

László Árpád GERGELY

PROFESSOR, UNIVERSITY OF SZEGED

Institute of Physics, Dóm tér 9, 6720 Szeged, Hungary

laszlo.a.gergely@gmail.com

<http://www.staff.u-szeged.hu/~gergely/>

gergely@physx.u-szeged.hu

POSITIONS

- 2015–present *Professor* – University of Szeged, HUNGARY
2013–2014 *Visiting professor, JSPS invitation fellow* – Tokyo University of Science, JAPAN (10 months)
2011 *Visiting researcher* – University of Hong Kong, HONG KONG (2 months)
2009 *Visiting fellow* – Institute for Advanced Study, Collegium Budapest, HUNGARY (5 months)
2009–2015 *Associate professor* – University of Szeged, HUNGARY
2007–2009 *Senior lecturer, IoP* – South Bank University, London, UK (15 months)
2003, 2004 *Visiting researcher, Eötvös fellow* – Inst. of Cosmology & Gravitation, Univ. of Portsmouth, UK (6 months)
2000–2008 *Senior research associate, Magyary, Széchenyi, Bolyai fellow* – University of Szeged, HUNGARY
2000 *Professeur invité* – Université Louis Pasteur, Strasbourg, FRANCE (3 months)
1998–2000 *Visiting researcher, Eötvös, Soros fellow* – Université Louis Pasteur, Strasbourg, FRANCE (19 months)
1996–2000 *Senior research associate, OTKA fellow* – KFKI Research Institute Budapest, HUNGARY
1995 *Visiting researcher, OTKA fellow* – University of Utah, Salt Lake City, USA (12 months)
1993–1996 *Lecturer* – JATE University, Szeged, HUNGARY
1990–1993 *TMB fellow of the Hungarian Academy of Sciences* – KFKI Research Institute Budapest, HUNGARY
1988–1990 *Research physicist* – IMPF Odorheiu-Secuiesc, ROMANIA

LANGUAGES Hungarian, English & Romanian (fluent), French (intermediate), German, Italian & Japanese (basic vocabulary)

EDUCATION, QUALIFICATIONS

- 2013 Doctor of the Hungarian Academy of Sciences (title required for Full Professorship)
Thesis: *Gravitationally radiating compact binaries and research in brane worlds*
2008 Habilitation in Physics – University of Szeged, Hungary (title required for Associate Professorship)
Research Talk: *Post-Newtonian dynamics of compact binaries and their gravitational radiation*
Public Lecture: *Black holes*
1996 PhD (CSci) in Physics, Hungarian Academy of Sciences (with maximal points)
Dissertation: *Vacuum-vacuum Kerr-Schild maps*. Supervisor: Zoltán Perjés
1988 Masters in Physics, University of Bucharest, Romania (10 points out of 10)
Thesis: *Local inertial systems in general relativity*. Supervisor: Mihai Vişinescu
1987 BSc in Physics, University of Bucharest, Romania (9.97 points out of 10, top 2% of the class)
Thesis: *Space-time and gauge symmetries in the fundamental interactions*. Supervisor: Mihai Vişinescu
1982 Baccalaureate, Áprily Lajos Főgimnázium, Brassó, Romania, Mathematics & Physics class (10 points out of 10)

MEMBERSHIPS

- 2016 - *Management Committee member, COST CA15117: Cosmology and Astrophysics Network for Theoretical Advances and Training Actions (CANTATA) Action*
2016 - *Secondary proposer, COST 20612: Black Hole Astrophysics (BLAST) Action*
2015 - *Core member, Physics Doctoral School, University of Szeged*
2014 - *Editorial Board Member, Universe, MDPI Switzerland* <http://www.mdpi.com/journal/universe/editors>
2014 - *Council member, LIGO Scientific Collaboration (LSC)*
2007 - 2015 *Council member, VIRGO-ESO Scientific Forum (VESF)*
2011 - 2014 *Scientific Committee member of the Particle Physics Section of the Hungarian Academy of Sciences*
2010 - 2014 *Management Committee member, Black Holes in a Violent Universe, EU COST Action*
2009 - 2014 *Member, LIGO Scientific Collaboration (LSC)*
2004 - 2011 *Member, Cosmology of Fundamental Interactions Collaboration (COSMOFUN)*
2004 - 2008 *Member, International Society on General Relativity and Gravitation*

SCIENTIFIC RECORD

Total number of scientific publications: **204** (in refereed journals: **127**) Talks given: **126** (invited: **45**)
Total impact factor: **625.165** Indep. cites: **3668**_(HEP) *h-index*: **35**_(ADS), **36**_(HEP) *i10-index*: **87**_(ADS), **86**_(HEP)

HONORS

- 2016 (as member of LIGO SC) **Special Breakthrough Prize in Fundamental Physics** awarded for detection of Gravitational Waves 100 years after Albert Einstein predicted their existence, Milner Global Foundation
<https://breakthroughprize.org/News/32>
- 2016 (as member of LIGO SC) **Gruber Cosmology Prize** awarded to Rainer Weiss, Kip Thorne, Ronald Drever, and the entire LIGO team for pursuing a vision to observe the universe in gravitational waves, leading to a first detection that emanated from the collision of two black holes, Gruber Foundation
<http://gruber.yale.edu/cosmology/press/2016-gruber-cosmology-prize-press-release>
- 2014 **János Szentágothai Experienced Researcher Fellow**, Hungarian National Excellence Program
- 2013 **JSPS Invitation Fellow**, Japan Society for the Promotion of Science
- 2009 **Bolyai Medal** of the Hungarian Academy of Sciences
- 2006 **Honorable Mention** in the Gravity Research Foundation's Essays in Gravitation Competition
Essay title: "Dark energy from gravitational collapse?"
- 2005 – 2008 **János Bolyai Fellow** of the Hungarian Academy of Sciences
- 2002 – 2005 **István Széchenyi Fellow** of the Hungarian Ministry of Education
- 2000 – 2002 **Zoltán Magyary Fellow** of the Hungarian Ministry of Education
- 1998, 1999, 2003 **Roland Eötvös Fellow** of the Hungarian Ministry of Education
- 1998 **Géza Györgyi Award** of the KFKI Research Institute for Particle and Nuclear Physics
- 1994, 1998 **Fellow** of the Soros Foundation
- 1993-1994 **Fellow** of the Foundation for Hungarian Science, Hungarian Loan Bank

SCIENTIFIC SERVICE

- Referee for** Physical Review Letters; Physical Review D; Journal of Cosmology and Astroparticle Physics (JCAP); Classical and Quantum Gravity; General Relativity and Gravitation; Monthly Notices of the Royal Astronomical Society; Astrophysics and Space Science; Physics Letters B; European Physical Journal C, Plus; International Journal of Modern Physics A, D; Entropy; Galaxies; Universe
- Reviewer** **Italy:** Italian Ministry for Education, University and Research (MIUR); Piscopia Fellowship Programme (University of Padova); **Netherlands:** Organisation for Scientific Research (NOW); **Czech Republic:** Czech Science Foundation; **Poland:** National Science Centre (Narodowe Centrum Nauki – NCN); **Romania:** National Council for Scientific Research of the Romanian Government; Romanian National Council for Research and Development; **Hungary:** Hungarian Scientific Research Fund (OTKA); Hungarian Scientific Student Conferences (Western Hungarian University, Szombathely 2009; Babes-Bolyai Science University, Kolozsvár 2015)
- Conference organising** **Quantum Gravity School** (Univ. Szeged, Hungary 2012) http://www.kfki.hu/~elftrfsz/iskola_2012.html
- Advisory board member** **7th Bolyai-Gauss-Lobachevsky Conference on Hyperbolic Geometry** (Babes-Bolyai Science University, Cluj, Romania 2010)
- Science Monitor** **Pomeranian Workshop in Fundamental Cosmology** (University of Szczecin, Pobierowo, Poland 2005)
<http://cosmo.fiz.univ.szczecin.pl/cosmofun/>
- Laser Interferometer Gravitational Wave Observatory** (Livingston site, US, Nov. 1-10. 2009)

PUBLIC UNDERSTANDING OF SCIENCE

English → Hungarian translation:

Brian Greene: The Elegant Universe. Superstrings, Hidden Dimensions and the Quest of a Final Theory
Akkord Publisher, Budapest, 2003, ISBN 963 9429 32 5

Roger Penrose (with A.Shimony, N.Cartwright, S.Hawking): The Large, the Small and the Human Mind
Akkord Publisher, Budapest, 2004, ISBN 963 9429 51 1

Referee of the English → Hungarian translation:

Timothy Ferris: The Whole Shebang. (A State-of-the-Universe(s) Report).
Typotex Publisher, Budapest, 2005, ISBN 963 9548 33 2

Editor (with Iván Gyémánt): The last manuscript of Zoltán Bay, Univ. Szeged, 1994 – in Hungarian

Interview on wormholes (Hungarian TV Channel 2, on 23th October 2005)

Interview on gravitational waves (DVD documentary: Einstein's finished symphony, 2006)

Interview on BICEP2 results (Hungarian newspaper Magyar Nemzet, on 20th March 2014)

Interviews on the detection of gravitational waves (in various Hungarian TV and Radio Channels, newspapers, February 2016)



RESEARCH GRANTS AS PRINCIPAL INVESTIGATOR

- 2012-2015 *Black hole horizon by accelerating electrons* (TÁMOP-4.2.2.A-11/1/KONV-2012-0060, EU; *research topic PI*)
2014 *Black hole binary dynamics and gravitational radiation*
(TÁMOP-4.2.4.A/2-11/1-2012-0001, Hungarian National Excellence Program, EU; *individual award*)
2013-2014 *Gravitational waves testing cosmology and alternative gravity theories* (JSPS, Japan; *individual award*)
2012-2014 *Spinning gravitational waveforms: optimized modeling for supercomputers and search in the LIGO data*
(TÁMOP-4.2.2.C-11/1/KONV, EU; *research topic PI*)
2012 *Periodic jet structures by merging supermassive spinning black holes* (COST, EU; *individual award*)
2010 *Gravitational wave background from supermassive black hole mergers* (COST, EU; *individual award*)
2008 *Research in gravitation* (LSBU Research Opportunities Fund, UK; *individual award*)
2005-2013 *ERASMUS* (with Universities of Bonn, Portsmouth, Naples, Umeå, Montpellier, Braşov; Hungarian PI)
2007-2010 *Gravitation and astro-particle physics* (OTKA Graduate School grant; PI)
2004-2007 *Brane-cosmologies and gravitational radiation phenomena* (OTKA research grant; PI)
2003-2006 *Gravitational waves and radiation phenomena in general relativity* (OTKA Graduate School grant; PI)
2003 *Mecenátúra Travel Grant* (Hungarian Ministry of Education; *individual award*)
1996-1998 *Research in general relativity* (OTKA postdoctoral fellowship and grant; *individual award*)
1995, 2003 *Travel Grants* (OTKA; *individual awards*)

SUPERVISED POSTDOCTORAL RESEARCHERS

- Zoltán Kovács: **Hamiltonian brane-world dynamics** (2006-07) <http://inspirehep.net/author/Z.Kovacs.1>
position after: Postdoctoral position, University of Hong Kong, China SAR
Zoltán Keresztes: **Cosmology and dark energy models** (2010-15) <http://inspirehep.net/author/Z.Keresztes.1/>
position after: Assistant Professor, University of Szeged, Hungary
Krisztina Éva Gabányi: **Radio interferometry studies of AGNs and binary system candidates** (2013-14) <http://inspirehep.net/author/K.E.Gabanyi.1/>
position after: Postdoctoral position, FÖMI Satellite Geodetic Observatory, Péc, Hungary
Zsolt Horváth: **Modified gravity** (2014-15) <http://inspirehep.net/author/Z.Horvath.3>
position after: Physicist, SemiLab, Budapest, Hungary

SUPERVISED PHD STUDENTS

- Zoltán Keresztes: **Randall-Sundrum type II brane-worlds and a tachyonic dark energy model** (2010)
position after: Postdoctoral position, University of Szeged, Hungary
Balázs Mikóczy: **Post-Newtonian evolution of compact binaries** (2011)
position after: Postdoctoral position, Wigner Research Centre for Physics Budapest, Hungary
Zsolt Horváth: **Gravitational lensing in alternative gravitational theories** (2014)
position after: Postdoctoral position, University of Szeged, Hungary
Marek Dwornik: **Galactic structure, dark matter and modified gravity** (in progress)
position after: Physicist, Patent Office Budapest, Hungary
Márton Tápai: **Gravitational waves from spinning compact binaries** (in progress)
Emma Kun: **Periodic structures in supermassive black hole jets** (in progress)

EXAMINER FOR PHD DEGREE / REFEREE FOR PHD THESIS / FOR ACADEMIC DOCTORATE THESIS

- 2013 Merse Előd Gáspár (Eötvös University, Budapest, Hungary; PhD):
Dynamics of spherical shells, shell systems and applications in general relativity
2013 Zoltán Lippai (Eötvös University, Budapest, Hungary; PhD):
Numerical methods in investigating quasar populations, quasars and active galactic nuclei
2011 István Rácz (Hungarian Academy of Sciences, DrMTA): **Black holes in the geometrized theories of gravity**
2009 László B. Szabados (Hungarian Academy of Sciences, DrMTA):
Gravitational conserved quantities and the canonical structure of general relativity
2008 Daniel Eriksson (University of Umeå, Sweden; PhD):
Perturbative Methods in General Relativity [<http://www.diva-portal.org/umu/theses/abstract.xsql?dbid=1488>]
2007 János Majár (Eötvös University, Budapest, Hungary; PhD): **Gravitational waves from compact binaries**
2007 Bence Kocsis (Eötvös University, Budapest, Hungary; PhD): **Astrophysical applications of gravity waves**
2006 Viktor Czinner (Eötvös University, Budapest, Hungary; PhD):
Linear perturbations of the late-time universe in the presence of a cosmological constant
2003 Burin Gumjudpaj (Institute of Cosmology and Gravitation, University of Portsmouth, UK; PhD):
Brane-world effects on cosmological dynamics
2002 Katalin Varjú (Univ. Szeged, Hungary; PhD): **Quantum tests for non-inertial and general relativistic effects**

UNIVERSITY TEACHING EXPERIENCE (LÁSZLÓ ÁRPÁD GERGELY)

PhD courses (University of Szeged)

Modern Cosmology, Constrained Dynamical Systems, Advanced General Relativity 1-2, Brane-worlds

Masters courses (University of Szeged)

General Relativity 1-2, Cosmology 1-2, Celestial Mechanics 1-2, Relativistic Astrophysics, Particle Physics, Special Relativity and Electrodynamics, Electrodynamics in Media

Masters seminars (University of Szeged)

Celestial Mechanics 1-2

Undergraduate courses (University of Szeged)

The Elegant Universe, Introduction to General Relativity, Mathematical Methods in Physics, Electrodynamics, Electromagnetism and Special Relativity, History of Physics

Undergraduate seminars

University of Szeged: Mathematical Methods in Physics, Thermodynamics, Electromagnetism, Electrodynamics

London South Bank University: Scientific Principles, Introductory Mathematics

Université Louis Pasteur, Strasbourg : Mechanics

University of Utah, Salt Lake City: Mechanics, Astronomy

Curriculum development

University of Szeged: PhD, MSc, BSc lectures in Physics and Astronomy

London South Bank University: Physics Curriculum for Integrated Sciences Honours Degree

SUPERVISING ACTIVITY

Several students at the University of Szeged have completed Master Theses in astrophysics, cosmology and general relativity under my supervision, many of them obtaining prizes at Hungarian national student competitions.

6 students (B. Mikóczy, Z. Keresztes, Zs. Horváth, M. Dwornik, M. Tápai and E. Kun) started their PhD studies under my supervision. Keresztes, Mikóczy and Horváth obtained PhD degrees in 2010, 2011 and 2014, respectively, and went to post-doctoral positions at the University of Szeged and at the KFKI Central Research Institute for Nuclear and Particle Physics Budapest. The thesis of the other three students is due in 2016.

I supervised the postdoctoral work of 4 colleagues (Z. Kovács, Z. Keresztes, K. Gabányi and Zs. Horváth). After their respective stays at the University of Szeged, Kovács became post-doctoral researcher at the University of Hong Kong, Gabányi at the FOMI Satellite Geodetic Observatory in Pécs, Hungary, Horváth left for industry and Keresztes got tenure at the University of Szeged.

I have been involved in the PhD defense process of students at the University of Szeged, Eötvös University in Budapest (Hungary), University of Portsmouth (UK), and University of Umeå (Sweden). I collaborated and co-authored papers with PhD and Masters students at the University of Utah (USA), University of Portsmouth (UK), University of Umeå (Sweden), University of Hong Kong (China) and Tokyo University of Science (Japan).