CURRICULUM VITAE

PERSONAL DATA

Name:	Mohammad Nouri-Zonoz
Nationality:	Iranian
Date of Birth:	17/10/1962
Marital Status:	Married with two children
Address:	Department of physics, University of Tehran, End of North Karegar St., 14395-547, Tehran, Iran
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ACADEMIC QUALIFICATIONS

1984 – 88	Bachelor of Science in Physics from the **University of Kerman**, Kerman, Iran.
1988 – 91	Master of Science in Physics from **Sharif University of Technology**, Tehran, Iran.
1993 – 94	Master of advanced study/Part III (Tripos) in Mathematics, **Department of Applied Mathematics and Theoretical Physics, University of Cambridge**, Cambridge, UK.
1994 – 98	**Ph.D** in Gravitation and Relativistic Astrophysics : **Institute of Astronomy, University of Cambridge**, Supervisor: Prof. Donald Lynden-Bell.

OCCUPATIONS

1991 – 93	Researcher at the Iranian Research Organization for Science and Technology (IROST), Tehran, Iran.
1999 -2006	Assistant professor, Physics Department, University of Tehran, Tehran, Iran and (resident) associate researcher at the school of Physics, Institute for studies in Theoretical Physics and Mathematics (IPM), Tehran, Iran.

2006 –	Associate professor, Physics Department, University of Tehran, Tehran, Iran and (non-resident) adjunct researcher at the school of Astronomy, Institute for studies in Theoretical Physics and Mathematics (IPM), Tehran, Iran.
2010 – 2012	Dean of research and graduate studies, Physics department, University of Tehran, Tehran, Iran.
2014 –	Professor, Department of Physics, University of Tehran, Tehran, Iran
2014 – 2017	Head, Department of physics, University of Tehran, Tehran, Iran.
2021 – 2023	Head, gravity and cosmology group, Department of physics, University of Tehran, Tehran, Iran.

AWARDS, FELLOWSHIPS AND MEMBERSHIPS

1. **Ranked 1st** in the B.Sc program.
2. **Ranked 8th** in the National M.Sc entrance exam.
3. **Ranked 7th** in the National Ph.D scholarship exam.
4. **Lundgren research award** from the ***Board of graduate studies, University of Cambridge***, 1997.
5. **Postdoctoral fellowship** at the **Inter University Center for Astronomy and Astrophysics (IUCAA)**, Pune, India., 1998.
6. **Life member** of the ***Cambridge Philosophical Society***, recommended by professors **Donald Lynden-Bell**, **Richard Ellis** and **Martin Rees**.
7. Selected member of the executive council of the **gravity and cosmology branch** of the Physical Society of Iran, (2013-2016).
8. Invited member of the Physics branch of the ***Iranian Academy of Sciences***, 2015-2024.
9. Selected as the **IOP (Institute of physics) trusted reviewer**, 2020.
10. Associate member of the Physics branch of the ***Iranian Academy of Sciences***, 2024-2028.
11. Member of the scientific committee of the **school of particles and fields**, IPM (Institute for research in fundamental sciences), 2016-2022.

12. Member of the scientific committee of the **school of Physics**, IPM (Institute for research in fundamental sciences), 2018-2022.

13. Member of the editorial board, **Iranian journal of Astronomy and Astrophysics**, 2021-2027.

14. Head of the Physics branch of the ***Iranian Academy of Sciences***, 2025-2027.

JOURNAL REFEREEING AND REVIEWING

1. Refereeing articles for the international journals:1-***Classical and Quantum Gravity*** 2-***Journal of Physics A : Mathematical and theoretical*** 3-***European Physical Journal C*** 4-***General Relativity and Gravitation*** 5-***Foundations of Physics*** 6-***Scientific reports*** 7-***Phys. Rev. D*** 8-***International journal of theoretical physics*** 9- ***Canadian journal of physics*** .

2. Reviewing articles for the **Mathematical reviews**, " *American Mathematical Society*".

3. Reviewing books for the **University of Tehran Press** (UTP).

VISITING POSITIONS

1. Institute of Astronomy, University of Cambridge; *July 2001- September 2001.*

2. Institute of Astronomy, University of Cambridge; *June 2003- July 2003.*

3. Institute of Astronomy, University of Cambridge; *July 2004- August 2004.*

4. Institute of Astronomy, University of Cambridge; *July 2005.*

5. University of Pisa; *Sept. 2006.*

6. Institute of Astronomy, University of Cambridge; *August 2008.*

7. School of astronomy, IPM, Tehran, Iran, *Sabbatical leave Oct. 2008 –Oct. 2009.*

8. Albert Einstein Center for Fundamental Physics, University of Bern; *Aug. 2015- Sept. 2015.*

9. Albanova University center, KTH and Stockholm University joint research center, Sweden, *July 2016- September 2016.*

10. UAB, Barcelona, *July-August, 2017.*

11. Abdus-Salam ICTP, *July 2018–September 2018.*

PUBLICATIONS

REFEREED PUBLICATION

1. Nouri-Zonoz, Mohammad & Lynden-Bell, Donald, Gravomagnetic Lensing by NUT space, *Mon. Not. R. Astron. Soc. 292 , 714-722 (1997).*

2. Nouri-Zonoz, Mohammad, Cylindrical analogue of NUT space: Spacetime of a line gravomagnetic monopole, *Class. Quantum Grav. 14 (1997) 3123-3129.*

3. Lynden-Bell, Donald & Nouri-Zonoz, Mohammad, Classical Monopoles: Newton, NUT-space, gravomagnetic lensing and atomic spectra, ***Rev. Mod. Phys. 70, 427, (1998)***.

4. Nouri-Zonoz, Mohammad, Dadhich, Naresh and Lynden-Bell, Donald, A spacetime dual to NUT spacetime, *Class. Quantum Grav. 16, 1021-1026 (1999).*

5. Nouri-Zonoz, Mohammad, Gravitoelectromagnetic approach to the gravitational Faraday rotation in stationary spacetimes, *Phys. Rev. D, 024013, (1999)*

6. Nouri-Zonoz, Mohammad, Gravomagnetic monopoles (Ph.D thesis abstract), *The observatory magazine, Vol. 119, No. 1151 (1999).*

7. Nouri-Zonoz, M. and Tavanfar A. R., Plane-symmetric analogue of NUT space, *Class. Quantum Grav. 18, 4293-4302, (2001).*

8. Rahvar, Sohrab and Nouri-Zonoz, Mohammad, Gravitational microlensing in NUT space, *Month. Not. Roy. Astro. Soc., 338, 926-930 (2003)*

9. Nouri-Zonoz, M. and Tavanfar A. R., Gauged motion in general relativity and in Kaluza-Klein theories *JHEP302 (2003)059.*

10. Nouri-Zonoz, Mohammad, Electromagnetic waves in NUT space : solutions to the Maxwell equations, *Class. Quantum Grav., 21, 2, 471 - 482. , (2004).*

11. Ahmadi, N. and Nouri-Zonoz, M., Massive spinor fields in flat spacetimes with non-trivial topology, *Phys. Rev. D 71, 104012 (2005).*

12. Khoeini-Moghaddam, S. and Nouri-Zonoz, M., Cylindrical solutions in Brane world gravity, *Phys. Rev. D 72 064004 (2005).*

13. Momeni, D., Nouri-Zonoz, M. and Ramazani-Arani, R., Morgan-Morgan-NUT disk space via the Ehlers transformation, *Phys. Rev. D 72 064023 (2005)* .

14. Ahmadi, N. and Nouri-Zonoz, M., Topology, Mass and Casimir energy, , *Nuclear Physics B,* **738** *(2006) 296-282.* **cited as top 25 hottest papers of the season** .

15. Ahmadi, N. and Nouri-Zonoz, M., Quantum gravitational optics : Effective Raychaudhuri equation, *Phys. Rev. D* **74***, 044034 (2006).*

16. Ahmadi N. and Nouri-Zonoz, M., Raychaudhuri equation in Quantum gravitational optics, **invited paper from the Indian academy of sciences for the 50$^{\text{th}}$ anniversary of the Raychaudduri equation**, *Pramana,Vol. 69, No. 1 (2007), 147-157.*

17. Ahmadi, N., Khoeini-Moghaddam, S. and Nouri-Zonoz, M., Quantum gravitational optics in the field of a gravitomagnetic monopole, J. Phys.: Conf. Ser. **67** (2007) 012056.

18. Ahmadi, N., Khoeini-Moghaddam, S. and Nouri-Zonoz, M., Fermat's principle in Quantum gravitational optics , *JCAP 05(2008)015, gr-qc/0612192.*

19. Ahmadi N. and Nouri-Zonoz, M., Quantum gravitational optics : The induced phase, *Class. Quantum Grav., 25 (2008), 135008 gr-qc/0703123.*

20. Azadi, A., Momeni, D. and Nouri-Zonoz, M., Cylindrical solutions in metric f(R) gravity *Phys. Lett. B, 670 (2008) 210-214.*

21. M. Nouri-Zonoz, B. Nazari, Vacuum energy and the spacetime index of refraction: A new synthesis, *Phys. Rev. D* **82** *044047 (2010).*

22. H. Miraghaei and M. Nouri-Zonoz, Classical tests of general relativity in the Newtonian limit of the Schwarzschild-deSitter spacetime, *General Relativity and Gravitation Volume 42, Number 12, (2010) 2947-2956.*

23. B. Nazari and M. Nouri-Zonoz, Electromagnetic Casimir effect and the spacetime index of refraction, *Phys. Rev. D* **85** *044060 (2012).*

24. M. Nouri-Zonoz and A. Parvizi, Gaussian curvature and global effects: gravitational Aharonov-Bohm effect revisited, *Phys. Rev. D* **88***, 023004 (2013).*

25. M. Nouri-Zonoz, H. Ramezani-Aval and R. Gharechahi, On Franklin's relativistic rotational transformation and its modification, *Eur. Phys. J. C 74 10 (2014) 3098*.

26. M. Nouri-Zonoz and H. Ramezani-Aval, Fermi coordinates and modified Franklin transformation : A comparative study on rotational phenomena, *Eur. Phys. J. C, 74 10 (2014) 3128*.

27. M. Nouri-Zonoz, J. Koohbor and H. Ramezani-Aval, Dark fluid or cosmological constant : Why there are different de Sitter-type spacetimes, *Phys. Rev. D* **91**, *063010 (2015)* .

28. M. Nouri-Zonoz and A. Parvizi, Papapetrou field as the gravitoelectromagnetic field tensor in stationary spacetimes, *Gen. Relativ. Gravit. (2016) 48:37*.

29. J. Lewandowski, M. Nouri-Zonoz, A. Parvizi and Y. Tavakoli, Quantum theory of EM fields in a cosmological quantum spacetime, *Phys. Rev. D.* **96**, *106007 (2017)*.

30. R. Gharechahi, M. Nouri-Zonoz and A. Tavanafar, A tale of two velocities: Threading vs Slicing, *Int. J. Geom. Meth. Mod. Phys. Vol. 15 (2018) 1850047*.

31. J. Koohbor, M. Nouri-Zonoz and A. R. Tavanfar, Hawking modes and and the optimal disperser : Holographic lessons from the observer's causal-patch unitarity, *J. Phys. Commun., 2 (2018) 045027*.

32. R. Gharechahi, J. Koohbor and M. Nouri-Zonoz, General relativistic analogs of Poisson's equation and gravitational binding energy, *Phys. Rev. D* **99**, *084046 (2019)*.

33. A. Besharat, M. Miri and M. Nouri-Zonoz, Optical Aharonov-Bohm effect due to the toroidal moment inspired by general relativity, *J. Phys. Commun., 2 (2019)* .

34. M. Nouri-Zonoz and A. R. Nouri-Zonoz, Static and Stationary dark fluid universes: A gravitoelectromagnetic perspective, *Scientific reports, 12:15032 (2022)*.

35. M. Nouri-Zonoz, A. Parvizi and H. Forghani, Metmaterial analog of a black hole shadow: an exact ray-tracing simulation based on the spacetime index of refraction, *Phys. Rev. D* **106**, *124013 (2022)*.

36. H. Sadegh, E. Kiani, and M. Nouri-Zonoz, Embedding diagrams in stationary spacetimes, *Scientific reports, 14:19041 (2024)*.

37. A. Parvizi, H. Forghani-Ramandy, E. Rahmani, and M. Nouri-Zonoz, Photon rings in the metamaterial analog of a gravitomagnetic monopole, *Phys. Rev. D 110, 104035 (2024).*

38. F. Masghatian, M. Esfandiar, and M. Nouri-Zonoz, Electrodynamics in curved spacetime: Gravitationally-induced constitutive equations and the spacetime index of refraction , *Class. Quantum Grav. 42 (2025) 125002* .

Papers in Persian

1. M. Nouri-Zonoz, The centennial of general relativity, Today's physics (published by the Physical Society of Iran), 11, 29-33 (2016).

2. M. Nouri-Zonoz, Dark energy and the cosmological constant problem, Society for the Appreciation of Cultural works and Dignitaries, 151/1, May 2016.

3. M. Nouri-Zonoz, Black holes and metamaterials: An opto-geometric relation, Science letter (published by the Iranian academy of sciences), No.1, p 208, 2022.

PREPRINTS IN ARXIV

1. M. Nouri-Zonoz and T. Padmanabhan, The classical essence of black hole radiation, *gr-qc/9812088*, presented at the conference *The large scale structure of the Universe, July 1999, Cambridge, UK.*

2. S. Zeynizadeh and M. Nouri-Zonoz, Primordial black holes, zero-point energy and the CMB: The cosmic connection, *arXiv:1212.6770.*

PREPRINTS IN PREPARATION

1. F. Masghatian, M. Nouri-Zonoz , and H. Sadegh, Conductors and superconductors in curved spacetime.

2. F. Masghatian, A. Parvizi and M. Nouri-Zonoz, Revisiting the effect of cosmological constant on light bending.

CONFERENCE MANAGEMENT

1. Chair, Quantum gravity/Cosmology session of DICE 2006, Piombino, Italy, 2006.

2. Chair, Scientific committee, Iranian national conference on gravity and cosmology, 2007, 2008, 2011 and 2012, Tehran, Iran.

3. Chair, Executive committee, Iranian national conference on gravity and cosmology, 2014, Tehran, Iran.

4. Member of the Scientific committee, Iranian national conference on gravity and cosmology, 2010, 2013, and 2016 Tehran, Iran.

5. Member of the scientific committee, Third conference on Recent Progress in Foundations of Physics, 2013.

TALKS

1. Plane-symmetric analogue of NUT space, GR16, Durban, South Africa, July 2001.

2. Black hole physics, 36th Physics Club of the Physical Society of Iran (PSI), University of tehran (UT), Dec. 2003.

3. The cosmological constant problem and dark energy, IPM String Cosmology School and Workshop, Kharanagh, Yazd, April 2004.

4. Raychauhdhuri equation in Quantum gravitational optics, DICE 2006, Piombino, Italy, Sept. 2006.

5. Invited lecture, *Quantum gravitational optics in the field of a gravitomagnetic monopole*, University of Pisa, Italy, 16 Sept. 2006.

6. Vacuum Energy and the spacetime index of refraction: A new synthesis, IPM spring Conference, IPM, April 2009.

7. Dark Energy or Cosmological constant? Problem of the century, University of Kerman, Kerman, Iran, April 2009.

8. What is Physics? UT open day, Uinversity of Tehran, Tehran, July 2009.

9. Astrophysics and particle physics, UT open day, Uinversity of Tehran, Tehran, July 2010.

10. Plenary talk, Vacuum energy, Cosmological constant and the spacetime index of refraction, Annual Iranian physics Conf., Hamedan, Iran, Sept. 2010.

11. On rotation and rotating frames, Shahid Madani Univ. Azarbayejan, Iran, Sept. 2011.

12. Vacuum energy, Dark energy and the cosmological constant problem, National Gravity and Cosmology Conference (NGCC), Tehran, Iran, Nov. 2011.

13. Relativity in rotating frames, Sharif Univ. Tech. (SUT), Tehran, April 2012.

14. Dark energy and dark matter: The greatest challenges of the 21st century physics, UT open day., Tehran, Dec. 2012.

15. Classical Black hole solutions, IPM, Nov. 2013.

16. Gravitational Aharonov-Bohm effect, IPM, Dec. 2013.

17. Dark fluid or cosmological constant: Why there are different de Sitter-type spacetimes, IPM, Tehran, Sept. 2014.

18. The centenial of general Relativity, 122nd Physics Club, PSI, UT Feb. 2015.

19. De Sitter-type spacetimes and their interpretations, The 2nd topical workshop on theoretical Physics, IPM, Tehran Oct. 2015.

20. General relativity, Open day lectures, University of Tehran, Tehran May 4, 2017.

21. The cosmological term and its interpretation in de sitter-type spacetimes, IV cosmology and quantum vacuum, Segovia, Spain 4-8 August, 2017.

22. The cosmological term and its interpretation in de sitter-type spacetimes, Prague, September 2018.

23. General relativity and different versions of Aharonov-Bohm effect, Plenary talk, National Gravity and cosmology conference, University of Tehran, Feb. 2020

24. Black holes from theory to observation: the 2020 Noble physics, Department of Physics, University of Tehran, November 2021.

25. Black holes and 2020 Nobel physics, IASBS, Zanjan, September 2021, and Kurdistan Physics day, December 2021.

26. Spacetime as a material medium, department of physics, university of Tehran, November 2025.

POSTDOCTORAL FELLOWS: PAST

1. Y. Tavakkoli

2. A. Parvizi

POSTGRDUATE STUDENTS: PRESENT

1. F. Masghatian, Ph.D student
2. D. Yahyazadeh, Ph.D student

POSTGRADUATE STUDENTS: PAST

Ph.D STUDENTS

1. N. Ahmadi - Now a faculty member in University of Tehran, Iran
2. S. Khoeini- Moghaddam - Now a faculty member in Khwarazmi University, Tehran, Iran
3. R. Ramazani-Arani- Now a faculty member in Kashan University, Kashan, Iran
4. D. Momeni - Now a faculty member in virginia college, USA.
5. B. Nazari - Now a faculty member in University of Tehran, Tehran, Iran
6. H. Ramezani-Aval - Now a faculty member in Gonabad University, Gonabad, Iran
7. J. Koohbor
8. R. Gharechahi
9. A. Parvizi, Now a Postdoc in Poland

MASTER STUDENTS

1- M. Azimlou 2- A. R. Tavanfar 3- M. Yavari 4- F. Homayounzade 5- D. Momeni 6- S. H. Ebrahimnejad 7- S. Kazemi 8- M. Majdzadeh 9- H. Miraghaei 10- A. Koohbor 11- A. Azadi 12- M. A. Khamechi 13- S. Bohloul 14- N. Helmi (in Philosophy of science from Amir Kabir Univ. of Tech.) 15- Sh. Taleei 16- R. Gharechahi 17- S. M. Sadjadi 18- A. Parvizi 19- N. Emami 20- S. Tayefe-Hashemi 21- H. Arabshahi 22- A. Besharat 23- M. Nazeri, 24- F. Z. Majidi 25- M. Nourmohammadi 26- H. Forghani 27- M. Ouladazimi 28- E. Rahmani 29- E. Kiani 30- H. Sadegh, 31- D. Yahyazade

COURSES TAUGHT:GRADUATE

1. Advanced mathematical physics, (*Nakahara; Frankel*)

2. Quantum field theory in curved spacetime I and II, (*1-Parker and Toms, 2-Mukhanov*)
3. Cosmology, (*Coles and Luccin; Liddle and Lyth; Linde*)
4. Relativistic quantum mechanics, (*QFT- Mandl and Shaw*)
5. Quantum field theory I and II, (*QFT- M. Schwartz*)
6. General Relativity I and II, (*1-W. Rindler + H. Stephani ; 2-E. Poisson*)
7. Black hole physics, (*Frolov and Novikov + Fabbri and Navarro Salas*)

COURSES TAUGHT:UNDERGRADUATE

1. Basic physics I, and III, (*Resnick-Halliday-Krane*)
2. Quantum Mechanics I and II, (*Griffiths, Greiner*)
3. Special relativity, (*W. Rindler, R. Hakim*)
4. Statistical physics, (*B. B. Laud*)
5. Mathematical physics I , II and III (*J. Arfken, S. Hasani*)
6. Thermodynamics, (*Thermal physics, Kittel and Kroemehr*)
7. English for physics students, (*1-Feynman Lectures on Physics and 2-about time: Paul Davies*)
8. History of Quantum theory, (*Quantum generations, H. Kragh*)
9. History of cosmology, (*Conceptions of Cosmos, H. Kragh*)
10. Introduction to particle physics, (*An introduction to elementary particle physics, D. Griffiths*)
11. Introductory Astrophysics (*Astrophysics for physicists, A. Rai-chaudhuri*)
12. Modern Physics (*Modern Physics, Krane*)
13. Physics of spacetime (*R. d'Inverno*)
14. Group theory (*A. Zee*)