Lucas.Bertucci@yale.edu **Lucas Bertucci** (502) 338-1681

EDUCATION

Yale University *(Aug. 2023 – Current)*
PhD in Chemical Engineering
University of Kentucky *(Aug. 2019 – May 2023)* GPA: 3.97
Major: Chemical Engineering | *Minors:* Computer Science, Mathematics
Lewis Honors College | Eng. Scholar in Undergraduate Research | Dean's Leadership Program

AWARDS

1st Place – Overall Environmental Division Poster Award *(2022 AIChE Student Conference)*
1st Place – Environmental Group IV Poster Award *(2022 AIChE Student Conference)*
1st Place – Poster Competition *(7th International Forum on Sustainable Manufacturing)*
1st Place – Undergraduate Poster Competition *(2nd Annual Sustainability Showcase)*
Inaugural Yale Planetary Solutions Doctoral Fellow *(June 2025)*
NSF – Graduate Research Fellow *(Aug. 2024)*
Inaugural Lee T. Todd, Jr. Student Innovation Award *(Aug. 2022)*
NSF – Research Undergraduate Experience (REU) *(June 2022 – Aug. 2022)*
Engineering Summer Undergraduate Research Fellowship *(May 2021 – July 2021)*
College of Engineering Dean's List *(Aug. 2019 – May 2023)*
Thomas W. Lester Scholarship *(Aug. 2019 – May 2023)*
University of Kentucky Presidential Scholarship *(Aug. 2019 – May 2023)*

EXPERIENCE

Semiconductor Catalysis & Reaction Engineering Lab
Researcher (Aug. 2023 – *Current*)

- Developing a chemical reactor system that utilizes recycled solar panel waste as a substrate for producing a photocatalyst designed for methane capture and conversion
- Collaborating on a project to develop and implement a photoelectrochemical device designed to generate hydrogen from sunlight and water
- Managed a project to overhaul the methods in which the lab group communicates the facets of our cutting-edge research to our various technical and non-technical stakeholders

Verdant Beneficiated Resources & American Solar Recycling Company
Co-Founder *(Dec. 2022 – Current)*

- Established a company to design processes for recovering resources from waste products through seeking funding via the U.S. Department of Energy's SBIR/STTR grants
- Directed relationships with Fortune 500 companies and investors interested in developing partnerships to commercialize Verdant's novel solar panel recycling technology
- Built relationships with local Kentucky companies to become their go-to business for recycling and handling their solar panel waste

Solar Panel Recycling
Principal Investigator *(Aug. 2022 – May 2023)*

- Led a research project for designing a process for recycling end-of-life solar panels utilizing physical and chemical separations to separate metallic, plastic, and glass fractions funded by the inaugural Lee T. Todd student innovation award

- Received a $50K grant from utility company Louisville Gas and Electric to further the project
- Collaborated with the University of Kentucky's Office of Technology Commercialization and Center for Applied Energy Research to patent the developed solar panel recycling technology
- Assessed economic viability of solar panel recycling through characterization of solar panel compositions via inductively coupled plasma optical emission spectrometry

Solvent Assisted Chromatography

Researcher *(Dec. 2021 – Sep. 2022)*

- Combined principles of solvent extraction and chromatography to design a new separation technology capable of producing individually separated, high-purity rare earth elements from coal waste products for the U.S. Department of Energy
- Derived a thermodynamic model for solvent extraction that incorporates the effects of mononuclear complexation on the distribution of rare earth elements between phases
- Created a MATLAB algorithm for modeling product purities for a solvent assisted chromatography unit based on variable inputs

Sustainable Materials and Recovery Technologies (SMaRT): General E-Waste

Undergraduate Research Team Leader *(Aug. 2021 – Aug. 2022)*

- Hired, led, and mentored 6 undergraduate engineers to perform research to meet the goals for a National Science Foundation Partnership for Innovation grant
- Taught weekly lectures in hydrometallurgical topics including electrowinning, leaching, and solvent extraction to enable the independent research activities of the team
- Collaborated with multiple domestic and international business partners to commercialize the electronic waste recycling technology to make a sustainable impact
- Derived a shrinking core mass transfer equation with changing bulk solution concentration to model the diffusion within the reactors to optimize the leaching process

Undergraduate Researcher *(Jul. 2020 – Aug. 2021)*

- Designed, constructed, and developed a continuous leaching and electrowinning system including 8 reactors, a 5-stage filtration circuit, and an electrowinning cell for recycling copper from electronic waste
- Scaled the recycling system from a 10-L beaker to a 400-L pilot plant producing >99.99% purity copper cathode from electronic waste

Sustainable Materials and Recovery Technologies (SMaRT): NiMH Batteries

Undergraduate Researcher *(Jan. 2020 – May 2021)*

- Developed a process for recycling nickel and cobalt from NiMH batteries through combining chemical engineering and mining engineering techniques
- Performed a characterization assay on the batteries to identify the metals of interest and analyze the economic value for process value stream mapping

Black Wall Street

Student Consultant & Team Leader *(Jan. 2021 – May 2021)*

- Created an equitable and inclusive entrepreneurial ecosystem designed to promote African American and minority business in Lexington, KY
- Presented recommendations for stakeholders to partner with and co-create multi-paths forward for allies of free enterprise and conscious capitalism

SKILLS

Certifications

Power & Energy (Univ. of KY) | Enviro. Eng. (Univ. of KY) | Fund. of Eng. – Chem. (NCEES)
Certified MATLAB Associate (MathWorks) | Safety and Chem. Eng. (AIChE)
Engineer–in–Training (KY Board of Licensure for Prof. Eng.)

Software

Aspen | SysCAD | MATLAB | Simulink | Python | C++ | Microsoft Office | Image J | Gamry Instruments Framework | Gamry Echem Analyst | OnShape | Bambu

PRESENTATIONS

Bertucci, Lucas. *Solar Panel Recycling: Environmental Sustainability*. Presented at: ***2023 AIChE Southern Student Regional Conference***. Mar. 4, 2023. Gainsville, Fl.

Bertucci, Lucas. *Solar Panel Sustainability: End-of-Life Recycling*. Poster Presented at: ***21st Annual Posters at the Capitol***. Mar. 2, 2023. Frankfort, KY.

Bertucci, Lucas. Todd, Lee T. Rodney, Andrews. *A Night with Lee and Lucas*. Feb. 27, 2023. Lexington, KY.

Bertucci, Lucas. *Solar Panel Sustainability: End-of-Life Recycling*. Poster Presented at: ***2022 AIChE Student Conference***. Nov. 14, 2022. Phoenix, AZ.

Bertucci, Lucas. *Solar Panel Recycling: Developing a Circular Economy.* Poster Presented at: ***7th International Forum on Sustainable Manufacturing***. Oct. 27-28, 2022. Lexington, KY.

Bertucci, Lucas. *Solar Panel Recycling: A Sustainable Future*. Poster Presented at: ***2nd Annual Sustainability Showcase***. Oct. 18, 2022. Lexington, KY.

Bertucci, Lucas. *SMaRT: Electronic Waste Recycling*. Poster presented at: ***16th Showcase of Undergraduate Scholars***. Apr. 26, 2022. Lexington, KY.

Bertucci, Lucas. *Sustainable Materials and Recovery Technologies*. Poster presented at: ***20th Annual Posters at the Capitol***. Mar. 3, 2022. Frankfort, KY.

NEWS ARTICLES

Jasi, Amanda. ***Life After End of Life***. *The Chemical Engineer*. Dec. 14, 2023.

Kendall, Mariah P. ***UK senior Lucas Bertucci wins first Lee T. Todd Student Innovation Scholarship for recycling project***. *Northern Kentucky Tribune*. Dec. 28, 2022.

Kendall, Mariah P. ***In his UK lab, senior Lucas Bertucci plots a green revolution, one recycled metal scrap at a time***. *Kentucky Lantern*. Dec. 23, 2022.

Melanson, Dave. ***Bertucci named UK's 1st Lee T. Todd, Jr. Student Innovation Scholar***. *UKNOW*. Aug. 24, 2022.

PUBLICATIONS

Kludze, A., **Bertucci, L.**, Gulati, S., & Hu, S. (2025). Opportunities for Heterogeneous Photocatalysis: Quantum Efficiency Enhancement, Selectivity Control, and Scale Up. *Catalysis Letters*. [Manuscript Submitted for Publication].

Lin, P., Werner, J., Ali, Z. A., **Bertucci, L**., & Groppo, J. (2023). Kinetics and Modeling of Counter-Current Leaching of Waste Random-Access Memory Chips in a Cu-NH3-SO4 System Utilizing Cu (II) as an Oxidizer. *Materials*, *16*(18), 6274.

PATENTS

Method of Solar Panel Recycling. Patent Pending. UKRF 2870.

Method for Recycling End-of-Life Solar Panels. Patent Pending. UKRF 2765.

Extraction of Copper and Other Elements from Waste Materials for the Production of Metallic Copper. U.S. Provisional Patent Serial No. 63/398,695.

Recovery of Metals and Elements of Value Batteries. U.S. Provisional Patent Serial No. 63/346,600