

Stefano Lanza

*II. Institut für Theoretische Physik, Universität Hamburg
Luruper Chaussee 149, 22607 Hamburg, Germany*

Personal information

Born in Agropoli, Italy, 18/09/1992

nationality Italian

email stefano.lanza@desy.de

webpages <https://stefanolanzaphys.github.io>
<http://inspirehep.net/author/profile/S.Lanza.1>

Research interests

- » Deep learning techniques for string phenomenology
- » The string Landscape and the Swampland conjectures
- » Statistical learnability properties of the string landscape
- » Geometrical structures of string theory and supergravity

Research positions and employments

Nov. 2023 – current Hamburg University, Germany

Postdoc Research Assistant
Supervisor: Prof. Timo Weigand

Sep. 2020 – Oct. 2023 Utrecht University, The Netherlands

Postdoc Postdoctoral Researcher
Supervisor: Prof. Thomas W. Grimm

Feb. 2020 – Aug. 2020 Harvard University, Cambridge, USA

Postdoc Postdoctoral Fellow
Funded by a fellowship of Angelo Della Riccia Foundation, Florence and a fellowship of Aldo Gini Foundation, Padova
Supervisor: Prof. Matthew Reece

Education

Oct. 2016 – Dec. 2019 Università di Padova, Italy

Ph.D. Ph.D. student in Theoretical Physics
Research topic: Effective field theories of string and M-theory with fluxes and branes
Title of the thesis: Exploring the Landscape of effective field theories
Supervisor: Prof. Luca Martucci

Sep. 2014 – Jul. 2016 Università di Pisa, Italy

Master's degree Master's Degree in Theoretical Physics, received in July 2016.
Thesis: Renormalizability and finiteness of nonlocal Quantum Gravity
Supervisor: Prof. Damiano Anselmi
Grade: 110/110 cum laude

Sep. 2011 – Sep. 2014 Università di Pisa, Italy

Bachelor's degree Bachelor's Degree in Physics, received in September 2014.
Thesis: Path integral formulation of density matrices
Supervisor: Prof. Giampiero Paffuti
Grade: 110/110 cum laude

Sep. 2006 – July 2011 Liceo Scientifico A. Gatto, Agropoli, Italy

High School Diploma Scientific High School Diploma (Diploma di istruzione secondaria superiore ad indirizzo scientifico)
Grade: 100/100 cum laude

Ph.D. schools attended

- 11 – 23 June 2018 Cargèse Summer School: Quantum Gravity, Strings and Fields
Institut d'Etudes Scientifiques de Cargèse, Cargèse, France
- 9 – 27 Jan. 2017 GGI Lectures on the Theory of Fundamental Interactions
Galileo Galilei Institute, Florence, Italy
- 21 Nov. – 9 Dec. 2016 LACES 2016: Advanced Lectures on Fields and Strings
Galileo Galilei Institute, Florence, Italy

Scientific stays and visits

- 1 Oct. 2018 – 31 Jan. 2019 IFT UAM-CSIC, Madrid, Spain
Local Advisor: Prof. Fernando Marchesano
- 16 – 20 April 2018 Katholieke Universiteit Leuven, Leuven, Belgium

Teaching experience

- 2024 Teaching assistance for the course of *Quantum Field Theory II*
Master of Theoretical Physics, Hamburg University
for the academic years 2023/2024
Lecturer: Prof. Timo Weigand
- 2021 – 2023 Super-teaching assistance for the course of *General Relativity*
Master of Theoretical Physics, Utrecht University
for the academic years 2021/2022 and 2022/2023
Lecturer: Prof. Tomislav Prokopec

Supervision of graduate students

- 2021 – 2022 Daily supervisor of Master Student: *Thomas van Vuren* – ITF, Utrecht University
Thesis: Generalized Global Symmetries and the Swampland

Organizational and institutional responsibilities

- 21 – 24 May 2024 Co-organizer of the workshop *Strings and Geometry 2024*
Hamburg, Germany
- 2 – 5 May 2022 Co-organizer of the workshop *Strings and Geometry 2022*
Utrecht, The Netherlands
- 2021 – 2023 Co-organizer of the weekly String Theory Journal Club and the String Seminar Series
ITF, Utrecht University, The Netherlands (virtual)

Reviewing activities

- Since 2020 Reviewer for the scientific journal *Journal of High Energy Physics (JHEP)*

Talks, seminars and poster sessions

- 12 Oct. 2022 Taming the Distance Conjecture
Virginia Tech, USA (virtual)
- 5 July 2022 Taming the Distance Conjecture
Parallel talk at *21st String Phenomenology Conference, Liverpool, 2022*
- 14 June 2021 The EFT stringy viewpoint on Large Distances
Utrecht University, The Netherlands (virtual)
- 14 June 2021 The EFT stringy viewpoint on Large Distances
Parallel talk at *PASCOS 2021 (virtual)*
- 10 June 2021 Strings at the End of the Swampland
at *Cortona Young 2021 (virtual)*
- 19 May 2021 The EFT stringy viewpoint on Large Distances
for the *Joint hep-th seminars with ULB, VUB and KUL (virtual)*
- 12 Mar. 2021 The Web of Swampland Conjectures
National Seminar THEP, The Netherlands (virtual)
- 28 Sep. 2020 Strings, Membranes and the Web of Swampland Conjectures
Utrecht University (virtual)
- 1 Sep. 2020 Swampland Conjectures for Strings and Membranes
for the *Seminar Series on String Phenomenology (virtual)*
- 31 Aug. 2020 de Sitter space and Non-supersymmetric String Theories
Cosmo-hep webinar, McGill University, Canada (virtual)

23 July 2020	Swampland Conjectures for Strings and Membranes Gong show and poster presentation at <i>QFT and Geometry Summer School 2020 (virtual)</i>
27 Mar. 2020	Gauge three- and two-forms and extended objects in 4D EFTs <i>Harvard University, Cambridge, USA</i>
29 Oct. 2019	The Cobordism Conjecture and defects in effective field theories <i>University of Padova, Padova, Italy</i>
9 July 2019	Exploring the Landscape through Membranes Poster presentation at <i>Strings 2019, Brussels, Belgium</i>
19 March 2019	The Swampland Distance Conjecture <i>University of Padova, Padova, Italy</i>
25 May 2018	Three-forms: from Supergravity to Flux Compactifications Parallel talk at <i>New Frontiers in Theoretical Physics XXXVI, Cortona, Italy</i>
17 April 2018	Three-forms, Supergravity and Membranes <i>Katholieke Universiteit Leuven, Leuven, Belgium</i>
21 Nov. 2017	Gravitational instability of non-supersymmetric AdS vacua <i>University of Padova, Padova, Italy</i>

Language skills

ITALIAN · Mother tongue
 ENGLISH · Proficient
 SPANISH · Basic
 GERMAN · Basic

Computer skills and competences

OPERATING SYSTEMS · Windows, macOS
 PROGRAMMING SKILLS · C++, R, SQL (basic), python (intermediate)
 SCIENTIFIC SOFTWARES · Wolfram Mathematica (intermediate), Matlab (basic)
 OFFICE SUITES · Microsoft Office, iWork, OpenOffice
 MARKUP LANGUAGES · L^AT_EX (advanced), HTML (basic)
 GRAPHICS · Adobe Photoshop, Autodesk Graphic (advanced)

A list of publications is available at

<http://inspirehep.net/search?p=exactauthor%3AS.Lanza.1&sf=earliestdate>

- [1] S. Lanza, “Neural Network Learning and Quantum Gravity,” Mar. 2024. arXiv: [2403.03245 \[hep-th\]](#).
- [2] S. Lanza, “Machine learning the breakdown of tame effective theories,” Nov. 2023. arXiv: [2311.03437 \[hep-th\]](#).
- [3] T. W. Grimm, S. Lanza, and T. van Vuren, “Global symmetry-breaking and generalized theta-terms in Type IIB EFTs,” *JHEP*, vol. 10, p. 154, 2023. DOI: [10.1007/JHEP10\(2023\)154](#). arXiv: [2211.11769 \[hep-th\]](#).
- [4] T. W. Grimm, S. Lanza, and C. Li, “Tameness, Strings, and the Distance Conjecture,” *JHEP*, vol. 09, p. 149, 2022. DOI: [10.1007/JHEP09\(2022\)149](#). arXiv: [2206.00697 \[hep-th\]](#).
- [5] S. Lanza, F. Marchesano, L. Martucci, and I. Valenzuela, “Large Field Distances from EFT strings,” in *21st Hellenic School and Workshops on Elementary Particle Physics and Gravity*, May 2022. arXiv: [2205.04532 \[hep-th\]](#).
- [6] S. Cremonesi, S. Lanza, and L. Martucci, “Semiclassics of three-dimensional SCFTs from holography,” *JHEP*, vol. 10, p. 111, 2022. DOI: [10.1007/JHEP10\(2022\)111](#). arXiv: [2202.06970 \[hep-th\]](#).
- [7] S. Lanza, F. Marchesano, L. Martucci, and I. Valenzuela, “The EFT stringy viewpoint on large distances,” *JHEP*, vol. 09, p. 197, 2021. DOI: [10.1007/JHEP09\(2021\)197](#). arXiv: [2104.05726 \[hep-th\]](#).
- [8] I. Bandos, S. Lanza, and D. Sorokin, “BPS-Domain Walls for the Gaugino Condensate of $N = 1$ Super-Yang–Mills Theory,” *Phys. Part. Nucl. Lett.*, vol. 17, no. 5, pp. 654–659, 2020. DOI: [10.1134/S1547477120050052](#).
- [9] I. Basile and S. Lanza, “de Sitter in non-supersymmetric string theories: no-go theorems and brane-worlds,” *JHEP*, vol. 10, p. 108, 2020. DOI: [10.1007/JHEP10\(2020\)108](#). arXiv: [2007.13757 \[hep-th\]](#).
- [10] S. Lanza, F. Marchesano, L. Martucci, and I. Valenzuela, “Swampland Conjectures for Strings and Membranes,” *JHEP*, vol. 02, p. 006, 2021. DOI: [10.1007/JHEP02\(2021\)006](#). arXiv: [2006.15154 \[hep-th\]](#).
- [11] I. Bandos, S. Lanza, and D. Sorokin, “How $N = 1$, $D = 4$ SYM domain walls look like,” *PoS*, vol. CORFU2019, p. 155, 2020. DOI: [10.22323/1.376.0155](#). arXiv: [2004.11232 \[hep-th\]](#).
- [12] S. Lanza, “Exploring the Landscape of effective field theories,” Ph.D. dissertation, Padua U., 2019. arXiv: [1912.08935 \[hep-th\]](#).
- [13] S. Lanza, F. Marchesano, L. Martucci, and D. Sorokin, “How many fluxes fit in an EFT?” *JHEP*, vol. 10, p. 110, 2019. DOI: [10.1007/JHEP10\(2019\)110](#). arXiv: [1907.11256 \[hep-th\]](#).
- [14] I. Bandos, S. Lanza, and D. Sorokin, “Supermembranes and domain walls in $\mathcal{N} = 1$, $D = 4$ SYM,” *JHEP*, vol. 12, p. 021, 2019. DOI: [10.1007/JHEP12\(2019\)021](#). arXiv: [1905.02743 \[hep-th\]](#).
- [15] I. Bandos, F. Farakos, S. Lanza, L. Martucci, and D. Sorokin, “Variant 4D supergravities and membranes,” *J. Phys. Conf. Ser.*, vol. 1194, no. 1, p. 012012, 2019. DOI: [10.1088/1742-6596/1194/1/012012](#).
- [16] I. Bandos, F. Farakos, S. Lanza, L. Martucci, and D. Sorokin, “Higher Forms and Membranes in 4D Supergravities,” in *Durham Symposium, Higher Structures in M-Theory Durham, UK, August 12-18, 2018*, 2019. arXiv: [1903.02841 \[hep-th\]](#).
- [17] N. Cribiori and S. Lanza, “On the dynamical origin of parameters in $\mathcal{N} = 2$ supersymmetry,” *Eur. Phys. J.*, vol. C79, no. 1, p. 32, 2019. DOI: [10.1140/epjc/s10052-019-6545-6](#). arXiv: [1810.11425 \[hep-th\]](#).

- [18] I. Bandos, F. Farakos, S. Lanza, L. Martucci, and D. Sorokin, “Three-forms, dualities and membranes in four-dimensional supergravity,” *JHEP*, vol. 07, p. 028, 2018. DOI: [10.1007/JHEP07\(2018\)028](https://doi.org/10.1007/JHEP07(2018)028). arXiv: [1803.01405](https://arxiv.org/abs/1803.01405) [[hep-th](#)].
- [19] F. Farakos, S. Lanza, L. Martucci, and D. Sorokin, “Three-forms, Supersymmetry and String Compactifications,” in *12th International Workshop on Supersymmetries and Quantum Symmetries (SQS’17) Dubna, Russia, July 31-August 5, 2017*, 2017. arXiv: [1712.09366](https://arxiv.org/abs/1712.09366) [[hep-th](#)]. [Online]. Available: <http://inspirehep.net/record/1645288/files/arXiv:1712.09366.pdf>.
- [20] F. Farakos, S. Lanza, L. Martucci, and D. Sorokin, “Three-forms in Supergravity and Flux Compactifications,” *Eur. Phys. J.*, vol. C77, no. 9, p. 602, 2017. DOI: [10.1140/epjc/s10052-017-5185-y](https://doi.org/10.1140/epjc/s10052-017-5185-y). arXiv: [1706.09422](https://arxiv.org/abs/1706.09422) [[hep-th](#)].