

Andrew Mueller

109 Marion Ave, Pasadena 91106
andrewstermueller@gmail.com
amueller@caltech.edu

(310) 947 1719

EDUCATION

Doctor of Philosophy - California Institute of Technology, Pasadena Defense Date: Dec 11th, 2023
Option: Applied Physics Graduation: June 2024
Thesis: [Quantum Measurements with SNSPDs](#), [Defense Video](#)
Caltech Advisor: Maria Spiropulu
JPL Advisor: Matthew Shaw

Bachelor of Science - University of California, San Diego
Major: Physics Graduation: March 2017
Minor: Engineering Mechanics GPA: 3.803

AWARDS AND FELLOWSHIPS

Phi Beta Kappa Society (May 2015)
Rose Hills Fellowship (Sept 2017)
Brinson Foundation Fellow (Sept 2020)

EXPERIENCE & PUBLICATIONS

Postdoctoral Scholar, JPL Microdevices Laboratory; INQNET program April 2024 – Present

Graduate Student, JPL Microdevices Laboratory; INQNET program Sept 2018 – Dec. 2023

Recent Publications (2020 – Present):

A. Mueller, S. I. Davis, B. Korzh, R. Valivarthi, A. D. Beyer, R. Youssef, N. Sinclair, C. Peña, M. D. Shaw, and M. Spiropulu, “High-rate multiplexed entanglement source based on time-bin qubits for advanced quantum networks,” [Optica Quantum 2, 64–71 \(2024\)](#).

A. Mueller, E. E. Wollman, B. Korzh, A. D. Beyer, L. Narvaez, R. Rogalin, M. Spiropulu, and M. D. Shaw, “Time-walk and jitter correction in snsps at high count rates,” [Physics Letters 122, 044001 \(2023\)](#).

A. S. Mueller, B. Korzh, M. Runyan, E. E. Wollman, A. D. Beyer, J. P. Allmaras, A. E. Velasco, I. Craiciu, B. Bumble, R. M. Briggs, L. Narvaez, C. Peña, M. Spiropulu, and M. D. Shaw, “Free-space coupled superconducting nanowire single-photon detector with low dark counts,” [Optica 8, 1586–1587 \(2021\)](#).

M. Colangelo, B. Korzh, J. P. Allmaras, A. D. Beyer, **A. S. Mueller**, R. M. Briggs, B. Bumble, et al., “Impedance-matched differential superconducting nanowire detectors,” [arXiv:2108.07962, 2021](#).

S. I. Davis, **A. Mueller**, R. Valivarthi, N. Lauk, L. Narvaez, B. Korzh, A. D. Beyer, O. Cerri, M. Colangelo, K. K. Berggren, M. D. Shaw, S. Xie, N. Sinclair, and M. Spiropulu, “Improved heralded single-photon source with a photon-number-resolving superconducting nanowire detector,” [Rev. Appl. 18, 064007 \(2022\)](#).

R. Valivarthi, S. I. Davis, C. Peña, S. Xie, N. Lauk, L. Narváez, J. P. Allmaras, A. D. Beyer, Y. Gim M. Hussein, et al., “Teleportation systems toward a quantum internet,” [PRX Quantum 1, 020317 \(2020\)](#).

R. Valivarthi, L. Narvarez, S. I. Davis, N. Lauk, C. Peña, S. Xie, J. P. Allmaras, A. D. Beyer, B. Korzh, **A. Mueller**, M. Kiburg, M. D. Shaw, E. E. Wollman, P. Spentzouris, D. Oblak, N. Sinclair, and M. Spiropulu, “Picosecond synchronization system for quantum networks,” [Journal of Lightwave Technology](#), 1–7 (2022).

[See more publications and conference proceedings on google scholar.](#)

- Other projects, ongoing projects
 - Testing and analysis of mid-infrared SNSPDs (20 - 45µm) at 250 mK
 - Theoretical modelling of ppKTP pair generating crystal for high purity and high rate photonic entanglement generation.
 - Packaging, building, and testing of low jitter photon-number-resolving 1550nm SNSPDs for quantum networks. Fiber splicing, device packaging, building readout electronics
 - Writing of graphical user interfaces for cryostat and experiment control, based on web-tooling
 - Installation, usage, and management of pulse tube and GM cryostats, installation and setup of water-cooled and air-cooled helium compressors.

Mechanical Engineer, Wireless Mobi Solution
San Diego, California

June - Aug 2017

- Solidworks design of novel smartphone incorporating micro-projector

Engineer, Basov Infrared Laboratory
University of California San Diego (moved to Columbia University)

Dec 2013 – June 2017

- Design of Terahertz optical system with parabolic mirrors using ZEMAX EE
- Conceptual design of new Cryogenic Infrared Atomic Force Microscope

SKILLS

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- Full-stack web development with Typescript, Svelte, Tailwind, Fastapi, MongoDB, Docker, Rust & WebAssembly – [github homepage](#)
 - Proficient with Python, Numpy, PyTorch, C, Matlab, Wolfram Mathematica
 - Proficient with Solidworks for research/prototyping purposes, ZEMAX for optical design
 - 3d and 2d Graphics, rendering. Creator of [Nature cover artwork](#), and [press-release artwork](#)

CLUBS AND AFFILIATIONS

Senior Producer, Triton Television, UC San Diego

October 2014 - 2015

- Director and head of short narrative film project with 20+ cast/crew
- Coordinator of Narrative Meetings/Scriptwriting Circle