# Andrew D. Mullen

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## SUMMARY

- Engineer with over 10 years of experience on NASA and NSF projects developing imaging and robotic systems.
- Led the design of custom instruments integrating optical, electrical, mechanical, and software elements.
- Member and leader of cross-functional teams conducting research in harsh polar and marine environments.

## EDUCATION

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|---|---|---|---|
| 2018 | Ph.D. | Electrical Engineering | University of California San Diego |
| 2015 | M.S. | Oceanography | University of California San Diego, Scripps Inst. of Oceanography |
| 2011 | B.S. | Civil Engineering | University of Notre Dame, *Magna Cum Laude* |

## PROFESSIONAL EXPERIENCE

2022-Present Senior Research Engineer, Cornell University

- Managed development of a custom science package successfully used in robotic exploration of deep-sea brines.
- Lead field engineer for geophysical studies of planetary analog ice formations in the Arctic.

2018-2022 Postdoctoral Fellow, Georgia Institute of Technology & NASA Postdoctoral Program

- Led collaboration between Georgia Tech & NASA JPL developing a submersible Digital Holographic Microscope. Demonstrated system capabilities by observing microbial life in Antarctica, an analog for "ocean worlds".
- Engineer on three Antarctic campaigns deploying underwater robot 'Icefin'. Team surveyed previously inaccessible sub-glacial environments providing critical measurements for modeling sea level rise.
- Co-led design of conceptual instrument payload for NASA mission to Europa. Coordinated 21 member team, surveyed state-of-the-art technologies, presented life detection payload integrating multiple sensors.

2012-2018 Graduate Research Fellow, UC San Diego

- Jointly developed and deployed first system to image seafloor corals in the ocean at micron-scale.
- Led development of imaging system to measure micro-scale fluid dynamics in the ocean using particle tracking.

## MANAGEMENT & TECHNICAL LEADERSHIP EXPERIENCE

- Management: developed project concepts, written funding proposals, coordinated stakeholders, led engineering teams, defined requirements, managed timelines and budgets, documented results through publication
- Instrument Development: experienced with full product lifecycle including project conception, product design, modeling and CAD, component procurement, fabrication, testing, lab validation, and field deployment
- Field Operations: organized logistics, developed operations plans, ran technical equipment, collaborated with international teams; conducted over 15 field research seasons including polar, ship and SCUBA work

## AWARDS & HONORS

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|---|---|---|---|
| 2021 | Antarctic Service Medal | 2014 | Link Ocean Engineering Ph.D. Fellowship |
| 2018 | NASA Postdoctoral Program Fellowship | 2012 | NSF Graduate Research Fellowship Program |
| 2017 | Microscopy Today Innovation Award | 2011 | University of California Regents Fellowship |

## PUBLICATION HIGHLIGHTS

- Peer Reviewed Journals: *Nature*, *Nature Geoscience*, *Nature Communications*, *Planetary Science Journal*
- Conference Papers: *Optical Society of America, IEEE Oceanic, American Institute of Aeronautics and Astronautics*
- Media Coverage: *New York Times, BBC*, *Washington Post*, *Wall Street Journal, PBS*, *Scientific American*

## TECHNICAL SKILLS

- Software*:* data analysis, image processing, computer vision, embedded controls software [*Python, Matlab*]
- Electrical: PCB design, embedded computer and micro-controller implementation [*Eagle, Python*]
- Mechanical: mechanical design, pressure housing design, 3D printing [*Solid Works*]
- Optical: microscopy, holography, computational imaging, opto-mechanics, opto-electronics