

SEPPE STAELENS



ABOUT ME

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. Furthermore, I enjoy teaching mathematics and physics to both high school and University students.

EDUCATION

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
- 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 2017-2020

KU Leuven | Leuven, Belgium

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

Greek-Mathematics (high school) 2011-2017

Sint-Albertuscollege | Haasrode, Belgium

PUBLICATIONS

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.

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.

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].

EXPERIENCE

ACADEMIC TUTOR

2024

Immerse Education | Cambridge, UK

- 2 × 2 weeks of 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

2023

Cambridge Centre for International Research | Online

- Course: *The Astrophysics of High-Density Objects: Plasma Physics, General Relativity, and Quantum Electrodynamics*
- Exercise sessions for talented high school students

TEACHING ASSISTANT

2020-2022

Faculty of Science, KU Leuven | Leuven, Belgium

- Bachelor courses in Physics and Mathematics

STUDY SUPPORT SERVICES

2020, 2022

Faculty of Science, KU Leuven | Leuven, Belgium

- Helped shaping the preparatory Summer School for Physics and Mathematics for prospective students

ACHIEVEMENTS

Awards

- Prize for best Master's Thesis in Physics 2022 (400 EUR)

EXTRACURRICULAR ACTIVITIES

- Certificates**
- *Animator* (2016), *Hoofdanimator* (2018) and *Instructor* (2021) certificate issued by the Flemish government.
 - Completion of *Teaching Assistant training* at the Faculty of Science, KU Leuven (2021)

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

SKILLS

● ● ● \LaTeX , Presentations, Time Management, Leadership

● ● ○ Programming (Python, C++), Linux, High-performance computing, Teamwork

● ○ ○ Programming (Mathematica, FORTRAN)

Languages • Dutch (native), English (C2), French (B2)

REFERENCES

Ulrich Sperhake Professor
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