

Jérémy Rekier

Planetary and geophysical fluid dynamics · Applied mathematics

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Summary

Applied mathematician working on the fluid interiors of planets, moons, and stars. I study how their internal waves and modes shape rotation, tides, and orbital evolution, combining spectral and asymptotic analysis with open-source numerical codes, and I use them to interpret measurements from space missions such as BepiColombo and JUICE. PhD, Department of Mathematics, University of Namur.

Employment History

Since 2026 **Research Associate**, Earth and Life Institute (ELIC), University of Louvain.
Interiors and rotation of the Earth and planets; from January 2027, within the ERC Advanced Grant *GEOSPIN*.

Since 2021 **Guest Lecturer**, Astronomy and Geophysics, University of Louvain.
Courses in astronomy, geodesy, and internal geophysics (Bachelor and Master), current load about 45 h per year.

2023–2025 **Senior Researcher** (Chef de travaux), Royal Observatory of Belgium.
Member of the ERC Synergy project *Graceful* (PIs V. Dehant, A. Cazenave, M. Mandea): the Earth's deep interior from rotation, gravity and magnetic observations; interior models of Mercury and icy moons. Visiting researcher since January 2026.

2023–2024 **Visiting Scholar**, Dpt. of Earth and Planetary Science, University of California, Berkeley.
Dynamics of the Earth's core and its coupling with the mantle, with Prof. B. Buffett.

2015–2023 **Researcher**, Royal Observatory of Belgium.
Member of the ERC Advanced Grant project *Rotanut* (PI V. Dehant, 2015–2020), then of *Graceful*. Dynamics of the fluid interiors of the Earth and other planets, and their signature in rotation.

2011–2015 **PhD Researcher** (FNRS Research Fellow), Dpt. of Mathematics, naXys, University of Namur.
Numerical methods for fluid dynamics in spherical geometry coupled to gravity in General Relativity (hybrid inflation, spherical collapse).

Education

2015 **PhD in Science**, Dpt. of Mathematics (naXys), University of Namur, 17 September 2015.
Applications of the (3+1)-formalism of General Relativity to Cosmology: A study of Hybrid Inflation and Spherical Collapse with quintessence.

2011 **Master in Physics**, *la plus grande distinction*, University of Namur.

2009 **Bachelor in Physics**, *grande distinction*, University of Namur.

Awards and Funding

2024 **Édouard Mailly Award of Astronomy**, Royal Academy of Belgium.

2024 **MIT Global Seed Funds**, collaborative project with W. Kang (MIT), USD 30,000.

2023 **Long Stay Abroad grant**, Research Foundation – Flanders (FWO), visiting scholar at UC Berkeley, €10,098.

2022 **Long-stay grant**, Fund for Scientific Research – FNRS, UC Berkeley, €2,500.

2021 **Annual Award of the Class of Sciences**, Royal Academy of Belgium.

2013 **Long-stay grant**, Fund for Scientific Research – FNRS, Rhodes University (South Africa), €2,500.

2011 **Research Fellowship (Aspirant)**, Fund for Scientific Research – FNRS.

Teaching

Spring 2027	**Partial Differential Equations and Numerical Methods** (SMATB317), Bachelor, *UNamur*. Substitute lecturer, 30 h of lectures (theory and numerics).
Since 2024	**Astronomy and Geophysics** (LPHYS1214), Bachelor, *UCLouvain*. Co-lecturer, 12.5–19 h per year.
Since 2023	**Internal Geophysics of the Earth and Planets** (LPHYS2161), Master, *UCLouvain*, in English. **Course holder** since 2025, 30 h per year (lectures and exercises); co-lecturer in 2023–24.
Since 2023	**Geodesy and GNSS** (LPHYS2260), Master, *UCLouvain*, in English. Co-lecturer, about 7 h per edition (biennial course).
2021–2024	Exercise sessions, **Astronomy and Geophysics** (LPHYS1214), *UCLouvain*, 15 h per year.
2011–2014	Exercise sessions, **Differential Geometry** (SMATB214) and **Complements of Mathematics** (functional analysis, then SMATB333), *UNamur*.

Supervision

Since 2025	PhD co-supervisor, **D. Laariara** (FNRS Aspirant fellowship), UCLouvain, with J.-F. Remacle (EPL).
Since 2025	PhD co-supervisor, **A. Nuyt** (FRIA fellowship), UCLouvain, with M. Crucifix (ELIC).
2021–2025	PhD co-supervisor, **F. Seuren**, KU Leuven; now postdoctoral fellow at Queen's University (Canada).
Since 2025	PhD thesis committee, V. Ernst, UCLouvain and ULiège.
2020–2024	PhD thesis committee, S.-A. Shih, UCLouvain and Academia Sinica (Taiwan).
	Supervision of Master's theses at ULB and UCLouvain.

Research Networks and Missions

From 2027	ERC Advanced Grant **GEOSPIN**, UCLouvain (Earth and Life Institute).
Since 2025	Co-organiser of **Switch to Space**, biennial meeting of the space industry and academia (Brussels).
Since 2024	ESA **JUICE** mission, scientific associate of the J-MAG magnetometer team.
Since 2023	ESA **BepiColombo** mission, scientific associate of the BELA team (working group 1).
Since 2023	SEDI representative to IAG Commission 3 (Earth Rotation and Geodynamics).
Since 2023	Member of **Louvain4Space** (UCLouvain), network of space research and industry: seminar co-organisation and talks.
2023–2026	**INT-ORB** project, Royal Observatory of Belgium.
2020–2025	ERC Synergy Grant **Graceful**, Royal Observatory of Belgium, ISSI (Bern), CNES (Paris).
2015–2020	ERC Advanced Grant **Rotanut**, Royal Observatory of Belgium.
	Member of the IAU (since 2020), EGU and AGU (since 2015).

Research Stays Abroad

2023–2024	**UC Berkeley**, Dpt. of Earth and Planetary Science, visiting scholar.
2024, 2025	**MIT**, Dpt. of Earth, Atmospheric and Planetary Sciences, invited visits (2 and 3 weeks).
2023	**Johns Hopkins University**, Dpt. of Earth and Planetary Sciences, invited visit (2 weeks).
2022	**UC Berkeley**, Dpt. of Earth and Planetary Science, visiting researcher (3 months).
2013	**Rhodes University** (South Africa), Dpt. of Mathematics, visiting researcher (3 months).

Service and Outreach

2023, 2024	Session convener: AGU Fall Meeting (2023, 2024), IUGG General Assembly (Berlin, 2023).
2016, 2020	Organising committee, *Rotanut Workshop* (Brussels) and *ISSI Meeting* (Bern).
Since 2016	Open days of the Belgian Space Pole; internships for secondary school students (Royal Observatory).
2025	Public astronomy course, ULB.
2011–2012	Exhibition *Universe Face A/Face B*, with A. Füzfa (FNRS Wernaers Prize 2013).
	Media: RTBF, Le Soir, La Libre, L'Avenir, AFP; live TV commentary of the 2026 total solar eclipse (RTBF).

Software and Languages

Codes	**Kore** (co-author, sparse spectral method), open-source Python code for the eigenmodes and forced flows of rotating fluids in near-spherical geometry, with magnetic field and stratification. github.com/repepo/kore
	Melinoë.jl (author), Julia package for the internal geodynamics of planetary bodies on a spectral discretisation: tidal Love numbers, free oscillations, compliances. github.com/jrekier/Melinoe.jl
Programming	Python, Julia, Fortran, C, Matlab, Mathematica; HTML, CSS, JavaScript.
Languages	French (native), English (fluent, C1), Dutch (intermediate, B1).