Andrzej Pokraka

Personal information

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Academic appointments

Senior Postdoctoral Researcher, Universe+ (ERC Synergy Grant) 2025–30
University of Amsterdam, Netherlands
Institute for Advanced Study, Princeton, USA

Postdoctoral Researcher 2022–25
Brown University, Providence, USA

Education

Doctor of Philosophy in Physics 2022
McGill University, Montreal, Canada • Advisor: Prof. Simon Caron-Huot

Master of Science in Physics 2017
University of Alberta, Edmonton, Canada • Advisor: Prof. Andrzej Czarnecki

Bachelor of Science in Physics, High Honours 2015
University of Saskatchewan, Saskatoon, Canada • Minors: Mathematics, Studio Art

Awards and fellowships

Fonds de recherche Nature et technologies Québec doctoral award 2019–22
CAD 80,000 • Main applicant • McGill University

Walter Sumner Foundation Fellowship 2017–19
CAD 16,000 • McGill University

NSERC Canada Graduate Scholarship – Master's 2016–17
CAD 17,500 • Main applicant • University of Alberta

University of Alberta Graduate Recruitment Scholarship 2015–16
CAD 22,500 • University of Alberta

Walter H. Johns Graduate Fellowship 2015–16
CAD 5,000 • University of Alberta

NSERC Undergraduate Student Research Award 2013–15
3 × CAD 4,500 • Co-applicant • University of Saskatchewan

Publications

27 papers, 785 citations, h-index 14 (INSPIRE, 31 October 2026). Two papers have at least 100 citations and six have over 50. As is customary in my field, authors are listed alphabetically.

[1] C. Larkin, A. J. McLeod, A. Pokraka and L. Ren, *Direct-to-Symbol Integration from Landau Analysis*, 2609.15952.

[2] A. J. McLeod, A. Pokraka and L. Ren, *A Graphical Coaction for FRW Integrals from Partial/Relative Twisted (Co)homology*, 2606.13627.

[3] G. Crisanti, H. Frellesvig, A. Pokraka and S. Smith, *Magic Relations and Critical Varieties of Feynman Integrals*, 2605.29789.

[4] A. McLeod, A. Pokraka and L. Ren, *A Graphical Coaction for FRW Wavefunction Coefficients*, 2603.25703.

[5] J. Gong, A. Pokraka, K. Yan and X. Zhang, *Toward the analytic bootstrap of energy correlators*, *JHEP* **06** (2026) 140, [2509.22782].

[6] A. Pokraka, L. Ren and C. Rodriguez, *A double copy from twisted (co)homology at genus g*, *JHEP* (accepted), [2509.01598].

[7] R. Glew and A. Pokraka, *Kinematic flow from the flow of cuts*, *JHEP* **06** (2026) 158, [2508.11568].

[8] A. Pokraka, M. Spradlin, A. Volovich and H.-C. Weng, *Symbol alphabets in QCD and flag cluster algebras*, *JHEP* **03** (2026) 120, [2506.11895].

[9] S. De, S. Paranjape, A. Pokraka, M. Spradlin and A. Volovich, *Hidden zeros of the cosmological wavefunction*, *JHEP* **07** (2025) 174, [2503.23579].

[10] S. De and A. Pokraka, *A physical basis for cosmological correlators from cuts*, *JHEP* **03** (2025) 040, [2411.09695].

[11] S. De, A. Pokraka, M. Skowronek, M. Spradlin and A. Volovich, *Surfaceology for colored Yukawa theory*, *JHEP* **09** (2024) 160, [2406.04411].

[12] A. Pokraka, S. Rajan, L. Ren, A. Volovich and W. W. Zhao, *Five-dimensional spinor helicity for all masses and spins*, *JHEP* **07** (2025) 056, [2405.09533].

[13] M. Giroux, A. Pokraka, F. Porkert and Y. Sohnle, *The soaring kite: a tale of two punctured tori*, *JHEP* **05** (2024) 239, [2401.14307].

[14] R. Bhardwaj, A. Pokraka, L. Ren and C. Rodriguez, *A double copy from twisted (co)homology at genus one*, *JHEP* **07** (2024) 040, [2312.02148].

[15] S. Caron-Huot, A. Pokraka and Z. Zahraee, *Two-point sum-rules in three-dimensional Yang-Mills theory*, *JHEP* **01** (2024) 195, [2309.04472].

[16] M. Giroux, A. Pokraka, F. Porkert and Y. Sohnle, *Looping the loops: a tale of elliptic dual Feynman integrals*, *PoS* **RADCOR2023** (2024) 033, [2309.04592].

[17] S. De and A. Pokraka, *Cosmology meets cohomology*, *JHEP* **03** (2024) 156, [2308.03753].

[18] M. Giroux and A. Pokraka, *Loop-by-loop differential equations for dual (elliptic) Feynman integrals*, *JHEP* **03** (2023) 155, [2210.09898].

[19] S. Caron-Huot and A. Pokraka, *Duals of Feynman Integrals. Part II. Generalized unitarity*, *JHEP* **04** (2022) 078, [2112.00055].

[20] S. Caron-Huot and A. Pokraka, *Duals of Feynman integrals. Part I. Differential equations*, *JHEP* **12** (2021) 045, [2104.06898].

[21] R. Gonzo and A. Pokraka, *Light-ray operators, detectors and gravitational event shapes*, *JHEP* **05** (2021) 015, [2012.01406].

[22] S. Mizera and A. Pokraka, *From Infinity to Four Dimensions: Higher Residue Pairings and Feynman Integrals*, *JHEP* **02** (2020) 159, [1910.11852].

[23] A. H. Fariborz, J. Ho, A. Pokraka and T. G. Steele, *The Bridge Between Chiral Lagrangians and QCD Sum-Rules*, *Nucl. Part. Phys. Proc.* **309-311** (2020) 119–123, [1909.07243].

[24] A. Pokraka and A. Czarnecki, *Parapositronium can decay into three photons*, *Phys. Rev. D* **96** (2017) 093002, [1707.09466].

[25] A. Pokraka and A. Czarnecki, *Positronium Decay into a Photon and Neutrinos*, *Phys. Rev. D* **94** (2016) 113012, [1611.07645].

[26] A. Pokraka and R. Dick, *Dimensional Effects on the Density of States in Systems with Quasi-Relativistic Dispersion Relations and Potential Wells*, *Can. J. Phys.* **94** (2016) 773–779, [1511.09421].

[27] A. H. Fariborz, A. Pokraka and T. G. Steele, *Connections between chiral Lagrangians and QCD sum-rules*, *Mod. Phys. Lett. A* **31** (2016) 1650023, [1505.05553].

Conference presentations

A coaction for FRW correlators from relative/partial twisted (co)homology Sep 2026
Scattering Amplitudes: from Positive Geometries to Analytic Structures • Pollica Physics Center, Pollica, Italy

A double copy at higher genus from twisted (co)homology Sep 2026
Elliptics and Beyond '26 • SwissMAP Research Station, Les Diablerets, Switzerland

Kinematic flow and new languages for correlators Jun 2026
Expanding Thoughts on de Sitter • La Ricotta, As Barreiras, Spain

A diagrammatic coaction for FRW power-law cosmological correlators • recorded — Mar 2026
Amplitudes and Algebraic Geometry • Erwin Schrödinger Institute, Vienna, Austria

Twisted (co)homology and single-valued integration — Jan 2026
YOUNGST@RS: Single-Valued Periods in Scattering Amplitudes (virtual) • Mainz Institute for Theoretical Physics, Germany

Relative twisted (co)homology for amplitudes and cosmology — Nov 2025
YOUNGST@RS: Loop-the-Loop (virtual) • Mainz Institute for Theoretical Physics, Germany

Zonotopes in cosmology: where and how to find them — Nov 2025
Cosmology Meets Non-Linear Algebra • University of Amsterdam, Netherlands

Relative twisted (co)homology in QFT — Oct 2025
Michigan Math-Physics Amplitudes Workshop • University of Michigan, Ann Arbor, USA

Relative twisted (co)homology in QFT — Sep 2025
New Ways To Higher Points • Humboldt University of Berlin, Germany

A double copy from twisted (co)homology at genus-one — Sep 2024
Eurostrings 2024 • University of Southampton, UK

Surfaceology for colored Yukawa theory • recorded — Aug 2024
The Mathematics behind Scattering Amplitudes • Galileo Galilei Institute, Florence, Italy

A physical basis for cosmological correlators from cuts — Aug 2024
Special Functions: from Geometry to Fundamental Interactions • TU Munich, Germany

Kinematic flow from the flow of cuts — Jul 2024
Amplitudes Afterparty • National Taiwan University, Taipei, Taiwan

Two-point sum-rules in three-dimensional Yang-Mills theory — Jun 2024
S-Matrix Bootstrap • Reykjavík University, Iceland

An epsilon-form differential equation for the 5-mass kite: a tale of two elliptic curves — Jun 2024
Beyond Elliptic Polylogarithms • Casa Matemática Oaxaca, Mexico

A double copy from twisted (co)homology at genus-one — Mar 2024
S-matrix Marathon • Institute for Advanced Study, Princeton, USA

Cosmology meets cohomology — Feb 2024
Universe+ Kickoff Conference • MPI for Mathematics in the Sciences, Leipzig, Germany

Cosmology meets cohomology — Sep 2023
Mathemamplitudes 2023 • University of Padova, Italy

A double copy from twisted (co)homology at genus-one — Sep 2023
Elliptics and Beyond • ETH Zürich, Switzerland

Loop-by-loop differential equations for dual (elliptic) Feynman integrals — Dec 2022
QCD Meets Gravity • ETH Zürich, Switzerland

The Duals of Feynman Integrals — Aug 2022
Amplitudes 2022 • Charles University, Prague, Czech Republic

The Duals of Feynman Integrals — May 2022
Loop Fest XX • University of Pittsburgh, USA

The Duals of Feynman Integrals — Dec 2021
QCD Meets Gravity (virtual) • University of California, Los Angeles, USA

Duals of Feynman Integrals, II: Generalized Unitarity — Oct 2021
Elliptics 2021 (virtual) • Uppsala University, Sweden

Duals of Feynman Integrals, I: Differential Equations • recorded — Jun 2021
CAP Virtual Congress • Canadian Association of Physicists

On the Poincaré dual of Feynman integrals Jul 2019
Amplitudes 2019 (poster) • Trinity College Dublin, Ireland

Positronium decay into a photon and neutrinos Jul 2016
Women in Physics Canada Conference • University of Saskatchewan, Saskatoon, Canada

New positronium decay channel Feb 2016
Winter Nuclear and Particle Physics Conference • TRIUMF, Banff, Canada

Invited seminars

Dublin Area Theoretical Physics Colloquium, Trinity College Dublin (2026) • Durham (2026) • MaScAmp Synergy Grant series: MPI for Gravitational Physics, Trinity College Dublin, Uppsala and Oxford (2026) • Uppsala (2026, 2023) • Joint Belgium High-Energy Seminars, Ghent (2025) • Universe+ Synergy Grant series: IAS Princeton, Amsterdam, MPP Munich, MPI MiS Leipzig (2025) • Perimeter Institute (2025) • McGill (2024) • Institute for Advanced Study (2024, 2022, 2021) • Bonn (2023) • Centre de Recherches Mathématiques, Montreal (2022) • Hertfordshire (2022, 2021) • Freiburg (2021) • Turin (2021) • CERN (2021) •
Michigan State (2019).

Maintained software

`frwcoaction.ca` • Web app for the graphical coaction of FRW correlators (source) 2026

Service and organizing

Organizer • Universe+ Online Seminar Series • University of Amsterdam 2026–Present

Organizer (3 days, ∼30 participants) • Cosmology Meets Non-Linear Algebra • University of Amsterdam Nov 2025

Organizer (1 day, ∼80 participants) • New England Strings 2023 • Brown University Apr 2023

Organizer • Graduate Student Physics Research Symposium • University of Alberta Sep 2016

Journal referee: JHEP (since 2019) • Phys. Rev. D (since 2023) 2019–Present

Mentoring

I have helped mentor 11 junior researchers (10 PhD students and one undergraduate), publishing with each of them.

Teaching

Guest lectures during my PhD and postdoctoral appointments: in graduate electromagnetism (Jackson), graduate quantum field theory (Srednicki) and fourth-year quantum mechanics (Griffiths)

Teaching assistant • McGill University • Electrodynamics I and II (Griffiths); advanced quantum mechanics 2017–19

Organized preparation sessions for the CAP University Prize Exam • Alberta (2015, 2016), McGill (2017, 2018) • students from these sessions placed 5th (2016) and 9th (2017) in Canada 2015–18

Teaching assistant • University of Alberta • First- and second-year physics help desk 2015–17