

# SEPPE STAELENS



## CONTACT INFO

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## ABOUT ME

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I am a motivated, young researcher with a profound interest in theoretical physics and astrophysics. I am especially excited about topics that combine both fields, like gravitational waves and black holes. In my research, I leverage multiple computational techniques varying from numerical relativity to machine learning. Furthermore, I enjoy teaching mathematics and physics to both high school and University students.

## EDUCATION

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**PhD in Applied Maths and Theoretical Physics** 2023-2027  
*University of Cambridge, DAMTP | Cambridge, United Kingdom*

- Numerical relativity, boson stars, black holes and gravitational waves
- Funding: Centre for Doctoral Training in Data Intensive Science (courses on research computing, Bayesian statistics and machine learning)
- Under supervision of prof. U. Sperhake

**MSc Astronomy & Astrophysics** 2020-2023  
*KU Leuven | Leuven, Belgium*

- Graduated *summa cum laude* (87.00 %)
- Thesis topic: "Merging Compact Objects in the LISA Frequency Band" under supervision of P. Jonker, G. Nelemans. Grade: 17.8/20
- Erasmus exchange to Radboud Universiteit Nijmegen (2022-2023)
- Courses on gravitational waves, black holes, data analysis, machine learning

**MSc Physics** 2020-2022  
*KU Leuven | Leuven, Belgium*

- Graduated *summa cum laude with congratulations of the Board of Examiners* (90.63 %)
- Option Theoretical Physics: e.g. General Relativity, QFT, cosmology
- Thesis topic: "Black Hole Photon Rings beyond General Relativity" under supervision of T. Hertog, D. Mayerson, F. Bacchini. Grade: 18.1/20

## TWIN BA Physics & Mathematics

KU Leuven | Leuven, Belgium

2017-2020

- Combination of two BA degrees for excelling students
- Graduated (phys.) with *magna cum laude* (84.42 %)
- Graduated (math.) with *summa cum laude* (85.17 %)

## PUBLICATIONS

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### Articles

- S. Staelens**, D.R. Mayerson, F. Bacchini, B. Ripperda, and L. Küchler (June 2023). "Black hole photon rings beyond general relativity". In: *Phys. Rev. D* 107 (12), p. 124026. DOI: 10.1103/PhysRevD.107.124026.
- S. Staelens** and G. Nelemans (Mar. 2024). "Likelihood of white dwarf binaries to dominate the astrophysical gravitational wave background in the mHz band". In: *Astronomy & Astrophysics* 683, A139. DOI: 10.1051/0004-6361/202348429.
- G. A. Marks **S. Staelens**, T. Evstafyeva and U. Sperhake (2025). *Long-term stable nonlinear evolutions of ultra-compact black-hole mimickers*. arXiv: 2504.17775 [gr-qc].

### Book Chapter

- A. Lupsasca D. R. Mayerson, B. Ripperda and **S. Staelens** (Feb. 2024). *A Beginner's Guide to Black Hole Imaging and Associated Tests of General Relativity*. arXiv: 2402.01290.

## EXPERIENCE

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### DATA SCIENCE INTERN

2026

*FactTrace AI* | Cambridge, UK

- *Fingerprinting Infrastructure for Truth Integrity*
- Learn how to apply deep learning and AI in a practical context.

### RESEARCH INTERN

2025

*Cancer Research UK Scotland Institute* | Glasgow, UK

- DiRAC Innovation Placement (6 months)
- Project: *Multimodal data integration and analysis*
- Machine / Deep Learning in a GPU-accelerated HPC environment.

### ACADEMIC TUTOR

2024,2025

*Immerse Education* | Cambridge, UK

- 2-week long summer school in Maths
- Designed own 40-hour course

### SUPERVISOR / TEACHING ASSISTANT

2024,2025

*University of Cambridge* | Cambridge, UK

- Course: *General Relativity - Part II of the Math. Tripos*
- Course: *Numerical Relativity and Gravitational Waves - Part III of the Math. Tripos*

**TEACHING ASSISTANT**  
*Faculty of Science, KU Leuven | Leuven, Belgium*

2020-2022

- Bachelor courses in Physics and Mathematics

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## ACHIEVEMENTS

- Awards**
- Prize for best Master's Thesis in Physics 2022 (400 EUR)
- Certificates**
- *Animator* (2016), *Hoofd animator* (2018) and *Instructor* (2021) certificate issued by the Flemish government.
  - Completion of *Teaching Assistant training* at the Faculty of Science, KU Leuven (2021)

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## EXTRACURRICULAR ACTIVITIES

- Sporta**
- This is an organization for youth camps, of which I have been a part for 7 years. I have been camp leader at 20+ summer camps, which taught me teamwork and responsibility. Furthermore, I was an instructor at 5 animator courses, which taught me how to transfer knowledge in multiple ways.
- CUBS**
- Cambridge University Belgian Society. Secretary 2023-2024, President 2024-2025
- Hobbies**
- guitar, snowboard, ski, wakeboard, football, Ju Jitsu

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## SKILLS

- ● ● Python, L<sup>A</sup>T<sub>E</sub>X, Presenting, Time Management, Leadership
  - ● ○ C++, Linux, HPC, PyTorch, Teamwork
  - ○ ○ Mathematica, FORTRAN
- Languages**
- Dutch (native), English (C2), French (B2)

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## REFERENCES

- Ulrich Sperhake**
- Professor  
Department of Applied Mathematics and Theoretical Physics  
Centre for Mathematical Sciences  
University of Cambridge  
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