



KAMAL HAJIAN

Curriculum Vitæ

✉ Institute for Research in Fundamental Sciences (IPM)
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PERSONAL INFORMATION

PhD in physics 2015
Nationality Iranian
Date of birth 30/10/1980
Place of birth Tehran, Iran
Languages Persian (native), English (fluent), German, Turkish (intermediate)

RESEARCH CAREERS

06/2023 – now **Researcher**
(current position) Institute for Research in Fundamental Sciences (IPM), Iran
05/2022 – 05/2023 **Researcher**
Middle East Technical University, Turkey
11/2020 – 05/2022 **Junior fellow**
HWK Institute for Advanced Study & Oldenburg University, Germany
11/2019 – 11/2020 **Researcher**
Middle East Technical University, Turkey
03/2019 – 07/2019 **Riemann fellow**
Leibniz University, Germany
09/2018 – 03/2019 **Long-term visitor**
Institute for Research in Fundamental Sciences (IPM), Iran
09/2015 – 09/2018 **Post-doctoral position**
Institute for Research in Fundamental Sciences (IPM), Iran

EDUCATION

September 2010 – August 2015 **Ph.D**
HIGH ENERGY PHYSICS, *Sharif University of Technology*
Supervisor Prof. Mohammad M. Sheikh-Jabbari
Advisor Prof. Mehdi Golshani
Thesis On Thermodynamics and Phase Space of Near Horizon
Extremal Geometries
GPA A+, 3.81/4.00, 18.98/20.00

September 2008 – September 2010	M.Sc PHYSICS, <i>Sharif University of Technology</i> Supervisor Prof. Mehdi Golshani Thesis Necessity of Privileged Frame of Reference in Physics GPA A+, 3.93/4.00, 19.66/20.00
September 2004 – September 2008	B.Sc PHYSICS, <i>Sharif University of Technology</i> GPA A+, 3.79/4.00, 18.79/20.00

AWARDS AND FELLOWSHIPS

2020 & 2022	TÜBITAK fellowship,
2019	Riemann fellowship,
2016	<i>Saramadan</i> postdoctoral grant of the Iranian vice presidency in science and technology,
2010	Ph.D Prize Grant of National Elites Foundation of Iran,
2009	Honored in 6 th ceremony of “Stars of Sharif”,
2008	Rank 1 st and gold medal in 13 th national olympiad of physics,
2007	Rank 9 th in national competition of admissions for M.Sc in physics,
2007	Rank 4 th in 12 th national olympiad of physics.

RESEARCH EXPERTISE

- Black hole thermodynamics and conserved charges,
- Classical gravity accompanied with quantum fields,
- Memory effect and soft charges.

SELECTED PUBLICATIONS

- K. Hajian** and B. Tekin, *Coupling Constants as Conserved Charges in Black Hole Thermodynamics*, Phys. Rev. Lett. **132**, no.19, 191401 (2024)
- K. Hajian**, *Single-rotating five-dimensional near-horizon extremal geometry in general relativity*, Phys. Rev. D **109**, no.4, 4 (2024).
- K. Hajian**, *On the origin of black hole paradoxes*, Nucl. Phys. B **999**, 116452 (2024).
- K. Hajian**, M. M. Sheikh-Jabbari and B. Tekin, *Gauge invariant derivation of zeroth and first laws of black hole thermodynamics*, Phys. Rev. D **106**, no.10, 104030 (2022).
- K. Hajian**, H. Özşahin and B. Tekin, *First law of black hole thermodynamics and Smarr formula with a cosmological constant*, Phys. Rev. D **104** no.4, 044024 (2021).
- K. Hajian**, *Light speed memory as a local observable for soft hairs*, EPL **136**, no.2, 29001 (2021).
- K. Hajian**, S. Liberati, M. M. Sheikh-Jabbari and M. H. Vahidinia, *On Black Hole Temperature in Horndeski Gravity*, Phys. Lett. B, **812**, 136002, (2021).
- K. Hajian** and A. Seraj, *Symplectic Structure of Extremal Black Holes*, Springer Proc. Phys. **208**, 61 (2018).
- D. Chernyavsky and **K. Hajian**, *Cosmological constant is a conserved charge*, Class. Quant. Grav. **35**, no. 12, 125012 (2018).
- K. Hajian**, M. M. Sheikh-Jabbari and H. Yavartanoo, “Extreme Kerr black hole microstates with horizon fluff,” Phys. Rev. D **98**, no. 2, 026025 (2018).
- K. Hajian** and M. M. Sheikh-Jabbari, *Redundant and Physical Black Hole Parameters: Is there an independent physical dilaton charge?*, Phys. Lett. B, **768**, 228, (2017).

M. Ghodrati, **K. Hajian** and M. R. Setare, *Revisiting Conserved Charges in Higher Curvature Gravitational Theories*, Eur. Phys. J. C **76**, no. 12, 701, (2016).

K. Hajian, *Conserved charges and first law of thermodynamics for Kerr-de Sitter black holes*, Gen. Rel. Grav. **48**, no. 8, 114, (2016).

K. Hajian and M. M. Sheikh-Jabbari, *Solution Phase Space and Conserved Charges: A General Formulation for Charges Associated with Exact Symmetries*, Phys. Rev. D, **93**, no. 4, 044074, (2016).

F. S. Dündar and **K. Hajian**, *Quantum Jump from Singularity to Outside of Black Hole*, JHEP, **1602**, 175, (2016).

G. Compère, **K. Hajian**, A. Seraj and M. M. Sheikh-Jabbari, *Wiggling Throat of Extremal Black Holes*, JHEP, **1510**, 093, (2015).

G. Compère, **K. Hajian**, A. Seraj and M. M. Sheikh-Jabbari, *Extremal Rotating Black Holes in the Near-Horizon Limit: Phase Space and Symmetry Algebra*, Phys. Lett. B, **749**, 443, (2015).

K. Hajian, A. Seraj and M. M. Sheikh-Jabbari, *Near Horizon Extremal Geometry Perturbations: Dynamical Field Perturbations vs. Parametric Variations*, JHEP, **1410**, 111, (2014).

K. Hajian, A. Seraj, M. M. Sheikh-Jabbari, *NHEG Dynamics: Laws of Near Horizon Extremal Geometry (Thermo) Dynamics*, JHEP, **1403**, 014, (2014).

RECENT PRESENTATIONS (CUT FROM 2016 TO 2021)

Invited speaker	Colloquium Theoretical Physics, Oldenburg university, Oldenburg, November 2021,
Lecturer	School on black hole physics, Tabriz University, Tabriz, October 2021,
Chair-Person	16th Marcel Grossmann meeting (online), BH3 session, Rome, July 2021,
Invited speaker	RTG Colloquium Models of Gravity, Oldenburg university, Oldenburg, May 2021,
Invited speaker	German Aerospace Center, Bremen, March 2021,
Fellow presentation	Hanse-Wissenschaftskolleg institute for advanced study, Delmenhorst, March 2021,
Invited speaker	1st online international conference on early universe and modified gravity, Tabriz, December 2020,
Speaker	18'th Workshop On Quantization Dualities & Integrable Systems, Ankara, October 2020,
Invited speaker	4th international conference on holography, string theory and discrete approach, Hanoi, August 2020,
Speaker	Institute for Research in Fundamental Sciences (IPM), August 2020,
Invited speaker	Sciencetoday.ir, Online presentation, June 2020,
Invited speaker	Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, Online presentation, May 2020,
Lecturer	Middle East Technical University, Ankara, January 2020,
Speaker	Recent Developments in Supergravity Theories and Related Topics, IMBM, Istanbul, December 2019,
Scientist visitor	ICTP, Trieste, November 2019,
Scientist visitor	CERN, Geneva, October 2019,
Participant	IPM summer school on game theory, August 2019,
Speaker	Institute for Theoretical Physics, Leibniz University, June 2019,

- Lecturer Shahrood University, February 2019,
 Invited speaker Conference in Gravity and Cosmology 1397, Tehran, January 2019,
 Invited speaker 2018 joint FAR/ANSEF-ICTP and RDP-VW summer school
 in theoretical physics, Yerevan,
 Invited speaker 25th IPM Physics Spring Conference, Tehran, June 2018,
 Speaker Recent trends in string theory and related topics, (IPM), Tehran, May 2018,
 Speaker DPG spring conference in Wuerzburg, March 2018,
 Speaker Carl von Ossietzky University of Oldenburg, February 2018,
 Speaker Institute for Research in Fundamental Sciences (IPM), Tehran, November 2017,
 Organizer *Recent trends in string theory and related topics*,
 Institute for Research in Fundamental Sciences (IPM), Tehran, May 2017,
 Poster DPG spring conference in Bremen, March 2017,
 Speaker GRK spring workshop, Leibniz University, Hannover, March 2017,
 Speaker Carl von Ossietzky University of Oldenburg, March 2017,
 Lecturer Carl von Ossietzky University of Oldenburg, March 2017,
 Speaker Institute for Research in Fundamental Sciences (IPM), Tehran, February 2017,
 Invited speaker Isfahan University of Technology, Isfahan, December 2016,
 Invited speaker IPM second workshop on xAct, (IPM), Tehran, October 2016,
 Speaker 4th Workshop and Seminar on Topics in Theoretical Physics,
 Azarbaijan Shahid Madani University, Tabriz, September 2016,
 Speaker 2nd workshop on quantum aspects of black holes and its recent progress,
 Yerevan, August 2016,
 Speaker Boğazici University, Istanbul, August 2016,
 Lecturer Boğazici University, Istanbul, August 2016,
 Speaker Institute for Research in Fundamental Sciences (IPM), Tehran, June 2016,
 Speaker Recent trends in string theory and related topics, (IPM), Tehran, May 2016,
 Speaker Scuola Normale Superiore di Pisa, Pisa, March 2016,
 Speaker ICTP Workshop on Topics in Three Dimensional Gravity,
 Trieste, March 2016,
 Speaker University of Barcelona, April 2016,
 Speaker Institute for Research in Fundamental Sciences (IPM), Tehran, February 2016,
 Speaker Colloquium in IPM, School of physics, Tehran, January 2016,
 Speaker 5th Bangkok workshop on high-energy theory, Bangkok, January 2016.

REFeree/PEER REVIEWER

- * General Relativity and Gravitation (GERG)
 Springer, ISSN: 0001-7701 (Print) 1572-9532 (Online),
- * European Physical Journal C (EPJ C)
 Springer, ISSN: 1434-6044 (Print) 1434-6052 (Online),
- * International Journal of Geometric Methods in Modern Physics (IJGMMP)
 World Scientific, ISSN: 0219-8878 (Print) 1793-6977 (Online),
- * Chinese Physics C
 IOP science, ISSN: 1674-1137 (Print) 2058-6132 (Online),
- * Physical Review D (PRD)
 APS journals, ISSN: 2470-0010 (Print) 2470-0029 (Online),
- * Physical Review Letters (PRL)
 APS journals, ISSN: 0031-9007 (Print) 1079-7114 (Online).

COMPUTER SKILLS

Basic	C++, HTML
Applied	Office, GIMP, Photoshop, Bluefish, Audacity, Pitivi, RVC
Advanced	MATLAB, Mathematica, xAct package, Diffgeo, COLSYS, \LaTeX , XePersian
Operating system	Linux, Microsoft Windows

OTHER SCIENTIFIC ACTIVITIES

Teaching and Lab assistance (in Sharif University)	Advanced Quantum Mechanics, Advanced Statistical Mechanics, General Physics 1, Electronics Lab, Advanced Lab
Group meeting organizer	Weekly meetings organizer in IPM (2016-2018)
Organizational activity	Permanent member of Physics Society of Iran

WRITING

- Book Guide Book for undergraduate students of physics,
published by *Sazman Sanjesh va Amoozesh Keshvar*, Tehran, (2008).
- Book Two lemons (poem in Persian),
ISBN: 978-625-400-658-6, published by Ingramspark (2020).
ISBN (e-book): 978-625-400-371-1
- Book Three Hundred Quatrains (poem in Persian),
ISBN: 978-625-400-658-6, printed by Ingramspark (2021).
- Book Six Hundred Quatrains (poem in Persian),
ISBN: 978-3-00-071476-4, printed by Ingramspark (2022).

OTHER INTERESTS

- Literature Persian poetry.
- Sports Tennis, Mountain climbing, Running, Cycling.
- Others Nature.

PERSONAL WEBSITE

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RESEARCH PROFILES



Scholar

<https://scholar.google.com/citations?user=S0y9fhkAAAAJ&hl=en&oi=ao><https://ir.linkedin.com/in/kamal-hajian-a581a7150><https://inspirehep.net/authors/1317827#with-citation-summary>https://www.researchgate.net/profile/Kamal_Hajian<https://publons.com/researcher/3409707/kamal-hajian/><https://orcid.org/0000-0002-1553-4246>

SOCIAL NETWORKS

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