

In the name of God

Curriculum Vital:

Personal:

- First Name: **Ahmad**
- Family Name: **Moshaii**
- Date of Birth: **23/08/1974 (1353/06/1)**
- Place of Birth: **Ghom, Iran.**
- Nationality: **Iranian.**
- Marital status: **Married**
- Children: **2 Sons (Behraad and Raadin)**



Academic Title:

Associate Professor of Atomic Physics

Address:

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Post-Secondary Education:

- Ph.D. in Physics
 - Atomic and molecular Physics;
 - " Formulation and Numerical Solution of the Navier-Stokes Equations for a Sonoluminescing Bubble "
 - Sharif University of Technology, Tehran, Iran 2004.
- Master of Science
 - Experimental physics;
 - "Auger electron spectroscopy, investigation of thermal decomposition of the oxide layer of Si (111)"
 - Sharif University of Technology, Tehran, Iran 1998.
- Bachelor of Science

Awards and honors

- Award of first student of physics department in Sharif University of Technology for the B.S. education period, (1996)
 - Third rank, National scientific Olympiad of physics (1997)
 - Award of first student of physics department in Sharif University of Technology for the M.S. education period, (1998)
 - Award of selected student of physics department in Sharif University of Technology for the Ph.D. education period, (2004)
 - Third rank Youth Kharazmi National Award for outstanding PhD level research in basic sciences, Ministry of Science, Research and Technology of Iran (December 2005)
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Employment Records

- “Institute for studies in Theoretical Physics and Mathematics”, Tehran, Iran, 2003 - 2004, Ph.D., Researcher
 - “Institute for studies in Theoretical Physics and Mathematics”, Tehran, Iran, 2004 – 2008, Researcher.
 - “European organization for nuclear research”, CERN, Switzerland, 2004 – 2010, visiting Researcher.
 - Atomic energy organization of Iran”, Tehran, Iran, 1999 - 2007, researcher.
 - Faculty of Basic Sciences, Physics Department, Tarbiat Modares University, Tehran, Iran, Assistant Professor, 2008- now.
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Executive Records:

- National Elite Foundation of Iran, Deputy of Secretary of Elite Council of Iran 2009-1010.
 - Deputy for Education, Faculty of Basic Sciences, Tarbiat Modares University, Tehran, Iran, 2010- now.
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Research Interests:

- Electrochemical and Optical Biosensors
 - Perovskite Solar Cells
 - Solar Water Splitting
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Simulation and Computer knowledge and experiences:

- Monte-Carlo Simulations
 - Molecular Dynamics Simulations
 - Numerical computations
 - Programming in Fortran
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Teaching Experiences:

1. Interaction of light with matter, Tarbiat Modares University
2. Advance Quantum Electronics, Tarbiat Modares University
3. Advance Electrodynamics I, Tarbiat Modares University
4. Advance Electrodynamics II, Tarbiat Modares University
5. Particle Physics, Tarbiat Modares University
6. Basic Physics I, II; Sharif University of Technology, Tehran.
7. Electromagnetism; University of Ghom, Ghom.
8. Laser, University of Ghom, Ghom.
9. Spectroscopy, University of Ghom, Ghom.
10. Supervising more than 30 graduate students; Tarbiat Modares University, Tehran.
11. Supervising 8 PHD students; Tarbiat Modares University and Amirkabir University of Technology, Tehran.

Selected Publications:

1. Irajizad A., Taghavinia N., Ahadian M., **Mashaei A.**, “Thermal desorption of ultrathin silicon oxide layers on Si(111)” *Semiconductor Science and Technology* (2000), vol.15, 160-163.
2. **Moshaii A.**, Sadighi-bonabi R., Taeibi-Rahni M., “Effects of bulk viscosity in non-linear bubble dynamics” *Journal of Physics: Condensed Matter* (2004), Vol.16, No.10, 1687.
3. **Moshaii A.**, Sadighi-bonabi R., Taeibi-Rahni M., Daemi, M., “Effects of Liquid Second Viscosity in High-Amplitude Sonoluminescence” *Chinese Physics Letters* (2004), Vol.21 No.2, 356.
4. **Moshaii A.** and Sadighi-bonabi R., “Role of liquid compressional viscosity in the dynamics of a sonoluminescing bubble” *Physical Review E* (2004), vol. 70, 016304.
5. **Moshaii A.** and Sadighi-bonabi R., “Reply to Comment on Role of liquid compressional viscosity in the dynamics of a sonoluminescing bubble” *Physical Review E*, (2005), vol. **72**, 048302
6. **Moshaii A.**, R. Rezaei-Nasirabad, Kh. Imani, M. Silatani and R. Sadighi-Bonabi “Role of Thermal Conduction in Single Bubble Sonoluminescence” *Physics Letters A*, (2008) vol. 372, 1283.
7. K. Doroud, **Moshaii A.**, Y. Pezeshkian, J. Rahighi, H. Afarideh “Simulation of temperature dependence of RPC operation”, *NIMA*, Vol. 602, (2009), 723.
8. **Moshaii A.**, and Doroud K. “Study the effect of humidity on the RPC performance”, *NIMA*, Vol. 602, (2009), 727.
9. **A. Moshaii**, Kh. Imani, and M. Silatani “Sonoluminescence radiation from different concentrations of sulfuric acid”, *Phys. Rev. E* **80**, 046325 (2009).
10. S. Hosseini, M. Mohammadi Najafabadi, **A. Moshaii**, Y. Radkhorrami, and N. Tazik, “Constraints on the masses of fourth generation quarks” *Phys. Rev. D* **79**, 113013 (2009).
11. L. Khosravi-Khorashad, M. Eskandari, **A. Moshaii** “Simulation of resistive plate chamber in streamer mode operation” *Nuclear Instruments and Methods A (NIMA)* **628**, (2011) 470–473
12. **A. Moshaii**, M. Faraji, S. Tajik-Nezhad, “Study of single bubble Sonoluminescence in phosphoric acid” *Ultrasonics Sonochemistry*, **18**, (2011) 1148-1152.
13. **A. Moshaii**, S. Tajik-Nezhad, and M. Faraji “Temperature dependency of single-bubble sonoluminescence in sulfuric acid” *Physical Review E*, **84**, (2011) 046301
14. Khosravi Khorashad, **A. Moshaii** and S. Hosseini “Fast and total charges in a resistive plate chamber: A numerical approach” *EPL (Europhysics Letters)* **96**, (2011), 45002.

15. **A. Moshaii**, L. Khosravi-Khorashad, M. Eskandari, S. Hosseini “RPC simulation in avalanche and streamer modes using transport equations for electrons and ions” *Nuclear Instruments and Methods in Physics Research Section A* **661** (2012) S168–S171
16. **A. Moshaii**, M. A. Hoseini, S. Gharibzadeh, A. Tavakoli-Anaraki “Temperature and intensity of sonoluminescence radiation in sulfuric acid” *Phys. Rev. E* **86**, (2012) 016316.
17. M. Faraji, **A. Moshaii** “Noble gas dependence of single-bubble sonoluminescence in phosphoric acid” *Physics Letters A* **376** (2012) 2703–2706
18. N. Sobhkhiz, **A. Moshaii** “Optical properties of Ag conic helical nanostructures” *Appl. Phys. Lett.* **100**, (2012) 113107.
19. S. Abbasian, **A. Moshaii**, M Nikkhah, N Farkhari “Adsorption of DNA on colloidal Ag nanoparticles: Effects of nanoparticle surface charge, base content and length of DNA” *Colloids and Surfaces B: Bio-interfaces* **116** (2014) 439–445
20. B. Eftekharinia, S.H. Nabavi, **A. Moshaii**, and A. Dabirian “High intensity enhancement of unidirectional propagation of a surface plasmon polariton beam in a metallic slit-groove nanostructure” *SCIENTIA IRANICA* **21**, 6, (2014), 2508-2512
21. N. Sobhkhiz, **A. Moshaii** “Silver conical helix broadband plasmonic nanoantenna” *J. of Nanophotonics* **8**, (2014), 083078
22. N. Sobhkhiz, **A. Moshaii** “Broadband Improvement of Light Absorption Properties of α -Fe₂O₃ Thin-film by Silver Helical Nanostructures” *Plasmonics* **10**, Issue 5, (2015),1243-1253
23. H. Dehkordi, K. Dastafkan, **A. Moshaii**, A. Mokhtari “Thermal post-annealing and gas concentration effect on liquid petroleum gas sensing characteristics of nanocrystalline zinc oxide thin films” *Journal of Materials Science: Materials in Electronics* **26**, Issue 5, (2015), pp 3134-3142
24. N Farkhari, S Abbasian, **A Moshaii**, M Nikkhah "Mechanism of adsorption of single and double stranded DNA on gold and silver nanoparticles: Investigating some important parameters in bio-sensing applications" *Colloids and Surfaces B: Biointerfaces* **148**, (2016), 657-664
25. N Mohammadian, **A Moshaii**, A Alizadeh, S Gharibzadeh, ... "Influence of Perovskite Morphology on Slow and Fast Charge Transport and Hysteresis in the Perovskite Solar Cells" *The Journal of Physical Chemistry Letters* **7** (22), (2016), 4614-4621
26. R Bahramian, H Eshghi, **A Moshaii** "Influence of annealing temperature on morphological, optical and UV detection properties of ZnO nanowires grown by

- chemical bath deposition" *Materials & Design* 107, (2016), 269-276
27. N Mohammadian, AH Alizadeh, **A Moshaii**, S Gharibzadeh, A Alizadeh A two-step spin-spray deposition processing route for production of halide perovskite solar cell *Thin Solid Films* 616, (2016), 754-759
 28. R Bahramian, **A Moshaii**, H Eshghi "Effect of seeding modification of substrate on the growth and UV detection properties of ZnO nanowires" *Materials Letters* 179, (2016), 222-225
 29. S Gharibzadeh, BA Nejand, **A Moshaii**, N Mohammadian, AH Alizadeh Two-Step Physical Deposition of a Compact CuI Hole-Transport Layer and the Formation of an Interfacial Species in Perovskite Solar Cells *ChemSusChem* 9 (15), (2016), 1929-1937
 30. **A Moshaii** "Output power enhancement of Rhodamine 6G dye laser by colloidal gold nanoparticles" *SCIENTIA IRANICA* 23 (6), (2016), 3115-3122
 31. S Abbasian, **A Moshaii**, NS Vayghan, M Nikkhah "Ag Nanostructures Produced by Glancing Angle Deposition with Remarkable Refractive Index Sensitivity" *Plasmonics*, 12(3), (2017) 631–640.
 32. B Eftekharinia, **A Moshaii**, A Dabirian, "Design of a Slit-Groove Coupler for Unidirectional Excitation of the Guided Surface Plasmon Polaritons Through a Plasmonic Slot Waveguide" *Plasmonics*, 12, (2017), 131–138
 33. BA Nejand, P Nazari, S Gharibzadeh, V Ahmadi, **A Moshaii** "All-inorganic large-area low-cost and durable flexible perovskite solar cells using copper foil as a substrate" *Chemical Communications* 53 (4), (2017) 747-750
 34. B Eftekharinia, **A Moshaii**, A Dabirian, N Sobhkhiz "Optimization of charge transport in a Co-Pi modified hematite thin film produced by a scalable electron beam evaporation for photoelectrochemical water oxidation" *Journal of Materials Chemistry A*, 5, (2017) 3412-3424
 35. S Jamali, **A Moshaii** "Improving photo-stability and charge transport properties of Cu₂O/CuO for photo-electrochemical water splitting using alternate layers of WO₃ or CuWO₄ produced by the same route" *Applied Surface Science* 419, (2017) 269-276
 36. S Gharibzadeh, **A Moshaii**, BA Nejand, V Ahmadi "Large grain γ -CuI thin film growth on a copper foil as a hole transport material by an easy and facile method" *Materials Letters* 202, (2017) 154-157
 37. B Eftekharinia, **A Moshaii**, A Dabirian "Design rules of nanostructured transparent conductive electrodes for light trapping in hematite photoanodes" *Journal of Photonics for Energy* 7 (3), (2017) 037001

38. S Abbasian, **A Moshaii**, NS Vayghan, M Nikkhah "Ag Nanostructures Produced by Glancing Angle Deposition with Remarkable Refractive Index Sensitivity" *Plasmonics* 12 (3), (2017) 631-640
39. S Jamali, **A Moshaii** "Improvement of Photoelectrochemical and Stability Properties of Electrodeposited Cu₂O Thin Films by Annealing Processes" *N Mohammadian physica status solidi (a)*, (2017) 214 (12).
40. A. Huckab, S. Gharibzadeh, M. Ralairiso, C. Roldán-Carmon, N. Mohammadian, G. Grancini, Y. Lee, P. Amsalem, E. J. Plicht, N. Koch, **A. Moshaii**, M. Kh. Nazeeruddin "Low-Cost TiS₂ as Hole-Transport Material for Perovskite Solar Cells Small Methods" DOI: 10.1002/smt.201700250 (2017)
41. M Yarbakht, M Nikkhah, **A Moshaii**, S Abbasian, A Dellith "Fabrication of Silver Chevron Arrays as an Efficient and Stable SERS Substrate: Implications in Biological Sensing" *Plasmonics* (2018) 13 (2), 715-726
42. Melina Yarbakht, Maryam Nikkhah, **A Moshaii**, Karina Weber, Christian Matthäus, Dana Cialla-May, Jürgen Popp, "Simultaneous isolation and detection of single breast cancer cells using surface-enhanced Raman spectroscopy" *Talanta* (2018) 186, 44-52
43. S Abbasian, **A Moshaii**, NS Vayghan, M Nikkhah, "Fabrication of Ag nanostructures with remarkable narrow plasmonic resonances by glancing angle deposition" *Applied Surface Science* (2018) 441, 613-620
44. Mohamad Zandieh, Seyed Nezamedin Hosseini, Manouchehr Vossoughi, Maryam Khatami, Sara Abbasian, **A Moshaii**, "Label-free and simple detection of endotoxins using a sensitive LSPR biosensor based on silver nanocolumns" *Analytical biochemistry* (2018) 548, 96-101
45. SH Nabavi, MH Khodabandeh, M Golbabaee, **A Moshaii** "Absorption of DCM Dye in Ethanol: Experimental and Time Dependent Density Functional Study" *International Journal of Optics and Photonics* (2018) 12 (1), 43-56