colloquia/seminars, 9 invited review talks.

June 2023	Invited talk, Conference: <i>The Wolf-Rayet phenomenon in the Universe</i> , Morelia, Mexico.
April 2023	Colloquium, Flatiron CCA, New York City, USA.
April 2023	Colloquium, UCLA, Los Angeles, USA.
March 2023	Invited talk, UVEX workshop at Caltech, Pasadena, USA.
February 2023	Colloquium, Radboud University, Nijmegen, The Netherlands.
February 2023	Colloquium, University of Wisconsin Madison, USA.
November 2022	Invited talk, Conference: <i>The Impact of Binaries on Stellar Evolution</i> , MIAPbP, Garching, Germany.
September 2022	Colloquium, Boston University, USA.
June 2022	Seminar, IAU working group on active B-stars.
May 2022	Seminar, University of Sheffield, UK.
April 2022	Invited talk, Workshop: <i>Bringing stellar evolution and feedback together</i> , Lorentz center, Leiden, The Netherlands.
March 2022	Seminar, American Museum of National History, New York, USA.
February 2022	Colloquium, University of Michigan, Ann Arbor, USA.
December 2021	Colloquium, University of Washington, Seattle, USA.
November 2021	Seminar, University of Auckland, Auckland, New Zealand.
November 2021	Review: “Recent observational advances in our understanding of interior transport in stars”, Conference: <i>Transport in Stars</i> , KITP, Santa Barbara, USA.
September 2021	Colloquium, Caltech, Pasadena, USA.
September 2021	Colloquium, Steward Observatory, Tucson, USA.
July 2021	Review: “Recent Advances in Formation of Stellar-mass Black Holes”, Conference: <i>EAS</i>
June 2021	Seminar, Texas Tech University, Lubbock, USA.
May 2021	Seminar, IA-UNAM, Mexico City, Mexico.
April 2021	Colloquium, UC Berkeley, San Francisco, USA.
April 2021	Seminar, University of Jerusalem, Israel.
March 2021	Seminar, Leuven, Belgium.
March 2021	Review: “Multiplicity”, <i>Bringing Stellar Evolution and Feedback Together</i> , Lorentz center, Leiden, The Netherlands.
October 2020	Colloquium, University of Delaware, USA.
September 2020	Seminar, Queen Mary University of London, UK.
September 2020	Seminar, Perimeter Institute, Canada.
August 2020	Seminar, UFRGS, Porto Alegre, Brazil.
June 2020	Seminar, National Research Council of Canada’s Herzberg Astronomy and Astrophysics Research Centre, Canada.
June 2020	Review: “Advances in our understanding of massive stars – nearby and at high redshift”, <i>EAS</i> .

- November 2019 Review: “Advances in our understanding of massive stars and how that affects the spectra of stellar populations”, Conference: *The art of measuring galaxy physical properties*, Milan, Italy.
- September 2019 Stars and Planets symposium, Harvard University, Cambridge, USA.
- June 2019 Review: “Evolution of Massive Binaries”, Conference: *Merging Visions: Exploring Compact-Object Binaries with Gravity and Light*, KITP, Santa Barbara, USA.
- December 2018 Colloquium, Stockholm University, Stockholm, Sweden.
- September 2018 Colloquium, Radboud University, Nijmegen, The Netherlands.
- September 2018 Review: “Massive Stripped Stars”, Conference: *Hydrogen-deficient Stars*, Armagh, Northern Ireland, UK.
- September 2017 Colloquium, Lund Observatory, Lund, Sweden.

## SUCCESSFUL PROPOSALS

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### Magellan Telescopes, Las Campanas Observatory, Chile

I have two larger observing programs ongoing on the Magellan Baade 6.5 meter telescope:

- “Unveiling the sources of He<sup>+</sup> ionizing photons in metal-poor star-forming environments”, Magellan/IMACS f/4, 2022A, 2022B, 2023A, 2023B (22 nights) **PI: Göteborg** & Senchyna. Two new narrow-band filters were manufactured for this survey.
- “The First Systematic Survey of Stars Stripped in Binaries”, Magellan/MagE, 2019B, 2020A, 2020B, 2021A, 2021B, 2022A, 2022B, 2023A, 2023B (28 nights) **PI: Göteborg** & Drout.

### Hubble Space Telescope

My main research done with HST is part of the UV initiative and focuses on ultraviolet spectroscopical studies of stars.

- HST/COS, “Characterizing four massive post-interaction binaries with HST/COS” (GO-17123, 9 orbits, Cycle 30), **PI: Göteborg**.
- HST/ACS, HST/WFC3, “Hot stars in the stellar evolution laboratory IZw18” (GO-17129, 28 orbits, Cycle 30), PI: Östlin.
- HST/COS, “Does MWC 656 host a black hole or stripped helium star? FUV spectroscopy will tell.” (GO-17202, 3 orbits, Cycle 30), PI: El-Badry.
- HST/COS, “From Supernova Progenitors to Ionizing Radiation - HST/COS Spectroscopy of Stripped Helium Stars” (GO-16755, 17 orbits, Cycle 29), PI: Drout.
- HST/COS, “UV spectroscopy of He stars: the elusive stripped-envelope supernova progenitors” (GO-15824, 10 orbits, Cycle 27), PI: Smith.
- HST/STIS, “The Missing Link in Massive Binary Star Evolution” (GO-15659, 39 orbits, Cycle 26), PI: Gies.
- HST/STIS, “Dwarfs and Giants: Massive Stars in Little Dwarf Galaxies” (GO-15093, 18 orbits, Cycle 25), PI: Andrews.

### Chandra X-ray Observatory

We search for compact companions and new types of X-ray binaries with Chandra:

- Chandra X-ray Observatory, “Confirmation of the First Helium Star Stripped by a Black Hole” (CXC 24400430, 50ks, Cycle 24), PI: Ludwig.
- Chandra X-ray Observatory, “Confirmation of the First Helium Star Stripped by a Black Hole” (CXC 23400459, 50ks, Cycle 23), PI: Ludwig.

### Other telescopes

- NTT/Ultracam, “Asteroseismology of massive stars stripped in binaries: a first glance inside evolved massive stars” (110.D-4269/110.24BW, 2 nights), PI: Johnston.
- Gemini, “Jumping Off the Upper-End: Constraining the mass-loss rates of the most massive stars in the universe with infrared spectroscopy” (GS-202B-Q-223, 13.4h), PI: Chisholm.
- VLT/XSHOOTER, “HOTFUSS – Hottest Faint Underluminous Stars Survey” (25.3h), PI: Geier.

- VLT/FLAMES, “Uncovering the fate of the Tarantula’s B-type binaries” (31h, Period 96A), PI: Taylor.

## SUPERVISION

Bachelor students:

- B. Hovis-Afflerbach (Caltech, 2020-current). Poster prize, Carnegie Astrophysics Summer Student Internship (CASSI) program. **Primary supervisor**. Beryl is moving to Northwestern CIERA to start as a graduate student in the fall 2023.
- A. Carpenter (UCLA, 2021-current). Poster prize, Carnegie Astrophysics Summer Student Internship (CASSI) program. **Primary supervisor**
- A. Roc (Pomona College, 2022-current). Poster prize, Carnegie Astrophysics Summer Student Internship (CASSI) program. **Primary supervisor**
- M. Briel (University of Amsterdam, 2016).
- T. Dodds (University of Amsterdam, 2016).

Master students:

- W. van Rossem (University of Amsterdam, 2016-2017).

PhD students:

- Kavli Summer Program in Astrophysics, Garching, Germany, summer 2023.
- B. Ludwig (University of Toronto, 2022-current).
- E. Laplace (University of Amsterdam, 2017-2021).

## TEACHING EXPERIENCE

- Lecturer for the summer school of the MESA stellar evolution code, 2021. Included lab development, lecture design, lecturing and TA.
- Lecture on massive binary interaction, Carnegie Astrophysics Summer Student Internship (CASSI) program for Bachelor students, 2020 & 2021, Pasadena, USA. [Course material]
- Guest lecture on radiative transfer modeling, MSc course on Computational Astrophysics, 2018, University of Amsterdam, The Netherlands.
- TA, Python introduction course 2020, 2021 (Carnegie Astrophysics Summer Student Internship program, Pasadena, USA).
- TA, MESA summer school 2017 (KITP, Santa Barbara, USA). Lab development included.
- TA, Stellar atmospheres and radiative transfer 2016 (Master’s course, University of Amsterdam, The Netherlands).
- TA, Stellar evolution and structure 2015, 2016 (Master’s course, University of Amsterdam, The Netherlands).

## SERVICE

**ULLYSES**, point of contact for working group 10 on the search for stripped stars. [ULLYSES website].

**Committee member** for the early-career scientist talks at the Carnegie Observatories. Includes reviewing nominations, selecting, inviting and hosting speakers.

**UVEX**, part of the “static science” team for the proposed NASA/MIDEX mission UVEX, recently selected for further study: [Press release] [Website].

**Organization** for the conferences/meetings: 3,2,1 Massive Triples, Binaries and Mergers (held in Leuven, Belgium, July 2023), the NASA Hubble Fellowship symposium (2020), and the Dutch Star Cluster meeting II (2017).

**Reviewer** for selection of grants to fund Graduate Student Research (anonymized name of the fund), 2021, 2023.

**Reviewer** for scientific articles submitted to ApJ, A&A, and MNRAS.

OUTREACH

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Public talks: Astronomy on Tap (Pasadena, 2022), Pint of Science (Amsterdam, 2018), Astronomy on Tap (Leiden, 2017), Astronomy on Tap (Santa Barbara, 2017), Public Symposium of IAU Symposium 329 (Auckland, 2016).

Interaction with seniors: Guest lecturer, “Cosmic Cocktail Hour with Carnegie Observatories”, Pasadena Senior Center, October 2021, Pasadena, USA.

Guest lecturer:

“Carnegie Astronomy Lectures”, Huntington gardens, May 2021, Pasadena, USA.

“Carnegie Observatories Lecture at Pasadena City College”, targeted for inspiring STEM studies, Pasadena City College, Pasadena, USA.

Interaction with children: Contribution to the space week at the kindergarten “Colegio María Montessori-Centro de educación preescolar en la Ciudad de México”, Mexico City, Mexico. Aimed for 3-5 year old children.