Xavier Kervyn

Max-Planck-Institut für Physik, Boltzmannstaße 8, 85748 Garching bei München, Germany
Born in May 2001. Belgian | xavier.kervyn@mpp.mpg.de | xavierkervyn.github.io/

Current Research Interests

→ A few keywords, in no particular order: holography and (string) scattering amplitudes in all backgrounds, non-relativistic string/M-theory, positive geometry, twistor theory, Carrollian physics, machine learning.

Academic Employment

Max Planck Institute for Physics Garching bei München, Germany — 10/2025
Doctoral Researcher, MPP QFT + String Theory Groups — –present

– IMPRS PhD candidate, advised by Stephan Stieberger and Johannes Henn

Max Planck Institute for Physics Garching bei München, Germany & remote — 09/2024
Graduate Researcher, MPP QFT + String Theory Groups — 09/2025

– Master's thesis, advised by Stephan Stieberger

Education

Ludwig-Maximilians-Universität München Munich, Germany — 10/2025
Dr. rer. nat. (PhD) in Theoretical Physics — –present

Ludwig-Maximilians- & Technische Universität München Munich, Germany — 10/2023
Master of Science in Theoretical and Mathematical Physics (TMP, with Distinction) — 09/2025

Peterhouse, University of Cambridge Cambridge, United Kingdom — 10/2022
Master of Advanced Study in Applied Mathematics (Part III, with First Class Honours) — 06/2023

Ecole Polytechnique Fédérale de Lausanne Lausanne, Switzerland — 09/2019
Bachelor of Science in Physics — 08/2022

Selected Awards, Grants & Scholarships

Study Grant – *Fondation du Domaine de Villette* // CHF 5'000 — 10/2024
Erasmus+ Scholarship – *Ludwig-Maximilians-Universität München* // 5 × 600€ — 05/2024
College Prize in Applied Mathematics – *Peterhouse, University of Cambridge* // £300 — 12/2023
Retrospective Scholarship in Mathematics – *Peterhouse, University of Cambridge* // £125 — 12/2023
Study Grant – *Fondation du Domaine de Villette* // CHF 5'000 — 06/2023
Greta Burkill Fund Award – *Peterhouse, University of Cambridge* // £300 — 03/2023
Bruckmann Fund Award – *Peterhouse, University of Cambridge* // £300 — 03/2023
Annual Scholarship – *Swiss Study Foundation* // CHF 20'000 — 11/2022
Excellence Scholarship – *Colbianco Stiftung* // CHF 2'000 — 08/2022
Fellowship – *Swiss Study Foundation* — 05/2022
Fellowship – *e-fellows.net* — 05/2022
Swiss Mobility Program Grant – *Ecole Polytechnique Fédérale de Lausanne* // CHF 1'500 — 09/2021
Baccalaureate Merit Award – *Région Provence-Alpes Côte d'Azur* // 400€ — 07/2019
Prix Maupassant de la Jeune Nouvelle – *Association des Membres d'Or de la Palme Académique* — 07/2016

Publications & Preprints [Inspire HEP; *:under review] (author ordering is alphabetical in hep-th)

Articles:

2. X. Kervyn and S. Stieberger, *High-energy string theory and the celestial sphere*, *J. High Energ. Phys* **09** (2025) 044 [2504.13738].
1. X. Kervyn, D. Polvara and A. Sfondrini, *Thermodynamics of integrable $\mathcal{N} = 2$ theories, squared*, *J. High Energ. Phys* **09** (2025) 018 [2502.10356].

Reviews:

1. X. Kervyn, *BMS symmetries of gravitational scattering*, *Nuclear Physics B* **1017** (2025) 116948 [2308.12979].

Theses & Study Projects

6. X. Kervyn, *Towards a String Worldsheet Description of Celestial Holography*, **Master Thesis**, Ludwig-Maximilians-Universität München, Aug., 2025. Grade: 1.0 (High Distinction).
5. X. Kervyn, *Bootstrapping $d = 4$, $\mathcal{N} = 4$ Super Yang-Mills in the presence of a $\frac{1}{2}$-BPS boundary defect* **Individual Study Project**, University of Copenhagen, Jan., 2025. Grade: 12/12. [link]
4. X. Kervyn, *Gauge-Gravity Duality* **Individual Study Project**, University of Copenhagen, Nov., 2024. Grade: 12/12.
3. X. Kervyn, *BMS Symmetries of Gravitational Scattering* **Part III essay**, University of Cambridge, May, 2023. Grade: 86%, Distinction.
2. X. Kervyn, N. Roux, *Towards an automatized analysis framework for the upcoming HL-LHC CMS ECAL* **Student Project**, ETH Zürich & CERN CMS collaboration, Jul., 2022. Grade: 6/6.
1. X. Kervyn, *Impact of non-perfect nulls on the detectable population by the LIFE space mission* **Student Project**, ETH Zürich, Dec., 2021. Grade: 6/6. [link]

Research Stays & Long-Term Academic Visits

Niels Bohr Institute Copenhagen, Denmark 09/2024
Visiting Student, Theoretical High-Energy Physics 01/2025

- Study project on the superconformal bootstrap of gauge theories with defects
- Supervised by Charlotte Kristjansen and Adam Chalabi
- Funding: Fondation du Domaine de Villette & LMU Erasmus+ Scholarship

Università degli Studi di Padova Padova, Italy 07/2023
Visitor, Theoretical Physics

- Research on integrability in string theory and AdS/CFT; thermodynamic Bethe Ansatz
- Supervised by Alessandro Sfondrini and Davide Polvara
- Funding: Fondation du Domaine de Villette

University of Cambridge Cambridge, United Kingdom 12/2022
Graduate Student, Department of Applied Mathematics and Theoretical Physics 08/2023

- Essay on the *BMS Symmetries of Gravitational Scattering*, expanded into a review article
- Supervised by Prahar Mitra
- Funding: Swiss Study Foundation & Colbianco Stiftung

CERN CMS collaboration Meyrin, Switzerland 06/2022
Undergraduate Researcher, ETH Zürich High-Energy Physics group 07/2022

- Research on the new CMS electrocalorimeter for the High-Luminosity phase of the LHC
- Supervised by Simone Pigazzini (ETHZ/CERN)
- Funding: ETH Zürich, Department of Physics

ETH Zürich Zürich, Switzerland 09/2021
Undergraduate Researcher, Exoplanets and Habitability group 12/2021

- Research on the LIFE space mission (LIFEsim software), characterizing imperfect nulling
- Supervised by Felix Dannert and Sascha Quanz
- Funding: Swiss-Mobility Program, Ecole Polytechnique Fédérale de Lausanne (EPFL)

Conferences, Schools and Workshops attended (*:scheduled, P:poster, T:talk)

*	Symbology @15, MPI MPP, Munich, Germany [link]	12/2025
*	DFG Kickoff: Modern Foundations of Scattering Amplitudes, BCTP, Bonn, Germany [link]	11/2025
*	Geometry and Combinatorics of Scattering Amplitudes, MPI MiS, Leipzig, Germany [link]	10/2025
	From Good Cuts to Celestial Holography, St Anthony's College, Oxford University, UK [link]	07/2025
(P)	School on asymptotic symmetries and flat holography, G. Galilei Inst., Florence, Italy [link]	05/2025
	Infrared Surprises of Scattering Amplitudes, CERN, Meyrin, Switzerland [link, *online*]	05/2025
	Physics of Machine Learning & ML for Physics, Nordita, Stockholm, Sweden [link, *online*]	01/2025
	Frontiers in Gravity, Niels Bohr Institute, Copenhagen, Denmark [link]	09/2024
	PhD School: "Towards Gravity", Nordita, Stockholm, Sweden [link, *online*]	08/2024
	Celestial Holography Summer School, Perimeter Institute, Waterloo, Canada [link, *online*]	07/2024
	Strings 2024, CERN, Meyrin, Switzerland [link]	06/2024
	Carollian Physics and Holography, ESI, Vienna, Austria [link]	04/2024
	Workshop [...] in analysis and mathematical physics, LMU, Munich, Germany [link]	10/2023
	Celestial 2023, University of Warsaw, Warsaw, Poland [link]	08/2023
	Integrability, Dualities and Deformations 2023, Durham University, Durham, UK [link]	07/2023
	Young Researchers Integrability School & Workshop, Durham University, Durham, UK [link]	07/2023
	Eurostrings 2023, Universidad de Oviedo, Gijon, Spain [link]	04/2023

Contributed Talks & Seminars

Boundary Carrollian Conformal Field Theories and Open Null Strings
String Theory Lunch Seminar, LMU Munich & Max Planck Institute for Physics — 06/2025

Spinor-Helicity Formalism, Twistor Theory and Scattering Amplitudes
Seminar on Scattering Amplitudes, LMU Munich — 05/2024

Gauging of Discrete Higher Form Symmetries in non-Abelian Yang-Mills theory
Seminar on Generalized Symmetries in QFT, LMU Munich — 12/2023

Gravitational Scattering and Covariant Phase Space methods in Gravity
DAMTP Part III Seminar Series, University of Cambridge — 03/2023

Holography and Twistor methods in AdS_5
DAMTP Part III Seminar Series, University of Cambridge — 12/2022

Outreach

Online Seminar, **Swiss Study Foundation** — 05/2024
Organizer, peer event – "The future of CERN and High-Energy Physics"

Volunteer Tutor, **Village Book Builders** — 06/2022 – 03/2023
1:1 weekly online tutoring sessions with a 13yo. child in Mukono, Uganda

Online Seminar, **Swiss Study Foundation** — 12/2023
Organizer & speaker, peer event – "The role of Symmetries in Physics"

High School Visits, **Lycée Dominique Villars (Gap, France)** — 02/2020 – present
Presenting my curriculum and advertising STEM university studies to high-school students

Technical Skills

Languages: French (native); English, German (full work proficiency); Danish (basics)
Programming: C++ (OOP), Python (NumPy, Pandas, Matplotlib, Seaborn, Plotly.express, SciPy)
Data Analysis: Python (advanced), MATLAB (intermediate), Microsoft Word/Excel/PPT (basics)
Scientific work: LaTeX (GitHub+VSCode/Overleaf), `Mathematica`, scientific writing, funding application

Academic References

- Dr. Stephan Stieberger (Max-Planck Institute for Physics) / stephan.stieberger@mpp.mpg.de
- Prof. Johannes Henn (Max-Planck Institute for Physics) / johannes.henn@mpp.mpg.de
- Prof. Niels Obers (Niels Bohr Institute) / obers@nbi.ku.dk
- Dr. Prahar Mitra (University of Amsterdam) / p.mitra@uva.nl

Last updated on Sat 4th Oct, 2025. Certificates, references and transcripts available upon request.