ALİ EFE KIŞLAK

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EDUCATION

Sorbonne Université *Sep 2026 – Expected Jun 2028*
M.Sc. in Physics – Paris Physics Master (PPM) *Paris, France*
M1 coursework: Advanced Quantum Mechanics • Statistical Physics • Numerical Physics • Macro- & Microscopic Complex Systems • Experimental Lab

Izmir Institute of Technology (IZTECH) *Sep 2021 – Jun 2026*
B.Sc. in Physics (incl. one-year English preparatory programme) *İzmir, Türkiye*

RESEARCH INTERESTS

Experimental condensed matter • Low-dimensional & 2D quantum materials • Nanoscale spectroscopy & microscopy

RESEARCH EXPERIENCE

IZTECH Integrated Research Centers *Mar 2026 – May 2026*
Research Intern (Supervisor: Kemal Davut) *İzmir, Türkiye*
- Performed structural analysis of materials using transmission electron microscopy (TEM).

Paris Institute of Nanosciences (INSP), Sorbonne Université *Jan 2026 – Mar 2026*
Research Intern, Erasmus+ Traineeship Grant (Supervisor: Slavica Stankic) *Paris, France*
- Synthesized low-dimensional TiO_2, ZnO and MgO powders by thermal evaporation.
- Studied H_2O, D_2O and formic acid adsorption on their surfaces by vacuum FTIR down to 9 K; complementary photoluminescence and TEM.

CENT Research Group, IZTECH *Apr 2023 – Dec 2025*
Research Intern (Supervisor: Hasan Şahin) *İzmir, Türkiye*
- Performed DFT calculations (VASP, Phonopy) of the structural, vibrational and electronic properties of semiconductors from bulk to monolayer, compared with Raman measurements; first-author manuscript on $PbSnS_2$.
- Developed a task-management app used for internal communication and project tracking in the lab.

Joint Institute for Nuclear Research (JINR) *Aug 2025 – Oct 2025*
Research Intern (Supervisor: Matlab Mirzayev) *Moscow, Russia*
- Studied radiation-induced defects in solids, including B_4C, under gamma, neutron, electron and ion irradiation, with Raman spectroscopy.
- Initiated a JINR–IZTECH collaboration; continued with high-pressure DFT studies (first-author B_4C manuscript).

OZYUZER Research Group, IZTECH & Teknoma Technological Materials Inc. *Oct 2021 – Sep 2022*
Research Intern / R&D Intern (Supervisor: Lütfi Özyüzer) *İzmir, Türkiye*
- Deposited ITO/Au/ITO and ZTO/Ag/ZTO multilayer thin films by magnetron sputtering; characterized them by UV-VIS-NIR spectroscopy and profilometry.
- Applied the same sputtering processes to production coatings for the defense industry at Teknoma.

MANUSCRIPTS

- **A. E. Kışlak** *et al.*, *A Combined Theoretical and Experimental Study on the Nuclear Characteristics of B_4C* – JINR–IZTECH collaboration (in preparation).
- **A. E. Kışlak** *et al.*, *From Bulk to Monolayer: A Comparative Study of Structural, Vibrational, and Electronic Properties in Possible Low-dimensional Phases of $PbSnS_2$* (in preparation).

PROJECTS & ACTIVITIES

- **Perovskite tandem solar cells**: Python drift–diffusion solver for charge transport, linked to AFM/KPFM measurements.
- **French & International Physicists' Tournament (FPT/IPT)**, Problem 11 "Bristle-bot swarm": experiments and simulations on whether a swarm of vibration-driven robots solves a maze faster than a single bot.
- **AVCI Rocket Team, IZTECH** – Co-founder: designed the production and recovery systems of a high-power rocket; Teknofest 2023 finalist (∼8,000 ft apogee, Mach 0.7).
- **GPA Wizard**: iOS GPA calculator published on the App Store (Swift, SwiftUI).

TECHNICAL SKILLS

Characterization: TEM • Photoluminescence • Raman • Cryogenic FTIR • UV-VIS-NIR • Profilometry
Fabrication: DC/RF magnetron sputtering (thin films) • Thermal evaporation (oxide powders)
Simulation: VASP (DFT) • Phonopy • P4Vasp • VESTA • OpenRocket
Programming: Python • Bash • Linux • Swift / SwiftUI • React Native • MATLAB

LANGUAGES & INTERESTS

Languages: Turkish (Native) • English (C1) • Mandarin (A2) • French (A1) • Russian (A1)
Interests: Professional videography (brand & product films, color grading) • Sailing & windsurf instructor • Chess