



Jarosław Kopiński

Curriculum Vitae

Research Experience

- 2026– **Researcher**, *Center for Theoretical Physics, Polish Academy of Sciences, Poland*
- 2023–2026 **Krener Visiting Assistant Professor**, *University of California, Davis, USA*
- 2020–2023 **Postdoctoral Researcher**, *Center for Theoretical Physics, Polish Academy of Sciences, Poland*

Education

- 2015–2020 **PhD in Theoretical Physics**, *University of Warsaw, Poland*
- 2013–2015 **Master's Degree**, *Physics, University of Warsaw, Poland*
- 2010–2013 **Bachelor's Degree**, *Physics, University of Poznań, Poland*

Scientific Interests

Conformal and projective geometry in general relativity
Geometric inequalities for black holes

Collaborations

Masaryk University, Brno, *S. Blitz*,
Characterization of asymptotically Kerr-de Sitter spacetimes

Department of Mathematics, University of California, Davis, *A. Waldron*,
Conformal description of spacetimes with initial singularities

Department of Mathematics, University of Auckland, *R. Gover*,
Applications of conformal geometry in the description of asymptotically de Sitter spacetimes

Stony Brook Mathematics Department, *M. Khuri*,
Conformal formulation of the Einstein constraint equations with trapped inner boundary on asymptotically hyperbolic manifolds

School of Mathematical Sciences at Queen Mary University of London, *J. A. Valiente Kroon*,
New spinorial approach to mass inequalities for black hole initial data

Center for Theoretical Physics of the Polish Academy of Sciences, *M. Korzyński*,
Optical drift effects in General Relativity

Centre for Mathematical Analysis, Geometry, and Dynamical Systems, Instituto Superior Técnico, *J. Natário*,
Knotted solutions of the Einstein-Maxwell equations with cosmological constant

Publications

- S. Blitz, A. Rod Gover, J. K. and A. Waldron, 2026, *The Dirichlet-to-Neumann Map for Poincaré-Einstein Fillings*, Rev. Mat. Iberoam. **42**, 1, 229–260
- S. Blitz and J. K., 2025, *Asymptotia of Kerr-de Sitter Black Holes*, Class. Quantum Grav. **42** 20LT02
- A. Rod Gover, J. K. and A. Waldron, 2025, *Boundary Curvature Scalars on Conformally Compact Manifolds*, J. Phys. A: Math. Theor. **58** 315402
- A. Rod Gover, J. K. and A. Waldron, 2024, *Stress and Geometry for Isotropic Singularities*, Phys. Rev. Lett. **133**, 011401
- J. K., A. Soria and J. A. Valiente Kroon, 2024, *New spinorial mass-quasilocal angular momentum inequality for initial data with marginally outer trapped surface*, J. Math. Phys. **65**, 042501
- M. Khuri and J. K., 2023, *Asymptotically Hyperbolic Einstein Constraint Equations with Apparent Horizon Boundary and the Penrose Inequality for Perturbations of Schwarzschild-AdS*, Class. Quantum Grav. **40** 045007
- A. R. Gover and J. K., 2023, *Higher fundamental forms of the conformal boundary of asymptotically de Sitter spacetimes*, Class. Quant. Grav. **40** 015001
- J. K. and J. A. Valiente Kroon, 2022, *Bach equation and the matching of spacetimes in conformal cyclic cosmology models*, Phys. Rev. D **106**, 084034
- J. K., 2021, *On the conformal transformation between two anisotropic fluid spacetimes*, Class. Quant. Grav. **38** 135029
- J. K. and J. A. Valiente Kroon, 2021, *New spinorial approach to mass inequalities for black holes in general relativity*, Phys. Rev. D **103**, 024057
- J. K. and J. Tafel, 2020, *The Penrose inequality for nonmaximal perturbations of the Schwarzschild initial data*, Class. Quant. Grav. **37** 105006
- J. K. and J. Tafel, 2020, *The Penrose inequality for perturbations of the Schwarzschild initial data*, Class. Quant. Grav. **37** 015012
- M. Korzyński and J. K., 2018, *Optical drift effects in general relativity*, JCAP03 **012**
- J. K. and J. Natário, 2017, *On a remarkable electromagnetic field in the Einstein Universe*, J. Gen. Relativ. Gravit. **49** 81

Invited Talks

- 07/2025 **Conformal higher spins, twistors and boundary calculus workshop, University of Mons,**
Conformal geometry of spacetimes with prescribed asymptotic behavior
- 03/2025 **Conformal Geometry and Submanifolds workshop, Masaryk University,**
Conformal geometry of spacetimes with prescribed asymptotic behavior
- 05/2024 **Geometry/Topology Seminar, University of California, Davis,**
New spinorial approach to mass inequalities for black holes in general relativity
- 04/2024 **GAP (Geometry, Algebra, Physics) Seminar, Pennsylvania State University,**
Tractor calculus and spacetimes with prescribed asymptotic behavior
- 04/2023 **Online seminar for the Grieg collaboration project SCREAM, CTP PAS, Warsaw,**
Lecture series 'Applications of tractor calculus in general relativity'

- 04/2022 **QMAP Seminar, University of California, Davis,**
Conformal fundamental forms and asymptotically de Sitter spacetimes
- 09/2021 **Global meeting of the GWVerse COST action,**
New spinorial approach to mass inequalities for black holes
- 04/2021 **Geometrical Methods in Physics seminar, University of Warsaw,**
Introduction to tractor calculus
- 03/2021 **Theory of Relativity and Gravitation seminar, University of Warsaw,**
A new spinorial approach to mass inequalities for black holes
- 06/2020 **General Relativity & Astrophysics Seminar, Jagiellonian University,**
The Penrose inequality for axisymmetric perturbations of the Schwarzschild initial data
- 06/2017 **General Relativity & Cosmology Group Seminar, University of Salamanca,**
Axisymmetric TT-tensors on conformally flat space

--- Awards

- 2026 National Science Center Poland SONATA grant
- 2026 ERA Fellowship
- 2026 Marie Skłodowska-Curie Individual Fellowship Seal of Excellence (score 97%)
- 2022 FCT Individual Call to Scientific Employment Stimulus grant
- 2021 National Science Center Poland MINIATURA grant
- 2021 Marie Skłodowska-Curie Individual Fellowship Seal of Excellence (score 93%)
- 2019 The Kosciuszko Foundation Grant (Program for Advanced Study, Research and/or Teaching in the United States)
- 2018 The COST Action CA16104 GWVerse Short Term Scientific Mission grant

--- Journal Referee

Communications in Mathematical Physics
 Differential Geometry and its Applications
 Foundations of Physics
 Classical and Quantum Gravity
 Journal of Mathematical Physics
 Journal of Geometry and Physics
 Mathematical Physics, Analysis and Geometry

--- Mentoring

- 2024 – 2026 **Tyler Valenti, Giovanni Diaz, University of California, Davis,** Supervisor, Undergraduate Senior Thesis (Mathematics)
(expected)
- 2023 – 2027 **Avi Hertz, University of California, Davis,** Co-supervisor, PhD programme in Physics
(expected)
- 2018 **Michał Łukawski, University of Warsaw,** Co-supervisor, Bachelor's thesis "Geometry of gauge field theory" (Physics)

Teaching Experience

University of California, Davis (Lectures):

- 2026 MAT 280 – Mathematical Relativity (graduate course of my authorship): 7 students
- Spring 2025 MAT 141 – Euclidean and Non-Euclidean Geometry: 65 students
- 2025 MAT 21D – Vector Analysis: up to 300 students
- 2024-2026 MAT 199 – Differential Geometry/General Relativity Reading Group: 3 students
- 2024, 2026 MAT 116 – Differential Geometry: up to 40 students
- 2024 MAT 145 – Combinatorics: 44 students
- 2024 MAT 22A – Linear Algebra: up to 300 students

University of Warsaw (Discussions):

- 2019 Electrodynamics: 20 students
- 2018 Classical Mechanics: 15 students
- 2017 Quantum Mechanics I: 15 students
- 2016 Mathematics II: 30 students

Conference Organization

- 2026 **Conformal Geometry, Einstein Metrics, and General Relativity**,
Simons Center for Geometry and Physics Workshop, Stony Brook, New York, USA
- 2024 **Special Session on Conformal Geometry, Einstein Metrics, and General Relativity**, *AMS Sectional Meeting*, Riverside, California, USA
- 2023 **GRIEG meets Chopin; Warsaw meeting on geometric methods in science**,
Warsaw, Poland