
Scientific Publications of Dr. Imre Ferenc Barna:

last modified 29.10.2024

82. I. F. Barna, and L. Mátyás

"Diffusion Cascades and Mutually Coupled Diffusion Processes"

[Mathematics 12, \(2024\) 3298](#)

IF 2.3 (2023)

81. G. Bognár, I. F. Barna, K. Hriczó and L. Mátyás

"Diffusion phenomena associated with surface growth"

[IP Conf. Proc. 3094, \(2024\) 250001](#)

IF 0.40 (2023) a proceedings forerunner of 79.

80. L. Mátyás and I.F. Barna

"Self-similar and traveling wave solutions of diffusion equations with concentration dependent diffusion coefficients"

[Romanian Journal of Physics 69 \(2024\) 106](#)

IF 1.5 (2022)

79. E. Kovács, I.F. Barna, G. Bognár, L. Mátyás and K. Hriczó

"Analytical and numerical study of diffusion propelled surface growth phenomena"

[Partial Differential Equations in Applied Mathematics 11 \(2024\) 100798](#)

IF 5.23 (2022)

78. B. E. Szigeti, I. F. Barna, and G. G. Barnaföldi

"The Formulation of Scaling Expansion in an Euler-Poisson Dark-fluid Model"

[Universe 9, \(2023\) 431](#)

IF 2.813

77. I. F. Barna and L. Mátyás

"Investigation of incompressible boundary layers with viscous heat conduction"

[AIP Conference Proceedings 2849, \(2023\) 160001](#)

IF 0.4

76. K. Hriczó and I. F. Barna

"Heat and mass transfer of nanofluids containing metallic nanoparticles"

[AIP Conference Proceedings 2849, \(2023\) 160003](#)

IF 0.4

75. S. Varró, Sz. Hack, G. Parag, P. Földi, I. F. Barna and A. Czirják

"Diatomic molecule in a strong infrared laser field: level-shifts and bond-length change due to laser-dressed Morse potential"

[New. J. Phys. 11, \(2023\) 131](#)

IF 3.3

74. A. H, Askar, Á. Nagy, I.F. Barna and E. Kovács

"Analytical Solution and Numerical Simulation of Heat Transfer in Cylindrical- and Spherical-Shaped Bodies"

[Computation 11, \(2023\) 131](#)

[We are on the cover page of the issue](#)

IF 2.813

73. A, H, Askar, Á, Nagy, I. F. Barna and E. Kovács

"Analytical and Numerical Results for the Diffusion-Reaction Equation When the Reaction Coefficient Depends on Simultaneously the Space and Time Coordinates"

[Computation 11, \(2023\) 127](#)

IF 2.813

72. L. Mátyás and I.F. Barna

"Even and Odd Self-Similar Solutions of the Diffusion Equation for Infinite Horizon"

[Universe 9, \(2023\) 264](#)

IF 2.813

71. I.F. Barna, M.A. Pocsai and K. Tökési

"Ab Initio Double-Differential Ionization Cross-Section Calculations in Antiproton–Helium Collisions"

[Atoms 11, \(2023\) 74](#)

IF 1.8

70. M. Saleh, E. Kovács and I.F. Barna

"Analytical and Numerical Results for the Transient Diffusion Equation with Diffusion Coefficient Depending on Both Space and Time"

[Algorithms 16, \(2023\) 184](#)

IF 2.3

69. G. Bíró, M. Pocsai, I.F. Barna, J.T. Moody and G. Demeter

"Machine learning methods for Schlieren imaging of a plasma channel in tenuous atomic vapor"

[Optics and Laser Technology 159, \(2023\) 108948](#)

IF 4.939

68. E. Kovács, M. Saleh, I.F. Barna and L. Mátyás

"New Analytical Results and Numerical Schemes for Irregular Diffusion Processes"

[Diffusion Fundamentals 35, \(2022\) 70](#)

or https://diffusion.uni-leipzig.de/contents_vol35.php

67. I.F. Barna, G. Bognár, L. Mátyás és K. Hriczó

"Self-similar analysis of the time-dependent compressible and incompressible boundary layers including heat conduction"

[Journal of Thermal Analysis and Calorimetry 147, \(2022\) 13625](#)

IF 4.626

66. I.F. Barna and L. Mátyás

"Lissajous curves with a finite sum of prime number frequencies"

[Annals of Mathematics and Physics 5\(2\), \(2022\) 137](#)

IF 0.16

65. Barna Imre Ferenc, Mátyás László és Hriczó Krisztián

"A fűtött határregeget leíró parciális differenciálegyenlet rendszer önhasznó megoldásai "

[Alkalmazott Matematikai Lapok 39, \(2022\) 1-15](#)

[a publication in Hungarian language, with an English abstract at the end](#)

64. I.F. Barna and L. Mátyás

"Advanced Analytic Self-Similar Solutions of Regular and Irregular Diffusion Equations"

[Mathematics 10, \(2022\) 3281](#)

IF 2.84

63. I.F. Barna, M.A. Pocsai and G. G. Barnaföldi

"Self-similar solutions of a gravitating dark fluid"

[Mathematics 10, \(2022\) 3220](#)

IF 2.84

62. M. Saleh, E. Kovács, I.F. Barna and L. Mátyás
 "New Analytical Results and Comparison of 14 Numerical Schemes for the Diffusion Equation with Space-Dependent Diffusion Coefficient"
[Mathematics 10, \(2022\) 2813](#)
 IF 2.84
61. I.F. Barna, M.A. Pocsai and L. Mátyás
 "Time-dependent analytic solutions for water waves above sea of varying depth"
[Mathematics 10, \(2022\) 2311](#)
 IF 2.84
60. I.F. Barna, G. Bognár, L. Mátyás and K. Hriczó
 "Analytical investigation of the rotating and stratified hydrodynamical problem"
[AIP Conference Proceedings 2425, \(2022\) 290002](#)
 IF 0.4
59. I.F. Barna, G. Bognár, L. Mátyás and K. Hriczó
 "Analytical examination of the time-dependent incompressible boundary layer with heat conduction"
[AIP Conference Proceedings 2425, \(2022\) 290003](#)
 IF 0.4
58. L. Mátyás and I.F. Barna
 "General Self-Similar Solutions of Diffusion Equation and Related Constructions"
[Romanian Journal of Physics 67, \(2022\) 101](#)
 IF 1.888
57. K. Gméling, T. Kocsis, J. Osán¹, Z. Kis, M. A. Pocsai, K. Tőkési, I. F. Barna and Gy. Pádi
 "Evaluation of major and trace elements present in extracted humic acid from bog peat"
[Asian Journal of Chemical Sciences 10, \(2021\) 47](#)
 IF 0.24
56. I.F. Barna and L. Mátyás
 "Analytic solutions of a two-fluid hydrodynamic model"
[Mathematical Modeling and Analysis 26, \(2021\) 582](#)
 IF 1.74
55. Á. Nagy, I. Omle, H. Kareem, E. Kovács, I.F. Barna and G. Bognár
 "Stable, explicit, leapfrog-hopscotch algorithms for the diffusion equation"
[Computation 9, \(2021\) 92](#)
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54. I.F. Barna and L. Mátyás
 "Analytic solutions of the rotating and stratified hydrodynamical equations"
[Asian Journal of Research and Reviews in Physics 4\(1\): 14, \(2021\); Article no.AJR2P.64107](#)
 IF 0.607
53. R.W. Assmann, M. Weikum.. et al.
 "EuPRAXIA Conceptual Design Report"
[Eur. Phys. J. Special Topics 229, \(2020\) 3675-4284](#)
 IF 2.707
52. I.F. Barna, G. Bognár, L. Mátyás, M. Guedda, and K. Hriczó
 "Analytic solutions of the two-dimensional Kardar-Parisi-Zhang growing equation"
[AIP Conference Proceedings 2293, \(2020\) 280002](#)
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51. I.F. Barna, G. Bognár, L. Mátyás, M. Guedda, and K. Hriczó
"Travelling-wave solutions of the Kardar-Parisi-Zhang interface growing equation with different kind of noise terms"
[AIP Conference Proceedings 2293, \(2020\) 280005](#)
IF 0.4
50. H. Kisztián, G. Bognár and I.F. Barna
"Effect of Nonuniform Magnetic Field on Ferrofluid Flow and Heat Transfer"
[AIP Conference Proceedings 2293, \(2020\) 280003](#)
IF 0.4
49. G. Bognár, I.F. Barna, and K. Hriczó
"Investigation of roughening in nonlinear surface evaluation models"
[AIP Conference Proceedings 2293, \(2020\) 280004](#)
IF 0.4
48. I.F. Barna, G. Bognár, M. Guedda, K. Hriczó and L. Mátyás
"Analytic self-similar solutions of the Kardar-Parisi-Zhang interface growing equation with various noise term"
[Mathematical Modelling and Analysis 25, \(2020\) 241](#)
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47. I.F. Barna, L. Mátyás and M.A. Pocsai
"Self-similar analysis of a viscous heated Oberbeck-Boussinesq flow system"
[Fluid. Dyn. Res. 52, \(2020\) 015515](#)
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46. M. K. Weikum et al.
"Status of the Horizon 2020 EuPRAXIA conceptual design study"
[IOP Conf. Series: Journal of Physics: Conf. Series 1350, \(2019\) 012059](#)
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45. S. Varró, P. Földi and I.F. Barna
"Laser induced distortion of band structure in solids: an analytic model"
[IOP Conf. Series: Journal of Physics: Conf. Series 1206, \(2019\) 012005](#)
IF 0.55
44. M.A. Pocsai, I.F. Barna and K. Tókési
"Photoionisation of Rubidium in strong laser fields"
[Eur. Phys. J. D. 73, \(2019\) 74](#)
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43. I.F. Barna, M.A. Pocsai and S. Varró
"The influence of a strong infrared radiation field on the conductance properties of doped semiconductors"
[Eur. Phys. J. Appl. Phys. 84, \(2018\) 20101](#)
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42. I.F. Barna, M.A. Pocsai and L. Mátyás
"Self-similarity analysis of the non-linear Schrödinger equation in the Madelung form"
[Advances in Mathematical Physics, Article ID 7087295, \(2018\) Volume 2018](#)
41. P. A. Walker et al.
"Horizon 2020 EuPRAXIA design study"
[IOP Conf. Series: Journal of Physics: Conf. Series 874, \(2017\) 012029](#)
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40. I.F. Barna, M.A. Pocsai and L. Mátyás
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39. I.F. Barna
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38. I.F. Barna, M.A. Pocsai, S. Lökös and L. Mátyás
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[Chaos Solitons and Fractals. 103,\(2017\) 336](#)
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37. I.F. Barna and R. Kersner
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[\(special issue, Recent Advances of Lie Theory in differential Geometry, in memory of John Nash\) 10, S2-10," \(2016\)](#)
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36. T. Csörgő, I.F. Barna and M.I. Nagy
 "Observables and initial conditions for rotating and expanding fireballs with spheroidal symmetry"
[Phys. Rev. C 93,\(2016\) 024916](#)
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35. M.A Pocsai, S. Varró and I.F. Barna
 "Electron acceleration by a bichromatic chirped laser pulse in underdense plasmas"
[Nucl. Instr. Meth. in Phys. Res. B. 369,\(2016\) 50](#)
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34. I.F. Barna and S. Varró
 "Proton scattering on carbon nuclei in bichromatic laser field at moderate energies"
[Nucl. Instr. Meth. in Phys. Res. B. 369,\(2016\) 77](#)
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33. I.F. Barna, G. Bognár and K. Hriczó
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32. I. F. Barna, M. A. Pocsai, A. Guba and A. Imre
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[Kerntechnik 80,\(2015\) 5](#)
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31. I.F. Barna and L. Mátyás
 "Analytic self-similar solutions of the Oberbeck-Boussinesq equation"
[Chaos Solitons and Fractals 78,\(2015\) 249](#)
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30. M.A. Pocsai, S. Varró and I.F. Barna
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[Laser and Particle Beams 33,\(2015\) 307.](#)
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29. I.F. Barna and S. Varró
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28. I.F. Barna
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27. I.F. Barna, L. Mátyás
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[Fluid. Dyn. Res. 46, \(2014\) 055508](#)
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26. M. Aladi, J.S. Bakos, I.F. Barna et al.
"Pre-Excitation Studies for Rubidium-Plasma Generation"
[Nucl. Instr. Meth. in Physics Res. A 740, \(2014\) 203](#)
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"Analytic solutions for the one-dimensional compressible Euler equation with heat conduction closed with different kind of equation of states"
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24. I.F. Barna
"A general telegraph-type model for heat conduction with self-similar behavior of solutions"
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22. I.F. Barna
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"Multiple condensation induced water hammer events, experiments and theoretical investigation"
[Kerntechnik 76, \(2011\) 231](#)
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20. I.F. Barna and R. Kersner
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19. A. R. Imre, A. S. Abyzov, I. F. Barna and J. W. P. Schmelzer
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17. A.R. Imre, I.F. Barna, G. Ezsol, G. Hazi and T. Kraska,

"Theoretical study of flashing and water hammer in supercritical water cycle during pressure drop"

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"Total and angular differential cross sections of electrons emitted in collision between antiprotons and helium atoms emission cross sections for ionization of helium by protons"

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"Photoionization of Helium Atoms through a Superposition of Higher Harmonics"

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11. I.F. Barna, J. Wang and J. Burgdoerfer

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"Coherent control calculations for helium atom in short and intensive XUV laser pulses"

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"Singly differential electron emission cross sections for ionization of helium by protons"

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"Spiral modes in the diffusion of a granular particle on a vibrating surface"

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[Eur. Phys. J. D 27, \(2003\) 287](#)

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"Coupled-channel study with Coulomb wave packets for ionization of helium in heavy ion collisions"

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"Localisation of nonlocal potentials by a Taylor expansion Method"

[J. Phys. G. 26, \(2000\) 323-331](#)

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I.F. Barna, L. Mátyás,

"Analytic Solutions of the Complex Diffusion Equation with Possible Quantum Mechanical Relevance "

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I.F. Barna, G. Bognár, L. Mátyás, K. Hriczó

"Analytical investigation of time-dependent two-dimensional non-Newtonian boundary layer equations"

<https://arxiv.org/abs/2311.04676>

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"Analytic solutions for irregular diffusion equations with concentration dependent diffusion coefficients"

<https://arxiv.org/abs/2310.01466>

L. Mátyás and I.F. Barna

"Even and odd self-similar solutions of the diffusion equation for infinite horizon"

<https://arxiv.org/abs/2304.06824>

S. Varró, Sz. Hack, G. Paragi, P. Földi, I.F. Barna and A. Czirják

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<https://arxiv.org/abs/2303.04858>

B.E. Szigeti, I.F. Barna and G.G. Barnaföldi

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G. Bíró, M. Pocsai, I.F. Barna, J.T. Moody and G. Demeter

"Machine learning methods for Schlieren imaging of a plasma channel in tenuous atomic vapor"

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"Advanced self-similar solutions of regular and irregular diffusion equations"

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"General self-similar solutions of diffusion equation and related constructions"

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"Self-similar analysis of the time-dependent compressible and incompressible boundary layers including heat conduction"

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"Lissajous curves with a finite sum of prime number frequencies"

<https://arxiv.org/abs/2009.01687>

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"Analytic Traveling-Wave Solutions of the Kardar-Parisi-Zhang Interface Growing Equation with Different Kind of Noise Terms"

[Springer Proceedings in Mathematics & Statistics Series, Vol. 333](#)

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[Page 239 - 255](#)

I.F. Barna, M. A. Pocsai and G. G. Barnaföldi

"Self-similar analysis for dark fluid hydrodynamics"

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"Analytic solutions of a two-fluid hydrodynamic model"

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Understanding the Schrödinger Equation: Some [Non]Linear Perspectives

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Chapter 6, Pages 181 - 224

I.F. Barna and L. Mátyás

["Self-similar And Travelling-Wave Analysis Of The Madelung Equations Obtained From the Free Schrödinger Equation"](#)

M.K. Weikum et al.

"EuPRAXIA – a compact, cost-efficient particle and radiation source"

[AIP Conference Proceedings 2160, 040012 \(2019\)](#)

M.A. Pocsai and I.F. Barna

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I.F. Barna, G. Bognár, M. Guedda, K. Hriczó and L. Mátyás

"Analytic traveling-wave solutions of the Kardar-Parisi-Zhang interface growing equation with different kind of noise terms"

<https://arxiv.org/abs/1908.09615>

I.F. Barna, L. Mátyás and M.A. Pocsai

"Self-similar analysis of a viscous heated Oberbeck-Boussinesq flow system"

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<https://arxiv.org/abs/1904.01856>

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"Analytic self-similar solutions of the Kardar-Parisi-Zhang interface growing equation with various noise term"

<https://arxiv.org/abs/1904.01838>

S. Varró, P. Földi, and I.F. Barna

"Laser induced distortion of band structure in solids: an analytic model"

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M.A. Pocsai, I.F. Barna and K. Tókési

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<https://arxiv.org/abs/1811.08427>

M.K. Weikum et al.

"EuPRAXIA – A Compact, Cost-Efficient Particle and Radiation Source"

[25th International Conference on the Application of Accelerators in Research and Industry \(CAARI 2018\)](#)

Z. Kis, K. Gmeling, T. Kocsis, J. Osán, M. A. Pocsai, K. Tókési, I.F. Barna and Gy. Pádi

"Major and Trace Elements in the Humic Acid"

"ChemRxiv doi.org/10.26434/chemrxiv.7122413.v1 "

https://chemrxiv.org/articles/Major_and_Trace_Elements_in_the_Humic_Acid/7122413/1

I.F. Barna, M.A. Pocsai and L. Mátyás

"Self-similarity analysis of the non-linear Schrodinger equation in the Madelung form"

<https://arxiv.org/abs/1804.06274>

I.F. Barna, M.A. Pocsai and S. Varró

"The influence of a strong infrared radiation field on the conductance properties of doped semiconductors"

<https://arxiv.org/abs/1801.09579>

I.F. Barna, M.A. Pocsai and L. Mátyás

"Analytic solutions of the Madelung equation"

<https://arxiv.org/abs/1703.10482>

I.F. Barna, M.A. Pocsai, S. Lökös and L. Mátyás

"Rayleigh-Benard convection in the generalized Oberbeck-Boussinesq system"

<https://arxiv.org/abs/1701.01647>

30th International Symposium on Shock Waves ISSW30 Conference Proceedings

Springer 2017 - Volume 2

Editors: Ben-Dor, Gabi; Igra, Ozer; Sadot, Oren

I.F. Barna and R. Kersner

Heat Conduction: Hyperbolic Self-Similar Shock-Waves in Solids

[Page 927 - 931](#)

Handbook on Navier-Stokes Equations: Theory and Applied Analysis

Editor: Denise Campos

Nova Science Publishers 2017

ISBN: 9781536102925

I.F. Barna

["Self-Similar Analysis of Various Navier-Stokes Equations in Two or Three Dimensions"](#)

[Chapter 16, Pages 275 - 304](#)

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"Observables and initial conditions for rotating and expanding fireballs with spheroidal symmetry"

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