

Laurentiu Rodina

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Research Interests

Theoretical high energy physics, quantum field theory, string theory, scattering amplitudes, S-matrix/CFT bootstrap

Academic Positions

Associate Professor Beijing Institute of Mathematical Science and Applications (BIMSA), Beijing, China	2025-
Assistant Professor Beijing Institute of Mathematical Science and Applications (BIMSA), Beijing, China	2023-2025
Marie Skłodowska-Curie Action Postdoctoral Fellow Queen Mary University of London, London, UK	2022-2023
Postdoctoral Researcher National Taiwan University, Taipei, Taiwan	2020-2022
Postdoctoral Researcher Institute of Theoretical Physics, CEA, Saclay, France	2017-2020

Education

Ph.D. in Physics , Princeton University, Princeton, USA, Thesis: “ <i>On the uniqueness and consistency of scattering amplitudes</i> ” Advisor: Nima Arkani-Hamed	09/2011-07/2017
BSc in Mathematical Physics , Brown University, Providence, USA Graduated <i>with honors, magna cum laude</i>	09/2007-05/2011

Funding and Grants

General Program, National Natural Science Foundation of China (NSFC), 2024
Award amount 520.000 RMB/4 years

Beijing International Scientist Project, Beijing Natural Science Foundation (BJNSF), 2024
Award amount 200.000 RMB/2 years

Horizon 2020 Marie Skłodowska-Curie Action, Individual Fellowship, European Commission, 2021
Award amount 1.700.000 RMB/2 years

Scientific publications

Full publication list: <https://inspirehep.net/authors/1607940>.

1. A. Hillman, Y.-t. Huang, L. Rodina, J. Rumbutis, “*Spectral Constraints on Theories of Colored Particles and Gravity*”, under review, [arXiv:2411.04857]

2. L. Rodina, “*Hidden zeros are equivalent to ultraviolet scaling, and lead to unique amplitudes in $Tr(\phi^3)$ theory*”, accepted for publication **Phys. Rev. Lett.**, [arXiv:2406.04234]
3. G. Chen, L. Rodina, C. Wen , “*Kinematic Hopf algebra and BCJ numerators at finite α'* ”, **Phys. Rev. D** 110 (2024) 4, L041902, [arxiv:2403.04614]
4. G. Chen, L. Rodina, C. Wen, “*Kinematic Hopf algebra for amplitudes from higher-derivative operators*, **JHEP** 02 (2024) 096, [arxiv:2310.11943]
5. L-Y. Chiang, T.-C. Huang, Y-t. Huang, W. Li, L. Rodina, H-C. Weng, “*The Geometry of the Modular Bootstrap*”, **JHEP** 02 (2024) 209, [arxiv:2308.11692]
6. L-Y. Chiang, Y-t. Huang, L. Rodina, H-C. Weng , “*De-projecting the EFTheatron*”, **JHEP** 05 (2024) 102, [arxiv:2204.07140]
7. L-Y Chiang, Y-t. Huang, W. Li, L. Rodina, H-C. Weng, “*(Non)-projective bounds on gravitational EFT*,” [arXiv:2201.07177]
8. L-Y Chiang, Y-t. Huang, W. Li, L. Rodina, H-C. Weng, “*Into the EFTheatron and UV constraints from IR consistency*,” **JHEP** 03 (2022) 063, [arXiv:2105.02862]
9. J. J. M. Carrasco, L. Rodina, S. Zekioglu “*Composing effective prediction at five points*,” **JHEP** 06 (2021) 169, [arXiv:2104.08370]
10. L. Rodina, Z. Yin “*Exploring the landscape for soft theorems of nonlinear sigma models*,” **JHEP** 08 (2021) 096, [arXiv:2102.08396]
11. I. Low, L. Rodina and Z. Yin, “*Double Copy in Higher Derivative Operators of Nambu-Goldstone Bosons*,” **Phys. Rev. D** 103 (2021) 2, 025004, [arXiv:2009.00008]
12. Y. t. Huang, J. Y. Liu, L. Rodina and Y. Wang, “*Carving out the Space of Open-String S-matrix*,” **JHEP** 04 (2021) 195, [arXiv:2008.02293]
13. L. Rodina, “*UV consistency conditions for Cachazo-He-Yuan integrands*,” **Phys. Rev. D** 102 (2020) no.4, 045012, [arXiv:2005.06446]
14. J. J. M. Carrasco, L. Rodina, Z. Yin and S. Zekioglu, “*Simple encoding of higher derivative gauge and gravity counterterms*,” **Phys. Rev. Lett.** 125 (2020) 251602 , [arXiv:1910.12850]
15. J. J. M. Carrasco and L. Rodina, “*UV considerations on scattering amplitudes in a web of theories*,” **Phys. Rev. D** 100 (2019) no.12, 125007, [arXiv:1908.08033]
16. L. Rodina, “*Scattering Amplitudes from Soft Theorems and Infrared Behavior*,” **Phys. Rev. Lett.** 122 (2019) no.7, 071601, [arXiv:1807.09738]
17. L. Rodina, “*Uniqueness from gauge invariance and the Adler zero*,” **JHEP** 1909 (2019) 084, [arXiv:1612.06342]
18. L. Rodina, “*Uniqueness from locality and BCFW shifts*,” **JHEP** 1909 (2019) 078, [arXiv:1612.03885]
19. N. Arkani-Hamed, J. Trnka, and L. Rodina, “*Locality and Unitarity of Scattering Amplitudes from Singularities and Gauge Invariance*,” **Phys. Rev. Lett.** 120 (2018) no.23, 231602, [arXiv:1612.02797]
20. D. A. McGady and L. Rodina, “*Recursion relations for graviton scattering amplitudes from Bose symmetry and bonus scaling laws*,” **Phys. Rev. D** 91 (2015) no.10, 105010, [arXiv:1408.5125]
21. D. A. McGady and L. Rodina, “*Higher-spin massless S-matrices in four-dimensions*,” **Phys. Rev. D** (2014) no.8, 084048, [arXiv:1311.2938]

Talks

Major Conference Invited Talks

The 42nd International Conference on High Energy Physics, Prague, Czech Republic, 20/07/2024
Amplitudes 2022, Charles University, Czech Republic, 11/08/2022
Amplitudes 2020, Brown University, USA, 15/05/2020
QCD Meets Gravity 2019, UCLA, USA, 12/12/2019
Infrared Physics: Asymptotic BMS symmetry, soft theorems, memory, information paradox and all that, Solvay Institutes, Brussels, Belgium, 17/05/2018

Workshop Invited Talks

Algebra Geometry and Gravity, YMSC-Tsinghua University, China, 23/03/2024
Prague Spring Amplitudes Workshop, Charles University, Czech Republic, 15/05/2023
Annual Taiwan Theorists Interdisciplinary Workshop, NSYSU, Taiwan, 09/01/2022
NTU-Kyoto High energy theory workshop, NTU-Kyoto University, Taiwan-Japan, 02/12/2020
Symmetries of S-matrix and Infrared Physics, University of Edinburgh, UK, 18/07/2018

Seminar Talks

BIMSA, Beijing, China, 14/11/2024
Institute of Theoretical Physics, CAS, Beijing, China, 07/05/2024
Kavli Institute for Theoretical Sciences, UCAS, Beijing, China, 26/04/2024
Uppsala University, Uppsala, Sweden, 28/03/2024
Rencontres Theoriciennes, Ecole Normale Supérieure, Paris, France, 08/12/2022
ETH Zurich, Switzerland, 18/10/2022
Queen Mary University of London, London, UK, 10/02/2022
National Tsing Hua University, Hsinchu, Taiwan, 1/04/2021
National Taiwan University, Taipei, Taiwan, 30/11/2020
Ecole Polytechnique, Palaiseau, France, 26/11/2019
Humboldt University, Berlin, Germany, 29/05/2019
Zhejiang University, Hangzhou, China, 05/12/2018
Brown University, Providence, USA, 07/11/2018
Northwestern University, Evanston, USA, 22/10/2018
University of Geneva, Geneva, Switzerland, 12/07/2018
Johannes Gutenberg University, Mainz, Germany 14/03/2018
ITP CAS, Beijing, China, 15/11/2017
ITP CAS, Beijing, China, 13/11/2017
NBIA University of Copenhagen, Copenhagen, Denmark, 12/09/2017

Awards

Ruolin Best Paper Award, BIMSA, 2024
Teaching Award, Department of Physics, Princeton University, 2017
R. Bruce Lindsay Prize for Excellence in Physics, Brown University, 2011
S. C. Rosenberger Prize, Brown University, 2011
Shoman Fellowship, Brown University, 2010-2011

Undergraduate Teaching and Research Award, Brown University, 2009, 2010

Teaching

QFT II, Qiuzhen College, Tsinghua University, Spring 2025

The S-matrix program, BIMSA, Fall 2024

Two directions in scattering amplitudes, BIMSA, Spring 2024

The geometry of scattering amplitudes, BIMSA, Fall 2024

Mini-course “Causality and higher spins”, National Taiwan University, 10/2020

Assistant Instructor, Princeton University, 2012-2017

Introductory Physics, Fall 2013, Fall 2015, Spring 2016

Quantum Mechanics, Fall 2012

Introductory Physics (laboratory), Fall 2016, Spring 2017

General Physics (laboratory), Spring 2013, Fall 2014

Advanced Physics (laboratory), Spring 2014

Trainer for Physics Olympiad, Tudor Vianu National High School, 2008 - 2015

Journal Refereeing

Physical Review Letters, Physical Review B, Physical Review D, Journal of High Energy Physics, Science China Physics Mechanics and Astronomy

Outreach

Member Seminar, BIMSA, Beijing, China, 15/04/2024

Presentation to IPHT students, staff, and faculty, IPHT Colloquium, L'Isle sur Sorgue, France, 16/10/2018

Symposia in honor of Mani L. Bhaumik, IPHT, Gif-sur-Yvette, France, 16/05/2018

Undergraduate Teaching and Research Awards, Poster session, Brown University, 05/08/2009 & 06/08/2010

Grader/Referee for Romania in NASA's “Cassini Scientist for a Day” Contest, 2010 - 2021

Training

Research management course, QMUL, 11/2022

Developing knowledge and skills in Public Engagement, QMUL, 11/2022

Teaching developments course, Princeton University, 09/2015-05/2017

Languages

English (fluent), Romanian (native), French (beginner)