Curriculum Vitae

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 I*
Master of Theoretical Physics, Hamburg University
for the academic years 2024/2025
Lecturer: Prof. Timo Weigand

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

2024 — Co-supervisor of Master Student: *Lukas Kaufmann* – University of Hamburg
Thesis: Bottom-up Emergent Strings

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

Organizational and institutional responsibilities

2024 – 2025 — Organizer of the weekly Journal Club on String Geometry
University of Hamburg, Germany

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

Reviewing activities

Since 2020 — Reviewer for the scientific journals *Journal of High Energy Physics (JHEP)* and *SciPost*

Talks, seminars and poster sessions

18 Dec. 2024 — Lectures on 'Machine Learning techniques for the String Landscape'
XX Avogadro meeting, Naples, Italy

8 Oct. 2024 — A model with cosmological Bell inequalities
Gravity and Entanglement workshop, Hamburg, Germany

24 Jun. 2024 — Neural Network Learning and Quantum Gravity
Parallel talk at 23rd String Phenomenology Conference, Padova, Italy

16 Apr. 2024 — Neural Network Learning and Quantum Gravity
Seminar Series on String Phenomenology

14 Dec. 2023 — Taming the Swampland
Swampland seminar, University of Hamburg, Germany

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 *QFT and Geometry Summer School 2020 (virtual)*

27 Mar. 2020 — Gauge three- and two-forms and extended objects in 4D EFTs
Harvard University, Cambridge, USA

29 Oct. 2019 — The Cobordism Conjecture and defects in effective field theories
University of Padova, Padova, Italy

9 July 2019 — Exploring the Landscape through Membranes
Poster presentation at *Strings 2019, Brussels, Belgium*

19 March 2019 — The Swampland Distance Conjecture
University of Padova, Padova, Italy

25 May 2018 — Three-forms: from Supergravity to Flux Compactifications
Parallel talk at *New Frontiers in Theoretical Physics XXXVI, Cortona, Italy*

17 April 2018 — Three-forms, Supergravity and Membranes
Katholieke Universiteit Leuven, Leuven, Belgium

21 Nov. 2017 — Gravitational instability of non-supersymmetric AdS vacua
University of Padova, Padova, Italy

Language skills

- Italian · Mothertongue
- 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 · LaTeX (advanced), HTML (basic)
- Graphics · Adobe Photoshop, Autodesk Graphic (advanced)

List of publications

A list of publications is available at
http://inspirehep.net/search?p=exactauthor%3AS.Lanza.1&sf=earliestdate

[1] S. Lanza and A. Westphal, "Uplifts in the Penumbra: Features of the Moduli Potential away from Infinite-Distance Boundaries," Dec. 2024. arXiv: 2412.12253 [hep-th].

[2] L. Kaufmann, S. Lanza, and T. Weigand, "Asymptotics of 5d Supergravity Theories and the Emergent String Conjecture," Dec. 2024. arXiv: 2412.12251 [hep-th].

[3] S. Lanza, "Neural network learning and Quantum Gravity," *JHEP*, vol. 07, p. 105, 2024. DOI: 10.1007/JHEP07(2024)105. arXiv: 2403.03245 [hep-th].

[4] S. Lanza, "Machine learning the breakdown of tame effective theories," *Eur. Phys. J. C*, vol. 84, no. 6, p. 631, 2024. DOI: 10.1140/epjc/s10052-024-12988-z. arXiv: 2311.03437 [hep-th].

[5] 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].

[6] 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].

[7] 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].

[8] 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].

[9] 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].

[10] 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.

[11] 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].

[12] 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].

[13] 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].

[14] S. Lanza, "Exploring the Landscape of effective field theories," Ph.D. dissertation, Padua U., 2019. arXiv: 1912.08935 [hep-th].

[15] 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].

[16] 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].

[17] 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. 012 012, 2019. DOI: 10.1088/1742-6596/1194/1/012012.

[18] 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].

[19] 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].

[20] 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. arXiv: 1803.01405 [hep-th].

[21] 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 [hep-th]. [Online]. Available: http://inspirehep.net/record/1645288/files/arXiv:1712.09366.pdf.

[22] 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. arXiv: 1706.09422 [hep-th].