

Prof. MEHMET EMRE TAŞGIN

Personal Information

Office Phone: [+90 312 297 6312](tel:+903122976312)

Fax Phone: [+90 312 297 6880](tel:+903122976880)

Email: metasgin@hacettepe.edu.tr

Other Email: metasgin@gmail.com

Web: <http://yunus.hacettepe.edu.tr/~metasgin/>

Address: Hacettepe Üniv Beytepe Yerleşkesi Nükleer Bilimler Enstitüsü Fizik Müh Zemin Kat F9

International Researcher IDs

ORCID: 0000-0001-8483-6881

Publons / Web Of Science ResearcherID: O-1707-2013

ScopusID: 8654956300

Yoksis Researcher ID: 177874

Education Information

Post Doctorate, Texas A&M University, Institute For Quantum Science And Engineering , United States Of America 2015 - 2015

Post Doctorate, University of Arizona, College Of Optical Sciences, United States Of America 2010 - 2011

Post Doctorate, Koc University, Faculty Of Science, Department Of Physics, Turkey 2009 - 2010

Doctorate, Ihsan Dogramaci Bilkent University, Faculty Of Science, Department Of Physics, Turkey 2003 - 2009

Undergraduate, Ihsan Dogramaci Bilkent University, Faculty Of Science, Department Of Physics, Turkey 1997 - 2003

Foreign Languages

English, C2 Mastery

Dissertations

Doctorate, Quantum entanglement and light propagation through Bose-Einstein condensate (BEC), Ihsan Dogramaci Bilkent University, Institute Of Engineering And Natural Sciences, 2009

Research Areas

Physics, Atomic and Molecular Physics, Atomic Spectra and Photon Interactions, Intensive Article 2: Electronic Structure, Electric, Magnetic and Optical Properties, Optical Properties, Spectroscopy of Matter, Natural Sciences

Academic Titles / Tasks

Associate Professor, 2013 - Continues

Courses

Doctorate

KUANTUM OPTİK, Doctorate, 2017 - 2018, 2016 - 2017

Nanoyapılarda Işık-Madde Etkileşiminin Simülasyonu, Doctorate, 2016 - 2017

Kuantum Optikte Hesaplama Yöntemleri, Doctorate, 2016 - 2017

Undergraduate

NANOYAPILARDA IŞIK-MADDE ETKİLEŞİMİNİN SİMÜLASYONU, Undergraduate, 2017 - 2018

Supervised Theses

Taşgin M. E., Bek A., Enhancement of plasmonic nonlinear conversion and polarization lifetime via fano resonances, Doctorate, B.CAN(Student), 2017

Taşgin M. E., Bek A., Comparative study on surface enhanced raman scattering activity of various silver nanostructures, Postgraduate, Ö.DEMİRTAŞ(Student), 2017

Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Voltage-controlled extraordinary optical transmission in the visible regime**
Asif H., BEK A., TAŞGIN M. E., ŞAHİN R.
Physical Review B, vol.109, no.12, 2024 (SCI-Expanded)
- II. **Experimental Characterization and Simulation of a Dipole Plasma Antenna for VHF Band and Effect of Ar-Ne Gas Composition**
Baslar G. K., Kayhan O., TAŞGIN M. E., ÇAKIR S.
IEEE TRANSACTIONS ON PLASMA SCIENCE, vol.52, pp.2218-2228, 2024 (SCI-Expanded)
- III. **All-optical control of ultrafast plasmon resonances in the pulse-driven extraordinary optical transmission**
Asif H., TAŞGIN M. E., ŞAHİN R.
Journal of Optics (United Kingdom), vol.25, no.7, 2023 (SCI-Expanded)
- IV. **On-demand continuous-variable quantum entanglement source for integrated circuits**
Günay M., Das P., YÜCE E., Polat E. O., BEK A., TAŞGIN M. E.
Nanophotonics, vol.12, no.2, pp.229-237, 2023 (SCI-Expanded)
- V. **Silent-enhancement of multiple Raman modes via tuning optical properties of graphene nanostructures**
Gencaslan A., Aytas T. T., Asif H., TAŞGIN M. E., ŞAHİN R.
European Physical Journal Plus, vol.137, no.12, 2022 (SCI-Expanded)
- VI. **Fano enhancement of unlocalized nonlinear optical processes**
Gunay M., Cicek A., Korozlu N., BEK A., TAŞGIN M. E.
PHYSICAL REVIEW B, vol.104, no.23, 2021 (SCI-Expanded)
- VII. **Actively tunable photonic crystal-based switch via plasmon-analog of index enhancement**
YÜCE E., Artvin Z., ŞAHİN R., BEK A., TAŞGIN M. E.
APPLIED PHYSICS LETTERS, vol.119, no.21, 2021 (SCI-Expanded)
- VIII. **Single-molecule-resolution ultrafast near-field optical microscopy via plasmon lifetime extension**
OVALI R. V., ŞAHİN R., BEK A., TAŞGIN M. E.
Applied Physics Letters, vol.118, no.24, 2021 (SCI-Expanded)
- IX. **Negative superluminal velocity and violation of Kramers-Kronig relations in causal optical systems**
TAŞGIN M. E.
PHYSICAL REVIEW A, vol.103, no.1, 2021 (SCI-Expanded)
- X. **Single-mode nonclassicality criteria via Holstein-Primakoff transformation**
TAŞGIN M. E.
JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS, vol.53, no.24, 2020 (SCI-Expanded)

- XI. **Fano-control of down-conversion in a nonlinear crystal via plasmonic-quantum emitter hybrid structures**
Artvin Z., Gunay M., BEK A., TAŞGIN M. E.
JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, vol.37, no.12, pp.3769-3776, 2020 (SCI-Expanded)
- XII. **Measuring nonclassicality of single-mode systems**
TAŞGIN M. E.
JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS, vol.53, no.17, 2020 (SCI-Expanded)
- XIII. **Nonclassicality and entanglement for wave packets**
TAŞGIN M. E., Gunay M., Zubairy M. S.
PHYSICAL REVIEW A, vol.101, no.6, 2020 (SCI-Expanded)
- XIV. **Continuously-tunable Cherenkov-radiation-based detectors via plasmon index control**
Gunay M., Chuang Y., TAŞGIN M. E.
NANOPHOTONICS, vol.9, no.6, pp.1479-1489, 2020 (SCI-Expanded)
- XV. **Quantum emitter interacting with graphene coating in the strong-coupling regime**
Gunay M., Karanikolas V., ŞAHİN R., Ovalı R. V., BEK A., TAŞGIN M. E.
PHYSICAL REVIEW B, vol.101, no.16, 2020 (SCI-Expanded)
- XVI. **Controlling steady-state second harmonic signal via linear and nonlinear Fano resonances**
Guenay M., Artvin Z., BEK A., TAŞGIN M. E.
JOURNAL OF MODERN OPTICS, vol.67, no.1, pp.26-34, 2020 (SCI-Expanded)
- XVII. **Quantifications for multimode entanglement**
TAŞGIN M. E., Zubairy M. S.
PHYSICAL REVIEW A, vol.101, no.1, 2020 (SCI-Expanded)
- XVIII. **Plasmon lifetime enhancement in a bright-dark mode coupled system**
Yildiz B. C., BEK A., TAŞGIN M. E.
PHYSICAL REVIEW B, vol.101, no.3, 2020 (SCI-Expanded)
- XIX. **Entanglement criteria for two strongly interacting ensembles**
Gunay M., Mustecaplioglu O. E., TAŞGIN M. E.
PHYSICAL REVIEW A, vol.100, no.6, 2019 (SCI-Expanded)
- XX. **Silent enhancement of SERS signa without increasing hot spot intensities**
Postaci S., Yildiz B. C., BEK A., TAŞGIN M. E.
NANOPHOTONICS, vol.7, no.10, pp.1687-1695, 2018 (SCI-Expanded)
- XXI. **Many-Particle Entanglement Criterion for Superradiantlike States**
TAŞGIN M. E.
PHYSICAL REVIEW LETTERS, vol.119, no.3, 2017 (SCI-Expanded)
- XXII. **Collectively induced many-vortices topology via rotatory Dicke quantum phase transition**
DAS P., TAŞGIN M. E., Mustecaplioglu O. E.
NEW JOURNAL OF PHYSICS, vol.18, 2016 (SCI-Expanded)
- XXIII. **Fluorescence excitation by enhanced plasmon upconversion under continuous wave illumination**
TAŞGIN M. E., Salakhutdinov I., Kendziora D., Abak M. K., Turkpence D., Piantanida L., Fruk L., Lazzarino M., BEK A.
PHOTONICS AND NANOSTRUCTURES-FUNDAMENTALS AND APPLICATIONS, vol.21, pp.32-43, 2016 (SCI-Expanded)
- XXIV. **Enhancement of four-wave mixing via interference of multiple plasmonic conversion paths**
SINGH S. K., Abak M. K., TAŞGIN M. E.
PHYSICAL REVIEW B, vol.93, no.3, 2016 (SCI-Expanded)
- XXV. **Enhanced second harmonic generation from coupled asymmetric plasmonic metal nanostructures**
Yildiz B. C., TAŞGIN M. E., Abak M. K., Coskun S., ÜNALAN H. E., BEK A.
JOURNAL OF OPTICS, vol.17, no.12, 2015 (SCI-Expanded)
- XXVI. **Conservation relation of nonclassicality and entanglement for Gaussian states in a beam splitter**
GE W., Tasgin M. E., ZUBAIRY M. S.
PHYSICAL REVIEW A, vol.92, no.5, 2015 (SCI-Expanded)

- XXVII. **Engineering nonlinear response of nanomaterials using Fano resonances**
TURKPENCE D., Akguc G. B., BEK A., TAŞGIN M. E.
JOURNAL OF OPTICS, vol.16, no.10, 2014 (SCI-Expanded)
- XXVIII. **Metal nanoparticle plasmons operating within a quantum lifetime**
Tasgin M. E.
NANOSCALE, vol.5, no.18, pp.8616-8624, 2013 (SCI-Expanded)
- XXIX. **Testing the reliability of a velocity definition in a dispersive medium**
Tasgin M. E.
PHYSICAL REVIEW A, vol.86, no.3, 2012 (SCI-Expanded)
- XXX. **Creation of a vortex in a Bose-Einstein condensate by superradiant scattering**
Tasgin M. E., Mustecaplioglu O. E., You L.
PHYSICAL REVIEW A, vol.84, no.6, 2011 (SCI-Expanded)
- XXXI. **Quantum-measurement backaction from a Bose-Einstein condensate coupled to a mechanical oscillator**
Steinke S. K., Singh S., Tasgin M. E., Meystre P., Schwab K. C., Vengalattore M.
PHYSICAL REVIEW A, vol.84, no.2, 2011 (SCI-Expanded)
- XXXII. **Spin squeezing with coherent light via entanglement swapping**
Tasgin M. E., MEYSTRE P.
PHYSICAL REVIEW A, vol.83, no.5, 2011 (SCI-Expanded)
- XXXIII. **Quantum correlations among superradiant Bose-Einstein condensate atoms**
Tasgin M. E., Oztop B., Oktel M. O., Mustecaplioglu O. E.
OPTICS AND SPECTROSCOPY, vol.108, no.3, pp.433-437, 2010 (SCI-Expanded)
- XXXIV. **Quantum entanglement via superradiance of a Bose-Einstein condensate**
Tasgin M. E., Oktel M. O., YOU L., MUSTEAPLIOGLU O. E.
LASER PHYSICS, vol.20, no.3, pp.700-708, 2010 (SCI-Expanded)
- XXXV. **Quantum correlated light pulses from sequential superradiance of a condensate**
Tasgin M. E., Oktel M. O., YOU L., Muestecaplioglu O. E.
PHYSICAL REVIEW A, vol.79, no.5, 2009 (SCI-Expanded)
- XXXVI. **Vortex lattice of a Bose-Einstein condensate as a photonic band gap material**
Tasgin M. E., Mustecaplioglu O. E., Oktel M. O.
LASER PHYSICS, vol.19, no.4, pp.647-654, 2009 (SCI-Expanded)
- XXXVII. **Photonic band gap in the triangular lattice of Bose-Einstein-condensate vortices**
Tasgin M. E., Muestecaplioglu O. E., Oktel M. O.
PHYSICAL REVIEW A, vol.75, no.6, 2007 (SCI-Expanded)
- XXXVIII. **Vortices in trapped boson-fermion mixtures**
Tasgin M. E., SUBASI A., OKTEL M., TANATAR B.
JOURNAL OF LOW TEMPERATURE PHYSICS, vol.138, pp.611-616, 2005 (SCI-Expanded)

Books

- I. **Fano Resonances in the Linear and Nonlinear Plasmonic Response**
TAŞGIN M. E., BEK A., Postaci S.
in: Fano Resonances in Optics and Microwaves, Kamenetskii, Eugene Sadreev, Almas Miroshnichenko, Andrey, Editor, Springer, pp.1-31, 2018

Papers Published in Refereed Scientific Meetings

- I. **Silent enhancement of SERS signal without increasing the hot spot intensity**
TAŞGIN M. E.

The 10th International Conference on Metamaterials, Photonic Crystals and Plasmonics, Lizbon, Portugal, 23 - 26 July 2019

II. Multi-particle entanglement in superradiance

TAŞGIN M. E.

48. PQE (Physics of Quantum Electronics) Conferences, UTAH/Salt Lake City, United States Of America, 7 - 12 January 2018

III. Explicit demonstration of how path interference can enhance plasmonic nonlinearity

TAŞGIN M. E.

META2017, the 8th International Conference on Metamaterials, Photonic Crystals and Plasmonics, Incheon-Seul, South Korea, 25 - 28 July 2017

IV. Many-particle entanglement for superradiant-like states

TAŞGIN M. E.

Technical Univ of Dortmund – Comsats Institute for Information Technology, International mini-School on Quantum and Ultrafast Optics: Theory and Experiment, Islamabad, Pakistan, 4 - 06 October 2017

V. Explicit demonstration of how nonlinearity enhancement emerges in Fano resonances

TAŞGIN M. E.

Turkey-Korea International Workshop in Electronics and Telecommunication, Daejeon, South Korea, 31 July - 01 August 2017

VI. Enhancement of nonlinear plasmonic processes via Fano resonances

TAŞGIN M. E.

24. İstatistiksel Fizik Günleri (İFG 24), İzmir, Turkey, 29 June - 01 July 2017

VII. Many-particle entanglement for superradiant-like states

TAŞGIN M. E.

Quantum Nanophotonics, Benasque, Spain, 26 February - 03 March 2017

VIII. Many-particle entanglement criterion for superradiant-like states

TAŞGIN M. E.

KOBİT (Kuantum Optiği ve Bilişim Tolantısı), İzmir, Turkey, 2 - 03 February 2017

IX. Enhanced second harmonic generation from coupled asymmetric plasmonic metal nanostructures

YILDIZ KARAKUL B. C., TAŞGIN M. E., abak m. k., coşkun ş., ÜNALAN H. E., BEK A.

KOBİT1, Turkey, 2 - 03 February 2017

X. Fano Enhancement of Raman Conversion

saatçi s., YILDIZ KARAKUL B. C., BEK A., TAŞGIN M. E.

KOBİT1, Turkey, 2 - 03 February 2017

XI. Explicit demonstration of how path interference effect can enhance plasmonic nonlinearity

TÜRKPENÇE D., Akgüç G. B., BEK A., TAŞGIN M. E.

COST Action MP1403 Nanoscale Quantum Optics, Attard, Malta, 15 - 18 November 2015

XII. Dynamical instability of a two component Bose-Einstein Condensate in an optical lattice

Taşgin M. E., Oktel M. O.

12th Central European Workshop on Quantum Optics, Ankara, Turkey, 6 - 09 June 2005, vol.36, pp.200-202

Supported Projects

Taşgin M. E., TUBITAK Project, Dört-Dalga Karışması Prosesinin Tamamen-Plazmonik Fano Rezonans ile Güçlendirilerek Multi-Frekans Kuantum-Dolaşıkları Yapılması, 2017 - 2021

TAŞGIN M. E., Project Supported by Higher Education Institutions, Kuantum teknolojileri için daha güçlü kuantum-dolaşıklık kriterleri bulunması, 2018 - 2020

TAŞGIN M. E., TUBITAK Project, Dört-Dalga Karışması Prosesinin Tamamen-Plazmonik Fano Rezonans ile Güçlendirilerek Multi-Frekans Kuantum-Dolaşıkları Yapılması, 2017 - 2020

TAŞGIN M. E., Project Supported by Higher Education Institutions, Emilim yollarının girişimi ile plazmon yaşam süresinin uzatılması ve Güneş enerjisi uygulamaları, 2017 - 2018

TAŞGIN M. E., Project Supported by Higher Education Institutions, Kuantum dolaşıklığı kriterleri, 2017 - 2018
TAŞGIN M. E., Project Supported by Higher Education Institutions, Doğrusal olmayan plazmonik proseslerin Fano rezonanslar ile güçlendirilmesi, 2017 - 2018
TAŞGIN M. E., Project Supported by Higher Education Institutions, Frekans dönüşüm yollarının girişimi ile doğrusalsızlık güçlendirilmesi, 2017 - 2018
TAŞGIN M. E., Project Supported by Higher Education Institutions, İnce film yüzeyinde ışığın nanoparçacıklar ile lokalizasyonunun 3-boyutlu simülasyonları, 2016 - 2018
TAŞGIN M. E., CAN YILDIZ KARAKUL B., Project Supported by Higher Education Institutions, Plazmonik yapılarda İkincil Frekans Çevriminin ikiden fazla çevrim yolunun girişimi ile güçlendirilmesi, 2015 - 2017
TAŞGIN M. E., Project Supported by Higher Education Institutions, Frekans dönüşüm yollarının girişiminin plazmonik doğrusalsızlığı nasıl güçlendirebildiğinin açık olarak gösterilmesi, 2016 - 2016
TAŞGIN M. E., TUBITAK Project, Doğrusal Olmayan Optik Özellikleri Fano Rezonansıyla Güçlendirerek Nano Boyutlu Kuantum Dolaşıklaştırıcı Yapılması, 2014 - 2016
TAŞGIN M. E., TUBITAK Project, Bose Einstein Yoğuşuğunda Süperışımaya İle Vorteks Örgüsü Faz Geçişi İndüklenmesi, 2013 - 2015

Peer Reviews in Scientific Publications

Journal of the Optical Society of America B, SCI Journal, March 2018
Physical Review Letters, SCI Journal, January 2017
Physical Review A, SCI Journal, April 2016

Tasks In Event Organizations

Taşgın M. E., 24. Yoğun Madde Fiziği Ankara Toplantısı, Workshop Organization, Ankara, Turkey, Aralık 2018
Taşgın M. E., KOBİT 2 Kuantum Optik ve Bilişimi Toplantısı, Workshop Organization, İstanbul, Turkey, Şubat 2018
Taşgın M. E., 23. Yoğun Madde Fiziği Ankara Toplantısı, Workshop Organization, Ankara, Turkey, Aralık 2017
Taşgın M. E., KOBİT 1 (Kuantum Optik ve Bilişimi Toplantısı), Workshop Organization, İzmir, Turkey, Şubat 2017
Taşgın M. E., 22. Yoğun Madde Fiziği Ankara Toplantısı, Workshop Organization, Ankara, Turkey, Aralık 2016
Taşgın M. E., KOBİT 0 Kuantum Optik ve Bilişimi (İlk) Toplantısı, Workshop Organization, Ankara, Turkey, Mart 2016
Taşgın M. E., 21. Yoğun Madde Fiziği Ankara Toplantısı, Workshop Organization, Ankara, Turkey, Aralık 2015
Taşgın M. E., 20. Yoğun Madde Fiziği Ankara Toplantısı, Workshop Organization, Ankara, Turkey, Aralık 2014

Metrics

Publication: 51
Citation (WoS): 166
Citation (Scopus): 127
H-Index (WoS): 8
H-Index (Scopus): 7

Congress and Symposium Activities

META-2019, 10. International Conference on Metamaterials, Photonic Crystals and Plasmonics, Invited Speaker, Lisbon, Portugal, 2019
48. Winter Colloquium on the Physics of Quantum Electronics, Invited Speaker, Utah, United States Of America, 2018
META-2017, 8. International Conference on Metamaterials, Photonic Crystals and Plasmonics, Invited Speaker, Incheon, South Korea, 2017

24. İstatistik Fizik Günleri, Invited Speaker, İzmir, Turkey, 2017
KOBİT (Kuantum Optik ve Bilişimi Toplantısı) 1, Invited Speaker, İzmir, Turkey, 2017
20. İstatistik Fizik Günleri, Invited Speaker, Kayseri, Turkey, 2013

Invited Talks

- 2021 TAMU-Baylor-Casper Summer School on Quantum Physics and Biophysics, Conference, Texas A&M University and Casper College, United States Of America, July 2021
Quantum Entanglement and uncontrolled Superluminal source-potential communication, Seminar, Korean Institute for Advanced Studies, South Korea, June 2019
Unification of entanglement criteria and Bose-Einstein condensates, Seminar, National Center for Theoretical Sciences , Taiwan, May 2019
Silent enhancement of SERS signal without increasing hot spot intensities, Seminar, National Center for Theoretical Sciences , Taiwan, May 2019
Quantum Plasmonics for circumventing the limitations in SERS and SNOM, Seminar, Texas A&M University, United States Of America, February 2019
Kimya Bölümü / Silent enhancement of SERS signal without increasing hot spot intensities, Seminar, İhsan Doğramacı Bilkent Üniversitesi, Turkey, October 2018
Many-particle entanglement for superradiant states, Seminar, • Institute for Quantum Optics and Quantum Information- Austrian Academy of Sciences, Austria, April 2018
Many-particle entanglement for superradiant-like states, Seminar, Mini-School on Ultrafast Optics and Plasmonics / COMSATS Institute of Technology and Technical University of Dortmund, Pakistan, December 2017
Explicit demonstration of Fano resonances, Seminar, Mini-School on Ultrafast Optics and Plasmonics / COMSATS Institute of Technology and Technical University of Dortmund, Pakistan, December 2017
Fizik Bölümü / Quantum entanglement and Violation of Kramers-Kroning Relations, Seminar, İhsan Doğramacı Bilkent Üniversitesi, Turkey, November 2017
Quantum entanglement criteria and Quantum Plasmonics, Seminar, KIAS (Korean Institute of Advanced Study) , South Korea, August 2017
Enhancement of nonlinear response via path interference, Seminar, ETRI (Electronics and Telecommunications Research Institute), South Korea, July 2017
Kuantum Plazmonik Teknolojileri, Workshop, TÜBİTAK BİLGEM / Horizon 2020: Kuantum Teknolojileri, Turkey, November 2016
Nanoscale Quantum Optics-ESR , Workshop, Malta Üniversitesi (University of Malta), Malta, November 2015

Awards

- Taşgın M. E., Parlar Araştırma Teşvik Ödülü, Odtü Parlar Vakfı, November 2018
Taşgın M. E., TÜBA Üstün Başarılı Genç Bilim İnsanı Ödülleri Programı, Türkiye Bilimler Akademisi, October 2017

Non Academic Experience

- IQSE, Texas AM University, Ziyaretçi Araştırmacı
Texas A&M University, Ziyaretçi Araştırmacı
The University of Arizona, Doktora-sonrası Araştırmacı
Koç Üniversitesi, Doktora-sonrası Araştırmacı
Bilkent Üniversitesi, Araştırma Görevlisi / Asistan