

Xavier Kervyn

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RESEARCH INTERESTS

Keywords: string theory, asymptotic symmetries, integrability, twistor theory, flat space holography

RESEARCH EXPERIENCE

Università degli Studi di Padova, Padova, Italy 07/2023
Visiting Researcher, Theoretical Physics present

- Research on integrability in string theory with [Prof. Alessandro Sfondrini](#) (Padova/IAS Princeton)
- TBA equations for strings propagating on mixed RR/NSNS background fluxes in $\text{AdS}_3 \times S^3 \times T^4$
- Funding: Fondation du Domaine de Villette

University of Cambridge, Cambridge, UK 12/2022

Part III student, Department of Applied Mathematics and Theoretical Physics 08/2023

- Part III essay under [Dr. Prahar Mitra](#) on the *BMS Symmetries of Gravitational Scattering*
- Work turned into a review article, uploaded to ArXiv: [2308.12979](https://arxiv.org/abs/2308.12979)
- Funding: Fondation Suisse d'Etudes (Swiss Study Foundation), Colbianco Stiftung

CERN CMS collaboration, Meyrin, Switzerland 06/2022

Undergraduate Researcher, ETH Zürich High-Energy Physics group 07/2022

- Worked under [Dr. Simone Pigazzini](#) (ETHZ/CERN) on the upgraded CMS ECAL for HL-LHC
- Wrote a [Python package](#) to automate the analysis of experiments and measured key properties
- Funding: ETH Zürich – Department of Physics

ETH Zürich, Zürich, Switzerland 09/2021

Undergraduate Researcher, Exoplanets and Habitability group 12/2021

- Worked under [Prof. Sascha Quanz](#) on the LIFE space mission (LIFEsim simulation software)
- Impact of imperfect nulling on the detection yield of the mission (Python code)

EDUCATION

TU München & Ludwig-Maximilians-Universität, Munich, Germany 10/2023

Elite Master Course in Theoretical and Mathematical Physics 08/2025

- Coursework: topology, geometry, mathematical gauge theory, topological string theory, CFT

Peterhouse, University of Cambridge, Cambridge, United Kingdom 10/2022

Master of Advanced Study (MASt) in Applied Mathematics 06/2023

- Part III essay (review article): *BMS Symmetries of Gravitational Scattering* ([Dr. Prahar Mitra](#))
- Coursework in theoretical physics: QFT; GR; string theory; SUSY; symmetries, particles and fields
- Funding: Fondation Suisse d'Etudes (Swiss Study Foundation), Colbianco Stiftung

Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland 09/2019

Bachelor of Science in Physics 08/2022

- Final year at **ETH Zürich** (Zurich, Switzerland) in the frame of the Swiss-Mobility program

PUBLICATIONS & PREPRINTS [[Inspire profile](#)]

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

CONFERENCES, SCHOOLS AND WORKSHOPS ATTENDED (*scheduled)

Workshop [...] in analysis and mathematical physics, Munich, Germany [link]	10/2023
Advanced school on [...] celestial holography (Celestial 2023), Warsaw, Poland [link]	08/2023
Integrability, Dualities and Deformations 2023, Durham, UK [link]	07/2023
Young Researchers Integrability School & Workshop 2023, Durham, UK [link]	07/2023
Eurostrings 2023, Gijon, Spain [link]	04/2023
Young Physicists Forum 2022, ETH Zürich, Switzerland [link]	05/2022

CONTRIBUTED TALKS & SEMINARS

DAMTP Part III Seminar Series, University of Cambridge	03/2023
Gravitational Scattering and covariant phase space methods in Gravity	
DAMTP Part III Seminar Series, University of Cambridge	12/2022
Holography and Twistor methods in AdS ₅	
Group Seminar, ETH Zürich HEP group & CERN CMS collaboration	07/2022
Towards an automatized analysis framework for the upcoming HL-LHC CMS ECAL upgrade	
LIFEsim Seminar, ETH Zürich Exoplanets and Habitability Group	12/2021
Characterisation of the impact of non-perfect nulls on the detectable planet population by LIFE	

TEACHING EXPERIENCE

Volunteer Tutor , <i>Village Book Builders</i> (remote)	
• 1:1 weekly online tutoring sessions with a 13yo. child in Mukono, Uganda	2022-23

SPECIFIC SKILLS

Languages: French (native); English, German (full working proficiency)
Programming: C++ (OOP), Python (NumPy, Pandas, Matplotlib, Seaborn, Plotly.express, SciPy)
Data Analysis: Python (advanced), MATLAB (intermediate), Microsoft Excel (elementary)
Scientific work: L^AT_EX, Mathematica, scientific writing, funding search and application

SELECTED AWARDS, GRANTS & SCHOLARSHIPS

Research Grant – <i>Fondation du Domaine de Villette</i>	06/2023
CHF 5'000 grant awarded to support summer research in Padova, Italy and Durham, UK	
Annual Scholarship – <i>Swiss Study Foundation</i>	11/2022
CHF 20'000 awarded for Masters studies at the University of Cambridge [press statement]	
Excellence Scholarship – <i>Colbianco Stiftung</i>	08/2022
CHF 2'000 awarded for Masters studies at the University of Cambridge	
Fellowship – <i>e-fellows.net</i>	06/2022
Admitted to the career and student network due to my results and extracurricular commitment	
Swiss Study Foundation Fellowship – <i>Swiss Study Foundation</i>	05/2022
The SSF supports outstanding students able to contribute to science and society	
Swiss Mobility Program grant – <i>Ecole Polytechnique Fédérale de Lausanne</i>	09/2021
CHF 1'500 awarded due to my results to pursue my studies at ETH Zurich	

ACADEMIC REFERENCES

- **Prof. Alessandro Sfondrini** (*Project supervisor*)
Dipartimento di Fisica e Astronomia "Galileo Galilei" - DFA, via F. Marzolo 8, Padova, Italy.
Email: alessandro.sfondrini@unipd.it / alessandro@ias.edu. Phone: +39 49 827 71 13
- **Dr. Prahar Mitra** (*Cambridge Part III essay setter*)
Office B0.02, Department of Applied Mathematics & Theoretical Physics, University of Cambridge, Wilberforce Road, Cambridge CB3 0WA, UK.
Email: pm729@damtp.cam.ac.uk
- **Prof. Matthias Gaberdiel** (*Lecturer for Quantum Mechanics I*)
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