Sophie **Rosu**

Observatoire de Genève
Université de Genève (UNIGE)
Chemin Pegasi 51
1290 Versoix (Switzerland)
+32 474 79 48 76
sophie.rosu@unige.ch
Nationality: Belgian
Birth date: June 16th, 1994

0000-0002-2461-6913
NASA/ADS Publications

Curriculum Vitae updated 1st November 2024

Academic Positions

10.2024 – ... **Postdoctoral Researcher**, *Swiss National Science Foundation, Geneva Observatory, Switzerland*

2022 – 2024 **Postdoctoral Researcher**, *KTH Royal Institute of Technology, Stockholm, Sweden*

Academic Background & Education

2018 – 2022 **Doctoral Student in Space Sciences, FNRS Fellowship**, *University of Liège, Belgium*
PhD thesis: Apsidal Motion in O-Star Binaries: Constraining the internal structure of the stars

2016 – 2018 **Master in Aerospace Engineering**, *University of Liège, Belgium*
Graduate in first session - *magna cum laude* - Third student of the promotion
Master thesis subject: Mistuned forced response of a bladed drum

2014 – 2016 **Master in Space Sciences**, *University of Liège, Belgium*
Graduate in first session - *summa cum laude* - First student of the promotion
Master thesis subject: Apsidal motion in the massive binary HD 152218

2011 – 2014 **Bachelor in Physics**, *University of Liège, Belgium*
Graduate in first session - *magna cum laude* - Third student of the promotion

2005 – 2011 **Secondary school**, *Institut Notre-Dame de Jupille (Liège), Belgium*

Teaching Experience

2022 – 2024 **Lecturer**, *KTH Royal Institute of Technology*, Sweden
- Astrophysics, Advanced Course: Theoretical lectures about Special Relativity and accretion disks, master and doctoral levels, ~ 10 students
- Introductory Astronomy for Engineers: Theoretical lectures about stars, galaxies, and latest breakthroughs in astronomy, 3rd bachelor in engineers, ~ 10 students

2019 – 2022 **Teaching assistant**, *University of Liège*, Belgium
Analytical mechanics: Exercises sessions about Lagrange mechanics, Hamilton principles, and Special Relativity, 3rd bachelor in mathematics and physics, ~ 30 students

2015 – 2016 **Student instructor**, *University of Liège*, Belgium
- Analytical mechanics course for 2nd bachelor in mathematics and physics, syllabi improvements
- Statistics course for 3rd bachelor in psychology, grading of weekly homeworks

Supervision of Master and Bachelor Students

2024 – 2025 **Co-Supervisor of Lucas Nys Master Thesis**, *Apsidal Motion in a short-period massive binary*, University of Liège, Belgium, and Geneva Observatory, Switzerland

2023 – 2024 **Supervisor of Amanda Helmfrid's Master Thesis**, *HST imaging of the outer rings of SN 1987A until 13 000 days post explosion*, KTH Royal Institute of Technology, Sweden

2023 – 2024 **Co-Supervisor of A. Avdic and A. Mjörnheim Bachelor Thesis**, *Cosmic Lighthouse: Exploring X-ray Pulsars in Python*, KTH Royal Institute of Technology, Sweden

2019 – 2022 **Co-Supervisor of Bachelor students**, *Characterisation of Stars Belonging to Massive Binaries*, University of Liège, Belgium

Non-Academic Professional Experience

01-06/2018 **Internship**, *Safran Aero Boosters Company*, Belgium
Work as an engineer on the mistuned forced response of a bladed drum

2010 – 2017 **Student job**, *Fiduciaire Rosu srl*, Belgium
Accounting and fiscal office: Encoding work, filing, and archiving of files

Fellowships, Prizes, & Awards

07/2024 **First Prize** for Best ePoster on the Apsidal Motion in Massive Binaries at the European Astronomical Society (EAS) Annual Meeting 2024, Padova, Italy

09/2022 Newton International Fellowships 2022 programme, UK: Held in Reserve
(The reserve list is comprised of applicants who were highly rated by the Panel but were ranked below the cut-off for funding.)

12/2021 **First Prize** for best speaker at the Young Speaker Contest of the Belgian Physical Society

11/2021 **Annual Award** of the Société Royale des Sciences de Liège

2018 – 2022 Fonds National de la Recherche Scientifique (F.R.S. - FNRS) **Fellowship**, Belgium

2016 Master in Space Sciences **Prize**

2008 – 2011 Selected member to the preparation of the *International Mathematical Olympiad,*
Société Belge des Professeurs de Mathématique

2005 – 2011 Finalist at the *Belgian Mathematical Olympiad*

Invitations

10/12/2023 **Invited guest** at the Nobel Prize Award Ceremony, Stockholm, Sweden

Oral Communications and Posters

Invited presentations at international conferences

[1] **Rosu, S.** (19 September 2024), Apsidal motion in (massive) binaries, Conference Rodolfo Barbá: the astronomer with a universe of massive stars in his OWN pocket, ESAC, Madrid, Spain

[2] **Rosu, S.** (19 September 2023), Apsidal motion in (massive) binaries, Hvar Stellar Meeting 2023: Variable and Binary Stars in the Era of Big Data and New Instrumentation, Hvar, Croatia

[3] **Rosu, S.** (02 December 2021), Apsidal motion in massive eccentric binaries in NGC 6231, General Scientific Meeting 2021 of the Belgian Physical Society

Presentations at international conferences

[4] **Rosu, S.** (18 September 2024), Hubble Space Telescope images of SN 1987A: Evolution of the ejecta and the equatorial ring from 2009 to 2022, Presentation at the VLT FLAMES Tarantula Survey Annual Scientific Meeting 2024, Madrid, Spain

[5] **Rosu, S.** (10 September 2024), Apsidal motion in massive binaries – or how to sound stellar interiors, Presentation at the conference Binary and Multiple Stars in the Era of Big Sky Surveys, Litomyšl, Czech Republic

[6] **Rosu, S.** (16 July 2024), Apsidal motion in massive binaries – or how to sound stellar interiors without asteroseismology, Presentation at the 41st Liège International Astrophysical Colloquium: The Eventful Life of Massive Star Multiples, Liège, Belgium

[7] **Rosu, S.** (01 July 2024), Hubble Space Telescope images of SN 1987A: Evolution of the ejecta and the equatorial ring from 2009 to 2022, Presentation at the European Astronomical Society (EAS) Annual Meeting 2024, S10: Supernovae: now in 3D!, Padova, Italy

[8] **Rosu, S.** (21 May 2024), Hubble Space Telescope images of SN 1987A: Evolution of the ejecta and the equatorial ring from 2009 to 2022, Presentation at the Finnish Astronomers' Days 2024, Vaasa, Finland

[9] **Rosu, S.** (07 May 2021), Apsidal motion in NGC 6231: Sounding the internal structure of massive binary stars, Presentation at the virtual IAU Symposium 361: Massive Stars Near & Far, Cavan, Ireland

Posters

[10] **Rosu, S.** (July 2024), Apsidal motion in (massive) binaries, Poster session presented at the European Astronomical Society (EAS) Annual Meeting 2024, S8: Asteroseismology in multiple-star systems in the era of large photometric surveys, Padova, Italy
https://k-poster.kuoni-congress.info/eas-2024/poster/e88d13e3-b8fd-4b8e-8f00-323c10dd1372

[11] **Rosu, S.**, Rauw, G., Nazé, Y., Gosset, E., & Sterken, C. (May 2022), Apsidal Motion in Massive Binaries: CPD-41° 7742, an Extreme Case?, Poster session presented at the IAU Symposium 361: Massive Stars Near & Far, Dublin, Ireland
https://hdl.handle.net/2268/291309

[12] **Rosu, S.**, Rauw, G., Gosset, E., Manfroid, J., & Royer, P. (September 2019), Apsidal Motion in The Massive Binary HD 152248, Poster session presented at Universe of Binaries, Binaries in the Universe, Telc, Czech Republic
https://hdl.handle.net/2268/239567

Invited presentations at scientific conferences in Universities

[13] **Rosu, S.** (7 February 2024), Hubble Space Telescope images of SN 1987A: Evolution of the ejecta and the equatorial ring from 2009 to 2022, Weekly Supernova group meeting at the Astronomy Department, Stockholm University, Sweden

[14] **Rosu, S.** (25 January 2024), SN 1987A in its third decade imaged by the Hubble Space Telescope: Evolution of the ejecta and equatorial ring, Weekly stellar seminars in the Department Group of Astrophysics, Geophysics, and Oceanography in Liège, Belgium

[15] **Rosu, S.** (18 November 2021), Apsidal Motion in Massive Eccentric Binary Stars in NGC 6231, Weekly stellar seminars in the Stellar Group of the Astrophysics department in Geneva, Switzerland

Theses and dissertations

[16] **Rosu, S.** (2022), Apsidal Motion in O-Star Binaries: Constraining the internal structure of the stars, **Doctoral thesis**, University of Liège, Belgium
https://hdl.handle.net/2268/292652

[17] **Rosu, S.** (2018), Mistuned Forced Response of a Bladed Drum, **Master thesis**, University of Liège, Belgium
https://hdl.handle.net/2268/264247

[18] **Rosu, S.**, (2016), Influence des interactions de marée sur le mouvement des apsides et la précession : Application aux binaires massives HD 152218 et HD 191612, **Master thesis** (in French), University of Liège, Belgium
https://hdl.handle.net/2268/264246

Pedagogical documents: lecture notes and syllabi

[19] Dauby, P. C., **Rosu, S.**, & Kosta, S. (2022), Analytical mechanics: Lagrange mechanics, Hamilton principles, and Special Relativity, Exercices Syllabus for 3rd bachelor in mathematics and physics, University of Liège, Belgium

Successful Observing Proposals

CAT/NOT & Mercator

2024 NOT/FIES: *A high-resolution spectroscopic survey of the bright OB stars in the ALS catalog with Gaia data*, 6 nights (54.0 hours), GTC1/24B, PI: M. Pantaleoni González

2024 Mercator/HERMES: *A high-resolution spectroscopic survey of the bright OB stars in the ALS catalog with Gaia data*, 13 nights (107.0 hours), GTC1/24B, PI: M. Pantaleoni González

El TIGRE, Mexico

2022 – 2023 AO 10: *Probing the (mis)alignment of stellar rotation axes in massive binaries via the Rossiter-McLaughlin effect*, 20 hours, PI: G. Rauw

2022 – 2023 AO 10: *First orbital solution of a sample of eclipsing massive binaries*, 15 hours, PI: G. Rauw

2022 – 2023 AO 10: *Tidal interactions in early-type binaries*, 15 hours, **PI: S. Rosu**

2022 – 2023 AO 9: *Tidal interactions in early-type binaries*, 17 hours, PI: G. Rauw

2021 – 2022 AO 7: *Spectral disentangling of the massive binary HD 165052*, 5 hours, PI: E. Quintero

2020 – 2021 AO 6: *Spectral disentangling of the massive binary HD 165052*, 7.5 hours, PI: P. Eenens

2020 – 2021 AO 6: *Apsidal motion in early-type binaries (Part III)*, 15 hours, **PI: S. Rosu**

2019 – 2020 AO 5: *Apsidal motion in early-type binaries (Part II)*, 19 hours, PI: G. Rauw

2018 – 2019 AO 4: *Apsidal motion in early-type binaries*, 11 hours, PI: G. Rauw

ESO/VLT

2024 MUSE: *A Compact Object in SN 1987A*, 10.0 hours, Cycle P112, PI: C. Fransson

Hubble Space Telescope

2024 HST/WFC3: *Expanding shocks and the emergence of the compact object in Supernova 1987A*, GO-17842, 5 orbits, Cycle 32, PI: J. Larsson
https://ui.adsabs.harvard.edu/abs/2024hst..prop17842L/abstract

2023 HST/WFC3 & COS: *Expanding shocks and the emergence of the compact object in Supernova 1987A*, GO-17496, 23 orbits, Cycles 31 & 33, PI: J. Larsson
https://ui.adsabs.harvard.edu/abs/2023hst..prop17496L/abstract

James Webb Space Telescope

2023 JWST/NIRSpec: *The nature of the compact object in SN 1987A*, GO-3131, 18.9 hours, Cycle 2, PI: J. Larsson
https://ui.adsabs.harvard.edu/abs/2023jwst.prop.3131L/abstract

Observatoire de Haute-Provence

2024 1m52/Aurélie: *Interactions de marée dans des binaires massives à éclipses*, 6 nights, PI: G. Rauw

Observer Missions

11/2024 Observatorios del Roque de Los Muchachos y del Teide, 7 nights at Mercator/HERMES, La Palma, Spain

Services

10/2024 **SOC member of and session chair at** Astronomdagarna 2024, October 2–4 2024, Lund, Sweden

09/2024 **Session chair** at the Conference Rodolfo Barbá: the astronomer with a universe of massive stars in his OWN pocket, 16–20 September 2024, ESAC, Madrid, Spain

07/2024 **Session chair** at the 41st Liège International Astrophysical Colloquium, July 15–19 2024, Liège, Belgium

2024 – ... **Reviewer** of ESO Proposals

2024 – ... International Astronomical Union (IAU) G2 commission – **Organiser** of the Massive Stars online lectures

2024 – ... **Active member** of the BlueMUSE Science Team

04/2023 **Opponent** of Oscar Wistemar's Master Thesis, *Fitting a photospheric prompt emission model to GRB data: The Kompaneets RMS approximation (KRA)*, KTH Royal Institute of Technology, Sweden

2018 – ... **Reviewer** of Scientific articles submitted to A&A and Ap&SS

Memberships

2024 – ... International Astronomical Union (IAU)

2023 – ... European Astronomical Society (EAS)

2016 – 2022 Belgian Physical Society (BPS)

Outreach

05/2023 Girls in STEM: speaker at one day event, talk about physics research for girls aged between 15 and 22 studying science at school or University, Stockholm, Sweden

03/2021 Interaction with children: contribution to the online *Printemps des Sciences* week entitled *Et demain*, Liège, Belgium

01/2020 Interaction with children: contribution to the learning workshop following the screening of the animated film *Le voyage dans la Lune*, Liège, Belgium

04/2019 Invited contribution to the *Orbiter Dictum* journal in the Law Faculty entitled *Explosera ou n'explosera pas ? Là est la question !*, Liège, Belgium

03/2019 Interaction with children: contribution to the *Printemps des Sciences* week entitled *Elémentaire !*, Liège, Belgium

Computer skills

Office LaTeX, Linux, MacOS, Microsoft Office (Word, Excel, Power Point), Windows

Processing DS9, IRAF, Midas (Image processing and data reduction), QFitsView

Programming Bash, Fortran, Matlab, Python, SuperMongo

Simulations Clés, CMFGEN, Nightfall

Languages

French Native language

English Level C2 - CERAN School - Spa 2016

Spanish Level B2

Swedish Level B2

Dutch Level B1

Sports and Hobbies

- Rowing, swimming, and cycling / Former rowing competitor and coach
- Dance - Charleston, Lindy Hop - Intense practice
- Music - Classical Guitar, Bass Guitar
- Boardgames and puzzles

Sophie Rosu sophie.rosu@unige.ch