RODOLFO GONZÁLEZ PARRA

Rudy Parra

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U.S. Citizen • Eligible for Security Clearance

Hands-on electrical lab technician and embedded systems developer with 3+ years of R&D experience spanning clean energy, defense, and spectroscopic materials science. First-author on a NASA/NSF-funded solar spectroscopy research poster; NSF-funded co-author on two additional published research posters in glass physics, X-ray absorption spectroscopy, and plasma science. Experienced with high-spectral-resolution optical instruments, advanced lab instrumentation, Python automation, and safe operation of hazardous materials. Former researcher at the National Solar Observatory and Lockheed Martin. Passionate about building the next generation of energy infrastructure.

TECHNICAL SKILLS

Lab Instrumentation: Oscilloscopes, DMMs, power supplies, function generators, spectrum analyzers, DAQ systems, EasyXAFS 300+, Raman spectrometers, DSC (STA449), high-temp furnaces (1100°C–1300°C), Integrated Sunlight Spectrometer (ISS)

Electrical Assembly: PCB rework (SMT/through-hole), wiring harnesses, crimping, cable routing, strain-relief, ESD handling, MOSFETs, SSRs, BMS systems

Embedded & Firmware: C++, Arduino IDE, ESP32, Particle Photon — sensor integration, relay/pump control, BLE/Wi-Fi, PID loops

Automation & Scripting: Python, MATLAB, Linux — data logging, anomaly detection, telemetry analysis, AI/ML implementation

Spectroscopy & Optics: X-ray Absorption Spectroscopy (XANES/EXAFS), Raman spectroscopy, DSC, XRD analysis, Hα 656.3nm spectral line analysis, high-spectral-resolution solar data (SOLIS/ISS instruments), Fourier transform & Hanning window processing

Lab Safety & Compliance: OSHA/LOTO practices, argon/nitrogen/lithium handling, glovebox (VAC) operations, ESD compliance, high-voltage awareness

Fabrication: 3D printing, laser cutting, CNC machining, PCB design, rapid prototyping, slurry casting

Documentation: BOMs, test records, calibration logs, build notes, research papers, grant writing, stoichiometric accuracy logs

Other: Schematic/wiring diagram reading, AutoCAD, CCNA networking, Git/GitHub, Cisco routing/switching

WORK EXPERIENCE

Senior Electrical Lab Technician | GridFlow | Albuquerque, NM *Sept 2024 – Present*

Clean energy startup; led R&D across lithium-sulfur hybrid flow batteries and now expanding into vanadium redox flow battery (VRFB) systems

- Spearhead end-to-end R&D lab operations — from prototype build and electrical assembly to structured test execution and real-time diagnostics.
- Fabricate and test battery system prototypes including peristaltic pump systems, custom PCBs, wiring harnesses, and IoT safety monitoring devices.
- Driving 0-to-1 development of vanadium redox flow battery (VRFB) systems — coordinating cross-disciplinary teams of mechanical and chemical engineers to advance design, testing, and system integration from concept to working prototype.
- Authored and implemented production SOPs covering both hardware assembly (enclosures, manifolds, cell stacks) and electrolyte preparation — establishing repeatable, audit-ready processes for a first-of-kind system.
- Integrate sensors (current, voltage, temperature, GPS) with ESP32 and Particle Photon microcontrollers via BLE/Wi-Fi; develop and maintain firmware in C++ and Arduino IDE.

- Configure and operate DAQ systems; write Python scripts for automated data logging, anomaly detection, and charge/discharge cycle analysis.
- Manage all lab safety protocols for hazardous materials (argon, nitrogen, lithium, vanadium electrolyte), including glovebox (VAC) operations, LOTO procedures, and ESD compliance.
- Built public demo units including an Earth Day Conference exhibit — coordinating laser-cut acrylic fabrication and full system integration.

Lead Software Developer | **Pii Energy** | Albuquerque, NM *Jan 2025 – Present*

GridFlow's residential plug-in home energy product line; Edge 2000 launched Pi Day 2025, featured in PV Magazine

- Architect and develop a full-stack energy management system tracking solar, battery, and grid power with real-time monitoring, room-based outlet control, and overcurrent detection.
- Investigated and integrated EcoFlow BKW API for output power control; built Cloudflare-based backend (D1 SQL, R2 storage).
- Produce technical LinkedIn video series communicating energy system design to professional and consumer audiences.

IoT & Software Developer | **Telemetry Insight** | Albuquerque, NM *Apr 2024 – Sept 2024*

- Developed and maintained Well Watcher telemetry code for real-time monitoring of industrial well controllers.
- Built AI-driven anomaly detection and predictive maintenance systems; optimized energy consumption algorithms for field hardware.
- Implemented BLE features (Tx Power monitoring, battery life analysis); led software testing for new controller features.

Image Creation Developer — DevOps | **Lockheed Martin** | Remote *Jan 2023 – May 2023*

- Participated in OS image development and troubleshooting for Cloud and On-prem Windows/Linux environments in a defense contractor setting.
- Gained experience with scripting, TCP/IP networks, virtualization, and purpose-built OS configurations.

RESEARCH EXPERIENCE

Solar Physics Researcher — First Author | **National Solar Observatory / Univ. of Colorado Boulder** | Remote *May – Aug 2020*

Funded by NASA contract NAS5-97045 (SORCE), NSF, NSO, and AURA | Mentor: Serena Criscuoli, NSO

- Led sole-first-author research investigating temporal variability of the Hα 656.3nm spectral line in sun-as-a-star observations using the Integrated Sunlight Spectrometer (ISS) — a high-spectral-resolution optical instrument.
- Analyzed disk-integrated Hα core-to-wing ratio data from SOLIS instruments (NISP/NSO/AURA/NSF) over the 27-day solar rotational timescale, alongside faculae, sunspot, and filament datasets.
- Found that sunspot area is the dominant modulator of Hα line shape; faculae and filaments showed negligible effect — contributing new understanding of chromospheric variability in solar-like stars relevant to exoplanet habitability research.
- Presented findings as sole first author at a poster session; research published under NASA/NSF/AURA sponsorship.

Glass Physics Researcher & Team Leader | **Coe College — Dr. Steve Feller Lab** | Cedar Rapids, IA *May – Aug 2023*

NSF-funded REU (Grant #1950330) & RUI (Grant #2203142) | Multi-institution: Coe College, Georgia Tech, NM Tech, Seton Hall

- Led a team of researchers across four complex NSF-funded projects investigating glass composition, atomic structure, and dielectric properties.
- Synthesized sodium borate and sodium silicate glasses at 1100°C–1300°C; performed stoichiometric weighing, controlled heating, roller quenching, and annealing.
- Operated EasyXAFS 300+ for X-ray Absorption Spectroscopy (XANES/EXAFS), Raman spectrometers, DSC (STA449), and high-temperature electric furnaces.

- Applied Hanning window and Fourier transform processing to convert energy-based XAS plots to wavenumber-based analysis; performed XRD interpretation.
- Investigated glass as a dielectric component in Dielectric Barrier Discharge (DBD) plasma generation — directly relevant to high-voltage and photonic applications.
- Co-authored two published conference posters; presented at Iowa Glass Conference; implemented new lab procedures improving stoichiometric accuracy across all departments.

PUBLICATIONS & RESEARCH POSTERS

FIRST AUTHOR ***Variability of H-alpha Line Observed at High Spectral Resolution in the Solar Atmosphere***
Rudy Parra | National Solar Observatory / University of Colorado Boulder | 2020 Instruments: Integrated Sunlight Spectrometer (ISS), SOLIS | Mentor: Serena Criscuoli, NSO
Funding: NASA NAS5-97045 (SORCE), NSF, National Solar Observatory, AURA

CO-AUTHOR ***Probing the Local Atomic Structure of Lead Borate Glasses with X-ray Absorption Spectroscopy***
Z. Cazares, R. Parra, R. Hao, K. Ameku, I. Slagle, Y. Wei, S. Feller, F. Alamgir Coe College, Georgia Tech, NM Tech | Iowa Glass Conference 2023
Funding: NSF REU #1950330 & RUI #2203142

CO-AUTHOR ***Using Sodium Borate Glass for a Dielectric Barrier Discharge (DBD)***
R.G. Parra, Z.E. Cazares, R. Hao, J.L. López, S.A. Feller Coe College, Seton Hall, CNM, NM Tech | Iowa Glass Conference 2023
Funding: NSF REU #1950330 & RUI #2203142

EDUCATION & CERTIFICATIONS

A.A.S. — Computer Information Systems, Network Administration | Central New Mexico Community College | Dec 2023 | 3.5 GPA
Coursework: IT Essentials, IoT, Linux, Python, C++, AutoCAD, Semiconductor Apprentice, Network Security, Calculus I

Deep Dive IoT Bootcamp | CNM Ingenuity STEMulus Center | Oct – Dec 2023
400+ hours: smart device coding (C++), electronic circuits, soldering, clean room ops, lab & factory automation

Certifications: CCNAv7 Introduction to Networks (Apr 2022) • CCNA Switching, Routing & Wireless Essentials (Aug 2022)

LEADERSHIP & COMMUNITY

Chapter Director — Techqueria New Mexico *Feb 2025 – Present*
Leading chapter strategy, events, and partnerships for Latinx professionals in tech across New Mexico.

Board Member — New Mexico Tech Talks *May 2025 – Present*
Strategic planning and community engagement for NM's premier tech organization; co-organizer of Desert Dev Lab hackathon.

Q-STEM (LGBTQ+ STEM Community) • STEM Core Program • ALRISE Program
Active organizer advancing equity and inclusion in STEM across New Mexico.