Xavier Kervyn

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

Current research interests

★ String theory, gravity and quantum field theory. Most recently: holography and string scattering amplitudes in flat and curved backgrounds, non-relativistic strings, twistor theory, positive geometry, Carrollian physics.

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

– Thesis: *Towards a String Worldsheet Description of Celestial Holography* (1.0, High Distinction)
– Awarded 2 scholarships. Research at **Niels Bohr Institute** & **Max Planck Institute for Physics**

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

– Part III essay: *BMS Symmetries of Gravitational Scattering* (86%, Distinction)
– Awarded 3 scholarships and 3 prizes. Summer research at **Università degli Studi di Padova**

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

– Awarded 2 fellowships and 1 scholarship. Research at **CERN** & **ETH Zürich**

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

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

– Research on integrability in superconformal field theories and AdS/CFT
– Supervised by Alessandro Sfondrini and Davide Polvara

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

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)

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

Selected awards, grants & scholarships

Doctoral Fellowship (ERC HoloBoot) – *Università di Napoli Federico II* // fully funded PhD (declined)	03/2025
Study Grant – *Fondation du Domaine de Villette* // CHF 5'000	10/2024
Erasmus+ Scholarship – *Ludwig-Maximilians-Universität München* // €3'000	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 & 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

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*, *Journal of High Energy Physics* **09** (2025) 044 [2504.13738].
1. X. Kervyn, D. Polvara and A. Sfondrini, *Thermodynamics of integrable $\mathcal{N} = 2$ theories, squared*, *Journal of High Energy Physics* **09** (2025) 018 [2502.10356].

Reviews:

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

Conferences, schools and workshops attended (*:scheduled, P:poster, T:invited talk)

18. Symbology @15, MPI MPP, Munich, Germany [link]		12/2025
17. Feynman calculus and its applications to gravity and particle physics [link, *online*]		11/2025
16. DFG meeting: modern foundations of scattering amplitudes, BCTP, Bonn, Germany [link]		11/2025
15. Geometry and combinatorics of scattering amplitudes, MPI MiS, Leipzig, Germany [link]		10/2025
14. From good cuts to celestial holography, St Anthony's College, Oxford University, UK [link]		07/2025
13. School on asymptotic symmetries and flat holography, G. Galilei Inst., Florence, Italy [link]	(P)	05/2025
12. Infrared surprises of scattering amplitudes, CERN, Meyrin, Switzerland [link, *online*]		05/2025
11. Physics of machine learning & ML for physics, Nordita, Stockholm, Sweden [link, *online*]		01/2025
10. Frontiers in gravity, Niels Bohr Institute, Copenhagen, Denmark [link]		09/2024
9. PhD school: "towards gravity", Nordita, Stockholm, Sweden [link, *online*]		08/2024

8. Celestial holography summer school, Perimeter Institute, Waterloo, Canada [link, *online*] 07/2024
7. Strings 2024, CERN, Meyrin, Switzerland [link] 06/2024
6. Carollian physics and holography, ESI, Vienna, Austria [link] 04/2024
5. Workshop [...] in analysis and mathematical physics, LMU, Munich, Germany [link] 10/2023
4. Celestial 2023, University of Warsaw, Warsaw, Poland [link] 08/2023
3. Integrability, dualities and deformations 2023, Durham University, Durham, UK [link] 07/2023
2. Young researchers integrability school & workshop, Durham University, Durham, UK [link] 07/2023
1. Eurostrings 2023, Universidad de Oviedo, Gijon, Spain [link] 04/2023

Contributed talks & seminars

Matrix theory reloaded: a BPS road to holography
String Theory Lunch Seminar, LMU Munich & Max Planck Institute for Physics 11/2025

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

Technical skills

Languages: French (native); English, German (full work proficiency); Danish (basics)
IT: Object-oriented programming (C++, Python), `Mathematica`, MATLAB, LaTeX (GitHub+VSCode/Overleaf)

Academic references (thesis advisory committee)

- 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

Last updated on Sun 7th Dec, 2025. Certificates, references and transcripts available upon request.