

Márton Beke

Rényi Alfréd Institute of Mathematics floor II room 5
Budapest University of Technology and Economics buliding H room 664
✉ bekem@renyi.hu | 📅 January 10th, 1999 | 🏠 users.renyi.hu/ bekem/ | 📄 Márton Beke | MTMT:10089773 | ✎ beke_m_1

Education

Budapest University of Technology and Economics Mathematician Phd • Supervisor: András Stipsicz	Budapest, Hungary Sep 2023 - ongoing
Eötvös Loránd University Mathematician Msc • Outstanding (5) qualification • 'Rational homology disk smoothings of isolated surface singularities', supervisor: András Stipsicz	Budapest, Hungary Sep 2021 - Jun 2023
Eötvös Loránd University Mathematics Bsc • Outstanding (5) qualification • 'Morse-Theory and its applications' (in hungarian), supervisor: Tamás Terpai	Budapest, Hungary Sep 2018 - Jun 2021

Publications

JOURNAL ARTICLES

Minimal rational graphs admitting a QHD smoothing Márton Beke <i>arXiv:2504.06929</i> (2025). 2025
An unexpected Rational blowdown Márton Beke, Olga Plamenevskaya, Laura Starkston <i>in preparation</i> (2025). 2025
New Exotic four-manifolds with $\mathbb{Z}/2\mathbb{Z}$ fundamental group Márton Beke, László Koltai, Sarah Zampa <i>arXiv:2312.08452</i> , to appear in <i>Michigan Journal of Mathematics</i> (2023). 2023

BOOK CHAPTER

A Knot-theoretic Tour of Dimension Four Kyle Hayden Márton Beke <i>Singularities and Low-dimensional Topology</i> , 2024, Budapest, Hungary

Fellowships, awards and competitions

Doctoral Excellence Fellowship Programme Budapest University of Technology and Economics • Two year fellowship to help young researchers careers • Id number: DKÖP-25-1-BME-34	2025-2027
Knots and Surfaces in four-manifolds Alfréd Rényi Institute of Mathematics • Participant as investigator • ERC grant KnotSurf4d	2024/29
Smooth four-manifolds and their applications Alfréd Rényi Institute of Mathematics • Participant as investigator • NKFI grant K146401	2024/27
Rényi Doctoral Fellowship Alfréd Rényi Institute of Mathematics • One year fellowship for highly promising PhD students	2023/24

OTDK first prize

Pannon University

- Supervisor: Balázs Gerencsér
- title: **Asymptotic spectral analysis of random modifications of cyclic graphs**
- Joint work with Márton Borbényi and Levente Szemerédi

Veszprém

spring 2023

Knots, links and complex singularities

Rényi Alfréd Institute of Mathematics

2018/23

- Participant as investigator
- NKFI grant KKP126683

National Higher Education Scholarship

ELTE

2022/23

- One year national scholarship for outstanding professional work

TDK first prize

ELTE Institute of Mathematics

Fall 2022

- Supervisor: Balázs Gerencsér
- title: **Asymptotic spectral analysis of random modifications of cyclic graphs**
- Joint work with Márton Borbényi and Levente Szemerédi

Research competition "M" category first prize

MTA Lendület

January 2021

- Week long competition on Morse-theory

Conferences and other visits

Modern Tools in Low-Dimensional Topology - Summer School and Conference

Trieste, Italy

ICTP

Jun 02 2025 - Jun 13 2025

- TA session given during summer school for "Lefschetz fibrations and closed exotic 4-manifolds" by András Stipsicz and Zoltán Szabó
- <https://indico.ictp.it/event/10839>

LiT II: Lost in Topology

Pisa, Italy

Centro di Ricerca Matematica Ennio de Giorgi

Sep 17 2024 - Sep 20 2024

- Workshop in low-dimensional topology and geometric group theory. Lightning talk given.
- <https://crm.sns.it/event/530/>

Low-dimensional topology days

Nantes, France

Nantes Université

Aug 26 2024 - Aug 30 2024

- The annual meeting of Réseau Thématique RTop Topologie algébrique et Géométrie
- <https://www.math.sciences.univ-nantes.fr/golla/docs/conferences/nantes-tresses.htm>

New structures in low-dimensional topology - summer school and conference

Budapest, Hungary

Erdős Center

Jul 01 2024 - Jul 12 2024

- A summer school and a workshop, part of the Simons collaboration. Lightning talk on "New exotic 4-manifolds with $\mathbb{Z}/2\mathbb{Z}$ fundamental group"
- summer school, conference

Combinatorial and Gauge theoretical methods in low dimensional topology and geometry

Pisa, Italy

Centro di Ricerca Matematica Ennio de Giorgi

Jun 03 2024 - Jun 07 2024

- Research conference
- <http://www.crm.sns.it/event/519/>

1st Budapest-Cluj meeting in Singularities and Beyond

Cluj-Napoca, Romania

Babeş-Bolyai University of Cluj-Napoca

Oct 31 2023 - Nov 2 2023

- Conference for better cooperation between the singularity theory communities in Budapest and Cluj-Napoca
- Talk title: **Rational blow-downs and exotic 4-manifolds**
- <https://math.ubbcluj.ro/laszlo.tamas/budcjsing.html>

Leaning into Topology Workshop

Pisa, Italy

University of Pisa

Sep 18 2023 - Sep 19 2023

- Two day workshop on Low-dimensional Topology
- <https://sites.google.com/sns.it/lit-workshop/>

The Low-dimensional Workshop

Budapest, Hungary

Erdős Center

Mar 27 2023 - Mar 31 2023

- Research workshop on recent advances in low dimensional topology
- Part of the singularities and low dimensional topology special semester
- <https://erdoscenter.renyi.hu/events/low-dimensional-workshop>

Winter school in singularities and low-dimensional topology

Erdős Center

Budapest, Hungary

Jan 20 2023 - Jan 27 2023

- Winter school with mini-courses on knot-theory, lattice cohomology deformation theory and Heegaard Floer homology
- Part of the singularities and low dimensional topology special semester
- <https://erdoscenter.renyi.hu/events/winter-school-singularities-and-low-dimensional-topology>

4-Manifolds: From Above and Below

CIRM

Luminy, France

Sep 12 2022 - Sep 16 2022

- Summer school with mini-courses on Knot Floer homology, surgery theory and symplectic 4-manifolds
- <https://conferences.cirm-math.fr/2593.html>

Frontiers in Geometry and Topology Summer School

ICTP

Trieste, Italy

Aug 1 2022 - Aug 5 2022

- Summer school with mini-courses on Heegaard Floer homology and Lattices among other topics
- <https://indico.ictp.it/event/9705/>

Work Experience

BME

teaching

2023-ongoing

- Mathematics G1-G3, lecturer: Jenő Szirmai
- As part of the Phd program

REU

research

Jul 2022

- One month long research program organized by Lendület groups
- Topic: **Topology of normal surface singularities and combinatorics of their generic analytic structures**
- Supervisor: János Nagy, work joint with Miklós Eper and Ákos Kőrösi

REU

research

Jul 2021 - Current

- One month long research program organized by Lendület groups, work ongoing
- Topic: **Speedup of random walks**
- Supervisor: Balázs Gerencsér, work joint with Márton Borbényi and Levente Szemerédi

ELTE

teaching

Feb 2021 - Jun 2021

- Complex analysis problem session, lecturer: István Sigray

Languages

English	Advanced (C1)
German	Basic (B2)
Hungarian	Native
Japanese	Basic (B1)