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Biography

Dr. Talha Erdem received his BS, MS, and PhD degrees all in Electrical and Electronics Engineering from Bilkent University in 2009, 2011, and 2016, respectively. During his MS and PhD he worked on the design and optimization of high-quality light-emitting diodes. After his PhD he was awarded the Newton International Fellowship by the Royal Society and moved to the University of Cambridge as a Newton International Fellow. At Cambridge, he worked on the smart self-assembly of nanomaterials for photonic applications. In April 2019 he moved to Abdullah Gül University as an Assistant Professor and established the Smart Nanophotonics Research Group, His current research interests are the design of stable nano-emitters, DNA-driven self-assembly of colloidal nanoparticles, and their photonic applications.

Research Areas

Dielectric Materials and Devices, Optical Materials and Devices, Optoelectronic Materials and Devices, Semiconducting Materials and Devices, Engineering and Technology

Academic Titles / Tasks

Assistant Professor, Abdullah Gul University, Mühendislik Fakültesi, Elektrik-Elektronik Mühendisliği, 2019 - Continues

Courses

Nano- and Microscale System Design Capsule, Undergraduate, 2022 - 2023

Sensor Systems Design Capsule, Undergraduate, 2022 - 2023

AGU Ways, Undergraduate, 2022 - 2023

Nanofotonik, Postgraduate, 2021 - 2022

Published journal articles indexed by SCI, SSCI, and AHCI

1. Effects of silver nanowires and their surface modification on electromagnetic interference, transport and mechanical properties of an aerospace grade epoxy

Özkutlu Demirel M., Öztürkmen M. B., SAVAŞ M., MUTLUGÜN E., ERDEM T., Öz Y.

Journal of Composite Materials, vol.58, no.10, pp.1267-1277, 2024 (SCI-Expanded)

- II. **Numerical analysis and experimental verification of optical scattering from microplastics**
Genç S., Icoz K., Erdem T.
ROYAL SOCIETY OPEN SCIENCE, vol.10, no.8, pp.1-11, 2023 (SCI-Expanded)
- III. **Use of Confocal Microscopy to Monitor Structural Transformations in Nanopillars Based on DNA and CdSe/CdZnSe/ZnS Quantum Dots**
Motevich I., ERDEM T., Akrema A., Maskevich S., Strekal N.
Journal of Applied Spectroscopy, vol.90, no.3, pp.576-581, 2023 (SCI-Expanded)
- IV. **Toward sustainable optoelectronics: solution-processed quantum dot photodetector fabrication using a surgical blade**
SAVAŞ M., Yazıcı A. F., BİÇER A., MUTLUGÜN E., ERDEM T.
Optical Engineering, vol.62, no.2, 2023 (SCI-Expanded)
- V. **Magnetically controlled anisotropic light emission of DNA-functionalized supraparticles**
ERDEM T., Zupkauskas M., O'Neill T., Cassiagli A., Xu P., ALTINTAS Y., MUTLUGÜN E., Eiser E.
MRS BULLETIN, vol.47, no.11, pp.1084-1091, 2022 (SCI-Expanded)
- VI. **Color Enrichment Solids of Spectrally Pure Colloidal Quantum Wells for Wide Color Span in Displays**
ERDEM T., SORAN ERDEM Z., Isik F., Shabani F., YAZICI A. F., MUTLUGÜN E., Gaponik N., DEMİR H. V.
ADVANCED OPTICAL MATERIALS, vol.10, no.14, 2022 (SCI-Expanded)
- VII. **Transparent Colloidal Crystals With Structural Colours**
Erdem T., O'Neill T., Zupkauskas M., Caciagli A., Xu P., Lan Y., Boesecke P., Eiser E.
FRONTIERS IN PHYSICS, vol.10, 2022 (SCI-Expanded)
- VIII. **Optical detection of microplastics in water**
Iri A. H., Shahrah M. H. A., Ali A. M., Qadri S. A., ERDEM T., ÖZDÜR İ. T., İÇÖZ K.
ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH, vol.28, no.45, pp.63860-63866, 2021 (SCI-Expanded)
- IX. **Tuning optical properties of self-assembled nanoparticle network with external optical excitation**
Senel Z., İÇÖZ K., ERDEM T.
JOURNAL OF APPLIED PHYSICS, vol.129, no.15, 2021 (SCI-Expanded)
- X. **Osmotic-Pressure-Induced Nematic Ordering in Suspensions of Laponite and Carboxy Methyl Cellulose**
Xu P., YAZICI A. F., ERDEM T., Lekkerkerker H. N. W., MUTLUGÜN E., Eiser E.
JOURNAL OF PHYSICAL CHEMISTRY B, vol.124, no.42, pp.9475-9481, 2020 (SCI-Expanded)
- XI. **A simple approach to prepare self-assembled, nacre-inspired clay/polymer nanocomposites**
Xu P., Erdem T., Eiser E.
SOFT MATTER, vol.16, no.23, pp.5497-5505, 2020 (SCI-Expanded)
- XII. **Transparent Films Made of Highly Scattering Particles**
Erdem T., Yang L., Xu P., ALTINTAS Y., O'Neil T., Caciagli A., Ducati C., MUTLUGÜN E., Scherman O. A., Eiser E.
LANGMUIR, vol.36, no.4, pp.911-918, 2020 (SCI-Expanded)
- XIII. **Multiplexed patterning of cesium lead halide perovskite nanocrystals by additive jet printing for efficient white light generation**
ALTINTAS Y., TÖRÜN İ., YAZICI A. F., Beskacak E., ERDEM T., ÖNSES M. S., MUTLUGÜN E.
CHEMICAL ENGINEERING JOURNAL, vol.380, 2020 (SCI-Expanded)
- XIV. **Ultrathin Highly Luminescent Two-Monolayer Colloidal CdSe Nanoplatelets**
Delikanlı S., Yu G., Yeltik A., Bose S., ERDEM T., Yu J., Erdem O., Sharma M., Sharma V. K., Quliyeva U., et al.
ADVANCED FUNCTIONAL MATERIALS, vol.29, no.35, 2019 (SCI-Expanded)
- XV. **Brightly Luminescent Cu-Zn-In-S/ZnS Core/Shell Quantum Dots in Salt Matrices**
Lox J. F., Eichler F., Erdem T., Adam M., Gaponik N., Demir H. V., Lesnyak V., Eychmüller A.
Zeitschrift für Physikalische Chemie, vol.233, no.1, pp.23-40, 2019 (SCI-Expanded)
- XVI. **Color-Enrichment Semiconductor Nanocrystals for Biorhythm-Friendly Backlighting**
ERDEM T., Demir H. V.
ZEITSCHRIFT FÜR PHYSIKALISCHE CHEMIE-INTERNATIONAL JOURNAL OF RESEARCH IN PHYSICAL CHEMISTRY

- & CHEMICAL PHYSICS, vol.232, pp.1457-1468, 2018 (SCI-Expanded)
- XVII. **Highly Luminescent CB[7]-Based Conjugated Polyrotaxanes Embedded into Crystalline Matrices**
Erdem T., Idris M., Demir H. V., Tuncel D.
Macromolecular Materials and Engineering, vol.302, no.11, 2017 (SCI-Expanded)
- XVIII. **Near-Unity Emitting Copper-Doped Colloidal Semiconductor Quantum Wells for Luminescent Solar Concentrators**
Sharma M., Gungor K., Yeltik A., Olutas M., Guzelturk B., Kelestemur Y., ERDEM T., Delikanli S., McBride J. R., Demir H. V.
ADVANCED MATERIALS, vol.29, no.30, 2017 (SCI-Expanded)
- XIX. **CdSe/CdSe_{1-x}Tex Core/Crown Heteronanoplatelets: Tuning the Excitonic Properties without Changing the Thickness**
Kelestemur Y., Guzelturk B., Erdem O., Olutas M., Erdem T., Usanmaz C. F., Gungor K., Demir H. V.
JOURNAL OF PHYSICAL CHEMISTRY C, vol.121, no.8, pp.4650-4658, 2017 (SCI-Expanded)
- XX. **Colloidal Nanocrystals Embedded in Macrocrystals: Methods and Applications**
Adam M., Gaponik N., Eychmueller A., ERDEM T., Soran-Erdem Z., Demir H. V.
JOURNAL OF PHYSICAL CHEMISTRY LETTERS, vol.7, no.20, pp.4117-4123, 2016 (SCI-Expanded)
- XXI. **High-Stability, High-Efficiency Organic Monoliths Made of Oligomer Nanoparticles Wrapped in Organic Matrix**
Soran-Erdem Z., ERDEM T., Gungor K., Pennakalathil J., Tuncel D., Demir H. V.
ACS NANO, vol.10, no.5, pp.5333-5339, 2016 (SCI-Expanded)
- XXII. **Excitonic improvement of colloidal nanocrystals in salt powder matrix for quality lighting and color enrichment**
ERDEM T., Soran-Erdem Z., Kelestemur Y., Gaponik N., Demir H. V.
OPTICS EXPRESS, vol.24, no.2, 2016 (SCI-Expanded)
- XXIII. **Colloidal nanocrystals for quality lighting and displays: milestones and recent developments**
ERDEM T., Demir H. V.
NANOPHOTONICS, vol.5, no.1, pp.74-95, 2016 (SCI-Expanded)
- XXIV. **Implementation of High-Quality Warm-White Light-Emitting Diodes by a Model-Experimental Feedback Approach Using Quantum Dot-Salt Mixed Crystals**
Adam M., ERDEM T., Stachowski G. M., Soran-Erdem Z., Lox J. F. L., Bauer C., Poppe J., Demir L. V., Gaponik N., Eychmueller A.
ACS APPLIED MATERIALS & INTERFACES, vol.7, no.41, pp.23364-23371, 2015 (SCI-Expanded)
- XXV. **Continuously Tunable Emission in Inverted Type-I CdS/CdSe Core/Crown Semiconductor Nanoplatelets**
Delikanli S., Guzelturk B., Hernandez-Martinez P. L., Erdem T., Kelestemur Y., Olutas M., Akgul M. Z., Demir H. V.
ADVANCED FUNCTIONAL MATERIALS, vol.25, no.27, pp.4282-4289, 2015 (SCI-Expanded)
- XXVI. **Macrocrystals of Colloidal Quantum Dots in Anthracene: Exciton Transfer and Polarized Emission**
Soran-Erdem Z., ERDEM T., Hernandez-Martinez P. L., Akgul M. Z., Gaponik N., Demir H. V.
JOURNAL OF PHYSICAL CHEMISTRY LETTERS, vol.6, no.9, pp.1767-1772, 2015 (SCI-Expanded)
- XXVII. **Sweet plasmonics: Sucrose macrocrystals of metal nanoparticles**
ERDEM T., Soran-Erdem Z., Hernandez-Martinez P. L., Sharma V. K., Akcali H., Akcali I., Gaponik N., Eychmueller A., Demir H. V.
NANO RESEARCH, vol.8, no.3, pp.860-869, 2015 (SCI-Expanded)
- XXVIII. **Construction of multi-layered white emitting organic nanoparticles by clicking polymers**
Keita H., Guzelturk B., Pennakalathil J., ERDEM T., Demir H. V., Tuncel D.
JOURNAL OF MATERIALS CHEMISTRY C, vol.3, no.39, pp.10277-10284, 2015 (SCI-Expanded)
- XXIX. **Stable and efficient colour enrichment powders of nonpolar nanocrystals in LiCl**
ERDEM T., Soran-Erdem Z., Sharma V. K., Kelestemur Y., Adam M., Gaponik N., Demir H. V.
NANOSCALE, vol.7, no.42, pp.17611-17616, 2015 (SCI-Expanded)
- XXX. **Manganese Doped Fluorescent Paramagnetic Nanocrystals for Dual-Modal Imaging**
Sharma V. K., Gokyar S., Kelestemur Y., ERDEM T., Unal E., Demir H. V.

SMALL, vol.10, no.23, pp.4961-4966, 2014 (SCI-Expanded)

- XXXI. **Energy-saving quality road lighting with colloidal quantum dot nanophosphors**
ERDEM T., Kelestemur Y., Soran-Erdem Z., Ji Y., Demir H. V.
NANOPHOTONICS, vol.3, no.6, pp.373-381, 2014 (SCI-Expanded)
- XXXII. **Highly polarized light emission by isotropic quantum dots integrated with magnetically aligned segmented nanowires**
Uran C., ERDEM T., Guzelturk B., Perkgoz N. K., Jun S., Jang E., Demir H. V.
APPLIED PHYSICS LETTERS, vol.105, no.14, 2014 (SCI-Expanded)
- XXXIII. **Comparative study of field-dependent carrier dynamics and emission kinetics of InGaN/GaN light-emitting diodes grown on (11(2)over-bar2) semipolar versus (0001) polar planes**
Ji Y., Liu W., ERDEM T., Chen R., Tan S. T., Zhang Z., Ju Z., Zhang X., Sun H., Sun X. W., et al.
APPLIED PHYSICS LETTERS, vol.104, no.14, 2014 (SCI-Expanded)
- XXXIV. **Tunable White-Light-Emitting Mn-Doped ZnSe Nanocrystals**
Sharma V. K., Guzelturk B., ERDEM T., Kelestemur Y., Demir H. V.
ACS APPLIED MATERIALS & INTERFACES, vol.6, no.5, pp.3654-3660, 2014 (SCI-Expanded)
- XXXV. **Morphology-Dependent Energy Transfer of Polyfluorene Nanoparticles Decorating InGaN/GaN Quantum-Well Nanopillars**
ERDEM T., Ibrahimova V., Jeon D., Lee I., Tuncel D., Demir H. V.
JOURNAL OF PHYSICAL CHEMISTRY C, vol.117, no.36, pp.18613-18619, 2013 (SCI-Expanded)
- XXXVI. **Color science of nanocrystal quantum dots for lighting and displays**
ERDEM T., Demir H. V.
NANOPHOTONICS, vol.2, no.1, pp.57-81, 2013 (SCI-Expanded)
- XXXVII. **Large-Area (over 50 cm x 50 cm) Freestanding Films of Colloidal InP/ZnS Quantum Dots**
Mutlugun E., Hernandez-Martinez P. L., Eroglu C., Coskun Y., Erdem T., Sharma V. K., Unal E., Panda S. K., Hickey S. G., Gaponik N., et al.
NANO LETTERS, vol.12, no.8, pp.3986-3993, 2012 (SCI-Expanded)
- XXXVIII. **Computational study of power conversion and luminous efficiency performance for semiconductor quantum dot nanophosphors on light-emitting diodes**
ERDEM T., Nizamoglu S., Demir H. V.
OPTICS EXPRESS, vol.20, no.3, pp.3275-3295, 2012 (SCI-Expanded)
- XXXIX. **Quantum dot integrated LEDs using photonic and excitonic color conversion**
Demir H. V., Nizamoglu S., Erdem T., Mutlugun E., Gaponik N., Eychmueller A.
NANO TODAY, vol.6, no.6, pp.632-647, 2011 (SCI-Expanded)
- XL. **Warm-white light-emitting diodes integrated with colloidal quantum dots for high luminous efficacy and color rendering: reply to comment**
Nizamoglu S., ERDEM T., Sun X. W., Demir H. V.
OPTICS LETTERS, vol.36, no.15, pp.2852, 2011 (SCI-Expanded)
- XLI. **High scotopic/photopic ratio white-light-emitting diodes integrated with semiconductor nanophosphors of colloidal quantum dots**
Nizamoglu S., ERDEM T., Demir H. V.
OPTICS LETTERS, vol.36, no.10, pp.1893-1895, 2011 (SCI-Expanded)
- XLII. **White-Emitting Conjugated Polymer Nanoparticles with Cross-Linked Shell for Mechanical Stability and Controllable Photometric Properties in Color-Conversion LED Applications**
Park E., ERDEM T., Ibrahimova V., Nizamoglu S., Demir H. V., Tuncel D.
ACS NANO, vol.5, no.4, pp.2483-2492, 2011 (SCI-Expanded)
- XLIII. **Semiconductor nanocrystals as rare-earth alternatives**
ERDEM T., Demir H. V.
NATURE PHOTONICS, vol.5, no.3, pp.126, 2011 (SCI-Expanded)
- XLIV. **Warm-white light-emitting diodes integrated with colloidal quantum dots for high luminous efficacy and color rendering**
Nizamoglu S., ERDEM T., Sun X. W., Demir H. V.

OPTICS LETTERS, vol.35, no.20, pp.3372-3374, 2010 (SCI-Expanded)

- XLV. **A photometric investigation of ultra-efficient LEDs with high color rendering index and high luminous efficacy employing nanocrystal quantum dot luminophores**

ERDEM T., NIZAMOĞLU S., SUN X. W., DEMİR H. V.

OPTICS EXPRESS, vol.18, no.1, pp.340-347, 2010 (SCI-Expanded)

Books & Book Chapters

- I. **Color Science and Photometry for Lighting with LEDs and Semiconductor Nanocrystals**

ERDEM T., DEMİR H. V.

Springer, Singapore, 2019

Refereed Congress / Symposium Publications in Proceedings

- I. **Machine Learning Based Classification of Microparticles Using Optical Scattering Simulations**

Genç S., İçöz K., Erdem T.

16th Nanoscience and Nanotechnology Conference (NANOTR), Ankara, Turkey, 5 - 08 September 2022, pp.51

- II. **Simple, sustainable fabrication of fully solution-processed, transparent, metal-semiconductor-metal photodetectors using a surgical blade as an alternative to conventional tools**

SAVAŞ M., YAZICI A. F., Arslan A., MUTLUGÜN E., ERDEM T.

Conference on Nanophotonics IX Part of SPIE Photonics Europe Conference, Strasbourg, France, 3 April - 20 May 2022, vol.12131

- III. **Machine Learning Assisted Particle Size and Type Classification Using Wavelength-Dependent Scattering Patterns**

Genç S., İçöz K., Erdem T.

International Conference on Optics and Photonics (OPTO) 2021, Wroclaw, Poland, 12 - 15 July 2021, pp.15

- IV. **Exciton transfer and polarized emission in colloidal quantum dot-anthracene crystals**

Soran-Erdem Z., Erdem T., Hernandez-Martinez P. L., Akgul M. Z., Gaponik N., Demir H. V.

IEEE Photonics Conference, IPC 2015, Virginia, United States Of America, 30 - 31 August 2015, pp.176-177

- V. **High-efficiency high-quality street lighting with colloidal quantum dot nanophosphors**

Erdem T., KELEŞTEMUR Y., Soran-Erdem Z., Ji Y., Demir H. V.

IEEE Photonics Conference, IPC 2015, Virginia, United States Of America, 30 - 31 August 2015, pp.53-54

- VI. **Large area 50 cm x 50 cm freestanding flexible optical membranes of Cd free nanocrystal quantum dots**

MUTLUGÜN E., Martinez Pedro H., Cuneyt E., Yasemin C., Talha E., Vijay K S., Emre U., Subhendu K P., Stephen G H., Nikolai G., et al.

IEEE Photonics Conference 2012, Burlingame, CA, USA, 23 - 27 September 2012

- VII. **Power conversion and luminous efficiency performance of nanophosphor quantum dots on color-conversion LEDs for high-quality general lighting**

ERDEM T., NIZAMOĞLU S., DEMİR H. V.

Conference on Light-Emitting Diodes - Materials, Devices, and Applications for Solid State Lighting XVI, San-Francisco, Costa Rica, 24 - 26 January 2012, vol.8278

- VIII. **Large-area (> 50 cm x 50 cm), freestanding, flexible, optical membranes of Cd-free nanocrystal quantum dots**

Mutlugun E., Martinez P. L. H., Eroglu C., Coskun Y., ERDEM T., Sharma V. K., Unal E., Panda S. K., Hickey S. G., Gaponik N., et al.

25th IEEE Photonics Conference (IPC), California, United States Of America, 23 - 27 September 2012, pp.477-478

- IX. **Non-radiative energy-transfer-driven quantum dot LEDs**

Guzelturk B., ERDEM T., Unal E., Nizamoglu S., Tuncel D., Demir H. V.

23rd Annual Meeting of the IEEE Photonics-Society, Colorado, United States Of America, 7 - 11 November 2010, pp.146-147

Supported Projects

Erkartal M., Erdem T., Büküşođlu E., Ően Ő., TUBITAK Project, Uçucu Organik Bileşik, Gaz Ve Nem Algılama Uygulamaları İçin Metal-Organik Kafes Ve Metal-Oksit Melez Yapılar İçeren Bir Boyutlu Fotonik Yapıların Geliştirilmesi, 2023 - 2025

Erdem T., Boynueđri A. R., TUBITAK Project, 8. Lazer Kullanılarak Yüksek Verimli Ve Uzun Mesafeli Kablosuz Güç Aktarımı, 2022 - 2024

Erdem T., TUBITAK Project, 2021 - 2024

Mutlugün E., ERDEM T., TUBITAK Project, İleri Malzeme Yüksek Teknoloji Platformları ile Elektronik ve Optik Bileşen Üretimi için Stratejik Ar-Ge Birliđi, 2021 - 2024

Erdem T., Newton Programme Project, Optical sensing of single-stranded DNAs by self-assembling DNA-functionalized nanoparticles of cellulose, semiconductors, and carbon dots, 2022 - 2023

Erdem T., TÜBİTAK International Bilateral Joint Cooperation Program Project, 2021 - 2023

Erdem T., Project Supported by Public Organizations in Other Countries, Investigation of the effect of light on the smart self-assembly of metal nanoparticles, 2020 - 2022

Erdem T., Project Supported by Public Organizations in Other Countries, Self-assembled liquid crystals of environmentally friendly 2D nanosheets for display applications, 2019 - 2020

Activities in Scientific Journals

Royal Society Open Science, Assistant Editor/Section Editor, 2017 - Continues

Metrics

Publication: 55

Citation (WoS): 1216

Citation (Scopus): 1690

H-Index (WoS): 19

H-Index (Scopus): 20