

# Deval Deliwala

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## Education

B.A. in Applied Mathematics and Astrophysics University of California, Berkeley	2022–2026 GPA: 3.76
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## Publications

- [1] D. R. Hart, D. M. Deliwala, R. Byrne, D. J. Spry. “Electrically detected magnetic resonance (EDMR) of introduced spin defects in silicon carbide for quantum magnetometry.” *Proc. SPIE Spintronics XVIII*, 13586, 135860F (2025). <https://doi.org/10.1117/12.3066222>

## Projects

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CORAL | Pure-Rust, memory-safe **BLAS** library (author)

- Developed CORAL, a BLAS library written in `safe` Rust with portable SIMD kernels and optional AArch64 NEON optimizations.
- Implemented Level-1/2/3 BLAS routines and tuned cache blocking, packing, and register tiling to reach  $\sim 100$  GFLOP/s SGEMM on Apple M4, comparable to OpenBLAS and within  $\sim 20\%$  of BLIS for  $n \geq 256$ .
- Open-source library with 200+ users and 50+ GitHub stars.

RIVER | Rust numerical computing library (author)

- Built a numerical computing library in Rust with an idiomatic API for batched routines, including root-finding, interpolation, quadrature, and ODE solvers.
- Integrated with CORAL so dense linear algebra workloads run on my optimized BLAS kernels.

## Experience

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NASA Glenn Research Center

Summer 2025

Quantum Artificial Intelligence Lab (QuAIL)

- Wrote fast simulations of electrically detected magnetic resonance (EDMR) for spin defects in 4H-SiC.
- Solved stochastic Liouville equations to generate EDMR spectra from experimental parameters.
- Calibrated simulations against measured spectra and predicted hyperfine features later confirmed experimentally and reported in [1]; first-author paper in editorial review for the *Journal of Applied Physics*.

Moving Universe Lab, UC Berkeley

2022–Present

- Derived spatially varying extinction laws in the vicinity of Sgr  $A^*$  using JWST NIRCam photometry.
- Built MCMC-based regression pipelines to estimate extinction ratios from Red Clump stars under extreme crowding and resolution limits.
- First-author paper in preparation for *The Astrophysical Journal*.

Lawrence Berkeley National Laboratory

2024–2025

Quantum Nanoelectronics Lab (QNL) / Advanced Quantum Testbed (AQT)

- Developed software for parametric generation and GDS rendering of superconducting fluxonium chips.
- Modeled multi-qubit fluxonium and transmon architectures and ran eigenmode simulations to study coupling topologies and optimize chip-level designs.

## Skills / Relevant Coursework

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- Rust, C, C++, AArch64 assembly, Python, L<sup>A</sup>T<sub>E</sub>X, Typst, Mathematica
- Numerical Analysis, PDEs, Linear Algebra, Abstract Algebra