

Dr. Yakup Bakış, PhD

Doctor of Philosophy in Physics

Semiconductor & Nanotechnology Specialist
Radiation Detector Systems
Advanced Instrumentation Expert

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Education

PhD, Physics (08/2005 - 09/2011)

Gebze Technical University, Gebze, Kocaeli-Turkey, **GPA: 3.79 / 4.00**

THESIS: Investigation of $A^3B^3C^6_2$ Ferroelectric Semiconductor with Dielectric Spectroscopy

Advisor: Prof. Dr. Rauf Süleymanlı

PhD Research Funding: TÜBİTAK Project (2006–2009)

Master of Science, Physics (05/2003 -07/2005)

Gebze Technical University, Gebze, Kocaeli-Turkey, **GPA: 2.71 / 4.00**

THESIS: Dielectric Spectroscopy Of Layered $TlInS_2$ Crystal

Advisor: Prof. Dr. Ferid Salehli

Master of Education, Physics (08/2001-04/2003)

Marmara University, Ataturk Education Faculty, Istanbul-Turkey

(Non-Thesis Master's program)

Bachelor of Science, Physics, (03/1995-09/1998)

Istanbul University, Istanbul/Turkey **GPA: 64 / 100**

Experimental study on neutron activation energy.

Academic Positions

Lecturer (2026–Present, (Part-Time))

Istanbul Aydın University, Management Information Sys. Eng.

Assistant Professor (2024-2025)

İstanbul Gelişim University, Electric and Electronics Eng.

Assistant Professor (2014 –2016)

Fatih University, BioNano Technology R&D Center,

Research Specialist (2010 –2014)

Fatih University, BioNanoTechnology R&D Center,

Project assistant (2007 –2009)

Gebze Technical University, Physics Department

Administrative Duties

Coordinator. 2014 –2016 Fatih University, BioNano Technology R&D Center,

Nonacademic Teaching Positions

IB, Physics Teacher	2022 -2025	Kartal A.İ.H.L.
IB, Physics Teacher.	2020-2021	Hüseyin Avni Sözen.
Physics Teacher	2020-2021	Şile Bilgi Kuram College,
Physics Teacher	2019-2020	Birey High School and Courses
IB Physics Teacher	2017- 2020	Doğa Schools, Acarkent Campus,

Industry Experience

Full Stack Developer

EVSE Teknik Energy Cons. Tour. and Food Ind. Tic Ltd. (2024-2025)

- Embedded IoT payment & energy control systems
- WebSocket communication infrastructure
- Hardware-software integration

R&D Engineer – Radiation Detection & Embedded Systems

IRADETS – Innovative Radiation Detector Systems (2023–2024)

- Developed a portable Gamma Camera system
- Designed embedded communication architecture using ESP32
- Implemented real-time data acquisition & transmission protocols
- Integrated CAEN 64-channel SiPM readout system
- Coordinated Raspberry Pi based signal processing
- Developed hardware-software synchronization algorithms
- Implemented embedded firmware and real-time signal processing

Advanced Laboratory Infrastructure & Accreditation Development

OPTOMED Calibration & Metrology Training Center (2021–2023)

R&D Laboratory Specialist

- Designed and implemented full ISO/IEC 17025 compliant laboratory documentation system
- Developed all uncertainty calculation spreadsheets for:
 - Volume calibration
 - Torque calibration
 - Temperature calibration
- Prepared laboratory procedures and accreditation documentation
- Conducted experimental validation and performance verification
- Implemented Excel-based automated uncertainty propagation models
- Contributed to electrical calibration system development (project phase)

Regional Director

Global Analitik LAB. C. SAN. TIC. LTD. S., (2008-2009)

- Managed regional technical sales and laboratory device integration
- Coordinated client technical support and calibration systems

Teaching Experience

Undergraduate Courses:

Fall 2026 (Language: English)

- IAT202 Advanced Network Technologies
- UMI224 Computer Network Programming
- UMI202 Web Design And Programming

Spring 2025 (Language: English)

- EEE202 Electronic Circuits
- EEE216 Electromagnetic Theory
- EEE218 Circuit Analysis II

Fall 2025 (Language: Turkish)

- HEE203 Temel Elektrik III Lab
- HEE205 Temel Elektronik III
- HEE207 Temel Elektronik III Lab

Graduate Courses:

2013-2016 (Language; English)

- BNTE 610 "Solar Energy and Technology",
- BNTE 613 "Materials Characterization Techniques",
- BNTE 614 "Advanced Semiconductor Devices",
- BNTE 617 "Semiconductor Physics and Technology",
- BNTE 619 "Organic Electronic, Devices and Technologies",
- CHEM 405 "Material Chemistry",
- CHEM 432 "Solid State Chemistry and Inorganic Materials",

Research Expertise

- Organic and Inorganic Electronic Devices (OFETs, Solar Cells, LEDs)
- Radiation Detector Systems
- Nanotechnology and Nanofabrication
- Semiconductor Physics and Dielectric Spectroscopy
- Photovoltaic Systems and Thin Film Technologies

Technical & Computational Skills

- Python (scientific computing)
- MATLAB
- LabVIEW
- Scientific Computing & Numerical data analysis, (Geant4)
- Programming & Software (Php, SQL, HTML, Java, Mobile Apps)
- Embedded systems development (ESP32, Raspberry Pi, CAEN SiPM Integration)
- AutoCAD, SolidWorks
- Data analysis and device communication
- PID control systems and graphical interface development
- IoT communication protocols
- Calibration & Metrology (ISO/IEC 17025 compliant calibration system development)

Advanced Instrumentation & Cleanroom Leadership (6+ Years)

(6+ Years Active Operational & Process Development Experience)

- Thin Film Growth & Micro/Nano Fabrication
- Molecular Beam Epitaxy (MBE)
- Electron Beam Deposition
- Magnetron RF-DC Sputtering
- Organic Evaporation Systems
- Plasma Enhanced Chemical Vapor Deposition (PECVD)
- Reactive Ion Etching (RIE)
- Maskless Photolithography

- E-Beam Lithography

Electrical & Semiconductor Characterization

- Semiconductor Parameter Analyzer (Keithley SCS-4200)
- Dielectric Spectroscopy (Novocontrol)
- Solar Simulator Systems
- LCR Meter & Electrometer (Keithley 6517B)

Optical & Spectroscopic Characterization

- UV-Vis-IR Transmission / Reflection / Photoluminescence
- Raman Spectroscopy (Thermo Scientific DXR2)
- FT-IR Spectroscopy (Thermo Nicolet 6700)
- Lock-In Amplifier Systems (Stanford SR850)

Surface & Structural Characterization

- X-Ray Diffraction (XRD) – RIGAKU SmartLab
- X-Ray Fluorescence (XRF) – RIGAKU ZSX Primus II
- Rietveld Refinement & Thin Film Analysis
- Grazing Incidence Measurements
- Atomic Force Microscopy (PARK Systems XE-100)
- High Resolution SEM (JEOL JSM-7001F FE-SEM)
- Confocal Microscopy (Leica TCS-SPE)

Certified Professional Instrument Training

All instruments were actively operated for 6+ years in research and production environments.

- Advanced XRD Training – RIGAKU (Japan), 15 Days (2011)
- AFM All Modes Training – PARK Systems (2012)
- Maskless Optical Lithography – Advanced Micro Patterning (2012)
- Raman Spectroscopy – Thermo Scientific DXR2 (2012)
- FT-IR Spectroscopy – Thermo Nicolet 6700 (2012)
- SEM Training – Tekser Corp
- XRD Training – Tekser Corp
- XRF Training – Tekser Corp
- PECVD Training – VAKSİS (2014)
- RIE Training – VAKSİS (2014)

Research Interests

- **Semiconductor Devices & Electronic Materials**

Organic & Inorganic electronic devices (CIGS, Perovskite, Tandem PV, LEDs/OLEDs, FETs/OFETs)

- **Nanotechnology & Nanofabrication**

Nanoparticles, nanocomposites, nano-photonics, thin films

- **Advanced Spectroscopy & Characterization**

Optical spectroscopy (UV-Vis-IR, photoluminescence), dielectric spectroscopy

- **Radiation Detector Systems & Embedded Electronics**

- **Applied Instrumentation, Control & Energy Systems**

Robotics, control systems, energy systems integration

Leadership & Research Coordination

- [Fatih University, BioNano Technology R&D Center, Coordinator](#)
Coordinated all experiments, analyses, maintenance activities, and specialist task distribution
- [Organic Electronics & Photovoltaics Research Group, Group leader \(OEPR Group\)](#)
Coordinated 4 national research projects.

Language skills

English – Advanced (C1)

- August 2021 YÖKDil ; 68,75
- Kasım 2017 YÖKDil ; 72.5

Thesis Supervision

Co-Supervisor

- [YASEEN ZAINAB, \(2016\). Design and morphological investigation of porous silicon nanostructures in P type silicon based on novel comparison between two electrochemical cells,](#)

Supervisor

- [ARSLAN YASIN, \(2015\). Nano material doped organic solar cell production and characterization](#)

Project Consulting (Inter-High School)

Advisor

- Participation in the 2020 High School Students Research Projects Competition Istanbul Asia Region Exhibition in the Physics Field: “A Different Method To Increase Solar Panel Efficiency: Peltier!!!!”, Berfin ÇETİN, Zeynep ZİREK

Prizes and awards

- National / international sources to be projects 'contribution to the innovative and entrepreneurial' University index, Fatih University, 2013
- National / international sources to be projects 'contribution to the innovative and entrepreneurial' University index, Fatih University, 2014

Grants & Funding (National Projects, Coordinator)

- Fabrication and Characterization of Lateral Three Dimensional and Nano-pillar–Gated Organic Field Effect Transistors (L3D-OFET and Pin Gate-OFET), TUBİTAK, 2014- 2017
- Investigation of the effect of nanostructures on parameters of Organic Solar Cells, University Research Fund Project, 2015- 2017
- Light emitting diode based on Porous Silicon Nanostructures fabrication and Characterization, University Research Fund Project, 2014-2016,
- Creation of Awareness from 7 to 70 on nanotechnology, TUBİTAK 4004 ,, 2013- 2014,

Publications

- **Total journal publications:** 11 (SCI/SCI-E: WoS verified)

- **Total citations:** 238 (Google Scholar)
- **h-index:** 7 (Google Scholar)
- **i10-index:** 6 (Google Scholar)

Journal Articles

- Karatutlu A., Patil B., Seker İ., Istengir S., Bolat A., Yildirim O., Sevgen, Y.N., Bakis Y., Ortac B., Yilmaz E., Sapelkin A., [“Structural, Optical, Electrical and Electrocatalytic Activity Properties Of Luminescent Organic Carbon Quantum Dots”](#), Chemistry Select, May 8, 2018 Volume3, Issue17, pp 4730-4737
- Şeker I., Karatutlu A., Gürbüz O., Yanık S., Bakış Y., Karakız M., [“Structural and electrical investigations of MBE-grown SiGe nanoislands”](#) Applied Physics A (2018) 124:47
- Bakis Y., Auwal I.A., Ünal B., Baykal A., [“Maxwell-Wagner relaxation in grain boundary of \$\text{BaBi}_x\text{La}_x\text{Y}_x\text{Fe}_{12-3x}\text{O}_{19}\$ hexaferrites”](#) Composites Part B 99 (2016) 248-256.
- Bakis Y., Auwal I. A., Ünal B., Baykal A., [“Conductivity and dielectric properties of \$\text{SrLa}_x\text{Bi}_x\text{Y}_x\text{Fe}_{12-3x}\text{O}_{19}\$ \(\$0.0 \leq x \leq 0.33\$ \) hexaferrites”](#) Ceramics International, 42 (2016) 11780-11795
- Guner S., Esir S., Baykal A., Demir A., Bakis Y., [“Magneto-optical properties of \$\text{Cu}_{1-x}\text{Zn}_x\text{Fe}_2\text{O}_4\$ nanoparticles”](#), 2014, Superlattices And Microstructures
- Demir A., Güner S., Bakis Y., Esir S., Baykal A., [“Magnetic and Optical Properties of \$\text{Mn}_{1-x}\text{Zn}_x\text{Fe}_2\text{O}_4\$ Nanoparticles”](#), 2014, Journal Of Inorganic And Organometallic Polymers And Materials
- Bayrakceken F., Yegin K., Korkmaz E., Bakis Y., Unal B., [“Absorption and Fluorescence Spectroscopy of 1,2: 3,4-Dibenzanthracene”](#), 2012, International Journal of Photoenergy Vol. 2012, No. 1, Oct. 2012, pp. 14
- Bayrakceken F., Yegin K., Korkmaz E., Bakis Y., Unal B., [“Optical Energy Transfer Mechanisms: From Naphthalene to Biacetyl in Liquids and from Pyrazine to Biacetyl”](#), 2012, International Journal of Photoenergy Vol. 2012, No. 239027, Oct. 2012, pp. 14
- Seyidov, M. Y., Suleymanov R., Bakis Y., Salehli F., [“Charge disproportionation in \$\text{TlGaSe}_2\$ crystals detected by dielectric spectroscopy”](#), 2010, Journal of Applied Physics Vol. 108, No. 7, Aug. 2010, pp. 074114-1 074114-5
- Seyidov, M. Y., Suleymanov R., Bakis Y., [“Temperature-dependent polarity reversal in \$\text{Au/TlGaSe}_2\$ Schottky junctions”](#), 2009, Journal Of Applied Physics Vol. 105, No. 4, Feb. 2009, pp. 043710-1;043710-3
- Salehli F., Bakis Y., Seyidov, Seyidov, M. Y., Suleymanov R., [“Dielectric spectroscopy and nonequilibrium phase transitions in \$\text{TlGaSe}_2\$ layered crystals”](#), 2007, Semiconductor Science And Technology, , Vol. 22, No. 8, Jun. 2007, pp. 843 850

Submitted Conference Proceedings

- Alpat, Ali Behcet, et al. [“MRADSIM \(Matter-RADiation Interactions SIMulations\).”](#) *arXiv preprint arXiv:2411.11173* (2024).
- Alpat, A. B., et al. [“IRADCAL: A Monolithic Inorganic Scintillator And Thin Scintillators To Measure Low Energy Electron, Proton And Heavy Ion Albedo Spectrums From Lunar Surface.”](#) *arXiv preprint arXiv:2411.11178* (2024).
- Oral; Bakış Y., Gülegül Z., Şimşek Ç., Özsoy K., Yanık S., (2016). [“Fabrication of Organic Thin Film Transistor With Lateral \$\text{Si}^{++}/\text{SiO}_2\$ Channel Gate”](#) 12th Nanoscience and Nanotechnology Conference (NanoTR12).
- Poster; Bakış Y., Gülegül Z., Özsoy K., Şimşek Ç., Yanık S., (2016). [“Fabrication of Nanostructures on Highly Doped Si Substrate for Various Applications using E-Beam Lithography and Reactive Ion Etching”](#) 12th Nanoscience and Nanotechnology Conference (NanoTR12).
- Oral; Bakış Y., [Organic electronic devices, Seminar Brazil-Turkey Nanotechnology II.](#) (2015).
- Poster; SEKER I., ÜNAL B., BAKIS Y., KARAKIZ M., YANIK S., (2014). Influence of layer design and growth conditions on the structure, optical and electrical properties of epitaxial SiGe quantum dots. The 30th European Conference on Surface Science (ECOSS 30),

Workshops/ Conferences

- 12th International Nanoscience & Nanotechnology Conference (NanoTR-12)/Kocaeli-TURKEY, June,2016
- Brazilian-Turkish Nanotechnology Seminar, Universidad Federal do ABC, Santo Andre/Brazil, December,2015
- Throughout 2023 Vision Research Laboratories of Universities Workshop II, Dumlupinar (as a member of the consultative committee) University/ Kütahya-TURKEY, November,2015
- Turkish-Brazilian Nanotechnology Workshop, Fatih University/Istanbul-TURKEY, December,2014