

# NICHOLAS FLOOD COTHARD, Ph.D.

Relocating to Seattle Area in Mid-2024 — [ncothard3@gmail.com](mailto:ncothard3@gmail.com) — (630) 272-3003 — [ncothard.github.io](https://ncothard.github.io)

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## SUMMARY

- Applied physicist with 8+ years experience integrating cross-functional, geographically dispersed technical teams
- 11+ years of technical experience, including device physics, radio-frequency engineering, optics and cryogenics
- Excellent problem-solving, project management, technical writing, collaboration and mentorship skills
- Passion for bridging the gap between emerging technologies and scientific applications

## RESEARCH EXPERIENCE

### **Goddard Space Flight Center**

Greenbelt MD

*NASA Postdoctoral Fellow*

Aug 2021 – Present

- Developed novel, ultra-low noise, cryogenic, light-sensing technologies for spaced-based far-infrared telescopes
- Interfaced cross-functional and geographically dispersed NASA teams, delivering successful prototype sensor arrays
- Collaborated with NASA teams to engineer and characterize optics and FPGA-based electronics for sensor arrays
- Successfully proposed and managed NASA-funded research programs, enabling superconducting sensor development
- Documented research programs, generated progress reports and regularly presented to NASA leadership teams
- Led the design of hardware, measurement systems and data analysis methods to evaluate cryogenic sensors
- Operated and optimized cryogenic systems, including dilution, adiabatic demagnetization and helium refrigerators
- Wrote data reduction and analysis software, generating science-grade infrared images of a nearby galaxy
- Communicated research results to the public via peer-reviewed publications and conference presentations

### **Cornell University**

Ithaca NY

*Graduate Student Research Fellow*

Aug 2015 – Aug 2021

- Developed light-sensing technologies for four international cosmology telescope collaborations
- Collaborated with cross-functional international teams to define telescope system design and specifications
- Designed, implemented and operated cryogenic radio-frequency testbeds for novel superconducting sensors.
- Provided data analysis and simulations to drive decisions on sensor materials and fabrication methods
- Documented and shared results internally, at international conferences and in peer-reviewed journals
- Formulated and led two successful research grants, resulting in 5 years of research program management

### **Fermi National Accelerator Laboratory**, Batavia IL, *Undergraduate Researcher*

Jun 2011 – Aug 2015

- Developed diagnostic, simulation and analysis software for magnetic monopole search in particle collider data

### **General Atomics**, San Diego CA, *Department of Energy Undergraduate Research Fellow*

Summer 2014

- Improved data analysis accuracy and time-resolution of ion-loss measurements in DIII-D Tokamak Fusion reactor

### **SRI International**, Menlo Park CA, *NSF REU Student Researcher*

Summer 2013

- Assembled, calibrated and wrote control software for UV-nearIR Echelle spectrometer for astronomical research

## EDUCATION

**Ph.D.**, Applied and Engineering Physics, Cornell University: NASA Space Technology Fellowship August 2021

**M.S.**, Applied and Engineering Physics, Cornell University: Kavli Nanoscale Science Fellowship July 2018

**B.S.**, Physics (Minor Math), University of Rochester: Phi Beta Kappa & Sigma Pi Sigma May 2015

## SKILLS

- Technical proposal & grant writing
- Research program documentation
- Cross-functional team management
- Strong collaborative mindset
- Communicating complex research
- Large scale systems integration
- Radio-frequency engineering
- Cryogenic measurement design
- Micro-fabrication techniques
- Device physics data analysis
- Optical system design
- Python, Matlab, Git, VS Code

## PUBLICATIONS & OTHER RELATED EXPERIENCE

- 10 main-author, 49+ co-authored publications. Full list available: [ncothard.github.io/publications](https://ncothard.github.io/publications)
- Presented research at over a dozen conferences, workshops and scientific collaboration meetings
- Subject matter expert in NASA peer reviews and peer-reviewer for two low-temperature physics journals
- Mentored 10+ undergraduate and graduate students in conducting scientific research
- Teaching assistant for six college courses ranging from honors and engineering physics to electronics lab
- Founder of Cornell Applied Physics Grad Society and former president of Rochester Society of Physics Students