

## Assoc. Prof. EMRE YÜCE

### Personal Information

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### International Researcher IDs

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Publons / Web Of Science ResearcherID: B-3181-2008

ScopusID: 35110769500

Yoksis Researcher ID: 245435

### Education Information

Doctorate, Universiteit Twente, Netherlands 2009 - 2013

Postgraduate, Koc University, Institute Of Science, Fizik (YI) (Tezli), Turkey 2007 - 2009

Undergraduate, Middle East Technical University, Faculty of Arts and Sciences, Department of Physics, Turkey 2002 - 2007

### Dissertations

Doctorate, Ultimate-fast all-optical switching of a microcavity, Universiteit Twente, 2013

Postgraduate, Optical modulation and spectroscopy with silicon microspheres, Koç Üniversitesi, Fizik (YI) (Tezli), 2009

### Research Areas

Physics, Interdisciplinary Physics and Related Science and Technology Areas, Intensive Article 2: Electronic Structure, Electric, Magnetic and Optical Properties, Optical Properties, Spectroscopy of Matter, Natural Sciences

### Academic Titles / Tasks

Associate Professor, Middle East Technical University, Faculty of Arts and Sciences, Department of Physics, 2022 - Continues

Assistant Professor, Middle East Technical University, Faculty of Arts and Sciences, Department of Physics, 2018 - 2022

Assistant Professor, Middle East Technical University, Faculty of Arts and Sciences, Department of Physics, 2016 - 2018

### Academic and Administrative Experience

Uygulama ve Araştırma Merkezi Yönetim Kurulu Üyesi, Middle East Technical University, Faculty of Economic and Administrative Sciences, GİMER, 2021 - Continues

Rektörlük Stratejik Plan Komisyonu Üyesi, Middle East Technical University, Faculty of Arts and Sciences, Department of Physics, 2021 - Continues

## Advising Theses

- Yüce E., Optical classification and reconstruction through multimode fibers, Doctorate, Ş.KÜREKÇİ(Student), 2022
- Yüce E., Yerci S., Spectral and spatial control of broadband light using wavefront shaping, Doctorate, A.YOLALMAZ(Student), 2022
- Yüce E., Concept of single pixel fiber optical imaging via compressed sensing, Postgraduate, A.AZGIN(Student), 2022
- Yüce E., Wavefront shaping optimization algorithms for focusing light through a multimode fiber, Postgraduate, M.TABAK(Student), 2022
- Yüce E., Multifocal LIDAR systems, Doctorate, K.ÜRKMEN(Student), 2022
- Yüce E., Enhancing performance of solar cells via wavefront shaping, Postgraduate, S.ATİLA(Student), 2022
- Yüce E., Enhancing the resolution of multimode fiber based spectrometers, Postgraduate, S.SÜLEYMAN(Student), 2021
- YÜCE E., 3D imaging via binary wavefront modulation for lidar and machine vision applications, Postgraduate, Ç.Anıl(Student), 2020
- YÜCE E., Wavefront shaping assisted design and application of effective diffractive optical elements providing spectral splitting and solar concentration: splicons, Postgraduate, B.Nezir(Student), 2020
- KOCAMAN S., YÜCE E., Controlling light inside a multi-mode fiber by wavefront shaping, Postgraduate, H.İBRAHİM(Student), 2018
- YÜCE E., YERCİ S., Broadband spectral splitting of light using wavefront shaping, Postgraduate, Y.BAŞAY(Student), 2018
- KOCAMAN S., YÜCE E., Zero-n gap design via modulation of hexagonal photonic crystal lattice, Postgraduate, S.MORADI(Student), 2017

## Published journal articles indexed by SCI, SSCI, and AHCI

- I. **Single-Pixel Multimode Fiber Spectrometer via Wavefront Shaping**  
Yüce E., Kurekci Ş., Kahraman S. S.  
ACS PHOTONICS, vol.10, pp.2488-2493, 2023 (SCI-Expanded)
- II. **Deep Learning-Based Fiber Bending Recognition for Sensor Applications**  
Bender D., Cakir U., YÜCE E.  
IEEE Sensors Journal, vol.23, no.7, pp.6956-6962, 2023 (SCI-Expanded)
- III. **On-demand continuous-variable quantum entanglement source for integrated circuits**  
Günay M., Das P., Yüce E., Polat E. O., Bek A., Taşgın M. E.  
NANOPHOTONICS, vol.12, no.2, pp.229-237, 2023 (SCI-Expanded)
- IV. **Design of a High-Resolution Multifocal LIDAR: Enabling Higher Resolution Beyond the Laser Pulse Rise Time**  
Urkmen K., Yüce E.  
IEEE Transactions on Instrumentation and Measurement, vol.72, 2023 (SCI-Expanded)
- V. **Laser Photochemical Nanostructuring of Silicon for Surface Enhanced Raman Spectroscopy**  
Akbiyık A., Avishan N., Demirtaş Ö., Demir A. K., Yüce E., Bek A.  
Advanced Optical Materials, vol.10, no.14, 2022 (SCI-Expanded)
- VI. **Hybrid design of spectral splitters and concentrators of light for solar cells using iterative search and neural networks**  
Yolalmaz A., YÜCE E.  
PHOTONICS AND NANOSTRUCTURES-FUNDAMENTALS AND APPLICATIONS, vol.48, 2022 (SCI-Expanded)
- VII. **Comprehensive deep learning model for 3D color holography**  
Yolalmaz A., YÜCE E.  
SCIENTIFIC REPORTS, vol.12, no.1, 2022 (SCI-Expanded)

- VIII. **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)
- IX. **Spectral splitting and concentration of broadband light using neural networks**  
Yolalmaz A., YÜCE E.  
APL PHOTONICS, vol.6, no.4, 2021 (SCI-Expanded)
- X. **Wavefront shaping assisted design of spectral splitters and solar concentrators**  
GÜN B. N., YÜCE E.  
SCIENTIFIC REPORTS, vol.11, no.1, 2021 (SCI-Expanded)
- XI. **Effective bandwidth approach for the spectral splitting of solar spectrum using diffractive optical elements**  
Yolalmaz A., YÜCE E.  
OPTICS EXPRESS, vol.28, no.9, pp.12911-12921, 2020 (SCI-Expanded)
- XII. **Adaptive Control of Necklace States in a Photonic Crystal Waveguide**  
Yuce E., Lian J., Sokolov S., Bertolotti J., Combrie S., Lehoucq G., De Rossi A., Mosk A. P.  
ACS PHOTONICS, vol.5, pp.3984-3988, 2018 (SCI-Expanded)
- XIII. **Fano lines in the reflection spectrum of directly coupled systems of waveguides and cavities: Measurements, modeling, and manipulation of the Fano asymmetry**  
Lian J., Sokolov S., Yuce E., Combrie S., De Rossi A., Mosk A. P.  
PHYSICAL REVIEW A, vol.96, no.3, 2017 (SCI-Expanded)
- XIV. **Tuning out disorder-induced localization in nanophotonic cavity arrays**  
Sokolov S., Lian J., YÜCE E., Combrie S., DE ROSSI A., Mosk A. P.  
OPTICS EXPRESS, vol.25, no.5, pp.4598-4606, 2017 (SCI-Expanded)
- XV. **Measurement of the profiles of disorder-induced localized resonances in photonic crystal waveguides by local tuning**  
Lian J., Sokolov S., Yuce E., COMBRÍÉ S., De Rossi A., Mosk A. P.  
OPTICS EXPRESS, vol.24, no.19, pp.21939-21947, 2016 (SCI-Expanded)
- XVI. **Optimal all-optical switching of a microcavity resonance in the telecom range using the electronic Kerr effect**  
Yuce E., CTÍSTÍS G., CLAUDON J., GÉRARD J., Vos W. L.  
OPTICS EXPRESS, vol.24, no.1, pp.239-253, 2016 (SCI-Expanded)
- XVII. **Dispersion of coupled mode-gap cavities**  
LIAN J., SOKOLOV S., Yuce E., COMBRÍÉ S., De Rossi A., Mosk A. P.  
OPTICS LETTERS, vol.40, no.19, pp.4488-4491, 2015 (SCI-Expanded)
- XVIII. **Femtosecond-scale switching based on excited free-carriers**  
SIVAN Y., CTÍSTÍS G., Yuce E., Mosk A. P.  
OPTICS EXPRESS, vol.23, no.12, pp.16416-16428, 2015 (SCI-Expanded)
- XIX. **Local thermal resonance control of GaInP photonic crystal membrane cavities using ambient gas cooling**  
Sokolov S., LIAN J., Yuce E., COMBRÍÉ S., LEHOUCQ G., De Rossi A., Mosk A. P.  
APPLIED PHYSICS LETTERS, vol.106, no.17, 2015 (SCI-Expanded)
- XX. **Dynamical electrical tuning of a silicon microsphere: used for spectral mapping of the optical resonances**  
Yuce E., Gürlü O., Thursby G. J., Serpenguzel A.  
APPLIED OPTICS, vol.53, no.27, pp.6181-6184, 2014 (SCI-Expanded)
- XXI. **Differential ultrafast all-optical switching of the resonances of a micropillar cavity**  
THYRRESTRUP H., Yuce E., CTÍSTÍS G., CLAUDON J., Vos W. L., GÉRARD J.  
APPLIED PHYSICS LETTERS, vol.105, no.11, 2014 (SCI-Expanded)
- XXII. **Polarization behavior of elastic scattering from a silicon microsphere coupled to an optical fiber**  
Murib M. S., Yuce E., Gürlü O., Serpenguzel A.  
PHOTONICS RESEARCH, vol.2, no.2, pp.45-50, 2014 (SCI-Expanded)

- XXIII. **All-optical switching of a microcavity repeated at terahertz rates**  
Yuce E., CTİSTİS G., CLAUDON J., Dupuy E., Buijs R. D., de Ronde B., Mosk A. P., GÉRARD J., Vos W. L.  
OPTICS LETTERS, vol.38, no.3, pp.374-376, 2013 (SCI-Expanded)
- XXIV. **Competition between electronic Kerr and free-carrier effects in an ultimate-fast optically switched semiconductor microcavity**  
Yuce E., CTİSTİS G., CLAUDON J., DUPUY E., Boller K. J., GÉRARD J., Vos W. L.  
JOURNAL OF THE OPTICAL SOCIETY OF AMERICA B-OPTICAL PHYSICS, vol.29, no.9, pp.2630-2642, 2012 (SCI-Expanded)
- XXV. **On the pathway of photoexcited electrons: probing photon-to-electron and photon-to-phonon conversions in silicon by ATR-IR**  
KARABUDAK E., Yuce E., SCHLAUTMANN S., Hansen O., Mul G., Gardeniers H. ( G. E.  
PHYSICAL CHEMISTRY CHEMICAL PHYSICS, vol.14, no.31, pp.10882-10885, 2012 (SCI-Expanded)
- XXVI. **Geometrically enhanced morphology-dependent resonances of a dielectric sphere**  
Demir A., Yuce E., Serpenguzel A., Lock J. A.  
APPLIED OPTICS, vol.50, no.36, pp.6652-6656, 2011 (SCI-Expanded)
- XXVII. **Addendum Ultimate fast optical switching of a planar microcavity in the telecom wavelength range**  
**Appl Phys Lett 98 161114 2011**  
CTİSTİS G., YÜCE E., HARTSUIKER A., CLAUDON J., MAELA B., GÉRARD J., WİLLEM L V.  
Applied Physics Letters, vol.99, pp.199901, 2011 (SCI-Expanded)
- XXVIII. **Ultimate fast optical switching of a planar microcavity in the telecom wavelength range**  
Ctistis G., Yuce E., HARTSUIKER A., Claudon J., Bazin M., Gerard J., Vos W. L.  
APPLIED PHYSICS LETTERS, vol.98, no.16, 2011 (SCI-Expanded)
- XXIX. **Optical Modulation With Silicon Microspheres**  
Yuce E., Gurlu O., Serpenguzel A.  
IEEE PHOTONICS TECHNOLOGY LETTERS, vol.21, no.20, pp.1481-1483, 2009 (SCI-Expanded)

### Articles Published in Other Journals

- I. **Nonlinear frequency conversion of light inside a microcavity**  
YÜCE E.  
TURKISH JOURNAL OF PHYSICS, vol.43, no.2, pp.221-227, 2019 (ESCI)
- II. **Broadband spectral splitting of white light via 2D diffractive optical elements**  
Başay Y., Yüce E.  
Turkish Journal of Physics, vol.42, pp.501-508, 2018 (Scopus)

### Refereed Congress / Symposium Publications in Proceedings

- I. **Fabrication of SERS Substrates via Laser Induced Surface Nanostructuring of Silicon**  
Akbiyık A., Avishan N., YÜCE E., BEK A.  
11th International Conference on Metamaterials, Photonic Crystals and Plasmonics, META 2021, Warszawa, Poland, 20 - 23 July 2021, pp.879-883
- II. **Deep learning-based spectral splitting and concentration of broadband light for solar cells applications**  
Yolalmaz A., Yüce E.  
PVCON2020, Ankara, Turkey, 1 - 03 July 2020, pp.39
- III. **Control of spatial phase empowering spectral splitting and concentration of solar spectrum**  
Gün B. N., Yüce E.  
PVCON 2020, Ankara, Turkey, 30 November - 02 December 2020, pp.39
- IV. **Single-Step Periodic Photoelectrochemical Texturing of Silicon for Photovoltaics**

Avishan N., Akbıyık A., YÜCE E., BEK A.

37th European Photovoltaic Solar Energy Conference and Exhibition, 7 - 11 September 2020, pp.549-553

- V. **Deep learning-based image transmission through a multi-mode fiber**  
Küreççi Ş., Odabaş E., Temur T., Afshari G., YÜCE E.  
SPIE Photonics Europe, 2020, 6 - 10 April 2020, vol.1135126
- VI. **Angle-independent diffractive optical elements for efficient solar energy conversion**  
Yolalmaz A., Yüce E.  
Photonics for Solar Energy Systems VIII 2020, None, France, 6 - 10 April 2020, vol.11366
- VII. **Deep learning-based image transmission through a multi-mode fiber**  
Küreççi Ş., Temur A. T., Odabas M. E., Afshari G., Yüce E.  
Unconventional Optical Imaging II 2020, Virtual, Online, France, 6 - 10 April 2020, vol.11351
- VIII. **Deep Learning Image Transmission Through a Multi-mode Fiber**  
Küreççi Ş., Temur A. T., Odabaş M. E., Yüce E.  
21. Ulusal Optik, Elektro-Optik ve Fotonik Çalıştayı, İstanbul, Turkey, 06 September 2019
- IX. **Broadband Spectral Splitting of Light Using a Spatial Light Modulator**  
Gün B. N., Yüce E.  
21. Ulusal Optik, Elektro-Optik ve Fotonik Çalıştayı, İstanbul, Turkey, 06 September 2019, pp.85
- X. **Designs of diffractive optical elements for solar energy harvesting**  
Yolalmaz A., Yüce E.  
5th International Conference on Power Generation Systems and Renewable Energy Technologies, PGSRET 2019, İstanbul, Turkey, 26 - 27 August 2019
- XI. **Focusing Light Through Scattering Medium**  
Küreççi Ş., Yeşil C., Afshari G., Tabak M., Yüce E.  
20. Ulusal Optik, Elektro-Optik ve Fotonik Çalıştayı, Ankara, Turkey, 14 August 2018
- XII. **Deep learning algorithm applied to daily solar irradiation estimations**  
Akbaba E. C., Yüce E., Akinoglu B. G.  
6th International Renewable and Sustainable Energy Conference, IRSEC 2018, Rabat, Morocco, 5 - 08 December 2018
- XIII. **Investigation of Spectral Splitting and Solar Concentration using Diffractive Optical Elements at Oblique Angles**  
Yüce E., Başay Y., Gün B. N.  
PVCON 2018, Ankara, Turkey, 4 - 06 June 2018
- XIV. **Tailoring Spontaneous Emission**  
YÜCE E.  
Türk Fizik Derneği 33. Uluslararası Fizik Kongresi, 6 - 10 September 2017
- XV. **Yarı İletken Yapıların ve Işığın Programlanması**  
YÜCE E.  
YMF22, Ankara, Turkey, 16 December 2016
- XVI. **Programmable Photonics**  
YÜCE E.  
Fotonik 2016, 18. Ulusal Optik, Elektro-Optik ve Fotonik Çalıştayı, Ankara, Turkey, 23 September 2016
- XVII. **Frequency dependent dynamics of semiconductor microcavities under ultrafast carrier switching**  
Ctistis G., YÜCE E., Julien C., Allard P M., Gerard J., Vos W. L.  
2013 Conference on Lasers Electro-Optics Europe International Quantum Electronics Conference CLEO EUROPE/IQEC, Munich, Germany, 12 - 16 May 2013
- XVIII. **All-optical Switching of a Microcavity Repeated at Terahertz Clock Rates**  
YÜCE E., Ctistis G., Claudon J., Dupuy E., Buijs R. D., de Ronde B., Mosk A. P., Gerard J., Vos W. L.  
Conference on Lasers and Electro-Optics Europe & International Quantum Electronics Conference (CLEO/Europe-IQEC), Munich, Germany, 12 - 16 May 2013
- XIX. **Competition between electronic Kerr and free carrier effects in an ultimate fast switched semiconductor microcavity**

YÜCE E., Ctistis G., Claudon J., Bazin M., Jean-Michel G., Vos W. L.

2011 Conference on Lasers and Electro-Optics Europe and 12th European Quantum Electronics Conference (CLEO EUROPE/EQEC), Munich, Germany, 22 - 26 May 2011

**XX. Q-factor dependent Kerr switching of semiconductor microcavities**

YÜCE E., Georgios C., Julien C., Maela B., Jean-Michel G., Willem L V.

2011 Conference on Lasers and Electro-Optics Europe and 12th European Quantum Electronics Conference (CLEO EUROPE/EQEC), Munich, Germany, 22 - 26 May 2011

**XXI. Ultimate fast optical switching of a semiconductor photonic microcavity**

Ctistis G., YÜCE E., Alex H., Maela B., Julien C., Jean-Michel G., Willem L V.

2011 Conference on Lasers and Electro-Optics Europe and 12th European Quantum Electronics Conference (CLEO EUROPE/EQEC), Munich, Germany, 22 - 26 May 2011

**XXII. Near-Infrared Resonant Cavity Enhanced Silicon Microsphere Photodetector**

Murib M. S., Yuce E., GÜRLÜ O., SERPENGÜZEL A.

Conference on Photonic Materials, Devices and Applications III, Dresden, Germany, 4 - 06 May 2009, vol.7366

**XXIII. Silicon microspheres for optical modulation applications**

Yuce E., Murib M. S., GÜRLÜ O., SERPENGÜZEL A.

Conference on Photonic Materials, Devices and Applications III, Dresden, Germany, 4 - 06 May 2009, vol.7366

## Supported Projects

YÜCE E., TUBITAK Project, Dalga önu şekillendirmesi ile ışığın çok modlu sistem sonrası kontrolü, 2016 - 2018

## Patent

Yüce E., DİJİTAL MİKROAYNA CİHAZI İLE HIZLI FAZ MODÜLASYONU, Patent, CHAPTER G Physics, The Invention Registration Number: 2021 022240 , Standard Registration, 2023

Yüce E., ÇOK EKSENLİ VE ÇOK YÜZEYLİ POLİGON TARAYICI İLE HIZLI VE YÜKSEK ÇÖZÜNÜRLÜKLÜ LIDAR, Patent, CHAPTER F Mechanical engineering; Lighting; Heating; Weaponry; Destroyed Materials, The Invention Registration Number: 2021 020308 , Standard Registration, 2023

Yüce E., Kürekcı Ş., KOMPAKT HOLOGRAFİK SLM SPEKTROMETRE, Patent, CHAPTER G Physics, The Invention Registration Number: 2020 22701 , Standard Registration, 2023

Yüce E., YÜKSEK ÇÖZÜNÜRLÜKLÜ LİDAR GÖRÜNTÜLEME SİSTEMİ, Patent, CHAPTER F Mechanical engineering; Lighting; Heating; Weaponry; Destroyed Materials, The Invention Registration Number: 2021 015058 , Standard Registration, 2022

Yüce E., HIZLI LIDAR VE KONUM TESPİT UYGULAMALARI İÇİN ADAPTİF YÖNTEM VE MEKANİZMALAR, Patent, CHAPTER G Physics, The Invention Registration Number: 2018 19800 , Standard Registration, 2021

Yüce E., Kürekcı Ş., ÇOK MODLU ORTAM İLE GİRİŞİM TEMELLİ SLM SPEKTROMETRE, Patent, CHAPTER G Physics, The Invention Recourse Number: 2020/16850 , Standard Registration, 2020

Yüce E., DEĞİŞKEN KİRİNİM OPTİK ELEMANLI OPTİK SPEKTROMETRE, Patent, CHAPTER G Physics, The Invention Recourse Number: 2020/10646 , Standard Registration, 2020

## Metrics

Publication: 62

Citation (WoS): 256

Citation (Scopus): 297

H-Index (WoS): 10

H-Index (Scopus): 10

## **Congress and Symposium Activities**

NanoTr, Attendee, Ankara, Turkey, 2022

## **Awards**

Yüce E., Üstün başarılı genç bilim insanı ödülü, Türkiye Bilimler Akademisi (Tüba), December 2021

## **Non Academic Experience**

Nanomanyetik

USSAK Teknoloji Elk. Elkt. Ürn. İmlt. San. Tic. Ltd. Şti.