



Assistant professor of physics at Kosar university of bojnord, Iran

PERSONAL DETAILS

Name: Fatemeh Badieian Baghsiyahi
Date of Birth: 21.03.1983
Address: Department of Physics, Kosar University of Bojnord, Iran
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EDUCATION

Ferdowsi University, Mashhad, Iran - Ph.D. in Solid State Physics (2007-2013)

- Thesis title: Monte Carlo Simulation of Electron Transport in ZnO Semiconductor

Ferdowsi University, Mashhad, Iran - M.A. in Solid State Physics (2004-2007)

- Thesis title: Determination of the Anisotropy Constants for $\text{HoFe}_{1-x}\text{Co}_x$ Ti Alloys and Study the Influence of Co Substitution for Fe on These Constants

Ferdowsi University, Mashhad, Iran - B.S. in Physics (2000-2004)

- Graduated in the top 5% of the class.

SKILLS & INTERESTS

I hold a PhD in solid-state physics. During my master's degree, I studied the magnetic anisotropy constants of $\text{HoFe}_{11-x}\text{Co}_x\text{Ti}$ intermetallic compounds using the two-sublattice method and Fortran programming. In my doctoral research, I focused on electron transport in diodes using the Monte Carlo method. Currently, I am analyzing the structure and electronic, optical, and magnetic properties of nanomaterials using the SIESTA package, and I also have an interest in optical design using Zemax.

GUEST RESEARCHER

Oct 2010- March 2011: Dipartimento di Elettronica, Politecnico di Torino, Italy

March 2008: KITPC/ITP-CAS, Beijing, China

Employment

- 2014- present **Factually member of Kosar University of Bojnord, Iran.**
 - Assistant Professor of physics (2013 – present),
- 2010–2014 **Part-time Lecturer**, At several Universities in Iran such as Ferdowsi University of Mashhad, Quchan university, Payame Noor University, Azad university.

Research Interests

- Nano materials simulation
- Electronics, magnetic and Optical properties characterization of materials
- Solid state physics
- I am interested in researching on biomaterials, too.

Teaching/mentoring experience

2010 - present **relatively skilled at teaching subjects below:**

Mathematical Methods for physics

Fundamental Physics.
Crystallography
General Physics Laboratory.
Statics and Mechanics of materials
Wave optics and laboratory.
Geometrical Optics and laboratory
Optical Design and Instrumentation

2015 - present

Proficient in mentoring B.Sc. and M.Sc. students.

Title of some theses and projects under my supervision or
advice:

- Phosphorene electronics band structure and determination of its elastic properties with phonon dispersion (M.Sc. level).
- Investigation of electronic and magnetic properties of AlN nanosheet doped with transition elements for use in spintronic devices (M.Sc. level).

Awards

- **First place** in the PhD exam in Isfahan University of Technology (2007)
- **Top Student**, Physics Group, Ferdowsi University of Mashhad (B. Sc. level, 2004).
- Admission to the master's degree as a top 5% of the B. Sc. students.

Technical Skills

- **Software development**

Proficient in simulation tools such as SIESTA for nanomaterials modeling.
Experienced programming skills in Fortran.
Enthusiastic in optical design software.

- **Personal skills**

Diligent and motivated in the tasks assigned.

Strong desire to learn and grow and creative to find solution for problems.
Thrives in dynamic research environments, managing multiple projects and collaborating across disciplines to achieve common goals.

Language

- Persian: Native.
- English: Intermediate.
- French: Beginners.

Academic Service

- **Director of the physics Group, Kosar University of Bojnord, (2025–present).**
- **Head of the Vice President for Academic Affairs, Research and Technology Kosar University of Bojnord, (2022–2025)**
- **Head of the Research Management Office, Kosar University of Bojnord, (2015–2016 & 2017-2020)**
- ***Reviewer for journals such as Int. J. Mod. Phys. B, Journal of Magnetism and Magnetic Materials.***

PUBLICATIONS

1. **FB Baghsiyahi**, M Yeganeh, “The theoretical investigation of the electronic and optical properties of Fe-doped anatase TiO₂”, **Solid State Communications** 396, 115758(2025).
- 2 M Beyranvand, T Movlaroooy, **FB Baghsiyahi**, “Ab initio study of electronic and magnetic properties of zigzag and armchair AlN nanosheets”, **Physica E: Low-dimensional Systems and Nanostructures** 150, 115670, (2023).
3. **FB Baghsiyahi**, M Yeganeh, “The effect of strain on the zigzag and armchair phosphorene nanoribbon”, **Physica E: Low-dimensional Systems and Nanostructures** 121, 114088 (2020).

4. M Beyranvand, T Movlaroooy, **FB Baghsiyahi**, “Magnetic phase stability of transition metals doped (4, 4) AlN nanosheet”, **Journal of Magnetism and Magnetic Materials** 497, 166028 (2020) .
5. M Yeganeh, PS Maddahi, **FB Baghsiyahi**, “A Density Functional Study on the Sensitivity of Small ZnO Nanoclusters to Sulfamethazine Considering Semilocal and Nonlocal Functionals”, **Journal of Electronic Materials** 49 (2), 1273-1281 (2020).
6. PS Maddahi, M Yeganeh, **FB Baghsiyahi**, “ZnO nanoparticles as a sensitive platform for detection of nitration in tyrosine and tryptophan: A DFT study”, **Materials Chemistry and Physics** 237, 121857 (2019).
7. M Yeganeh, **FB Baghsiyahi**, RP Shahri, “Ab initio study of electronic and transport anisotropy of two square and rectangle phosphorene nanoflakes”, **Applied Physics A** 125, 1-7 (2019).
8. M Yeganeh, **FB Baghsiyahi**, RP Shahri, “Study of the Quantum Confinement Effects and Stability Properties of Small Nanoclusters of Bare and Hydrogenated Diamond.”, **Acta Physica Polonica, A**. 136 (1) (2019).
9. M Yeganeh, **FB Baghsiyahi** ,”Vibrational and thermodynamical properties of MgO nanosheets of (111) and (100) facets by density functional theory”, **Journal of Electronic Materials** 48, 3816-3822 (2019).
10. M Yeganeh, **FB Baghsiyahi**, M. Mousavi, “Investigation of structural and optical properties of Cr doped TiO₂ synthesized at different annealing temperature by analyzing the XRD patterns and DRS spectroscopy”, *Iranian Journal of Crystallography and Mineralogy*, 27(1)221-230 (2019).
11. M Yeganeh, **FB Baghsiyahi**, “Exploring the sensitivity of nanodiamond to sarafloxacin: A DFT approach”, **Journal of Physics and Chemistry of Solids** 124, 235-241 (2019).
12. M Yeganeh, **FB Baghsiyahi**, “structural and optical properties of Fe doped TiO₂ nanoparticles”, *Journal of Research on Many-body Systems*, 8(18) 183-192 (2018)
13. **FB Baghsiyahi**, A Akhtar, M Yeganeh, “*Ab initio* study of thermodynamic properties of bulk zinc-blende CdS: Comparing the LDA and GGA”, **International Journal of Modern Physics B** 32 (20), 1850207 (2018).
14. **FB Baghsiyahi**, MR Roknabadi, H Arabshahi, “Electron transport simulation in bulk wurtzite ZnO and its n+-n+ diode, compared with GaN”, **Physica E: Low-dimensional Systems and Nanostructures** 47, 252-256 (2013).

15. H Arabshahi, MR Rokn-Abadi ,**F Badieian-Baghsiyahi**, “Simulation of High Field Electron Transport in Wurtzite Phase of ZnO”, **International Archive of Applied Sciences and Technology** 3, 105-111 (2012).
16. H Arabshahi, **F Badieian-Baghsiyahi**, “Monte Carlo Simulation of Submicron ZnO n⁺-n-n⁺ Diode” **International Journal of Science & Emerging Technologies** 2 (1) (2011).
17. H Arabshahi, M Rezaee Roknabadi, **F Badieyan**, Z Eslami, “Steady-state and Transient Electron Transport Within Bulk III-V Nitride Semiconductors Using an Updated Semiclassical Three-valley Monte Carlo Method”, **Advances in Applied Science Research** 1(1)19-25 (2010).
18. H Arabshahi, M Rezaee Roknabadi, **F Badieian Baghsiyahi**, “Semiclassical three-valley Monte Carlo simulation analysis of steady-state and transient electron transport within bulk InAs_{1-x}P_x, InAs and InP”,**Maejo International Journal of Science and Technology** 4 (01)159-168 (2010).
19. H Arabshahi, MR Rokn-Abadi, **F Badieeyan**, MR Khalvati, “Hot electron of steady-state transport in submicrometer ZnSe and ZnS n⁺-i (n)-n⁺ diodes”, **Indian Journal of Science and Technology** 3 (1) (2010).
20. H Arabshahi, MR Rokn-Abadi, **F.B. Baagh-Siyahi**, “Comparison of high field electron transport properties in wurtzite phase of ZnO, GaN and SiC”, *Research Journal of Applied Sciences* 5 (3) 215-220 (2010).
21. H Arabshahi, MR Rokn-Abadi, **F Badieian B.**, MR Khalvati, “Monte carlo simulation of steady-state transport in submicrometer InP and GaAs n⁺-i(n)-n⁺ diode”, *Modern Physics Letters B*, 24(6) 549-560 (2010).

Conferences

1. F Badieian Baghsiyahi,” Optical properties of black phosphorene monolayer under strain”, Annual Physics Conference of Iran, Arak University, Sep. 2024.
2. F Badieian Baghsiyahi,” Effect of 5% Fe impurity on optical properties of TiO₂ and defining the Abbe number" Annual Physics Conference of Iran, Sistan and Baluchestan University, Sep. (2022).
3. F Badieian Baghsiyahi, M Yeganeh, A Akhtar ,“Effects of pressure on phonon dispersion and reststrahlen band of CdS " Annual Physics Conference of Iran,Tabriz, Sep. 2019.

4. F Badieian Baghsiyahi, M Yeganeh," Comparing the Strain Effect on Zigzag and Armchair Direction on Phosphorene Monolayer "

5. M Beyranvand, T Movlarooy, FB Baghsiyahi, " Study of the magnetic and electronic properties of AlN zigzag nanosheet doped with transition metals, 10th Conference on Statistical Physics, Soft condensed Matter and Complex Systems,Ardabil, Apr. 2018.

6. M Beyranvand, T Movlarooy, FB Baghsiyahi, "Investigation of Magnetic stable Phases of Aluminum Nitride Nanosheet doped with Fe and Mn Atoms", 3rd Iranian Computational Physics Conference, Shahid Beheshti University,Tehran, Iran, 31Jan-1Feb (2018).

7. M Beyranvand, T Movlarooy, FB Baghsiyahi, "Electron and magnetic properties of AlN armchair nanosheet doped by transition metals",3rd Iranian Computational Physics Conference, Shahid Beheshti University,Tehran, Iran, 31Jan-1Feb (2018).

8- F Badieian Baghsiyahi, M Yeganeh, "Study the structural properties and X-ray analysis of 3% Fe-doped TiO₂ nanoparticles by Williamson-Hall method", 25th Symposium of crystallography and Mineralogy of Iran, Yazd University, Yazd, Iran, January (2018).

9 A. Jahani, S.R. Saleh, FB Baghsiyahi, "Investigating the effect of the distance between the impeller and the centrifugal pump shell (side wall gap) on the pump outlet head",17rd Fluid dynamics Conference, Shahrood University of Technology, Shahrood, Iran, August (2017).

10. M Yeganeh , F Badieian Baghsiyahi," X-ray Analysis of Cu doped TiO₂ nanoparticles prepared by sol-gel method by Williamson-Hall method ", Annual Physics Conference of Iran,Yazd University, August (2017).

11. S. Sobhani, R. Pilevarshahri, F Badieian Baghsiyahi," Probing Young modulus in mono and bi-layer phosphorene and bulk black phosphorus ", Annual Physics Conference of Iran,Yazd University, August (2017).

12 S. Sobhani, F Badieian Baghsiyahi, R. Pilevarshahri," DFT Calculation of Electronic, Mechanical and Phonon properties of Phosphorene ", Annual Physics Conference of Iran, Shiraz University, August (2016).

13. S. Sobhani, F Badieian Baghsiyahi, R. Pilevarshahri," Investigation of band gap in multi layers of phosphorene ", Annual Physics Conference of Iran, Shiraz University, August (2016).

- 14- F Badieian Baghsiyahi, M. Penna,” Calculation of the electronic structure based on singular value decomposition ", Annual Physics Conference of Iran, Ferdowsi University, August (2015).
15. F Badieian B., H Arabshahi, MR Rokn-Abadi, “Monte Carlo simulation of steady state high field electron transport property in wurtzite phase of GaN, ZnO and SiC”, Annual Physics Conference of Iran, Bu-Ali Sina University, Hamedan, Iran (2010).
16. **F Badieian B.**, MR Rokn-Abadi, H Arabshahi, MR Khalvati, “Investigation of the unsteady state of high electric field on electron transport properties in ZnO, GaN, SiC semiconductors using Monte Carlo method”, 16th Annual IASBS Meeting on Condensed Matter Physics, Zanjan, Iran, May (2010).
17. M. Alinejad, N. Tajabor, F. Badieian B., “Analysis of crystal field parameters and magnetic anisotropy of $\text{HoFe}_{11-x}\text{Co}_x\text{Ti}$ compounds”, 16th Symposium of Crystallography and Mineralogy of Iran, Gilan University, Iran, January (2009).
18. M. Alinejad, N. Tajabor, K. Javidan, F. Badieian B., “Simulating the magnetization curve of the $\text{HoFe}_{11}\text{Ti}$ compound using the two-sublattice model”, 8th Conference on Condensed Matter, Ferdowsi University, Mashhad, Iran, January (2007).