

Bence Kocsis CV

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Status Associate Professor University of Oxford
Tutorial Fellow St Hugh's College

Personal Born: Budapest, Hungary
Languages: Hungarian (native), English (fluent), German (basic)

Education

2006 – 2007 Predoctoral Fellow, Harvard-Smithsonian Center for Astrophysics
2004 – 2007 PhD in Astrophysics, Eötvös University, Hungary
Thesis: *Astrophysical Applications of Gravitational Waves*
Advisors: Zsolt Frei (Eötvös), Zoltan Haiman (Columbia)
2003 Summer student research internship at LIGO, CalTech (advisor: Szabolcs Marka)
2002 Summer student research internship at Harvard CfA (advisor: Matt Holman)
1999 – 2004 M.S. in Physics, Eötvös University, Budapest, Hungary
Thesis: *The Detection of Cluster Edges with the Sunyaev Zel'dovich Effect*
Advisors: Zsolt Frei (Eötvös) and Zoltan Haiman (Columbia)
1998 – 1999 Harvard Extension School

Positions

2020 – Associate professor, University of Oxford
2020 – Tutorial Fellow, St Hugh's College
2017 – 2021 Gravitational Wave Astrophysics Dynamics COST Action Group Leader
2015 – 2021 GALNUC ERC Research Group Leader
2015 – 2020 Assistant professor, Eötvös University
2009 – 2013 NASA Einstein Fellow and ITC Fellow, Harvard (independent researcher)
2008–09, 13–15 Member of the Institute for Advanced Study, Princeton (independent researcher)
2008–09, 13–15 Member of the Institute for Advanced Study, Princeton (independent researcher)
2007 – 08 ITC Postdoctoral Fellow, Harvard (advisor: Abraham Loeb)

Grants/Research

Scholarships

2022–2025 STFC Grant, part of Oxford Astrophysics Consolidated Grant (398,092 GBP)
2017–2019 NKFI-KH17 Funding of internationally outstanding research (20 million HUF)
2015–2021 ERC Starting Grant (1.5 million EUR)
2013–15, 08–09 Institute for Advanced Study, 3-year Member Fellowship
2012 – 2013 Harvard ITC Fellowship
2009 – 2012 NASA Einstein Fellowship (337,435 USD)

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| 2007 – 2008 | Harvard ITC Fellowship |
| 2006 – 2007 | NKTH Öveges József Scholarship (24,800 EUR) |
| 2003 | Summer Undergraduate Research Foundation Fellowship, LIGO, Caltech (5,000 USD) |
| 2002 – 2004 | Student-Scholar of the Hungarian Republic Award (2,400 EUR) |

Awards

Promising Researcher Award of Eotvos Univeristy, 2015
 Prima Primiissima Junior Prize (highest honor in Hungary below age 30), 2008
 Honorable Mention, Gravitational Wave International Committee Thesis Prize, 2008
 1st prize, Best Publication Award, Nat. Soc. of the Hungarian Grad. Students, 2007, 2006
 3rd prize for the presentation at Virgo-VESF School on Gravitational Waves, 2006
 Excellence in Undergradual Studies Award, Eötvös University, Faculty of Sciences, 2004
 1st prize, NyIFFF National Team Competition of Experimental Physics, 2004, 2003
 1st prize (Solid State Physics), National College Science Workshop, 2003
 2nd prize, Science Workshop of the Eötvös University in Physics, 2002, 2001
 1st prize, Ortway International College Competition in Physics, 2001, 2000
 (highest score in the 32-year history of the competition)

Research

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| 2018 – | Smoothed particle hydrodynamics (SPH) simulations of compact objects embedded in gas |
| 2014 – | Direct N-body and symplectic simulations in stellar dynamics |
| 2009 – | Statistical mechanics of galactic nuclei and globular clusters |
| 2009 – | Stellar dynamics in the Galactic center and globular clusters |
| 2011 – | Secular dynamics of hierarchical triples |
| 2010 – | Stellar mass objects embedded in accretion disks – observables and migration |
| 2003 – | Gravitational wave sources for LIGO, LISA, and Pulsar Timing Arrays |
| 2017 – 2018 | Tidal disruption events from globular clusters |
| 2017 – 2018 | Intermediate mass black holes in globular clusters |
| 2015 – 2018 | Globular cluster galaxy coevolution |
| 2015 | Gamma ray excess in the galactic center |
| 2011 – 2014 | Stellar transits in active galactic nuclei |
| 2008 – 2014 | Electromagnetic counterparts of merging black holes |
| 2008 – 2014 | Interaction of gravitational waves with matter |
| 2008 | Transiting extrasolar planets |
| 2006 | Self-gravitational contraction of gravitational wave packets (advisor: Avi Loeb) |
| 2003 – 2004 | Virialization shocks of galaxy clusters and the SZ effect (advisor: Zoltan Haiman) |
| 2002 – 2003 | Magnetic quantum antidots (advisor: Jozsef Cserti) |
| 2002 | Chaos in celestial mechanics (advisor: Matt Holman) |

- 2002 Maximum time travel in the twin paradox (advisor: Zoltan Perjes)
- Teaching Experience**
- General Relativity Tutorial, St Hugh's College Oxford, 2021, 2022 Spring
 Statistical Physics Tutorial, St Hugh's College Oxford, 2021, 2022 Spring
 Symmetries and Relativity Tutorial, St Hugh's College Oxford, 2020, 2021 Fall
 Thermal Physics Tutorial, Oxford, St Hugh's College 2020, 2021 Fall
 Mathematical methods tutorial, Oxford, 2020, 2021 Fall
 Topics in Astrophysics, Eötvös U., 2020 Spring
 Galactic Dynamics, Eötvös U., 2019, 2017, 2016 Spring
 Introduction to Astrophysics, Eötvös U., 2018 Fall
 Black Hole Physics (course founder), Eötvös U., 2018, 2017, 2015 Fall
 Astrophysics Seminar, Eötvös U., 2018, 2017, 2016, 2015 Fall
 Topics in Cosmology, Princeton Senior Resource Center, 2015 Spring
 Ortway Problem-solving Seminar (course founder), Eötvös U., 2006 Spring
 Astrophysics Laboratory, Eötvös U., 2005 Fall
 Theoretical Physics Seminar – Electrodynamics, Eötvös U., 2005 Spring
 Theoretical Physics Seminar – Mechanics, Eötvös U., 2004 Fall
- Mentoring**
- Postdoctoral mentor: Taras Panamarev (2020-2023), Tjarda Boekholt (2020-2023)
 Alexander Rasskazov (2017-2020, now postdoc at Cambridge, UK), Hiromichi Tagawa
 (2017-2020, now postdoc at Tohoku University, Japan), Yohai Meiron (2016-2019,
 now staff at CITA, Toronto, Canada), Zacharias Roupas (2015-2016, now assistant
 professor at British University, Egypt)
- Graduate student advisor (exp. year of graduation): Hanxi Wang (2025, Oxford),
 Connor Rowan (2024, Oxford), Gergely Máthé (2022, Eotvos), Barnabás Deme
 (2022, Eotvos), Ákos Szölgyén (2022, Eotvos, Fulbright Fellow at Harvard)
- Graduate student coadvisor: László Gondán (2020 Eotvos, now postdoc at Eotvos),
 Bence Béky (2013, Harvard, now at Google), Gongjie Li (2016 Harvard, now profes-
 sor at Georgia Tech.), Ryan O'Leary (2011 Harvard, now at Google), Balázs Mikóczi
 (2011 U. Szeged, now postdoc at KFKI)
- Masters degree student advisor: Kristóf Jakovác (2019, Eotvos), Gergely Máthé
 (2018, Eotvos), Deme Barnabás (2018, Eotvos), Ákos Szölgyén (2017, Eotvos)
- Professional Activities**
- Journal referee (Science, ApJ, MNRAS, PRL, PRD, CQG), book reviewer (WILEY-
 VCH, Cambridge Univ. Press)
- Chandra grant review panelist (2017), NASA grant review panelist (2009, 2013),
 NSF grant reviewer (2013, 2016), Hungarian NSF (OTKA) grant reviewer (2012,
 2013, 2016, 2021)
- PhD Examiner (Eotvos U. 2018, 2019, 2020; U. Cambridge 2021)
- Student support committee member St Hugh's college 2021-
- Governing Body member, St Hugh's College 2020-
- Institute Committee member, Physics Institute of Eötvös University 2016-2018

Academic Committee member, Int'l Olympiad in Astronomy and Astrophysics, Hungary 2018-2019
 Eötvös U. Astrophysics Pizza Seminar Organizer 2015-2020
 Institute for Advanced Study Informal Seminar Series Organizer 2013-2014
 Harvard Visitor Committee 2012-2013

Conference Organizer Unsolved Problems in Astrophysics, Budapest, July 2018
 Young Astronomers on Galactic Nuclei, Budapest, October 2018
 AstroHome: Astrophysics and Theoretical Physics Research Morning, June 2022

Publications Summary 87 refereed papers (+5 submitted), 20 first author in ApJ, AJ, MNRAS, SSR, PRD, PRB, and PRL, 2 review, 2 book chapters
 5,964 ADS citations; H index 46; 1620 ADS normalized citations per author
 76/42/19 papers with over 10/50/100 citations

Refereed Publications

92. “AGN as potential factories for eccentric black hole mergers” J. Samsing, I. Bartos, D. J. D’Orazio, Z. Haiman, **B. Kocsis**, N. W. C. Leigh, B. Liu, M. E. Pessah, H. Tagawa, 2022, Nature, 603, 7900, p.237-240
91. “Merger rates of intermediate-mass black hole binaries in nuclear star clusters” G. Fragione, A. Loeb, **B. Kocsis**, F. A. Rasio, Frederic A., 2022, ApJ, accepted, arXiv:2204.03745
90. “On the Jacobi capture origin of binaries with applications to the Earth-Moon system and black holes in galactic nuclei” B. C. N. Tjarda, C. Rowan, B. Kocsis, 2022, MNRAS, submitted, arXiv:2203.09646
89. “Spin Variations of Black Hole Binaries in AGN Disks” G. Li, H. G. Bhaskar, **B. Kocsis**, D. N. C. Lin, 2022, ApJ, submitted, arXiv:2202.11739
88. “Black Hole Discs and Spheres in Galactic Nuclei – Exploring the Landscape of Vector Resonant Relaxation Equilibria” G. Máthé, Á Szölglyén, **B. Kocsis**, Bence, 2022, MNRAS, submitted, arXiv:2202.07665
87. “Astrophysical Gravitational-Wave Echoes from Galactic Nuclei” L. Gondán, **B. Kocsis**, 2022, MNRAS, submitted, arXiv:2110.09540
86. “Repeated Mergers, Mass-gap Black Holes, and Formation of Intermediate-mass Black Holes in Dense Massive Star Clusters” G. Fragione, **B. Kocsis**, F. A. Rasio, J. Silk, 2022, ApJ, 927, 231
85. “Signatures of hierarchical mergers in black hole spin and mass distribution”, H. Tagawa, Z. Haiman, I. Bartos, **B. Kocsis**, K. Omukai, 2021, MNRAS, 507, 3362
84. “First- and second-generation black hole and neutron star mergers in 2+2 quadruples: population statistics”, A. S. Hamers, G. Fragione, P. Neunteufel, **B. Kocsis**, 2021, MNRAS, 506, 5345

83. “*High Eccentricities and High Masses Characterise Gravitational-wave Captures in Galactic Nuclei as Seen by Earth-based Detectors*”, L. Gondan, **B. Kocsis**, 2021, MNRAS, 506, 1665
82. “*Thermal equilibrium of an ideal gas in a free-floating box*”, S. Tremaine, **B. Kocsis**, A. Loeb, 2021, Am.J.Ph., 89, 789
81. “*A Canonical Transformation to Eliminate Resonant Perturbations. I.*”, B. Deme, & **B. Kocsis**, 2021, AJ, 162, 22
80. “*Order in the chaos. Eccentric black hole binary mergers in triples formed via strong binary-binary scatterings*”, M. Arca-Sedda, G. Li, & **B. Kocsis**, 2021, A&A, 650, 189
79. “*Mass-gap Mergers in Active Galactic Nuclei*”, H. Tagawa, **B. Kocsis**, Z. Haiman, I. Bartos, K. Omukai, J. Samsing, 2021, ApJ, 908, 194
78. “*Eccentric Black Hole Mergers in Active Galactic Nuclei*”, H. Tagawa, **B. Kocsis**, Z. Haiman, I. Bartos, K. Omukai, J. Samsing, 2021, ApJ, 907, 20
77. “*Detecting Kozai-Lidov Imprints on the Gravitational Waves of Intermediate-mass Black Holes in Galactic Nuclei*”, B. Deme, B-M. Hoang, S. Naoz, **B. Kocsis**, 2020, ApJ, 901, 125
76. “*Binary Intermediate-mass Black Hole Mergers in Globular Clusters*”, A. Rasskazov, G. Fragione, **B. Kocsis**, 2020, ApJ, 899, 149
75. “*Spin Evolution of Stellar-mass Black Hole Binaries in Active Galactic Nuclei*”, H. Tagawa, Z. Haiman, I. Bartos, **B. Kocsis**, 2020, ApJ, 898, 25
74. “*Formation and Evolution of Compact-object Binaries in AGN Disks*”, H. Tagawa, Z. Haiman, **B. Kocsis**, 2020, ApJ, 898, 25
73. “*Cosmic Evolution of Stellar-mass Black Hole Merger Rate in Active Galactic Nuclei*”, Y. Yang, I. Bartos, Z. Haiman, B. Kocsis, S. Marka, H. Tagawa, 2020, ApJ, 896, 138
72. “*Electromagnetic transients and gravitational waves from white dwarf disruptions by stellar black holes in triple systems*”, G. Fragione, B. D. Metzger, R. Perna, N. W. C. Leigh, **B. Kocsis**, 2020, MNRAS, 495, 1061
71. “*Effective spin distribution of black hole mergers in triples*”, G. Fragione, **B. Kocsis**, 2020, MNRAS, 493, 3920
70. “*Intermediate-mass Black Holes' Effects on Compact Object Binaries*”, B. Deme, Y. Meiron, **B. Kocsis**, 2020, ApJ, 892, 130
69. “*Making a Supermassive Star by Stellar Bombardment*”, H. Tagawa, Z. Haiman, **B. Kocsis**, 2020, ApJ, 892, 36
68. “*GW170817A as a Hierarchical Black Hole Merger*”, V. Gayathri, I. Bartos, Z. Haiman, S. Klimentenko, **B. Kocsis**, S. Marka, Y. Yang, 2020, ApJ, 890, 20

67. “*Anisotropic Mass Segregation in Rotating Globular Clusters*”, A. Szolgyen, Y. Meiron, **B. Kocsis**, 2019, ApJ, 887, 123
66. “*Hierarchical Black Hole Mergers in Active Galactic Nuclei*”, Y. Yang, I. Bartos, V. Gayathri, K. E. S. Ford, Z. Haiman, S. Klimentenko, **B. Kocsis**, S. Marka, Z. Marka, B. McKernan, R. O’Shaughnessy, 2019, PRL, 123, 181101
65. “*Tidal disruption events on to stellar black holes in triples*”, G. Fragione, N. W. C. Leigh, R. Perna, **B. Kocsis**, 2019, MNRAS, 489, 727
64. “*Localization of Binary Black-Hole Mergers with Known Inclination*”, K. R. Corley, I. Bartos, L. P. Singer, A. R. Williamson, Z. Haiman, **B. Kocsis**, S. Nissanke, Z. Marka, S. Marka, 2019, ApJ, 488, 4459
63. “*The Rate of Stellar Mass Black Hole Scattering in Galactic Nuclei*”, A. Rasskazov, **B. Kocsis**, 2019, ApJ, 881, 20
62. “*Black hole mergers from quadruples*”, G. Fragione, **B. Kocsis**, 2019, MNRAS, 486, 4781
61. “*Black holes, gravitational waves and fundamental physics: a roadmap*”, L. Barack, et al.; chapter I.5 by A. Askar & **B. Kocsis**, 2019, CQG, 36, 143001
60. “*Resonant relaxation in globular clusters*”, Y. Meiron & **B. Kocsis**, 2019, ApJ, 878, 138
59. “*AGN Disks Harden the Mass Distribution of Stellar-mass Binary Black Hole Mergers*”, Y. Yang, I. Bartos, Z. Haiman, **B. Kocsis**, Z. Marka, N. C. Stone, S. Marka, 2019, ApJ, submitted, arxiv:1903.01405
58. “*Detecting Supermassive Black Hole-Induced Binary Eccentricity Oscillations with LISA*”, B.-M. Hoang, S. Naoz, **B. Kocsis**, W. Farr, J. McIver, 2019, ApJ, submitted, arxiv:1903.00134
57. “*Measurement Accuracy of Inspiralng Eccentric Neutron Star and Black Hole Binaries Using Gravitational Waves*”, L. Gondan & **B. Kocsis**, 2019, ApJ, 871, 178
56. “*On the rate of black hole binary mergers in galactic nuclei due to dynamical hardening*”, N. W. C. Leigh, A. M. Geller, B. McKernan, K. E. S. Ford, M.-M. Mac Low, J. Bellovary, Z. Haiman, W. Lyra, J. Samsing, M. O’Dowd, **B. Kocsis**, S. Endlich 2018, MNRAS, 474, 5672
55. “*Constraining Stellar-mass Black Hole Mergers in AGN Disks Detectable with LIGO*”, B. McKernan, K. E. S. Ford, J. Bellovary, N. W. C. Leigh, Z. Haiman, **B. Kocsis**, et al., 2018, ApJ, 866, 66
54. “*Tidal Disruption Events and Gravitational Waves from Intermediate Mass Black Holes in Evolving Globular Clusters Across Space and Time*”, G. Fragione & **B. Kocsis**, 2018, ApJ, 867, 119, arXiv:1806.02351
53. “*Black hole mergers from an evolving population of globular clusters*”, G. Fragione & **B. Kocsis**, 2018, PRL, 121, 161103

52. “*Disks of black holes in galactic nuclei*”, A. Szolgyen & **B. Kocsis**, 2018, PRL, 121, 101101
51. “*Compact object mergers driven by gas fallback*”, H. Tagawa & **B. Kocsis**, 2018, PRL, 120, 261101
50. “*Diffusion and mixing in globular clusters*”, Y. Meiron & **B. Kocsis**, 2018, ApJ, 855, 87
49. “*Isotropic-Nematic Phase Transitions in Gravitational Systems II: Higher Order Multipoles*”, A. Takacs & **B. Kocsis**, 2018, ApJ, 856, 113
48. “*Gravitational Waves and Intermediate Massive Black Hole Retention in Globular Clusters*”, G. Fragione, I. Ginsburg, **B. Kocsis**, 2018, ApJ, 856, 92
47. “*Hidden universality in the merger rate distribution in the primordial black hole scenario*”, **B. Kocsis**, T. Suyama, T. Tanaka, & S. Yokoyama, 2018, ApJ, vol. 854, p. 41
46. “*Gamma-ray and X-ray emission from the Galactic centre: hints on the nuclear star cluster formation history*”, M. Arca-Sedda, **B. Kocsis**, T. Brandt, 2018, MNRAS, 479, 900
45. “*Black Hole Mergers in Galactic Nuclei Induced by the Eccentric Kozai-Lidov Effect*”, B. Hoang, S. Naoz, **B. Kocsis**, F. A. Rasio, & F. Dosopoulou, 2018, ApJ, 856, 140
44. “*Eccentric Black Hole Gravitational-Wave Capture Sources in Galactic Nuclei: Distribution of Binary Parameters*”, L. Gondan, **B. Kocsis**, P. Raffai, & Z. Frei 2018, ApJ, vol. 860, p. 5
43. “*Accuracy of Estimating Highly Eccentric Binary Black Hole Parameters with Gravitational-Wave Detections*”, L. Gondan, **B. Kocsis**, P. Raffai, & Z. Frei 2018, ApJ, vol. 855, p. 34
42. “*Testing the binary hypothesis: pulsar timing constraints on supermassive black hole binary candidates*”, A. Sesana, Z. Haiman, **B. Kocsis**, & L. Z. Kelley, 2018, ApJ, vol. 856, p. 42
41. “*Isotropic-Nematic Phase Transitions in Gravitational Systems*”, Z. Roupas, **B. Kocsis**, & S. Tremaine, 2017, ApJ, vol. 842, p. 90
40. “*Rapid and Bright Stellar-mass Binary Black Hole Mergers in Active Galactic Nuclei*”, I. Bartos, **B. Kocsis**, Z. Haiman, & S. Marka 2017, ApJ, vol. 835, p. 165
39. “*Detecting Triple Systems with Gravitational Wave Observations*”, Y. Meiron, **B. Kocsis**, A. Loeb, 2017, ApJ, vol. 834, p. 200
38. “*Merging binaries in the Galactic Center: the eccentric Kozai-Lidov mechanism with stellar evolution*”, A. P. Stephan, S. Naoz, A. M. Ghez, G. Witzel, B. N. Sitarski, T. Do, & **B. Kocsis**, 2016, vol. 460, p. 3494

37. “*Dynamical Formation Signatures of Black Hole Binaries in the First Detected Mergers by LIGO*”, R. M. O’Leary, Y. Meiron, & **B. Kocsis**, 2016, vol. 824, p. 12
36. “*Disrupted Globular Clusters Can Explain the Galactic Center Gamma Ray Excess*”, T. Brandt & **B. Kocsis**, 2015, vol. 812, p. 15
35. “*Implications of the eccentric Kozai-Lidov mechanism for stars surrounding super-massive black hole binaries*”, G. Li, S. Naoz, **B. Kocsis**, & A. Loeb, 2015, ApJ, vol. 451, p. 1341
34. “*A numerical study of vector resonant relaxation*”, **B. Kocsis** & S. Tremaine, 2015, MNRAS, vol. 451, p. 1341
33. “*Stars as resonant absorbers of gravitational waves*”, B. McKernan, K. E. S. Ford, **B. Kocsis**, & Z. Haiman, 2014, MNRAS, vol. 445, p. 74
32. “*Eccentricity growth and orbit flip in near-coplanar hierarchical three body systems*”, G. Li, S. Naoz, **B. Kocsis**, & A. Loeb, 2014, ApJ, vol. 785, p. 116
31. “*Intermediate mass black holes in AGN disks II. Model predictions and observational constraints*”, B. McKernan, K.E.S. Ford, **B. Kocsis**, W. Lyra, H.B. Perets & L.M. Winter, 2014, MNRAS, 441, 900
30. “*Menus for Feeding Black Holes*”, **B. Kocsis** & A. Loeb, 2014, Space Science Reviews, vol. 183, p. 163
29. “*Gas Cloud G2 can Illuminate the Black Hole Population near the Galactic Center*”, I. Bartos, Z. Haiman, **B. Kocsis**, & S. Márka, 2013, PRL, vol. 110, id. 221102
28. “*Ripple effects and oscillations in the broad FeK α line as a probe of massive black hole mergers*”, B. McKernan, K.E.S. Ford, **B. Kocsis**, & Z. Haiman, 2013, MNRAS, vol. 432, p. 1468
27. “*High Frequency Gravitational Waves from Supermassive Black Holes: Prospects for LIGO–Virgo Detections*”, **B. Kocsis**, 2013, ApJ, vol. 763, p. 122
26. “*Stellar Transits in Active Galactic Nuclei*”, B. Béky & **B. Kocsis**, 2013, ApJ, vol. 762, p. 35
25. “*Resonant Post-Newtonian Eccentricity Excitation in Hierarchical Three-body Systems*”, S. Naoz, **B. Kocsis**, A. Loeb, & N. Yunes, 2013, ApJ, vol. 773, p. 187
24. “*Parameter estimation for inspiraling eccentric compact binaries including pericenter precession*”, B. Mikóczi, **B. Kocsis**, P. Forgács, & M. Vasúth, 2012, PRD, vol. 86, Issue 10, id. 104027
23. “*Gas pile-up, gap overflow, and Type 1.5 migration in circumbinary disks: application to supermassive black hole binaries*”, **B. Kocsis**, Z. Haiman, & A. Loeb, 2012, MNRAS, vol. 427, Issue 3, p. 2680-2700
22. “*Gas pile-up, gap overflow, and Type 1.5 migration in circumbinary disks: general theory*”, **B. Kocsis**, Z. Haiman, & A. Loeb, 2012, MNRAS, vol. 427, Issue 3, p. 2660-2679

21. “*Gravitational Wave Heating of Stars and Accretion Disks*”, G. Li, **B. Kocsis**, & A. Loeb, 2012, MNRAS, vol. 425, Issue 4, p. 2407-2412
20. “*Mapping the Galactic Center with Gravitational Wave Measurements using Pulsar Timing*”, **B. Kocsis**, A. Ray, & S. Portegies Zwart, 2012, ApJ, vol. 752, Issue 1, id. 67
19. “*Repeated Bursts from Relativistic Scattering of Compact Objects in Galactic Nuclei*”, **B. Kocsis** & J. Levin, 2012, PRD, vol. 85, id. 123005.
18. “*Observable Signatures of EMRI Black Hole Binaries Embedded in Thin Accretion Disks*”, **B. Kocsis**, N. Yunes, & A. Loeb, 2011, PRD., vol. 84, Issue 2, id. 024032.
17. “*Imprint of Accretion Disk-Induced Migration on Gravitational Waves from Extreme Mass Ratio Inspirals*”, N. Yunes, **B. Kocsis**, A. Loeb, & Zoltan Haiman, 2011, PRL, vol. 107, id. 171103.
16. “*Resonant relaxation and the warp of the stellar disc in the Galactic Centre*”, **B. Kocsis** & S. Tremaine, 2011, MNRAS, vol. 412, Issue 1, p. 187-207
15. “*Gas driven massive black hole binaries: signatures in the nHz gravitational wave background*”, **B. Kocsis** & A. Sesana, 2011, MNRAS, vol. 411, Issue 3, p. 1467-1479
14. “*All-Sky LIGO Search for Periodic Gravitational Waves in the Early Fifth-Science-Run Data*”, B. P. Abbott et al., 2009, PRL, vol. 102, Issue 11, id. 111102
13. “*The Population of Viscosity- and Gravitational Wave-driven Supermassive Black Hole Binaries Among Luminous Active Galactic Nuclei*”, Z. Haiman, **B. Kocsis**, & K. Menou, 2009, ApJ, vol. 700, Issue 2, p. 1952-1969
12. “*Gravitational waves from scattering of stellar-mass black holes in galactic nuclei*”, R. M. O’Leary, **B. Kocsis**, & A. Loeb, 2009, MNRAS, vol. 395, Issue 4, p. 2127-2146
11. “*Identifying decaying supermassive black hole binaries from their variable electromagnetic emission*”, Z. Haiman, **B. Kocsis**, K. Menou, Z. Lippai, & Z. Frei, 2009, CQG, vol. 26, Issue 9, p. 094032
10. “*Periastron precession measurements in transiting extrasolar planetary systems at the level of general relativity*”, A. Pál & **B. Kocsis**, 2008, MNRAS, vol. 389, p. 191-198.
9. “*Brightening of an accretion disk due to viscous dissipation of gravitational waves during the coalescence of supermassive black holes*”, **B. Kocsis** & A. Loeb, 2008, PRL, vol. 101, id. 041101.
8. “*Premerger localization of gravitational wave standard sirens with LISA: triggered search for an electromagnetic counterpart*”, **B. Kocsis**, Z. Haiman, & K. Menou, 2008, ApJ, vol. 684, p. 870-887.
7. “*Cosmological physics with black holes (and possibly white dwarfs)*”, K. Menou, Z. Haiman, & **B. Kocsis**, 2008, New Astron. Rev., vol. 51, Issue 10-12, p. 884-890.

6. “*Distortion of gravitational wave packets due to their self-gravity*”, **B. Kocsis** & A. Loeb, 2007, PRD, vol. 76, id. 084022.
5. “*Premerger localization of gravitational-wave standard sirens with LISA: harmonic mode decomposition*”, **B. Kocsis**, Z. Haiman, K. Menou, & Z. Frei, 2007, PRD, vol. 76, id. 022003.
4. “*Detection rate estimates of gravitatonal waves emitted during parabolic encounters of stellar black holes in globular clusters*”, **B. Kocsis**, M. E. Gáspár, & S. Márka, 2006, ApJ, vol. 648, p. 411-429.
3. “*Finding the electromagnetic counterparts of cosmological standard sirens*”, **B. Kocsis**, Z. Frei, Z. Haiman, & K. Menou, 2006, ApJ, vol. 637, p. 27-37.
2. “*Can virialization shocks be detected around galaxy clusters through the Sunyaev-Zel'dovich effect*”, **B. Kocsis**, Z. Haiman, & Z. Frei, 2005, ApJ, vol. 623, p. 632-649.
1. “*Quantum and semiclassical study of magnetic quantum dots*”, **B. Kocsis**, G. Palla, & J. Cserti, 2005, PRB, vol. 71, id. 075331.

Book Chapters

2. “The Dynamical Origin of Black Hole Mergers”, chapter in hardcover book by Springer, “Handbook of Gravitational Wave Astronomy”, 2022, Eds. C. Bambi, S. Katsanevas, K. D. Kokkotas,
1. “Menus for Feeding Black Holes”, published in hardcover book by Springer, “The Physics of Accretion onto Black Holes”, 2015, Eds. M. Falanga, R. Belloni, P. Casella, M. Gilfanov, P. Jonker, A. King,

**Selected
Invited
Conference
Talks**

44. Astrophysics in the Next Decade: From the First Stars to Intelligent Life, Martha's Vineyard, MA, USA, June 2022
43. NBIA Workshop on Black Hole Dynamics: From Gaseous Environments to Empty Space, Copenhagen, Denmark, May 2022
42. Gravitational wave physics and astronomy: Genesis, Kyoto, Japan, hybrid, April 2022
41. Dynamical Formation of Gravitational Wave Sources, Aspen, January 2022
40. The Gravitational Wave Physics and Astronomy Workshop, Hannover (hybrid), December, 2021
39. Modern theories of gravity, Hungarian Academy of Sciences, Budapest, Hungary, May 2019
38. Astrophysics with Gravitational-Wave Populations, Aspen, USA, February 2019.
37. MWStreams: Survival of Dense Star Clusters in the Milky Way System, MPA Heidelberg, Germany, November 2018
36. MODEST18, Santorini, Greece, June 2018.
35. Gravity@Malta, Malta, Jan 2018.
34. Harvard Sackler Conference Gravitational Wave Astrophysics, Harvard, Cambridge, MA, May. 2018.
33. Stellar Dynamics in Galactic Nuclei, IAS, Princeton, NJ, Nov. 2017.
32. MODEST17, Prague, Chechia, Sep. 2017.
31. Astrophysics of Gravitational Radiation Sources and Multimessenger Astronomy in the Era of LIGO Detections, Aspen, CO, July 2017.
30. The Dawning Era of Gravitational Wave Astrophysics, Aspen, CO, Feb. 2017.
29. 100 éves a relativitáselmélet, NKE, Budapest, Hungary, Nov. 2016.
28. Magyar Fizikus Vándorgyűlés, Szeged, Hungary, Aug. 2016.
27. Gravitációs hullámok felfedezése, Hungarian Academy of Sciences, Hungary, May 2016.
26. The secular evolution of self-gravitating systems over cosmic ages, Paris, France, May 2016.
25. MTA Statistical Physics Day, Hungarian Academy of Sciences, Hungary, April 2016.
24. Dynamics and accretion at the Galactic Center, Aspen, CO, Feb. 2016.
23. 28th Texas Symposium on Relativistic Astrophysics, Geneva, Switzerland, 2015.

22. Alajar Meeting, Alajar, Spain, Oct. 2015.
21. Supermassive Black Hole Binaries, Las Cruces, Chile, 2014.
20. 27th Texas Symposium on Relativistic Astrophysics, Dallas, TX, 2013.
19. Gravitational-wave Science Workshop, South Padre, TX, 2013.
18. Black Hole Fingerprints: Dynamics, Disruptions and Demographics, Snowbird, UT, 2013.
17. The Physical Applications of Millisecond Pulsars, Aspen, CO, 2013.
16. ISSI Workshop on The Physics of Accretion onto Black Holes, Bern, Switzerland, 2012.
15. The Physics of Astronomical Transients, Aspen, CO, 2012.
14. Sackler Conf.: Testing General Relativity (GR) with Astrophysical Systems, Harvard, 2012.
13. Einstein Symposium, at NASA Goddard in 2011, and at Harvard in 2009 and 2010.
12. International Pulsar Timing Array Workshop, Snowshoe, WV., 2011.
11. Galaxy and Black Hole Coevolution, Aspen, CO, 2011.
10. Unsolved Problems in Astrophysics and Cosmology, Benqasque, Spain, 2011.
9. From Planets to Galaxies, Budapest, Hungary, 2010.
8. Central Massive Objects, ESO Garching, Germany, 2010.
7. Sackler Conf.: Dynamics from the Galactic Center to the Milky Way Halo, Harvard, 2010.
6. Stars and Singularities, Rehovot, Israel, 2009.
5. Astrophysics with Radio and Gravitational-Wave Observations, Charlottesville, VA, 2008.
4. XXIV Texas Symposium on Relativistic Astrophysics, Vancouver, Canada, 2008.
3. Merging Black Holes in Galaxies, Katoomba, Australia, 2008.
2. Gravitational Wave Astronomy Aspen Summer Workshop, Aspen, CO, 2008.
1. Measurements and Einstein's Theory of Gravity, Gyöngyöstarján, Hungary, August 2006.

**Selected
Invited
Colloquia**

59. Astro Seminar, Queen Mary University, December, 2021

58. Astrophysical Fluid Dynamics Seminar, Cambridge (virtual), October 2021
57. Astrophysics Seminar, Institut d'Astrophysique de Paris (virtual), September 2021
56. Astrophysics Colloquium, Georgia Tech (virtual), September 2021
55. Astrophysics Seminar, Brno University (virtual), April 2021
54. Astrophysics Colloquium, KIAA Peking University (hybrid), November 2020
53. ITC Colloquium, Harvard (virtual), November 2020
52. Astrophysics Colloquium, Oxford (virtual), November 2020
51. Informal Astrophysics Seminar, Institute for Advanced Study, USA, September 2020
50. Konkoly Seminar, Hungary, February 2020
49. CSH-CEH Virtual Seminar Series, University of Bern, Switzerland, April 2020
48. Physics Seminar, Bolyai College, Hungary, October 2019
47. Astrophysics Colloquium, Kyoto University, Kyoto, Japan, July 2019
46. Santa Barbara Astro Lunch, UCSB, Santa Barbara, USA, May 2019
45. Special seminar, Oxford Department of Physics, May 2019
44. Astrophys. and Cosm. Relativity Seminar, AEI, Postdam, Germany, Mar. 2019.
43. CERN Particle and Astro-particle Seminar, Geneva, Jan. 2019.
42. CERN Cosmo Coffee, Geneva, Jan. 2019.
41. ELFT Summer School, Matrahaza, Hungary, Oct. 2018.
40. DARK Niels Bohr Institute Seminar, Copenhagen, Oct. 2017.
39. Black Hole Initiative Colloquium, Harvard, Feb. 2017.
38. Particle Physics Seminar, Eötvös University, Hungary, Nov. 2016.
37. Physics Seminar, Sapienza Univeristy of Rome, Italy, Nov. 2016.
36. Physics Colloquium, University of Bern, Switzerland, Oct. 2016.
35. Wigner SZFI Seminar, Wigner Institute, Hungary, Oct. 2016.
34. Astrophysics Colloquium, Kyoto University, Japan, July 2016.
33. RESCEU Colloquium, University of Tokyo, Japan, June 2016.
32. Statistical Physics Seminar, Eötvös University, Hungary, April 2016.
31. Physics Seminar, Bolyai College, Hungary, Mar. 2016.
30. Astrophysics Seminar, Konkoly Observatory, Hungary, Nov. 2015.

29. Astrophysics Colloquium, Leiden, Netherlands, Oct. 2015.
28. Ortway Colloquium, Eötvös University, Hungary, Sep. 2015.
27. Evergreen Forum Topics in Cosmology, Princeton Senior Resource Center, Apr. 2015.
26. Astronomy Colloquium, Columbia, Feb. 2015.
25. Astrophysics Seminar, CITA, Toronto, Nov. 2014.
24. Astronomy Colloquium, Columbia, Nov. 2014.
23. Penn State Univ., April 2014.
22. Astrophysics Seminar Series, Institute for Advanced Study, May 2014.
21. Princeton Center for Theoretical Sciences, April 2014.
20. CGCA Seminar, UWisconsin, May 2013.
19. Wunch Seminar, Princeton, April 2013.
18. CIERA Seminar, Northwestern, February 2013.
17. TASC Seminar, UC Santa Cruz, December 2012.
16. TAPIR Seminar, Caltech, November 2012.
15. GRAILS Seminar, MIT, May 2011.
14. TAC Seminar, Berkeley, May 2011.
13. Particle Seminar, Columbia, March 2011.
12. CCRG Seminar, Rochester Institute of Technology, January 2011.
11. GRAILS Seminar, MIT, December 2010.
10. Astrophysics Seminar Series, Institute for Advanced Study, April 2009.
9. CFA Postdoc Symposium, Harvard, October 2009.
8. Gravity Theory Seminar, Univeristy of Maryland, May 2009.
7. Friday Seminar, KICP Univeristy of Chicago, April 2009.
6. Physics Seminar, Columbia, NY, March 2009.
5. Lunch Seminar, Eötvös University, Hungary, July 2008.
4. University of Melbourne, Australia, June 2008.
3. NASA Space Flight Center, Goddard, MD, April 2008.
2. ITC Seminar, Harvard, May 2007.
1. ITC Seminar, Harvard, April 2006.

ArXiv preprints

- “*Challenges Facing Young Astrophysicists*”, N. Zakamska et al., 2009, Astro2010 Decadal Survey Whitepaper, arXiv0905.1986
- “*Coordinated Science in the Gravitational and Electromagnetic Skies*”, J. Bloom et al., 2009, Astro2010 Decadal Survey, Position Papers, no. 69, arXiv0902.1527

Proceedings

- “*LISA Parameter Estimation Accuracy for Compact Binaries on Eccentric Orbits*”, Mátyás Vasúth, Balázs Mikóczy, **B. Kocsis**, Péter Forgács, 2012 Proceedings of the Twelfth Marcel Grossmann Meeting on General Relativity, ed. Thibault Damour, Robert T. Jantzen and Remo Ruffini. ISBN 978-981-4374-51-4. Singapore: World Scientific, p.823
- “*Statistical Physics of Stellar Disks*”, **B. Kocsis**, 2010, Dynamics from the Galactic Center to the Milky Way Halo, Proceedings, Cambridge, MA., multimedia presentation published online, p.9
- “*Identifying Gravitationally Inspiralng Black Hole Binaries Using their Variable Electromagnetic Emission*”, Z. Haiman, **B. Kocsis**, K. Menou, Z. Lippai, Z. Frei, 2008 Panoramic Views of Galaxy Formation and Evolution ASP Conference Series, Vol. 399, ed. Tadayuki Kodama, Toru Yamada, and Kentaro Aoki. San Francisco: Astronomical Society of the Pacific, 2008., p.20
- “*Finding the electromagnetic counterparts of standard sirens*”, **B. Kocsis**, Z. Haiman, & Z. Frei, 2008, Relativistic Astrophysics Legacy and Cosmology, ESO Astrophys. Symp., Ed. B. Achenbach, V. Burwitz, G. Hasinger, & B. Leibundgut p. 82
- “*Detecting virialization shocks around galaxy clusters through the SZ effect*”, **B. Kocsis**, Z. Haiman, & Z. Frei, 2008, Relativistic Astrophysics Legacy and Cosmology, ESO Astrophys. Symp., Ed. B. Achenbach, V. Burwitz, G. Hasinger, & B. Leibundgut p. 334.

Reports

- “*Expectations on the Gravitational Wave Signals Associated with Cosmic Bremsstrahlung Events*”, B. Kocsis & M. E. Gáspár, 2003, LIGO note, LIGO-T030136-00-D
- “*The Data Analysis for Short-term Gravitational Wave Burst Signals with a Modified Maximum Likelihood Detection Method*”, B. Kocsis & M. E. Gáspár, 2003, LIGO note, LIGO-T030213-00-D
- “*The Development of a Digital Camera with a High Dynamic Range*”, M. E. Gáspár & B. Kocsis, 2003, LIGO note, LIGO-T030232-00-D

**Public
Outreach**

- "*Nobel prize for the new organ of humanity*", featured in *Elet es Tudomány*, ed. Zoltan Trupka, 10 Nov. 2017
- "*Riding gravitational waves in the midst of stars*", featured in *Elet es Tudomány*, ed. Zoltan Trupka, 11 Oct. 2017
- "*Supermassive black holes in astrophysics*", From Atoms to Stars Series public talk, Eötvös University, Hungary, Dec. 2015.
- "*Ragyogó fekete lyukak*", Physics Colloquium, Fazekas High School, Hungary, Nov. 2015.
- "*Mysterious Glow at Galactic Center Could Be Dark Matter or Hidden Pulsars*", featured in *Scientific American*, 18 Nov. 2015
- In *Delta*, Science and technology news, Hungarian M1 TV, January 15, 2011.
- "*Stars in the Galactic Center*", 3D animation presented in the Visualization Center of Eotvos University, Budapest, Hungary, 2010.
- In *Tudástár (Knowledge Base)*, Popular science TV show, Hungarian M1 TV, September 28, 2010.
- "*Hullámvadászok (Wave Hunters)*", Popular science documentary film in Hungarian, broadcasted on Hungarian M2 TV, August 27, 2010.