

Timur Abdilov

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EDUCATION

Texas Tech University, Lubbock, TX

GPA: 3.95/4.0

BS in Electrical Engineering with Honors, May 2026 (expected)

BS in Applied Physics with Honors, May 2026 (expected)

Relevant Coursework: Quantum Physics/Lab, Circuits I-II, Microcontrollers with C, Signals & Systems, Digital Systems, Electronics I-II, Probability & Statistics, Advanced Quantum Mechanics, Optics, Electromagnetic Fields I-II, Spintronics & Magnetic Devices, Nuclear/Particle Physics, Statistical Mechanics, Classical Mechanics, VLSI Design, VLSI Semiconductor Processing, Quantum Computing, Solid State Device Physics, Microwave Engineering, Microwave Solid State Circuits

EXPERIENCE

Chatzakis Ultrafast Sciences Lab, Lubbock, TX

(May 2025 – Present)

- Designed and tuned optical probing equipment, operated Coherent Astrella 100fs Ti:Sapphire pulsed laser system
- Introduced Quantum ESPRESSO, ASE, and VASP computational methods for hexagonal Boron Nitride properties investigation

Advanced Particle Detector Laboratory, Lubbock, TX

(Jan. 2023 – Present)

- Assisted measurements of solid-state silicon photomultipliers for novel calorimeters in CMS at CERN
- Researched and designed semiconductor metamaterials and metasurfaces for Cherenkov calorimetry using Synopsys Photonic Solutions (RSoft CAD, MetaOptic Designer, CODE V)

Undergraduate Research Scholar, Center for Emerging Energy Sciences, Lubbock, TX

(Aug. 2024 – May 2025)

- Led radiation tracking project and addressed challenges in detection accuracy by researching and designing a CR39 aerogel system to filter out background noise, improving the system's precision and reliability
- Developed a custom software tool that accelerated real-time alpha radiation analysis, reducing manual processing time by 30%; tested implementation on a portable setup

S-REU 2024 Texas A&M University, Advanced Spectroscopy Lab, College Station, TX

(May 2024– Aug. 2024)

- Designed and tested advanced Raman Spectroscopy systems, contributing to a 25% increase in spectral resolution
- Built a robust software framework for cosmic ray peak detection, which significantly streamlined data analysis workflows

Undergraduate Research Scholar, Smith Group Lab, Lubbock, TX

(Aug. 2023 – May 2024)

- Assembled and optimized the TIRFM system for single-molecule tracking, improving the resolution 15% for high-precision protein interaction studies
- Designed a dual-laser optical setup for TIRFM, expanding the system's capabilities to track multiple molecular interactions simultaneously in different channels

USRG 2023 Texas A&M University, Advanced Spectroscopy Lab, College Station, TX

(May 2023 – Aug. 2023)

- Led the design and testing of QPI and DHM imaging systems, significantly enhancing imaging capabilities in biological research
- Developed an implementation of a novel phase retrieval algorithm that reduced hologram processing time by 40%

Electrical Engineer, Raider Aerospace Society, Lubbock, TX

(Aug. 2022 – May 2023)

- Developed motor control system using feedback loops to improve flight stability, enhancing aircraft performance in simulations
- Engineered a load cell device for thrust measurement, leading to design optimizations and a 12% boost in propulsion efficiency

PUBLICATIONS AND PRESENTATIONS

Publications:

I. Chatzakis, **T. Abdilov**, E. Walker, et al., "Frohlich-type polarons in isotopically enriched hexagonal boron nitride," submitted to Physical Review Letters, 2025.

T. Abdilov et al., "A method to observe field-region oxide charge and inter-electrode isolation from CV-characteristics of n-on-p devices," Journal of Instrumentation, vol. 19, no. 09, p. P09010, Sep. 2024. DOI: 10.1088/1748-0221/19/09/P09010

PUBLICATIONS AND PRESENTATIONS, CONT.

Conference Presentations:

T. Abdilov and I. Chatzakis, “Photoluminescence Pathways in Hexagonal Boron Nitride for Quantum Applications.” Oral presentation at the Gulf Coast Undergraduate Research Symposium (Applied Physics Section), Smalley Curl Institute at Rice University, Houston, TX, October 2025.

T. Abdilov and N. Akchurin, “Design and Simulation of Metasurfaces for High-Energy Physics Applications,” presented at the Texas Tech University Undergraduate Research Conference (URC 2025), Lubbock, TX, Apr. 2025.

T. Abdilov and R. V. Duncan, “Computational Imaging Methods for CR-39 Alpha Particle Dosimetry,” presented at the Texas Tech University Undergraduate Research Conference (URC 2025), Lubbock, TX, Apr. 2025.

T. Abdilov, Vladislav V. Yakovlev, and Vsevolod Cheburkanov, “Unveiling Water Clusters: Exploring Formation with Alternating Electric Fields.” Oral presentation at the Gulf Coast Undergraduate Research Symposium (Applied Physics Section), Smalley Curl Institute at Rice University, Houston, TX, November 2024.

T. Abdilov, M. Ghahremani, and A. W. Smith, “Total Internal Reflection Fluorescence Microscopy (TIRFM) for cancer research,” presented at the Texas Tech University Undergraduate Research Conference (URC 2024), Lubbock, TX, Apr. 2024.

T. Abdilov and Vladislav V. Yakovlev, “From 2D to 3D: Advancing Diagnostic Devices with Quantitative Phase Contrast.” Oral presentation at the Gulf Coast Undergraduate Research Symposium (Applied Physics Section), Smalley Curl Institute, Rice University, Houston, TX, October 2023.

SKILLS

- Programming: MATLAB, Python, C/C++, Verilog, HTML/CSS
- Tools and Software: Solid Edge, Nikon NIS Elements, FIJI/ImageJ, LabVIEW, KiCAD/EasyEDA, TI CCS, LaTeX, Vivado 2018.3, Synopsys MetaOptic Designer/RSoft CAD, LT SPICE, MS Office, CST Microwave Studio, Ansys HFSS/Circuits, Cadence Virtuoso, Quantum ESPRESSO, Nextnano, OOMMF
- Hardware: Arduino/AVR, Raspberry Pi, BASYS3 Artix-7 FPGA, 3D printing, Optics, VNA/Spectrum Analyzer/Oscilloscope
- Languages: Russian, English, Kazakh, Ukrainian

LEADERSHIP & CIVIC ENGAGEMENT

Vice President, Tech Russian Speaking Association (TRSA), Lubbock, TX (Oct. 2025 –Present)

- Managed and supported technical aspects of TRSA events, including movie nights, Russian-speaking practice sessions, and Durak game nights, ensuring smooth execution and member engagement.

Industry Chair, Tau Beta Pi (Texas Beta chapter), Engineering Honors Society, Lubbock, TX (Jan. 2025 –Present)

- Organized career info-sessions linking 100+ engineering students with top recruiters
- Led faculty and student organization collaborations to expand professional opportunities

President, Central Asian Student Association (CASA), Lubbock, TX (Jul. 2025 – Present)

- Organized cultural outreach events linking Central Asian students with the Texas Tech and Lubbock communities
- Coordinated mentorship between current and incoming Central Asian students

Mentor, Launch Your Future in Engineering (LYFE) Program, Texas Tech University (Aug. 2024 – Present)

- Mentor first-year students, providing guidance on academics, campus life, and personal development

Active Member, American Chemical Society (ACS), Texas Tech University (Dec. 2024 – Dec. 2025)

- Collaborated to lead chemistry outreach classes for middle school students during camps and family STEM events
- Served the community in the Adopt the Highway campaign and campus service projects like Arbor Day

First-Year Council Member, Texas Tech Student Government Association, Lubbock, TX (Sep. 2022 – May 2023)

- Contributed to student policy discussions as a voting Senate member
- Actively participated in volunteer initiatives at local schools and food banks serving the Lubbock community

PROJECTS

Modular 3D-printed optical table

(Feb. 2025 – Present)

Developer

- Designed and fabricated a cost-effective and sustainable modular optical table system using 3D printing to provide stable, vibration-dampened surfaces for precision optical experiments and laser alignment applications
- Engineered interlocking modular components with standardized mounting interfaces, enabling scalable configurations and rapid reconfiguration for diverse experimental setups while reducing costs compared to traditional optical tables

Microcontroller Project Lab: Long-Range RFID Scanner for Warehouse Tracking

(Sep. 2025 – Dec. 2025)

Co-Developer

- Built a Raspberry Pi-based warehouse tracking system using UHF RFID tags and readers, capable of reading up to 150 tags simultaneously via EPCglobal Gen 2 protocol
- Enhanced range and reliability through microwave engineering techniques, including antenna design and shielding; applied AVR microcontroller programming, embedded systems, and signal processing principles

Electromagnetics Project Lab: Photoconductive Switch for Microwave Applications

(Jan. 2025 – May 2025)

Co-Developer

- Designed and implemented a silicon-based photoconductive switch with microstrip waveguide, shielded package, and custom ultrafast LED system for GHz-range microwave control
- Achieved fast switching with only 1 W optical power, -20 dB attenuation (open), and <0.1 dB insertion loss (closed); applied electromagnetics, optics, PCB design, and quantum mechanics principles

Lab Power Supply

(Oct. 2024 – Dec. 2024)

Developer

- Built a digital programmable lab power supply with 120 W PSU, protection circuitry, and DC-DC buck converter for precise voltage control
- Designed 3D-printed enclosure and implemented voltage-time plotting; delivered a low-cost (<\$40) solution for project lab equipment

Robotics Project Lab: Office Delivery Rover

(Sep. 2024 – Dec. 2024)

Co-Developer

- Developed an autonomous warehouse rover to identify and deliver packages by color, streamlining logistics and reducing manual sorting time
- Implemented control system on Basys3 FPGA with TCS3200 color sensor, IR array, optical communication, and calibrated inductive sensors; applied Verilog, optics, 3D printing, and power management

HONORS AND AWARDS

- President's Honor List: Fall 2022, Spring 2023, Fall 2023, Spring 2024, Spring 2025, Summer 2025
- Scholarships: Presidential Scholarship, Preston Smith Honors Scholarship, ECE Lankford Outstanding Achievement Scholarship, CPEEC Engineering Scholarship, C.C. and Alma Schmidt Memorial Scholarship, Chinese Alumni Electrical Engineering Scholarship, Grace Lasater Allensworth Scholarship, Western Union Foundation Global Scholars
- TrUE Scholars Program Graduate
- College of Arts & Sciences Undergraduate Research Academy (CASURA) award