

Xavier Kervyn

Max-Planck-Institut für Physik, Boltzmannstraße 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-Lorentzian 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: <i>Towards a String Worldsheet Description of Celestial Holography</i> (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: <i>BMS Symmetries of Gravitational Scattering</i> (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 <i>BMS Symmetries of Gravitational Scattering</i> , 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) – <i>Università di Napoli Federico II</i> // fully funded PhD (declined)	03/2025
Study Grant – <i>Fondation du Domaine de Villette</i> // CHF 5'000	10/2024
Erasmus+ Scholarship – <i>Ludwig-Maximilians-Universität München</i> // €3'000	05/2024
College Prize in Applied Mathematics – <i>Peterhouse, University of Cambridge</i> // £300	12/2023
Retrospective Scholarship in Mathematics – <i>Peterhouse, University of Cambridge</i> // £125	12/2023
Study Grant – <i>Fondation du Domaine de Villette</i> // CHF 5'000	06/2023
Greta Burkill Fund Award – <i>Peterhouse, University of Cambridge</i> // £300	03/2023
Bruckmann Fund Award – <i>Peterhouse, University of Cambridge</i> // £300	03/2023
Annual Scholarship – <i>Swiss Study Foundation</i> // CHF 20'000	11/2022
Excellence Scholarship – <i>Colbianco Stiftung</i> // CHF 2'000	08/2022
Fellowship – <i>Swiss Study Foundation</i> & <i>e-fellows.net</i>	05/2022
Swiss Mobility Program Grant – <i>Ecole Polytechnique Fédérale de Lausanne</i> // CHF 1'500	09/2021
Baccalaureate Merit Award – <i>Région Provence-Alpes Côte d'Azur</i> // €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 , <i>online</i>]	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 , <i>online</i>]	05/2025
11. Physics of machine learning & ML for physics, Nordita, Stockholm, Sweden [link , <i>online</i>]	01/2025
10. Frontiers in gravity, Niels Bohr Institute, Copenhagen, Denmark [link]	09/2024
9. PhD school: "towards gravity", Nordita, Stockholm, Sweden [link , <i>online</i>]	08/2024

8. Celestial holography summer school, Perimeter Institute, Waterloo, Canada [link , <i>online</i>]	07/2024
7. Strings 2024, CERN, Meyrin, Switzerland [link]	06/2024
6. Carrollian 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