

DALIMIL MAZÁČ

Email: dalimil.mazac@ipht.fr

Phone: +33629910075

Website: www.dalimilmazac.com

Institut de Physique Théorique
 Université Paris Saclay, CEA, CNRS
 F-91191 Gif-sur-Yvette
 France

ACADEMIC POSITIONS

2023-present	Institut de Physique Théorique, CEA Saclay	permanent member (ingénieur chercheur au CEA)
2020-2023	Institute for Advanced Study, Princeton School of Natural Sciences	Founders' Circle member
2017-2020	Simons Center for Geometry and Physics & C.N. Yang Institute for Theoretical Physics, Stony Brook	research assistant professor

EDUCATION

2017	University of Waterloo Perimeter Institute for Theoretical Physics	Ph.D. in Physics advisor: Davide Gaiotto
2012	University of Waterloo Perimeter Scholars International	M.Sc. in Physics
2011	University of Cambridge Trinity College	B.A. in Mathematics first class distinction every year

AWARDS AND HONORS

2020-present	Affiliated Investigator, Simons Collaboration on the Nonperturbative Bootstrap
2018	Votruba prize for the best thesis in theoretical physics
2012-2017	Perimeter Institute PhD Award
2011-2012	Perimeter Scholars International Award
2010	Senior Scholarship, Trinity College, Cambridge
2009	Junior Scholarship, Trinity College, Cambridge
2008	Gold medal, International Physics Olympiad
2007	Gold medal, International Physics Olympiad

PUBLICATIONS

- [1] J. Bonifacio, D. Mazáč, and S. Pal, *Spectral Bounds on Hyperbolic 3-Manifolds: Associativity and the Trace Formula*, [[arXiv:2308.11174](#)].
- [2] W. Knop and D. Mazáč, *Dispersive sum rules in AdS₂*, *JHEP* **10** (2022) 038, [[arXiv:2203.11170](#)].

- [3] T. Hartman, D. Mazáč, D. Simmons-Duffin, and A. Zhiboedov, *Snowmass White Paper: The Analytic Conformal Bootstrap*, [[arXiv:2202.11012](#)].
- [4] S. Collier, D. Mazáč, and Y. Wang, *Bootstrapping boundaries and branes*, *JHEP* **02** (2023) 019, [[arXiv:2112.00750](#)].
- [5] P. Kravchuk, D. Mazáč, and S. Pal, *Automorphic spectra and the conformal bootstrap*, *Comm. Amer. Math. Soc.* **4** (2024) 1–63, [[arXiv:2111.12716](#)].
- [6] S. Caron-Huot, D. Mazáč, L. Rastelli, and D. Simmons-Duffin, *AdS Bulk Locality from Sharp CFT Bounds*, *JHEP* **11** (2021) 164, [[arXiv:2106.10274](#)].
- [7] S. Caron-Huot, D. Mazáč, L. Rastelli, and D. Simmons-Duffin, *Sharp Boundaries for the Swampland*, *JHEP* **07** (2021) 110, [[arXiv:2102.08951](#)].
- [8] S. Caron-Huot, D. Mazáč, L. Rastelli, and D. Simmons-Duffin, *Dispersive CFT Sum Rules*, *JHEP* **05** (2021) 243, [[arXiv:2008.04931](#)].
- [9] D. Mazáč, L. Rastelli, and X. Zhou, *A Basis of Analytic Functionals for CFTs in General Dimension*, *JHEP* **08** (2021) 140, [[arXiv:1910.12855](#)].
- [10] T. Hartman, D. Mazáč, and L. Rastelli, *Sphere Packing and Quantum Gravity*, *JHEP* **12** (2019) 048, [[arXiv:1905.01319](#)].
- [11] D. Mazáč, L. Rastelli, and X. Zhou, *An Analytic Approach to BCFT_d*, *JHEP* **12** (2019) 004, [[arXiv:1812.09314](#)].
- [12] D. Mazáč, *A Crossing-Symmetric OPE Inversion Formula*, *JHEP* **06** (2019) 082, [[arXiv:1812.02254](#)].
- [13] D. Mazáč and M. F. Paulos, *The Analytic Functional Bootstrap II: Natural Bases for the Crossing Equation*, *JHEP* **02** (2019) 163, [[arXiv:1811.10646](#)].
- [14] D. Mazáč and M. F. Paulos, *The Analytic Functional Bootstrap I: 1D CFTs and 2D S-matrices*, *JHEP* **02** (2019) 162, [[arXiv:1803.10233](#)].
- [15] B. Gabai, D. Mazáč, A. Shieber, P. Vieira, and Y. Zhou, *No Particle Production in Two Dimensions: Recursion Relations and Multi-Regge Limit*, *JHEP* **02** (2019) 094, [[arXiv:1803.03578](#)].
- [16] N. Bobev, E. Lauria, and D. Mazáč, *Superconformal Blocks for SCFTs with Eight Supercharges*, *JHEP* **07** (2017) 061, [[arXiv:1705.08594](#)].
- [17] D. Mazáč, *Analytic Bounds and Emergence of AdS₂ Physics from the Conformal Bootstrap*, *JHEP* **04** (2017) 146, [[arXiv:1611.10060](#)].
- [18] N. Bobev, S. El-Showk, D. Mazáč, and M. F. Paulos, *Bootstrapping SCFTs with Four Supercharges*, *JHEP* **08** (2015) 142, [[arXiv:1503.02081](#)].
- [19] N. Bobev, S. El-Showk, D. Mazáč, and M. F. Paulos, *Bootstrapping the Three-Dimensional Supersymmetric Ising Model*, *Phys. Rev. Lett.* **115** (2015), no. 5 051601, [[arXiv:1502.04124](#)].
- [20] D. Gaiotto, D. Mazáč, and M. F. Paulos, *Bootstrapping the 3d Ising Twist Defect*, *JHEP* **03** (2014) 100, [[arXiv:1310.5078](#)].
- [21] D. Mazáč and A. Hamma, *Topological Order, Entanglement, and Quantum Memory at Finite Temperature*, *Annals Phys.* **327** (2012) 2096, [[arXiv:1112.0947](#)].

PLENARY CONFERENCE AND WORKSHOP TALKS

Simons Bootstrap Collaboration Annual Meeting, New York City	Nov 2023
Durham Symposium 2023: Spectral Gaps	Aug 2023
Bootstrapping Quantum Gravity, KITP, Santa Barbara	Jan 2023
Computational Differential Geometry and its Applications in Physics, SCGP	Nov 2022
Positivity, PCTS, Princeton	Nov 2022
Probability and Conformal Field Theory 2022, Agay les roches rouges	Sep 2022
Amplitudes 2022, Prague	Aug 2022
String Math 2022, Warsaw	Jul 2022
Possible and Impossible in Effective Field Theory, IAS, Princeton	May 2022
Boundaries and Defects in CFT and Holography, PCTS, Princeton	Mar 2022
Simons Bootstrap Collaboration Annual Meeting, New York City	Nov 2021
Bootstrapping String Theory, Aspen Center for Physics	Aug 2021
Sphere Packing and the Conformal Bootstrap, SCGP	Dec 2020
Developments in the Numerical Bootstrap, SCGP	Oct 2019
Quantum-Mechanical Systems at Large Quantum Number, SCGP	Sep 2019
Integrability in Gauge and String Theories, Nordita	Jul 2019
Strings 2019, Brussels	Jul 2019
Nonperturbative Methods for Conformal Theories, ITP Natal	Apr 2019
Analytic Approaches to the Bootstrap, Azores	May 2018
Bootstrap Approach to Conformal Field Theories and Applications, OIST	Mar 2018
Nonperturbative and Numerical Approaches to Quantum Gravity, String Theory and Holography, ICTS Bangalore	Feb 2018
Infrared Behaviour of Conformal and Quasi-Conformal Gauge Theories, SCGP	Jan 2018
Simons Summer Workshop 2017, SCGP	Jul 2017
Bootstrap 2017, ICTP-SAIFR	Jun 2017
S-matrix Bootstrap, EPFL	Jan 2017
Back to the Bootstrap IV, Weizmann Institute	May 2015
Flux Tubes, Perimeter Institute	May 2015

INVITED SEMINARS AND COLLOQUIA

Institut de Mathématique d'Orsay, Harmonic Analysis Seminar	Feb 2024
University of Torino, Theoretical Physics Seminar	Jan 2024
King's College London, Theoretical Physics Seminar	Nov 2023
University of Amsterdam, String Seminar	Nov 2023
IAS School of Mathematics, Special Seminar on Sphere Packing	Nov 2023
Seed Seminar of Mathematics and Physics Paris	Oct 2023
Rencontres Théoriciennes Paris	Sep 2023
Neve Shalom Joint Seminar	May 2023
Weizmann Institute HET Group Meeting	May 2023
Joint Columbia-CUNY-NYU Number Theory Seminar	May 2023
Purdue University, High Energy Theory Seminar	May 2023

Caltech, High Energy Theory Seminar	Mar 2023
Western Hemisphere Colloquium on Geometry and Physics (virtual)	Nov 2022
Rutgers University, Number Theory Seminar	Nov 2022
CRM Montréal, Mathematical Physics Seminar	Oct 2022
IPhT-Saclay, Séminaire Exceptionnel	Apr 2022
DAMTP Cambridge, Theoretical High Energy Physics Seminar	Mar 2022
ETH Zürich, QFT, Strings and Beyond Seminar Series (virtual)	Mar 2022
IAS School of Mathematics, Mathematical Physics Seminar	Mar 2022
AEI Potsdam, Gravity, Quantum Fields and Information Seminar (virtual)	Feb 2022
Durham University, HEP Seminar (virtual)	Feb 2022
Rutgers University, NHETC Seminar (virtual)	Feb 2022
ICTS Bangalore, String Theory and Quantum Gravity Seminar (virtual)	Feb 2022
Neve Shalom Joint Seminar (virtual)	Jan 2022
ICTP Trieste, High Energy Seminar	Jan 2022
Stanford, SITP Colloquium (virtual)	Dec 2021
IHES, Quantum Encounters Seminar (virtual)	Nov 2021
DESY Hamburg, String Theory Seminar (virtual)	Nov 2021
King's College London, Theoretical Physics Seminar (virtual)	Nov 2021
Durham University, Amplitudes and Correlators Journal Club (virtual)	Oct 2021
Crete Center for Theoretical Physics, HEP Seminar (virtual)	Oct 2021
Codes, Sphere Packings, Lattices, and CFTs Online Seminar (virtual)	Sep 2021
CEICO Prague, String Theory Seminar	June 2021
UCLA, Theoretical Elementary Particle Physics Seminar (virtual)	June 2021
UC Davis, Fields, Strings and Gravity Seminar (virtual)	May 2021
CERN, String Theory Seminar (virtual)	Apr 2021
East Asian Strings Webinar (virtual)	Mar 2021
QFT and Geometry Online Seminar (virtual)	Mar 2021
NYU, Physics Research Seminar (virtual)	Feb 2021
Nordic Remote HET Seminar (virtual)	Oct 2020
Bootstrap Collaboration Online Seminar (virtual)	Sep 2020
Caltech, High Energy Theory Seminar (virtual)	Sep 2020
TIFR Mumbai, Quantum Spacetime Seminar (virtual)	Jun 2020
Brown University, High Energy Theory Seminar	Feb 2020
Rencontres Théoriciennes Paris	Dec 2019
Harvard, String Duality Seminar	Oct 2019
ETH Zürich, Strings, CFT & Integrability Seminar (virtual)	Oct 2019
UIUC, Mathematical and Theoretical Physics Seminar	Oct 2019
CEICO Prague, String Theory Seminar	Oct 2019
McGill University, Theory Seminar	May 2019
Caltech, High Energy Theory Seminar	May 2019
University of Michigan, Brown Bag Seminar	Mar 2019
NYU, High Energy Physics Seminar	Mar 2019

Cornell, Theory Seminar	Feb 2019
Laval University, High Energy Theory Seminar (virtual)	Feb 2019
ENS Paris, Theoretical Physics Seminar	Dec 2018
CERN, String Theory Seminar	Dec 2018
EPFL Lausanne, High Energy Seminar	Dec 2018
Doppler Institute Prague, Seminar	Dec 2018
Texas A&M, High Energy Theory Seminar	Oct 2018
City University of New York, High Energy Physics Seminar	Sep 2018
Perimeter Institute, Quantum Fields and Strings Seminar	Feb 2018
IISc Bangalore, High Energy Journal Club	Feb 2018
ENS Paris, Theoretical Physics Seminar	Dec 2017
Institute of Physics Prague, String Theory Seminar	Dec 2017
Bootstrap Collaboration Online Seminar (virtual)	Jan 2017
UC Davis, Fields, Strings and Gravity Seminar	Dec 2016
Caltech, Informal High Energy Seminar	Dec 2016
Stanford, High Energy Theory Seminar	Dec 2016
YITP Stony Brook, String Theory Seminar	Sep 2016
PCTS Princeton, High Energy Theory Seminar	Sep 2016
KU Leuven, String Theory Seminar	Jan 2015
DAMTP Cambridge, String Theory Seminar	Jan 2015
King's College London, String Theory Seminar	Jan 2015
Institute of Physics Prague, String Theory Seminar	Jan 2015
CERN, Journal Club on String Theory	Dec 2014

DEPARTMENTAL TALKS

IPhT Saclay, Mathematical Physics Seminar	Nov 2023
IAS, High Energy Theory Seminar	Apr 2023
IAS, School of Mathematics, Journal Club on CFT	Mar 2023
IAS, Physics Group Meeting	Nov 2021
IAS, High Energy Theory Seminar (virtual)	Oct 2020
SCGP, Physics Group Meeting	Sep 2020
SCGP, Physics Group Meeting	Apr 2019
SCGP, Weekly Colloquium	Feb 2018
YITP, Bootstrap Journal Club	May 2017
Perimeter Institute, String Theory Group Meeting	Oct 2016
Perimeter Institute, String Theory Group Meeting	Nov 2013

TEACHING

Graduate Schools

- Lecturer, *Topics in the Bootstrap* (4 lectures), CERN Winter School, August 2022.
 Lecturer, *Bootstrap Introduction* (3 lectures), Bootstrap School 2018, Caltech, July 2018.

Stony Brook University

Recitation instructor for *PHY132: Electromagnetism and Optics*, Fall 2018, lecturer: Peter Koch.

University of Waterloo, Perimeter Institute for Theoretical Physics

Teaching assistant (TA) for *Quantum Field Theory II*, Fall 2015, lecturer: François David.

TA for *Conformal Field Theory*, Fall 2014, lecturers: Jaume Gomis and Pedro Vieira.

TA for *String Theory*, Winter 2014, lecturer: Davide Gaiotto.

TA for *Quantum Field Theory I*, Fall 2013, lecturer: Freddy Cachazo.

TA for *Explorations in String Theory*, Spring 2013, lecturer: Pedro Vieira.

TA for *Beyond Standard Model*, Winter 2013, lecturers: Itay Yavin and Natalia Toro.

GRADUATE MENTORING

Sridip Pal (postdoc at the Institute for Advanced Study), joint publications [1, 5]

Waltraut Knop (PhD student at Stony Brook University), joint publication [2]

Thibaud Raymond (masters student at École Normale Supérieure)

Atharva Patil (masters student at Université Paris-Saclay)

Acted as a project leader at the Perimeter Scholars International Winter School 2016 and 2017
led research projects with participating masters students, resulting in publication [15]

OUTREACH

On Quantum Fields and Sphere Packings, popular talk for Friends of the IAS, Princeton Apr 2021

Instructor of the Advanced Physics Club, School Nova, 2018-2019, Stony Brook
led regular problem-solving sessions with local high-school students

Project leader at the International Summer School for Young Physicists 2015, Perimeter Institute
led a research project with high-school participants of ISSYP 2015

SERVICE

Member of the scientific council, Institut de Physique Théorique, CEA-Saclay, 2024-present

Organizer, SCGP Workshop: Sphere Packing and the Conformal Bootstrap, December 2020

Referee for the journals: JHEP, SciPost Physics