ACADEMIC CV

Tanaka Chonyera

Mechanical & Aerospace Engineer · Project Manager, Capital Projects, Eli Lilly · Founder, Dreamernaut Rocket Bootcamp

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EDUCATION

B.S. Mechanical Engineering, Aerospace Concentration — April 2024

Michigan State University (MSU), Honors College · East Lansing, MI

- GPA 3.5/4.0 · Dean's List · $140,000 in merit-based scholarships · $1,250 Boeing Scholarship
- Programming coursework: C++ and Python, data structures and algorithms, object-oriented programming

RESEARCH EXPERIENCE

Applied Research & Additive Manufacturing Intern — May 2022 - May 2023

Fraunhofer USA · East Lansing, MI

- Investigated boron-doped diamond (BDD) microelectrodes as a more durable replacement for carbon fiber electrodes in nanomolar dopamine detection
- Ran long-term coating experiments with fast-scan cyclic voltammetry and impedance spectroscopy in a flow cell simulating brain conditions, to raise dopamine and serotonin sensitivity while keeping durability; coating data acknowledged in Gupta et al., *Biosensors* (2023)
- Tested BDD electrode response to dopamine, serotonin, and DOPAC, and characterized electrodes with electron microscopy
- Fabricated a carbon fiber microelectrode that measured dopamine in vivo for Parkinson's research at MSU's Institute for Quantitative Health Science & Engineering
- Delegated work across the BDD fabrication team and trained new interns in electrochemical techniques
- Developed a BDD electrode fabrication method and Siemens NX 3D-printed fixtures that standardized fabrication and quality control; the product went from selling at cost to $15,000+ in sales at a 57% margin

Mechanical Design & Nuclear Physics Research Intern — September 2021 - April 2022

FRIB, Dr. Kei Minamisono's BECOLA team · East Lansing, MI

- Designed in Siemens NX and built a high voltage divider for collinear laser spectroscopy of radioactive nuclei at BECOLA, where ppm-level knowledge of beam energy is needed to extract nuclear structure information
- Held 30 kV stable to within 0.05 V (2 ppm) using the team's feedback system
- Analyzed the divider's output in Python to determine its ratio and compare it with a reference divider from Germany's National Metrology Institute
- Created a full technical draft of the divider for lower-cost reproduction and use in other FRIB facilities
- Presented the divider design and ratio measurement as first author of a UURAF 2022 poster, and co-authored the system's write-up in FRIB's *The Greensheet* (March 2022)

PRESENTATIONS & RESEARCH CONTRIBUTIONS

- **Chonyera, T.**, Dockery, A., Koenig, K., and Minamisono, K. "Accurate High Voltage Measurement for Laser Spectroscopy." Poster, University Undergraduate Research and Arts Forum (UURAF), Michigan State University, 2022
- Dockery, A., **Chonyera, T.**, Koenig, K., and Minamisono, K. "Stable HV System for Laser Spectroscopy Measurements." *The Greensheet* 43, no. 10, Facility for Rare Isotope Beams, March 25, 2022

- Acknowledged for experimental help in: Gupta, B., et al. “In Vitro Biofouling Performance of Boron-Doped Diamond Microelectrodes for Serotonin Detection Using Fast-Scan Cyclic Voltammetry.” *Biosensors* 13, no. 6 (2023): 576. doi:10.3390/bios13060576

ENGINEERING PROJECTS

Team Lead, Aerodynamic Body Design (Senior Capstone)
January 2024 - April 2024

MSU Solar Racing Team · East Lansing, MI

- Led the senior capstone team designing an aerodynamic, lightweight, manufacturable body for MSU’s solar car; the cockpit design cut drag coefficient by 50%
- Made design decisions in Siemens NX and MATLAB, evaluated airfoil profiles in Xfoil, and justified them with fluid dynamics and boundary layer theory
- Earned a 4.0 in the capstone course

Self-Balancing Mini-Segway (ME 456)
Spring 2024

Michigan State University · East Lansing, MI

- Tuned pitch and wheel-speed PID controllers in MATLAB/Simulink for a self-balancing robot (Arduino, IMU with a complementary filter), reaching a pitch settling time under 0.1 s with no overshoot

High-Power Rocketry
2025 - Present

Tripoli Rocketry Association, Level 2 · High-Power Rocket Bootcamp

- Ranked #1 flyer by flight count at LDRS 44 (2026), the world’s largest high-power rocketry launch, with 34 flights of student-built rockets flown under him as Flyer of Record
- Serve as Flyer of Record for 170+ student-built rockets, responsible for every one being built correctly and flying safely under NAR safety codes and FAA airspace rules

Aerodynamics & Powertrain Team Member, MSU Formula Racing (Formula SAE)

Michigan State University · East Lansing, MI

September 2021 - April 2022

- Machined radiator mount and suspension components on manual mills and lathes for the team’s new monocoque car, and inspected parts for quality control
- Researched air filter alternatives for air-to-fuel ratio, power delivery, and combustion efficiency, and front wing designs that resist failure under aerodynamic load; documented findings for team leads

Solid-Propellant Rocket and Parabolic Solar Concentrator
2018 - 2019

Maru-a-Pula School · Gaborone, Botswana

- Built a solid-propellant rocket from scratch, from the fuel to the fuselage, as team captain; the school placed first overall and the rocket won the gold medal at the 2018 Lebone STEM Derby, South Africa
- Designed and built a parabolic solar concentrator that heats water to steam for low-cost power; runner-up at the 2019 African Leadership Academy STEM Derby

PROFESSIONAL EXPERIENCE

Project Manager, Capital Projects
June 2024 - Present

Eli Lilly and Company, Global Facilities Delivery · Indianapolis, IN

- Lead a **$150M+ capital capacity expansion** of warehouse and logistics infrastructure for one of Lilly’s flagship therapeutics, from design through construction, commissioning, and qualification (C&Q)
- Direct the design, construction, and C&Q of the project
- Hold monthly governance reviews with the site head of the receiving business unit, translating engineering decisions into executive-ready risk and progress reporting and aligning capital partners on tradeoffs and recovery plans
- Built a meeting minutes template that Global Facilities Delivery adopted department-wide

Development & Process Engineering Intern
May 2023 - August 2023

First Solar · Perrysburg, OH

- Validated and optimized a new ultrasonic welding process for solar modules; JMP analysis of the test data drove the process changes that stopped automated manufacturing from damaging modules
- Supported assembly and testing of new tandem modules that combine monocrystalline and thin-film technology for higher conversion efficiency

TEACHING, MENTORING & OUTREACH

Founder & Lead Instructor, High-Power Rocket Bootcamp **August 2025 - Present**

Dreamernaut Rocket Bootcamp · Indiana

- Founded and run a free high-power rocketry program: **362 students** across 10 bootcamps (August 2025 to September 2026), plus 1 in progress, **390+ participants** trained, **335 rockets built** (278 student, 57 volunteer), and **170+ launched** to altitudes up to 5,000 feet
- Designed the curriculum (aerodynamics, propulsion, recovery systems, FAA airspace coordination) and built a corps of **174+ adult volunteers**, screening applicants for technical fit and teaching ability; trained **56 volunteers** to build their own rockets
- Designed a tiered train-the-trainer model that let one lead oversee **150 simultaneous builds** with 25 volunteers trained in four full-day sessions
- Teach MEPI's ninth-grade group, including a drone flight session (March 2026), and won MEPI board approval to use a 13-foot rocket as the group's capstone project
- Ran a sold-out bootcamp for the Indiana State Museum's Space Day (July 2026); participants rated it 11/10
- Ran a booth for K-12 school groups at the Indiana State Museum's Tinkerfest (September 18, 2026) after the museum invited the bootcamp back
- Raised **$161K** from MEPI (Minority Engineering Program of Indianapolis; $80K, including a $40K Cummins grant), **Lilly Social Impact** ($75K for Lilly's 2026 Global Day of Service) and Purdue University (funder of the Indiana Black Expo cohort); spent **$159K** on the program
- Cut the cost per student **60%**, from $1,227 at the first bootcamp to **$490** at the most recent, lowering barriers of entry so the same funding reaches more kids; average cost per student, one student per rocket: $564 (materials used, 263 students across 8 bootcamps); scaling one cohort to 150 kids for Lilly's 2026 Global Day of Service was a P10 stretch target that forced process improvements and brought the cost down
- Run every build and launch day under OSHA's hierarchy of controls, applying the construction safety standards and protocols from managing a $150M+ capital project at Eli Lilly
- Wrote the build-day HSE safety plan for 150 students (task-specific hazard assessment and PPE plan), approved by Lilly Lebanon's HSE Senior Director
- Secured the Hamilton County Airport Authority's approval to close Sheridan Airport for a 150-kid launch, with signed landowner permissions and an FAA certificate of waiver through Indiana Rocketry
- Expanded to 6 Indiana communities and 10+ partner institutions, including the Indiana State Museum (sold out, rated 11/10) and the City of Fishers; ran a bootcamp for 75 students at Enlace Academy
- **Franklin College, Franklin, IN (October 2026):** guest speaker in Professor Miranda Carter's public relations class on the High-Power Rocket Bootcamp and capital project management at Eli Lilly; seven students sent thank-you emails afterward
- **Teach For America Indianapolis (2026):** matched as a 2026-27 STEM Connects volunteer with The PATH School at School 67
- **Broadhurst Primary School, Gaborone (May 2019):** school assembly talk to students and parents on the DStv Eutelsat win and rocketry

BOOTCAMP COHORTS

- **Summer 2025**, Camp Dellwood, Indianapolis, 20 students: builds Aug 2, 9 and 16, 2025; launch Aug 24, 2025, Muncie
- **Fall 2025**, Park, Indianapolis, 20 students: builds Nov 1, 8 and 15, 2025; launch Feb 8, 2026, Pence
- **Winter 2026**, Camp Dellwood, Indianapolis, 15 students: build Feb 1, 2026; launch Feb 8, 2026, Pence
- **Spring 2026, April 4 group**, Camp Dellwood, Indianapolis, 11 students: build Apr 4, 2026; launch Apr 19, 2026, Pence, during LDRS 44
- **Spring 2026, April 18 group**, Camp Dellwood, Indianapolis, 20 students: build Apr 18, 2026; launch Apr 19, 2026, Pence, during LDRS 44
- **Enlace Academy**, Indianapolis, 75 students: build May 7, 2026
- **Indiana Black Expo Youth Leadership Summit**, Indiana Convention Center, Indianapolis, funded by Purdue University, 24 students: build Jul 17, 2026
- **Indiana State Museum, Space Day**, Indianapolis, 12 students: build Jul 18, 2026; launch Aug 9, 2026, Muncie
- **City of Fishers**, Fishers Maker Playground, 20 students: build Aug 2, 2026; launch Aug 9, 2026, Muncie
- **Lilly Global Day of Service**, Hattie B. Stokes Elementary, Lebanon, 145 students: build Sep 24, 2026; launch Sep 25, 2026, Sheridan Airport
- **MEPI 9th Grade, in progress**, Indianapolis: November 2026 to May 2027

HONORS & AWARDS

- **Letter of Recognition from the Governor of Indiana** for the High-Power Rocket Bootcamp (2026)
- **NSBE 25 Under 25**, National Society of Black Engineers, received at the Golden Torch Awards (2026)
- **Eli Lilly Rise Recognition, "Deliver"**, from Lilly's Chief People Officer (2026)
- **Wielenga Research Scholar**, Michigan State University, $4,000 stipend (2022)
- **1st Place in Africa, DStv Eutelsat Star Awards**, Best Overall Essay, in a competition open to ages 14 to 19 in 42 countries and judged by a panel chaired by ESA astronaut Paolo Nespoli (2018)

LEADERSHIP & SERVICE

Chapter Secretary, Communications Chair

September 2022 - May 2024

National Society of Black Engineers (NSBE), MSU Chapter · East Lansing, MI

- Rebranded the chapter's social media under @nsbemsu and redesigned nsbemsu.org; Instagram reach rose **38%**, membership **47%**, and interest in national convention attendance **121%**

SKILLS

- **Project delivery:** capital projects; design, construction, and C&Q oversight; vendor selection; governance and risk reporting; FDA-regulated facilities
- **Program leadership:** grant proposals and grant reports, HSE safety plans, FAA launch waiver coordination, volunteer training, single-day events for 145 students
- **Engineering tools:** Siemens NX, SolidWorks, AutoCAD, MATLAB, Xfoil, JMP, Python, C++
- **Engineering analysis:** aerodynamics, fluid dynamics, boundary layer theory, statistical analysis (JMP)
- **Lab, shop, and certification:** fast-scan cyclic voltammetry, impedance spectroscopy, electron microscopy, 3D printing, mills and lathes, Tripoli Rocketry Association and National Association of Rocketry Level 2
- **Languages:** English; Shona and French (limited proficiency)

SELECTED PRESS

- Indianapolis Star (2026), WTHR NBC Indianapolis (2026), Fox59 (2026), The Week Junior (2026), Botswana Guardian (2019, 2020), Space in Africa (2019)