

# Eva Laplace | Astrophysicist

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## Education and degrees

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<b>PhD candidate in astrophysics</b> Anton Pannekoek Institute (API), University of Amsterdam	<b>Amsterdam, The Netherlands (NL)</b> Nov. 2017 – Nov. 2021 (exp.)
<b>Master student in physics (achieved the max. grade of 1.0)</b> University of Tübingen, <i>Degree: Master of Science</i>	<b>Tübingen, Germany</b> Jan. 2016 – Apr. 2017
<b>Bachelor student in physics (av. grade: 1.8)</b> University of Tübingen, <i>Degree: Bachelor of Science</i>	<b>Tübingen, Germany</b> Oct. 2011 – Dec. 2015
<b>International high school student</b> Lycée International des Pontonniers <i>Degrees: Baccaauréat (French diploma) and Abitur (German diploma)</i>	<b>Strasbourg, France</b> 2008–2011

## Research Experience

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<b>PhD research project at the Anton Pannekoek Institute</b> <i>Advisors: Prof. Selma de Mink, Prof. Stephen Justham</i> Subject: Lives, deaths, and afterlives of binary-stripped stars	<b>Amsterdam, NL</b> Nov. 2017 – present
<b>Invited research visit, National Astronomical Observatory of Japan</b> <i>Advisor: Prof. Takashi Moriya</i> Subject: Bayesian inference of stripped-envelope supernovae light-curves	<b>Tokyo, Japan</b> 2 months, Sept. – Oct. 2019
<b>International Program Associate in the MAXI team lab at RIKEN</b> <i>Advisors: Prof. Andrea Santangelo, Dr. Tatehiro Mihara</i> Subject: Spectral and timing properties of the Be X-ray binary EXO 2030+375	<b>Wako, Japan</b> 9 months, Jan.– Oct. 2016
<b>Traineeship at the European Space Astronomy Centre</b> <i>Advisors: Dr. Peter Kretschmar, Emilio Salazar</i> Subject: Long-term timing variability of Be X-ray binaries.	<b>Madrid, Spain</b> 3 months, Aug. – Nov. 2015
<b>Traineeship at the European Space Astronomy Centre</b> <i>Advisors: Dr. Peter Kretschmar, Emilio Salazar, Miguel Arregui</i> Subject: Developing <b>The BeXRB monitor</b> , a web-based tool for astronomical discovery	<b>Madrid, Spain</b> 3 months, July – Oct. 2014
<b>Student assistant at the Astronomy &amp; Astrophysics Institute</b> <i>Advisor: Dr. Dmitry Klochkov</i> Study of hardness-luminosity dependence in transient accreting X-ray pulsars	<b>Tübingen, Germany</b> 2 years, Oct. 2013 – Jul. 2015

## Grants, awards, and scholarships

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**Outreach award (5000 Euro)** of the Royal Holland Society of Sciences and Humanities, through the de Zeeuw-van Dishoeck fund, for developing the TULIPS software to visualize the evolution of stars, 2020

**Total of > 4000 Euro awarded for conferences and international research visits** by the Leids Kerkhoven-Bosscha Fonds, the Space Telescope Science Institute, Baltimore, USA, and the Yukawa Institute in Kyoto, Japan, 2018 – present

**Computing time on National Supercomputer Cartesius, of 500 000 CPU hours**, PI: E. Laplace "Stripped-envelope supernovae from massive binaries", Amsterdam, NL, 2018

**Short-term International Program Associate scholarship at RIKEN.** Funded the majority of a nine months research visit at RIKEN, Japan, 2016

## Teaching and advising experience

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**Advisor** of Thomas Dodds, Bachelor student, at API, NL with Prof. Selma de Mink, 2018 (continued in the MSc program in Leiden, NL)

**Co-advisor** of Carla Alejandra Calle García, summer student through the ASPIRE program for student of challenged socio-economic background at API, NL, with Dr. Robert Farmer, 2019 (continued in the MSc program in Padova, Italy)

**Teaching assistant for the MSc lecture "Structure and Evolution of Stars"**, University of Amsterdam, NL. (2019-2020 with Prof. Lamers, 2019 with Prof. de Mink, 2018 with Prof. Watts)

**Teaching assistant at the summerschool "Stellar astrophysics with MESA"** in Beijing, China, Summer 2018

**Guest lecturer** in the astrophysics course, Leibniz Kolleg, Tübingen, Germany, 2014

## Scientific talks

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### Invited seminars.....

- Invited talk at monthly seminar, **European Space Astronomy Centre**, Madrid, Spain – Oct. 2020 (online)
- Invited talk at high energy astrophysics seminar, **Hebrew University of Jerusalem**, Israel – Aug. 2020 (online).
- Invited talk at high energy astrophysics lunch seminar, **Center for Astrophysics, Harvard University**, Cambridge, USA – Mar. 2020
- Invited talk at monthly seminar, **RIKEN**, Saitama, Japan – Sep. 2019

### Contributed talks at conferences and international meetings.....

- Talk at conference (postponed): **IAU symposium Massive Stars Near and Far** – Ballyconnell, Ireland (*initially May 2020, awarded talk postponed to May 2021*)
- Talk at the **VFTS collaboration annual meeting** – Oct. 2020 (online).
- Talk at conference: **German astronomical society meeting** – Sep. 2020 (online)
- Talk at conference: Joint **European Astronomical Society meeting** and **Netherlands Astronomy Conference** – Jul. 2020 (online)
- Talk at conference: **14th Bonn neutron star workshop** Bonn, Germany – Feb. 2020
- Talk at conference: **Spring symposium of the Space Telescope Science Institute** *The death and afterlives of stars*, Baltimore, USA– Apr. 2019
- Talk at conference: **Fifty-one ergs conference** University of North Carolina, Raleigh, USA – May 2019
- Talk at conference: **Massive stars and supernovae conference**, Bariloche, Argentina – Nov. 2018
- Talk at the **Bonn-Amsterdam-Leuven massive stars meeting**, Leuven, Belgium – Oct. 2018
- Talk at conference: **Fall meeting of the Astronomical Society of Japan**, Ehime University, Matsuyama, Japan – Sep. 2016

### Further seminars.....

- Invited informal talk in the research group of Prof. Mandel, **Monash University**, Melbourne, Australia – Aug. 2020 (online)
- Talk at API lunch seminar, **University of Amsterdam**, Amsterdam, NL – Apr. 2020 (online)
- Talk at lunch seminar, **National Astronomical Observatory of Japan**, Tokyo, Japan – Sep. 2019
- Talk at galaxy coffee seminar, **MPIA Heidelberg**, Heidelberg, Germany – Aug. 2018
- Talk at monthly astrophysics seminar at **RIKEN**, Saitama, Japan – Mar. 2016
- Talk at Tech Talk seminar, **European Space Astronomy Centre** Madrid, Spain – Aug. 2015
- Talk at High Energy Astrophysics seminar, **University of Tübingen**, Tübingen, Germany – Oct. 2014

## Conferences, workshops, and research visits

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### Research visits.....

- **Invited** two weeks research visit at the **Center for Astrophysics, Harvard University**, Cambridge, USA – Mar. 2020 (host: Prof. de Mink. Originally three weeks, cut short due to pandemic)
- Five days visit of Prof. Yoon at **Seoul National University**, Seoul, South Korea – Oct. 2019
- One week at the **Max Planck Institute for Astrophysics**, Heidelberg, Germany (host: Prof. Modjaz) – Aug. 2018

### Conferences.....

- *Shocking Supernovae*, Stockholm, Sweden (**poster**: Self-consistent full evolutionary binary models of stripped-envelope supernova progenitors) – May 2018
- Netherlands Astronomy Conference, Groningen, NL – May 2018
- *European Week of Astronomy and Space Science 2018*, Liverpool, England – Apr. 2018
- *Impact of binaries on stellar evolution*, ESO Garching, Germany (**poster**: Are long-term periodicities and giant outbursts in BeXRBs driven by Kozai-Lidov oscillations?) – Jul. 2017
- *7 years of MAXI*, RIKEN, Saitama, Japan (**poster**: Long-term periodicities in the Be X-ray binary EXO 2030+375?) – Dec. 2016
- *INTEGRAL: The New High Energy Sky after a Decade of Discoveries*, Rome, Italy – Oct. 2015

### Workshops.....

- Yukawa International workshop *Neutron stars and black holes with gravitational waves* at the Yukawa Institute for Theoretical Physics, Kyoto, Japan (**poster**: The size of stars stripped in massive binaries and its impact on gravitational wave events) – Oct. 2019
- *Triple Evolution and Dynamics Trendy-2*, Lorentz Centre, Leiden, NL – Sep. 2018
- *Transients in New Surveys: the Undiscovered Country*, Lorentz Centre, Leiden, NL – Jul. 2018
- *BlackGEM* in Nijmegen, NL – Mar. 2018
- *11th Bonn workshop on neutron stars*, Bonn, Germany – Dec. 2017

## Leadership skills

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**Founder and main organizer of weekly meetings:** BinCosmos group, API, NL; since 2018

**Chair of the PhD/Postdoc council:** API, NL; 2018 – 2019

**Certified youth leader:** summer camps for youth of challenged background, France and Germany; Summers 2012 – 2017 (French BAFA diploma since 2012)

## Scientific services and other academic activities

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**PhD representative** in the Equity and Inclusion Committee of API, NL, since July 2020

**Referee** for Monthly Notices of the Royal Astronomical Society and Astronomy & Astrophysics since 2019

## Large international collaborations

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**ChETEC:** Chemical Elements as Tracers of the Evolution of the Cosmos; funded by the COST action program of the European Union. Member since 2020

**BlackGEM:** Optical robotic telescope array. Member since 2018

**VFTS collaboration** VLT-FLAMES Tarantula Survey of Massive Stars based on data from ESO/Very Large Telescope. Member since 2017

**MAGNET:** Collaboration for studying accreting X-ray pulsars. Member from 2014 to 2017

## Outreach

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**Leading an outreach project** based on the TULIPS software for making the structure and evolution of stars more accessible at API, NL through the ET Outreach award, Nov. 2020 – present

**Volunteer for public stargazing events** at API, NL, 2017 – present

**Co-organiser of outreach events**, including stargazing events, school visits and "Kinder-Uni" (Children's day) at the IAAT, Tübingen, Germany, 2014 – 2017

## Computing skills

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**Web development:** HTML, CSS, JavaScript, PHP

**Software development:** PYTHON, FORTRAN, C, C++, SCHEME (Racket), QML

**Graphics:** Inkscape, Blender 3D

**Astrophysics codes:** Modules for Experiments in Stellar Astrophysics (MESA), SuperNova Explosion Code (SNEC), Modular Open Source Fitter for Transients (MOSFiT)

## Observational skills

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**X-ray spectral analysis:** Monitor of All-sky X-ray Image (ISS Experiment) / Gas Slit Camera (MAXI/GSC) data, with the XSPEC software

**X-ray timing analysis:** Data from MAXI/GSC, the Neil Gehrels Swift Observatory/Burst Alert Telescope, the Fermi Gamma-Ray Space Telescope/Gamma-ray Burst Monitor, and the Rossi X-ray Timing Explorer/All Sky Monitor

## Languages

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**French:** Bilingual native speaker

**German:** Bilingual native speaker

**English:** Fluent, [Duolingo Test Center, 2015](#)

**Spanish:** Good command

**Dutch:** Good command

**Japanese:** Basic communication skills

## References

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### Prof. Selma de Mink

Max Planck Institute Director

[SEdeMink@MPA-Garching.MPG.de](mailto:SEdeMink@MPA-Garching.MPG.de)

Max Planck Institute for Astrophysics  
Garching (Germany)

### Prof. Stephen Justham

Senior research associate

[S.Justham@uva.nl](mailto:S.Justham@uva.nl)

Anton Pannekoek Institute of Astronomy,  
University of Amsterdam (The Netherlands)

### Prof. Takashi Moriya

Assistant professor in astrophysics

[takashi.moriya@nao.ac.jp](mailto:takashi.moriya@nao.ac.jp)

National Institutes of Natural Sciences  
National Astronomical Observatory of Japan (Japan)

### Prof. Maryam Modjaz

Associate professor in astrophysics

[mmodjaz@gmail.com](mailto:mmodjaz@gmail.com)

Center for Cosmology and Particle Physics  
New York University (USA)

### Dr. Peter Kretschmar

Mission manager of XMM Newton

[peter.kretschmar@esa.int](mailto:peter.kretschmar@esa.int)

European Space Astronomy Centre (Spain)

### Prof. Andrea Santangelo

Head of the high energy astrophysics group

[andrea.santangelo@uni-tuebingen.de](mailto:andrea.santangelo@uni-tuebingen.de)

Institute for Astronomy and Astrophysics  
University of Tübingen (Germany)

## PUBLICATION LIST

### To be submitted shortly and included in my PhD thesis

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[2021]: D. Vartanyan; **E. Laplace**; M. Renzo; Y. Götberg; A. Burrows & S. E. de Mink

*Stripped binary stars as core-collapse supernova progenitors*

– To be submitted to ApJL

[2021]: R. Farmer; **E. Laplace** et al.

*The differences in supernova nucleosynthesis from single and binary-stripped star progenitors*

– To be submitted to ApJL

[2021]: **E. Laplace** et al.

*TULIPS: a Tool for Understanding the Lives, Interiors, and Physics of Stars*

– To be submitted to Astronomy & Computing

### Submitted

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[2021]: **E. Laplace**; S. Justham; M. Renzo; Y. Götberg; R. Farmer; D. Vartanyan & S. E. de Mink

*Different to the core: the pre-supernova structures of massive single and binary-stripped stars*

– Submitted to A&A; [arXiv:2102.05036](https://arxiv.org/abs/2102.05036)

### Refereed publications

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[2020]: L. A. C. van Son; S. E. de Mink; F. S. Broekgaarden; M. Renzo; S. Justham; **E. Laplace**; J. Moran-Fraile; D. D. Hendriks; R. Farmer; [ApJ 897, 100V](#); *Polluting the pair-instability mass gap for binary black holes through super-Eddington accretion in isolated binaries*

[2020]: **E. Laplace**, Y. Götberg, S. de Mink, S. Justham, and R. Farmer; [A&A, 637, A6](#); *The expansion of stripped-envelope stars: Consequences for supernovae and gravitational-wave progenitors*

[2019]: M. Renzo; S. E. de Mink; D. J. Lennon; I. Platais; R. P. van der Marel; **E. Laplace**; J. M. Bestenlehner; C. J. Evans; V. Hénault-Brunet; S. Justham; A. de Koter; N. Langer; F. Najarro; F. R. N. Schneider; J. S. Vink; [MNRASL, 482 \(1\): L102-L106](#); *Space astrometry of the very massive  $\sim 150M_{\odot}$  candidate runaway star VFTS682*

[2017]: **E. Laplace**; T. Mihara; Y. Moritani; M. Nakajima; T. Takagi; K. Makishima; A. Santangelo; [A&A, 597, A124](#); *Possible regular phenomena in EXO 2030+375*

[2015]: K. A. Postnov; M. I. Gornostaev; D. Klochkov; **E. Laplace**; V. V. Lukin; N. I. Shakura; [MNRAS 452 \(2\): 1601-1611](#); *On the dependence of the X-ray continuum variations with luminosity in accreting X-ray pulsars*

### Astronomer's Telegrams

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[2016]: [#10616](#); **E. Laplace**; M. Nakajima; T. Mihara; Y. Moritani; A. Santangelo *MAXI/GSC detection of a brightening of GRO J1008-57*

[2016]: [#9263](#); **E. Laplace**; T. Mihara; T. Takagi; Y. Moritani; M. Nakajima; K. Makishima; A. Santangelo *Orbital phase shift in a new type I outburst of the Be/X-ray binary EXO 2030+375*

[2015]: [#6917](#); P. Kretschmar; E. Salazar; **E. Laplace**; C. A. Wilson-Hodge; R. E. Rothschild; I. Kreykenbohm; M. Kuehnel; T. Mihara and M. Nakajima; *Bright apastron outburst of GRO J1008-57*

[2014]: [#6656](#); M. Kuehnel et al. (with **E. Laplace**) *Swift-XRT spectrum of the first detected double-peaked outburst of GRO J1008-57*