

List of publications of István Rácz

January, 2023

According to the record held at the Google Scholar (in 2022)
with total number of citations: 11033, and with h-index: 48

I was the founder and group leader, for the period 2008-2015, of a Hungarian research team
of my home institute (Wigner Research Center for Physics) that is a full member
of the European Virgo gravitational wave experiment.

63 research papers, published as a member of the Virgo Scientific Collaboration, are not included below

A link to a complete list can be found, e.g. at <http://www.kfki.hu/~iracz/>

Monography:

1. **Rácz, I.** (2014): *Bevezetés az Einstein-féle gravitációelméletbe: (Title in English: An introduction to Einstein's theory of gravity)*, Nagykanizsa: Czupi Kiadó, www.czupi.hu, 342 pp., ISBN:978-963-9782-39-6
2. **Rácz, I.** (2014): *Gyenge gravitációs hullámok leírása az általános relativitáselméletben: (Title in English: Description of weak gravitational waves in general Relativity)*, Nagykanizsa: Czupi Kiadó, www.czupi.hu, 78 pp. ISBN:978-963-9782-37-2

Research Papers:

A) Papers with peer review process

1. **Rácz, I.** (2023): *Spacetime singularities and curvature blow-ups. Gen Relativ Gravit*, Gen. Rel. Grav. **55**, 3
2. **Rácz, I.** (2022): *On the construction of Riemannian three-spaces with smooth inverse mean curvature foliation*, Gen. Rel. Grav. **54**, 55
3. **Rácz, I.** (2021): *Can we prescribe the physical parameters of multiple black holes?*, Mathematics **9**, no. 24: 3170
4. Nakonieczna, A., Nakonieczny, L., **Rácz, I.** (2021): *Black hole initial data by numerical integration of the parabolic-hyperbolic form of the constraints*, Int. J. Modern Physics D **30**, 2150111
5. Csukás, K., **Rácz, I.** (2021): *Numerical investigation of the dynamics of linear spin s fields on a Kerr background II: Superradiant scattering*, Phys. Rev. D **103**, 084035
6. Csukás, K., **Rácz, I.** (2020): *Numerical investigations of the asymptotics of solutions to the evolutionary form of the constraints*, Class. Quantum Grav. **37** 155006
7. Csukás, K., **Rácz, I.**, Tóth, G.Zs. (2019): *Numerical investigation of the dynamics of linear spin s fields on Kerr background I. Late time tails of spin $s = \pm 1, \pm 2$ fields* Phys. Rev. D **100**, 104025
8. Dobkowski-Ryłko, D., Lewandowski, J., **Rácz, I.** (2019): *The type D equation on horizons of non-trivial bundle topology*, Phys. Rev. D **100**, 084058
9. **Rácz, I.** (2019): *On the evolutionary form of the constraints in electrodynamics*, Symmetry **11** 10
10. Cole, M.J., **Rácz, I.**, Valiente Kroon, J.A. (2018): *Killing spinor data on distorted black hole horizons and the uniqueness of stationary vacuum black holes*, Classical and Quantum Gravity **35** 205001
11. **Rácz, I.**, Winicour, J. (2018): *Toward computing gravitational initial data without elliptic solvers*, Classical and Quantum Gravity **35** 135002
12. **Rácz, I.** (2018): *A simple method of constructing binary black hole initial data*, Astronomy Reports **62** 953-958

13. Lewandowski, J, **Rácz, I.**, Szereszewski, A (2017) *Near horizon geometries and black hole holograph*, Physical Review D **96**, 044001
14. **Rácz, I.** (2016) *Constraints as evolutionary systems*, Classical and Quantum Gravity **33**, 015014
15. **Rácz, I.** Winicour, J. (2015): *Black hole initial data without elliptic equations*, Physical Review D **91**, 124013
16. Garfinkle, D., **Rácz, I.** (2015): *Resolving a gravitational wave memory paradox*, General Relativity and Gravitation **47**, 79
17. **Rácz, I.** (2015): *Cauchy problem as a two-surface based 'geometrodynamics'*, Classical and Quantum Gravity **32**, 015006
18. Frenkel, A., **Rácz, I.** (2015): *On the use of projection operators in electrodynamics*, European Journal of Physics **36**, 015022
19. **Rácz, I.** (2014): *Is the Bianchi identity always hyperbolic?*, Classical and Quantum Gravity **31**, 155004
20. **Rácz, I.** (2014): *Stationary black holes as holographs II.*, Classical and Quantum Gravity **31**, 035006
21. Csizmadia, P., László, A., **Rácz, I.** (2013): *On the use of multipole expansion in time evolution of nonlinear dynamical systems and some surprises related to superradiance*, Classical and Quantum Gravity **30**, 015010
22. Nagy-Egri, M.F., **Rácz, I.**, Debreczeni G. (2013): *Evolution of non-linear dynamics using Graphical Processing Units*, Astronomische Nachrichten **334**, 1036-1038
23. Csizmadia, P., Debreczeni, G., **Rácz, I.**, Vasúth, M. (2012): *Gravitational waves from spinning eccentric binaries*, Classical and Quantum Gravity **29**, 245002
24. **Rácz, I.**, Tóth, G.Zs. (2011): *Numerical investigation of the late-time Kerr tails*, Classical and Quantum Gravity **28**, 195003
25. Gáspár, M. E., **Rácz, I.** (2011): *On the dynamics of relativistic multi-layer spherical shell systems*, Classical and Quantum Gravity **28**, 085005
26. Gáspár, M.E., **Rácz, I.** (2011): *Probing the stability of gravastars by dropping dust shells onto them*, Classical and Quantum Gravity **27**, 185004
27. **Rácz, I.** (2010): *Space-time extensions II*, Classical and Quantum Gravity **27**, 155007
In 2011 the Editorial Board of Classical and Quantum Gravity selected this paper as one of the Highlights of 2010.
28. Csizmadia, P., **Rácz, I.** (2010): *Gravitational collapse and topology change in spherically symmetric dynamical systems*, Classical and Quantum Gravity **27**, 015001
29. **Rácz, I.** (2009): *On the topology of untrapped surfaces*, Classical and Quantum Gravity **26**, 055017
30. **Rácz, I.** (2008): *A Simple proof of the recent generalisations of Hawking's black hole topology theorem*, Classical and Quantum Gravity **25**, 162001
In 2009 the Editorial Board of Classical and Quantum Gravity selected this paper as one of the Highlights of 2008.
31. Fodor, G., **Rácz, I.** (2008): *Numerical investigation of highly excited magnetic monopoles in $SU(2)$ Yang-Mills-Higgs theory*, Physical Review D **77**, 025019
32. **Rácz, I.** (2007): *Stationary black holes as holographs*, Classical and Quantum Gravity **24**, 5541-5571
33. Bradley, M., Eriksson, D., Fodor, G., **Rácz, I.** (2007): *Slowly rotating fluid balls of Petrov type D*, Physical Review D **75**, 024013
34. Fodor, G., Forgács, P., Grandclement, P., **Rácz, I.** (2006): *Oscillons, Quasi-breathers in the Φ^4 Klein-Gordon model*, Physical Review D **74**, 124003

35. **Rácz, I.** (2006): *On the use of the Kodama vector field in spherically symmetric dynamical problems*, Classical and Quantum Gravity **23**, 115-123
 36. Fodor, G., **Rácz, I.** (2004): *What does a strongly excited 't Hooft-Polyakov magnetic monopole do?*, Physical Review Letter 92, 151801
 37. Fodor, G., **Rácz, I.** (2003): *Massive fields tend to form highly oscillating self-similarly expanding shells*, Physical Review D **68**, 044022
 38. **Rácz, I.** (2001): *Symmetries of spacetime and their relation to initial value problems*, Classical and Quantum Gravity **18**, 5103-5113
 39. **Rácz, I.** (2000): *Does the third law of black hole thermodynamics really have a serious failure*, Classical and Quantum Gravity **17**, 4353-4356
 40. **Rácz, I.** (2000): *On further generalization of the rigidity theorem for spacetimes with a stationary event horizon or a compact Cauchy horizon*, Classical and Quantum Gravity **17**, 153-178
 41. **Rácz, I.** (1999): *On the existence of Killing vector fields*, Classical and Quantum Gravity **16**, 1695-1703
 42. Friedrich, H., **Rácz, I.**, Wald, R.M. (1999): *On the rigidity theorem for spacetimes with a stationary event horizon or a compact Cauchy horizon*, Communications in Mathematical Physics **204**, 691-707
 43. **Rácz, I.**, Süveges, M. (1998): *On the uniqueness of stationary axisymmetric ellipsoidal vacuum configurations*, Mod. Phys. Lett. **13**, 1101-1109
 44. **Rácz, I.** (1997): *On Einstein's equations for spacetimes admitting a non-null Killing field*, Journal of Mathematical Physics **38**, 4237-4254
 45. **Rácz, I.**, Zsigrai, J. (1997): *Generating new perfect fluid solutions from known ones II.*, Classical and Quantum Gravity **14**, 1997-2002
 46. **Rácz, I.**, Zsigrai, J. (1996): *Generating new perfect fluid solutions from known ones*, Classical and Quantum Gravity **13**, 2783-2797
 47. **Rácz, I.**, Wald, R.M. (1996): *Global extensions of spacetimes describing asymptotic final states of black holes*, Classical and Quantum Gravity **13**, 539-553
 48. **Rácz, I.** (1993): *Maxwell fields in spacetimes admitting non-null Killing vectors*, Classical and Quantum Gravity **10**, L167-172
 49. **Rácz, I.** (1993): *Spacetime extensions I.*, Journal of Mathematical Physics **34**, 2448-2464
 50. **Rácz, I.**, Wald, R.M. (1992): *Extension of spacetimes with Killing horizon*, Classical and Quantum Gravity **9**, 2643-2656
 51. **Rácz, I.** (1992): *Note on stationary-axisymmetric vacuum spacetimes with inside ellipsoidal symmetry*, Classical and Quantum Gravity **9**, L93-98
 52. Kánnár, J., **Rácz, I.** (1992): *On the strength of spacetime singularities*, Journal of Mathematical Physics **33**, 2842-2848
 53. **Rácz, I.** (1988): *Causal boundary for stably causal space-times*, General Relativity and Gravitation **20**, 893-904
 54. **Rácz, I.** (1987): *Causal boundary of space-times*, Physical Review D **36**, 1673-1675
 55. **Rácz, I.** (1987): *Distinguishing properties of causality conditions*, General Relativity and Gravitation **19**, 1025-1031
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56. **Rácz, I.** (1988): *Strong curvature singularities in spacetimes*, Essay received "Honourable Mention" by *Gravity Research Foundation* in 1988
57. **Rácz, I.** (1987): *A new causal boundary of space-times*, Essay received "Honourable Mention" by *Gravity Research Foundation* in 1987

B) Submitted papers with peer review process

1. Petersen O.L., **Rácz, I.** (2018): *Symmetries of vacuum spacetimes with a compact Cauchy horizon of constant non-zero surface gravity*, arXiv:1804.10287, submitted to *Annales Henri Poincaré*

C) Papers without peer review process

1. **Rácz, I.** (2016): *On the ADM charges of multiple black holes*, arXiv:1608.02283
2. **Rácz, I.**, Winicuoar, J. (2016): *On solving the constraints by integrating a strongly hyperbolic system*, arXiv:1601.05386
3. **Rácz, I.** (2014): *Dynamical determination of the gravitational degrees of freedom*, arXiv:1412.0667
4. László, A., **Rácz, I.** (2014): *Superradiance or total reflection?*, in *Relativity and Gravitation: 100 Years after Einstein in Prague*, Springer Proceedings in Physics, (Eds.) Bičák, J., Ledvinka, T. pp. 119-127
5. Csizmadia, P., László, A., **Rácz, I.** (2010): *Linear waves on fixed Kerr background, their relevance in jet formation*, *Journal of Physics: Conference Series* **218**, 012007
6. **Rácz, I.** (2009): *Gravitational radiation and isotropic change of the spatial geometry*, arXiv:0912.0128
7. Csizmadia, P., **Rácz, I.** (2010): *Numerical investigations of gravitational collapse*, *Journal of Physics: Conference Series* **218**, 012006
8. Csizmadia, P., Kovács, G., **Rácz, I.** (2010): *Some preliminary results on the dynamics of Einstein-Yang-Mills-Higgs systems*, *Journal of Physics: Conference Series* **218**, 012008
9. Fodor, G., Forgács, P., Grandclement, P., **Rácz, I.** (2006): in *Lifetime of oscillons*, 11th Marcel Grossmann Meeting on General Relativity, p 1543-1545, Berlin
10. M. Bradley, D. Eriksson, Fodor, G., **Rácz, I.** (2007): *Some results on rotating fluid balls of Petrov type D*, in *Proceedings of the XXIX Spanish Relativity Meeting, E.R.E. 2006*, published as *Journal of Physics: Conference Series* 66, 012010
11. Fodor, G., **Rácz, I.** (2004): *Dynamical SU(2) magnetic monopoles*, in *RELATIVITY TODAY, Proceedings of the Seventh Hungarian Relativity Workshop, 2003* Ed. **Rácz, I.**, Akadémiai Kiadó
12. Fodor, G., **Rácz, I.** (2003): *What does a magnetic monopole do?*, Proc. of the Tenth Marcel Grossmann Meeting on General Relativity 2003
13. **Rácz, I.** (2002): *On rigidity of spacetimes with a compact Cauchy horizon*, Proceedings of the Ninth Marcel Grossmann Meeting on General Relativity, eds. R.T. Jantzen, V. Gurzadyan, R. Ruffini, World Scientific, p. 983-985
14. **Rácz, I.** (1995): *On Einstein's equations for spacetimes admitting non-null Killing fields*, in *Abstracts of Contributed Papers, 14th International Conference on General Relativity, Gravitation*, p. A131.
15. **Rácz, I.**, Wald, R.M. (1995): *Global extensions of spacetimes describing final asymptotic states of black holes*, in *Abstracts of Contributed Papers, 14th International Conference on General Relativity, Gravitation*, p. A130

16. **Rácz, I.** (1995): *On Einstein's equations for perfect fluid sources possessing 4-velocity parallel to a timelike Killing field*, in *Inhomogeneous Cosmological Models*, eds. A. Molina, J.M.M. Senovilla, World Scientific, p. 222-226
17. **Rácz, I.**, Wald, R.M. (1992): *Extensions of spacetimes with Killing horizon*, in *Abstracts of Contributed Papers, 13th International Conference on General Relativity and Gravitation*, p. 253.
18. **Rácz, I.** (1992): *Extension of spacetimes with null geodesically incomplete Killing horizon*, in *Proceedings of the 1st Midwest Relativity Conference*, Coord. Edvard Seidel, March 6-7, 1992; NCSA Urbana, Illinois
19. **Rácz, I.** (1992): *Curvature singularities*, in *RELATIVITY TODAY (Proc. 3rd Hungarian Relativity Workshop, 1989)* Ed. Z. Perjés, Nova Science Publishers, Inc. p. 195-205
20. **Rácz, I.** (1989): *Curvature singularities in globally hyperbolic spacetimes*, in *Abstracts of Contributed Papers, 12th International Conference on General Relativity, Gravitation*, (Vol. 1, p. 252.)

Edition of conference proceedings

21. Ed. **Rácz, I.** (2004): *RELATIVITY TODAY (Proceedings of the Seventh Hungarian Relativity Workshop, 2003)* , Akadémiai Kiadó, pp. 290

Popularising science in Hungarian

22. **Rácz, I.** (2014): *Magyar részvétel az európai gravitációshullám-kísérletekben, I. rész*, Fizikai Szemle **LXIV**, 2-5
23. **Rácz, I.** (2014): *Magyar részvétel az európai gravitációshullám-kísérletekben, II. rész*, Fizikai Szemle **LXIV**, 50-53
24. **Rácz, I.** (2011): *Hogyan hallgatható meg az Univerzum zenéje?*, Természet világa **142**, p. 546
25. **Rácz, I.** (2005): *Einstein befejezetlen szimfóniája* (Einstein's unfinished symphony), a 52-minute film on Einstein's theory of gravity and the gravitational wave experiments), Producer: Reál Stúdió Kft.
26. **Rácz, I.** (2005): *Megemlékezés: Perjés Zoltán 1943-2004* (A tribute to Zoltán Perjés), Fizikai Szemle, **LV**, 70-71
27. **Rácz, I.** (2005): *Létezik-e a kozmikus cenzor?*, Fizikai Szemle, **LV**, 382-387