



CAMILLE LANDRI

They/them

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I am a computational astrophysicist interested in binary interactions and stellar winds. I mainly work with 3D hydrodynamics methods to simulate interactions in massive binary stars, such as common envelope evolution, and winds of evolved stars in binaries. I previously worked on the analysis of observations of cataclysmic variables and supernovae. My current focus is on implementing chemistry emulation in hydrodynamics simulations of stellar winds to improve their accuracy and produce synthetic observables. I spend a significant portion of my time teaching and supervising, as well as studying to improve my pedagogical skills.

EDUCATION

Ph.D. in Theoretical Physics, Astronomy and Astrophysics, 2020 - 2024
Charles University, Prague, Czechia

Thesis: Theory and observation of two stars undergoing strong interactions, **Supervisor:** Dr. Ondřej Pejcha

M.Sc. in Physics 2017 - 2019
Uppsala Universitet, Uppsala, Sweden

Thesis: The Peculiar IR Emission of SN2014dt,

Supervisor: Dr. Joel Johansson

B.Sc. in Physics 2014 - 2017
Université Grenoble Alpes, Grenoble, France
Final year at Umeå Universitet, Umeå, Sweden

EMPLOYMENT

Emulating chemistry in 3D hydrodynamical simulations 2024 - present
KU Leuven, Leuven, Belgium

- Post-processing of 3D models of AGB winds with MACE and MAGRITTE to produce synthetic observables
- Coupling of the chemistry emulator MACE with the hydrodynamics code PHANTOM to run 3D hydro-chemical simulations of AGB outflows.

Funded by KU Leuven C1 research grant BRAVE

Theory and observation of two stars undergoing strong interactions October 2020 - 2024
Institute of theoretical physics, Charles University, Prague, Czechia

- Simulation of red supergiant envelope grazed by a compact companion star with the SPH code PHANTOM to investigate the formation of dust and asymmetric winds.

- Analysis of photometric and spectroscopic analysis of a candidate cataclysmic variable showing unusually long outbursts recurring every 3 years.

Advisor: Dr. Ondřej Pejcha, Charles University

Funded by Horizon 2020 ERC Starting Grant Cat-In-hAT and the Charles University Grant Agency project no. 116324

Impact of donor rejuvenation on common envelope evolution July-August 2023
MPA Kavli Summer Program 2023, MPA, Garching, Germany

- Study of the effect of previous mass transfer in a system undergoing common envelope evolution through 3D hydrodynamics simulations run with the AMR grid-based code FLASH4.

Advisors: Prof. Paul Ricker, University of Illinois; Dr. Mathieu Renzo, Flatiron Institute; and Dr. Alejandro Vigna-Gómez, MPA

Funded by the Max Planck Institute for Astrophysics (MPA) and the Kavli Foundation

PUBLICATIONS

Selected out of 8 publications:

- The effect of donor star rejuvenation on common envelope evolution, **Camille Landri**, Paul Ricker, Mathieu Renzo, Shau-Jie Ra, Alejandro Vigna-Gómez, 2025, ApJ, Volume 979, Issue 1, id.57, 15 pp.
- Driving asymmetric red supergiant winds with binary interaction, **Camille Landri**, Ondřej Pejcha, 2024, MNRAS, Volume 531, Issue 3, pp.3391-3405
- OGLE-BLG504.12.201843: A possible extreme dwarf nova, **Camille Landri**, Ondřej Pejcha, Michał Pawlak, Andrzej Udalski, Jose L. Prieto, Manuel Barrientos, Jay Strader and Subo Dong, 2022, MNRAS, Volume 517, Issue 2, pp.2746-2756
- The complex dynamical past and future of double eclipsing binary CzeV343: misaligned orbits and period resonance, Ondřej Pejcha, Pavel Cagaš, **Camille Landri**, Michael M. Fausnaugh, Gisella De Rosa, Jose L. Prieto, Zbyněk Henzl, Milan Pešta, 2022, A&A, Volume 667, id.A53, 29 pp.

SCIENTIFIC CONTRIBUTIONS

CONTRIBUTED TALKS:

- **Why Galaxies care about AGB stars 2025**, ESO, Chile November 2025
3D Hydro-chemical simulations with MACE and Phantom
- **EAS 2025**, Cork, Ireland June 2025
The effect of donor star rejuvenation on common envelope evolution
- **Phantom workshop 2025**, Université Grenoble Alpes, France June 2025
3D Hydro-chemical simulations with MACE and Phantom
- **Atomium Meeting 2025**, Université de Bordeaux, France May 2025
3D Hydro-chemical simulations with MACE and Phantom
- **Symbiotic Stars 2024**, Charles University, Prague, Czechia June 2024
Driving asymmetric red supergiant winds with binary interaction
- **MPA Kavli Summer Program 2023**, Munich, Garching, Germany August 2023
The Effect of Donor Star Rejuvenation on Common Envelope Evolution
- **Week of Doctoral Students**, Charles University, Prague, Czechia June 2021
OGLE-BLG504.12.201843: A possible extreme dwarf nova

INVITED SEMINARS:

- **Phantom workshop 2026**, Sydney, Australia June 2026
Simulating chemistry in astrophysical environments
- **EDUCADO–MWGaiaDN Training School, Astro–AI and Machine Learning**, Ghent, Belgium, March 2026
Improving theoretical models with machine learning
- **KU Leuven** Leuven, Belgium, [available online](#) April 2024
Exploring the evolution of massive stars in binaries with 3D simulations
- **Mazarikova Univerzita** Brno, Czechia April 2024
Stellar interactions and their impact on stellar evolution
- **Max Planck Institute for Astrophysics**, Munich, Germany September 2023
Driving asymmetric winds in RSG with binary interaction
- **Institute of theoretical physics, Charles University**, Prague, Czechia February 2020
The Peculiar IR Emission of SN2014dt

POSTERS:

- **Cool Stars 23**, Tokyo, Japan June 2026
Accounting for previous phases of binary evolution in common envelope simulations
- **360° approach to common envelope evolution**, Barcelona, Spain June 2024
Accounting for previous phases of binary evolution in common envelope simulations

POSTERS (CONTINUED):

- **The Impact of Binaries on Stellar Evolution**, Munich, Germany
OGLE-BLG504.12.201843: A possible extreme dwarf nova

November 2022

DEVELOPMENT:

- **Contributing developer**, PHANTOM, smoothed particle hydrodynamics code
- **Database developer and maintainer**, AGB wind models within the ATOMIUM collaboration

2023 - present

2024 - present

OUTREACH:

- **MACE: Machine-accelerated Chemistry Emulation**,
video tutorials for the DiRAC online learning platform, [accessible here](#)

February 2025

- **Scientific Game Jam**, Grenoble, France

March 2019

48-hour-long contest to design a game explaining a topic of scientific research to the general public. Game designer/co-developer of two games themed around supernovae and tunnel magneto-resistance.

REFEREE:

- **The Astrophysical Journal Letters** (1)
- **Natural Sciences and Engineering Research Council of Canada**, Discovery Grant (1)

SERVICE ROLES:

- **Mental health point of contact**, Institute of Astronomy, KU Leuven
- **Solvay-Torino XVth Workshop on AGB stars 2027**, member of the LOC

COLLABORATIONS:

- **BRAVE**, KU Leuven internal C1 research grant
Binary star physics in the era of electRomagnetic and grAvitational waVe sciEnce
- **ATOMIUM**, ALMA Large Program
ALMA Tracing the Origins of Molecules In dUst-forming oxygen-rich M-type stars
- **SOUL**, KU Leuven Methusalem grant for interdisciplinary research
Stellar evOlution in fUll gLory

2024 - present

2024 - present

2024 - present

TEACHING AND SUPERVISION

TEACHING:

- **Lecturer**, EDUCADO–MWGaiaDN Training School, Astro–AI and Machine Learning, UGent, BE *March 2026*
- **Lecturer**, Binary Stars, KU Leuven, BE *Autumn term 2025*
- **Teaching assistant and lecturer**, Stellar Atmosphere and Stellar Winds, KU Leuven, BE *Spring term 2025*
- **Teaching within doctoral program**, Stellar Evolution, Charles University, CZ *2021-2022*

TRAINING:

- **Teaching at KU Leuven**, training in teaching and pedagogy for professors at KUL *March - December 2026*
- **Mental health in academia**, training for supervisors at KUL, KU Leuven, BE *Spring 2026*

MASTER THESIS:

- **Bart Devogel**, Master of Astrophysics, KU Leuven, Belgium *2026-2027*
Astrochemistry with machine learning: Upgrading MACE, a chemistry emulator for AGB outflows
- **Agung Prawira**, Master of Astrophysics, KU Leuven, Belgium *2026-2027*
From hydrodynamics models to synthetic observables: Using chemistry and radiative transfer to create images of AGB stars

BACHELOR THESIS:

- **Elise Callens**, Bachelor of Physics, KU Leuven, Belgium

Spring 2026

Training a chemistry emulator on Oxygen-rich AGB outflows

- **Kaat Lauwers**, Bachelor of Physics, KU Leuven, Belgium

Spring 2026

Training a chemistry emulator on Oxygen-rich AGB outflows

OTHER PROJECTS:

- **Agung Prawira**, Theoretical project in astrophysics, KU Leuven, Belgium

Spring 2026

Running 3D hydrodynamics models to generate training data for chemistry emulation

FUNDING AND AWARDS

2026 - **FWO Travel funds, Belgium**, Travel grant for short stays provided by the Flemish Government Grant Agency FWO (Fonds voor Wetenschappelijk Onderzoek) approx. EUR 4 000.

2024 - **Charles University Grant agency, Czechia**, The impact of binary evolution on common envelope evolution, approx. EUR 10 000.

2024 - **IT4Innovations National Supercomputing Center, Czechia**, Impact of binary evolution on the outcome of common envelope evolution in massive stars, 4 million CPU hours

SKILLS

Languages: French (native), English (C1), Swedish (A2), German (A2)

Programming: Fortran, Python, C/C++, Java, Matlab, HTML/CSS

Scientific codes: PHANTOM, FLASH4, MESA, PHOEBE, IRAF

Other: git, SQL, Elasticsearch, Streamlit, L^AT_EX

REFERENCES

1. Prof. Dr. Leen Decin

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2. Dr. Ondřej Pejcha

Institute of Theoretical Physics
Charles University, Czechia
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3. Prof. Paul Ricker

Department of Astronomy
University of Illinois, USA
pmricker@illinois.edu