Ben Phillips

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EDUCATION

2022 - 2026 **Engineering Physics B.S. in Digital Electronics Design** — **University of Kansas**

Current sophomore (junior by credits) and honors student with 4.0 GPA.
Combination of computer engineering and physics programs.
Recent coursework includes frequency analysis in Circuits II, baremetal programming in Embedded Systems, and applied calculus in Mechanics.

SKILLS

Technical Skills: Mathematical Modeling, Electron Beam Lithography, CAD Software, Audio & Video Processing, Lighting Design

Languages: Rust, C, JavaScript, Python, Java, OpenGL, LaTeX

WORK EXPERIENCE

11/2022 – Present **2D Materials Researcher (Condensed Matter Physics)** — **KU Department of Physics**

- Software specialist for the Ovchinnikov lab group at KU
- Superuser for electrical measurement systems and stereo microscope
- Use a scanning electron microscope to perform EBL (electron beam lithography) on a weekly basis

2/2021 – 5/2021 **Cerner Scholars Software Engineering Internship** — **Cerner**

- Worked on a Java + ReactJS web application codebase
- Developed a tool for users to run an array of tests on a SQL database

2021 – 2023 **H. Roe Bartle Summer Camp Staff** — **Scouts BSA - Heart of America Council**

- Worked for 3 summers with children age 10+ and adult leaders
- Served as the escape room lodge lead in 2023 with two junior staff working under me
- Designed and ran lighting scripts on an ETC board for campfire ceremonies

PROJECTS

Team Leadership & Software Engineering

1st Place HackKU Project: Wikidungeon — **devpost.com/software/wikidungeon**

At HackKU 2023, I led two friends in developing Wikidungeon, a roguelike game that fetches HTML pages from Wikipedia and then transforms them into levels of a dungeon that interconnect according to the links present on the actual page. The project is a proof of concept in data reinterpretation, using network protocols, parsing, filtering, probability modeling, procedural generation, and game engine design to accomplish its goals. All of the code for this project was written during the 36 hour hackathon, and at the end of the event our work won 1st prize in the general track.

Theoretical Condensed Matter Physics Research

Moiré Models — **github.com/Jorbon/moire_models**

For my research lab, I created a software utility for visualizing moiré patterns between layers of various 2D materials. This project uses coordinate space transformation and culling-based optimizations to display crystal structures on a large scale. I have used this utility to develop the theory portion of a future paper on twisted PdSe2 systems. Captures from this software are used in our group's presentations for both their technical accuracy and aesthetic quality.

Applied Math & Open Source Collaboration

Published Minecraft Mod — **www.curseforge.com/minecraft/mc-mods/cool-elytra-roll**

I developed and published a mod for the popular game Minecraft that adds physics-based camera movement and control to the game's flight system by calculating and injecting transformation matrices into the original code. I have maintained and updated the mod with the help of other contributors, and it has now received over 55,000 downloads on the mod hosting site Curseforge.

CAD & Electrical Design

Guitar Panel Patch Board — **/in/ben-a-phillips/details/projects**

When the pickup switch on one of my electric guitars broke, I decided to fabricate and install a custom patch board to enable access to all 572 possible pickup wirings instead of just choosing 5. I found dimensions for 3.5mm audio ports and engineered a panel to fit in the confining space of the electronics compartment, then printed the model, ordered parts, and soldered everything according to my design. It now functions just as I envisioned, giving me many unique tones to choose from.

HONORS AND AWARDS

Eagle Scout **Order of the Arrow Vigil Honor Member** **National Merit Scholar** **Valedictorian** **NSDA Degree of Honor**