CODY MITCHELL

PRODUCT ENGINEER | NATIVE APPS, LOCAL AI & DEVELOPER TOOLS
Pensacola, FL | cody@frg.earth | linkedin.com/in/codysmitchell | frg.earth

Founder and hands-on product engineer building native applications, research workspaces and developer tools. Own architecture, implementation, verification, release and support across web, mobile and desktop products. Recent work extends PSI's Get Physics Done with existing AI subscriptions, private research context and human-reviewed public contributions.

TECHNICAL PROFILE

Product & native apps: TypeScript, React, Node.js, Swift, SwiftUI, AppKit, Kotlin, Electron, PostgreSQL, SQLite
Speech & device integration: Python, macOS Accessibility, Kokoro, faster-whisper, Tailscale, WebSockets, WebRTC, P256
Verification & research: FastAPI, Nextflow, Docker, typed schemas, reproducible pipelines, Playwright, XCTest, CI

PRODUCTS I BUILD AND USE

Fractal Research Group LLC | Founder & Lead Product Engineer | Sep 2025-Present

Get Physics Done (FRG Preview) | gpd.frg.earth | Overview | Changelog

Independent extension of PSI's GPD and the OpenCode workspace | Public macOS preview

- Reimagined GPD around existing OpenAI Codex and Anthropic Claude subscriptions, removing the API-key requirement for supported research workflows; added streamed sessions, resumable conversations, allowance visibility and explicit paid-usage controls.
- Built private local research notebooks and a versioned public Knowledge library. Submission checks require attribution, scope, limitations, sources and dated prior-work searches; Exact/Verified claims also require documented reproducible checks.
- Wired the research agent to save structured notes and prepare contribution drafts. Human review, CC BY 4.0 acceptance and an explicit publish action from an email-verified website account remain required; agent tools cannot approve or publish.
- Repaired background execution, phase bookkeeping and artifact paths; completed a two-phase pendulum demonstration with independent numerical checks and a reproducible HTML/ZIP result package.
- Shipped publicly downloadable Intel and Apple Silicon previews, signed with my Apple Developer ID, Apple-notarized and stapled; published searchable overview and release records.

ClawDad | clawdad.earth

Codex-first orchestration across native iPhone, Android and Mac clients

- Built and use daily a Codex-first orchestration system with persistent sessions, supervisor and delegate continuity, Watchtower review findings, synchronized goals, deterministic hooks, heartbeats, and repair paths across a Node runtime, SwiftUI iPhone client, and AppKit Mac app.
- Engineered P256 pairing, signed commands, a Cloudflare WebSocket relay and WebRTC Remote Assist. August 2026 evidence includes internal TestFlight distribution and a signed, notarized Mac build. The current native platform is private; the earlier Tailscale-based public V1 reached 13,794 registry-recorded downloads through August 23, 2026.
- Implemented Android and iPhone WebRTC recovery with stale-reply rejection and guards against replaying unresolved terminal actions. Added native packet-loss, renderer and keyboard regression tests; physical-device acceptance and full Android parity remain in progress.

ORP | orp.earth

production agent workflow platform and public npm CLI

- Built and operate a Next.js, React, PostgreSQL, TypeScript, and Python platform for durable agent workspaces, structured plans, hosted synchronization, scheduled runs, checkpoints, repository governance, and a public npm CLI.
- Support a 30 to 40 person user base, with some user content hosted for more than seven months; the public npm CLI reached 7,267 registry-recorded downloads through August 23, 2026. Automated web and CLI suites cover synchronization, checkpoints, governance, and recovery.

Read Docs | npmjs.com/package/read-docs | Windows integration | CI

Doc Reader for macOS speech workflows and published Windows support

- Built and regularly use a macOS speech application that replaced Wispr Flow in my own workflow. It reads selected text aloud, inserts dictated text into the active field, and transcribes uploaded audio into a local library.
- Integrated a native Swift menu-bar helper and macOS Accessibility with Python, Kokoro text-to-speech and faster-whisper speech-to-text. Released publicly as read-docs; the May to August 2026 local record includes 1,072 dictations.
- Built native app windows and guided setup; packaged Apple silicon, Intel Mac and Windows installers with offline speech models. Added audio CI and resolved an Intel OpenMP collision. Mac releases are signed and notarized; Windows remains an unsigned preview.
- Reviewed and integrated Aaron Tate's 22-commit Windows implementation; corrected process ownership, launcher arguments, clipboard preservation and Qt callbacks. Added regressions and Windows/macOS CI on September 22: 70 tests passed on Windows; macOS ran 70 with three platform skips. Published in read-docs 0.5.2; physical acceptance pending.

Dumpy | npmjs.com/package/dumpy-files

private file sharing between phones and computers

- Built and regularly use a Tailscale file-sharing application to drop files and images from one device and access them from my phone and computers on my private network.
- Released as the open-source dumpy-files npm package, with a locally bound Node.js service, private Tailscale access, browser previews, grouped uploads and recovery for deleted files.

MERGED PRS TO OPEN SOURCE PROJECTS

11 selected maintainer-accepted PRs across five open-source projects.

Google DeepMind, Formal Conjectures

- #2770: Formalized the statement of Erdős Problem 857 in Lean 4 and extracted reusable sunflower definitions for shared use.
- #2771: Formalized Erdős Problem 367, including its product bounds and variants.
- #3975: Formalized Erdős Problem 1109 using squarefree sumsets and an extremal function, with bound variants.

PSI, Get Physics Done

- #23: Added phase checkpoint reports generated from research summaries and verification records, with lifecycle synchronization.
- #26: Built a reusable research verification kernel with deterministic verdict hashes and reproducibility-manifest integration.
- #28: Fixed paper build end-to-end tests for dependency preflight behavior and strengthened success and PDF output assertions.

mathlib

- #36313: Proved the inversion limit theorem for approach to the inversion center in Lean. Merged through Bors on July 27, 2026; coauthored with Oliver Nash.

LinkML

- #3312: Added visible warnings when unavailable ROBOT tooling causes OWL checks to be skipped.
- #3315: Consolidated regression snapshots and moved issue tests into feature-specific suites, removing 19 snapshot files.

Superagent Grok CLI

- #184: Added tests for request headers, environment parsing, Telegram message chunking and custom instructions.

- #185: Added structured newline-delimited JSON output for headless runs, including tool calls and results, with tests and documentation.

PUBLIC PACKAGE ENGINEERING

Public npm Ecosystem | npmjs.com/~sproutseeds

18 public packages with 40K+ registry-recorded downloads

- Published 18 public npm packages with 40K+ registry-recorded downloads through August 23, 2026 across agent tooling, research infrastructure, local-first applications, benchmarking, and developer utilities.

SUBMITTED OPEN SOURCE CONTRIBUTIONS

ActiGraph | Open Source Contributions

Four public PRs: pygt3x #55 ready for review; #56 and actiapi #27/#28 drafts. Open, none merged as of September 27, 2026.

- pygt3x #55: Corrected Python 3.13 patch-release installation metadata and added Python 3.12/3.13 CI coverage with an explicit pip install check.
- pygt3x #56: Prevented checksum-rejected tail records from changing the terminal idle-sleep fill boundary; added 14 regression cases to the GT3X reader.
- actiapi #27: Isolated V3 authentication tokens by client and scope; added 13 offline cases covering client alternation, all eight V3 entry points and pagination.
- actiapi #28: Added per-client sessions, finite timeouts, bounded retries and cancellation; verified 75 offline checks, including three loopback HTTP tests. Live API verification remains pending.

xAI Grok Build Plugin | Open Source Contribution

Open draft PR #41, submitted September 14, 2026; still pending review and merge September 27.

- PR #41: Implemented lock recovery for confirmed exited owners and reconciled interrupted Grok runs, preserving logs, session IDs and saved results while protecting live or uncertain owners.
- Added 30 regression cases and verified real Mac delegation and thread-preserving resume. Real Windows CLI, real-model crash recovery and hosted test execution remain unverified.

Neuralink datarepo | Open Source Contribution

Open draft PR #69, checked September 27, 2026. Maintainer review and hosted CI approval pending.

- PR #69: Implemented explicit missing-source errors and typed empty results in a Python/Polars Parquet connector, preserving partition types, lazy row reads and existing corruption/access errors.
- Added 27 regression and control cases using Parquet files and a localhost S3 server; verified 181 passing local tests and Polars 1.9.0 compatibility. Hosted CI and production S3 performance remain unverified.

Google DeepMind MuJoCo | Open Source Contribution

Open PR #3582, ready for review as of September 27, 2026. Maintainer review and hosted build/lint approval pending.

- PR #3582: Added handler, event and traceback logging to MuJoCo Studio's Python plugin dispatch while preserving exception identity, priority and event consumption.
- Added 11 registry tests passing on Python 3.10/3.12; verified diagnostics in a native Mac viewer using 3.13.0 wheel extensions. The reported Linux abort remains outside this fix.

NASA Open MCT | Open Source Contributions

Two open draft PRs as of September 27, 2026; maintainer review and hosted workflow approval pending.

- openmct #8443: Implemented live Compact/Expanded editing previews with Save/Cancel behavior and listener cleanup; added four browser cases and one unit regression.
- openmct #8445: Restored telemetry WebSocket worker startup in coverage builds; added three browser regressions for message delivery, reconnects and overflow, verified in Chromium and Firefox.

mathlib | Inversion Calculus Follow-up

Open PR #36323, ready for review as of September 27, 2026; substantive hosted checks pass. Upstream merge pending.

- PR #36323: Formalized inversion discontinuity and derivative formulas in Lean 4, covering zero-radius and subsingleton cases; verified 11 regression examples and hosted CI. At nondifferentiable points, zero is the fderiv fallback.

GEOquery | Retrieval Receipts

Open draft PR #231 as of September 27, 2026; maintainer review and hosted workflow approval pending.

- PR #231: Implemented optional JSON retrieval receipts for GEOquery downloads, cache and local reuse, including nested GPL files; corrected requested versus parsed accession identity with a typed warning. Verified 21 focused receipt tests, local HTTP behavior and the installed offline suite.

Rerun | Mesh Texture Update Helper

Open draft PR #12952 as of September 28, 2026; API design and maintainer review pending.

- PR #12952: Implemented a Python Mesh3D helper that updates only a mesh's albedo texture without re-logging geometry; shared the constructor's image conversion and added regression tests. Verified byte-identical constructor output on eight inputs and 940 passing local unit tests, with 15 unchanged environment-related failures.

Astropy | Cosmology Age Integration

Open, ready PR #20497 as of September 28, 2026; maintainer review and hosted validation pending.

- PR #20497: Implemented one scale-factor integral for FLRW.age to correct non-monotonic high-redshift results across supported cosmologies; added 28 regression cases that fail on main and pass with the patch. The local cosmology suite passed 6,079 tests, with 332 skips and 108 expected failures.

PSI, Get Physics Done | Installer Reliability

Open, ready PR #276 as of September 29, 2026; follows accepted #23, #26 and #28.

- PR #276: Bound mcp below 2 to restore seven built-in servers in fresh-install tests; updated dependency assertions and verified all nine entry-point imports on Python 3.11 and 3.13, following sknob3l's report and proposed bound.
- Community fork: Launched SproutSeeds/get-physics-done on September 29, 2026 to keep GPD maintained while upstream has merged nothing since May 28. Six fork PRs restored OpenAlex arXiv lookups, improved paper search (key papers found on a nine-query physics set rose from 22 to 29 of 39) and added checked new-paper listings and citation tracing across OpenAlex and INSPIRE-HEP; merged on the fork, not upstream.

PUBLIC CONTRIBUTOR SUPPORT

NVIDIA NeMo Agent Toolkit | Contributor Support

Repair and supplemental tests merged upstream in NVIDIA PR #2178 on September 21, 2026, following adoption by AmirF194. Status verified September 27, 2026.

NVIDIA PR #2178

- Adopted repair: Diagnosed and repaired async stream context leakage that disabled retries on later requests to the same instance; scoped retry context to each stream advancement before yielding.
- Supplemental #1: Added eight regression cases covering suspension, task changes, nested budgets, concurrency, filtering and cancellation; verified 354 installed utility/evaluation tests on macOS. AmirF194 merged the tests into his branch.

Tesla Camera Kit and Kafka Helmsman | Contributor Support

Public support for ZayanKhan-12's PRs; both supplemental PRs are open as of September 27, 2026. Author adoption and Tesla upstream acceptance remain unconfirmed.

Camera #814 findings | Kafka #90 findings

- Camera correction: Corrected unwanted Android pinch callbacks and coalesced discrete taps; preserved native focus/zoom behavior and clarified iOS documentation. Verified 44 checks per Android renderer, three iOS methods and four iPhone checks.
- Kafka regression: Strengthened a quota regression to expose unintended deletion and built 48 stateful lifecycle cases with an explicitly stale second metadata read. Preserved ZayanKhan-12's production fix; real broker timing remains unverified.

OpenTelemetry Swift | Integration Runner Reliability

Merged into Billy Zhou's feature branch September 24, 2026; upstream PR #1198 remains open as of September 27.

Supplemental PR #1 | Upstream #1198 and findings

- Repaired two shell filters so failed Swift builds stop before launching a stale helper and silent successful tests pass; preserved failure propagation through pipefail.
- Validated eight isolated runner scenarios (four failed before repair), a real SwiftPM stale-binary control, 616 existing package tests and 21 existing collector/iOS simulator assertions across five launches.

Triton | GPU Memory Validation Support

Validation support for Srijan Keshri's PR #11720, merged September 24, 2026. Srijan owns the repair; Cody's credit is public GPU evidence.

Upstream PR #11720 | Public findings | Harness and raw evidence

- Built a hash-checked diagnostic and compared four process-isolated CUDA/PyTorch/Triton variants on an RTX 4090 under WSL 2; published the harness, exact sources and raw measurements.
- Cache-clearing variants completed all 294 cases; original/stream-only runs reached a 10 GiB guard after 54/219. Both softmax implementations passed 105 additional correctness shapes. Guard stops were not OOMs.

Newton | Numerical Reliability and GPU Validation

Draft supplemental PR to StafaH's Jacobi SVD branch; open September 27, 2026. Adoption and upstream acceptance unconfirmed.

Draft supplemental PR #1 | Upstream #4300 and findings | GPU harness and results

- Repaired Warp-based Jacobi SVD deflation to preserve small singular directions and minimum-norm controller output; added 16 correctness subcases that pass original/repaired sources and fail the proposal on CPU/CUDA.
- Verified 290 controller tests under WSL and 72 fresh CUDA graph-replay configurations on an RTX 4090; benchmarked nine isolated runs to quantify the repair's correctness/performance tradeoff.

cuRobo | Collision Reliability and GPU Validation

Authored repair PR #726 and supplemental regression PR for #700 open and ready; upstream review pending, September 27, 2026.

Open repair PR #726 | Ready supplemental PR #1 | Upstream #700 and findings | Signed regression commit

- Restored per-query self-collision gradient scaling in cuRobo and authored 18 CUDA regressions; original code failed 15 new cases, while the repair passed all 18 within 229 distinct cost/collision cases on an RTX 4090.
- Separately supported aleksantari's voxel rounding repair with 20 analytic regressions and GPU validation: 73 SDF tests passed with one existing skip, including the additions.

Biolearn | Methylation Model Validation Support

Ready supplemental PR #1 to Marc Balestreri's feature branch; open September 28, 2026. Adoption and upstream merge pending.

Ready supplemental PR #1 | Marc Balestreri's upstream PR #212

- Repaired Biolearn methylation-model validation after preprocessing, preserving DunedinPACE imputation while rejecting a CpG removed before scoring; authored 11 synthetic regressions, with four failing Marc's branch and all passing the repair.

NVIDIA OpenShell Runtime Provenance

Public fork patch, September 29, 2026. Vouch and maintainer review pending; no upstream PR.

Proposed patch | Scope discussion

- Implemented kernel and security configuration provenance across Linux ARM64 builds, macOS firmware wrapping and runtime packaging. Added 29 regression cases and verified real builds plus OpenShell sandbox startup, allowed file access and denied reads and writes on Apple Silicon. Earlier kernel hardening remains credited to drew.

COMMUNITY AND CLIENT DELIVERY

Save Ascension | saveascension.org

verified petition and community survey

- Built and operate a public petition with more than 2,000 email-verified signatures and 500 optional survey responses, using expiring verification and removal flows, encrypted personal data, keyed email hashes, rate limits, cleanup, aggregate reporting, and automated verification of privacy and abuse-prevention paths.

Root to Crown | roottocrown.earth

production wellness brand and booking site

- Designed and launched a responsive Next.js, React, and TypeScript site for a working sound-healing practice with accessible booking and event flows, testimonials, SEO, structured data, and Playwright coverage.

Ran the Credit Man | ranthecreditman.com

client website and application automation

- Designed and deployed a responsive HTML, CSS and JavaScript client website with consumer and business service pages; integrated Typeform applications and Resend acknowledgment emails for consumer intake, with automated page and workflow checks.

ADDITIONAL PRODUCT ENGINEERING

RoomWave | roomwave.earth

production venue music platform; licensed DBA

- Built and operate a production venue music platform spanning Next.js, React, PostgreSQL, React Native, native Swift and Kotlin playback, and Electron macOS and Windows applications.
- Engineered AVAudioEngine and Media3 and ExoPlayer playback, secure native sessions, multizone device control, and a 639-track offline library. Release gates combine automated web and native suites, signed-build checks, production smoke checks, and physical iPhone and Pixel acceptance.

College Kid | collegekid.frg.earth

student planning and schedule-aware work discovery; public desktop and web release

- Built and shipped a college planning application that connects education and funding plans with job discovery around classes, existing work shifts, protected time off and individual role preferences.
- Engineered one-click verified Codex installation, staged runtime updates and signed application updates across macOS, Windows and Linux. Verified actual upgrade and relaunch from 0.6.0 to 0.7.0 on Mac, Windows and Linux under WSL, with saved plan and conversation continuity.

DeckFound

AI-native MTG Arena desktop workspace; private

- Built a Windows-first Electron, React, TypeScript, and SQLite product that synchronizes a player's Arena collection, gold, gems, vault progress, wildcard balances, local account data, saved decks, and public tournament references.
- Integrated persistent, branchable Codex threads with streaming, cancellation, retry, recovery, archives, and isolated ChatGPT subscription, personal API, and hosted intelligence profiles. Deterministic local code validates legality, copy limits, ownership, and wildcard budgets; automated desktop and gateway suites cover agent behavior, security, persistence, recovery, and provider isolation.

Founder Operations

CMAIL and LifeOps Actions

- Built CMAIL with queued ingestion, Resend outbound, encrypted local persistence, threading, retries, and health checks, plus LifeOps Actions for scheduled agent work with durable occurrences, bounded Codex review, structured results, closure gates, visible next actions, and service health.

Panhandle Parcels | panhandleparcels.com

production property intelligence; private beta

- Built and operate a Next.js, React, and PostgreSQL property-intelligence platform for 16 Northwest Florida counties, with official-record research, sortable filters, saved workspaces, watchlists, comparable sales, underwriting scenarios, verified email access, and scheduled refreshes.
- Maintain 899,832 parcel records, 150,120 current sales, and 745,446 exact local Property Appraiser matches behind explicit public and private data boundaries. Automated data, access, saved-workspace, and refresh validation supports version 0.30.0.

Food | food.frg.earth

production grocery planning, shared lists, and structured AI

- Turned firsthand grocery-shopping friction into a live product with quantities, categories, checkoff, purchase history, Google OAuth and classic authentication, per-user PostgreSQL isolation, email sharing, and saves designed to handle conflicts.
- Added authenticated structured-output AI for list creation, recipe conversion, and receipt review; automated coverage exercises authentication, sharing, conflict handling, rollback, purchase history, and AI workflows.

Ritmo Coffee | ritmo.coffee

prelaunch storefront, brewing guidance and inventory planning

- Built a Next.js, React and TypeScript storefront with regional coffee discovery, an optional seven-method brewing guide, equipment-aware recommendations and navigation that preserves cart context. Verified responsive and keyboard flows while keeping checkout disabled for prelaunch. Added an authenticated PostgreSQL sales desk with finite shipment and sample allocation, dated repeat deliveries and shared stock across package sizes. Tested concurrent reservations, payment-linked inventory and backup recovery.

Bind My Soul | bindmysoul.com

released addon and cross-device product

- Released a Lua addon, native Windows and Linux companion, and React, TypeScript, and PostgreSQL service with deterministic snapshots, SHA256 archives, Ed25519 device identity, and signed synchronization receipts; operate support and ship releases through state, identity, synchronization, archive, and recovery checks.

SCIENTIFIC COMPUTING AND FORMAL RESEARCH

Multiple Myeloma T-Cell Research | Source study: Foster et al.

Fractal Research Group | September 2026 | Single-cell reconstruction and model evaluation

- Reconstructed Foster et al.'s analysis of malignant-cell stress and RNA-defined T-cell fractions from versioned single-cell data and pinned author code, recovering all 33 published coordinate pairs. Python/R calculations reproduced the plotted r=0.67; printed P-value and participant-count differences remain unresolved.
- Evaluated a fixed 94-gene classifier on 285,521 T cells from 160 coded donors across ten study holdouts. Traced 99% of its improvement over a zero-fraction baseline to three studies and documented four zero-recall failures, retaining the predeclared stop.
- Audited eligibility and measured zeros in a 36-donor source panel, retaining the positive association under the specified inclusion change. Built provenance, donor/sample and assay-compatibility checks; independent target inference remains deferred and biological validation remains open.

NanoGPT Slowrun

PyTorch distributed training and model optimization benchmark

- Built a guarded 4090, 1x H100 and 8x H100 evaluation funnel for the NanoGPT Slowrun limited-compute benchmark, with autoresearch-style proxy screening, repeat confirmation, transfer checks and proxy/transfer heatmaps.
- Implemented and evaluated distributed PyTorch training code with CUDA tuning, torch.compile, Muon and AdamW optimizer groups, and separate embedding and unembedding learning-rate controls. A real 8x H100 run reached 3.250739 validation loss in 57.99 minutes versus a same-session 3.252010 baseline, an improvement of 0.001271.

Robot Arm Lab | v0.1.0 release

Public seven-joint Newton/Warp simulation, reliability harness and CPU/CUDA validation

- Released a seven-joint Robot Arm Lab with a recorded demo and verifiable source/evidence bundle; built independent kinematic checks, replay and a 27-case reliability harness on Newton and NVIDIA Warp.
- Implemented a proportional 2 rad/s speed policy and independently indexed batches of 1, 8, 32 and 128 arms; qualified CPU/CUDA reaches within about 3.24 mm while retaining original failure controls.
- Validated the frozen batch workload with 72 RTX 4090 tests and 78 passing Mac release tests (four CUDA skips); reanalyzed 1,344 summaries and 144 comparisons, with ordinary CPU/GPU timing ratios indeterminate.

Retinal Longevity Controller Benchmarks | GitHub benchmark repository

public research benchmarks and retinal-evidence evaluation tools

- Built a retinal longevity evaluation framework that separates restoration signals, adult cell identity, safety boundaries and uncertainty, with evidence provenance, contradiction tracking and explicit abstention when required measurements are missing.
- Released four npm packages for schema validation, benchmark data, JavaScript analysis and a runnable CLI, with a Zenodo-archived software release. Built walkthroughs for conflicting evidence and hazard-based blocking; biological restoration and therapeutic efficacy remain unestablished.

BioSentinel

desktop-first microbial sequencing and scientific-computing platform

- Built a desktop-first microbial sequencing platform with a Tauri application, independent FastAPI execution engine, typed schemas, Docker, and containerized Nextflow workflows designed for local, HPC, and cloud execution.
- Completed a verified execution foundation with deterministic paired-FASTQ fixtures, manifest and checksum provenance, immutable container digests, cached resume, byte-identical recompute summaries, explicit failure fixtures, 21 Python tests with 92.90% branch-aware coverage, native desktop checks, and passing hosted CI. Pipeline Alpha now implements an auditable metagenomics graph and remains in canonical validation.

RejuveBench | rejuvenebench.vercel.app

evidence-gated cellular rejuvenation research platform

- Built a Tauri and React macOS application with an authoritative Python engine, CLI, and API for lineage-preserving fibroblast rejuvenation benchmarking under explicit identity, boundary, uncertainty, and fail-closed rules.
- Produced a v0.1 release candidate with 31 Python tests, 4 TypeScript contract tests, and 10 frontend tests, plus a 76-file integrity-checked report bundle that reconstructs inputs, evidence, decisions, scores, and results byte for byte. Published a read-only web demo for external review.
- Direct cellular function remains unmeasured; this work establishes software and reproducibility infrastructure for research.

Erdos Problems and Sunflower Lean | github.com/SproutSeeds/erdos-problems

agent research workflow, Lean 4 formalization, and upstream work

- Published an agent-ready npm research CLI for problem dossiers, machine-readable status, verification records and reviewed contributions; it reached 3,676 registry-recorded downloads in its first 14 days and 4,929 through August 23, 2026.
- Built a Lean 4 formalization layer and reproducible research workflows for sunflower set systems. The general Sunflower Conjecture remains open.

Chain Theory Audit | github.com/SproutSeeds/chain-theory-audit | math-lab

October 2026 public audit of a proposed physics derivation, with Lean 4 proofs and exact certificates

- Replicated A. D. Wissner-Gross's Chain Theory candidate for the fine-structure constant and its Lean file, and checked all 1,492,992 combinations of the alternatives the paper lists; only the published one falls within one standard deviation of CODATA 2022.
- Proved the theory's read cap in Lean 4 in both directions: link types whose dimensions multiply to more than 6 have positive maps that are not decomposable (the Choi map and an explicit integer map from 2x2 to 4x4 matrices), and smaller types are readable, via a formal proof of Woronowicz's 1976 theorem; extended it to the PPT criterion for quantum states (PPT states are separable exactly when the dimensions multiply to at most 6) and proved that the least rank of a PPT entangled state is 4; standard axioms only.

PUBLICATIONS AND RESEARCH NOTES

Neurons Through the Looking Glass | doi.org/10.5281/zenodo.24020729

November 2026 version 3 Zenodo preprint with reproducible document source

- Published a construction connecting two process-neuron architectures to an interacting two-dimensional field under named classical and source assumptions, preserving reflection positivity across the two central coordinate lines at every finite stage. The paper includes conditional quantitative bounds and a prescribed renormalized local-square observable; the 172-page preprint has reproducible document source, while practical computational benefit remains open.

Positivity Before the Limit | doi.org/10.5281/zenodo.23095903

October 2026 Zenodo preprint with a tested code archive, Lean 4 checks and its internal review record

- Built two-dimensional neural network ensembles that are reflection positive at every finite width and cutoff and proved they converge to the finite-volume P(phi)_2 measure, taking up an open question from the first network construction of that measure; the public archive holds 41 automated tests, Lean 4 checks and the full internal review record.

Determinism, Not Finiteness | doi.org/10.5281/zenodo.23055919

September 2026 Zenodo preprint, corrected October 2026 (version 2), with a tested code archive and Lean 4 lemma

- Proved that finite-width neural network field theories with analytic time dependence fail reflection positivity unless static, because their values at positive times determine their past rather than because width is finite, addressing open questions from two August 2026 papers; built one-dimensional networks satisfying every Osterwalder-Schrader axiom at every width. Version 2 corrects version 1.

Three-Sunflower Set Systems | doi.org/10.5281/zenodo.20693260

June 2026 Zenodo preprint with deterministic checkers and Lean 4 companion

- Proved exact M(l,1) = 2l+2 with an extremal classification and explicit quadratic bounds for M(l,2), supported by deterministic checkers and Lean 4 verification of the t=1 result.

Frequency Flow Theory | doi.org/10.5281/zenodo.19752002

April 2026 corrected Zenodo research note; exploratory entropy framework

- Developed an exploratory entropy framework for finite checks and conjecture generation in sunflower-free families; its asymptotic formula remains unproved.

Exact Values for Maximum Sunflower-Free Families | doi.org/10.5281/zenodo.18250374

January 2026 corrected Zenodo preprint on exact small-instance values

- Reported exact 3-sunflower-free maxima through n = 6 and constructions for n = 7 and 8; the broader formula remains conjectural.

PUBLIC COMMUNICATION AND BOOKS

Back To The Fort | youtube.com/@BackToTheFort

- Produced and hosted 99 videos reaching 193K+ channel views and 800+ subscribers through August 31, 2026, using technical explainers, interviews and long-form analysis across AI, software, research, gaming and online communities.
- Host on-camera interviews and collaborative discussions, translating complex or contested subjects into clear, evidence-led explanations for a public audience.

Lawyer Without Law School | Amazon paperback

- Authored and independently published a 17,652-word, 178-page practical guide that translates law-office-study routes in California, Vermont, Virginia, and Washington into supervision strategy, a four-year curriculum, Baby Bar and bar preparation, and professional-responsibility checkpoints.
- Designed the book for autodidacts and career changers pursuing a lower-debt path, combining more than 50 legal-document examples with legal writing, research and citation, all seven MBE subjects, ethics, and practice operations while directing readers to verify current state-bar requirements.

Solving the Unsolvable | Amazon paperback

- Authored and independently published a 65,677-word, 342-page book that turns curiosity into a disciplined operating method through ten question types, a Question-to-Claim-to-Verify loop, one-page audits, action ladders, and sustainable practice.
- Designed the method to help readers surface inherited constraints and convert stuck problems into the smallest verifiable next action, connecting personal narrative, human-AI collaboration, traceable case studies, reproducible-research appendices, and explicit evidence ladders that separate conjecture from verified and certified results.

EARLIER EXPERIENCE

Prudential Financial | Customer Service Specialist | Apr-Sep 2025

Documented regulated insurance workflows, created process guidance, and validated policy-performance illustrations.

Amazon | Recruiting Coordinator | Jun 2022-Aug 2023

Coordinated 25+ active interviews per day across candidates, hiring managers, Bar Raisers, and interview teams.

UST (Intel client) | Testing Engineer & Team Lead | Jan-Jun 2022

On an Intel client engagement, ran stress tests on unreleased CPU silicon and helped design Python-based result-recording workflows.

ShopWindow | Technical Sales Engineer, Music Window | Jan 2020-Jan 2022

On the Music Window product line, personally closed approximately $100K in cumulative sales to universities and college music programs nationwide, including an approximately $10K school deal, by owning discovery, tailored demo slides and solutions, presentations, and close.

Chegg | Customer Experience Specialist - Faculty Support Team | Apr-Dec 2021

Handled international faculty honor-code and copyright takedown cases; tracked product bugs and feature requests in Jira and Confluence; created reusable communication templates; and built a monthly report presented to leadership.

Sound Physicians | Application Support Analyst | Oct 2017-Jan 2020

Supported healthcare application workflows, translated user issues into reproducible escalations, and improved formal QA documentation.

EDUCATION

Computer Science coursework: Portland State University (2019-2021); North Seattle College (2017-2019)

PROFESSIONAL AND COMMUNITY AFFILIATIONS

Pensacola Young Professionals (PYP) | Member | Pensacola, FL

- Member of a Pensacola nonprofit organization connecting professionals and business leaders through leadership development, mentorship and networking, while strengthening the local community through volunteer service and civic engagement.