Jishnu Khanna

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Education & Academic Status

University of Alberta Edmonton, AB
B.Sc. in Engineering Physics (Nano Option), Mathematics Minor Class of 2029

- **Additional Credential:** Enrolled in the Certificate in Sustainability
- **Academic Standing:** Cumulative GPA: 3.7 / 4.0 (First Class Standing) | Completed Terms: 5 of 8 Academic, 1 of 5 Co-op
- **Co-op Availability:** 12-Month Work Term starting January 2027 | **Willingness to Relocate:** Yes

Technical Skills

- **Cleanroom & Microfabrication:** Spin Coating, O_2 Plasma Etch, Piranha Clean, BOE Etch, Pulsed Laser Deposition
- **Materials Characterization:** XRD, Raman Spectroscopy, AFM, UV-Vis, Ellipsometry, Photoluminescence (PL), 4PP
- **Hardware & Prototyping:** Altium PCB Design, SolidWorks, Microcontrollers (Teensy 4.0 & ESP-32), 3D Printing, Soldering, Cricut cutter
- **Programming & Simulation:** Python, MATLAB, Java, QuantumATK (DFT), LTSpice, WaveForms
- **Data Analysis & Technical Tools:** Origin, LaTeX, Inkscape, Microsoft Office Suite, LoggerPro, ImageJ

Work Experience

Student Instructor Partnership Program: Student Partner Sep 2026 – Present
Department of Civil & Environmental Engineering, University of Alberta Edmonton, AB

- Collaborating with the course instructor to improve curriculum materials, lab modules, and engagement strategies for 1,400+ students.
- Developing structured feedback loops and interactive instructional tools, increasing class participation rates by 30% for a first-year Engineering Mechanics course.
- Assisting the instructional team in deploying an AI-based grading system to accelerate evaluation timelines and eliminate bias in student feedback.

Undergraduate Research Assistant May 2026 – Aug 2026
AMD Lab, Dept. of Electrical & Computer Engineering, University of Alberta Edmonton, AB

- Optimized Tungsten Ditelluride (WTe_2) thin film growth parameters for transistor integration using a $750k Pulsed Laser Deposition (PLD) 248 nm UV laser system, achieving a 72% increase in short-range atomic ordering.
- Conducted QuantumATK Density Functional Theory (DFT) simulations to evaluate thin film electronic band gaps and electronic injection between van der Waals heterostructures.
- Correlated PLD process parameters with characterization data to establish highly reproducible thin film growth protocols, yielding consistent sample quality across successive batches.

Undergraduate Research Assistant Jul 2025 – Aug 2025
Dept. of Physics, University of Alberta Edmonton, AB

- Co-authored an article titled 'Sun-synchronous satellite orbits and Analemma', which is published in the Canadian Journal of Physics.
- Prepared presentations on various scientific topics such as Analemma and wrote the first draft of paper.
- Used MATLAB and Spyder to make simulations in order to develop a deeper understanding of Celestial mechanics.

Projects & Research Initiatives

DRA Research Assistant – NEMS-Photonic Gyroscopes Sep 2026 – Present
Van Lab, Dept. of Electrical & Computer Engineering, University of Alberta Edmonton, AB

- Co-designing compact, high-sensitivity optical gyroscopes on a Silicon-on-Insulator (SOI) platform by integrating NEMS sensors with silicon photonic interferometers.
- Simulating electro-mechanical and optical performance in COMSOL and Ansys Lumerical to optimize sensitivity and response speed, benchmarking results against state-of-the-art MEMS gyroscopes.

DRA Research Assistant – High Energy Lasers & Optical Systems Jan 2026 – Apr 2026
Fedosejev Lab, Dept. of Electrical & Computer Engineering, University of Alberta Edmonton, AB

- Designed a custom mechanical mirror mount in SolidWorks and created 3D-printed prototypes to correct optical aberrations in the 15-TW laser beamline path.
- Configured a Mach-Zehnder & Michelson Interferometer on an optical bench to characterize wavefront distortion and evaluate optical path corrections.

Hardware Developer – NEST (Nursing Environment & Safety Tracking) Jan 2026
Hack Beta – Computer Engineering Club, University of Alberta Edmonton, AB

- Developed a wearable clinical tracking device to continuously monitor ambient temperature, humidity, and air quality for clinical safety.
- Designed a custom multi-sensor PCB in Altium and a SolidWorks enclosure, assembling the functional prototype via precision soldering and 3D printing.

DRA Research Assistant – Organic Semiconductors Sep 2025 – Dec 2025
Shankar Lab, Dept. of Electrical & Computer Engineering, University of Alberta Edmonton, AB

- Fabricated novel organic semiconductor thin films via spin and drop coating techniques across various substrates to find optical properties of these new materials.
- Conducted ellipsometric analysis and drafted manuscript sections, earning the **Faculty-wide Outstanding Research Performance Award (1st out of 69 presenters)**.

Electrical Subteam Member Sep 2024 – Sep 2025
Autonomous Research Vehicle Project (ARVP) – Engineering Club Edmonton, AB

- Designed a PCB using Altium for the autonomous underwater robot to measure temp. & pressure conditions.
- Engineered a Teensy 4.0 water leakage detection circuit and configured sensor calibration in a 5m deep tank.

Publications

- **Khanna J.**, Czarnecki A., & Marchand R. (2026). "Sun-synchronous orbits, quadrupole deformation of Earth, and analemma." *Canadian Journal of Physics*, 104, 1–10.
- Czarnecki A., & **Khanna J.** (2026). "False-vacuum decay and flaws in Frampton's model of the origin of life." *Acta Physica Polonica B Proceedings Supplement*, 19(2), 1.

Honors, Awards & Certifications

- **Scholarships & Awards:** Outstanding Research Performance Award (1st out of 69 presenters), Dean's Research Awards (Multiple Terms), UAlberta International Undergraduate & Admission Scholarships, Regional Excellence Award & Dr. Eric Newell Entrance Scholarship.
- **Safety Certifications:** WHMIS Chemical Safety, Lab Safety, Hazardous Waste Management, Concepts in Biosafety, Laser Safety, Workplace Violence Prevention.

Community Involvement

Academic Peer Tutor: Residence Services, University of Alberta Sep 2025 – Present
Residence Services, University of Alberta Edmonton, AB

- Mentored 20+ undergraduate students in core first year Mathematics, Physics & Chemistry concepts.

Kitchen Crew Helper Sep 2024 – Present
Hope Mission Edmonton, AB

- Facilitated meal preparation and distribution services for vulnerable community members serving 300+ individuals weekly.