



Curriculum Vitae

Aziz Kolkiran

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Nationality: Turkish

Professional Experience

- 2011- present Assistant Professor, Department of Electrical and Electronics Engineering, Katip Celebi University, Izmir, Turkey.
- 2009- 2011 Assistant Professor, Head of Department-Department of Electrical and Electronics Engineering, Gediz University, Izmir, Turkey.
- 2008-2009 Postdoctoral Research Associate, Department of Physics, Mesoscopic Physics & Quantum Information Group, Chonnam National University, Gwangju, South Korea.
- 2003-2008 Research/Teaching Assistant, Department of Physics, Quantum Optics and Quantum Information Science Group, Oklahoma State University, Stillwater.
- 2002-2003 Research Assistant, 4. Physikalisches Inst., Universitate Stuttgart, Stuttgart, Germany
- 1996-2002 Research/Teaching Assistant, Department of Physics, Middle East Technical University, Ankara, Turkey.

Education

- Ph.D.** **Photonics/Physics**, Oklahoma State University, Stillwater, USA, July 2008.
- M.Sc.** **Physics**, Middle East Technical University, Ankara, Turkey, February 1999.
- B.Sc.** **Double Major in Mathematics and Physics**, Middle East Technical University, Ankara, Turkey, July 1996.

Research Interest

- Theoretical studies of entangled light and atoms in the context of quantum imaging and sensing.
- Quantum metrology.
- Quantum measurement theory.
- Heisenberg-limited measurements.
- Theoretical investigations of quantum effects in nano-mechanical systems.
- Quantum coherence and quantum information theory in mesoscopic systems.
- Nano-optics, Nano-photonics

Collaborations

1. **Professor Girish Saran Agarwal (Fellow of Royal Society)**, Noble Foundation Chair and Regents Professor, Department of Physics, Oklahoma State University, Stillwater, OK, USA.
2. **Associate Professor Kicheon Kang**, Department of Physics, Chonnam National University, Gwangju, South Korea.

Teaching Experience

- Graduate level: **Quantum Optics, Nanophotonics**
- Undergraduate level: **General Physics, Modern Physics, Electromagnetic Theory**

List of Scientific Publications

Thesis

1. **Aziz Kolkıran**, “Classical dynamics of p-branes”, M.Sc. Thesis, Middle East Technical University, Ankara, Turkey, February 1999.
2. **Aziz Kolkıran**, “Quantum imaging and sensing with entangled photons”, Ph.D. Thesis, Oklahoma State University, Stillwater, USA, July 2008.

Refereed International Journal Articles

1. **Aziz Kolkıran** and G. S. Agarwal, “Resolution of objects within subwavelength range by using the near field of a dipole”, *Optics Letters*, Vol. 37, Iss. 12, pp. 2313–2315 (2012). 2010 ISI Impact Factor: 3.318
2. **Aziz Kolkıran** and G. S. Agarwal, “Amplitude Noise Reduction in a Nano-mechanical Oscillator,” *Mathematical and Computational Applications* 16, 290-300 (2011).
3. **Aziz Kolkıran** and G. S. Agarwal, “Quantum Imaging Using Coherent Beam Stimulated Parametric Down-conversion,” *Optics Express* **16**, 6479-6485 (2008). 2010 ISI Impact Factor: 3.753
4. **Aziz Kolkıran** and G. S. Agarwal, “Heisenberg limited Sagnac interferometry,” *Optics Express* 15, 6798-68 (2007). 2010 ISI Impact Factor: 3.753
5. **Aziz Kolkıran** and G. S. Agarwal, “Towards the Heisenberg limit in magnetometry with parametric down-converted photons,” *Phys. Rev. A* 74, 053810 (2006). 2010 ISI Impact Factor: 2.861

Book

1. **Aziz Kolkıran**, “Quantum Imaging and Sensing with Entangled Photons: Heisenberg-limited measurements with entangled light,” ISBN-13: 978-3639192919, VDM Verlag (September 9, 2009).

Other publications

1. **Aziz Kolkıran**, “High-noon states with high flux of photons using coherent beam stimulated non-collinear parametric down conversion”, arXiv:1104.3266v1 [quant-ph]
2. **Aziz Kolkıran** and G. S. Agarwal, “Quantum properties of a nano-mechanical oscillator,” [eprint cond-mat/0608621].
3. **Aziz Kolkıran**, “Deli dolu Kuantum Davulu,” *NTV BİLİM*, Sayı 25, Sayfa 51, ISSN 1308-8637, Mart 2011.
4. **Aziz Kolkıran**, “Bakmadan Görmek Mümkün mü?,” *NTV BİLİM*, Sayı 21, Sayfa 40, ISSN 1308-8637, Kasım 2010.
5. **Aziz Kolkıran**, “Makineler, Mantık ve Kuantum Hesaplama,” *Tübitak Bilim ve Teknik Dergisi*, Sayı 400, Sayfa 81, (2001).

Invited Talk

1. **Aziz Kolkıran**, “Quantum Metrology with High-Noon States”, *18th Istanbul Statistical*

Physics Days, Sabanci University, Istanbul , Turkey, 30 June – 2 July 2011.

Refereed Conference Abstracts

1. “Quantum imaging using evanescent waves,” Aziz Kolkıran, Alexei Kornetov, G. S. Agarwal, Central European Workshop on Quantum Optics (CEWQO 2012, Sinaia, Romania, 2-6 July 2012).
2. “Subwavelength resolution by using the near field of a dipole,” Aziz Kolkıran and G.S. Agarwal, 2nd International Advances in Applied Physics and Materials Science Congress (APMAS2012), Antalya, Turkey, 26-29 May 2012 [Oral presentation by Aziz Kolkıran].
3. “High-noon states with high flux of photons using coherent beam stimulated non-collinear parametric down conversion”, Aziz Kolkıran, *International Conference on Quantum Metrology (QM 2011)*, Poznan, Poland, 11-13 May 2011 [**Oral presentation by Aziz Kolkıran**].
4. “Amplitude Noise Reduction in a Nano-mechanical Oscillator”, *1st International Symposium on Computing in Science and Engineering*, Kuşadası, Aydın, Turkey, 3-5 June 2010. [**Oral presentation by Aziz Kolkıran**].
5. “Phase Sensitivity of Entangled Electrons,” Aziz Kolkıran and Kicheon Kang, *Brain Korea Project 21 Workshop*, Muju Ski Resort, Northern Jeolla Province, Guney Kore, 18-19 February 2009 [**Oral presentation by Aziz Kolkıran**].
6. “Heisenberg Limited Sagnac Interferometry with Higher Order Entanglement,” Aziz Kolkıran and G. S. Agarwal, *OSA Topical Meeting, International Conference on Quantum Information (ICQI) and Ninth Conference on Coherence in Quantum Optics (CQO9)*, Rochester, New York, ABD, 10 –15 June, 2007 [Poster presentation by Aziz Kolkıran].
7. **Aziz Kolkıran** and G. S. Agarwal, “Heisenberg limited Sagnac interferometry,” *American Physical Society March meeting*, Denver, Colorado, ABD, 5-9 March, 2007 [**Oral presentation by Aziz Kolkıran**].
8. **Aziz Kolkıran** and G. S. Agarwal, “Towards Heisenberg limit in magnetometry with parametric down-converted photons,” *Frontiers in Optics 2006/Laser Science XXII, The 90th Optical Society of America Annual Meeting*, Rochester, New York, ABD, 8 – 12 October, 2006 [**Oral presentation by Aziz Kolkıran**].
9. **Aziz Kolkıran** and G. S. Agarwal, “Heisenberg limited measurements in magnetometry with parametric down-converted photons,” *International Focus Workshop on Linear Optical Quantum Information Processing (LOQuIP)*, Baton Rouge, Louisiana, ABD, 9 - 12 April, 2006 [Poster presentation by Aziz Kolkıran].
10. **Aziz Kolkıran** and G. S. Agarwal, “Squeezing in a nano-mechanical oscillator,” 12th Central European Workshop on Quantum Optics (CEWQO) 2005, Ankara, Turkiye, 6 - 9 June , 2005 [Poster presentation by Aziz Kolkıran].

Conference/Workshop organizations

1. **Organizing committee member**, Advances in Applied Physics and Material Science Congress (APMAS 2012), Antalya, Turkey, April 26-29, 2012.

2. **Chairman, organizer and lecturer**, “Advanced Lectures in Quantum Optics,” ITAP, International Advanced Research School in Physics, Marmaris, Turkey, 8-18 June 2010.
3. **Organizing committee member**, “6th Nanoscience and Nanotechnology Conference,” Izmir Institute of Technology, Çeşme, Izmir, Turkey, 15-18 June 2010.
4. **Organizing committee member, contact person**, “1st International Symposium on Computing in Science and Engineering”, Gediz University, Kuşadası, Turkey, 3-5 June 2010.

Editor

1. **Editor**, Expert Systems with Applications Special Issue: “*Intelligent computational techniques in Science, Engineering and Business*,” Volume: 39 Issue: 1 Pages: 1-2 DOI: 10.1016/j.eswa.2011.06.039 Published: JAN 2012.
2. **Co-editor of proceedings book, ISBN: 978 – 605 – 61394 – 0 – 6**, “1st International Symposium on Computing in Science and Engineering”, Gediz University, Kuşadası, Turkey, 3-5 June 2010.

Research Projects/Grants

1. “Sub-wavelength resolution in quantum imaging using uncorrelated single photon sources,” **Aziz Kolkıran-Principle Investigator**, Gediz University, supported by TÜBİTAK, Grant no: 110T321, 2010-2012.
2. “Manipulation of Quantum Entanglement and Decoherence in Neutral Atoms and Quantum Dots,” **Aziz Kolkıran-Researcher**, Oklahoma State University, supported by NSF, Grant No: CCF-0524673 2006-2008.

Honors & Awards

- **Outstanding Theoretical Research Assistant Award** by the Department of Physics, Oklahoma State University, April 2008.
- **Merit based travel grant from American Physical Society Division of Laser Science** for The 90th Optical Society of America Annual Meeting, October 2006.
- **Alexander von Humboldt Foundation Research Fellowship** with a monthly stipend of 2000 Euros for a period of 24 months, Stuttgart, Germany, July 2002.
- **First Rank Student Medal** by the President of University, **High Honor Student** in the Dean’s List for 3 years, Department of Physics, Middle East Technical University, Ankara, Turkey, July 1996.
- **Dean’s Scholarship for 3 years**, Middle East Technical University, Ankara, Turkey, 1994 – 1996.

Postgraduate research supervision

PhD Theses

Alexey Kornetov, “Quantum imaging using evanescent waves”, Fatih University, Istanbul, 2011- continuing.