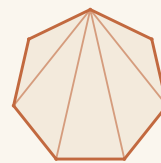


Giulio Salvatori

Theoretical physicist — scattering amplitudes & positive geometry

I look for the hidden geometry behind how particles scatter, reformulating quantum field theory in the language of curves on surfaces, polytopes, and tropical geometry.

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PROFESSIONAL POSITIONS

- 2024 — MSCA Global Fellow**
Institute for Advanced Study, Princeton · Max Planck Institute for Physics, Munich
- 2022 – 24 Postdoctoral Fellow**
Max Planck Institute for Physics, Munich
- 2019 – 22 Postdoctoral Fellow (joint)**
Brown University · Perimeter Institute · Institute for Advanced Study
- 2019 Visiting Scientist — ETH Zürich**
Invited by Prof. V. Del Duca · master integrals for Higgs-plus-jet production

EDUCATION

- 2016 – 19 Ph.D. Physics — Università degli Studi di Milano**
Thesis: *Amplituhedra for φ^3 theory at tree and loop level*
Advisor: Prof. Dietmar Klemm · *Scattering Amplitudes & Algebraic Geometry*
- 2014 – 16 M.Sc. Physics — Università degli Studi di Milano** 110/110 cum laude
Thesis: *Global Residue Theorem and Grassmannian formulation of N=4 super Yang–Mills*
Advisor: Prof. Sergio Cacciatori
- 2011 – 14 B.Sc. Physics — Università degli Studi di Milano** 110/110 cum laude
Thesis: *Quantum estimation for spin systems at criticality*
Advisor: Prof. Matteo Paris

SELECTED GRANTS & HONOURS

- 2024 Marie Skłodowska-Curie Global Fellowship** score 99%
Hosted by IAS Princeton & MPP Munich · €265,647.84

PRESS

Quanta Magazine — “Physicists Reveal a Quantum Geometry That Exists Outside of Space and Time”

PUBLICATIONS

17 publications · 8 in leading peer-reviewed journals · 3 single-authored · average **44.8** citations / paper
· **h-index 13**. Full record: inspirehep.net/authors/2098300

- 01★ SubTropica.** with M. Giroux & S. Mizera. *arXiv:2604.20954 [hep-th]*
- 02 Configuration Spaces of Finite Representation Type Algebras.** with N. Arkani-Hamed, H. Frost, P-G. Plamondon & H. Thomas. *arXiv:2512.24870 [math.RT]*
- 03★ All Loop Scattering as a Sampling Problem.** *JHEP 02, 196 (2026)*
- 04 The Cut Equation.** with N. Arkani-Hamed & H. Frost. *arXiv:2412.21027 [hep-th]*
- 05★ The Tropical Geometry of Subtraction Schemes.** *arXiv:2406.14606 [hep-th]*
- 06 Tropical Amplitudes for Colored Lagrangians.** with N. Arkani-Hamed, H. Frost & C. Figueiredo. *JHEP 05, 051 (2025)*
- 07 Exact Quark-Mass Corrections to Higgs + Jet Production at the LHC.** with R. Bonciani, V. Del Duca, H. Frellesvig et al. *Acta Phys. Polon. Supp. 17 (2024) 2*

- 08 **All Loop Scattering for All Multiplicity.** with N. Arkani-Hamed, H. Frost, P-G. Plamondon et al. *JHEP 09, 033 (2025)*
- 09 ★ **All Loop Scattering as a Counting Problem.** with N. Arkani-Hamed, H. Frost, P-G. Plamondon et al. *JHEP 08, 194 (2025)*
- 10 **Next-to-Leading-Order QCD Corrections to Higgs Production in Association with a Jet.** with R. Bonciani, V. Del Duca, H. Frellesvig et al. *Phys. Lett. B, 137995*
- 11 **Causal Diamonds, Cluster Polytopes and Scattering Amplitudes.** with N. Arkani-Hamed, S. He & H. Thomas. *JHEP 11, 049 (2022)*
- 12 **Scattering Amplitudes and Simple Canonical Forms for Simple Polytopes.** with S. Stanojevic. *JHEP 2021, 67 (2021)*
- 13 **The Complete Set of Two-Loop Master Integrals for Higgs + Jet Production in QCD.** with H. Frellesvig, M. Hidding, L. Maestri & F. Moriello. *JHEP 2020, 93 (2020)*
- 14 **Evaluating a Family of Two-Loop Non-Planar Master Integrals for Higgs + Jet Production with Full Heavy-Quark Mass Dependence.** with R. Bonciani, V. Del Duca, J. M. Henn, V. A. Smirnov et al. *JHEP 2020, 132 (2020)*
- 15 ★ **1-Loop Amplitudes from the Halohedron.** *JHEP 2019, 74 (2019)*
- 16 **Hyperbolic Geometry and Amplituhedra in 1+2 Dimensions.** with S. Cacciatori. *JHEP 2018, 167 (2018)*
- 17 **Quantum Metrology in Lipkin–Meshkov–Glick Critical Systems.** with A. Mandarino & M. Paris. *Phys. Rev. A 90, 022111 (2014)*

ORGANIZING

- 2026 **Meeting at the Extremes** co-organizer
Workshop, Institute for Advanced Study, Princeton · 18–22 May 2026
with N. Arkani-Hamed, H. Frost, M. Giroux & A. Guevara

TALKS & SEMINARS · SELECTED

- Plenary** **All Loop Scattering as a Sampling Problem**
Amplitudes 2025, Seoul National University
- Plenary** **Colorless Surfaceology**
QCD Meets Gravity 2024, LeCosPa / CTP / NTU
- Plenary** **Positive Geometries Beyond the Planar Limit**
QCD Meets Gravity 2020, Northwestern University
- Seminar** **A Primer on Surfaceology**
Mathematical Physics Seminar, Perimeter Institute · 2025
- Seminar** **The Tropical Geometry of Subtraction Schemes**
Mathematical Physics Seminar, University of Oxford
- Workshop** **A Supposedly Fun Computation I'll Never Do Again: Surfacehedra and Beyond**
String Amplitudes at Finite α' 2023, IAS
- Workshop** **The Positive Geometry of Riemann Surfaces**
MIAPbP 2022 · MITP 2021
- Workshop** **A Very Gentle Introduction to Positive Geometry**
Scattering Amplitudes & Cosmology 2023, ICTP

Earlier talks include Amplitudes 2018 (UC Davis), GGI 2018, and New Frontiers in Theoretical Physics XXXVI (2018), with research seminars at Durham, ETH Zürich, ASC Munich, and the IAS.

MENTORING & TEACHING

- 2025 **Michael Kasprzak — Princeton University**
Junior Paper: *Generalized String Theory Amplitudes*
- 2024 – 25 **Aaron Willen — Ludwig Maximilian University, Munich**
Master's thesis: *Tropical Tools for Feynman Integrals*

2016 – 18 **Teaching Assistant — Università degli Studi di Milano**
Mathematical Methods of Physics I · Geometry I

SKILLS & OUTREACH

LANGUAGES Italian (native) · English (fluent) · French (intermediate)

SOFTWARE Mathematica · Maple · Macaulay2 · LaTeX · C++ · CUDA