

# Prof. MEHMET MAHİR BÜLBÜL

## Personal Information

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## International Researcher IDs

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Publons / Web Of Science ResearcherID: AHE-8178-2022

ScopusID: 7004692444

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## Education Information

Doctorate, University of Essex, United Kingdom 1994 - 1998

Postgraduate, Gazi University, Fen Bilimleri Enstitüsü, Fizik (YI) (Tezli), Turkey 1984 - 1987

Undergraduate, Ankara University, Fen Fakültesi, Fizik Bölümü, Turkey 1978 - 1983

## Foreign Languages

English, C1 Advanced

## Dissertations

Doctorate, Raman spectroscopy of GaN epilayers and InGaAlAs quaternary semiconductor alloys., University of Essex, Physics, 1998

Postgraduate, Foton dedeksiyonu ve kızılötesi bölge lazerlerine uygulamaları, Gazi University, Fen Bilimleri Enstitüsü, Fizik (YI) (Tezli), 1987

## Research Areas

Natural Sciences

## Academic Titles / Tasks

Professor, Gazi University, Fen Fakültesi, Fizik Bölümü, 2013 - Continues

Associate Professor, Gazi University, Fen Fakültesi, Fizik Bölümü, 2009 - 2013

Assistant Professor, Gazi University, Fen Fakültesi, Fizik Bölümü, 2001 - 2008

Research Assistant, Gazi University, Fen Fakültesi, Fizik Bölümü, 1984 - 2001

## Advising Theses

Bülbül M. M., Salman O. N., Preparation and characterization of plasmonic dye-sensitized solar cells based on Au@SiO<sub>2</sub> AND Ag@SiO<sub>2</sub> core-shell nanoparticles for solar energy utilization , Postgraduate, M.ADIL(Student), 2022

BÜLBÜL M. M., Au/P3HT/n-Si (MPS) Schottky engel diyotların elektriksel ve dielektrik özelliklerinin frekansa sıcaklığa ve aydınlatma şiddetine bağlı incelenmesi, Doctorate, E.YÜKSELTÜRK(Student), 2016

BÜLBÜL M. M., Investigation Of Temperature Dependent Electrical Characteristics Of The Au/C20h12/N -Si Schottky Barrier Diodes, Postgraduate, K.MORAKİ(Student), 2015

BÜLBÜL M. M., The investigation of temperature and radiation dependent electrical and dielectric characteristics of Al/HfO<sub>2</sub>/p-Si (MIS) structure, Doctorate, S.BENGİ(Student), 2013

SALAMOV B., BÜLBÜL M. M., Photoelectric and spectral properties of photosensitive semiconductor gas discharge system, Doctorate, S.Karaköse(Student), 2012

BÜLBÜL M., Al<sub>x</sub>Ga<sub>1-x</sub>As/ GaAs SÜPERÖRGÜNÜN OPTİKSEL ÖZELLİKLERİNİN İNCELENMESİ, Postgraduate, E.YÜKSELTÜRK(Student), 2010

Bülbül M. M., Au/PVA/n-Si MIS yapıların akım-voltaj (I-V) ölçümlerinin sıcaklığa bağlı incelenmesi, Postgraduate, R.ÖZAYDIN(Student), 2009

Bülbül M. M., Al/SiN<sub>x</sub>/p-Si(100) (MY) Schottky diyotların elektriksel karakteristiklerinin düşük sıcaklıklarda incelenmesi, Doctorate, S.ZEYREK(Student), 2005

Bülbül M. M., GaAs/Al<sub>0.2</sub>Ga<sub>0.8</sub>As süperörgünün optiksel özelliklerinin fotoluminesans yöntemiyle incelenmesi, Postgraduate, S.ÖZKAYA(Student), 2005

BÜLBÜL M. M., III-V grubu yarıiletken bileşiklerin raman özellikleri, Postgraduate, E.GÜÇ(Student), 2005

Bülbül M. M., GaN yarıiletken ince filmlerin optik özelliklerinin fotoluminesans tekniğiyle incelenmesi, Postgraduate, S.CEBE(Student), 2004

Bülbül M. M., Altın ve kübik galyum nitrid ince tabakalarının raman özellikleri, Postgraduate, Y.TAN(Student), 2003

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

- I. **Preparation of Ag@SiO<sub>2</sub> core-shell nanoparticles for plasmonic dye-sensitized solar cell application using laser ablation in liquid technique**  
Mohammed M. A., Salman O. N., BÜLBÜL M. M.  
Optical and Quantum Electronics, vol.56, no.1, 2024 (SCI-Expanded)
- II. **Investigation of electrical characterization of Al/HfO<sub>2</sub>/p-Si structures in wide temperature range**  
Bengi S., Yükseltürk E., BÜLBÜL M. M.  
Journal of Materials Science: Materials in Electronics, vol.34, no.3, 2023 (SCI-Expanded)
- III. **Temperature dependence of characteristic parameters of the Au/C20H12/n-Si Schottky barrier diodes (SBDs) in the wide temperature range**  
Moraki K., Bengi S., Zeyrek S., Bulbul M. M., Altındal Ş.  
JOURNAL OF MATERIALS SCIENCE-MATERIALS IN ELECTRONICS, vol.28, no.5, pp.3987-3996, 2017 (SCI-Expanded)
- IV. **Annealing effect on the electrical properties of HfO<sub>2</sub> based Schottky barrier diodes**  
Bengi S., BÜLBÜL M. M.  
JOURNAL OF OPTOELECTRONICS AND ADVANCED MATERIALS, vol.16, pp.451-456, 2014 (SCI-Expanded)
- V. **Electrical and dielectric properties of Al/HfO<sub>2</sub>/p-Si MOS device at high temperatures**  
Bengi S., Bulbul M. M.  
CURRENT APPLIED PHYSICS, vol.13, no.8, pp.1819-1825, 2013 (SCI-Expanded)
- VI. **The effect of series resistance and interface states on the frequency dependent C-V and G/w-V characteristics of Al/perylene/p-Si MPS type Schottky barrier diodes**  
Zeyrek S., Acaroglu E., Altındal Ş., Birdogan S., Bulbul M. M.  
CURRENT APPLIED PHYSICS, vol.13, no.7, pp.1225-1230, 2013 (SCI-Expanded)
- VII. **The C-V and G/omega-V Electrical Characteristics of Co-60 gamma-Ray Irradiated Al/Si<sub>3</sub>N<sub>4</sub>/p-Si (MIS) Structures**  
Zeyrek S., Turan A., Bulbul M. M.

CHINESE PHYSICS LETTERS, vol.30, no.7, 2013 (SCI-Expanded)

- VIII. **Frequency dependent dielectric properties and electrical conductivity of platinum silicide/Si contact structures with diffusion barrier**  
Afandiyeva I. M., Bulbul M. M., Altindal Ş., Bengi S.  
MICROELECTRONIC ENGINEERING, vol.93, pp.50-55, 2012 (SCI-Expanded)
- IX. **The density of interface states and their relaxation times in Au/Bi<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub>/SiO<sub>2</sub>/n-Si(MFIS) structures**  
Bulbul M. M., Altindal Ş., Parlaktürk F., TATAROĞLU A.  
SURFACE AND INTERFACE ANALYSIS, vol.43, no.13, pp.1561-1565, 2011 (SCI-Expanded)
- X. **Temperature dependent capacitance and conductance-voltage characteristics of Au/polyvinyl alcohol(Co,Zn)/n-Si Schottky diodes**  
Bulbul M. M., Bengi S., Dokme İ., Altindal Ş., Tunc T.  
JOURNAL OF APPLIED PHYSICS, vol.108, no.3, 2010 (SCI-Expanded)
- XI. **Temperature and frequency dependent dielectric properties of Au/Bi<sub>4</sub>Ti<sub>3</sub>O<sub>12</sub>/SiO<sub>2</sub>/Si (MFIS) structures**  
ALTINDAL Ş., Parlaktürk F., TATAROĞLU A., BÜLBÜL M. M.  
Journal of Optoelectronics and Advanced Materials, vol.12, no.10, pp.2139-2143, 2010 (SCI-Expanded)
- XII. **The Double Gaussian Distribution of Inhomogeneous Barrier Heights in Al/GaN/p-GaAs (MIS) Schottky Diodes in Wide Temperature Range**  
Zeyrek S., Buelbuel M. M., Altindal Ş., Baykul M. C., Yuezzer H.  
BRAZILIAN JOURNAL OF PHYSICS, vol.38, no.4, pp.591-597, 2008 (SCI-Expanded)
- XIII. **Frequency and voltage effects on the dielectric properties and electrical conductivity of Al-TiW-Pd<sub>2</sub>Si/n-Si structures**  
Afandiyeva I. M., Doekme İ., Altindal Ş., Buelbuel M. M., TATAROĞLU A.  
MICROELECTRONIC ENGINEERING, vol.85, no.2, pp.247-252, 2008 (SCI-Expanded)
- XIV. **The effect of Co-60 (gamma-ray) irradiation Au/SnO<sub>2</sub>/n-Si on the electrical characteristics of (MIS) structures**  
Goekcen M., TATAROĞLU A., Altindal Ş., Buelbuel M. M.  
RADIATION PHYSICS AND CHEMISTRY, vol.77, no.1, pp.74-78, 2008 (SCI-Expanded)
- XV. **The barrier height distribution in identically prepared Al/p-Si Schottky diodes with the native interfacial insulator layer (SiO<sub>2</sub>)**  
Altindal Ş., Kanbur H., TATAROĞLU A., Buelbuel M. M.  
PHYSICA B-CONDENSED MATTER, vol.399, no.2, pp.146-154, 2007 (SCI-Expanded)
- XVI. **The barrier height inhomogeneity in Al/p-Si Schottky barrier diodes with native insulator layer**  
Dokme İ., Altindal Ş., Bulbul M. M.  
APPLIED SURFACE SCIENCE, vol.252, no.22, pp.7749-7754, 2006 (SCI-Expanded)
- XVII. **The role of the interface insulator layer and interface states on the current-transport mechanism of Schottky diodes in wide temperature range**  
Altindal Ş., Dokme İ., Bulbul M. M., Yalcin N., Serin T.  
MICROELECTRONIC ENGINEERING, vol.83, no.3, pp.499-505, 2006 (SCI-Expanded)
- XVIII. **On the profile of temperature dependent series resistance in Al/Si<sub>3</sub>N<sub>4</sub>/p-Si (MIS) Schottky diodes**  
Bulbul M. M., Zeyrek S., Altindal Ş., Yuzer H.  
MICROELECTRONIC ENGINEERING, vol.83, no.3, pp.577-581, 2006 (SCI-Expanded)
- XIX. **Current transport mechanism in Al/Si<sub>3</sub>N<sub>4</sub>/p-Si (MIS) Schottky barrier diodes at low temperatures**  
Zeyrek S., Altindal Ş., Yuzer H., Bulbul M. M.  
APPLIED SURFACE SCIENCE, vol.252, no.8, pp.2999-3010, 2006 (SCI-Expanded)
- XX. **Temperature and frequency dependent electrical and dielectric properties of Al/SiO<sub>2</sub>/p-Si (MOS) structure**  
Tataroğlu A., Altindal Ş., Bulbul M. M.  
MICROELECTRONIC ENGINEERING, vol.81, no.1, pp.140-149, 2005 (SCI-Expanded)
- XXI. **Segregation and non-segregation of Ge for H(Cl): Si(001)/Ge-(2x1) and H(Cl): Si(001)/Ge-(3x1)**

- Bulbul M. M., ÇAKMAK M., Srivastava G., Colakoglu K.  
SURFACE SCIENCE, vol.507, pp.40-45, 2002 (SCI-Expanded)
- XXII. **First-order Raman spectra from In<sub>1-x-y</sub>GaxAlyAs epitaxial layers grown on InP substrates**  
Bulbul M. M., Farrant G., Smith S.  
EUROPEAN PHYSICAL JOURNAL B, vol.24, no.1, pp.3-6, 2001 (SCI-Expanded)
- XXIII. **Effect of hydrogenation on the adsorption of Ge on Si(001)**  
Bulbul M. M., ÇAKMAK M., Srivastava G., Colakoglu K.  
PHYSICAL REVIEW B, vol.64, no.15, 2001 (SCI-Expanded)
- XXIV. **Infrared spectroscopic study on the T-d-type clathrates: Cd(Cyclohexylamine)(2)M(CN)(4)center dot 2C(6)H(6) (M = Cd or Hg)**  
Kantarci Z., Karabacak M., Bulbul M. M.  
JOURNAL OF INCLUSION PHENOMENA AND MACROCYCLIC CHEMISTRY, vol.40, no.4, pp.317-321, 2001 (SCI-Expanded)
- XXV. **Infrared spectroscopic and gravimetric studies on the dicyclohexylaminemetal(II) tetracyanonickellate(II) host-aromatic guest systems**  
Kantarci Z., Bulbul M. M.  
JOURNAL OF INCLUSION PHENOMENA AND MACROCYCLIC CHEMISTRY, vol.40, pp.105-116, 2001 (SCI-Expanded)
- XXVI. **Raman spectroscopy of optical phonons as a probe of GaN epitaxial layer structural quality**  
Bulbul M. M., Smith S., Obradovic B., Cheng T., Foxon C.  
EUROPEAN PHYSICAL JOURNAL B, vol.14, no.3, pp.423-429, 2000 (SCI-Expanded)
- XXVII. **Far-infrared and Raman analysis of phonons and phonon interface modes in GaN epilayers on GaAs and GaP substrates**  
Mirjalili G., Parker T., Farjami Shayesteh S., BÜLBÜL M. M., Smith S., Cheng T., Foxon C.  
Physical Review B - Condensed Matter and Materials Physics, vol.57, no.8, pp.4656-4663, 1998 (SCI-Expanded)

## Articles Published in Other Journals

- I. **Hybrid Organic-Inorganic ZnO/PCBM Electron Transport Layer with Organic Lead Halide Perovskite Solar Cell Materials CH<sub>3</sub>NH<sub>3</sub>PbIX<sub>2</sub>, X is Cl or I**  
Alaiawi A. A. L., BÜLBÜL M. M., Jafar A. M.  
International Journal of Nanoscience, vol.23, no.3, 2024 (ESCI)

## Refereed Congress / Symposium Publications in Proceedings

- I. **Hybrid organic-inorganic ZnO/PCBM electron transport layer with perovskite solar cell material CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub> in numerical simulation with SCAPS**  
Alaiawi A. A. L., BÜLBÜL M. M., Jafar A. M.  
5th International Conference on Applied Sciences, ICAS 2023, Baghdad, Iraq, 26 - 27 August 2023, vol.3097
- II. **Electrical characteristics of Au/n-Si structure with perylene interfacial layer at room temperature**  
BENGİ S., BÜLBÜL M. M.  
5th International Conference on Materials Science and Nanotechnology for Next Generation, 4 - 06 June 2018
- III. **The effect of illumination on the electrical characterization of Al/HfO<sub>2</sub>/p-Si MOS device**  
YÜKSELTÜRK E., BENGİ S., BÜLBÜL M. M.  
5th International Conference on Materials Science and Nanotechnology for Next Generation, 4 - 06 October 2018
- IV. **Electrical properties of Al/HfO<sub>2</sub>/p-Si MOS device in dark and under 250 W illumination level,**  
YÜKSELTÜRK E., BENGİ S., BÜLBÜL M. M.  
2nd International Conference on Innovations in Natural Science and Engineering, KYİV, Ukraine, 7 - 10 September 2018
- V. **Capacitance-voltage and Conductance-voltage Characteristics of Au/C<sub>20</sub>H<sub>12</sub>/n-Si Structure at high**

## temperatures

BENGİ S., YÜKSELTÜRK E., BÜLBÜL M. M.

2nd International Conference on Innovations in Natural Science and Engineering, Kye, Ukraine, 7 - 10 September 2018

- VI. **Capacitance - voltage and Conductance - voltage Characteristics of Au/ C20H12/n-Si Structure at high temperatures**  
BENGİ S., YÜKSELTÜRK E., BÜLBÜL M. M.  
2nd International Conference on Innovations in Natural Science and Engineering, 7 - 09 September 2018
- VII. **Al/P3HT/p-Si (MPS) Schottky Diyotlarının Oda Sıcaklığında Akım-Gerilim Karakteristiklerinin I-V, Norde ve Cheung Metodu Kullanılarak İncelenmesi**  
YÜKSELTÜRK E., ÇOTUK M., BÜLBÜL M. M., ZEYREK S.  
23. Yoğun Madde Fiziği - Ankara Toplantısı, Ankara, Turkey, 22 December 2017
- VIII. **On the profile of temperature dependent main electrical parameters inAl/P3HT/p-Si (MPS) structures at low temperatures**  
YÜKSELTÜRK E., ÇOTUK M., BÜLBÜL M. M., ALTINDAL Ş., ZEYREK S.  
InternationalCongress on Semiconductor Materials and Devices (ICSMD-2017), Konya, Turkey, 17 - 19 August 2017
- IX. **THE INVESTIGATION OF FREQUENCY AND VOLTAGE DEPENDENCE ON ELECTRIC CHARACTERISTICS OF Al/P3HT/ P-Si (MPS) STRUCTURES**  
YÜKSELTÜRK E., ÇOTUK M., BÜLBÜL M. M., ALTINDAL Ş., ZEYREK S.  
INTERNATIONAL CONGRESS ON SEMICONDUCTOR MATERIAL AND DEVICES, 17 - 19 August 2017
- X. **The Effects of Illumination on Electrical Parameters of Au/P3HT/n-Si Schottky Barrier Diode**  
Yukselturk E., Bulbul M. M., Zeyrek S.  
9th International Physics Conference of the Balkan-Physical-Union (BPU), İstanbul, Turkey, 24 - 27 August 2015, vol.1722
- XI. **Surface behaviour of plasma etched photodetector in a planar gas discharge image converter, Malmö, Sweden**  
BÜLBÜL M. M., KURT H. H., salamov b.  
7th International Conference on Nanometer-Scale Science and Technology, (ECOSS-21), 14 - 16 June 2002

## Supported Projects

BÜLBÜL M. M., Project Supported by Higher Education Institutions, Yarıiletken katotlu gaz boşalma sistemin incelenmesi, 2009 - 2011

BÜLBÜL M. M., Project Supported by Higher Education Institutions, Metal/Gap ve Metal/Inp (Ms) Yapıların Hazırlanması, Elektriksel ve Dielektrik Özelliklerinin Sıcaklık ve Frekansa Bağlı İncelenmesi, 2008 - 2009

Bülbül M. M., Project Supported by Other Official Institutions, Gazi Üniversitesi İleri Araştırma ve Eğitim Programı DPT Projesi 2001K120590, 2001 - 2006

Bülbül M. M., Çakmak M., TUBITAK Project, Moleküler Dinamik Method Kullanılarak Yarıiletkenlerin Büyütme Modellemesi ve ab initio Elektronik Band Yapısı Hesabı Tübitak Projei TBAG 1950 100T073, 2000 - 2002

## Metrics

Publication: 41

Citation (WoS): 1100

Citation (Scopus): 1142

H-Index (WoS): 16

H-Index (Scopus): 16

## **Non Academic Experience**

TUBITAK, TUBİTAK-BİDEB, TUBİTAK-BİDEB