

CURRICULUM VITAE

Rouhollah Farghadan



Academic position: Associate Professor

Affiliation:

Department of Physics, University of Kashan, Kashan, 87317-51167, Iran

Education:

❖ **Ph. D. (*Solid State Physics*):**

Tarbiat Modares University, Tehran, Iran. Sep. 2007- Feb 2012.

Thesis title: Spin-dependent electrical transport in armchair graphene nanoribbons and carbon nanotubes carbon

❖ **M. S. (*Solid State Physics*):**

Tarbiat Modares University, Tehran, Iran. Sep. 2004-May 2007.

Thesis title: Construction and Study structural magnetic behavior of I.M.C. R_xPt_y

❖ **B. S. (*Applied physics*):**

Department of Physics, Shiraz University, Shiraz, Iran. Sep. 2000 - June 2004

Research Interests:

- Spin electronics
- Optical and Thermal properties of nanostructures
- Computational Modeling of Nano-Structures

Scientific publications:

1. **Farghadan, R.** (2024). Role of twist in modulating the electronic and thermoelectric properties of zigzag graphene nanoribbons. *Physical Review B*, 110 (7), 075132.
2. Abbasi, M., **Farghadan, R.** (2024). Exploring spin photovoltaics in defective armchair phosphorene nanoribbons, *Physica Scripta*, 99 (8), 085911.
3. Esteki, S., **Farghadan, R.** (2024). Spin thermoelectric properties induced by hydrogen impurities in zigzag graphene nanoribbons, *Physical Chemistry Chemical Physics*, 26 (15), 12035-12043.
4. Heidari, Moghari, MR., **Farghadan, R.** (2023). Research Paper: Investigation of Electronic and Transport Properties of Armchair and Zigzag β_{12} Borophene Nanoribbon
5. Nikoofard, H., Esmailzadeh M, **Farghadan, R.**, Sun JT. (2022). Quantum pumping through the surface states of a topological insulator, *Physical Review B*, 106 (16), 165127.
6. **Farghadan, R.** (2022). Half-metallicity in strained phosphorene nanoribbons. *Physics Letters A*, 128363.
7. Ildarabadi, F., & **Farghadan, R.** (2022). Spin-polarized edge states in silicene-like nanoribbons with non-uniform strain. *Journal of Magnetism and Magnetic Materials*, 556, 169381.
8. Mousavi, F. M., & **Farghadan, R.** (2021). Electrical control of Ruderman–Kittel–Kasuya–Yosida exchange interaction in zigzag edge MoS₂ nanoflakes. *Journal of Physics and Chemistry of Solids*, 158, 110242.
9. Ildarabadi, F., & **Farghadan, R.** (2021). Edge magnetization and spin-valley-caloritronics in germanene and stanene nanoribbons. *Journal of Magnetism and Magnetic Materials*, 529, 167870.
10. Ildarabadi, F., & **Farghadan, R.** (2021). Spin-thermoelectric transport in nonuniform strained zigzag graphene nanoribbons. *Physical Review B*, 103(11), 115424.
11. Abdi, R., & **Farghadan, R.** (2021). Tunable spin-photovoltaic effect in zigzag MoS₂ nanoribbons. *Physica E: Low-dimensional Systems and Nanostructures*, 126, 114488.
12. Ildarabadi, F., & **Farghadan, R.** (2021). Fully spin-valley-polarized current induced by electric field in zigzag stanene and germanene nanoribbons. *Physical Chemistry Chemical Physics*, 23(10), 6084-6090.

13. **Farghadan, R.**, & Abdi, R. (2020). Spin-polarized photocurrent in armchair TMD nanoribbons. *Iranian Journal of Physics Research*, 20(2), 383-392.
14. **Farghadan, R.**, & Ildarabadi, F. (2020). Gate-voltage induced giant spin Seebeck effect in phosphorene nanoribbons. *Physical Review B*, 102(3), 035430.
15. **Farghadan, R.** (2020). Spin photocurrents in zigzag phosphorene nanoribbons: From infrared to ultraviolet. *Journal of Applied Physics*, 128(1), 013103.
16. Shirdel-Havar, M., & **Farghadan, R.** (2020). Thermal magnetoresistance and spin thermopower in C60 dimers. *Journal of Physics: Condensed Matter*, 32(28), 285302.
17. Zamani, S., & **Farghadan, R.** (2020). Molecular spin-photovoltaic device based on a graphene nanoflake. *JOSA B*, 37(3), 593-600.
18. Ildarabadi, F., & **Farghadan, R.** (2020). Carbon atomic chains in a spin thermoelectric device. *Journal of Magnetism and Magnetic Materials*, 497, 165980.
19. Mousavi, F. M., & **Farghadan, R.** (2019). RKKY interaction in the zigzag-edge silicene-like nanoflake. *Physics Letters A*, 383(35), 125991.
20. **Farghadan, R.**, & Masoodi Nia, F. (2019). The effect of extended vacancies on the thermal properties of armchair graphene nanoribbons. *Iranian Journal of Physics Research*, 18(2), 322-329.
21. Masoodinia, F., & **Farghadan, R.** (2019). Thermal properties of graphene nanowiggles. *Journal of Research on Many-body Systems*, 9(2), 141-150.
22. Shirdel-Havar, M., & **Farghadan, R.** (2019). Large thermospin effects in carbon nanotubes with vacancy defects. *The Journal of Physical Chemistry C*, 123(33), 20105-20115.
23. Zamani, S., & **Farghadan, R.** (2019). Electric field induced enhancement of photovoltaic effects in graphene nanoribbons. *Physical Review B*, 99(23), 235418.
24. Zamani, S., & **Farghadan, R.** (2019). Spin-photovoltaic effects induced by the edge magnetism in a graphene nanoribbon junction. *Journal of Physics D: Applied Physics*, 52(23), 235502.
25. **Farghadan, R.** (2018). Edge magnetism in triangular silicene quantum dots. *Journal of Magnetism and Magnetic Materials*, 466, 301-305.
26. Shirdel-Havar, M., **Farghadan, R.** (2018). "Spin caloritronics in spin semiconducting armchair graphene nanoribbons." *Physical Review B*, 97(23), 235421.
27. Zamani, S., **Farghadan, R.** (2018). "Graphene Nanoribbon Spin-Photodetector." *Physical Review Applied*, 10(3), 034059.

28. Havar, M. S., **Farghadan, R.** (2018). "Armchair graphene nanoribbons with giant spin thermoelectric efficiency." *Physical Chemistry Chemical Physics*.
29. Zamani, S., **Farghadan, R.** (2018). "Spin photocurrents in chevron-type graphene nanoribbons under terahertz to visible light irradiation." *Journal of Physics D: Applied Physics*, 51(30), 305103.
30. **Farghadan, R.** (2018). "Edge magnetism in triangular silicene quantum dots." *Journal of Magnetism and Magnetic Materials*, 466, 301-305.
31. **Farghadan, R.**, et al. (2018). "The effect of extended vacancies on the thermal properties of armchair graphene nanoribbons." *Iranian Journal of Physics Research*.
32. **Farghadan, R.** (2017). "Enhanced half-metallicity at reconstructed zigzag edge of silicene." *EPL (Europhysics Letters)*, 117(1), 17002.
33. **Farghadan, R.** (2017). "Bipolar magnetic semiconductor in silicene nanoribbons." *Journal of Magnetism and Magnetic Materials*, 435, 206-211.
34. **Farghadan, R.**, Sehat, A. (2016). "Enhancement of Rashba spin-orbit coupling by electron-electron interaction." *RSC Advances*, 6(82), 78714-78719.
35. **Farghadan, R.**, Yoosefi, M. (2016). "Magnetism and spin transport of carbon chain between armchair graphene nanoribbon electrodes." *Physica E: Low-dimensional Systems and Nanostructures*, 83, 414-419.
36. **Farghadan, R.**, Farekiyan, M. (2016). "Giant magnetoresistance in bilayer graphene nanoflakes." *Solid State Communications*, 242, 1-5.
37. **Farghadan, R.**, Saffarzadeh, A. (2015). "Generation of fully spin-polarized currents in three-terminal graphene-based transistors." *RSC Advances*, 5(106), 87411-87415.
38. **Farghadan, R.**, Saffarzadeh, A. (2014). "Electric field control of spin-resolved edge states in graphene quantum nanorings." *Journal of Applied Physics*, 115(17), 174310.
39. **Farghadan, R.**, Saffarzadeh, A., & Heidari Semiromi, E. (2013). "Magnetic edge states in Aharonov-Bohm graphene quantum rings." *Journal of Applied Physics*, 114(21), 214314.
40. **Farghadan, R.**, & Saievar-Iranizad, E. (2012). "Spin-polarized transport in zigzag-edge graphene nanoribbon junctions." *Journal of Applied Physics*, 111(1), 014304.
41. **Farghadan, R.**, & Saievar-Iranizad, E. (2011). "Spin-polarized edge and magnetoresistance in graphene flake." *Solid State Communications*, 151(23), 1763-1766.

42. Saffarzadeh, A., & **Farghadan, R.**, (2011). "A spin-filter device based on armchair graphene nanoribbons." *Applied Physics Letters*, 98(2), 023106.
43. **Farghadan, R.**, & Saffarzadeh, A. (2010). "The effect of vacancy-induced magnetism on electronic transport in armchair carbon nanotubes." *Journal of Physics: Condensed Matter*, 22(25), 255301.
44. Yazdani, A., Molayi, M., & **Farghadan, R.**, (2007). "Prevention of the second phase by diluted system of Gd₂In." *Journal of Magnetism and Magnetic Materials*, 310(2), e451-e453.
45. **Farghadan, R.**, Saffarzadeh, A., & Iranizad, E. S. (2010). "Spin transport through a triangular graphene flake." In *Journal of Physics: Conference Series*, 248(1), 012014.

Conferences (Published in Proceedings):

- 1- Ildarabadi, F., & **Farghadan, R.**, “Pure Spin-valley Current and seebeck effect in Silicene Nanoribbon”, Proceedings of the 8 th International Conference on Nanostructures (ICNS8), Dec 2020 Tehran.
- 2- S. Zamani, **R. Farghadan**, “Detectors for visible and UV applications based on graphene nanowiggles”, 5th International Conference on Nanostructures, Sharif University of Technology, Feb 2018 Tehran.
- 3- S. Zamani, **R. Farghadan**, “Simulation of photocurrent in zigzag silicene nanoribbon”, 3rd Iraninan Computational physics Conference, Shahid Beheshti University, 31 Jan-1Feb 2018 Tehran.
- 4- F. Mazhari Mousavi, **R. Farghadan**, “Indirect Exchange Interaction and Spin-Orbit Coupling in Silicene Nanoflakes”, 3rd Iraninan Computational physics Conference, Shahid Beheshti University, 31 Jan-1Feb 2018.
- 5- F. Rezaei Neisiani, **R. Farghadan**, “Enhanced half-metallicity in zigzag phosphorene nanoribbons”, Annual Physics Conference of Iran Yazd University, 28-31 August 2017.
- 6- F. Mazhari Mousavi, **R. Farghadan**, “Zigzag silicene nanoribbons in the present of magnetic impurity”, Annual Physics Conference of Iran Yazd University, 28-31 August 2017.
- 7- F. Rezaei, **R. Farghadan**, “Electron-electron interaction in hexagonal silicene nanoflakes”, 13 th Condensed Matter Conference of the Iranian Physical Society, Shahid Rajae Teacher Training University, 13 and 14 February 2016.
- 8- F. Masoudinia, **R. Farghadan**, “The influence of structural defects on the thermal properties of graphene nanoribbon”, 13 th Condensed Matter Conference of the Iranian Physical Society, Shahid Rajae Teacher Training University, 13 and 14 February 2016.
- 9- F. Mazhari Mousavi, **R. Farghadan**, “Zigzag silicene nanoribbons in the presence of external magnetic and electric fields”, 13 th Condensed Matter Conference of the Iranian Physical Society, Shahid Rajae Teacher Training University, 13 and 14 February 2016.
- 10- F. Masoudinia, **R. Farghadan**, “Vacancy effects on transport properties of graphene nano riboons”, Annual physics Conference of Iran, Shiraz University, 22-25 Agust 2016.
- 11- A. Sehat, **R. Farghadan**, A. Majid., “Rashab spin-orbit effect on spin polarized-current three terminal transistors”, 12th Condensed Matter Conference of the Iranian Physical Society, Isfahan University of Technology, 8 and 9 February 2015.

- 12-M. Farrekiyan, **R. Farghadan**, “Field effects on electronic properties of hexagonal graphene quantum dots”, 12th Condensed Matter Conference of the Iranian Physical Society, Isfahan University of Technology, 8 and 9 February 2015.
- 13-M. Moghadasin, **R. Farghadan**, Soltani, Omid, “Magnetic and electronic properties in strained graphene quantum disks”, 12th Condensed Matter Conference of the Iranian Physical Society, Isfahan University of Technology, 8 and 9 February 2015.
- 14-M. Yoosefi, **R. Farghadan**, “Localized magnetization in free Carbon Chains”, 12th Condensed Matter Conference of the Iranian Physical Society, Isfahan University of Technology, 8 and 9 February 2015.
- 15-M. Farrekiyan, **R. Farghadan**, “Electrical-field-induced spin depolarization in hexagonal graphene quantum ring”, Second National-Electronic Conference on Physics Applications, Jahrom University, Feb 2014.
- 16-O. Soltani, **R. Farghadan**, “investigated electronic structure silicene flake in the presence of vacancy”, DFT Workshop, Shahid Rajaei Teacher Training University, Feb 2014.
- 17-**R. Farghadan**, “electric- field controlled spin polarization in triangular graphene quantum ring”, 5th International Conference on Nanostructures, Sharif University of Technology, March 2014.
- 18-**R. Farghadan**, E. SaievarIranizad., “Spin filter device in zigzag edge graphene nanoribbons”, The 17th Meeting on Condensed Matter Physics, IASBS, Zanjan, Iran (2011).
- 19-**R. Farghadan**, A. Saffarzadeh, E. SaievarIranizad., “The effect of magnetic behavior of vacancy defect on the conductance of carbon nanotubes”, 3rd Conference on Nanostructures, Kish Island, Iran (2010).
- 20-**R. Farghadan**, A. Saffarzadeh, E. SaievarIranizad., “Spin transport through a triangular graphene flake”, J. Phys. Conf. Ser 248-012014 (2010).
- 21-**R. Farghadan**, A. Saffarzadeh., “Giant magnetoresistance in graphene nanodisk with ferromagnetic contacts”, Iranian Annual Conference of Physics, Hamedan, Iran (2010).
- 22-**R. Farghadan**, A. Saffarzadeh, E. Saievar Iranizad., “Spin-polarized currents in graphene nanodisks”, Iranian Annual Conference of Physics, Isfahan Technical University, Isfahan, Iran (2009).
- 23-**R. Farghadan**, A. Saffarzadeh, and E. Saievar Iranizad., “The effect of Stone-Wales and vacancy defects on the conductance of carbon nanotubes”, Iranian Annual Conference of Physics, Isfahan Technical University, Iran (2009).

- 24-**R. Farghadan**, A. Yazdani., "Electronic structure of the Intermetallic compounds Gd₃Pt, Gd₂Pt and estimate the Curie temperature for Gd₃Pt", 8th symposium of condense matter, Ferdowsi University, Mashhad, Iran (2007).
- 25-A. Yazdani, **R. Farghadan**, "Crystal and spin lattice relaxation in Gd-IMC", International conference on magnetism (ICM), Japan (2006).
- 26-**R. Farghadan**, A. Yazdani., "Investigation the magnetic and structural properties of Gd₂Pt, Gd₃Pt", 14th symposium of the society of crystallography, University of Birjand, Iran, (2006).

Refereed Journal:

- 1) Three articles of the set paper Conference of the Iranian Physical Society 2016
- 2) One article of the set paper Condensed Matter Conference of the Iranian Physical Society 2016

M. Sc. students:

1. Marziyeh Farrakiyan, Graduated
Thesis title: "Electric field effect on the electronic and magnetic properties in graphene nanodots and nanorings (September 2014)."
2. Marziyeh Yoosefi Sheydani , Graduated
Thesis title: "Spin transport in the presence of electron- phonon interaction in carbon chains (September 2014)."
3. Maryam Leghaei, Graduated
Thesis title: "The effect of Rashba coupling on the electronic and magnetic transport properties of graphene rings and flakes (September 2014)."
4. Mohammad Moghadasin, Graduated
Thesis title: "The effect of Anderson disorder and structural defects on the electronic and magnetic properties of graphene nanostructures (February 2015)."
5. Ali Sehat, Graduated
Thesis title: "Three-terminal graphene transistor and Rashba spin-orbit interaction (September 2015)."
6. Omid Soltani, Graduated
Thesis title: "Electronic properties of silicene nanostructures: The multi-band tight-binding model (September 2015)."

7. Ali Latif Shushtari, Graduated
Thesis title: “A study of electronic magnetic optical and transport of silicene (February 2017).”
8. Fereshteh Masoudinia, Graduated
Thesis title: “Thermal properties of defected two-dimensional nanostructures: graphene and silicene (February 2017).”
9. Fatemeh Mazhari Mousavi, Graduated
Thesis title: “The electronic and Magnetic properties of silicene nanostructure in the presence of magnetic impurities (February 2018).”
10. Fatemeh Rezaei Neisiani, Graduated
Thesis title: “Electronic and magnetic properties of phosphorene nanostructures (February 2018).”
11. Saeedeh Norouz, Graduated
Thesis title: “Thermoelectric properties of silicene based on Dirac equation
12. Reyhane Abdi Ghohrudi, Graduated
Thesis title: “Spin-photovoltaic effect in transition metal dichalcogenide nanoribbons”
13. Mohammad Reza Heidari Moghari, Graduated
Thesis title: “Investigation of electronic properties and transport of borophene by multi-band tight binding method”
14. Marzieh Mahmoodi Gahrooi, Graduated
Thesis title: “Electronic and Thermal Transport in Gallenene and plumbene Nanostructures: Multiband Tight-binding Model”

Ph. D students:

1. Sara Zamani, Graduated
Thesis title: “Simulation of spin-dependent photocurrent in graphene nanostructures.”
2. Majid Shirdel-Havar, Graduated
Thesis title: “Enhancement of spin-caloritronic properties in carbon nano-junctions.”
3. Fereshte Ildarabadi, Graduated
Thesis title: “Spin-valley caloritronics in silicene-like structures”
4. Mojgan Abbasi, Working

5. Fatemeh Mazhari Mousavi, Working

Thesis title: "Spin thermoelectric in bilayer graphene-like nanoribbons"

6. Reyhane Abdi Ghohrudi, Working

7. Somayeh Staki, Working

8. Elham Azadi, Working