Deval Deliwala

+1 (480) 734-9235

Education

B.A. Applied Math and Astrophysics — 2022–2026
University of California, Berkeley — GPA 3.75

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

[2] **D. M. Deliwala**, M. Hosek. "The Extinction Laws of the Galactic Center." *The Astrophysical Journal. Pending Publication.* ⟨Preprint⟩

Projects

CORAL | a pure-Rust BLAS for AArch64

- ◇ COre Rust Architecture for Linear Algebra – a BLAS library written from scratch in Rust for AArch64.
- ◇ Derived cache-blocking and register-tiling parameters analytically for microkernels using NEON SIMD.
- ◇ Achieved performance comparable with OpenBLAS. You can see the `GEMM` benchmark ⟨here⟩.
- ◇ Authored a technical blog series detailing the math derivation, computational anatomy, and memory-bandwidth performance model of all Level 1–3 routines in CORAL ⟨dev-undergrad.dev⟩

RIVER | a Rust Numerical Library

Rust Numerical Computing Library

- ◇ Rust Infrastructure for Vector and Eigenvalue Routines – a numerical-computing library combining Python-like clarity with Rust's safety and performance.
- ◇ Emphasizes clear, expressive and intuitive syntax for implementing numerical algorithms.
- ◇ Foundation for future vector, eigenvalue, and other numerical routines. Will wrap CORAL to have critical fast LAPACK routines – all in pure Rust. Only root-finding algorithms have been written.

Experience

NASA Internship — Summer 2025
Quantum Artificial Intelligence Lab (QuAIL)

- ◇ Wrote fast EDMR simulations of spin-defects in silicon carbide in magnetic fields for quantum sensing.
- ◇ Numerically solved stochastic Liouville equations for 16×16 coupled spin Hamiltonians to generate EDMR spectra from experimental parameters.
- ◇ Validated my simulations against measured spectra and predicted new hyperfine signals. These signals were later confirmed and are described in [1].

Moving Universe Lab — 2022–Present

- ◇ Derived spatially-dependent extinction laws in the immediate vicinity of Sag A^* using data from JWST.
- ◇ Wrote MCMC regression algorithms to measure extinction ratios using Red Clump stars despite lacking resolution. My work is being finalized into [2].

Lawrence Berkeley National Lab — 2024–2025
Quantum Nanoelectronics Lab (QNL) / Advanced Quantum Testbed (AQT)

- ◇ Developed software packages for rendering superconducting fluxonium chips in GDS.
- ◇ Modeled multi-qubit fluxonium and transmon architectures; performed eigenmode simulations to optimize chip-level coupling topologies.

Skills

Rust, C, C++, AArch64 assembly, Python, LaTeX, Mathematica