

Curriculum Vitae

Seyed Mahmoud Ashrafi
PhD in Physics



E-mail: s.ashrafi@sharif.edu
Phone: +989105961440

Current Position:

Postdoctoral Researcher at Quantum Engineering and Photonics Technology Group, Sharif University of Technology, Tehran, Iran (started from February 2021).

Academic Career:

- **Visiting PhD Student** in Quantum Nano Photonic Group at Universidad Autonoma de Madrid, Spain under Supervision of Dr. Johannes Feist (started from February 2018 -nine months)
- **PhD.** Physics, Molecular Optomechanics, Tarbiat Modares University, Tehran, Iran, September 2020, Total GPA: 18.02/20
Thesis: The Investigation of Strong Coupling Regime in Molecular Optomechanics systems
Under Supervision of Prof. R. Malekfar & Prof. Dr. A. R .Bahrampour
Thesis grade: 19.40
- **M.Sc.** Atomic/Molecular Physics, Minor in Quantum Optics, Imam Khomeini International University (IKIU), Qazvin, Iran; February 2013, Total GPA: 18.43/20
Thesis: Quantum Jump Method in Entangled State Representation
Under Supervision Prof. Dr. M. R. Bazrafkan
Thesis grade: 19.80
- **B. Sc.** Physics, Shahid Bahonar University, Kerman, Iran, September 2010,
Total GPA: 16.25/20
- **Diploma:** Mathematics and Physics, 2005, Total GPA: 17.87/20

Research Interests:

- Quantum Optics
- Quantum Communication
- Optomechanics
- Quantum Plasmonics
- Nano Photonics

Publications:

- **S. M. Ashrafi**, R. Malekfar, A. R. Bahrapour and J. Feist “long distance heat transfer between molecular systems through a hybrid plasmonic- photonic nano-resonator”, *J. Opt.* 23, 015003 (2020)
- **S. M. Ashrafi**, N. Taghadomi, A. R. Bahrapour, and R. Malekfar “Coupled quantum molecular cavity optomechanics with surface plasmon enhancement”:comment, *Photonics Research*, Vol. 183, 1760 (2020)
- **S. M. Ashrafi**, R. Malekfar, A. R. Bahrapour and J. Feist “Optomechanical heat transfer between molecules in a nanoplasmonic cavity”, *Phys. Rev. A* 100, 013826, (2019)
- M. R. Bazrafkan, **S. M. Ashrafi** and F. Naghdi " Damping in a squeezed bath and its time evolution through Complete Class of Gaussian Quasi-distributions", *Chin. Phys. Lett.* Vol. 31, No. 7, 070303 (2014)
- **S. M. Ashrafi**, M. R. Bazrafkan, " New approach for solving Master Equations of density Operator for the Jaynes-Cummings Model with Cavity Damping ", *Chin. Phys. B* Vol. 23, No. 9, 090303 (2014)
- **S. M. Ashrafi**, M. R. Bazrafkan, "Unraveling Driven Damped Harmonic Oscillator through Entangled State Representation", *Chin. Phys. Lett.* Vol. **30**, No. 11 (2013)
- M. R. Bazrafkan, **M. Ashrafi**, "A Driven Damped Harmonic Oscillator in the ket-Vector Representation of the Density Operator", *J. Russia Laser*, Vol **34**, No1, (2013)
- F. Shahandeh, M. Bazrafkan and **M. Ashrafi**, "The S- Ordered Fock Space Projectors Gained by the General Ordering Theorem", *Chin. Phys. Lett.* Vol. **29**, No. 9 (2012)

Conferences:

- **S. M. Ashrafi**, R. Malekfar, A. R. Bahrapour and J. Feist, “long distance heat transfer between molecular systems through a hybrid plasmonic- photonic nanoresonator”, *Molecular polaritonics 2019: theoretical and numerical approach*, Madrid, Spain
- **S. M. Ashrafi**, R. Malekfar, A. R. Bahrapour and J. Feist, “Optomechanical heat transfer between molecules in a nanoplasmonic cavity”, *XVV international summer school 2018*, Madrid, Spain
- **S. M. Ashrafi**, H. Dizajghorbani, R. malekfar and A. R. Bahrapour “The analysis of the effect of external quantum field on the hybrid system of plasmonic nano antenna and quantum dot in entangled state representation”, *The 23rd Iranian Conference on Optics and Photonics (ICOP 2017)* and the 9th Iranian Conference on Photonics Engineering and Technology (ICPET 2017)
- H. Dizajghorbani , **S. M. Ashrafi** and R. malekfar "One-dimensional photonic crystals band gap made by alternating SiO₂ or PMMA with MoS₂ monolayers under irradiation of Gaussian wave " in *The 23rd Iranian Conference on Optics and Photonics (ICOP 2017)* and the 9th Iranian Conference on Photonics Engineering and Technology (ICPET 2017)

Honors:

- Ranked 1st in Scientific Competition of Department of Physics at Tarbiat Modares University, Spring 2016, Total GPA: 18:02/20
- The Juror of Iran Physics Cup, Spring 2015.
- Ranked 14 out of about 4800 Students in National PhD, Physics, Entrance Competition; September 2014.
- Ranked 58 out of about 4000 Students in National MSc, Photonics, Entrance Competition; September 2010.

Work Experience and Academic Activities

- Project manager, “Passive Quantum Navigation Roadmap”, Tehran, Iran, 2020 (Five Months).
- Project coadjutor, “Quantum network”, Iran Telecommunication Research Center, Tehran, Iran, started from 2019 (five months).
- Elite Center military services project, “The Investigation of QKD Protocols and the feasibility of improving Its security using optomechanical systems”, Defense Industry Research Institute, Tehran, Iran, started from 2019.
- Project advisor, “single photon detector in QKD”, Iran Telecommunication Research Center, Tehran, Iran, 2017-2018.
- TA in Mathematical Physics I, Physics Department, IKIU, Qazvin, Iran; Fall 2012.

Computer Skills

- Simulation Environments: QUTIP, MATLAB

Language Skills

- Persian: Native
- English: Fluent

References

- Prof. Dr. A. R. Bahrapour, Department of Physics, Sharif University, Bahrapour@sharif.edu
- Prof. Dr. R. Malekfar, Department of Physics, Tarbiat Modares University, Malekfar@modares.ac.ir
- Dr. Johannes Feist, Departamento de Física Teórica de la Materia Condensada Universidad Autónoma de Madrid, Spain johannes.feist@uam.es
- Dr. Mohammad Reza Bazrafkan, Department of Physics, IKIU Bazrafkan@sci.ikiu.ac.ir