

## Prof. MEHMET EMRE TAŞGIN

### Personal Information

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### International Researcher IDs

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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

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

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

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

Kuantum Optikte Hesaplama Yöntemleri, Doctorate, 2016 - 2017

## Advising Theses

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

Taşgın 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. **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, 2024 (SCI-Expanded)
- II. **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)
- 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., Ovali 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 & Book Chapters**

- 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

## **Refereed Congress / Symposium Publications in Proceedings**

- 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. **Manyparticle 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-Dolaşıklaştırıcı Yapılması, 2017 - 2021
- TAŞGIN M. E., Project Supported by Higher Education Institutions, Kuantum teknolojileri için daha güçlü kuantum-dolaşıklığı kriterleri bulunması, 2018 - 2020
- TAŞGIN M. E., TUBITAK Project, Dört-Dalga Karışması Prosesinin Tamamen-Plazmonik Fano Rezonans ile Güçlendirilerek Multi-Frekans Kuantum-Dolaşıklaştırıcı 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 Dolaşıkları Yapılması, 2014 - 2016

TAŞGIN M. E., TUBITAK Project, Bose Einstein Yoğuşuğunda Süperışım ile Vorteks Örgüsü Faz Geçişi İndüklenmesi, 2013 - 2015

## Scientific Refereeing

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 Superuminal 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

Texas A&M University

The University of Arizona

Koç Üniversitesi

Bilkent Üniversitesi