

**Research interest:** multimessenger astronomy (VLBI and single-dish in radio, X-rays, gamma-rays, cosmic neutrinos, gravitational waves), high-energy astroparticle physics, active galactic nuclei, supermassive black hole binaries, black holes, gravitational wave astrophysics, pulsar timing arrays, cosmology, cosmo-paleontology

**Research output:** <https://emmakun.com/research.html>

**Full list of publications:** [https://emmakun.com/publications\\_emmakun.pdf](https://emmakun.com/publications_emmakun.pdf)

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## Education

- 2017 **PhD in Physics (Astrophysics)**, with *summa cum laude qualification*. Supervisors: Prof. László Á. Gergely and Dr. Krisztina É. Gabányi, Doctoral School in Physics, University of Szeged.
- 2012 **Diploma in Astronomy**, with *excellent qualification*. Supervisor: Dr. Johanna Jurcsik (cons. Prof. Károly Szatmáry), Faculty of Science and Informatics, University of Szeged.

## Positions

- 10/2024–09/2025 **Postdoctoral Researcher**, Theoretical Physics IV, Ruhr-University Bochum, Germany
- 04/2023–09/2024 **Humboldt Experienced Postdoctoral Fellow**, Astronomical Institute, Ruhr-University Bochum, Germany
- 10/2022–03/2023 **CIM Postdoctoral Fellow**, Theoretical Physics IV, Ruhr-University Bochum, Germany
- 09/2022–present **Voluntary Fellow**, Konkoly Observatory, ELKH Research Center for Astronomy and Earth Sciences, Budapest, Hungary
- 09/2019–08/2022 **MTA Premium Postdoctoral Fellow**, Konkoly Observatory, Budapest, Hungary
- 07/2017–06/2019 **Assistant Research Fellow**, Institute of Physics, University of Szeged, Hungary
- 09/2015–06/2017 **Predoctoral Researcher**, Institute of Physics, University of Szeged, Hungary

## Scientometrics (up to 19.07.2025)

- **Papers in refereed journals: 99**, of which **first author in: 20**
- **Total number of citations: 2368**
- **Cumulative impact factor: 645.6** (as of the year of publication)
- **H-index: 27**

## Collaborations, memberships

- 2021– European Astronomical Society
- 2020– **IceCube Collaboration**
- 2019– Public body of the Hungarian Academy of Sciences
- 2018– Junior member of the International Astronomical Union

## Awards

- 2021 **Bruno Rossi Prize**, as member of the IceCube Collaboration
- 2018 **Junior Prima Award** in category Hungarian Science
- 2011 Special prize of the Hungarian Astronomical Foundation, XXX. National Scientific Students' Associations Conference.

## Experiences in astronomical data analysis

- **Gamma-ray astronomy** Aperture photometry and likelihood analysis of Fermi Gamma-ray Space Telescope data on single CPU and on supercomputing facilities.
- **Neutrino astronomy** Stacking analyses.
- **Radio astronomy** Analysis of VLBA and VLA interferometry data.
- **Optical astronomy** Aperture and PSF photometry, image subtraction methods.

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## Conferences, scientific travels

- 2025
  - International Cosmic-Ray Conference 2025, Geneva, Switzerland, (**talk**, 14-24 July 2025)
  - IceCube Collaboration Spring Meeting, Uppsala, Sweden, (10-16 May, 2025)
- 2024
  - IceCube Collaboration Fall Meeting, Wisconsin-Madison, USA (**talk**, 23-27 September, 2024)
  - Cosmic neutrinos from radio-loud and radio-quiet AGN, Columbia University, New York, USA, (**invited talk**, 18 September, 2024)
  - Cosmic neutrinos from radio-loud and radio-quiet AGN, University of Nevada, Las Vegas, USA, (**invited talk**, 11 September, 2024)
  - 1st Nordic Meeting on Neutrino and Radio Astronomy, Göteborg, Sweden (**talk**, 27–30 May 2024)
  - University of Maryland, Space and Cosmic Ray Physics Seminar, online (**invited talk**, 15 April, 2024)
  - MANST Meeting, Bochum, Germany (**poster**, 24-25 March, 2024)
  - IceCube Collaboration Summer Meeting, Münster, Germany (**talk**, 17-22 March, 2024)
- 2023
  - TeV Particle Astrophysics, Naples, Italy (**talk**, 11–15 Sept 2023.)
  - IceCube Collaboration Summer Meeting, Aachen, Germany (**talk**, 12-17 March, 2023)
  - 4th Graduate School on Plasma-Astroparticle Physics, Bad Honnef, Germany (29 Jan-3 Febr, 2023)
- 2022
  - CRC ring lecture series - CRC1491, Dortmund, Germany (**invited talk**, online, 20 May 2022)
  - HEP-Cosmo-Astro seminar/Proca seminars series, Cluj-Napoca, Romania (**invited talk**, online, 19 May 2022)
  - Short-term research visit, Ruhr-Universität Bochum, Germany (04-22 April 2022)
- 2021 - all virtual
  - European Physical Society conference on high energy physics (EPS-HEP) 2021 (**invited talk**, 26-30 July 2021)
  - International Cosmic Rays Conference 2021 (12-23 July 2021)
  - European Astronomical Society Annual Meeting (**poster**, 28 June - 2 July 2021)
  - 70th Lindau Nobel Laureate Meeting (27 June - 2 July 2021)
- 2019
  - Short-term research visit, Ruhr-Universität Bochum (9-13 December 2019, Bochum, Germany)
  - Short-term research visit, Max-Planck-Institut für Radioastronomie (3-7 June 2019, Bonn, Germany)
- 2018
  - ELFT Summer School, Astroparticle Physics (**invited talk**, 3-7 September, 2018, Mátraháza, Hungary)
  - 15th Marcel Grossman Meeting (**2 talks**, 1-7 July, 2018, Rome, Italy)
- 2017
  - 10th Bolyai-Gauss-Lobachevsky Conference (**talk**, 21-26 August, 2017, Gyöngyös, Hungary)
  - Balaton Summer School (**talk**, 17-23 July 2017, Siófok, Hungary)
- 2016
  - Travelling assembly of Hungarian physicists (**poster**, 24-27. August 2016, Szeged, Magyarország)
- 2015
  - Long-term research program, Max-Planck-Institut für Radioastronomie (18 May-26 June 2015, Bonn, Germany)
- 2014
  - Group meeting “MAGNA” (24-28 November 2014, Bern, Switzerland)
  - 7th Workshop of Young Researchers in Astronomy and Astrophysics (**talk**, 17-19 September 2014, Budapest, Hungary)
  - 44th Young European Radio Astronomers Conference (**talk**, 08-12 September 2014, Torun, Poland)
  - Group meeting “MAGNA” (17-23 March 2014, Bern, Switzerland)
- 2013
  - Short-term research visit, Max-Planck-Institut für Radioastronomie (14-26 October 2013, Bonn, Germany)
  - ERASMUS Summer Term, Argelander Institut für Astronomie (**2 talks**, 2 April-31 July 2013, Bonn, Germany)
  - SnowPAC2013 Black Hole Fingerprints: Dynamics, Disruptions and Demographics (**poster**, 17-22 March 2013, Snowbird, Utah, USA)
- 2012
  - 5th Meeting of COST Action MP0905 “Black Holes in a Violent Universe” Black Holes and Jets (**poster**, 21-23 November 2012, Palermo, Italy)
  - 6th Workshop of Young Researchers in Astronomy and Astrophysics (**talk**, 3-6 September 2012, Budapest, Hungary)
- 2011
  - XXX. National Scientific Students’ Associations Conference (27-29 April 2011, Nyíregyháza, Hungary)

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## Supervision

Supervised 4 BSc and 1 MSc theses to completion; currently supervising 1 MSc student.

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## Teaching activity

- 2023 General Relativity (2 lectures, Ruhr-University, Bochum, MSc level)
- 2021 High-energy astronomy (1 lecture, ELTE, Budapest, Hungary, MSc level)
- 2016-2019 Physics laboratory practice 3 (University of Szeged, Hungary, BSc level)

- 2016-2019 Electromagnetism practice (University of Szeged, Hungary, BSc level)
- 2016 Relativistic astrophysics lecture (University of Szeged, Hungary, MSc level)
- 2014-2019 Physics-biophysics laboratory practice (University of Szeged, Hungary, BSc level)
- 2012-15 Physics practice for engineers (University of Szeged, Hungary, BSc level)

## Professional and community service

- Reviewer for ApJ, MNRAS, MDPI, NKFI Hungary, NSC Poland
- 2021-2024 Co-founder and permanent speaker of the Astronomy on Air podcast series
- 2019-2021 Organizer of the Astronomy on Tap Budapest
- 2015-2020 Founder and organizer of the Astroparty at the Beach
- 2006- Public talks and observations, interviews in magazines (50+)

## Computer skills

- Intermediate AIPS, Wolfram Mathematica, Maple,html
- Advanced Linux, bash-shell, L<sup>A</sup>T<sub>E</sub>X, C, python, DIFMAP, Fermitools, Fermipy, Docker,IRAF, WCSTools

## Observational routine

- 2008-2012 Konkoly Observatory, Budapest, Hungary (> 100 nights)
- 2011-2012 Piszkestető Mountain Station of Konkoly Observatory, Piszkestető, Hungary (~20 nights)
- 2011 Observatory of Szeged, Szeged, Hungary (~15 nights)

## Languages

- English **Fluent** *(B2 language exam, Telc, 2014)*
- German **Intermediate** *(iB2 language exam, Goethe Institut, 2005)*