Assoc. Prof. DEFNE AKAY

**Personal Information**

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**International Researcher IDs**

ScholarID: y007pTMAAAAJ
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Publons / Web Of Science ResearcherID: AAQ-6181-2021
ScopusID: 56523020100
Yoksis Researcher ID: 111637

**Biography**

1985 yılında Ankara’daki doğmuştur. İlkokul, ortaokul ve liseyi Ankara’da, lisans eğitimini Ankara Üniversitesi Fen Fakültesi Fizik Bölümü’nde tamamlamıştır. Yüksek lisans ve doktora derecelerini ise Ankara Üniversitesi Fen Bilimleri Enstitüsü Fizik Anabilim Dalı’nda almıştır.

2010 yılında Ankara Üniversitesi Fen Fakültesi Fizik Bölümü’nde araştırma görevlisi olarak akademik hayatı başlayarak Defne Akay, 2016 yılında doktora eğitimi sürecini başarı ile tamamlamıştır. 2017 yılında Tübitak 2219 doktora sonrası araştırma bursu ile ödüllendirilmiş ve Regensburg Üniversitesi Teorik Fizik Enstitüsünde “Quantum Transport and Spintronics” araştırma grubu ile 12 ay süreli çalışmıştır. 2021 yılında Doçent unvanını almış ve 2022 yılında Ankara Üniversitesi Fen Fakültesi Fizik Bölümü Matematiksel Fizik Anabilim Dalı’nda doçent kadrosuna atanmıştır.

TÜBİTAK 1001 Araştırma Projeleri kapsamında 2021-2024 yılları arasında proje yürütücüliği yapmaktadır. Ayrıca yükseköğrenimizin destekli birçoğun önemli projeye çalışmısız, “Engineering on energy material” isimli kitabin editörlüğünü yapmıştır. Tübitak Ulakbim ve diğer önemli indexlerde tanımlı “Gazi University Journal of Science Part A: Engineering and Innovation” dergisinde Alan Editörü olarak 2020 yılından beri görev yapmaktadır. Uluslararası birçok dergide hakemlik yapmaktadır. SCI-Expanded taralı önemli dergilerde yayımlanmış çalışmaların bulunduğu WOS verilerine göre H-indexi 13’tür. İyi derecedeinglesce bilmektedir.

Evli ve bir çocukludur.

**Education Information**

Post Doctorate, Universitaet Regensburg, Institut I - Theoretische Physik, Quantum Transport and Spintronics, Germany 2017 - 2018
Doctorate, Ankara University, Fen Bilimleri Enstitüsü, Fizik (Dr), Turkey 2010 - 2016
Postgraduate, Ankara University, Fen Bilimleri Enstitüsü, Fizik (Yıl) (Tezli), Turkey 2008 - 2010
Undergraduate, Ankara University, Fen Fakültesi, Fizik Bölümü, Turkey 2003 - 2007
**Research Areas**

Electronic, Energy, Physics, Interdisciplinary Physics and Related Science and Technology Areas, Materials Science, Mathematical Methods in Physics, Statistical physics, thermodynamic and nonlinear dynamic systems, Quantum Mechanics, Fields Theory and Relativity, Electrical properties of electronic structures, interfaces, thin films and low-dimensional structures, Electronic transport in condensed matter, Natural Sciences, Engineering and Technology

**Academic Titles / Tasks**

Associate Professor, Ankara University, Fen Fakültesi, Fizik Bölümü, 2021 - Continues
Research Assistant PhD, Ankara University, Fen Fakültesi, Fizik Bölümü, 2016 - 2021
Research Assistant PhD, Universitaet Regensburg, Faculty Of The Institute Of Theoretical Physics, Solid State Physics, 2017 - 2018
Research Assistant, Ankara University, Fen Fakültesi, Fizik Bölümü, 2010 - 2016

**Courses**

Malzeme Fiziği, Postgraduate, 2022 - 2023
Düşük Sıcaklıklar Fiziği, Undergraduate, 2021 - 2022
Fizik II, Undergraduate, 2018 - 2019
Optik Lab., Undergraduate, 2016 - 2017

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

I. **Electrical characterization of Al/SnO2/PbO/Si double layer MOS under the moderate radiation effect**
   Akay D., Alkan S., Altin Z., Gökmen U., Oçak S. B.
   RADIATION PHYSICS AND CHEMISTRY, vol.216, pp.1-19, 2024 (SCI-Expanded)

II. **Characterization of electrical parameters in PbO/SnO2 double layer semiconductor (DLS) diodes**
    Seven E., AKAY D., BİLGE OÇAK S., ERDOĞAN ORHAN İ.
    Materials Science in Semiconductor Processing, vol.169, 2024 (SCI-Expanded)

III. **Semiconducting Double-Layer Lead Monoxide Tin Oxide Nanostructures for Photodetectors**
    AKAY D., Seven E., GÖKMEN U., BİLGE OÇAK S.
    ACS APPLIED NANO MATERIALS, vol.6, no.19, pp.17482-17490, 2023 (SCI-Expanded)

IV. **Electrical and optical properties of p-Si based structures with lead oxide interfaces**
    Aydemir G. A., AKAY D., TATAROĞLU A., BİLGE OÇAK S.
    Materials Science and Engineering B: Solid-State Materials for Advanced Technology, vol.294, 2023 (SCI-Expanded)

V. **Thermodynamic properties of the 2D generic helical edge states with quadrangular potential effects**
   Alkan S., AKAY D.
VI. **Beta-borophene under the circularly polarized radiation: polaritonic and polaronic dynamic band structure**
Akay D., Schlemann J.
EUROPEAN PHYSICAL JOURNAL PLUS, vol.137, pp.1273-1284, 2022 (SCI-Expanded)

VII. **Structural role of double layer amphoteric oxides forms on electrical conductivity: PbO/zinc oxide semiconductor**
Akay D., Gökmenc U., Bilge Oacak S.
PHYSICA SCRIPTA, vol.97, no.9, 2022 (SCI-Expanded)

VIII. **Mini band gap generation in magnetic beta-borophene: effects of optical phonon interaction**
Akay D., Maiti S. K.
JOURNAL OF PHYSICS D-APPLIED PHYSICS, vol.55, no.25, 2022 (SCI-Expanded)

IX. **Thermodynamic Properties and Optical Absorption of Polaron in Monolayer Graphene Under Laser Field**
Kenfack-Sadem C., Fobasso Mbognou F. C., Fotue A. J., Hounkonnou M. N., Akay D., Fai L. C.
JOURNAL OF LOW TEMPERATURE PHYSICS, vol.203, no.3-4, pp.327-344, 2021 (SCI-Expanded)

X. **Manipulating electronic dynamics of 8-Pmmn borophene with surface optical phonons**
Akay D.
SEMICONDUCTOR SCIENCE AND TECHNOLOGY, vol.36, no.4, 2021 (SCI-Expanded)

XI. **Thermodynamics Properties and Optical Conductivity of Bipolaron in Graphene Nanoribbon Under Laser irradiation**
Mbognou F. C. F., Kenfack-Sadem C., Fotue A. J., Hounkonnou M. N., Akay D., Fai L. C.
JOURNAL OF LOW TEMPERATURE PHYSICS, vol.203, no.1-2, pp.204-224, 2021 (SCI-Expanded)

XII. **TUNING THE ELECTRICAL PROPERTIES WITH HIGHER GAMMA-RAY IRRADIATION: POLY (METHYL METHACRYLATE)/LEAD OXIDE (PbO) COMPOSITE NANOSTRUCTURES**
Akay D., Bilge Oacak S.
SURFACE REVIEW AND LETTERS, vol.27, no.6, 2020 (SCI-Expanded)

XIII. **Ionizing Radiation Influence on Rubrene-Based Metal Polymer Semiconductors: Direct Information of Intrinsic Electrical Properties**
Akay D., Gökmenc U., Bilge Oacak S.
JOM, vol.72, no.6, pp.2391-2397, 2020 (SCI-Expanded)

XIV. **An evaluation of dielectric qualities by using frequency dependence in superbenzene-ring based organic polymer-semiconductors**
Akay D., Gökmenc U., Bilge Oacak S.
MATERIALS CHEMISTRY AND PHYSICS, vol.245, 2020 (SCI-Expanded)

XV. **Radiation-induced changes on poly(methyl methacrylate) (PMMA)/lead oxide (PbO) composite nanostructure**
Akay D., Gökmenc U., Bilge Oacak S.
PHYSICA SCRIPTA, vol.94, no.11, 2019 (SCI-Expanded)

XVI. **Laser light and external magnetic field control of polaron in asymmetric quantum dot**
Fobasso M. F. C., Fotue A. J., Kenfack S. C., Ekengue C. M., Ngoufack C. D. G., Akay D., Fai L. C.
SUPERLATTICES AND MICROSTRUCTURES, vol.129, pp.77-90, 2019 (SCI-Expanded)

XVII. **Stability and coherence of strong-coupling magneto-bipolaron in asymmetric quantum dot under laser field effect**
Fobasso M. F. C., Fotue A. J., Kenfack S. C., Bawe G. N., Akay D., Fai L. C.
PHYSICS LETTERS A, vol.382, no.48, pp.3490-3499, 2018 (SCI-Expanded)

XVIII. **Study of frequency dependent characterization: applied gamma-ray irradiation on metal-polymer nanostructure**
Akay D., Efil E., Kaymak N., Orhan E., Bilge Oacak S.
JOURNAL OF RADIOANALYTICAL AND NUCLEAR CHEMISTRY, vol.318, no.2, pp.1409-1417, 2018 (SCI-Expanded)

XIX. **Photoinduced Dynamical Band Gap in Graphene: The Effects of Electron-Phonon and Spin-Orbit...**
Interaction
KANDEMİR B. S., AKAY D.
PHYSICA STATUS SOLIDI B-BASIC SOLID STATE PHYSICS, vol.255, no.10, 2018 (SCI-Expanded)

Effect of gamma-ray irradiation on the electrical characteristics of Al/C24H12/p-Si nano-structure
AKAY D., Karadeniz S., Selcuk A. B., BİLGE OCAK S.
PHYSICA SCRIPTA, vol.93, no.9, 2018 (SCI-Expanded)

Trigonal warping and photo-induced effects on zone boundary phonon in monolayer graphene
AKAY D.
SUPERLATTICES AND MICROSTRUCTURES, vol.117, pp.18-24, 2018 (SCI-Expanded)

The effect of electron-A(1g) phonon coupling in spin-orbit-coupled graphene
KANDEMİR B. S., AKAY D.
PHILOSOPHICAL MAGAZINE, vol.97, no.25, pp.2225-2235, 2017 (SCI-Expanded)

Tuning the pseudo-Zeeman splitting in graphene cones by magnetic field
KANDEMİR B. S., Akay D.
JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS, vol.384, pp.101-105, 2015 (SCI-Expanded)

Articles Published in Other Journals

I. Circularly Polarized Light on Graphene with Trigonal Warping
AKAY D.
Bitlis Eren Üniversitesi Fen Bilimleri Dergisi, vol.9, no.2, pp.697-702, 2020 (Peer-Reviewed Journal)

II. Triangular Potential Effects on the Fermi Velocity Renormalization in 8-Pmmn Borophene
AKAY D.
Journal of Boron, vol.4, no.3, pp.153-157, 2019 (Peer-Reviewed Journal)

III. Off plane Impurity Effects in Graphene Quantum Dots
KANDEMİR B. S., AKAY D.
Cumhuriyet University Faculty of Science, vol.37, no.1, pp.20-29, 2016 (Peer-Reviewed Journal)

Books & Book Chapters

I. Comparison Of Electronic Properties Of Poly (Methyl Methacrylate) With The Double Heterostructure (Pmma/ Lead Oxides)
AKAY D., GÖKMEN U., BİLGE OCAK S.
in: Engineering on Energy Materials, Akay Defne, Editor, Ilkad Publications, Ankara, pp.1-30, 2020

Refereed Congress / Symposium Publications in Proceedings

I. LIGHT IRRADIATION EFFECT ON THE TOPOLOGY OF β-BOROPHENE
AKAY D.
IV. INTERNATIONAL ANKARA CONFERENCE ON SCIENTIFIC RESEARCH, Ankara, Turkey, 10 - 11 April 2021

II. DYNAMIC CHARGE CARRIERS IN LOW-SYMMETRIC AND ANISOTROPIC 2D DIRAC MATERIAL: 8-PMMN BOROPHENE
AKAY D.
CUKUROVA 6th INTERNATIONAL SCIENTIFIC RESEARCHES CONFERENCE, Adana, Turkey, 5 - 06 March 2021

III. Characterization Of Electrical Properties Of PMMA/Pbo Structures
BİLGE OCAK S., AKAY D., GÖKMEN U.
türk fizik derneği 35. uluslararası fizik kongresi, Muğla, Turkey, 5 - 09 September 2019, vol.1, pp.251-254

IV. Analyses Of Diode Parameters Using C–V and G–V Characteristics Of Al/PMMA/PbO/P-Si Structures
Activities in Scientific Journals

Gazi University Journal of Science Part A: Engineering and Innovation, Committee Member, 2021 - Continues

Metrics

Publication: 42
Citation (WoS): 303
Citation (Scopus): 300
H-Index (WoS): 13
H-Index (Scopus): 12

Scholarships

2219, TUBITAK, 2017 - 2018

Artistic Activity

AKAY D., 2017 yılında Tübitak 4007 Bilim Şenlikleri Destekleme Programı kapsamında "Bilim Yolculuğu" adlı etkinlikte "Atölye Lideri " olarak katkı verilmiştir., July 2017
AKAY D., 2016 yılında Tübitak 4007 Bilim Şenlikleri Destekleme Programı kapsamında "Şimdi Bilim Gerçek Hayat Atölyelerinde Herkes İçin" adlı etkinlikte Rehber olarak katku verilmiştir., May 2016