11/12/2025

CURRICULUM VITAE AND LIST OF PUBLICATIONS

Personal Details

Name: Shahar Hod.
Date and place of birth: 05/01/1970, Rehovot, Israel.
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Electronic Address: shaharhod@gmail.com .

Higher Education

A. Undergraduate and Graduate Studies

Period of Study	**Name of Institution and Department**	**Degree**	**Year of Approval of Degree**
1988-1991	The Hebrew University.	B.Sc. *Summa cum laude* in Chemistry and Physics (Final grade 96).	1991
1994-1996	The Hebrew University. Physics department. Thesis advisor: Prof. Tsvi Piran.	M.Sc. *cum laude* in Physics (Final grade 95).	1996
1996-2000	The Hebrew University. Physics department. Thesis advisor: Prof. Tsvi Piran.	Ph.D.	2001

B. Post-Doctoral Studies

Period of Study	**Name of Institution and Department**	**Degree**	**Year of Completion**
2001-2003	The Weizmann Institute of Science. Physics department [1].	Post-Doc	2003
2003-2005	The Hebrew University. Physics department.	Post-Doc	2005

[1]Chosen over offers from Cambridge University and The University of British Columbia.

Academic Ranks in Institutes of Higher Education

Dates	**Name of Institution**	**Rank / Position**
2017-2025	The Hadassah Academic College	Full Professor
2009-2017	The Hadassah Academic College	Associate Professor
2007-2009	The Hadassah Academic College	Senior Lecturer
2004-2007	The Hadassah Academic College	Lecturer
2017-2025	The Ruppin Academic Center	Full Professor
2009-2017	The Ruppin Academic Center	Associate Professor
2007-2009	The Ruppin Academic Center	Senior Lecturer
2001-2007	The Ruppin Academic Center	Lecturer
2017-2025	The Achva Academic College	Full Professor
2009-2017	The Achva Academic College	Associate Professor

Offices in Academic Adminstration

2016-2025: Member of the Supreme Academic Council of The Jerusalem Multidisciplinary College (former name: Hadassah Academic College).
2018-2025: Member of the Supreme Promotions Committee, The Ruppin Academic Center.
2018-2019: Member of the Promotions Committee, The Ruppin Academic Center Faculty of Marine Sciences.
2018: Member of a Professional Promotion Committee, The Hadassah Academic College.
2007-2017: Board member of The Ruppin Academic Center School of Marine Sciences.
2014-2017: Member of the Teaching Committee, The Ruppin Academic Center School of Marine Sciences.
2017-2022: Director of exams in Physics and Mathematics, The Hadassah Academic College.
2015: Member of the Appointments Committee, The Ruppin Academic Center School of Marine Sciences.
2004-2015: Academic consultant for undergraduate students, The Hadassah Academic College.
2007-2014: Director of Mathematical and Physical studies, The Ruppin Academic Center School of Marine Sciences.
2010-2014: Academic consultant for a Ph. D. student, The Hebrew University, Jerusalem.
2009-2011: Academic consultant for pre-academic preparatory program, The Ruppin Academic Center.
1996: Member of the local Scientific secretariat of the Eighth Marcel Grossmann meeting on recent developments in theoretical and experimental General Relativity, The Hebrew University.

Scholarly Positions and Activities outside the Institution

Professional functions

1998-2025: During my years as a researcher, I have been serving as a professional reviewer and a referee for the following scientific journals:

- Physical Review Letters
- Physical Review D
- Physical Review E
- Physics Letters B
- Journal of High Energy Physics
- Classical and Quantum Gravity
- General Relativity and Gravitation
- Journal of Cosmology and Astroparticle Physics
- Europhysics Letters
- The European Physical Journal C
- Journal of High Energy Astrophysics
- Nuclear Physics B
- New Journal of Physics
- Modern Physics Letters A
- Physics Letters A
- Annals of Physics
- Frontiers in Physics
- Proceedings of the Royal Society of London
- Physical Science International Journal
- Advances in Mathematical Physics
- International Journal of Modern Physics D
- Entropy
- Astronomy
- Gravitation and Cosmology
- Communications in Theoretical Physics
- Physica Scripta
- Chinese Physics C

- Central European Journal of Physics
- International Journal of Physical Sciences
- Canadian Journal of Physics
- Journal of Mathematical Physics
- Fractal and Fractional
- Physical Review & Research International
- Journal of Physics and Astronomy Research
- The European Physical Journal Plus
- Physics Open
- Universe
- Journal of Applied Physical Science International
- British Journal of Mathematics & Computer Science
- Galaxies
- British Journal of Applied Science & Technology
- Mathematics
- International Journal of Geometric Methods in Modern Physics
- Applied Sciences
- Journal of Modern Physics
- Physica A
- Particles
- International Journal of Modern Physics A
- Acta Mathematica Scientia
- New Astronomy
- International Journal of Theoretical Physics
- Symmetry
- Axioms
- Journal of Gravity
- Future Internet
- Games
- Journal of Physics Communications
- Astrophysics and Space Science
- Annalen der Physik

- Advances in High Energy Physics
- Journal of Optics
- Physics of the Dark Universe

Fellowships

2001: The Marie Curie Fellowship offered by the European Commission (declined).

2001-2003: The Picard Postdoctoral fellowship at the Weizmann Institute of Science, 170,000 NIS.

Awards and Prizes

- 1998: Professor Katzir high school, Best Student Award.
- 1988: The Hebrew University of Jerusalem, Excellence Prize.
- 1990: The Hebrew University of Jerusalem, The Dean Prize from the Faculty of Mathematics and Natural Sciences.
- 1990: The Hebrew University of Jerusalem, The Rector Prize for outstanding B.Sc. students.
- 1990: The Israeli Knesset (Parliament), The Knesset Education Committee Prize for academic excellence.
- 1991: The Hebrew University of Jerusalem, The Philip Elving Prize for academic excellence.
- 1991: The Hebrew University of Jerusalem, The Dean Prize from the Faculty of Mathematics and Natural Sciences.
- 1992: The Hebrew University of Jerusalem, The Rector Prize for outstanding M.Sc. students.
- 1996: The Hebrew University of Jerusalem, The Shimon Ofer Prize for the best M.Sc. student in physics.
- 1998: The Gravity Research Foundation (USA), Second Prize from the Gravity Research Foundation together with Prof. Tsvi Piran.
- 1998: The Hebrew University of Jeruslaem, The Rector Prize for outstanding Ph.D. students.
- 1999: The Israeli Physical Society, Prize for the best Ph.D. student in theoretical physics.
- 1999: The Gravity Research Foundation (USA), Fifth Prize from the Gravity Research Foundation.
- 2000: The Gravity Research Foundation (USA), Second Prize from the Gravity Research Foundation together with Prof. Tsvi Piran.
- 2001: The Marie Curie Fellowship offered by the European Commission (declined).
- 2001: The Picard Postdoctoral Fellowship.
- 2007: The Gravity Research Foundation (USA), Honorable Mention from the Gravity Research Foundation.
- 2008: The Ruppin Academic Center, Prize for Academic Excellence (The Ruppin Award for Outstanding Research Activity).

- 2009: The Gravity Research Foundation (USA), Third Prize from the Gravity Research Foundation.
- 2009: The Ruppin Academic Center, Best Lecturer Award.
- 2010: The Gravity Research Foundation (USA), Honorable Mention from the Gravity Research Foundation.
- 2010: The Achva Academic College, Best Lecturer Award.
- 2010: The Ruppin Academic Center, Certificate of Appreciation for Excellence in Teaching and Outstanding Contribution to the Institute.
- 2011: The Gravity Research Foundation (USA), Honorable Mention from the Gravity Research Foundation.
- 2011: The Ruppin Academic Center, Best Lecturer Award.
- 2012: The Gravity Research Foundation (USA), Honorable Mention from the Gravity Research Foundation.
- 2012: The Achva Academic College, Best Lecturer Award.
- 2012: The Hadassah Academic College, Prize for Excellence in Teaching and Outstanding Contribution to the Institute.
- 2012: The Ruppin Academic Center, Best Lecturer Award & Prize for Outstanding Research Activity.
- 2013: The Achva Academic College, Best Lecturer Award (first semester).
- 2013: The Gravity Research Foundation (USA), Honorable Mention from the Gravity Research Foundation.
- 2013: The Hadassah Academic College, Prize for Excellence in Teaching and Outstanding Contribution to the Institute.
- 2013: The Achva Academic College, Best Lecturer Award (second semester).
- 2014: The Ruppin Academic Center, Best Lecturer Award & Prize for Outstanding Research Activity.
- 2014: The Achva Academic College, Best Lecturer Award.
- 2014: The Gravity Research Foundation (USA), Honorable Mention from the Gravity Research Foundation.
- 2014: The Hadassah Academic College, Prize for Excellence in Teaching and Outstanding Contribution to the Institute.
- 2015: The Ruppin Academic Center, Best Lecturer Award & Prize for Outstanding Research Activity.

- 2015: The Gravity Research Foundation (USA), Honorable Mention from the Gravity Research Foundation.
- 2016: The Ruppin Academic Center, Best Lecturer Award & Prize for Outstanding Research Activity (3rd).
- 2016: The Gravity Research Foundation (USA), Honorable Mention from the Gravity Research Foundation.
- 2017: The Ruppin Academic Center, Best Lecturer Award & Prize for Outstanding Research Activity.
- 2017: The Gravity Research Foundation (USA), Fourth Prize from the Gravity Research Foundation.
- 2018: The Ruppin Academic Center, Best Lecturer Award & Prize for Outstanding Research Activity (2nd).
- 2018: The European Physical Journal C, Letter of appreciation as a committed referee.
- 2018: The Gravity Research Foundation (USA), Honorable Mention from the Gravity Research Foundation.
- 2019: The European Physical Journal C, Letter of appreciation as a committed referee.
- 2019: The Ruppin Academic Center, Best Lecturer Award & Prize for Outstanding Research Activity (2nd).
- 2019: The Gravity Research Foundation (USA), Honorable Mention from the Gravity Research Foundation.
- 2019: The European Physical Journal, Selected as a "Distinguished EPJ referee".
- 2020: The Ruppin Academic Center, Best Lecturer Award & Prize for Outstanding Research Activity (2nd).
- 2020: The Gravity Research Foundation (USA), Third Prize from the Gravity Research Foundation.
- 2021: The Ruppin Academic Center, Best Lecturer Award & Prize for Outstanding Research Activity (2nd).
- 2021: The Gravity Research Foundation (USA), Honorable Mention from the Gravity Research Foundation.
- 2021: The Hadassah Academic College, Best lecturer award.
- 2021: Listed in the Stanford/Elsevier Top 2% Scientists (Global Ranking of Scientists), published by Stanford University in collaboration with Elsevier.
- 2022: The Ruppin Academic Center, Best Lecturer Award & Prize for Outstanding

Research Activity.

- 2022: The Achva Academic College, Best Lecturer Award & Prize for Outstanding Research Activity.
- 2022: The Ruppin Academic Center, Chosen as the favorite lecturer by the graduating students.
- 2022: Listed in the Stanford/Elsevier Top 2% Scientists (Global Ranking of Scientists), published by Stanford University in collaboration with Elsevier.
- 2022: Ranked 5th worldwide among the leading black-hole physicists according to the ScholarGPS global rankings.
- 2023: The Ruppin Academic Center, Best Lecturer Award & Prize for Outstanding Research Activity.
- 2023: The Gravity Research Foundation (USA), Fourth Prize from the Gravity Research Foundation.
- 2023: The Hadassah Academic College, Prize for Excellence in Teaching and Outstanding Contribution to the Institute (3rd).
- 2023: Listed in the Stanford/Elsevier Top 2% Scientists (Global Ranking of Scientists), published by Stanford University in collaboration with Elsevier.
- 2023: Ranked 5th worldwide among the leading black-hole physicists according to the ScholarGPS global rankings.
- 2024: The Ruppin Academic Center, Best Lecturer Award & Prize for Outstanding Research Activity (2nd).
- 2024: The Gravity Research Foundation (USA), Honorable Mention from the Gravity Research Foundation.
- 2024: The Hadassah Academic College, Prize for Excellence in Teaching and Outstanding Contribution to the Institute (3rd).
- 2024: The European Physical Journal C, selected as Distinguished European Physical Journal (EPJ) Referee.
- 2024: Listed in the Stanford/Elsevier Top 2% Scientists (Global Ranking of Scientists), published by Stanford University in collaboration with Elsevier.
- 2024: Ranked 4th worldwide among the leading black-hole physicists according to the ScholarGPS global rankings.

- 2025: The Ruppin Academic Center, Best Lecturer Award & Prize for Outstanding Research Activity (2nd).
- 2025: Listed in the Stanford/Elsevier Top 2% Scientists (Global Ranking of Scientists), published by Stanford University in collaboration with Elsevier.
- 2025: Ranked 5th worldwide among the leading black-hole physicists according to the ScholarGPS global rankings.

Educational Activities – Teaching

Years	Name of Course	Type of Course	Degree	Number of Students
1996-2001	Physics I (Mechanics). The Hebrew University. Served as a teaching assistant.	Physics Lecture	B.Sc.	~150
1997-1999	Quantum Physics. The Hebrew University. Served as a teaching assistant.	Physics Lecture.	B.Sc.	~70
2000-2001	Waves and Optics. The Hebrew University. Served as a teaching assistant.	Physics Lecture.	B.Sc.	~70
2000-2025	Physics I (Mechanics). The Ruppin Academic Center.	Physics Lecture.	B.Sc.	~120
2000-2025	Physics II (Electricity and Magnetism). The Ruppin Academic Center.	Physics Lecture.	B.Sc.	~120
2005-2006	Modern Physics: Quantum Physics and Relativity. The Ruppin Academic Center.	Physics Lecture.	B.Sc.	~30
2003-2025	Physics I (Mechanics). The Jerusalem Multidisciplinary College (former name: Hadassah Academic College).	Physics Lecture.	B.Sc.	~100
2004-2025	Physics II (Electricity and Magnetism). The Jerusalem Multidisciplinary College (former name: Hadassah Academic College).	Physics Lecture.	B.Sc.	~100
2004-2025	Waves and Optics. The Jerusalem Multidisciplinary College (former name: Hadassah Academic College).	Physics Lecture.	B.Sc.	~25
2010-2025	Physics I (Mechanics). The Achva Academic College.	Physics Lecture.	B.Sc.	~30
2009-2025	Physics II (Electricity and Magnetism). The Achva Academic College.	Physics Lecture.	B.Sc.	~30

Received outstanding reviews in official teaching evaluation surveys.

Additional Information: Excellence in Teaching

I believe that my scientific activity as a researcher contributes significantly to my abilities as a lecturer. I enjoy teaching very much and consider it an important mission.
In my opinion, maintaining a high quality of academic education in Israel would shape the future of our society.

During my years as a lecturer I have constantly been ranked by students as one of the best teachers in the institute (in the top 10% of the teaching staff).

Scientific Publications

M.Sc. Thesis:
The Hebrew University (1996).
Thesis advisor: Prof. Tsvi Piran.
Title of thesis: Critical behavior and Universality in Gravitational Collapse of a Charged Scalar Field.

Ph.D. Dissertation:
The Hebrew University (2001).
Thesis advisor: Prof. Tsvi Piran.
Title of thesis: Black Holes: Classical and Quantum Properties.

Articles in Refereed Journals

I.F = Impact Factor.
R = Rank.
N = Number of citations.
* = Publications since last promotion.
For papers published in the Physical Review: (x-y) means page numbers.

My h-index = 33

(1) **S. Hod** and T. Piran,
Fine structure of Choptuik's mass-scaling relation,
Physical Review D **55**, **Rapid** Communication, 440-442 (1997).
I.F=4.37 ; R=7/29
N = 67

(2) **S. Hod** and T. Piran,
Critical behavior and universality in gravitational collapse of a charged scalar field,
Physical Review D **55**, 3485-3496 (1997).
I.F=4.37 ; R=7/29
N = 68

(3) **S. Hod** and T. Piran,
Late-time evolution of charged gravitational collapse and decay of charged scalar hair – I,
Physical Review D **58**, 024017(1-6) (1998).
I.F=4.37 ; R=7/29
N = 107

(4) **S. Hod** and T. Piran,
Late-time evolution of charged gravitational collapse and decay of charged scalar hair – II,
Physical Review D **58**, 024018(1-6) (1998).
I.F=4.37 ; R=7/29
N = 72

(5) **S. Hod** and T. Piran,
Late-time evolution of charged gravitational collapse and decay of charged scalar hair - III. Nonlinear analysis,
Physical Review D **58**, 024019(1-6) (1998).
I.F=4.37 ; R=7/29
N = 64

(6) **S. Hod** and T. Piran,
Late-time tails in gravitational collapse of a self-interacting (massive) scalar-field and decay of a self-interacting scalar hair,
Physical Review D **58**, 044018(1-6) (1998).
I.F=4.37 ; R=7/29
N = 86

(7) **S. Hod** and T. Piran,
Mass inflation in dynamical gravitational collapse of a charged scalar field,
Physical Review Letters **81**, 1554-1557 (1998).
I.F=8.84 ; R=6/78
N = 89

(8) **S. Hod** and T. Piran,
The inner structure of black holes,
General Relativity and Gravitation **30**, 1555-1559 (1998).
[This essay is awarded **2nd Prize** in the 1998 Essay Competition of the Gravity Research Foundation].
I.F=1.72; R=39/78
N = 40

(9) **S. Hod**,
Late-time evolution of realistic rotating collapse and the no-hair theorem,
Physical Review D **58**, 104022(1-7) (1998).
I.F=4.37 ; R=7/29
N = 68

(10) **S. Hod**,
Bohr's correspondence principle and the area spectrum of quantum black holes,
Physical Review Letters **81**, 4293-4296 (1998).
I.F=8.84 ; R=6/78
N = 608

(11) **S. Hod**,
Best approximation to a reversible process in black-hole physics and the area spectrum of spherical black holes,
Physical Review D **59**, 024014(1-4) (1998).
I.F=4.37 ; R=7/29
N = 64

(12) **S. Hod**,
Black-hole polarization and cosmic censorship,
Physical Review D **60**, 104031(1-3) (1999).
I.F=4.37 ; R=7/29
N = 16

(13) **S. Hod**,
High-order contamination in the tail of gravitational collapse,
Physical Review D **60**, 104053(1-4) (1999).
I.F=4.37 ; R=7/29
N = 31

(14) **S. Hod**,
Mode-coupling in rotating gravitational collapse of a scalar field,
Physical Review D **61**, 024033(1-8) (1999).
I.F=4.37 ; R=7/29
N = 57

(15) **S. Hod**,
Universal entropy bound for rotating systems,
Physical Review D **61**, 024018(1-4) (1999).
I.F=4.37 ; R=7/29
N = 25

(16) **S. Hod**,
Improved upper bound to the entropy of a charged system,
Physical Review D **61**, 024023(1-3) (1999).
I.F=4.37 ; R=7/29
N = 37

(17) **S. Hod**,
Gravitation, the quantum, and Bohr's correspondence principle,
General Relativity and Gravitation **31**, 1639-1644 (1999).
[This essay is awarded **5th Prize** in the 1999 Essay Competition of the Gravity Research Foundation].
I.F=1.72; R=39/78
N = 54

(18) **S. Hod**,
Mode-coupling in rotating gravitational collapse: Gravitational and electromagnetic perturbations,
Physical Review D **61**, 064018(1-7) (2000).
I.F=4.37 ; R=7/29
N = 36

(19) **S. Hod**,
Cosmic censorship: The role of quantum physics,
e-print gr-qc/9908004 (1999).
N = 7

(20) **S. Hod**,
Radiative tail of realistic rotating gravitational collapse,
Physical Review Letters **84**, 10-13 (2000).
I.F=8.84 ; R=6/78
N = 52

(21) **S. Hod** and T. Piran,
Cosmic censorship: The role of quantum gravity,
General Relativity and Gravitation **30**, 1555-1559 (2000).
[This essay is awarded **2nd Prize** in the 2000 Essay Competition of the Gravity Research Foundation].
I.F=1.72; R=39/78
N = 25

(22) **S. Hod**,
Evidence for a null entropy of extremal black holes,
Physical Review D **61**, 084018(1-4) (2000).
I.F=4.37 ; R=7/29
N = 12

(23) **S. Hod**,
Black-hole radiation, the fundamental area unit, and the spectrum of particle species,
Physical Review D **61**, 124016(1-3) (2000).
I.F=4.37 ; R=7/29
N = 9

(24) **S. Hod**,
Wave tails in nontrivial backgrounds,
Classical and Quantum Gravity **18**, 1311-1314 (2001).
I.F=3.28 ; R=13/78
N = 26

(25) **S. Hod**,
Discrete black-hole radiation and the information loss paradox,
Physics Letters A **299**, 144-149 (2002).
I.F=1.86 ; R=39/78
N = 22

(26) **S. Hod** and E. Nakar,
Self-segregation versus clustering in the evolutionary minority game,
Physical Review Letters **88**, 238702(1-4) (2002).
I.F=8.84 ; R=6/78
N = 85

(27) **S. Hod**,
Wave tails in time-dependent backgrounds,
Physical Review D **66**, 024001(1-4) (2002).
I.F=4.37 ; R=7/29
N = 27

(28) **S. Hod**,
Cosmic censorship, area theorem, and self-energy of particles,
Physical Review D **66**, 024016(1-4) (2002).
I.F=4.37 ; R=7/29
N = 29

(29) E. Nakar and **S. Hod**,
Temporal oscillations and phase transitions in the evolutionary minority game,
Physical Review E **67**, 016109(1-5) (2003).
I.F=2.27 ; R=6/55
N = 22

(30) **S. Hod**,
Time-dependent random walks and the theory of complex adaptive systems,
Physical Review Letters **90**, 128701(1-4) (2003).
I.F=8.84 ; R=6/78
N = 23

(31) **S. Hod**,
Kerr black-hole quasinormal frequencies,
Physical Review D **67**, **Rapid** Communication, 081501(1-3) (2003).
I.F=4.37 ; R=7/29
N = 53

(32) **S. Hod** and E. Nakar,
Strategy updating rules and strategy distributions in dynamical multiagent systems,
Physical Review E **68**, 026115(1-4) (2003).
I.F=2.27 ; R=6/55
N = 14

(33) **S. Hod** and E. Nakar,
Reply to comment on Self-Segregation versus Clustering in the Evolution Minority Game,
Physical Review Letters **91**, 189802(1) (2003).
I.F=8.84 ; R=6/78
N = 2

(34) **S. Hod** and U. Keshet,
Phase transition in random walks with long-range correlations,
Physical Review E **70**, **Rapid** Communication, 015104(1-4) (2004).
I.F=2.27 ; R=6/55
N = 39

(35) **S. Hod** and E. Nakar,
Evolutionary minority game: the roles of response time and mutation threshold,
Physical Review E **69**, 066122(1-4) (2004).
I.F=2.27 ; R=6/55
N = 4

(36) E. Nakar and **S. Hod**,
Survival probabilities in time-dependent random walks,
Physical Review E **70**, 016116(1-4) (2004).
I.F=2.27 ; R=6/55
N = 9

(37) **S. Hod**,
High-order corrections to the entropy and area of quantum black holes,
Classical and Quantum Gravity, **Letter** to the Editor, volume **21**, 97-100 (2004).
I.F=3.28 ; R=13/78
N = 52

(38) **S. Hod** and U. Keshet,
Intermediate asymptotics of the Kerr quasinormal spectrum,
Classical and Quantum Gravity, **Letter** to the Editor, volume **22**, 71-74 (2005).
I.F=3.28 ; R=13/78
N = 22

(39) U. Keshet and **S. Hod**,
Survival probabilities of history-dependent random walks,
Physical Review E **72**, 046144(1-3) (2005).
I.F=2.27 ; R=6/55
N = 11

(40**)** **S. Hod** and U. Kehset,
Selection rules for black-hole quantum transitions,
Physical Review D **73**, 024003(1-4) (2006).
I.F=4.37 ; R=7/29
N = 6

(41) **S. Hod**,
Quasinormal spectrum and quantization of charged black holes,
Classical and Quantum Gravity, **Letter** to the Editor, volume **23**, 23-28 (2006).
I.F=3.28 ; R=13/78
N = 42

(42) **S. Hod**,
Universal bound on dynamical relaxation times and black-hole quasinormal ringing,
Physical Review D **75**, 064013(1-5) (2007).
I.F=4.37 ; R=7/29
N = 70

(43) U. Keshet and **S. Hod**,
Analytic study of rotating black-hole quasinormal modes,
Physical Review D **76**, **Rapid** Communication, 061501(1-5) (2007).
I.F=4.37 ; R=7/29
N = 50

(44) **S. Hod**,
Near extreme black holes and the universal relaxation bound,
Classical and Quantum Gravity **24**, 4235-4237 (2007).
I.F=3.28 ; R=13/78
N = 33

(45) **S. Hod**,
On the quantization of a multi-horizon black hole,
Classical and Quantum Gravity **24**, 4871-4874 (2007).
I.F=3.28 ; R=13/78
N = 12

(46) **S. Hod**,
Einstein-Yang-Mills solitons: the role of gravity,
Physics Letters B **657**, 255 (2007).
I.F=4.16 ; R=4/20
N = 7

(47**)** **S. Hod**,
Bounds on the mass-to-radius ratio for non-compact field configurations,
Classical and Quantum Gravity **24**, 6019-6024 (2007).
I.F=3.28 ; R=13/78
N = 6

(48) **S. Hod**,
Black holes have a good temper(ature),
International Journal of Modern Physics D **17**, 563-566 (2008).
[This essay received an **Honorable Mention** from the Gravity Research Foundation 2007].
I.F=2.00 ; R=33/66

(49) **S. Hod**,
Lifetime of unstable hairy black holes,
Physics Letters B **661**, 175 (2008).
I.F=4.16 ; R=4/20
N = 17

(50) **S. Hod**,
Weak cosmic censorship: As strong as ever,
Physical Review Letters **100**, 121101 (2008).
I.F=8.84 ; R=6/78
N = 74

(51) **S. Hod**,
Quasinormal resonances of near-extremal Kerr-Newman black holes,
Physics Letters B **666**, 483 (2008).
I.F=4.16 ; R=4/20
N = 37

(52) **S. Hod**,
Return of the quantum cosmic censor,
Physics Letters B **668**, 346 (2008).
I.F=4.16 ; R=4/20
N = 23

(53) **S. Hod**,
Slow relaxation of rapidly rotating black holes,
Physical Review D **78**, 084035(1-5) (2008).
I.F=4.37 ; R=7/29
N = 69

(54) **S. Hod**,
Black-hole quasinormal resonances: Wave analysis versus a geometric-optics approximation,
Physical Review D **80,** 064004(1-4) (2009).
I.F=4.37 ; R=7/29
N = 35

(55) **S. Hod**,
How pure is the tail of gravitational collapse?
Classical and Quantum Gravity **26**, 028001 (2009).
I.F=3.28 ; R=13/78
N = 16

(56) **S. Hod**,
From thermodynamics to the bound on viscosity,
Nuclear Physics B **819**, 177-182 (2009).
I.F=3.19 ; R=11/29
N = 1

(57) **S. Hod**,
Gravitation, thermodynamics, and the bound on viscosity,
General Relativity and Gravitation **41**, 2295-2299 (2009).
[Also published in: International Journal of Modern Physics D **18**, 2337-2341 (2009).]
[This essay is awarded **3rd Prize** in the 2009 Essay Competition of the Gravity Research Foundation].
I.F=1.72; R=39/78
N = 5

(58) **S. Hod** and O. Hod,
Analytic treatment of the black-hole bomb,
Physical Review D **81**, **Rapid** Communication, 061502(1-5) (2010).
I.F=4.37 ; R=7/29
N = 76

(59) **S. Hod**,
Relaxation dynamics of charged gravitational collapse,
Physics Letters A **374**, 2901 (2010).
I.F=1.86 ; R=39/78
N = 25

(60) **S. Hod**,
Universal charge–mass relation: From black holes to atomic nuclei,
Physics Letters B **693**, 339-342 (2010).
I.F=4.16 ; R=4/20
N = 11

(61) **S. Hod**,
Quantum buoyancy, generalized second law, and higher-dimensional entropy bounds,
Journal of High Energy Physics **1012**, 033(1-10) (2010).
I.F=5.54 ; R=4/29
N = 4

(62) **S. Hod**,
Analytic treatment of the network synchronization problem with time delays,
Physical Review Letters **105**, 208701(1-4) (2010).
I.F=8.84 ; R=6/78
N = 23

(63) **S. Hod**,
Gravitation, thermodynamics, and the fine-structure constant,
International Journal of Modern Physics D **19**, 2319-2323 (2010).
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Synopsis of my Research Projects

My main scientific research interests are:

- Classical general relativity
- Black-hole physics
- Quantum gravity and semiclassical general relativity
- Statistical physics and thermodynamics
- Information theory
- Complex systems
- Interdisciplinary physics
- Mathematical physics

The following is a brief summary of my various research projects:

Cloudy Black Holes:
In this part of the research program I explicitly demonstrate for the first time that rotating Kerr black holes can support stationary (rather than static) scalar configurations (massive scalar “clouds”) in their exterior regions [Please see details in my papers 76, 77, 83, 96, 100, 110, 114, and 123 of my CV file].
I show, in particular, that the hairy black-hole-scalar-field stationary configurations owe their existence to the intriguing phenomenon of superradiant scattering of bosonic fields in black-hole spacetimes.

The Cosmic Censorship Conjecture:
In this part of my research program I analyze extreme situations which have been considered as counterexamples to the cosmic censorship hypothesis. In particular, I have explored the absorption of fermionic particles by spinning black holes. Ignoring quantum effects may lead one to conclude that an incident fermionic wave may over spin the black hole, thereby exposing its inner singularity to distant observers.
However, in this part of the research program I prove that when quantum effects are properly taken into account, the integrity of the black-hole horizon is irrefutable. This observation may suggest that the cosmic censorship principle is intrinsically a quantum phenomenon [Please see details in my papers 50, 52, 60, and 81 of my CV file].

The Universal Relaxation Bound:
In the present part of my research program I show that black holes provide deep insights into natural limitations on the maximal rate at which a perturbed physical system approaches thermal equilibrium. In particular, from information theory and thermodynamic considerations I derive a universal bound on the relaxation time τ of a perturbed physical system: $\tau \geq 1/\pi T$, where T is the system's temperature. Moreover, I explicitly show that black holes may actually saturate this fundamental relaxation bound. This intriguing finding implies that black holes are the fastest relaxing objects in the universe [Please see details in my papers 42, 57, 59, 72, 89, 106, and 108 of my CV file].

Analytic Treatment of the Black-Hole Bomb:
In this part of the research program we have provided for the first time an analytic treatment of the superradiant instability (the black-hole bomb mechanism) in the physically most interesting regime, $M\mu=O(1)$, where the superradiant instability is most pronounced. In addition, we have also provided strict bounds on the superradiant instability regime of the composed black-hole-massive-scalar-field bomb [Please see details in my papers 58, 71, 112, and 125 of my CV file].

The Composed Black-Hole-Scalar-Field-Mirror System:
In this part of my research program I study analytically the composed black-hole-mirror system. I have developed new analytical techniques which provide important physical insights and new quantitative results for the instability growth rates (or equivalently, for the energy extraction rates from the black hole) which characterize the superradiant instability of the composed black-hole-scalar-field-mirror system. In particular, I have proved that the charged black-hole-mirror bomb is generally more explosive than the rotating black-hole-mirror bomb system [Please see details in my papers 87, 92, 97, 98, and 120 of my CV file].

In addition, in this part of the research program I prove for the first time that the innermost (smallest) radius of the confining mirror which allows the extraction of energy from a rotating Kerr black hole approaches the black-hole horizon radius in the extremal limit (see paper 97).

Universal Bound on Viscosity:
The conjectured bound on viscosity has been the focus of much recent attention. In this part of my research program I show that this mysterious viscosity bound is actually a direct outcome of the interplay between gravity, quantum theory, and thermodynamics [Please see details in my papers 55, 56, and Hod2016 (submitted to EPJC) of my CV file].

Late-Time Wave Tails:
In this part of the research program I analyze for the first time the late-time dynamics of the Klein-Gordon wave equation with a slowly decaying scattering potential: $V(x \to \infty)=\alpha/x$.
In particular, I find an explicit mathematical solution (that is, an exact analytic solution which is not based on the first Born approximation) for this scattering problem.
As shown in my research, this non-linear dependence of the wave fields on the amplitude α of the scattering potential reflects the fact that the late-time dynamics associated with this slowly decaying scattering potential is dominated by multiple scattering from asymptotically far regions [Please see details in the paper 85 of my CV file].

Black-Hole Quasinormal Resonances:
In this part of the research program I study analytically the relaxation phase of perturbed, rapidly rotating black holes. In particular, I derive for the first time a simple formula for the fundamental quasinormal resonances of near-extremal Kerr black holes. The formula is expressed in terms of the black-hole physical

parameters: the temperature and angular velocity of the black hole [Please see details in my papers 57, 59, 67, 74, 89, 108, 115 and 118 of my CV file].

The results of the present research program imply that the relaxation periods of perturbed black holes become extremely long as the extremal limit is approached. I use these results to demonstrate analytically the fact that near-extremal Kerr black holes saturate the conjectured universal relaxation bound [Please see details in my papers 42, 57, 59, 72, 89, 106, and 108 of my CV file].

The Generalized Second Law of Thermodynamics: The Role of the Hoop Conjecture:
In this part of the research program I re-analyze an intriguing gedanken experiment which was designed by Bekenstein in order to challenge the generalized second law (GSL) of thermodynamics. In this historical gedanken experiment an entropy-bearing box is lowered into a charged Reissner-Nordstrom black hole. For the GSL to work, the resulting increase in the black-hole surface area (entropy) must compensate for the loss of the box's entropy.

In this part of the research program I explicitly show for the first time that if the box can be lowered adiabatically all the way down to the black-hole horizon, as previously assumed in the literature, then for near-extremal (highly charged) black holes the resulting increase in black-hole surface-area (due to the assimilation of the box by the black hole) may become too small to compensate for the loss of the box's entropy.
In order to resolve this apparent violation of the GSL, I suggest to use a generalized version of the hoop conjecture. In particular, I prove that a new (and larger) horizon is already formed before the entropy-bearing box reaches the horizon of the original near-extremal black hole (please see paper 116).

Universality in the Relaxation Dynamics of Charged Black Holes:
In this part of the research program the quasinormal resonance spectra of charged massive scalar fields in the charged Reissner-Nordstrom black-hole spacetime are studied analytically [Please see details in my papers 72 and 106 of my CV file].
As I demonstrate explicitly, this physical system provides a striking illustration for the validity of the universal relaxation bound, $\tau \geq 1/\pi T$, in black-hole physics. In particular, it is shown that the relaxation dynamics of charged massive scalar fields in the charged Reissner-Nordstrom black-hole spacetime may saturate this quantum time-times-temperature inequality. Interestingly, I also prove that potential violations of the universal relaxation bound by light scalar fields are excluded by the Schwinger-type pair-production mechanism (a vacuum polarization effect).

Black-hole Quasinormal Resonances: Wave Analysis versus a Geometric-Optics Approximation:
In the present part of the research I use the geometric-optics technique of perturbing a bundle of unstable null rays to calculate the resonances of near-extremal Kerr black holes in the eikonal approximation. I then solve directly

the Teukolsky wave equation and prove that the resultant quasinormal spectrum obtained directly from the wave analysis is in accord with the spectrum obtained from the geometric-optics approximation of perturbed null rays.
The results presented in this part of the research program provide the first direct proof for the validity of the eikonal approximation in calculating the spectra of black-hole quasinormal resonances [Please see details in my papers 57 and 74 of my CV file].

Hairy Black Holes and Null Circular Geodesics:
In this part of the research program I study Einstein-matter theories in which hairy black-hole configurations have been found. In particular, I prove for the first time a theorem which reveals the important role played by the null circular geodesic (the photonsphere) in the context of hairy black-hole configurations. According to this theorem, the non-trivial structure of the hair must extend above the photonsphere of the corresponding spherically-symmetric black-hole spacetime. In addition, in this part of the research program I prove a no-short scalar hair theorem for non-spherically symmetric (rotating) black holes [Please see details in my papers 68, 69, 100, 114, and 123 of my CV file].

Analytic Treatment of the Network Synchronization Problem with Time Delays:
In this part of the research program I analyze the effects of nonzero time delays in stochastic synchronization problems with linear couplings in an arbitrary network. In particular, I determine analytically the fundamental limit of synchronization efficiency in a noisy environment with uniform time delays. Interestingly, I show that the optimal efficiency of the network is achieved for $\lambda T=O(1)$, where λ is the coupling strength (relaxation coefficient) and T is the characteristic time delay in the communication between pairs of nodes.

My research (please see paper 62 of my CV file) provides the first analytical treatment of the network synchronization problem with time delays. Moreover, my analysis reveals the underlying mechanism responsible for the trade-off phenomena observed in recent numerical simulations of the network synchronization problem.

Issues in Mathematical Physics:
In this part of the research program I present a novel and compact derivation of the asymptotic eigenvalues of the spin-weighted spheroidal harmonics. My analysis is based on a simple trick which transforms the corresponding spin-weighted spheroidal angular equation into a Schrodinger-like wave equation which is amenable to an analytical treatment [Please see details in my papers 75, 82, and 105 of my CV file].

Hawking Evaporation of Higher-Dimensional Black Holes:
In this part of the research program I study the Hawking radiation emitted into the bulk by (D + 1)-dimensional Schwarzschild black holes. In particular, I explicitly show that, for higher-dimensional black holes with $D>>1$, the total power emitted into the bulk is well approximated by the analytical formula for perfect blackbody radiation.

In addition, in this part of the research program I analyze the entropy emission properties of (D + 1)-dimensional Schwarzschild black holes. It is found that, in their entropy emission properties, these higher-dimensional black holes behave as one-dimensional entropy emitters.
[Please see details in my papers 65, 103, and 124 of my CV file].

The Gravitational Two-Body Problem:
In this part of my research program I propose to model the two-body problem in general relativity using the analytically solvable model of a ring of particles in orbit around a central black hole. In particular, I use this proposed toy-model in order to calculate the ISCO (innermost stable circular orbit) frequency which characterizes the two-body dynamics. Remarkably, I explicitly show that the analytically derived formula predicts with astonishing accuracy the actual value of this fundamental parameter [Please see details in my papers 80, 86, and 94 of my CV file].
Interestingly, my model suggests that the second-order spin-orbit interaction between the black hole and the orbiting particle (the dragging of inertial frames) is the main element determining the observed value of the ISCO shift which characterizes the gravitational two-body problem in general relativity.

Future Research Interests

My future scientific interests include the following fields of research:

- The universal physical properties of hairy black holes.
- Analytic study of the black-hole bomb mechanism.
- Quantum lower bounds on the Bekenstein-Hawking temperature.
- The collisional Penrose process.
- Analytic study of cloudy black holes.
- Black-hole area quantization.
- The weak gravity conjecture.
- The instability spectra of magnetically charged black holes.
- The Hawking black-hole information puzzle.
- Analytic study of black-hole quasinormal resonances.
- Wave dynamics in black-hole spacetimes.
- Hyperentropic systems and gravitational stability.
- The role on null circular geodesics in black-hole spacetimes.
- The gravitational two-body problem in general relativity.
- Analytic study of the hydrodynamic vortex model.
- The physical relation between the universal relaxation bound and the viscosity bound.
- Thermodynamic properties of low-temperature physical systems.
- Quantum bound-state resonances of complex potentials.
- New no-hair theorems for black holes and compact reflecting stars.