David Nicholaeff

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About

> *Ἀδικεῖ πολλάκις ὁ μὴ ποιῶν τι, οὐ μόνον ὁ ποιῶν τι.*
>
> *He often acts unjustly who does not do a certain thing; not only he who does a certain thing.*
>
> — Marcus Aurelius, Meditations 9.5

It is the ultimate hubris to strive to change the world, but it is the ultimate nobility to make a difference for good in the world. I have always been most passionate in this endeavour, in seeking justice, truth, and ultimately understanding why we are here. My technical passion thereby lies in leveraging the elegance of mathematics to build computational models to simulate complex physical systems, that I may solve problems that remain out of reach.

Experience

DaletN

02/18 – Present

Founder & CEO

Consulting

- Acting as a Fractional CTO for clients
- Building customer solutions leveraging cloud deployments and agentic AI

Student Journey Platform

- Creating better paths for prospective students on their education journey by matching them with schools driven by data and intelligence

Education Sanctum

- Dreaming of an education renaissance with quantum theory, computational philosophy, and artificial intelligence as a new education technology pedagogy

New Mexico Consortium

12/23 – Present

Quantum Computing Lead — *Los Alamos, NM*

Quantum Cloud Access Project

- Acting as the quantum computing lead on a subcontract for Los Alamos National Laboratory
- Managing quantum cloud access for researchers across New Mexico
- Democratizing user workflows through education and community outreach
- Researching new metrics and protocols for scalable quantum advantage via quantum Darwinism and quantum contextuality

GitOps Development

- Hosting on-prem GitLab

SavantX

09/22 – 03/23

Mathematician — *Santa Fe, NM*

High Risk Quantum Computing Research

- Researched models, derived theory, and conducted experiments to emulate quantum circuits on D-Wave quantum annealers

MRI Technologies

10/20 – 08/22

Senior DevOps Engineer — *Houston, TX*

NASA Mission Telemetry Data Services

- Prototyped a provable zero trust architecture and Kubeflow AI platform to share telemetry data from mission control with external partners
- Helped win the Mission Enabling Services Contract (MESC, C22-012)

New Mexico Consortium

10/18 – 09/20

U.S. Department of Energy Exascale Computing Project — *Los Alamos, NM*

U.S. DOE Exascale Computing Project

- Managed the ECP DevSecOps research team across all national laboratories
- Developed a zero trust infrastructure to enable secure continuous integration in a multi-cloud environment

Descartes Labs, Inc.

10/16 – 02/18

Computer Scientist / Data Scientist — *Santa Fe, NM*

Geospatial satellite data refinery

- Enriched petabytes of hyperspectral data: visible (RGB), near infrared (NIR), shortwave infrared (SWIR), and synthetic aperture radar (SAR)

Asynchronous, event-driven scalable distributed compute

- Constructed a task manager using Google Cloud Platform's Pub/Sub: pipelines on 64k+ cores across managed instance groups

Los Alamos National Laboratory

06/11 – 09/16

Computational Physicist / Staff Scientist — *Los Alamos, NM*

D-Wave adiabatic quantum computer exploration

- Bridged discrete and continuous (quadratic, non-convex) optimization: sphere packing with local topological constraints and unequal volumes

Multiphysics (Eulerian) code modernization

- Developed higher order function mappings over physics kernels (replaced core mesh iteration patterns)

Accelerated asynchronous message passing interface (MPI) facility

- Unified cell-based adaptive mesh refinement (AMR) and N-body particle models and simulations using projective geometry and hashing

Radiation-Hydrodynamics codes at exascale

- Researched hash-based algorithms to discretize continuous spaces into computational meshes and tested on heterogeneous GPU clusters

Shallow water equations model simulation using cell-based AMR on GPUs.

Lambda Labs

Summer – Fall 2014

Early Engineer (Employee #3)

- Developed a face recognition API, an Elm-compiled web frontend UI, and implemented machine learning algorithms including deep learning convolutional neural networks.

Education

University of Oxford

2014

MSc. in Mathematics and the Foundations of Computer Science

- Dissertation: On the topology of measurement contexts for asymmetric multipartite spin systems
  - Computed degrees of non-locality of entangled qubits using algebraic topology
- Adviser: Samson Abramsky

University of California, Los Angeles

2012

BSc. in Physics & Mathematics

- Departmental Honors
- Dean's List

Publications

David Nicholaeff & Akram Touil (2026). Observation of quantum Darwinism and the origin of classicality with trapped ions (Quantinuum). *Manuscript in preparation*.

Connor Aronoff, Travis Howard, David Nicholaeff, Alejandro Lopez-Bezanilla, & Wade DeGottardi (2026). Assessing quantum coherence in quantum annealers. *Manuscript in preparation*.

QC Ware (2025, February 4). Q2B24 Silicon Valley | David Nicholaeff, Systems Research Scientist, New Mexico Consortium. *YouTube*. https://www.youtube.com/watch?v=pLSCHSTQFCc

GitLab (2020, January 15). Commit San Francisco 2020: Federation and Zero Trust CI in GitLab. *YouTube*. https://www.youtube.com/watch?v=5mOnp26Ingo

Daniela I. Moody, Steven P. Brumby, David Nicholaeff, Rick Chartrand, Mark Mathis, Justin Poehnelt, Samuel W. Skillman, & Michael S. Warren (2018). Satellite imagery analysis for automated global food security forecasting. *SPIE Defense + Commercial Sensing 2018 (Proc. SPIE 10644)*. https://doi.org/10.1117/12.2315960

Guillaume Julien Chapuis, David Nicholaeff, & Stephan Eidenbenz (2016). Predicting Performance of Smoothed Particle Hydrodynamics Codes at Large Scales. *WSC '16: Simulating Complex Service Systems*. https://doi.org/10.1109/WSC.2016.7822229

Charles Roger Ferenbaugh & et al. (2016). Modernizing a Legacy Physics Code. *Submitted to Supercomputing '16*.

David Nicholaeff & Robert W. Robey (2016). Fast Mesh Operations using Hierarchical and Templated Spatial Hashing: Remaps and Neighbor Finding. *JOWOG-34*.

David Nicholaeff (2015). Hashing in the Discrete Exterior Calculus. *New Trends in Compatible Discretizations CEA-EDF-INRIA School*.

Robert W. Robey, David Nicholaeff, Rachel N. Robey, Patrick S. McCormick, Marion K. Davis, Adam McLaughlin, David R. Montoya, & Scott D. Pakin (2013). Algorithms for Optimizing the Eulerian Applications Code Base for Future Computational Architectures. *LA-UR Report LA-UR 13-20169*.

Rachel N. Robey, David Nicholaeff, & Robert W. Robey (2013). Hash-Based Algorithms for Discretized Data. *SIAM Journal on Scientific Computing*, 35(4), C346–C368. https://doi.org/10.1137/120873686

Neal E. Davis, Robert W. Robey, Charles R. Ferenbaugh, David Nicholaeff, & Dennis P. Trujillo (2012). Paradigmatic shifts for exascale supercomputing. *The Journal of Supercomputing*, 62(2), 1023–1044. https://doi.org/10.1007/s11227-012-0789-3