Deval Deliwala

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Education

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

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

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

- Developed CORAL, a memory-safe BLAS library in 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 ~ 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+ downloads 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

NASA Glenn Research Center — Summer 2025
Quantum Sensing and Spin Physics Laboratory

- 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 peer 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

- Rust, C, C++, AArch64 assembly, Python, LaTeX, Typst, Mathematica
- Numerical Analysis, PDEs, Linear Algebra, Abstract Algebra