Roland Púček

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PROFESSIONAL APPOINTMENTS

2021 - present   Research Fellow, Institute of Mathematics, University of Jena
Group leader: Prof. Hendrik Süß

EDUCATION

2021   PhD, Department of Mathematical Sciences, University of Bath
Thesis title: Extremal Kähler metrics and separable toric geometries
Supervisor: Prof. David M.J. Calderbank

2016   Mgr., Faculty of Mathematics and Physics, Charles University
Major: Mathematical Analysis
Thesis title: Application of invariant operators in real parabolic geometries
Supervisor: Prof. RNDr. Vladimír Souček, DrSc.

2014   Bc., Faculty of Mathematics and Physics, Comenius University
Thesis title: Some properties of smooth manifolds
Supervisor: Prof. RNDr. Július Korbaš, CSc.

PUBLICATIONS

2023   M. TORDA, J. Y. GOULERMAS, R. PÚČEK AND V. KURLIN, Entropic trust region for densest crystallographic symmetry group packings, *SIAM Journal on Scientific Computing*, 45(4), B493–B522.

2017   R. PÚČEK, Almost c-spinorial geometry, *Arch. Math. (Brno)*, 53(5):325-334, 2017

Manuscripts in review

2023   R. Púček, Factorization structures, cones, and polytopes,
arXiv preprint arXiv:2311.07328

2024   M. Brandenburg, R. Púček, Veronese polytopes: extending the framework
of cyclic polytopes
arXiv preprint arXiv:2411.13702

Manuscripts in Preparation

2025   R. Púček, Separable geometries and extremal metrics

2025   R. Púček, M. Torda, Integral formulae for solutions of ultrahyperbolic
equations and Leray residue

MEMBERSHIP

2023 - 2026   member of two working groups, *Cartan Geometry and Representation Theory*,
and *Integrable Systems and Supersymmetry* in the COST Action CaLISTA

SECURED FUNDING

2024   CaLISTA Short-Term Scientific Mission
Title: Integral formulae for solutions of PDEs with constant coefficients
and their integrability
Amount: €2000

2023   CaLISTA Short-Term Scientific Mission
Title: Exploring the Duality between Geometric Networks and Stochastic
Learning Machines through the Lens of the Crystallisation Conjecture
Amount: €2000

2023   FSU Funding Programme: Organising Academic Events
Amount: €1500

2017 - 2021   EPSRC DTP Studentship
Title: Special geometric structures and integrability
Amount: cca. £70 000

AWARDS

2016   1st prize in Czech-Slovak competition for university students in
       mathematical research (SVOČ)
       Section: Algebra, Topology and Geometry
       Title: Metrizability problem and invariant first order differential operators

ORGANISED EVENTS

2023   Regional Workshop in Algebraic Geometry, Jena

RESEARCH VISITS

2024   KTH, 3 weeks (Feb)
       Geometry of compatible polytopes

2024   KTH, 3 weeks (Nov)
       Veronese polytopes

CONFERENCE ACTIVITY

2024   Workshop on Generalized complex structure and homological methods, Hamburg

2024   BRIDGES meeting in Gauge Theory, extremal structures and stability, Cargèse

2024   K-Stability, Birational Geometry and Mirror Symmetry, Oberwolfach
       Talk title: Separable toric geometries and explicit extremal metrics

2023   Singularities and torus actions, Oldenburg

2023   Training school on Cartan geometry, Brno

2023   Gauge theory and its application to geometry and low-dimensional topology, Regensburg

2023   43rd Winter School of Geometry and Physics, Srní
       Talk title: Separable geometries and new examples of extremal Kähler metrics

2022   Geometry and Topology of Homogeneous Spaces, Będlewo conference center

2022   Differential Geometry and its Applications, Hradec Králové

2022   Workshop on Complex Analysis and Geometry (Grauert Tubes), Essen

2022   Invariants in Algebraic Geometry, Dijon

2021   ITT13, 13th Integrative Think Tank, online

2020   IMA, LMS Joint Meeting: Topological methods in Data Science, online

2020   Winter School of Geometry and Physics, Srní

2019   Kähler and special toric geometry, London

2019   Winter School of Geometry and Physics, Srní
        Talk title: Examples of toric extremal Kähler metrics

2018   Eduard Čech Institute meeting, Telč

2018   Winter School of Geometry and Physics, Srní

2017   11th International Conference on Clifford Algebras and Their Applications in Mathematical Physics, Ghent

2017   Winter School of Geometry and Physics, Srní
        Talk title: C-spinorial geometry and metrisability problem

2016   Winter School of Geometry and Physics, Srní

DEPARTMENTAL RESEARCH TALKS

2024   Oberseminar Algebra, Jena
        Title: Veronese polytopes

2021   Oberseminar Algebra, Jena
        Title: Constructing new and unifying old examples of extremal toric Kähler metrics

2019   Postgraduate Seminar Series, Bath
        Title: Simplicial homology

2018   Topics in geometry, Bath
        Title: Bounded derived categories of coherent sheaves on $\mathbb{P}^1$ and representations of Kronecker quiver are equivalent

2017   Week of Doctoral Students, Prague
        Title: Metrizability problem

TEACHING EXPERIENCE

University of Jena

category theory (WS, 2024, lecturer)
toric varieties (SS, 2024, lecturer)
oberseminar: derived categories (WS, 2023, lecturer)

Kähler geometry (WS 2023, lecturer)
basic category theory (SS 2023, lecturer)
advanced topics in differential geometry (SS 2023, lecturer)
vector, principal and fibre bundles, connections, and characteristic classes (WS 2022, lecturer)
toric symplectic geometry (SS 2022, lecturer)
linear algebra (WS 2021, tutor)

University of Bath

mathematical analysis (WS 2017, SS 2018, tutor)
linear algebra (WS 2018, WS 2019, tutor)
algebra (SS 2019, SS 2020, tutor)
group theory (WS 2019, teaching assistant)

Charles University

linear algebra (WS 2016, SS 2017, tutor)

University of Economics in Prague

mathematical praktikum (WS 2015, SS 2016, WS 2016, tutor)
mathematics A (SS 2015, tutor)

SUPERVISED THESES

2023   Complex Geometry
        Konrad Brandts, University of Jena

EXTRA TRAINING

2020   two-week training at High Performance Computing Academy organised by the
        Centre of Scientific Computing, Cambridge

2018   module Scientific Report Writing, Bath

2018   module Presentation Skills, Bath

LANGUAGES

Slovak   native

English   fluent