Mao Zeng

Curriculum Vitae

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Overview

I am a Royal Society University Research Fellow at the Higgs Centre for Theoretical Physics, University of Edinburgh. My research focuses on modern methods for scattering amplitudes and their applications to precision QCD and gravitational-wave physics. I have secured a total of £1,662,305 in individual grant income from the Royal Society, comprising an initial University Research Fellowship (2021–2025) and its subsequent three-year renewal (2026–2028).

Education

2010 – 2015: Doctor of Philosophy in Physics, C.N. Yang Institute for Theoretical Physics, Stony Brook University, United States.
PhD Advisor: George Sterman.
Research areas: Quantum chromodynamics, Effective field theories.

2009-2010: Certificate of Advanced Study in Mathematics (Part III Mathematics), Honours pass with distinction, Cambridge University, United Kingdom.
Study area: Mathematical physics.

2006-2009: Bachelor of Arts, First-class honours, top 5 of class in all three years, Cambridge University, United Kingdom. Study area: Experimental and theoretical physics.

Employment

2021-present: Royal Society University Research Fellow, Higgs Centre of Theoretical Physics, School of Physics and Astronomy, University of Edinburgh

2021: Royal Society University Research Fellow, Department of Physics, University of Oxford, United Kingdom.

2018-2020: Postdoctoral Scholar in theoretical particle physics, Department of Physics, ETH Zurich, Switzerland.

2015-2018: Postdoctoral Scholar in theoretical particle physics, Department of Physics and Astronomy, University of California at Los Angeles, USA

Awards and Funding

2026-2030: STFC Consolidated Grant, Particle Physics at the Higgs Centre, group grant for the whole Particle Physics Group at the Higgs Centre, with a significant allocation of funds for the scattering amplitudes sub-area.

2026-2028: Three-year Renewal of UK Royal Society University Research Fellowship, £697,305.00 of funding, project title "Scattering amplitudes, Feynman Integrals and Gravitational Wave Physics".

2023, 2026 (two times): Frontiers of Science Award, International Congress of Basic Science, Beijing, a total $25,000 award shared between 7 recipients, for work on the correspondence between scattering amplitudes and binary black hole dynamics.

2023-2026: STFC Consolidated Grant, Particle Physics at the Higgs Centre, group grant for the whole Particle Physics Group at the Higgs Centre, with a significant allocation of funds for the scattering amplitudes sub-area.

2021-2025: UK Royal Society University Research Fellowship, £965,000 of funding (£543,000 of initial funding, £410,000 from successful applications of supplemental funding, £12,000 from automatic funding increase), project title "Scattering amplitudes and applications to precision QCD and gravitational waves".

2018: (Declined) Marie Curie COFUND Fellowship (for postdoc position at Freiburg University, Germany; declined in favor of a regular postdoc position at ETH Zurich)

2016: President's Award to Distinguished Doctoral Student, Stony Brook University.
(Awarded annually to five doctoral graduates in all fields in the university)

2006-2010: Cambridge Overseas Scholarship, Cambridge University, UK
(Full tuition scholarship for four years of study)

2007: Percy Pemberton Prize for Distinguished Undergraduate Student, Trinity College, Cambridge University, UK
(Awarded annually to two first-year undergraduate students in Trinity College)

Publications (latest first)

56 publications, cited 5469 times as of 29 July, 2026, h index = 36, according to the database INSPIRE-HEP.net for high-energy physics publications.
(Links to publications: INSPIRE; arXiv)

[1] Justin Berman, Francois Charton, Andres Luna, Matthias Wilhelm, and Mao Zeng. "Efficient AI-Inspired Reduction of Feynman Integrals via Tube Seeding". In: (June 2026). arXiv: 2606.10698 [hep-ph].

[2] Zvi Bern, Enrico Herrmann, Radu Roiban, Michael S. Ruf, Alexander V. Smirnov, Sid Smith, and Mao Zeng. "Scattering Amplitudes and Conservative Binary Dynamics at O(G5) without Self-Force Truncation". In: *Phys. Rev. Lett.* 137.2 (2026), p. 021402. DOI: 10.1103/zjcp-ssrw. arXiv: 2512.23654 [hep-th].

[3] Alexander V. Smirnov and Mao Zeng. "FIRE 7: Automatic Reduction with Modular Approach". In: (Oct. 2025). arXiv: 2510.07150 [hep-ph].

[4] Zvi Bern, Enrico Herrmann, Radu Roiban, Michael S. Ruf, Alexander V. Smirnov, Vladimir A. Smirnov, and Mao Zeng. "Second-Order Self-Force Potential-Region Binary Dynamics at O(G5) in Supergravity". In: *Phys. Rev. Lett.* 136.8 (2026), p. 081401. DOI: 10.1103/jmby-htz9. arXiv: 2509.17412 [hep-th].

[5] Dogan Akpinar, Graham R. Brown, Riccardo Gonzo, and Mao Zeng. "Unexpected symmetries of Kerr black hole scattering". In: *Phys. Rev. D* 113.10 (2026), p. L101501. DOI: 10.1103/dd5t-8dn5. arXiv: 2508.10761 [hep-th].

[6] Sid Smith and Mao Zeng. "Feynman integral reduction using syzygy-constrained symbolic reduction rules". In: *JHEP* 01 (2026), p. 102. DOI: `10.1007/JHEP01(2026)102`. arXiv: `2507.11140 [hep-th]`.

[7] Mao Zeng. "Reinforcement learning and metaheuristics for Feynman-integral reduction". In: *Phys. Rev. D* 112.11 (2025), p. 114051. DOI: `10.1103/dmlf-jkfc`. arXiv: `2504.16045 [hep-ph]`.

[8] Dogan Akpinar, Fernando Febres Cordero, Manfred Kraus, Alexander Smirnov, and Mao Zeng. "First Look at Quartic-in-Spin Binary Dynamics at Third Post-Minkowskian Order". In: *Phys. Rev. Lett.* 135.4 (2025), p. 041602. DOI: `10.1103/c2dh-tj4v`. arXiv: `2502.08961 [hep-th]`.

[9] Zeno Capatti and Mao Zeng. "Classical worldlines from scattering amplitudes". In: *Phys. Rev. D* 111.12 (2025), p. 125002. DOI: `10.1103/PhysRevD.111.125002`. arXiv: `2412.10864 [hep-th]`.

[10] Alexander Smirnov and Mao Zeng. "Feynman integral reduction: balanced reconstruction of sparse rational functions and implementation on supercomputers in a co-design approach". In: (Sept. 2024). DOI: `10.26089/NumMet.2024s03`. arXiv: `2409.19099 [hep-ph]`.

[11] Zvi Bern, Enrico Herrmann, Radu Roiban, Michael S. Ruf, and Mao Zeng. "Global bases for nonplanar loop integrands, generalized unitarity, and the double copy to all loop orders". In: *JHEP* 06 (2025), p. 115. DOI: `10.1007/JHEP06(2025)115`. arXiv: `2408.06686 [hep-th]`.

[12] Dogan Akpinar, Fernando Febres Cordero, Manfred Kraus, Michael S. Ruf, and Mao Zeng. "Spinning black hole scattering at $\mathcal{O}(\mathrm{G}^3\mathrm{S}^2)$: Casimir terms, radial action and hidden symmetry". In: *JHEP* 03 (2025), p. 126. DOI: `10.1007/JHEP03(2025)126`. arXiv: `2407.19005 [hep-th]`.

[13] Zvi Bern, Enrico Herrmann, Radu Roiban, Michael S. Ruf, Alexander V. Smirnov, Vladimir A. Smirnov, and Mao Zeng. "Amplitudes, supersymmetric black hole scattering at $\mathcal{O}\left(G^5\right)$, and loop integration". In: *JHEP* 10 (2024), p. 023. DOI: `10.1007/JHEP10(2024)023`. arXiv: `2406.01554 [hep-th]`.

[14] Andrei V. Belitsky, Anna A. Kokosinskaya, Alexander V. Smirnov, Vadim V. Voevodin, and Mao Zeng. "Efficient Reduction of Feynman Integrals on Supercomputers". In: *Lobachevskii J. Math.* 45.7 (2024), pp. 2984–2994. DOI: `10.1134/S1995080224603709`. arXiv: `2402.07499 [hep-ph]`.

[15] Alexander V. Smirnov and Mao Zeng. "FIRE 6.5: Feynman integral reduction with new simplification library". In: *Comput. Phys. Commun.* 302 (2024), p. 109261. DOI: `10.1016/j.cpc.2024.109261`. arXiv: `2311.02370 [hep-ph]`.

[16] Zvi Bern, Enrico Herrmann, Radu Roiban, Michael S. Ruf, Alexander V. Smirnov, Vladimir A. Smirnov, and Mao Zeng. "Conservative Binary Dynamics at Order $\alpha 5$ in Electrodynamics". In: *Phys. Rev. Lett.* 132.25 (2024), p. 251601. DOI: `10.1103/PhysRevLett.132.251601`. arXiv: `2305.08981 [hep-th]`.

[17] Kirill Mokrov, Alexander Smirnov, and Mao Zeng. "Rational Function Simplification for Integration-by-Parts Reduction and Beyond". In: (Apr. 2023). DOI: `10.26089/NumMet.v24r425`. arXiv: `2304.13418 [hep-ph]`.

[18] Leor Barack et al. "Comparison of post-Minkowskian and self-force expansions: Scattering in a scalar charge toy model". In: *Phys. Rev. D* 108.2 (2023), p. 024025. DOI: `10.1103/PhysRevD.108.024025`. arXiv: `2304.09200 [hep-th]`.

[19] Mao Zeng. "Feynman integrals from positivity constraints". In: *JHEP* 09 (2023), p. 042. DOI: `10.1007/JHEP09(2023)042`. arXiv: `2303.15624 [hep-ph]`.

[20] Zvi Bern, Julio Parra-Martinez, Radu Roiban, Michael S. Ruf, Chia-Hsien Shen, Mikhail P. Solon, and Mao Zeng. "Scattering amplitudes and conservative dynamics at the fourth post-Minkowskian order". In: *PoS* LL2022 (2022), p. 051. DOI: `10.22323/1.416.0051`.

[21] Fernando Febres Cordero, Manfred Kraus, Guanda Lin, Michael S. Ruf, and Mao Zeng. "Conservative Binary Dynamics with a Spinning Black Hole at O(G3) from Scattering Amplitudes". In: *Phys. Rev. Lett.* 130.2 (2023), p. 021601. DOI: 10.1103/PhysRevLett.130.021601. arXiv: 2205.07357 [hep-th].

[22] Alessandra Buonanno, Mohammed Khalil, Donal O'Connell, Radu Roiban, Mikhail P. Solon, and Mao Zeng. "Snowmass White Paper: Gravitational Waves and Scattering Amplitudes". In: *Snowmass 2021*. Apr. 2022. arXiv: 2204.05194 [hep-th].

[23] Zvi Bern, Juan Pablo Gatica, Enrico Herrmann, Andres Luna, and Mao Zeng. "Scalar QED as a toy model for higher-order effects in classical gravitational scattering". In: *JHEP* 08 (2022), p. 131. DOI: 10.1007/JHEP08(2022)131. arXiv: 2112.12243 [hep-th].

[24] Zvi Bern, Julio Parra-Martinez, Radu Roiban, Michael S. Ruf, Chia-Hsien Shen, Mikhail P. Solon, and Mao Zeng. "Scattering Amplitudes, the Tail Effect, and Conservative Binary Dynamics at O(G4)". In: *Phys. Rev. Lett.* 128.16 (2022), p. 161103. DOI: 10.1103/PhysRevLett.128.161103. arXiv: 2112.10750 [hep-th].

[25] R. Alves Batista et al. "EuCAPT White Paper: Opportunities and Challenges for Theoretical Astroparticle Physics in the Next Decade". In: (Oct. 2021). arXiv: 2110.10074 [astro-ph.HE].

[26] Enrico Herrmann, Julio Parra-Martinez, Michael S. Ruf, and Mao Zeng. "Radiative classical gravitational observables at $\mathcal{O}(\mathrm{G}^3)$ from scattering amplitudes". In: *JHEP* 10 (2021), p. 148. DOI: 10.1007/JHEP10(2021)148. arXiv: 2104.03957 [hep-th].

[27] Enrico Herrmann, Julio Parra-Martinez, Michael S. Ruf, and Mao Zeng. "Gravitational Bremsstrahlung from Reverse Unitarity". In: *Phys. Rev. Lett.* 126.20 (2021), p. 201602. DOI: 10.1103/PhysRevLett.126.201602. arXiv: 2101.07255 [hep-th].

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[29] Charalampos Anastasiou, Rayan Haindl, George Sterman, Zhou Yang, and Mao Zeng. "Locally finite two-loop amplitudes for off-shell multi-photon production in electron-positron annihilation". In: *JHEP* 04 (2021), p. 222. DOI: 10.1007/JHEP04(2021)222. arXiv: 2008.12293 [hep-ph].

[30] Samuel Abreu, Harald Ita, Francesco Moriello, Ben Page, Wladimir Tschernow, and Mao Zeng. "Two-Loop Integrals for Planar Five-Point One-Mass Processes". In: *JHEP* 11 (2020), p. 117. DOI: 10.1007/JHEP11(2020)117. arXiv: 2005.04195 [hep-ph].

[31] Julio Parra-Martinez, Michael S. Ruf, and Mao Zeng. "Extremal black hole scattering at $\mathcal{O}(G^3)$: graviton dominance, eikonal exponentiation, and differential equations". In: *JHEP* 11 (2020), p. 023. DOI: 10.1007/JHEP11(2020)023. arXiv: 2005.04236 [hep-th].

[32] Zvi Bern, Andres Luna, Radu Roiban, Chia-Hsien Shen, and Mao Zeng. "Spinning black hole binary dynamics, scattering amplitudes, and effective field theory". In: *Phys. Rev. D* 104.6 (2021), p. 065014. DOI: 10.1103/PhysRevD.104.065014. arXiv: 2005.03071 [hep-th].

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[34] Samuel Abreu, Lance J. Dixon, Enrico Herrmann, Ben Page, and Mao Zeng. "The two-loop five-point amplitude in $\mathcal{N} = 8$ supergravity". In: *JHEP* 03 (2019), p. 123. DOI: 10.1007/JHEP03(2019)123. arXiv: 1901.08563 [hep-th].

[35] Zvi Bern, Clifford Cheung, Radu Roiban, Chia-Hsien Shen, Mikhail P. Solon, and Mao Zeng. "Scattering Amplitudes and the Conservative Hamiltonian for Binary Systems at Third Post-Minkowskian Order". In: *Phys. Rev. Lett.* 122.20 (2019), p. 201603. DOI: 10.1103/PhysRevLett.122.201603. arXiv: 1901.04424 [hep-th].

[36] Samuel Abreu, Lance J. Dixon, Enrico Herrmann, Ben Page, and Mao Zeng. "The two-loop five-point amplitude in $\mathcal{N} = 4$ super-Yang-Mills theory". In: *Phys. Rev. Lett.* 122.12 (2019), p. 121603. DOI: 10.1103/PhysRevLett.122.121603. arXiv: 1812.08941 [hep-th].

[37] Samuel Abreu, Ben Page, and Mao Zeng. "Differential equations from unitarity cuts: nonplanar hexa-box integrals". In: *JHEP* 01 (2019), p. 006. DOI: 10.1007/JHEP01(2019)006. arXiv: 1807.11522 [hep-th].

[38] Samuel Abreu, Fernando Febres Cordero, Harald Ita, Ben Page, and Mao Zeng. "Five-Point Two-Loop Amplitudes from Numerical Unitarity". In: *PoS* LL2018 (2018), p. 016. DOI: 10.22323/1.303.0016. arXiv: 1807.09447 [hep-ph].

[39] Zvi Bern, Michael Enciso, Harald Ita, and Mao Zeng. "Two-loop D-dimensional unitarity and dual conformal symmetry". In: *PoS* LL2018 (2018), p. 084. DOI: 10.22323/1.303.0084. arXiv: 1807.08434 [hep-th].

[40] Ben Page, Samuel Abreu, Fernando Febres Cordero, Harald Ita, Matthieu Jaquier, and Mao Zeng. "First two-loop amplitudes with the numerical unitarity method". In: *PoS* RADCOR2017 (2018). Ed. by Andre Hoang and Carsten Schneider, p. 012. DOI: 10.22323/1.290.0012.

[41] Zvi Bern, Michael Enciso, Chia-Hsien Shen, and Mao Zeng. "Dual Conformal Structure Beyond the Planar Limit". In: *Phys. Rev. Lett.* 121.12 (2018), p. 121603. DOI: 10.1103/PhysRevLett.121.121603. arXiv: 1806.06509 [hep-th].

[42] Zvi Bern, John Joseph Carrasco, Wei-Ming Chen, Alex Edison, Henrik Johansson, Julio Parra-Martinez, Radu Roiban, and Mao Zeng. "Ultraviolet Properties of $\mathcal{N} = 8$ Supergravity at Five Loops". In: *Phys. Rev. D* 98.8 (2018), p. 086021. DOI: 10.1103/PhysRevD.98.086021. arXiv: 1804.09311 [hep-th].

[43] Samuel Abreu, Fernando Febres Cordero, Harald Ita, Ben Page, and Mao Zeng. "Computing Planar Five-Gluon Amplitudes with Numerical Unitarity". In: *53rd Rencontres de Moriond on QCD and High Energy Interactions*. 2018, pp. 241–244.

[44] Samuel Abreu, Fernando Febres Cordero, Harald Ita, Ben Page, and Mao Zeng. "Planar Two-Loop Five-Gluon Amplitudes from Numerical Unitarity". In: *Phys. Rev. D* 97.11 (2018), p. 116014. DOI: 10.1103/PhysRevD.97.116014. arXiv: 1712.03946 [hep-ph].

[45] Zvi Bern, Michael Enciso, Harald Ita, and Mao Zeng. "Dual Conformal Symmetry, Integration-by-Parts Reduction, Differential Equations and the Nonplanar Sector". In: *Phys. Rev. D* 96.9 (2017), p. 096017. DOI: 10.1103/PhysRevD.96.096017. arXiv: 1709.06055 [hep-th].

[46] Zvi Bern, John Joseph M. Carrasco, Wei-Ming Chen, Henrik Johansson, Radu Roiban, and Mao Zeng. "Five-loop four-point integrand of $N = 8$ supergravity as a generalized double copy". In: *Phys. Rev. D* 96.12 (2017), p. 126012. DOI: 10.1103/PhysRevD.96.126012. arXiv: 1708.06807 [hep-th].

[47] Zvi Bern, Michael Enciso, Julio Parra-Martinez, and Mao Zeng. "Manifesting enhanced cancellations in supergravity: integrands versus integrals". In: *JHEP* 05 (2017), p. 137. DOI: 10.1007/JHEP05(2017)137. arXiv: 1703.08927 [hep-th].

[48] S. Abreu, F. Febres Cordero, H. Ita, M. Jaquier, B. Page, and M. Zeng. "Two-Loop Four-Gluon Amplitudes from Numerical Unitarity". In: *Phys. Rev. Lett.* 119.14 (2017), p. 142001. DOI: 10.1103/PhysRevLett.119.142001. arXiv: 1703.05273 [hep-ph].

[49] Mao Zeng. "Differential equations on unitarity cut surfaces". In: *JHEP* 06 (2017), p. 121. DOI: 10.1007/JHEP06(2017)121. arXiv: 1702.02355 [hep-th].

[50] S. Dawson, P. Jaiswal, Ye Li, H. Ramani, and Mao Zeng. “Resummation of jet veto logarithms at N^3LL_a + NNLO for W^+W^- production at the LHC”. In: *Phys. Rev. D* 94.11 (2016), p. 114014. DOI: 10.1103/PhysRevD.94.114014. arXiv: 1606.01034 [hep-ph].

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Talks and Presentations (latest first)

1. Machine Learning for Optimizing Feynman Integral Algorithms, remote talk at Neural Collisions seminar series on HEP / ML in the Annecy-Geneva-Lausanne area, 21 May 2026
2. Gravitational Waves, Feynman Integrals, and Machine Learning CERN Theory Colloquium, 06 May 2026
3. Particle Physics Methods for Precision Gravitational Wave Physics, IoP Joint APP-HEPP Conference, 08 Apr 2026
4. QCD Integrals Meet Gravity, QCD Meets Gravity 2025 Conference, ICTP-SAIFR, Sao Paulo, Brazil, 16 Dec 2025
5. Optimizing Feynman Integral Reduction, remote talk at Amplitudes Lounge seminar series at Padova University, 21 Nov 2025
6. Collider Physics Methods for Gravitational Wave Physics, Colloquium at High Energy Physics Group, Southern University of Science and Technology, China, 23 Jul 2025
7. Caravel reveals surprising symmetries in Kerr binaries, Caravel Collaboration Meeting 2025, University of Zurich, 26 Jun 2025
8. Unexpected symmetries in Kerr black hole scattering, Amplitudes 2025 Conference, Seoul National University, 16 Jun 2025
9. Efficient supercomputer-scale IBP reduction, Scattering Amplitudes @ Liverpool Workshop, University of Liverpool, 26 Mar 2025
10. Classical worldlines from scattering amplitudes, Workshop on First Quantization in Strong Fields, Higgs Centre for Theoretical Physics, University of Edinburgh, 27 Feb 2025
11. Finite classical observables from amplitudes and the emergent worldline, Theoretical Physics seminar at Queen Mary University of London, 28 Nov 2024
12. Unity of scattering amplitude and worldline approaches to binary dynamics, Theoretical Physics seminar at Scuola Normale Superiore, Pisa, Italy, 14 Nov 2024

13. Collider Methods for Gravitational Wave Physics, Particle Phenomenology Seminar at the University of Liverpool, 13 Mar 2024
14. Scattering Amplitudes and Gravitational Wave Physics, remote, Theoretical Particle Physics Seminar at the University of Sussex, 06 Nov
15. Lectures on Gravitational Binary dynamics from Scattering Amplitudes, 6^{th} School of Analytic Computing in High-Energy and Gravitational Theoretical Physics, Atrani, Italy, 12-13 Oct 2023
16. Adding FUEL to FIRE for faster IBP, "MathemAmplitudes 2023: QFT at the Computational Frontier" conference at Padova University, Italy, 26 Sep 2023
17. Feynman integrals from positivity constraints, remote, Seminar at the University of Colorado Boulder, Nuclear Theory Group, 07 Sep 2023
18. Overview: scattering amplitudes and the gravitational two-body problem, Gravitational Waves meet Amplitudes in the Southern Hemisphere, ICTP-SAIFR, Brazil, 15 Aug 2023
19. Scattering Amplitudes and Gravitational Wave Physics, Frontiers of Science Lecture for receiving an award at the First International Congress of Basic Science, Beijing, 20 Jul 2023
20. Feynman integrals from positivity constraints, LoopFest XXI conference, SLAC National Accelerator Laboratory, 27 Jun 2023
21. Feynman integrals from positivity constraints, remote, Amplitudes Seminar at Bonn University, 11 May 2023
22. Feynman integrals from positivity constraints, remote, Peking University HEP Seminar, 02 Feb, 2023
23. A new method for evaluating Feynman integrals, Zurich Phenomenology Workshop, 12 Jan, 2023
24. Electrodynamics as toy model for binary gravitational dynamics at higher orders, remote, Physics in Intense Fields Conference 2022 (PIF22), Plymouth University, 31 Aug, 2022
25. Multi-loop integrals for binary dynamics, Workshop on From Scattering Amplitudes to Gravitational-Wave Predictions for Compact Binaries, University of Zurich, 14 Jul, 2022
26. Spinning binary black holes & 2-loop scattering amplitudes, remote, Seminar at Institute of Theoretical Physics, Chinese Academy of Science, 30 Jun, 2022
27. Multi-loop scattering amplitudes and gravitational binary dynamics, remote, Colloquium at CERN Department of Theoretical Physics, 02 Mar, 2022
28. Multi-loop scattering amplitudes and gravitational binary dynamics, Seminar at Kings College London, 26 Jan, 2022.
29. Amplitudes, Loops, and Gravity, Seminar at Queen Mary University of London, remote, 11 Nov, 2021.
30. Conservative and radiative binary dynamics from scattering amplitudes, remote, Amplitudes 2021 International Conference, Michigan State University, 18 Aug, 2021.
31. Particle physics methods for gravitational wave physics, remote, Qingdao Summer School in Particle Physics Theory, Qingdao University, China, Jul 13, 2021
32. Importing perturbative QCD methods into gravitational wave physics, remote, Radcor-LoopFest 2021 Conference, Florida State University, May 20, 2021.
33. Integrals for post-Minkowskian classical dynamics, remote, GGI Workshop on Gravitational Scattering, Inspiral, and Radiation, May 12, 2021
34. Gravitational physics from scattering amplitudes and collider methods, remote, Colloquium at University of Oxford, Apr 30, 2021
35. Third-post-Minkowskian binary dynamics from KMOC formalism, remote, UCLA / AEI Potsdam joint journal club, Mar 09, 2021
36. New results for gravitational binary dynamics from scattering amplitudes, remote, Seminar at Nordita, Feb 16, 2021
37. New results for gravitational binary dynamics from QFT amplitudes, remote, Seminar at Mathematical Institute, University of Oxford, Jan 26, 2021
38. Locally finite representation of 2-loop amplitudes, remote, Seminar at University of Edinburgh, Oct 22, 2020
39. Factorization and subtraction of singularities of 2-loop amplitudes, remote, Seminar at Peking Univer-

sity, Oct 13, 2020

40. NNLO subtraction for numerical integration of virtual amplitudes, remote, QCD@LHC-X Conference, CERN, Sep 10, 2020
41. Towards 4th-Post-Minkowskian Potential, QCD Meets Gravity Conference, University of California at Los Angeles, Dec 10, 2019
42. Black Hole Binary Dynamics from Scattering Amplitudes, Seminar at Zurich University, Dec 03, 2019
43. Orbital Dynamics from double copy and EFT, RadCor 2019 – 14th International Symposium on Radiative Corrections, 11 September 2019
44. Generalized unitarity and numerical ansatzes for 2-loop 5-point amplitudes, LoopFest XVIII Conference, Fermilab, August 13, 2019
45. Generalized unitarity and frontiers of perturbative QFT, Seminar at SLAC National Accelerator Laboratory, August 08, 2019
46. High-multiplicity Frontier for Amplitudes at the LHC, Annual Meeting of the Institute of Theoretical Physics, Chinese Academy of Science, Beijing, April 29, 2019
47. Loop amplitudes from unitarity and ansatz, Particle Physics Seminar at the Institute for Theoretical Physics, ETH Zurich, February 26, 2019
48. The high-multiplicity frontier for two-loop QCD, Workshop on Amplitudes in the LHC Era, Galileo Galilei Institute for Theoretical Physics, Florence, October 29, 2018
49. Five-loop UV properties of N=8 supergravity, International Workshop on High Precision for Hard Processes, Albert-Ludwidgs-Universitat Freiburg, October 03, 2018
50. Calculating supergravity divergences at high loop orders, Amplitudes 2018 International Conference, SLAC National Accelerator Laboratory, June 20, 2018
51. Integral reduction and five-loop supergravity, Workshop on Taming the Complexity of Multiloop Integrals, June 05, 2018
52. Two-loop D-dimensional unitarity and dual conformal symmetry, 14th Workshop on Loops and Legs in Quantum Field Theory, St. Goar, Germany, May 04, 2018
53. Unitarity cuts beyond loop integrands, Seminar at SLAC National Accelerator Laboratory, December 01, 2017.
54. Unitarity cuts and loop amplitudes in QCD and supersymmetric theories, Seminar at UC Los Angeles, October 03, 2017.
55. QCD at the LHC using new theoretical tools in scattering amplitudes, Seminar at Lawrence Berkeley National Laboratory, Sep 20, 2017.
56. Unitarity cuts and UV divergences, Scattering Amplitudes and Beyond Workshop, Kavli Institute for Theoretical Physics, UC Santa Barbara, Jun 29, 2017.
57. Differential equations and integration by parts from unitarity, LoopFest XVI Workshop, Argonne National Laboratory, Jun 02, 2017
58. Towards multi-jet production at NNLO, Topical Workshop on QCD Structure of Nucleons in the Modern Era, UC Los Angeles, May 06, 2017.
59. New integration-by-parts techniques for gravity amplitudes, QCD Meets Gravity Workshop, UC Los Angeles, Dec 05, 2016.
60. Partial N3LL + NNLO resummation for WW production under a jet veto, LoopFest XV Conference, University at Buffalo, Aug 16, 2016
61. Same title as above, Seminar UC San Diego, Jun 14, 2016.
62. Same title as above, Seminar at Harvard University, May 10, 2016.
63. Jet vetoes and discrete symmetries, QCD Factorization Workshop, University at Buffalo, Nov 03, 2015.
64. Drell-Yan Process with Jet Vetoes: Breaking of Generalized Factorization, The 12th International Symposium on Radiative Corrections and LoopFest XIV, UC Los Angeles, Jun 17, 2015.
65. Transverse Momentum Resummation effects in WW measurements, PITT-PACC Workshop on QCD and Beyond at Colliders, Pittsburgh University, Nov 14, 2014.
66. Same title as above, Seminar at Argonne National Laboratory, Nov 12, 2014.

67. Same title as above, Phenomenology / Experiment Joint Seminar, Stony Brook University, Sep 29, 2014.
68. Effective Field Theory for Higgs plus Jet Production, Seminar at Brookhaven National Laboratory, Sep 26, 2014.
69. Transverse Momentum Resummation effects in WW measurements, remote, ATLAS Collaboration Standard Model Plenary Meeting, Aug 14, 2014.
70. Parton Luminosity Shapes and Threshold Resummation in SCET and Direct QCD, XIth Annual Workshop on Soft-Collinear Effective Theory, Technical University of Munich, Mar 26, 2014.

Teaching

2024-2025: Project supervisor of Senior Honours Mathematical Physics Program, University of Edinburgh. Two students supervised.

2024-: Project supervisor of MSc program at Edinburgh University. Seven MSc students supervised so far.

2023:- Supervisor for summer project of exchange undergraduate student from Nankai University, China

2022-: Lecturer for Computer Simulations, course for 2nd year undergraduate physics students, Edinburgh University

2022-: PhD student supervision. Three PhD students supervised.

2018-2019: Supervision of master student thesis, ETH Zurich (postdoc appointment)

2021-: Project supervisor of MPhys program at Edinburgh University. Two MPhys students supervised so far.

2018-2019: Supervision of master student thesis, ETH Zurich (postdoc appointment)

Fall 2018: Teaching Coordinator for Quantum Field Theory I, ETH Zurich (postdoc appointment)

Spring 2011: graduate Teaching Assistant for PHY 512 Quantum Mechanics II, Stony Brook University

Summer 2011 and Fall 2011: graduate Teaching Assistant for PHY 124 Physics for the Life Sciences II, Stony Brook University

Fall 2010 and Spring 2011: graduate Teaching Assistant for PHY 277 Computation for Physics and Astronomy, Stony Brook University