

## Doç. Dr. Fatih AKYOL

### Kişisel Bilgiler

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### Uluslararası Araştırmacı ID'leri

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Publons / Web Of Science ResearcherID: AAE-8502-2020

Yoksis Araştırmacı ID: 286293

### Eğitim Bilgileri

Post Doktora, Ohio State University, Electrical And Computer Engineering, Amerika Birleşik Devletleri 2016 - 2017

Doktora, Ohio State University, Electrical And Computer Engineering, Amerika Birleşik Devletleri 2011 - 2016

Yüksek Lisans, Ohio State University, Electrical And Computer Engineering, Amerika Birleşik Devletleri 2009 - 2011

Lisans, Gaziantep Üniversitesi, Elektrik - Elektronik Muh., Türkiye 2003 - 2008

### Yabancı Diller

Almanca, A1 Başlangıç

İngilizce, C1 İleri

### Yaptığı Tezler

Doktora, Nanoscale Electron Transport Engineering for GaN Optoelectronic Devices, Ohio State University, Electrical And Computer Engineering, Faculty Of Engineering, 2016

Yüksek Lisans, N-Polar III-Nitride Optoelectronic Devices, Ohio State University, Electrical And Computer Engineering, Faculty Of Engineering, 2011

### Araştırma Alanları

Elektrik-Elektronik Mühendisliği, Optoelektronik Malzeme ve Aygıtlar , Yarı İletken Malzeme ve Aygıtlar , Nanomalzemeler, Mühendislik ve Teknoloji

### Akademik Unvanlar / Görevler

Dr. Öğr. Üyesi, Yıldız Teknik Üniversitesi, Kimya-Metalurji Fakültesi, Met.Ve Malzeme Müh.Böl., 2018 - Devam Ediyor

### SCI, SSCI ve AHCI İndekslerine Giren Dergilerde Yayınlanan Makaleler

- I. **Carrier transport in LPCVD grown Ge-doped  $\beta$ -Ga<sub>2</sub>O<sub>3</sub>/4H-SiC isotype heterojunction**  
Saquib T., AKYOL F., Ozden H., Somaiah N., Sahoo J., Muralidharan R., Nath D.  
Journal of Applied Physics, cilt.135, sa.6, 2024 (SCI-Expanded)
- II. **Chemical vapor deposition growth of  $\beta$ -Ga<sub>2</sub>O<sub>3</sub> on Si- and C- face off-axis 4H-SiC at high temperature**  
AKYOL F., Ozden H.  
Materials Science in Semiconductor Processing, cilt.170, 2024 (SCI-Expanded)
- III. **Close oxygen coupled low-pressure chemical vapor deposition growth of high quality beta - Ga<sub>2</sub>O<sub>3</sub> on sapphire**  
AKYOL F., DEMİR İ.  
MATERIALS SCIENCE IN SEMICONDUCTOR PROCESSING, cilt.146, 2022 (SCI-Expanded)
- IV. **Simulation of beta-Ga<sub>2</sub>O<sub>3</sub> vertical Schottky diode based photodetectors revealing average hole mobility of 20cm<sup>2</sup>V<sup>(-1)</sup>s<sup>(-1)</sup>**  
AKYOL F.  
JOURNAL OF APPLIED PHYSICS, cilt.127, sa.7, 2020 (SCI-Expanded)
- V. **Tunnel-injected sub 290 nm ultra-violet light emitting diodes with 2.8% external quantum efficiency**  
Zhang Y., Jamal-Eddine Z., Akyol F., Bajaj S., Johnson J. M., Calderon G., ALLERMAN A. A., MOSELEY M. W., ARMSTRONG A. M., Hwang J., et al.  
APPLIED PHYSICS LETTERS, cilt.112, sa.7, 2018 (SCI-Expanded)
- VI. **High Al-Content AlGa<sub>N</sub> Transistor With 0.5 A/mm Current Density and Lateral Breakdown Field Exceeding 3.6 MV/cm**  
Bajaj S., ALLERMAN A., ARMSTRONG A., Razzak T., Talesara V., Sun W., Soheli S. H., Zhang Y., Lu W., Arehart A. R., et al.  
IEEE ELECTRON DEVICE LETTERS, cilt.39, sa.2, ss.256-259, 2018 (SCI-Expanded)
- VII. **Ultralow-voltage-drop GaN/InGa<sub>N</sub>/GaN tunnel junctions with 12% indium content**  
Akyol F., Zhang Y., Krishnamoorthy S., Rajan S.  
APPLIED PHYSICS EXPRESS, cilt.10, sa.12, 2017 (SCI-Expanded)
- VIII. **Graded AlGa<sub>N</sub> Channel Transistors for Improved Current and Power Gain Linearity**  
Bajaj S., Yang Z., Akyol F., PARK P. S., Zhang Y., Price A. L., Krishnamoorthy S., MEYER D. J., Rajan S.  
IEEE TRANSACTIONS ON ELECTRON DEVICES, cilt.64, sa.8, ss.3114-3119, 2017 (SCI-Expanded)
- IX. **Reflective metal/semiconductor tunnel junctions for hole injection in AlGa<sub>N</sub> UV LEDs**  
Zhang Y., Krishnamoorthy S., Akyol F., Johnson J. M., ALLERMAN A. A., MOSELEY M. W., ARMSTRONG A. M., Hwang J., Rajan S.  
APPLIED PHYSICS LETTERS, cilt.111, sa.5, 2017 (SCI-Expanded)
- X. **Tunnel-injected sub-260nm ultraviolet light emitting diodes**  
Zhang Y., Krishnamoorthy S., Akyol F., Bajaj S., ALLERMAN A. A., MOSELEY M. W., ARMSTRONG A. M., Rajan S.  
APPLIED PHYSICS LETTERS, cilt.110, sa.20, 2017 (SCI-Expanded)
- XI. **Design of p-type cladding layers for tunnel-injected UV-A light emitting diodes**  
Zhang Y., Krishnamoorthy S., Akyol F., ALLERMAN A. A., MOSELEY M. W., ARMSTRONG A. M., Rajan S.  
APPLIED PHYSICS LETTERS, cilt.109, sa.19, 2016 (SCI-Expanded)
- XII. **AlGa<sub>N</sub> channel field effect transistors with graded heterostructure ohmic contacts**  
Bajaj S., Akyol F., Krishnamoorthy S., Zhang Y., Rajan S.  
APPLIED PHYSICS LETTERS, cilt.109, sa.13, 2016 (SCI-Expanded)
- XIII. **Design and demonstration of ultra-wide bandgap AlGa<sub>N</sub> tunnel junctions**  
Zhang Y., Krishnamoorthy S., Akyol F., ALLERMAN A. A., MOSELEY M. W., ARMSTRONG A. M., Rajan S.  
APPLIED PHYSICS LETTERS, cilt.109, sa.12, 2016 (SCI-Expanded)
- XIV. **Enhanced light extraction in tunnel junction-enabled top emitting UV LEDs**  
Zhang Y., ALLERMAN A. A., Krishnamoorthy S., Akyol F., MOSELEY M. W., ARMSTRONG A. M., Rajan S.  
APPLIED PHYSICS EXPRESS, cilt.9, sa.5, 2016 (SCI-Expanded)
- XV. **Low-resistance Ga<sub>N</sub> tunnel homojunctions with 150 kA/cm<sup>2</sup> current and repeatable negative differential resistance**  
Akyol F., Krishnamoorthy S., Zhang Y., Johnson J., Hwang J., Rajan S.

- APPLIED PHYSICS LETTERS, cilt.108, sa.13, 2016 (SCI-Expanded)
- XVI. **Density-dependent electron transport and precise modeling of GaN high electron mobility transistors**  
Bajaj S., Shoron O. F., Park P. S., Krishnamoorthy S., Akyol F., Hung T., REZA S., CHUMBES E. M., Khurgin J., Rajan S.  
APPLIED PHYSICS LETTERS, cilt.107, sa.15, 2015 (SCI-Expanded)
- XVII. **GaN-based three-junction cascaded light-emitting diode with low-resistance InGaN tunnel junctions**  
Akyol F., Krishnamoorthy S., Zhang Y., Rajan S.  
APPLIED PHYSICS EXPRESS, cilt.8, sa.8, 2015 (SCI-Expanded)
- XVIII. **Interband tunneling for hole injection in III-nitride ultraviolet emitters**  
Zhang Y., Krishnamoorthy S., Johnson J. M., Akyol F., ALLERMAN A., MOSELEY M. W., ARMSTRONG A., Hwang J., Rajan S.  
APPLIED PHYSICS LETTERS, cilt.106, sa.14, 2015 (SCI-Expanded)
- XIX. **InGaN/GaN tunnel junctions for hole injection in GaN light emitting diodes**  
Krishnamoorthy S., Akyol F., Rajan S.  
APPLIED PHYSICS LETTERS, cilt.105, sa.14, 2014 (SCI-Expanded)
- XX. **Tunneling-based carrier regeneration in cascaded GaN light emitting diodes to overcome efficiency droop**  
Akyol F., Krishnamoorthy S., Rajan S.  
APPLIED PHYSICS LETTERS, cilt.103, sa.8, 2013 (SCI-Expanded)
- XXI. **Low resistance GaN/InGaN/GaN tunnel junctions**  
Krishnamoorthy S., Akyol F., Park P. S., Rajan S.  
APPLIED PHYSICS LETTERS, cilt.102, sa.11, 2013 (SCI-Expanded)
- XXII. **Polarization-engineered GaN/InGaN/GaN tunnel diodes**  
Krishnamoorthy S., Nath D. N., Akyol F., Park P. S., Esposito M., Rajan S.  
APPLIED PHYSICS LETTERS, cilt.97, sa.20, 2010 (SCI-Expanded)

## **Diğer Dergilerde Yayınlanan Makaleler**

- I. **Investigating the effect of self-trapped holes in the current gain mechanism of beta-Ga<sub>2</sub>O<sub>3</sub> Schottky diode photodetectors**  
AKYOL F.  
TURKISH JOURNAL OF PHYSICS, cilt.45, sa.3, ss.169-177, 2021 (ESCI)

## **Kitap & Kitap Bölümleri**

- I. **Gallium Nitride-Based Interband Tunnel Junctions**  
AKYOL F.  
Gallium Nitride (GaN) Physics, Devices, and Technology, Farid Medjdoub, Editör, Crc Press, Florida, Boca Raton, ss.299-326, 2017

## **Hakemli Kongre / Sempozyum Bildiri Kitaplarında Yer Alan Yayınlar**

- I. **Epitaxial Growth of Monoclinic Gallium Oxide ( $\beta$ -Ga<sub>2</sub>O<sub>3</sub>) Layers on 4H- Silicon Carbide (SiC)**  
Özden H., AKYOL F.  
International Marmara Sciences Congress 2022, Kocaeli, Türkiye, 9 - 10 Aralık 2022
- II. **Growth of single crystal Ga<sub>2</sub>O<sub>3</sub> by customized low pressure chemical deposition**  
AKYOL F.  
Global conference on Material Sciences, İstanbul, Türkiye, 30 Ekim - 01 Kasım 2020

- III. **Tunnel-injected ultraviolet light-emitting diodes (Conference Presentation)**  
RAJAN S., ZHANG Y., JAMAL EDDIE Z., AKYOL F., HWANG J., JOHNSON J.  
Gallium Nitride Materials and Devices XIII, San Francisco, United States, Amerika Birleşik Devletleri, 27 Ocak - 01 Şubat 2018, cilt.10532
- IV. **Small-Signal Characteristics of Graded AlGa<sub>N</sub> Channel PoIFETs**  
BAJAJ S., YANG Z., AKYOL F., PARK P. S., ZHANG Y., SOHEL S. H., KRISHNAMOORTHY S., MEYER D. J., RAJAN S.  
2017 75TH ANNUAL DEVICE RESEARCH CONFERENCE (DRC), South Bend, 25 - 28 Haziran 2017
- V. **Ultra-Wide Bandgap AlGa<sub>N</sub> Channel MISFET with Polarization Engineered Ohmics**  
BAJAJ S., AKYOL F., KRISHNAMOORTHY S., ZHANG Y., ARMSTRONG A., ALTERMAN A., RAJAN S.  
2016 74TH ANNUAL DEVICE RESEARCH CONFERENCE (DRC), Newark, 19 - 22 Haziran 2016
- VI. **Sub 300 nm Wavelength III-Nitride Tunnel-Injected Ultraviolet LEDs**  
ZHANG Y., KRISHNAMOORTHY S., AKYOL F., KHANDAKER S., ALLERMAN A., MOSELEY M. W., ARMSTRONG A., RAJAN S.  
2015 73RD ANNUAL DEVICE RESEARCH CONFERENCE (DRC), Columbus, 21 - 24 Haziran 2015, ss.69-70
- VII. **Density-Dependent Electron Transport for Accurate Modeling of AlGa<sub>N</sub>/Ga<sub>N</sub> HEMTs**  
BAJAJ S., SHORON O. F., PARK P. S., KRISHNAMOORTHY S., AKYOL F., HUNG T. H., REZA S., CHUMBES E. M., KHURGIN J. B., RAJAN S.  
2015 73RD ANNUAL DEVICE RESEARCH CONFERENCE (DRC), Columbus, 21 - 24 Haziran 2015, ss.33-34
- VIII. **Power Switching Transistors Based on Ga<sub>N</sub> and AlGa<sub>N</sub> Channels**  
Bajaj S., Hung T., Akyol F., Krishnamoorthy S., Khandaker S., ARMSTRONG A., ALLERMAN A., Rajan S.  
3rd IEEE Workshop on Wide Bandgap Power Devices and Applications (WiPDA), Virginia, Amerika Birleşik Devletleri, 2 - 04 Kasım 2015, ss.16-20
- IX. **III-nitride tunnel junctions for efficient solid state lighting**  
Krishnamoorthy S., Akyol F., Rajan S.  
Conference on Gallium Nitride Materials and Devices IX, San-Francisco, Kostarika, 3 - 06 Şubat 2014, cilt.8986

## Desteklenen Projeler

Akyol F., Demir I., TÜBİTAK - AB COST Projesi , European Network for Innovative and Advanced Epitaxy, 2021 - 2026  
Akyol F., Demir İ., Gür E., TÜBİTAK Projesi, Ultra Geniş Bant Aralıklı Rutil-Geo2 Tek Kristal Yapıların Düşük Basınçlı Kimyasal Buhar Biriktirme Yöntemiyle Büyütülmesi Ve Karakterizasyonu, 2022 - 2025  
Akyol F., TÜBİTAK Projesi, Monoklinik Galyum Oksit ( $\beta$ -Ga<sub>2</sub>O<sub>3</sub>) Tabakalarının 4h- Silisyum Karbür (SiC) Üzerine Epitaksiyel Elde Edilmesi, 2021 - 2022  
Akyol F., TÜBİTAK Projesi, Low Pressure Chemical Vapor Deposition of Ga<sub>2</sub>O<sub>3</sub>, 2019 - 2022

## Patent

Akyol F., TUNNEL JUNCTION ULTRAVIOLET LIGHT EMITTING DIODES WITH ENHANCED LIGHT EXTRACTION EFFICIENCY, Patent, BÖLÜM H Elektrik, Buluşun Tescil No: WO 2018/204402 A1 , Standart Tescil, 2018

## Metrikler

Yayın: 33  
Atıf (WoS): 931  
Atıf (Scopus): 1023  
H-İndeks (WoS): 17  
H-İndeks (Scopus): 17