

Ali Abdolazadeh Ziabari, PhD

Condensed Matter Physicist

Professional Profile

Over 14 years of research experience in Materials Physics. Research focuses on synthesis and preparation of transparent conducting materials (TCMs) and study their optical and electrical properties for photovoltaic applications, numerical simulation of optoelectronic devices and DFT study of nanostructured materials.

Research

* More than 8 years of experience in thin film lab using Guilan University facility:
– Vacuum system (diffusion and rotary pumps, UHV)
– Thin film deposition and characterization (physical evaporation, electron beam deposition, DC and RF sputtering, sol–gel dip–coating and spin coating)
– X–ray diffraction (XRD), Optical spectroscopy (Uv–vis), Raman Spectroscopy, Scanning Electron Microscopy (SEM), Atomic Force Microscopy (AFM), Photoluminescence (PL), X–ray Photoelectron Spectroscopy (XPS) and Hall Effect measurements.

* Establishment of Nano Research Lab in Islamic Azad University of Lahijan, Iran (2012–2015).

* Design and making of gas–sensing package (in collaboration with my teammate) (2013–2015).

* Design and making of dip–coating deposition setup (as a research project in Azad University of Lahijan) (2015–2016).

* Research project funded by Azad University, Lahijan Branch, Lahijan, Iran 2009–2011

Title: Optical and structural studies of sol–gel deposited nanostructured CdO thin films: Annealing effect.

* Research project funded by Azad University, Lahijan Branch, Lahijan, Iran 2011–2012

Title: Design and investigation of nano Metal–Oxide–Semiconductor Field Effect Transistor (MOSFET)

* Research project funded by Azad University, Lahijan Branch, Lahijan, Iran 2012–2013

Title: Fabrication and study of electro–optic, morphology and photoluminescence of CdS:Cu nanostructured thin films.

*** Dissertation advisor of the PhD Program:**

- "Performance improvement of CIGS solar cells by using of plasmonic nanoparticles" by Sahar Royanian, Underway.

*** Secondary dissertation advisor of the PhD Program:**

– "Lactose biosensors based immobilized beta-galactosidase on carbon nanotubes electrode" by Rafieh Meraat, Underway.

– "Growth, characterization and study the sensing properties of graphene nanostructures" by Nastaran Hosseini, Underway.

– " Study of the effects of utilizing plasmonic nanoparticles on the performance improvement of CZTS thin film solar cells" by Mina Mirzaei, Underway.

– "Study, Simulation and efficiency improvement of single and tandem nanostructured CIGS solar cells" by Mojtaba Amiri, Underway.

–"Investigation of application of multi walled carbon nanotubes functionalized polymer based solar cells in photovoltaic properties of polyaromatics" by M. Mostashari, Underway.

*** Dissertation supervisor of the M.Sc. Program:**

– " Preparation and characterization of nanostructured CZTS thin films for photovoltaic solar cell application" by Nader Mohabbati, Defense: November 2018.

*** Secondary dissertation supervisor of the M.Sc. Program:**

– "Growth and study of the physical properties of nanostructured thin films based on Si– Zn composite by Sol–Gel method" by Maryam Nilkar, Defense: February 2012

– " Optical and structural studying of Tungsten doped Vanadium Oxide nano–films fabricated by sol–gel method" by Asieh Sokhan–Sheno Haghi, Underway.

– "In–Situ synthesis and characterization of Titanium Dioxide nanopowder and evaluation of its antibacterial properties" by Sajihe Bahrekazemi, Defense: September 2012

– "Synthesis of ZnO:F nanoparticles by sol–gel method: antibacterial efficacy against *Pseudomonas aeruginosa* PTCC1430" by Kamyar Mazloom Jalali, Defense: February 2014.

– "Synthesis of ZnO:Mg nanoparticles by sol–gel method: antibacterial efficacy against *Listeria Monocytogenes (Serotype 1a) PTCC1430*" by Nima Shadan, Defense: February 2014.

– "study of the structural, electronic and optical properties of cadmium sulfide nanostructures using density functional theory (DFT)" by Morteza Sirous, Defense: September 2017.

Teaching

** The University of Guilan, Rasht, Iran, Teaching Assistant. 2000–2012

- Chosen to deliver lectures and prepare course materials for undergraduate course.
- Teaching Fundamental Physics I & II, Modern Physics, Electromagnetism

** Azad University, Lahijan Branch, Lahijan, Iran, Lecturer. 2007–2013

- Teaching Fundamental Physics I & II & III, Modern Physics, Electromagnetism
- Head of Optical Laser Engineering group (2012-present).

Education

09/07–02/12

Ph.D. Degree: The University of Guilan, Rasht, Iran

Department of Physics, Condensed Matter and Nanophysics;

Advisor: Professor Farhad E. Ghodsi;

Dissertation: Growth and Studying of Physical Properties of Nanostructured Thin Films of Cadmium Compounds.

09/03–11/05

M.Sc. Degree: The University of Guilan, Rasht, Iran

Supervisor: Professor Seyyed Mohammad Rozati;

Thesis: The Effects of Scattering Mechanisms on the Electrical Properties of Transparent Conductive Oxide Thin Films

09/98–6/02

B.Sc. Degree: University of Shahid Beheshti, Tehran, Iran

Department of Physics (Specialization in Nuclear & Applied Physics)

Selected Publications

1. **Abdolahzadeh Ziabari, A.**, Ghodsi, F.E., Synthesis and characterization of nanocrystalline CdZnO thin films prepared by sol–gel dip–coating process, *Thin Solid Films* 520 (2011) 1228–1232.

2. **Abdolahzadeh Ziabari, A.**, Ghodsi, F.E., Optoelectronic studies of sol–gel derived nanostructured CdO–ZnO composite films, *Journal of Alloys and Compounds*, 509 (2011) 8748–8755.
3. **Abdolahzadeh Ziabari, A.**, Ghodsi, F.E., Surface morphology and optoelectronic studies of sol–gel derived nanostructured CdO thin films: heat treatment effect, *Journal of Materials Science: Materials in Electronics* 23 (2012) 1628–1639.
4. **Abdolahzadeh Ziabari, A.**, Ghodsi, F.E., Growth, characterization and studying of sol–gel derived CdS nanocrystalline thin films incorporated in polyethyleneglycol: effects of post–heat treatment, *Solar Energy Materials and Solar Cells* 105 (2012) 249–262.
5. **Abdolahzadeh Ziabari, A.**, Rozati, S.M., Carrier transport and bandgap shift in n–type degenerate ZnO thin films: the effect of band edge nonparabolicity, *Physica B* 407 (2012) 4512–4517.

Most cited paper¹

6. **Abdolahzadeh Ziabari, A.**, Ghodsi, F.E., Kiriakidis, G., Correlation between morphology and electro–optical properties of nanostructured CdO thin films: Influence of Al doping, *Surface and Coating Technology* 213 (2012) 15–20.

Hot paper²

7. **Abdolahzadeh Ziabari, A.**, Ghodsi, F.E., Influence of Cu doping and post heat treatment on the microstructure, optical properties and photoluminescence features of sol–gel derived nanostructured CdS thin films, *Journal of Luminescence* 141(2013)121–129.
8. **Abdolahzadeh Ziabari A.**, Charmi M, Mashayekhi H R, The impact of body doping concentration on performance of nano DG–MOSFETs: A Quantum Simulation”, *Chinese Journal of Physics*, 5(4) (2013) 844–853.
9. **Abdolahzadeh Ziabari, A.**, Ghodsi, F.E., The effects of Cd:Zn:S molar ratio and post heat treatment on the optical and photoluminescence properties of nanocrystalline CdZnS thin films, *Materials Science in Semiconductor Processing* 16 (2013) 1629–1636.
10. Amoopour, E., **Abdolahzadeh Ziabari, A.**, Ghodsi, F.E., Anderva, H., Influence of Air/N₂ treatment on the structural, morphological and optoelectronic traits of nanostructured ZnO:Mn thin films, *Superlattices and Microstructures*, 65 (2014) 332–343.
11. **Abdolahzadeh Ziabari, A.**, Exploring low, moderate and heavy Al doping impacts on microstructure and optical attributes of nanostructured cadmium oxide thin films, *Superlattices and Microstructures*, 72 (2014) 172–185.
12. Nilkar, M., Ghodsi, F.E., **Abdolahzadeh Ziabari, A.**, Compositional evolution and surface–related phenomena effects in ZnS–SiO₂ nanocomposite films, *Applied Physics A: Materials Science & Processing*, 118(4) (2015) 1377–1386.
13. Ahmadi, K., **Abdolahzadeh Ziabari, A.**, Mirabbaszadeh, K., Ahadpour Shal A, Synthesis and characterization of ZnO/TiO₂ composite core/shell nanorod arrays by sol–gel method for organic solar cell applications, *Bull. Mater. Sci.* 38(3)(2015) 617–623.
14. **Abdolahzadeh Ziabari, A.**, Rozati, S.M., Investigation of the band edge nonparabolicity on the carrier transport of ITO thin films, *Journal of Korean Physical Society* 65(4) (2014) 487–490.

¹ <https://www.journals.elsevier.com/physica-b-condensed-matter/most-cited-articles>

² <http://top25.sciencedirect.com/subject/materials-science/15/journal/surface-and-coatingstechnology/02578972/archive/41>

15. **Abdolahzadeh Ziabari A**, Refahi Sheikhan A H, Vatani Nezafat R, Monsef Haghhighidoust K, Optical modeling and electrical properties of cadmium oxide nanofilms: Developing a meta-heuristic calculation process model, *Journal of Applied Physics* 117(13) (2015) 135303.
16. Ahmadi K, **Abdolahzadeh Ziabari A**, Mirabbaszadeh K, Ahmadi S, Synthesis of TiO₂ nanotube array thin films and determination of the optical constants using transmittance data, *Superlattices and Microstructures* 77 (2015) 25–34.
17. R. Meraat, **Abdolahzadeh Ziabari A**, Issazadeh K, Shadan N, Mazloom Jalali K, Synthesis and Characterization of the Antibacterial Activity of Zinc Oxide Nanoparticles against *Salmonella typhi*, *Acta Metallurgica Sinica* 29(7) (2016) 601–608.
18. Askaripour Lahiji M, **Abdolahzadeh Ziabari A**, First-principle calculation of the elastic, band structure, electronic states, and optical properties of Cu-doped ZnS nanolayers, *Physica B*, 501 (2016) 146–152.
19. A. Amirsalari, **Abdolahzadeh Ziabari A**, R. Taheri, S. Farjami Shayesteh, A fundamental study on the effects of nano-silver incorporation on the structure and luminescence properties of color centers in γ' -alumina nanoparticles, *Journal of Luminescence*, 192 (2017) 910–918.
20. **Abdolahzadeh Ziabari A**, S. J. Mousavi, M.H. Ahmadi, A comparative *ab initio* study of the effect of Ni doping on the structural, mechanical, electronic and optical behaviors of ZnO nanostructured layers, *Chinese Journal of Physics*, 51 (2019) 61-71.

Software:

Lumerical, COMSOL, AMPS, Silvaco, SCAPS, Wien2k, Matlab, Materials Studio, ZEMAX.