

# Xavier Kervyn

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Born on 18 May 2001. Belgian

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## CURRENT RESEARCH INTERESTS

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- String theory, (flat space) holography, asymptotic symmetries, string amplitudes, twistor theory.
- Currently a visiting student at the *Niels Bohr Institute* in Copenhagen, Denmark, and writing my master's thesis under Prof. Stieberger at the *Max Planck Institute for Physics* in Munich, Germany.

## ACADEMIC RESEARCH EXPERIENCE & EMPLOYMENT

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|---|---------|
| <b>Max-Planck Institute for Physics</b> Garching, Germany & remote  | 09/2024 |
| Graduate Researcher / Master Thesis, MPI String Theory Group  | 08/2025 |
| <ul style="list-style-type: none"><li>• Research on string amplitudes and flat space holography; twisted intersection theory</li><li>• MSc advisor: <a href="#">Prof. Stephan Stieberger</a></li><li>• Funding: Fondation du Domaine de Villette</li></ul>  |         |
| <b>Niels Bohr Institute</b> Copenhagen, Denmark   | 09/2024 |
| Visiting Student, Theoretical High-Energy Physics   | 01/2025 |
| <ul style="list-style-type: none"><li>• Research on correlation functions in <math>\mathcal{N} = 4</math> SYM and ABJM theory with defects</li><li>• Advisors: <a href="#">Prof. Charlotte Kristjansen</a> and <a href="#">Dr. Adam Chalabi</a></li><li>• Study project on AdS/CFT under <a href="#">Prof. Niels Obers</a>. Grade: 12/12.</li><li>• Funding: LMU Erasmus+ Scholarship, Fondation du Domaine de Villette</li></ul> |         |
| <b>Università degli Studi di Padova</b> Padova, Italy & remote  | 07/2023 |
| Visiting Researcher, Theoretical Physics  | 06/2024 |
| <ul style="list-style-type: none"><li>• Research on integrability in string theory and <math>\text{AdS}_3/\text{CFT}_2</math>, Thermodynamic Bethe Ansatz</li><li>• Supervisors: <a href="#">Prof. Alessandro Sfondrini</a> and <a href="#">Dr. Davide Polvara</a></li><li>• Funding: Fondation du Domaine de Villette</li></ul>  |         |
| <b>University of Cambridge</b> Cambridge, United Kingdom  | 12/2022 |
| Part III student, Department of Applied Mathematics and Theoretical Physics   | 08/2023 |
| <ul style="list-style-type: none"><li>• Essay on the <i>BMS Symmetries of Gravitational Scattering</i>, expanded into a <a href="#">review article</a></li><li>• Funding: Swiss Study Foundation &amp; Colbianco Stiftung</li></ul>   |         |
| <b>CERN CMS collaboration</b> Meyrin, Switzerland   | 06/2022 |
| Undergraduate Researcher, ETH Zürich High-Energy Physics group  | 07/2022 |
| <ul style="list-style-type: none"><li>• Research under <a href="#">Dr. Simone Pigazzini</a> (ETHZ/CERN) on the new HL-LHC CMS ECAL</li><li>• Funding: ETH Zürich, Department of Physics</li></ul>   |         |
| <b>ETH Zürich</b> Zürich, Switzerland   | 09/2021 |
| Undergraduate Researcher, Exoplanets and Habitability group   | 12/2021 |
| <ul style="list-style-type: none"><li>• Research under <a href="#">Prof. Sascha Quanz</a> on the LIFE space mission (LIFEsim software)</li><li>• Funding: Swiss-Mobility Program</li></ul>  |         |

## EDUCATION

<b>TU München &amp; Ludwig-Maximilians-Universität</b> Munich, Germany	10/2023
Master of Science in Theoretical and Mathematical Physics	08/2025
<ul style="list-style-type: none"><li>• Thesis Advisor: <a href="#">Prof. Stephan Stieberger</a> (Max-Planck Institute for Physics)</li><li>• Erasmus+ exchange semester at the <b>University of Copenhagen</b>, Denmark</li></ul>	
<b>Peterhouse, University of Cambridge</b> Cambridge, United Kingdom	10/2022
Master of Advanced Study (MASt) in Applied Mathematics	06/2023
<ul style="list-style-type: none"><li>• Part III essay: <i>BMS Symmetries of Gravitational Scattering</i> (<a href="#">Dr. Prahar Mitra</a>, Distinction)</li><li>• Graduated with First Class Honours (Merit). Awarded 3 scholarships and 3 prizes</li></ul>	
<b>Ecole Polytechnique Fédérale de Lausanne</b> Lausanne, Switzerland	09/2019
Bachelor of Science in Physics	08/2022
<ul style="list-style-type: none"><li>• Final year at <b>ETH Zürich</b>, Switzerland (Swiss-Mobility program)</li><li>• Awarded a fellowship from the Swiss Study Foundation and e-fellows.net</li></ul>	

## PUBLICATIONS & PREPRINTS [[Inspire HEP](#) / [Google Scholar](#)]

1. X. Kervyn, *BMS Symmetries of Gravitational Scattering*, Aug., 2023. 10.48550/arXiv.2308.12979

## CONFERENCES, SCHOOLS AND WORKSHOPS ATTENDED (\*scheduled)

*School on asymptotic symmetries and flat holography, Galileo Galilei Inst., Florence, Italy [ <a href="#">link</a> ]	05/2025
*Infrared Surprises of Scattering Amplitudes, CERN, Meyrin, Switzerland [ <a href="#">link</a> ]	05/2025
*Physics of Machine Learning & ML for Physics, Nordita, Stockholm, Sweden [ <a href="#">link</a> , <i>online</i> ]	01/2025
Frontiers in Gravity, Niels Bohr Institute, Copenhagen, Denmark [ <a href="#">link</a> ]	09/2024
PhD School: "Towards Gravity", Nordita, Stockholm, Sweden [ <a href="#">link</a> , <i>online</i> ]	08/2024
Celestial Holography Summer School, Perimeter Institute, Waterloo, Canada [ <a href="#">link</a> , <i>online</i> ]	07/2024
Strings 2024, CERN, Meyrin, Switzerland [ <a href="#">link</a> ]	06/2024
Carollian Physics and Holography, ESI, Vienna, Austria [ <a href="#">link</a> ]	04/2024
Workshop [...] in analysis and mathematical physics, LMU, Munich, Germany [ <a href="#">link</a> ]	10/2023
Celestial 2023, University of Warsaw, Warsaw, Poland [ <a href="#">link</a> ]	08/2023
Integrability, Dualities and Deformations 2023, Durham University, Durham, UK [ <a href="#">link</a> ]	07/2023
Young Researchers Integrability School & Workshop, Durham University, Durham, UK [ <a href="#">link</a> ]	07/2023
Eurostrings 2023, Universidad de Oviedo, Gijon, Spain [ <a href="#">link</a> ]	04/2023
Young Physicists Forum 2022, ETH Zürich, Zürich, Switzerland [ <a href="#">link</a> ]	05/2022

## CONTRIBUTED TALKS & SEMINARS

Seminar on Scattering Amplitudes, <b>LMU Munich</b>	05/2024
Spinor-Helicity Formalism, Twistor Theory and Scattering Amplitudes	
Seminar on Generalized Symmetries in QFT, <b>LMU Munich</b>	12/2023
Gauging of Discrete Higher Form Symmetries in non-Abelian Yang-Mills theory	
DAMTP Part III Seminar Series, <b>University of Cambridge</b>	03/2023
Gravitational Scattering and Covariant Phase Space methods in Gravity	

DAMTP Part III Seminar Series, <b>University of Cambridge</b> Holography and Twistor methods in $\text{AdS}_5$	12/2022
Group Seminar, <b>ETH Zürich HEP group &amp; CERN CMS collaboration</b> Towards an automatized analysis framework for the upcoming HL-LHC CMS ECAL upgrade	07/2022
LIFEsim Seminar, <b>ETH Zürich Exoplanets and Habitability Group</b> Characterisation of the impact of non-perfect nulls on the detectable planet population by LIFE	12/2021
<b>OUTREACH</b>	
Online Seminar, <b>Swiss Study Foundation</b> Organisator, peer event – “The future of CERN and High-Energy Physics”	05/2024
Online Seminar, <b>Swiss Study Foundation</b> Organisator & speaker, peer event – “The role of Symmetries in Physics”	12/2023
Website, <b>online</b> Built a <a href="#">website</a> to share online learning resources in mathematics and physics with like-minded students	2022–...
Classroom Presentation, <b>Lycée Dominique Villars</b> Presenting my curriculum and advertising STEM university studies to high-school students	2019–...
<b>TEACHING EXPERIENCE</b>	
<b>Volunteer Tutor</b> remote	06/2022
It Takes a Village / Village Book Builders	03/2023
<ul style="list-style-type: none"> <li>1:1 weekly online tutoring sessions with a 13yo. child in Mukono, Uganda (10 months)</li> </ul>	
<b>INDUSTRY &amp; NON-ACADEMIC EXPERIENCE</b>	
<b>Research Analyst</b> Munich, Germany	11/2023
180 Degrees Consulting Munich	02/2024
<ul style="list-style-type: none"> <li>Team manager. Carrying out research and market analysis; punctual support to consulting teams</li> <li>Blueprint for the transition of fashion companies to a circular economy in the DACH region</li> </ul>	
<b>Recovery Team Leader</b> Lausanne, Switzerland	09/2020
EPFL Rocket Team	07/2021
<ul style="list-style-type: none"> <li>Managed a team of 10 students, coordinated the project with other subsystems</li> <li>Test/manufacturing procedures; parachutes, altimeter and ejection, drogue chute for ‘Bella Lui II’</li> <li>1st place at EuRoc 2021, 2nd at the 2021 Spaceport America Cup (category SRAD-10K)</li> </ul>	
<b>TECHNICAL SKILLS</b>	
<b>Languages:</b> French (native); English, German (full work proficiency)	
<b>Programming:</b> C++ (OOP), Python (NumPy, Pandas, Matplotlib, Seaborn, Plotly.express, SciPy)	
<b>Data Analysis:</b> Python (advanced), MATLAB (intermediate), Microsoft Excel (elementary)	
<b>Scientific work:</b> $\text{\LaTeX}$ (Overleaf), Mathematica, scientific writing, funding search and application	

## SELECTED AWARDS, GRANTS & SCHOLARSHIPS

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<b>Research Grant</b> – <i>Fondation du Domaine de Villette</i> CHF 5'000. Supporting graduate research in Munich and Copenhagen in 2024/2025	10/2024
<b>Erasmus+ Scholarship</b> – <i>Ludwig-Maximilians-Universität Munich</i> €600/month, 5 months. Awarded to support an exchange semester at the University of Copenhagen	05/2024
<b>College Prize in Applied Mathematics</b> – <i>Peterhouse, University of Cambridge</i> £800. Awarded in recognition of my academic achievements	12/2023
<b>Retrospective Scholarship in Mathematics</b> – <i>Peterhouse, University of Cambridge</i> £125. Awarded in recognition of my academic achievements	12/2023
<b>Research Grant</b> – <i>Fondation du Domaine de Villette</i> CHF 5'000. Supporting research and attendance to conferences in the summer 2023	06/2023
<b>Greta Burkill Fund award</b> – <i>Peterhouse, University of Cambridge</i> £800. Supporting attendance to conferences	03/2023
<b>Bruckmann Fund award</b> – <i>Peterhouse, University of Cambridge</i> £800. Supporting extracurricular travels	03/2023
<b>Annual Scholarship</b> – <i>Swiss Study Foundation</i> CHF 20'000. Financial support for master studies at the University of Cambridge	11/2022
<b>Excellence Scholarship</b> – <i>Colbianco Stiftung</i> CHF 2'000. Financial support for master studies at the University of Cambridge	08/2022
<b>Swiss Mobility Program grant</b> – <i>Ecole Polytechnique Fédérale de Lausanne</i> CHF 1'500. Supporting an exchange year at ETH Zurich	09/2021
<b>Baccalaureate Merit Award</b> – <i>Région Provence-Alpes Côte d'Azur</i> Awarded for achieving the highest distinction at the French Baccalaureate	07/2019

## ACADEMIC REFERENCES

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- **Prof. Alessandro Sfondrini** (*Padova project advisor*)  
Email: [alessandro.sfondrini@unipd.it](mailto:alessandro.sfondrini@unipd.it)
- **Dr. Prahar Mitra** (*Cambridge Part III essay setter*)  
Email: [p.mitra@uva.nl](mailto:p.mitra@uva.nl)