

CURRICULUM VITAE

Mahmood Roshan

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PERSONAL DATA

- Nationality: Iran
- Born: August 9th 1983
- Current position: Associate professor of physics, Ferdowsi university of Mashhad-Iran
- Mailing address: Department of Physics, Ferdowsi University of Mashhad, P.O.Box 1436, Mashhad, Iran
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EDUCATION AND DEGREES

- **Ph.D. in Gravitation and Astronomical Physics:**
September 2007- September 2011
University of Tehran, Tehran, Iran
Thesis title: *Experimental and theoretical constraints on the functionality of $f(R)$ in the modified theories of gravity*
Thesis Advisor: Fatimah Shojai
- **M.Sc. in Theoretical Physics:**
September 2005- September 2007
University of Tabriz, Tabriz, Iran
Thesis title: *Noether symmetry in cosmological models*
Thesis Advisor: Hossein Motavalli and Farhad Darabi
- **B.S. in Physics.:**
September 2001- September 2005
University of Sistan and Baluchestan, Zahedan, Iran

MEMBERSHIPS

- Member of Physics Society of Iran(PSI)
- Member of Astronomical Society of Iran(ASI)
- Member of Iran national committee of Astronomy Olympiad (2016-present)

RESEARCH INTERESTS

- Gravitation and Cosmology (Post-Newtonian formalism, Modified theories of gravity, Cosmological bouncing solutions)
- Astrophysics: Dark matter, Galactic N-body simulations, Galactic Dynamics (bar formation and evolution, local and global stability of spiral galaxies)

PROFESSIONAL EXPERIENCE

Academic Positions:

- Associate Professor, Department of Physics, Ferdowsi University of Mashhad, Mashhad, Iran (April 2017 - Present)
- Assistant Professor, Department of Physics, Ferdowsi University of Mashhad, Mashhad, Iran (February 2013 - April 2017)
- Member of the board of directors of "The Astronomical Society of Iran (ASI)", (February 2018 - Present)
- Resident researcher, Astronomy school, Institute for research in fundamental sciences (IPM), Tehran, (September 2018-Present)

Scientific Visits:

- Aspen Center for Physics, Aspen, Colorado, USA, September 2016
- International Center of Theoretical Physics (ICTP), Trieste, Italy, July 2017

Postdoctoral position:

- Postdoctoral associate, Institute For Research in Fundamental Sciences (IPM), Tehran , Iran (December 2011- December 2012)

AWARDS

- Funds for young Assistant professor: Research award from "Iranian National Institute of Elites", 2013
- Scholarship award for distinguished graduate students from "Iranian National Institute of Elites", 2009-2011
- Distinguished Ph.D Student Researcher in University of Tehran, 2011
- 1st place, among Ph.D. candidates in Physics department, University of Tehran, 2008

COURSES TAUGHT (G:GRADUATE, U:UNDERGRADUATE)

- Basic Physics (U)
- Special relativity (U)
- Thermodynamics and statistical physics (U)
- Analytical mechanics (U)
- Special topics in astrophysics (G)
- Cosmology I (G)
- General relativity I (G)
- Advanced Astrophysics II (G)
- Structure and Evolution of Galaxies (G)
- "Cosmology" for Iranian National Astronomy Olympiad Team-Summer 2016
- "Galactic dynamics" for Iranian National Astronomy Olympiad Team-Summer 2018

SUPERVISION OF PH.D. STUDENTS

- Sara Jamali;
Ferdowsi University Of Mashhad;
Thesis topic: "*Cosmological and astrophysical consequences of scalar-tensor-vector theory of gravity*";
September 2013- September 2018.
- Neda Ghafourian;

Ferdowsi University Of Mashhad;
Thesis topic: "*Dynamics of spiral galaxies in modified gravity (MOG)*";
September 2013- September 2018.

■ Elham Nazari (ongoing);
Ferdowsi University Of Mashhad;
Co-supervisor: Shahram Abbassi;
Thesis topic: "*Investigating relativistic corrections on the Jeans instability in the first post-Newtonian approximation*";
Starting date: March 4th, 2017.

■ Ali Kazemi;
Ferdowsi University Of Mashhad;
Thesis topic: "*Post-Newtonian corrections on the gravitational stability of self-gravitating systems with rotation*";
September 2014- September 2018.

LIST OF PUBLICATIONS IN PEER-REVIEW JOURNALS

1. **Roshan, M.**, Rahvar, S. (2018): Evolution of spiral galaxies in non-local gravity, In: submitted to The Astrophysical Journal.
2. Nazari, E., **Roshan, M.** (2018): Post-Newtonian Magnetohydrodynamics, In: Astrophysical Journal 868, 98, 1-14.
3. Nari, N., **Roshan, M.** (2018): Compact stars in Energy-Momentum Squared Gravity, In: Physical Review D 98, 24031-24044.
4. Kazemi, A., **Roshan, M.**, Nazari, E. (2018): Post-Newtonian corrections to Toomre's criterion, In: Astrophysical Journal 865, 71, 1-19.
5. **Roshan, M.**, Kazemi, A., De Martino, I. (2018): Local fragmentation of thin disks in Eddington-inspired gravity, In: Monthly Notices of the Royal Astronomical Society 479, no.1, 1287-1296.
6. Hoseinirad, M., Abbassi, S., **Roshan, M.**, Naficy, K. (2018): Gravitational instability of filamentary molecular clouds, including ambipolar diffusion; non-isothermal filament, In: Monthly Notices of the Royal Astronomical Society 475, no. 2, 2632-2541.
7. **Roshan, M.** (2018): Stellar Bar evolution in the absence of dark matter halo, In: The Astrophysical Journal 854, 38, 1-12.
8. Jamali, S., **Roshan, M.**, Amendola, L. (2018): On the cosmology of scalar-tensor-vector gravity theory, In: Journal of Cosmology and Astroparticle Physics 1801, 048, 1-18.
9. Nazari, E., Kazemi, A., **Roshan, M.**, Abbassi, S. (2017): Post-Newtonian Jeans analysis, In: The Astrophysical Journal 839, 75, 1-14.
10. Ghafourian, N., **Roshan, M.** (2017): Global stability of self-gravitating disks in modified gravity, In: Monthly Notices of the Royal Astronomical Society 468, no.4, 4450-4464.
11. Hosseinirad, M., Naficy, K., Abbassi, S., **Roshan, M.** (2017): Gravitational instability of filamentary molecular clouds, including ambipolar diffusion, In: Monthly Notices of the Royal Astronomical Society 465, 1645-1653.

12. **Roshan, M.**, Abbassi, S., Khosroshahi, H. (2016): On the gravitational stability of the Maclaurin disk, In: The Astrophysical Journal 832, no.2, 201, 1-12.
13. Jamali, S., **Roshan, M.** (2016): The phase space analysis of modified gravity (MOG), In: European Physical Journal C 76, no.9, 490, 1-13.
14. **Roshan, M.**, Shojai, F. (2016): Energy-Momentum Squared Gravity, In: Physical Review D 94, no.4, 1-10.
15. **Roshan, M.** (2015): Exact cosmological solutions for MOG, In: European Physical Journal C 75, no.9, 405, 1-8.
16. **Roshan, M.**, Abbassi, S. (2015): Local stability of self-gravitating disks in $f(R)$ gravity, In: Astrophysics and Space Science 358, no.1, 11, 1-11.
17. **Roshan, M.**, Abbassi, S. (2015): On the stability of a galactic disk in modified gravity, In: The Astrophysical Journal 802 no.1, 9, 1-10.
18. **Roshan, M.**, Abbassi, S. (2014): Jeans analysis in modified gravity, In: Physical Review D 90, 044010, 1-12.
19. Capozziello, S., **Roshan, M.** (2013): Exact cosmological solutions from Hojman conservation quantities, In: Physics Letters B 726, 471-480.
20. **Roshan, M.** (2013): Test particle motion in modified theories of gravity, In: Physical Review D 87, 044005, 1-9.
21. **Roshan, M.** (2012): Post-Newtonian virial theorem, In: Classical and Quantum Gravity 29 , 215001, 1-9.
22. **Roshan, M.**, Shojai, F. (2011): Notes on the Post-Newtonian limit of Massive Brans-Dicke theory, In: Classical and Quantum Gravity 28, 145012, 1-12.
23. **Roshan, M.**, Shojai, F. (2009): Thawing $f(R)$ cosmology, In: Physical Review D 80, 043508, 1-7.
24. **Roshan, M.**, Shojai, F. (2009): Tracking $f(R)$ cosmology, In: Physical Review D 79, 103510, 1-6.
25. **Roshan, M.**, Nouri, M., Shojai, F. (2009): Cosmological solutions of time varying speed of light theories, In: Physics Letters B 672, 3, 197-202.
26. **Roshan, M.**, Shojai, F. (2008): Palatini $f(R)$ cosmology and Noether symmetry, In: Physics Letters B 668, 3, 238-240.
27. Motavali, H., Capozziello, S, **Roshan, M.** (2008): Scalar tensor cosmology with R^{-1} curvature correction by Noether symmetry, In: Physics Letters B 666, 1, 10-15.

CONTRIBUTIONS TO REFEREED CONFERENCE PROCEEDINGS

1. Abbassi, A., Kazemi, A., Nazari, E., **Roshan, M.**: Gravitational stability analysis in post-Newtonian gravity. Fifteenth Marcel Grossmann Meeting, Rome, Italy, July 2018.
2. **Roshan, M.**: On the local and global stability of spiral galaxies in modified gravity. Proceedings of Armenian-Iranian Astronomical Workshop (AIAW), Byurakan Astrophysical Observatory, Yerevan, Armenia, October 2015, 110-115
3. **Roshan, M.**: Virial masses of galaxy clusters in the Post-Newtonian limit, Thirteen Marcel Grossmann Meeting, Stockholm, Sweden, July 2012, 963-965.

4. **Roshan, M.:** Virial theorem in metric theories of gravity. Proceedings of the National Conference of Cosmology and Gravitation, University of Tehran, Tehran, Iran, January 2012.
5. **Roshan, M.,** Shojai, F.: Palatini $f(R)$ cosmology, Proceedings of the National Conference of Cosmology and Gravitation, Sharif University of Technology, Tehran, Iran, January 2008.

SEMINARS AND WORKSHOPS

- National Conference of Cosmology and Gravitation, 2018 (Esfahan University- Esfahan, Iran) (**Invited speaker**)
- "*Energy-momentum-squared gravity*", Sharif University of Technology, Tehran, Iran, Weekly Cosmology Seminar- 9 April 2017. (**Invited talk**)
- "*Stellar Bar evolution in the absence of dark matter halo*", Astronomy Weekly seminars, School of Astronomy, Institute For Research in Fundamental Sciences (IPM), Tehran, Iran, 23 October 2017. (**Invited talk**)
- 24th Spring Theoretical Physics Conference, 2017 (IPM, Iran) (**Invited speaker**)
- 21st Meeting on Research in Astronomy 2016 (IASBS, Iran), (**Invited speaker**)
- Universal Accretion: The Physics of Mass Accretion on All Scales and in Diverse Environments, Aspen center for physics, Colorado, USA on 4-18 September 2016
- The 2nd Karl Schwarzschild Meeting on Gravitational Physics, Frankfurt am Main, Germany on 20-24 July 2015.
- Armenian-Iranian Astronomical Workshop (AIAW), held 13-16 October 2015 in Byurakan Astrophysical Observatory, Armenia
- First winter school of the Astronomical society of Iran, January 2015, Sistan and Baluchestan university, Zahedan, Iran (**Invited lecturer**)
- 13th Marcel Grossmann Meeting on Recent Developments in Theoretical and Experimental General Relativity, Astrophysics, and Relativistic Field Theories, 2012, Stockholm, Sweden.
- National Conference of Cosmology and Gravitation, 2012 (University of Tehran, Tehran, Iran) (**Invited speaker**)
- Work shop on infrared modifications of gravity, The Abdus Salam International Center for Theoretical Physics (ICTP), 26-30 September 2011, Trieste, Italy.
- Conference on Recent Progress in Foundation of Physics, 2010, IPM
- Summer School in Cosmology, The Abdus Salam International Center for Theoretical Physics (ICTP), 19-30 July 2010, Trieste, Italy.
- National Conference of Cosmology and Gravitation, 2009 (Shahid Beheshti University- Tehran, Iran)
- National Conference of Cosmology and Gravitation, 2008 (Sharif University of Technology- Tehran, Iran)
- Conference on Recent Progress in Foundation of Physics, 2008 (IPM, Iran)
- 15th Spring Theoretical Physics Conference, 2008 (IPM, Iran)
- 14th Spring Theoretical Physics Conference, 2007 (IPM, Iran)

ORGANIZATION OF SCIENTIFIC CONFERENCES/WORKSHOPS

- Scientific Committee member of "11th national meeting in astronomy and astrophysics", January 2018, Ferdowsi university of Mashhad, Mashhad, Iran;
- Local organizing committee member of "11th national meeting in astronomy and astrophysics", January 2018, Ferdowsi university of Mashhad, Mashhad, Iran;
- Scientific Committee member of "10th national meeting in astronomy and astrophysics", January 2016, Sistan and Baluchestan university, Zahedan, Iran;
- Scientific Committee member of "9th national meeting in astronomy and astrophysics", January 2015, Sistan and Baluchestan university, Zahedan, Iran;
- Local organizing committee member of "The Annual Physics Conference of Iran", August 2015, Ferdowsi university of Mashhad, Mashhad, Iran;
- Scientific Committee member of "18th Meeting on Research in Astronomy at IASBS", May 2015, Zanjan, Iran;

REFEREE IN JOURNALS

- Physics Letters B
- Physics of the Dark Universe
- Astrophysics and space science
- International Journal of Theoretical Physics

REFERENCES

- Prof. Fatimah Shojai
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