

Curriculum Vitae **As of 2015, October**

Özgür E. Müstecaplıoğlu

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EDUCATION

- 1995-1999 **Bilkent University**, Ankara, Turkey
Ph.D. in physics
Dissertation: Quantum Statistical Properties of Light Interacting with Matter
Supervisor: A. S. Shumovsky
- 1993-1995 **Bilkent University**, Ankara, Turkey
M.S. in physics
Thesis: Rabi Oscillations in an Exciton-Polariton System
Supervisor: A. S. Shumovsky
- 1989-1993 **Bilkent University**, Ankara, Turkey
B.S. in physics

HONORS AND AWARDS

- 2013 Selected as a full member of The Science Academy Society
- 2012 Outstanding Referee, American Physical Society (APS)
- 2009 Middle East Technical University Mustafa Parlar Foundation Research Encouragement Award
- 2007 TÜBİTAK Encouragement Award
- 2005 Interuniversity Board, Turkey – University Associate Professor
- 2004 Turkish Academy of Science – Distinguished Young Scientist Award
- 1995-1999 The Scientific and Technical Research Council of Turkey, Unified National and International Doctorate Program Fellowship
- 1993-1999 Bilkent University, Turkey - Graduate Fellowship
- 1989-1993 Bilkent University, Turkey - Undergraduate Fellowship
- 1989 9th place at the national university entrance exam (among about 600 000 students)

RESEARCH INTERESTS

Quantum Optics, Quantum Information Science and Technology, Foundations of Quantum Electrodynamics, Atomic, Molecular and Optical Physics, Bose-Einstein Condensates, Matter Waves, Optical Properties of Semiconductors, Nonlinear Optics, Plasmonics, Quantum Decoherence, Cavity QED, Circuit QED, Topological Quantum Computation, Optical lattices, Degenerate Fermi Gas, Quantum Plasmonics, Nanophotonics, Topological Insulators, Quantum Memory, Quantum Thermodynamics, Quantum Walk, Nitrogen-Vacancy Centers in Diamond

TEACHING AND ACADEMIC EXPERIENCE

- 2014 summer **Princeton University**, Department of Electrical Engineering and Applied Science
Visiting Research Scholar
- 2012-... **Koç University**, Istanbul, Turkey
Professor of Physics
- 2009-2010 **ETH, Swiss Federal Institute of Technology**, Zurich, Switzerland
Institute of Quantum Electronics
Academic Guest, Quantum Photonics Group
- 2007-2012 **Koç University**, Istanbul, Turkey
Associate Professor of Physics
- 2002-2007 **Koç University**, Istanbul, Turkey
Assistant Professor of Physics
- 1999-2002 **Georgia Institute of Technology**, Atlanta, GA USA
Post-Doctoral Fellow, Atomic, Molecular and Optical Physics Group
- 1998 Summer **University of Toronto**, Toronto, Canada
Visiting Researcher, Quantum Optics and Solid State Physics Group
- 1993-1999 **Bilkent University**, Ankara, Turkey
Research and Teaching Assistant in Department of Physics

COURSES TAUGHT

- Koç University, Istanbul, Turkey

Undergraduate

- Classical Mechanics (PHYS 201)
- Advanced Classical Mechanics (PHYS 311)
- Electromagnetism (PHYS 302),
- Introductory Physics (PHYS 101 & 102)
- Statistical Physics (Phys 301)
- Independent Study I & II (Phys 390, Phys 490)
- Calculus (Math 102) (for non-science majors)
- Advanced Electromagnetism (PHYS 312/ELEC 312)

- Multivariable Calculus and Linear Algebra (MATH 203)
- Advanced Solid State Physics (PHYS 409/509)

Graduate

- Statistical Physics (PHYS 506)
 - Classical Mechanics (PHYS 501)
 - Advanced Solid State Physics (PHYS 409/509)
 - Special Topics in Electrical and Computer Engineering:
Advanced Photonics (PHYS580/ECOE580)
 - Special Topics in Condensed Matter Physics:
Quantum Transport (PHYS 580)
 - Special Topics in Condensed Matter Physics:
Theory and Applications of Surface -Plasmon Polaritons (PHYS 580)
 - Special Topics in Physics: Quantum Optics (PHYS 550)
 - Nanophotonics (OEPE 526)
 - Advanced Quantum Mechanics (PHYS 503)
- Developed MatLab scripts, Mathematica notebooks and GUI for physical animations to use in interactive teaching for various courses. Used interactive teaching methods. Designed courses where students actively participate developing original exam problems and evaluation of exams. Designed course projects relevant to interest of double major students.

GRADUATE THESIS SUPERVISED

- Selçuk Çakmak, Ph. D. in Physics, January 2016 (expected), “Quantum Heat Engines with Interacting Spins”, Samsun 19 Mayıs University. Co-supervised.
- Onur Danacı, M. S. in Physics, January 2015, “Quantum Control of Hyperbolic Metamaterials”. He was accepted PhD program of Tulane University, New Orleans, USA.
- Ali Ümit Cemal Hardal, Ph. D. in Physics, September 2014, “Multiphoton Processes, Entanglement and Quantum Walk in Hybrid Systems: Circuit QED and Nitrogen Vacancy Centers”. He was accepted to Lockheed-Martin Coherence Capacitor and Quantum Heat Engines project at Koc University as a postdoctoral scholar.
- Omid Khosravani, M.S. in Physics, September 2011, “Quantum Information Transfer Between Photon Fields Coupled to an Ensemble of Cyclic Quantum Systems”. He was accepted to Florida State University PhD program.
- Devrim Tarhan, Ph.D. in Physics, March 2007, “Quantum coherent effects on linear and nonlinear pulse propagation in Bose-Einstein condensates”, Istanbul Technical University. Co-supervised. Supervisor: Nazmi Postacıoğlu. Devrim Tarhan is a YÖK (Council of Higher Education of Turkey) scholarship student and is required to join Physics Department of Harran University after graduation.
- Turan Birol, M.S. in Physics, July 2007, “Symmetry breaking and quantum decoherence in a Bose-Einstein condensate”, Koç University. Co-supervisor: Tekin Dereli. Turan Birol is a TUBITAK scholarship student. He was accepted to Cornell University PhD program.
- Arif Engin Cetin, M.S. in Electronics Engineering, July 2009, “Non-Local Effects on Surface Plasmon Theory and Their Novel Applications: Nano-Scale Plasmonic

Structures". A.E. Cetin is a TUBITAK scholarship student. He was accepted to Boston University PhD program.

- Fatih Pelik, M.S. in Physics, September 2010, "Contact Angle Change and Wetting of Droplets on Planar Surfaces". He was accepted to Koç University PhD program.
- Ramazan Uzel, M. S. in Physics, January 2011, "Modelling Single Molecule Single Photon Sources Using Master Equation", Koç University. He has joined ASELSAN Company.
- Evren Karakaya, M. S. in Physics, February 2011, "Dissipative Quantum Brain Model", Koç University. She was accepted Koç University PhD program.

GRADUATE THESIS COMMITTEE MEMBERSHIPS

- Mykola Bordyuh, PhD in Physics, "Many-Body Effects in Coupled Light-Matter Systems", Princeton University, Electrical Engineering Department, Princeton, NJ, USA. Supervisor: Hakan Türeci. (Thesis Reader)
- Muhammad Rehan Chaudhry, M.S. in Optoelectronics and Photonics Engineering, 10 September 2015, "Two-Dimensional Hexagonal Photonic Crystal in the X-band", Koç University, Istanbul, Turkey. Supervisor: Ali Serpengüzel.
- Muhammad Hamza Humayun, M.S. in Optoelectronics and Photonics Engineering, 10 September 2015, "Elastic and inelastic scattering enhanced spherical and rectangular silicon photodiodes in amorphous and crystalline liquids", Koç University, Istanbul, Turkey. Supervisor: Ali Serpengüzel.
- Neşe Aral, PhD in Physics, 03 September 2015, "Coherent Organization in Gene Regulatory Networks", Koç University, Istanbul, Turkey. Supervisor: Alkan Kabakçioğlu.
- Ulaş Sabahattin Gökay, Ph.D. in Physics, 17 September 2014, "Elastic Light Scattering and Optoelectronic Response of Spherical Silicon Microresonators", Koç University, Istanbul, Turkey. Supervisor: Ali Serpengüzel.
- Nur Aslan, M.S. in Physics, December 2014, "Application of the Density Matrix Renormalization Group to the Single Particle Problem", İstanbul Technical University, İstanbul, Turkey. Supervisor: Levent Subaşı.
- Gül Seda Ünal, Ph.D. in Electrical and Electronics Engineering, 18 September 2014, "Bridging the Gap between Optical and RF Antennas: An Optical Patch Antenna Design inspired by RF Cavity Model", Koç University, Istanbul, Turkey. Supervisor: İrşadi Aksun.
- Aybike Ural Yalçın, M.S. in Physics, September 2013, "Surface – Plasmon Enhanced Optical Forces in Nanostructures and Waveguides", Koç University, Istanbul, Turkey. Supervisor: Kaan Güven.
- Göktuğ Karpat, Ph. D. in Physics, January 2013, "Entanglement and Other Measures of Non-Classicality", Sabancı University, Istanbul, Turkey. Supervisor: Zafer Gedik.
- Güneş Aydınoğan, M.S. in Physics, September 2012, "Dynamics of optical soliton – surface plasmon interaction in dielectric - metal and metal – dielectric – metal interfaces", Koç University, Istanbul, Turkey. Supervisor: Kaan Güven.
- Mehdi Yavuz Yüce, Ph.D. in Physics, September 2012, "Applications and Techniques for Single Molecule Experiments", Koç University, Istanbul, Turkey. Supervisor: Alper Kiraz.
- Emine Pınar Karabulut, Ph.D. in Electrical & Electronics Engineering, January 2012, "Optical Characterization of 2D Metals and Dielectric Nano-structures via MoM-based Numerical Technique, and Development of DCIM with Spatial Error Criterion and Automatic Order Selection", Koç University, Istanbul, Turkey. Supervisor: İrşadi Aksun.
- Yasa Ekşioğlu, Ph.D. in Physics, September 2011, "Nonlinear Dynamical Aspects of the Dielectric Waveguide - Surface Plasmon Josephson Junction", Koç University, Istanbul, Turkey. Supervisor: Kaan Güven.

- Ozan Sariyer, Ph.D. in Physics, August 2011, “Renormalization Group Theory of Quantum Particulate Systems”, Koç University, Istanbul, Turkey. Supervisor: A. Nihat Berker.
- Fırat Solgun, M.S. in Physics, August, 2011, “Designing Qubits With Superconducting Circuits”, Koç University, Istanbul, Turkey. Supervisor: Tekin Dereli.
- Nader Ghazanfari, Ph.D. in Physics, June 2011, “Rapidly Rotating Ultracold Atoms in Harmonic Traps”, Middle East Technical University (METU), Ankara, Turkey. Supervisor: Altug Ozpineci, Co-Supervisor: M. Ozgur Oktel.
- Şeyda İpek, M.S. in Physics, September 2010, “2+1 Dimensional Quantum Gravity”, Koç University, Istanbul, Turkey. Supervisor: Tekin Dereli.
- Utkan Güngördü, M.S. in Physics, September 2010, “Quantum Cryptology”, Koç University, Istanbul, Turkey. Supervisor: Tekin Dereli.
- Hamit Kalaycıoğlu, Ph.D. in Electrical and Electronics Engineering, September 2008, “Development and Characterization of Advanced Mid-Infrared Solid State Lasers”, Koç University, Istanbul, Turkey. Supervisor: Alphan Sennaroglu.
- Aytac Alparslan, M.S. in Electrical and Computer Engineering, September 2008, “Study of Green’s Functions of Potentials and Fields in Layered Media Composed of Left-Handed and Right-Handed Materials”, Koç University, Istanbul, Turkey. Supervisor: M. İrşadi Aksun.
- Cenk Akyüz, Ph.D. in Physics, July 2008, “Quantum Entanglement in Low Dimensional Spin Systems”, Dokuz Eylül University, Izmir, Turkey. Supervisor: Ekrem Aydiner .
- Aykut Erbaş, M.S. in Physics, June 2007, “Two Statistical Physics Problems: Phase Diagram Calculation of Spatially Anisotropic, Surfaced d=3 Layered Systems by Renormalization-Group Theory and Vehicle-Route Optimization with Traffic Factors for Migros Home Delivery System by Simulated Annealing”, Koç University, Istanbul, Turkey. Supervisor: A. Nihat Berker.
- Onur Akatlar, M.S. in Material Science and Engineering, September, 2006, “Rainbow enhanced elastic scattering of Gaussian beams from microspheres in infrared wavelengths”, Koç University, Istanbul, Turkey. Supervisor: Ali Serpenguzel.
- Meltem Gönülol, Ph.D. in Physics, December, 2006, “Development of Quantum Computation Algorithms”, Dokuz Eylül University, Izmir, Turkey. Supervisor: Ekrem Aydiner.
- İdris Kabalcı, Ph.D. in Physics, December, 2005, “Effect of lead fluoride on Thulium ions emission probabilities in Telurite optical glasses”, Istanbul Technical University, Istanbul, Turkey. Supervisors: Alphan Sennaroglu, and Gönül Özen.
- Ufuk Paralı, M.S. in Computational Science and Engineering, August, 2005, “A molecular dynamics simulation study of torsional deformations of single-walled carbon nanotubes”, Koç University, Istanbul, Turkey. Supervisor: Tekin Dereli.
- Emre Yuce, M.S. in Physics, July 2009, “Optical Modulation and Spectroscopy with Silicon Microspheres” Koç University, Istanbul, Turkey. Supervisor: Ali Serpengüzel.

UNDERGRADUATE PROJECTS SUPERVISED

- “Force and torque measurements using magnetic micro beads for single molecule biophysics” (Ayşe Rezzan Köse, freshman summer project)
- “Superluminal light propagation”, (Nuray Sürücü, Phys 490 Independent Study Project, Spring 2003)
- “Physics of cerebrovascular diseases” (Nuray Sürücü, Phys 490 Independent Study Project, Fall 2003)

- “Optical properties of and four wave mixing in carbon nanotubes”, (Kamil Varol, Phys 490 Independent Study Project, Fall 2003)
- “Numerical Simulations of pulse propagation in optical fibers via implicit algorithms”, (Hüseyin Çankaya, Phys 490 Independent Study Project, Fall 2003)
- “Levy Distributions for econophysics”, (Bora Akyıldız, Phys 490 Independent Study Project, Spring 2004)
- “Development of a virtual introductory physics labs for distance learning for high schools“, (Ersin Sarıcı, Phys 490 Independent Study Project, Spring 2004)
- “Web implementations of virtual physics labs for distance learning for high schools”, (Tunç Bayrak, Phys 490 Independent Study Project, Spring 2004)
- “Monte Carlo Simulations of stock market models”, (Ümit Kıvanç Battal, Phys 490 Independent Study Project, Spring 2004)
- “Physics of Facial Animations”, (Nesra Yannier, PHYS 390, co-supervised, Spring 2004)
- “Customer behavior modeling”, (Tunç Bayrak, PHYS 390, Fall 2004)
- “Distribution of wealth in the minority game”, (Kadir Yılmaz, PHYS 390, Spring 2005)
- “A descriptive research on quantum optics and optical memory”, (Duygu Altınsoy, PHYS 390, Spring 2005).
- “New science and organizations”, (İrem Güroğlu, PHYS 390, Spring 2005).
- “Dynamics of Wealth Distribution”, (Metin Nebiler, PHYS 390, Spring 2006).
- “Physics of Heart Attack”, (Turgut Oruç Yılmaz, PHYS 390, Spring 2006).
- “Quantum Networks”, (Ömer Demirel, PHYS 390, Spring 2007) .
- “Mathematical and Numerical Analysis of Medical Imaging and Tomography”, (Serhat Okumuş, PHYS 390, Spring 2007).
- “Physical Foundations and Challenges in Spintronics”, (Meriç Çelik, PHYS 390, Spring 2007)
- “Simulations of Chaotic Systems”, (Bekir Barış Hamarat, PHYS 390, Spring 2008)
- “Physics of Flight”, (Mehmet Çetin, PHYS 390, Spring 2008).
- “Classical and Quantum Random Walks”, (Turabi Kaniyolu, PHYS 390, Spring 2009)
- “Quantum Random Number Generator”, (Erkan Tahsin Konuk, PHYS 390, Spring 2009)
- “Quantum Decision Theory and Econophysics” (Mehpare Atay, Phys 490 Independent Study Project, Fall 2011)
- “Vortices in superfluids: Numerical Examples” (Koray Erdoğan, PHYS 390, Fall 2012)
- “An Exploration of Visual Perception: The Eye and the Mind” (Roza Kamiloğlu, PHYS 390, Spring 2014)
- “Quantum Optical Master Equation for Miscromaser Heat Engines” (Gökhan Tanısalı, PHYS 390, Spring 2015)
- “Quantum Thermodynamics of Non-Markovian Systems” (Gökhan Tanısalı, PHYS 491, Fall 2015)

PUBLICATIONS IN REFEREED JOURNALS (COVERED BY SCI)

1. F. Altintas, and Ö. E. Müstecaplıoğlu, "General formalism of local thermodynamics with an example: Quantum Otto engine with a spin-1/2 coupled to an arbitrary spin", Phys. Rev. E **92**, 022142 (2015).
2. A. Ü. C. Hardal and Ö. E. Müstecaplıoğlu, "Superradiant Quantum Heat Engine", Sci. Rep. **5**, 12953; (2015).
3. A. K. Ardabili, T. Dereli, and Ö. E. Müstecaplıoğlu, "Z2 topological insulator of ultracold atoms in bichromatic optical lattices", Physica B: Condensed Matter **459**, 1 (2015).
4. F. Altintas, A. Ü. C. Hardal, and Ö. E. Müstecaplıoğlu, "Rabi model as a quantum coherent heat engine: From quantum biology to superconducting circuits", Phys. Rev. A **91**, 023816 (2015).
5. F. Altintas, A. Ü. C. Hardal, and Ö. E. Müstecaplıoğlu, "Quantum correlated heat engine with spin squeezing", Phys. Rev. E **90**, 032102 (2014).
6. Ali Ü. C. Hardal and Ö. E. Müstecaplıoğlu, "Spin squeezing, entanglement, and coherence in two driven, dissipative, nonlinear cavities coupled with single- and two-photon exchange", Jour. Opt. Soc. Amer. B – Opt. Phys., **31**, 1402 (2014).
7. Nader Ghazanfari and Ö. E. Müstecaplıoğlu, "Acoustic superradiance from an optical-superradiance-induced vortex in a Bose-Einstein condensate", Phys. Rev. A **89**, 043619 (2014).
8. Aybike Ural Yalçın, Ö. E. Müstecaplıoğlu, and Kaan Güven, "Modification of the surface plasmon enhanced optical forces on metal nanorod pairs by axial rotation and by dielectric intralayer", Applied Surface Science, **318**, 285 (2014).
9. E. Karakaya, F. Altintas, K. Guven, and Ö. E. Müstecaplıoğlu, "Non-Hermitian quantum dynamics and entanglement of coupled nonlinear resonators", Europhys. Lett. **105**, 40001 (2014).
10. S. Aas and Ö. E. Müstecaplıoğlu, "Optical bistability in one-dimensional doped photonic crystals with spontaneously generated coherence", Phys. Rev. A **88**, 053846 (2013).
11. S. Safaei, Ö. E. Müstecaplıoğlu, and B. Tanatar, "Raman superradiance and spin lattice of ultracold atoms in optical cavities", New Jour. Phys. **15**, 083037 (2013).
12. A. Ü. C. Hardal, P. Xue, Y. Shikano, Ö. E. Müstecaplıoğlu, and B. Sanders, "Discrete-time quantum walk with nitrogen-vacancy centers in diamond coupled to a superconducting flux qubit", Phys. Rev. A **88**, 022303 (2013).
13. Y. Ekşioğlu, Ö. E. Müstecaplıoğlu, and K. Güven, "Dissipative Josephson junction of an optical soliton and a surface plasmon", Phys. Rev. A **87**, 023823 (2013).
14. D. Tarhan, H. Sumei, and Ö. E. Müstecaplıoğlu, "Superluminal and ultraslow light propagation in optomechanical systems", Phys. Rev. A **87**, 013824 (2013).
15. D. Tarhan, A. Sennaroglu, Ö. E. Müstecaplıoğlu, "Laser pulse amplification and dispersion compensation in effectively extended optical cavity containing Bose-Einstein condensates", J. Phys. B: At. Mol. Opt. Phys. **46**, 015501 (2013).
16. A. E. Çetin, A. A. Yanik, A. Mertiri, S. Erramilli, , Ö. E. Müstecaplıoğlu, and H. Altug, "Field-effect active plasmonics for ultracompact electro-optic switching", App. Phys. Lett. **101**, 121113 (2012).

17. B. Öztıp, M. Bordyuh, Ö. E. Müstecaplıoğlu, and H. Türeci, "Excitations of optically driven atomic condensate in a cavity: theory of photodetection measurements", *New Jour. Phys.* **14**, 085011 (2012).
18. A. Ümit C. Hardal and Ö. E. Müstecaplıoğlu, "Transfer of spin squeezing and particle entanglement between atoms and photons in coupled cavities via two-photon exchange", *J. Opt. Soc. B* **29**, 1822 (2012).
19. T. Dereli, Y. Gül, P. Forn-Diaz, and Ö. E. Müstecaplıoğlu, "Two-frequency Jahn-Teller systems in circuit QED", *Phys. Rev. A* **85**, 053841 (2012).
20. M. E. Taşgın, Ö. E. Müstecaplıoğlu, and L. You, "Creation of a vortex in a Bose-Einstein condensate by superradiant scattering", *Phys. Rev. A* **84**, 063628 (2011). [Figure 2d selected for Kaleidoscope, December 2011 images for APS web site]
21. Y. Eksioğlu, Ö.E. Müstecaplıoğlu, and K. Güven, "Dynamical analysis of a weakly coupled nonlinear dielectric waveguide Surface-plasmon model as another type of Josephson junction", *Phys. Rev. A*, **84**, 033805 (2011).
22. M. Gönüloğlu, E. Aydinler, Y. Shikano, and Ö.E. Müstecaplıoğlu, "Survival probability in a one-dimensional quantum walk on a trapped lattice", *New Jour. Phys.* **13**, 033037 (2011).
23. D. Tarhan, S. Sefi, and Ö. E. Müstecaplıoğlu, "Dispersive propagation of ultraslow pulses in an atomic Bose-Einstein condensate", *Acta Physica Polonica A* **120(6)**, 992-997 (2011).
24. D. Tarhan, A. Sennaroglu, and Ö. E. Müstecaplıoğlu, "Lensing and waveguiding of ultraslow pulses in an atomic Bose-Einstein condensate", *Optics Commun.* **284**, 1197 (2011).
25. Ö. E. Müstecaplıoğlu, "Quantum coherence and correlations of optical radiation by atomic ensembles interacting with a two-level atom in a microwave cavity", *Phys. Rev. A* **83**, 023805 (2011).
26. A. E. Cetin, K. Güven, and Ö. E. Müstecaplıoğlu, "Active Control of Focal Length and Beam Deflection in a Metallic Nanoslit Array Lens with Multiple Sources", *Opt. Lett.* **35(12)**, 1980-1982, Jun. (2010).
27. A. E. Cetin and Ö. E. Müstecaplıoğlu, "Electrically tunable Dicke effect in a double-ring resonator", *Phys. Rev. A* **81(4)**, 043814, April (2010).
28. A. E. Cetin, A. Sennaroglu, and Ö. E. Müstecaplıoğlu, "Nanoscale Plasmonic Devices for Dynamically Controllable Beam Focusing and Scanning", *Photonics and Nanostructures - Fundamentals and Applications*, **8**, 7-13, (2010).
29. T. Birol and Ö. E. Müstecaplıoğlu, "Phase diffusion of a q-deformed oscillator" *Symmetry* **1**, 240-251 (December, 2009).
30. M. Gonulol, E. Aydinler and Ö. E. Müstecaplıoğlu, "Decoherence in two-dimensional quantum random walks with traps", *Phys. Rev. A* **80**, 022336 (2009).
31. B. Öztıp, M. Ö. Oktel, Ö. E. Müstecaplıoğlu, and L. You, "Quantum entanglement of spin-1 bosons with coupled ground states in optical lattices", *J. Phys. B: At. Mol. Opt. Phys.* **42**, 145505 (2009).
32. M. E. Taşgın, M. Ö. Oktel, L. You, and Ö. E. Müstecaplıoğlu, "Quantum correlated light pulses from sequential superradiance of a condensate", *Phys. Rev. A* **79**, 053603 (2009).
33. M. E. Taşgın, M. Ö. Oktel, and Ö. E. Müstecaplıoğlu, "Vortex Lattice of a Bose-Einstein Condensate as a Photonic band Gap Material", *Laser Physics* **19**, 647 (2009). [Invited paper for the special issue].

34. R. Dermez and Ö. E. Müstecaplıoğlu, "Long-Lived entangled qudits in a trapped three-level ion beyond Lamb-Dicke limit", *Phys. Scr.* **79**, 015304 (7pp) (2009).
35. C. Akyüz, E. Aydiner, Ö. E. Müstecaplıoğlu, "Thermal entanglement of a two-qutrit Ising system with Dzialoshinski–Moriya interaction", *Optics Communications* **281**, 5271–5277 (2008).
36. T. Birol, T. Dereli, Ö. E. Müstecaplıoğlu, L. You, "Coherence lifetimes of excitations in an atomic condensate due to the thin spectrum", *Phys. Rev. A* **76**, 043616 (2007).
37. M. E. Taşgın, Ö. E. Müstecaplıoğlu, and M. Ö. Oktel, "Photonic band gap in the triangular lattice of Bose-Einstein-condensate vortices", *Phys. Rev. A* **75**, 063627 (2007).
38. Haydar Uncu, Devrim Tarhan, Ersan Demiralp, and Özgür E. Müstecaplıoğlu, "Bose-Einstein condensate in a harmonic trap decorated with Dirac Delta functions", *Phys. Rev. A* **76**, 013618 (2007).
39. Devrim Tarhan, Nazmi Postacioglu, and Ö. E. Müstecaplıoğlu, "Ultraslow optical waveguiding in an atomic Bose-Einstein condensate", *Optics Lett.*, **32** (9), 1038-1040 (2007).
40. Ö. E. Müstecaplıoğlu, W. Zhang, and L. You, "Quantum dynamics of a spin-1 condensate in a double-well potential", *Phys. Rev. A* **75**, 023605 (2007).
40. Wenxian Zhang, Ö. E. Müstecaplıoğlu, and L. You, "Solitons in a trapped spin-1 atomic condensate", *Phys. Rev. A* **75**, 043601 (2007).
41. Devrim Tarhan, Alphan Sennaroglu, and Ö. E. Müstecaplıoğlu, "Dispersive effects on optical information storage in Bose-Einstein Condensates with ultra-slow short pulses", *Jour. Opt. Soc. America B* **23** (9), 1925-1933 (2006).
42. A. Kiraz, M. Ehrl, Th. Hellerer, Ö. E. Müstecaplıoğlu, C. Bräuchle, and A. Zumbach, "Indistinguishable Photons from a Single Molecule", *Phys. Rev. Lett.* **94**, 223602 (2005).
43. Ö. E. Müstecaplıoğlu, M. Zhang, and L. You, "Tunneling of condensate magnetization in a double-well potential", *Phys. Rev. A* **71**, 053616 (2005).
44. Ö. E. Müstecaplıoğlu and M. Ö. Oktel, "Photonic Band Gap via Quantum Coherence in Vortex Lattices of Bose-Einstein Condensates", *Phys. Rev. Lett.* **94**, 220404 (2005). (cover paper)
45. M. Ö. Oktel and Ö. E. Müstecaplıoğlu, "Electromagnetically induced left-handedness in a dense gas of three level atoms", *Phys. Rev. A* **70**, 053806 (2004);
46. M. Ö. Oktel and Ö. E. Müstecaplıoğlu, *Phys. Rev. A* **72**, 019903 (E) (2005).
46. Ö. E. Müstecaplıoğlu, "Scattering of short laser pulses from trapped atoms in a double well potential", *Optics Communications*, **236/4-6**, 363 (2004), short communication.
47. Ö. E. Müstecaplıoğlu, M. Zhang, S. Yi, L. You, and C. P. Sun, "Dynamic Fragmentation of a Spinor Bose-Einstein Condensate", *Phys. Rev. A* **68**, 063616 (2003).
48. Ö. E. Müstecaplıoğlu, "Motional Macroscopic Quantum Superposition States of a trapped three level ion", *Phys. Rev. A* **68**, 023811 (2003).
49. S. Yi, Ö. E. Müstecaplıoğlu, and L. You, "Dynamics of quantum phases in a spinor condensate", *Phys. Rev. A* **68**, 013613 (2003).
50. S. Yi, Ö. E. Müstecaplıoğlu, and L. You, "Quantum Phase Diffusions of a Spinor Condensate", *Phys. Rev. Lett.* **90**, 140404 (2003).
51. Ö. E. Müstecaplıoğlu, M. Zhang and L. You, "Spin squeezing and entanglement in spinor condensates", *Phys. Rev. A* **66**, 033611 (2002).

52. S. Yi, Ö. E. Müstecaplıoğlu, C. P. Sun and L. You, "On the single mode approximation in spinor-1 condensates", Phys. Rev. A **66**, 011601 (2002), rapid communication.
53. Ö. E. Müstecaplıoğlu and L. You, "Motional Rotating Wave approximation for harmonically trapped particles", Phys. Rev. A **65**, 033412 (2002).
54. Ö. E. Müstecaplıoğlu and L. You, "Optical Detection of Trapped Atom Statistics", Phys. Rev. A **64**, 033612 (2001).
55. Ö. E. Müstecaplıoğlu and L. You, "Propagation of electromagnetically induced transparency pulses through a Bose-Einstein condensate", Optics Commun. **193**, 301 (2001).
56. Ö. E. Müstecaplıoğlu and L. You, "Slow light propagation in trapped atomic quantum gases", Phys. Rev. A **64**, 013604 (2001).
57. T. Wong, Ö. E. Müstecaplıoğlu, L. You, and M. Lewenstein, "Scattering of Short Laser Pulses from Trapped Fermions", Phys. Rev. A **61**, 041604 (2000).
58. Ö. E. Müstecaplıoğlu and L. You, "Superradiant Rayleigh Scattering from Trapped Atoms", Phys. Rev. A **62**, 063615 (2000).
59. Ö. E. Müstecaplıoğlu and A. S. Shumovsky, "Statistics of Raman Active Excitations via Measurement of Stokes-Anti-Stokes Correlations", Phys. Rev. B **60**, 3970 (1999).
60. A. S. Shumovsky and Ö. E. Müstecaplıoğlu, "Polarization of Dipole Radiation in Quantum Domain", Phys. Rev. Lett. **80**, 1202 (1998).
61. A. S. Shumovsky and Ö. E. Müstecaplıoğlu, "Stokes Operators, Angular Momentum and Radiation Phase", Jour. Mod. Opt. **45**, 619 (1998).
62. A. S. Shumovsky and Ö. E. Müstecaplıoğlu, "Radiation Phase and Stokes Parameters", Optics Comm. **146**, 124 (1998).
63. A. S. Shumovsky and Ö. E. Müstecaplıoğlu, "Quantum Phase in the Jaynes-Cummings Model Describing an Electric-Dipole Transition", Phys. Lett. A **235**, 438 (1997).
64. Ö. E. Müstecaplıoğlu and A. S. Shumovsky, "Detecting Squeezed Phonons through an Indirect Radiative Transition", App. Phys. Lett. **70**, 3489 (1997).
65. A. S. Shumovsky and Ö. E. Müstecaplıoğlu, "Conditions for Observation of Rabi Oscillations in an Exciton-Polariton System", Phys. Lett. A **209**, 88 (1995).

CONFERENCE PUBLICATIONS IN REFEREED JOURNALS (COVERED BY ISI)

1. E. Karakaya, K. Güven, and Ö. E. Müstecaplıoğlu, "Controlled excitations of surface plasmons via optical soliton photons in the quantum regime", Phys. Scr. **T160**, 014020 (2014).
2. A. Ü. C. Hardal and Ö. E. Müstecaplıoğlu, "Einstein-Podolsky-Rosen type quantum entanglement between coupled cavities", Phys. Scr. **T160**, 014016 (2014).
3. B. Öztıp, Ö. E. Müstecaplıoğlu, and H. E. Türeci, "Collective excitations of a laser driven atomic condensate in an optical cavity", Laser Phys. **23**, 025501 (2013).

4. S. Safei, Ö. E. Müstecaplıoğlu, and B. Tanatar, "Bistable behavior of a two-mode Bose-Einstein condensate in an optical cavity", *Laser Phys.* **23**, 035501 (2013).
5. M. Gönülol, E. Aydinler, Y. Shikano, and Ö. E. Müstecaplıoğlu, "Survival Probability in a Quantum Walk on a One-Dimensional Lattice with Partially Absorbing Traps", *Jour. Computational and Theor. Nanosci.* **10**, 1596 (2013).
6. M. E. Taşgın, B. Öztıp, M. Ö. Oktel, and Ö. E. Müstecaplıoğlu, "Quantum correlations among superradiant Bose-Einstein condensate atoms", *Optics and Spectroscopy*, **108(3)**, 433-437, March (2010).
7. M. E. Taşgın, M. Ö. Oktel, L. You, and Ö. E. Müstecaplıoğlu, "Quantum entanglement via superradiance of a Bose-Einstein condensate", *Laser Physics*, **20(3)**, 700-708, March (2010).
8. B. Öztıp, M. Ö. Oktel, and Ö. E. Müstecaplıoğlu, "Quantum correlations of spin-1 atoms in an optical lattice", *Laser Physics* **19(4)**, 625-631 (2009).
9. D. Tarhan, A. Sennaroglu, and Ö. E. Müstecaplıoğlu, "Control of optical dynamic memory capacity of an atomic Bose-Einstein condensate", *Eur. Phys. J. Special Topics* **160**, 399-409 (2008).
10. T. Birol and Ö. E. Müstecaplıoğlu, "Effects of zero mode and thin spectrum on the life time of atomic Bose Einstein condensates", *Eur. Phys. J. Special Topics* **160**, 11-22 (2008).
11. Haydar Uncu, Devrim Tarhan, Ersan Demiralp, and Özgür E. Müstecaplıoğlu, "Bose-Einstein Condensate in a Harmonic Trap with an Eccentric Dimple Potential", *Laser Physics*, **18 (3)**, 331-334 (2008).
12. Devrim Tarhan and Ö. E. Müstecaplıoğlu, "Enhancing Capacity of coherent Optical Information Storage and Transfer in Bose-Einstein Condensates", *Laser Physics* **17 (2)**, 157-161 (2007).
13. Devrim Tarhan, Seçkin Şefi, and Ö. E. Müstecaplıoğlu, "Propagation of short pulses through a Bose-Einstein Condensate", *Journal of Physics: Conference Series (IOP)* **36**, 194-199 (2006).
14. Ö. E. Müstecaplıoğlu and L. You, "Macroscopic quantum tunneling of magnetization in spinor Bose-Einstein condensates", *Journal of Physics: Conference Series (IOP)* **36**, 149-153 (2006).
15. A. Kiraz, M. Ehrl, Th. Hellerer, Ö. E. Müstecaplıoğlu, C. Bräuchle, and A. Zumbach, "Observation of two-photon interference using the zero-phonon-line emission of a single molecule", *Journal of Physics: Conference Series (IOP)* **36**, 67-71 (2006).
16. Ö. E. Müstecaplıoğlu, M. Zhang, and L. You, "Nonlinear dynamics of a spinor Bose-Einstein condensate in a double-well potential", *Laser Physics* **16 (2)**, 379-384 (2006).
17. Ö. E. Müstecaplıoğlu and L. You, "Quantum Entanglement and Correlations of Bose Condensed Atoms", *Laser Phys.* **14**, 312 (2004).
18. A. S. Shumovsky, Ö. E. Müstecaplıoğlu and M. Unsal, "Stokes Parameters and Stokes Operators", *Laser Physics* **10**, 31 (2000).

PAPERS IN CONFERENCE PROCEEDINGS AND BOOK CHAPTERS

1. Y. Ekşioğlu, Ö. E. Müstecaplıoğlu, and K. Güven, "Dynamical properties of a coupled nonlinear dielectric waveguidesurface-plasmon system as another type of Josephson junction", *Photonics, Devices and Systems V*, August (2011), published October 11, 2011, Proc. SPIE 8306, Prague Czech Republic.
2. Y. Ekşioğlu, Ö. E. Müstecaplıoğlu, and K. Güven, "Dynamical properties of a coupled nonlinear dielectric waveguidesurface-plasmon system as another type of Josephson

- junction", 16th. International Conference on Optical MEMS and Nanophotonics, August, (2011), Koç University, Istanbul, Turkey.
3. Ö. E. Müstecaplıoğlu, "Quantum state transfer among crystallographic groups of N-V centers in diamond", Proc. SPIE, Vol. 8069, (May 2011); Integrated Photonics: Materials, Devices, and Applications, Prague Czech Republic, Ali Serpengüzel; Giancarlo C. Righini, Editors. **[refereed, invited paper]**.
 4. A. E. Cetin and Ö. E. Müstecaplıoğlu, "Effects of Bloch's hydrodynamic model on surface plasmon polariton dispersion curve and enhanced transmission of light through single nano-apertures", Proc. SPIE, Vol. 7366, 73660G (May, 2009); Photonic Materials, Devices, and Applications III, Dresden, Germany, Ali Serpenguzel, Gonçal Badenes, Giancarlo C. Righini, Editors. **[refereed]**.
 5. Ö. E. Müstecaplıoğlu, "Towards New Horizons with Bose-Einstein Condensation", Balkan Physics Letters, Special Issue, 44-47 (2008). **[refereed]**.
 6. Devrim Tarhan and Ö. E. Müstecaplıoğlu, "Ultralow Optical Modes in Bose-Einstein Condensates" in Photonic Materials, Devices, and Applications, eds. Ali Serpengüzel, Gonçal Badenes, Giancarlo C. Righini, Proc. SPIE Vol. **6593**, 659306 (9 pages), (SPIE, Bellingham, WA, July, 2007) **[refereed]**.
 7. A. Kiraz, M. Ehrl, Th. Hellerer, Ö. E. Müstecaplıoğlu, C. Bräuchle, and A. Zumbach, "Hong-Ou-Mandel Correlations Using the Zero-Phonon-Line Emission of a Single Molecule", The Conference on Lasers and Electro-Optics and the Quantum Electronics and Laser Science Conference (CLEO/QELS) & Photonic Applications, Systems and Technologies (PhAST) Conference, Baltimore, Maryland, USA, May 22-27 2005. **[refereed]**
 8. A. Kiraz, M. Ehrl, Ö. E. Müstecaplıoğlu, Th. Hellerer, C. Bräuchle, and A. Zumbach, "Zero-phonon-line emission of single molecules for applications in quantum information processing", in Photonic Materials, Devices, and Applications, edited by Goncal Badenes, Derek Abbott, Ali Serpengüzel, Proceedings of SPIE Vol. **5840** (SPIE, Bellingham, WA, 2005) 584. **[refereed]**
 9. Ö. E. Müstecaplıoğlu and M. Ö. Oktel, "Refractive index-enhanced vortex lattices", in Photonic Materials, Devices, and Applications, edited by Goncal Badenes, Derek Abbott, Ali Serpengüzel, Proceedings of SPIE Vol. **5840** (SPIE, Bellingham, WA, 2005) 710. **[refereed]**
 10. A. S. Shumovsky and Ö. E. Müstecaplıoğlu, "Quantum Phase of Light via Spin of Photons", in Causality and Locality in Modern Physics, ed. G. Hunter, et.al., Kluwer Acad. Pub., Netherlands, Book Series: FUNDAMENTAL THEORIES OF PHYSICS **97**, 195-202 (1998).
 11. Ö. E. Müstecaplıoğlu, "Detection of Squeezed Thermal Phonons", Fifth International Conference on Squeezed States and Uncertainty Relations, ed. D. Han, J. Janszky, and V. I. Manko, NASA/CP-1998-206855, 97 (1998).
 12. Ö. E. Müstecaplıoğlu and A. S. Shumovsky, "Quantum Phase in the Jaynes-Cummings Model Describing an Electric-Dipole Transition", Fifth International Conference on Squeezed States and Uncertainty Relations, ed. D. Han, J. Janszky, and V. I. Manko, NASA/CP-1998-206855, 435 (1998).
 13. Ö. E. Müstecaplıoğlu and A. S. Shumovsky, "Rabi Oscillations in an Exciton-Polariton System", Series in Nonlinear Optics 3: Notions and Perspectives of Nonlinear Optics, ed. Ole Keller, World Scientific, Singapore, 494 (1996).

OTHER PUBLICATIONS

1. D. Tarhan, N. Postacıoğlu, Ö. E. Müstecaplıoğlu, "Bose-Einstein yoğuşuk maddesinde optik bilgi kağısitesinin artırılması", İTÜ Dergisi / c, **5 (1)**, (2009).

2. Ö. E. Müstecaplıoğlu, “Quantum Optics with Bose-Einstein Condensates”, KÜ Fener – Koç University Research Journal, **1 (3)**, 27-29 (2008).
3. Ö. E. Müstecaplıoğlu, “Quantum Entanglement in Optical Fiber”, OPN – Optics and Photonics News, **19 (3)**, 26-31 (2008). [**Cover Story**].
4. T. Birol and Ö. E. Müstecaplıoğlu, “Bogoliubov Transformations and Quantum Decoherence in an Atomic Bose-Einstein Condensate”, Concepts in Phys. **4(3)**, 349-360 (September, 2007).
5. A. Shumovsky and Ö. E. Müstecaplıoğlu, “The concept of free electromagnetic field in quantum domain”, Turkish Journal of Physics, **23 (5)**, 839-845 (May, 1999).

PAPERS SELECTED FOR VIRTUAL JOURNALS

1. M. Gonulol, E. Aydinler and Ö. E. Müstecaplıoğlu, “Decoherence in two-dimensional quantum random walks with traps”, Phys. Rev. A **80**, 022336 (2009). Virtual Journal of Quantum Information, (Ed. D.P. DiVincenzo), September, 2009.
2. M. E. Taşgın, M. Ö. Oktel, L. You, and Ö. E. Müstecaplıoğlu, “Quantum correlated light pulses from sequential superradiance of a condensate”, Phys. Rev. A **79**, 053603 (2009). Virtual Journal of Quantum Information, (Ed. D.P. DiVincenzo), May, 2009.
3. T. Birol, T. Dereli, Ö. E. Müstecaplıoğlu, L. You, “Coherence lifetimes of excitations in an atomic condensate due to the thin spectrum “, Phys. Rev. A **76**, 043616 (2007). Virtual Journal of Quantum Information, (Ed. D.P. DiVincenzo), November, 2007.
4. Ö. E. Müstecaplıoğlu, W. Zhang, and L. You, “Quantum dynamics of a spin-1 condensate in a double-well potential”, Phys. Rev. A **75**, 023605 (2007). Virtual Journal of Quantum Information, (Ed. D.P. DiVincenzo) February, 2007.
5. A. Kiraz, M. Ehrl, Th. Hellerer, Ö. E. Müstecaplıoğlu, C. Bräuchle, and A. Zumbach, “Indistinguishable Photons from a Single Molecule”, Virtual Journal of Quantum Information, (Ed. D.P. DiVincenzo) June, 2005.
6. A. Kiraz, M. Ehrl, Th. Hellerer, Ö. E. Müstecaplıoğlu, C. Bräuchle, and A. Zumbach, “Indistinguishable Photons from a Single Molecule”, Virtual Journal of Nanoscale Science and Technology, (Ed. D. Awschalom) June 20, 2005.
7. Ö. E. Müstecaplıoğlu and M. Ö. Oktel, “Photonic Band Gap via Quantum Coherence in Vortex Lattices of Bose-Einstein Condensates”, Virtual Journal of Quantum Information, (Ed. D.P. DiVincenzo) June, 2005.
8. S. Yi, Ö. E. Müstecaplıoğlu, C. P. Sun and L. You, “Single mode approximation in spinor-1 condensates”, Virtual Journal of Quantum Information, (Ed. D.P. DiVincenzo), July, 2002, invited paper.

TALKS AND PRESENTATIONS

1. Ö. E. Müstecaplıoğlu, **invited talk**, “Quantum Correlations in a Quantum Heat Engine with Interacting Spins”, ICTS Discussion Meeting on Frontiers in Light-Matter Interactions, Kolkata, India, 19-22 December (2014).
2. Ö. E. Müstecaplıoğlu, “A Quantum Otto Engine with Spin Squeezing”, **invited colloquium talk**, Crete Center for Quantum Complexity and Nanotechnology, Crete, Greece, October 10 (2014).

3. Ö. E. Müstecaplıoğlu, "Optik Kovuklarda Manyetik Süperkatı Sentezi", **invited talk**, Mimar Sinan Güzel Sanatlar Üniversitesi, October 24, (2013).
4. Ö. E. Müstecaplıoğlu, "Kuantum Termodinamik", **invited lecture**, 20. Statistical Physics Days, Kayseri, June 27-29, (2013).
5. A. Ü. C. Hardal ve Ö. E. Müstecaplıoğlu, "Squeezed States in Discrete Time Quantum Walk with Nitrogen-Vacancy Centers in Diamond", **poster**, Okazaki, Japan, November 24-26, (2012).
6. "Quantum Walk in Optical Lattices", **talk**, Workshop on Quantum Dynamics and Quantum Walks, Okazaki, Japan, November 24-26, (2012).
7. A. Ü. C. Hardal and Ö. E. Müstecaplıoğlu, "Transfer of Spin Squeezing and Particle Entanglement between Atoms and Photons in Coupled Cavities via Two-Photon Exchange", **poster**, 14. Ulusal Optik, Elektro-Optik ve Fotonik Çalıştayı, Koç University, Istanbul, Turkey, 14 September (2012).
8. "Quantum Optics of NV Centers, Circuit QED and Ultracold Atoms in CQED", 3 hrs. Lecture Series, 2012 Cambridge-ITAP School and Workshop on Coherence and Condensation in Low Dimensional Systems, Turunç, Marmaris, ITAP Dereözü Kampüsü, September 9-16 (2012).
9. "Soğuk Atomlarda Topolojik Düzen", 3 hrs. Lecture Series, Eurasia-Pacific Summer School and Workshop on Strongly Correlated Electrons: A Joint Organization of ITAP, APCTP (South Korea) and Academia Sinica (Taiwan), Turunç, Marmaris, ITAP Dereözü Kampüsü, August 6-17 (2012).
10. A. Ü. C. Hardal and Ö. E. Müstecaplıoğlu, "Transfer of Spin Squeezing and Particle Entanglement between Atoms and Photons in Coupled Cavities via Two-Photon Exchange", **poster**, The 23rd. International Conference on Atomic Physics, ICAP, Ecole Polytechnique, Palaiseau, France, 23-27 July (2012).
11. A. Ü. C. Hardal and Ö. E. Müstecaplıoğlu, "Transfer of Spin Squeezing and Particle Entanglement between Atoms and Photons in Coupled Cavities via Two-Photon Exchange", **poster, Best Poster Award**, Central European Workshop on Quantum Optics, Sinaia, Romania, 2-6 July (2012).
12. "Elmas Işıltıları Arasında Kuantum Yürüyüşü", İstanbul Technical University, March, 2012.
13. "Sentetik Ayar Alanları, Topolojik Yalıtkanlar ve Geometrik Faz: Ultra-soğuk atomlar ile kuantum simülasyon", Turunç, Marmaris, ITAP (Institute of Theoretical and Applied Physics) Winter School, 8 hrs. Lecture Series, 30 January – 4 February 2012.
14. "Quantum Phase Transitions in Atomic Condensates Coupled to Driven Dissipative Optical Cavities", **invited talk**, 15. Ulusal Sıvıhal Fiziği Sempozyumu, Piri Reis University, November 24-26, 2011.
15. "Discrete Time Quantum Walk in Diamond with Nitrogen-Vacancy Centers", **invited talk**, International Workshop on Theoretical Aspects of the Discrete Time Quantum Walk, Valencia, İspanya, November 7-11, 2011.
16. "Superradiant and structural dynamical phase transitions in an atomic condensate in a driven and dissipative optical cavity", **invited talk**, 20th International Laser Physics Workshop, Sarajevo, Bosnia and Herzegovina, July 11-15, 2011.
17. "Elmas ile Işıl Işıl Bir İletişim Dünyasına Yolculuk", **invited talk**, İstanbul University, İstanbul, May 13, 2011.

18. "Quantum State Transfer among Crystallographic Groups of N-V Centers in Diamond", **invited talk**, SPIE Microtechnologies Conference, Prague, Czech Republic, April 18-20, 2011.
19. "Diamonds are a Physicist's Best Friend", **invited talk**, Sabancı University, İstanbul, November 2010.
20. "Building Quantum Memories with Diamonds – and no Rust!", **invited talk**, Bilkent University, Ankara, November 2010.
21. "Quantum Optics and Atomic Physics at Koç University - a Research Overview", **talk**, ETH Quantum Photonics Group Seminar, Zurich, Switzerland, August 18, 2010.
22. "EPR-Correlations in an atomic superradiant Bose-Einstein condensate", **invited talk**, 18th International Laser Physics Workshop, Barcelona, Spain, July 13-17, 2009.
23. "Atomik Fizik ve Optikte Yeni Gelişmeler", **invited talk**, Osmangazi Üniversitesi, Eskişehir, 19 Aralık 2008.
24. "Soğuk Atom Sistemlerinde Kuantum Optik ve Kuantum Bilişim", **invited talk**, 10. Ulusal Optik, Elektro-optik ve Fotonik Çalıştayı, Kocaeli Üniversitesi, Kocaeli, 17 Ekim 2008.
25. "Photonics with Atomic Bose-Einstein Condensates", Greek-Turkish Conference on Statistical Mechanics and Dynamical Systems, **invited talk**, Rhodes, Greece and Turunç/Marmaris, Turkey, 11-17 September 2008.
26. M. E. Tasgin, M. O. Oktel and Ö. E. Müstecaplıoğlu, "Quantum Entanglement in Quantum Collective Phenomena", XII International Conference on Quantum Optics and Quantum Information (ICQO'2008), Vilnius, Lithuania, 20-23 September 2008.
27. "Bose-Einstein Yoğuşuk Maddesinin optik ve manyetik özellikleri", **invited talk**, Dokuz Eylül University, İzmir, Turkey (Jan. 25, 2008).
28. "Towards New Horizons with Bose-Einstein Condensation", **invited talk**, Turkish Physical Society, 24th International Physics Congress, Malatya, İnönü University, Turkey, 28-31 August, 2007.
29. Devrim Tarhan and Ö. E. Müstecaplıoğlu, "Ultraslow Optical Modes in Bose-Einstein Condensates", **poster**, SPIE Microtechnologies in New Millenium 2007, Maspalomas, Gran Canaria, Spain, 2-5 May, 2007.
30. "Advanced Quantum Statistical Mechanics", **invited lecture series**, Institute of Theoretical and Applied Physics – International Advanced Research School, Turunç-Marmaris, Turkey, 9–14 June, 2007.
31. "Control of Optical Dynamic Memory Capacity of Atomic Bose-Einstein Condensate", **invited talk**, 14th Central European Workshop on Quantum Optics, Palermo, Italy, 1-5 June, 2007.
32. "Soğuk Atom Fiziğinde Kuantum Bilişim Uygulamaları", **invited talk**, Mersin University, 10th Physics Days, Mersin, Turkey, 16-17 May, 2007.
33. "Quantum Engineering with Bose-Einstein Condensates", **invited talk**, 5th International Student Conference of Balkan Physical Union, Bodrum, Turkey, 21-24 August, 2007.
34. "Atomik Josephson Eklemlerinde Kuantum Dolanıklık", **invited talk**, İstanbul Technical University, İstanbul, April 13 (2007).
35. "Optical properties of atomic Bose-Einstein condensates", **invited talk**, The 1st Workshop on Quantum Information, Computation and Quantum Spin Systems, Dokuz Eylül University, İzmir, January 12 (2007).

36. "Modification of refractive index via spatial and quantum coherent effects in atomic Bose-Einstein condensates", **invited talk**, Feza Gürsey Institute, Istanbul, November 2006.
37. "Tailoring optical pulses in atomic Bose-Einstein condensates via quantum coherence", **invited talk**, Tsinghua University, Beijing, China, August, 2006.
38. "Tailoring optical pulses in atomic Bose-Einstein condensates via quantum coherence", **invited talk**, Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing, China, August, 2006.
39. "Enhancing capacity of coherent optical information storage and transfer in Bose-Einstein condensates", **invited talk**, 15th International Laser Physics Workshop, Lausanne, Switzerland, July 24-28, 2006.
40. "Enhanced optical information storage in Bose-Einstein Condensates", **poster**, D. Tarhan and Ö. E. Müstecaplıoğlu, 20TH International Conference on Atomic Physics, ICAP 2006, Innsbruck, Austria, August (2006).
41. "Optical and magnetic properties of Bose-Einstein condensates", **invited talk**, 12th Ankara Condensed Matter Conference, Ankara University, November 18, 2005.
42. "Nonlinear dynamics of a spinor Bose-Einstein condensate in a double-well potential", **invited talk**, 14th International Laser Physics Workshop, Kyoto, Japan, July 4-8, 2005.
43. "Refractive index-enhanced vortex lattices", **poster**, Microtechnologies for the new millennium, SPIE conference, Seville, Spain, May 8-11, 2005.
44. "Macroscopic quantum tunneling of magnetization in spinor Bose-Einstein condensates", 12th Central European Workshop on Quantum Optics, **invited talk**, Bilkent University, Ankara, Turkey (June 6-9, 2005).
45. "Ferromanyetik ve antiferromanyetik Bose-Einstein yoğunlaşmış maddesinde dönüşüm temelli kuantum bilişim uygulamaları", **invited talk**, Erciyes University, Kayseri, Turkey (May 30, 2005).
46. "Quantum Entanglement and decoherence in atomic Bose-Einstein condensates", **invited talk**, Boğaziçi University, Istanbul, Turkey (April 20, 2005).
47. "Dynamics and decoherence of magnetization in ferromagnetic and antiferromagnetic Bose-Einstein condensates", **invited talk**, Technical University of Istanbul, Istanbul, Turkey (November 26, 2004).
48. "Magnetic properties of solids: a coherent state approach", **invited lecture series** (5 lectures, each 2 hours), Feza Gürsey Institute, Istanbul, Turkey (July, 2004).
49. "Optical Probing Quantum Statistical Properties of Matter", **invited talk**, ITU Statistical Physics Conference, Istanbul, Turkey (June, 2004).
50. "Building a spin lattice with Bose-Einstein Condensates", **invited talk**, Bilkent University, Ankara-Turkey, April 2004.
51. "Quantum Entanglement and Correlations of Bose Condensed Atoms", **invited talk**, International Laser Physics Workshop, Hamburg-Germany, August 2003.
52. "Spin Diffusion in Spinor Bose-Einstein Condensates", **invited talk**, International Summer School on Quantum Computation at the Atomic Scale, Istanbul-Turkey, June 2003.
53. "Multicomponent Schrödinger Cat States in Ion Traps", **invited talk**, International Summer School on Quantum Computation at the Atomic Scale, Istanbul-Turkey, June 2003.

54. "Sub-luminal and super-luminal light propagation", **department seminar**, Koç University, Istanbul-Turkey, October 2002.
55. "Quantum field theory of multi-component Bose-Einstein condensates", a **series of department lectures**, Koç University, Istanbul-Turkey, November 2002.
56. "Macroscopic Quantum Entanglement in BECs", **invited talk**, Bilkent University, Ankara-Turkey November 2002.
57. "Spin Squeezing", **poster**, American Physical Society, Division of Atomic, Molecular, and Optical Physics May 29 – June 1, 2002, The College of William & Mary – Williamsburg VA, USA.
58. "Superradiant Bose-Einstein Condensate", **invited talk**, Koç University, Istanbul-Turkey, August 2001.
59. "Coherent Propagation of Laser Pulses in Quantum Gases", **poster**, American Physical Society, Division of Atomic, Molecular, and Optical Physics May 16-19, 2001, London-Ontario-CA.
60. "Raman Spectroscopy of Two Component Degenerate Fermi Gas", **talk**, American Physical Society, Division of Atomic, Molecular, and Optical Physics, June 14-17, 2000, Storrs, CT-USA.
61. "Superradiant BEC", **poster**, American Physical Society, Division of Atomic, Molecular, and Optical Physics, June 14-17, 2000, Storrs, CT-USA.
62. "Polarization of Radiation from Localized Sources", **invited talk**, NEC Research Institute, New Jersey USA and Rochester Theory Center, Rochester, USA, June 1999.
63. "Polarization of Radiation from Localized Sources", **invited talk**, Rochester Theory Center, Rochester, USA, June 1999.
64. "Quantum Character of Polarization", **talk**, Centennial Meeting of the American Physical Society, Atlanta-USA, March 1999.
65. "Correlations among Stokes and Anti-Stokes Components of Raman Scattering", **poster**, Ankara Seminars on Condensed Matter VII, Bilkent University, Ankara-Turkey, March 1998.
66. "Detection of Squeezed Phonons", **talk**, V. International Conference on Squeezed States and Uncertainty Relations, Balatonfüred-Hungary, May 1997.
67. "Angular Momentum and Quantum Phase in Jaynes-Cummings Model", **poster**, V. International Conference on Squeezed States and Uncertainty Relations, Balatonfüred-Hungary, May 1997.
68. "Rabi Oscillations in an Exciton-Polariton System", **talk**, III. International Summer School on Nonlinear Optics, Aalborg-Denmark, August 1995.
69. "Luminescence Properties of Ionic Crystals", **talk**, IV. Ankara Conference on Condensed Matter Physics, Hacettepe University Ankara-Turkey, November 1994.
70. "Luminescence in Ionic Crystals and Role of Surface Polaritons", **talk**, International School of Condensed Matter Physics, Middle East Technical University, Ankara-Turkey, September 1994.

PATENTS

- U.S. Provisional Patent Application No. **62/109,410** “Quantum Otto Engine”, filed **January 29, 2015**.

GRANT FUNDING

- Lockheed-Martin and Koç University Research Agreement, “Quantum Heat Engines”, 220 000 USD (2015-August, 2016).
- TUBİTAK 3501, 112T927, “Bose-Einstein Yoğuşuğunda Süperışılma ile Vorteks Örgüsü GazGeçışı İndüklenmesi”, 86 183 TL, Danışman (PI: Emre Taşgın, Hacettepe Üniversitesi) (Mayıs 2013 – Kasım 2014).
- TUBİTAK 1001, 114F170, Doğrusal-Olmayan Optik Özellikleri Fano Rezonansıyla Güçlendirerek, Nano-Boyutlu Kuantum-Dolaşıklıklaştırmacı Yapılması, (PI: M. Emre Taşgın, Hacettepe University), 216 712 TL (October, 2014-April 2016).
- Lockheed-Martin and Koç University Research Agreement, “Quantum Heat Engines”, 360 000 USD (2014-August, 2015).
- Abdullah Gül University BAP Project, “Josephson Eklemleri Kontrolü Dinamiği”, (2015-2016) (PI Sergei Borisenok, Abdullah Gül University).
- TUBİTAK 1001, 112T974, 202.800 TL, “Yapay Ayar Alanlarında Ultra Soğuk Atomlar” (“Ultracold Atoms in Synthetic Gauge Fields”), (April 2013-2016).
- TUBİTAK, Rapid Support, 112T049, “Devre Kuantum Elektrodinamiğinde Çok Modlu Jahn-Teller Sistemleri”, 5900 TL (Haziran 2012 – Aralık 2012).
- TUBİTAK-BİDEP 2217, “Düşük boyutlu sistemlerde kuantum istatistiksel etkiler: Bose-Einstein yoğuşması, Aharonov-Bohm Fazı, Casimir etkisi”, 14490 TL, Winter School Organization Support, ITAP, Turunç, Marmaris.
- TUBİTAK TBAG-111T285 Dielektrik Dalga Kılavuzu - Yüzey Plazmon Josephson Eklemlerinin Fiziği Ve Uygulamaları: Klasikten Kuantum Plazmoniğine, (October, 2011-2013) 180 295 YTL (PI Kaan Güven, Koç University).
- DPT (T.R. Prime Ministry State Planning Organization) Quantum Cryptology Research Center, (2008-2011) 1500000 YTL (with T. Dereli and A. Kiraz, Koç University).
- TUBİTAK TBAG-109T267 Ultracold atoms in optical lattices: quantum phases for simulation and information, (January 2010-2013) 143,000 YTL (PI Bilal Tanatar, Bilkent University).
- TUBİTAK EEEAG-106E215, Integration of optical monolithic resonators on silicon for photonic communications, (2007-2009) 144 000 YTL (PI Ali Serpenguzel, Koç Üniversitesi).
- TUBİTAK TBAG-108T003, “Gamze Potansiyelleri Kullanarak Bose-Einstein Yoğuşuk Maddesini Kontrol Etmek”, (Ağustos 2008-2011) 100,000 YTL (PI Haydar Uncu, Adnan Menderes Üniversitesi).
- The European Commission, Brussels, Belgium, (2004-2008), FP6-IST 511616, “Network of Excellence NanoPHOTonics to REalization of MOlecular Scale Technologies (PHOREMOST)” (134,000 EUR, total budget 4,700,000 EUR)
- Turkish Academy of Sciences, Distinguished Young Scientist (TÜBA-GEBİP) Award (2004-2007), “Studies on quantum computations in macroscopic multi-partite systems” (\$25,000)
- Istanbul Technical University Research Grant (for co-supervising an ITU Ph.D student) (Istanbul Technical University–Scientific Research Project under project 31192.)
- TUBİTAK Visiting Scientist Grant (to invite Dr. Bimalendu Deb)

- GeorgiaTech Visiting Scientist Grant (to visit GeorgiaTech) (5000 USD)
- Quantum Photonics Group, ETHZ, Academic Guest Grant (24 000 CHF)
- Chinese Academy of Sciences, Visiting Scientist Grant (to visit Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing)
- Tsinghua University, Beijing, China travel grant

SERVICE – PROFESSIONAL

Reviewer for Professional Journals

- Physical Review X, Physical Review Letters, New Journal of Physics, Optics Express, Physical Review A, Physical Review B, Physical Review E, Journal of Physics B, Physics Letters A, ARI - Bulletin of the Technical University of Istanbul, Journal of Physics: Condensed Matter, Journal of Optics B: Quantum and Semiclassical Optics, Physica Scripta, Journal of Physics D: Applied Physics, Modern Physics Letters B, JEMWA, JOSAB, Surface Review and Letters, Nature Scientific Reports, Optics Communications

Reviewer for Research Proposals

- The Scientific and Technical Research Council of Turkey (consulting and panelist reviewer)

Professional Affiliations

- 1995-Present Member, Turkish Physical Society (TFD)
- 1995-Present Member, American Physical Society (APS)
- 2003-Present Member, European Physical Society (EPS)
- 2003-2011 Vice President, Optical Committee of Turkey (OCT) – (International Commission for Optics (ICO), Turkey Chapter)
- 2004-Present Member, The International Society of Optical Engineering (SPIE)
- 2006-Present Member, Optical Society of America (OSA)
- 2006-Present Member, Scientific Organizational Board, Institute of Theoretical and Applied Physics, Turkey

Conference Organizations

- Session Chair, “23rd Annual International Laser Physics Workshop”, Sofia, Bulgaria, July 14-18, (2014)
- Conference Organization Committee Member, “Düşük boyutlu sistemlerde kuantum istatistiksel etkiler: Bose-Einstein yoğunlaşması, Aharonov-Bohm Fazı, Casimir etkisi”, Winter School, ITAP, Turunç, Marmaris, (30 Jan. – 4. Feb., 2012). (supported by Tubitak-BİDEP 2217).
- Conference Committee Member, “Twelfth Central European Workshop on Quantum Optics” (Bilkent University, Ankara, Turkey, (June 6-9, 2005)
- Member of Scientific Committee, 27th International Physics Congress, Turkish Physical Society, Istanbul University, Turkey (14-17 September, 2010).
- Member of Scientific Committee, 26th International Physics Congress, Turkish Physical Society, Bodrum, Muğla, Turkey, (September 24-27, 2009).
- Member of Scientific and organization committee, Statistical Physics Days
- Session Chair, “Workshop on Quantum Dynamics and Quantum Walks”, Okazaki, Japan, Nov. 24-26 (2012).

- Session Chair, “International Summer School on Quantum Computation at the Atomic Scale”, Istanbul-Turkey, (June 2003).
- Session Chair (Two Sessions), “SPIE Microtechnologies Conference”, Prague, Czech Republic, (April 18-20, 2011).
- Session Chair, “20th International Laser Physics Workshop 2011”, Sarajevo, Bosnia and Herzegovina, (July 11-15, 2011).
- Conference Committee Member, “Photonics 2006”, Koç University, Istanbul.
- Session Chair, Session: Laser Systems and Applications I, “8th National Photonics Workshop, - Photonics 2006”, Koç University, Istanbul (September 15, 2006).

SERVICE – UNIVERSITY

- 2015-... Faculty Council, member
- 2015, Summer, Supervised 4 high school students for KU Summer Research Program for High School Students
- 2015, Coordinator (with T. Dereli and A. Sennaroglu), International Year of Light and Centennial of General Relativity Seminars Program
- 2014-... Coordinator, Global Exchange Student Program
- 2014-... Coordinator, ECTS (European Credit Transfer System)
- 2012-... Coordinator, Weekly Graduate School of Science and Engineering Physics Seminar Series
- 2011-2014 Member of the editorial board of KU Frontiers Research Journal
- 2008-2009 Member, Faculty Council, College of Sciences
- 2006-... Coordinator, Graduate Physics Program, Koç University
- 2010-... Coordinator, Optoelectronics Graduate Program, Koç University
- 2003-2004 Coordinator, Weekly Science-Mathematics seminars
- Presentation of physics department to grade A-B students in Introductory Physics Course
- University Presentations for High School Students, Eskişehir, February 2012.
- Conference Organization at Koç University.
 - “Photonics 2006”, a National workshop, (September, 2006)
 - “Recent trends in atomic physics”, Lecture series for graduate students and researchers at Koç University and in Turkey, Bimalendu Deb of Physical Research Institute, Ahmedabad, India, ,(July, 2005), supported by TÜBA-GEBİP and TÜBİTAK visiting scientist program.
- Initiated and organized Best Teaching Assistant Award for Physics Department
- KU Summer Research Program for High School Students, mentored 4 students (2015)
- Student Club Advising.
 - Organized a trip with Student Club, Koç University Science Society, to a military optical lens lab at TSK 1. Ana Bakım Tesisi, Arifiye, Sakarya, December 24, 2004.

More references are available upon request

REFERENCES

External Reviewers/References for Dr. Özgür E. Müstecaplıoğlu

Collaborators (Dr. Müstecaplıoğlu has papers with)

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