

Luke C. Stewart

Contact Information 8079 Quince Cir. *Cell* : (256) 683-1560
Centennial, CO 80112 *E-mail*: stewalc@gmail.com

Security Clearance Department of Defense **Secret**
Education **Auburn University** – Auburn, Alabama USA
B.S., Electrical Engineering, May 2006.

Summary of Qualifications

Intangibles

- An energetic and self-motivated engineer with a record of successfully leading groups, organizing tasks and designing, implementing, deploying, and maintaining full-stack solutions ahead of schedule and under budget
- Effective communicator across cultural, organizational, and engineering disciplines

Technical Skills

- Programming: Python, C/C++, Java, Bash, Go, JavaScript (React, Angular, Svelte), Awk, Groovy, L^AT_EX, Markdown, PyTorch, NLTK, MCP, LLM, Ollama
- Applications: AMPCS, Ant, AWS, Claude, CMake, Docker/Podman, Eclipse, FPrime, Git (Hub, Lab, command line), Gradle, GreenHills, Ivy, Jenkins, Linux/Unix platforms, Matlab, NGINX, Octave, Purify, SQL (many DB flavors), Sun Grid Engine (SGE), Subversion, System ToolKit (STK), Terraform, Valgrind, Vim, VMWare, VS-Code, VxWorks

Professional Experience

NASA Jet Propulsion Laboratory – Pasadena, California USA

Software Systems Engineer III

May 2019 to present

- Currently working in Mission Control Information Systems (393C).
- Cognizant Engineer (CogE) – **Psyche Deep Space Optical Communications (DSOC) OpenMCT**. Locally deployed (Podman containers) at Ground Laser Transmit (GLT) and Ground Laser Receive (GLR) Antennas with real-time synchronized telemetry to AWS deployed (GovCloud; JPL Net) custom OpenMCT adaptation with RethinkDB (real-time) and InfluxDB (time series; historical) data management running with automated telemetry processing and replication. The AWS RESTful endpoint provides necessary real-time Psyche pass telemetry observation for all mission stakeholders.
- **Multiple Uplink Per Antenna (MUPA) Space Link Extension (SLE) Forward CLTU (FCLTU) Service Multiplexer (FMUX)**. Python-based novel approach for multiplexing CLTUs allowing one DSN antenna to service multiple spacecrafts' uplink needs.
- **Common Mission Control (CMC)**. Integrating **YAMCS** mission control framework (Java) into JPL missions to establish a NASA-wide Common Mission Control Ground Data System (GDS), which requires a deep understanding of CCSDS packets, frames, and Space Link Extension (SLE) interfaces
- **Psyche Pass Automation**. Python program currently used by Psyche, Europa Clipper, and other Earth-orbiting missions to automatically initiate space antenna station connection and downlink processing using AMPCS driven by DSN (SPS) track scheduling. Supports passes on the DSN in addition to the NEN and SN.
- Actively supported Mars 2020 (Perseverance Rover; Ingenuity Drone) automated execution and analysis of Second Chance (SECC) FSW to ensure successful Martian Entry Descent and Landing (EDL). This uses my framework for automated and distributed execution of FSW simulation across 50 servers to complete 450 individual test cases.

- Created a self-contained automated Docker orchestration framework to launch and interact with AMPCS (Ground Control Software), Vista (a NASA Open-MCT plugin for telemetry visualization), and cFS (Core Flight System; an open-source flight software framework)/FPrime (a flight-proven, multi-platform, open-source flight software framework) to demonstrate Mission Control System's full suite of functionality with a simple, user-facing emphasis.
- Helped implement a Continuous Integration pipeline for Mars 2020 CS3 (Common Software and Services Subsystem) to build Docker images and auto-deploy AWS (Amazon Web Services) GovCloud environments for 80+ subsystem component functionalities using Jenkins, Docker, and terraform.

Raytheon Company – Pasadena, California USA

Principal Software Engineer

June 2017 to April 2019

- Developed, Executed, and Reviewed Functional Integration Tests (FIT) for Mars 2020 Flight Software.
- Architected and implemented a Continuous Integration Automated Testing Solution for Mars 2020 (WART).

Raytheon Company – Aurora, Colorado USA

Systems Engineer

August 2010 to June 2017

- GPS OCX automation/integration specialist, Subject matter expert for JPL program code (RTGx Kalman Filter; Trajedy astrodynamics propagator).
- GPS OCX System Simulator (GSYS) developer, integrator, and subject matter expert.
- Worked with Digital Defense Services (DDS) to integrate DevOps mentality and practices into the GPS OCX Program.
- Implemented Distributed Computing framework for analysis/execution using parallel processing (C++ [an IPC methodology]) and MapReduce (modular Distributed Computing) techniques.
- Wrapped real-time Satellite Flight Software (C++ and ADA compiled with GreenHills and GNAT Pro/AdaCore, respectively) to interact within the GSYS Simulation Framework.

Raytheon Company – Woburn, Massachusetts USA

Systems Engineer

July 2008 to August 2010

- Support Analyst at MDIOC in Colorado Springs as AN/TPY-2 radar simulation (CRUSHM) support analyst for the TA-10 event.
- Worked on classified defense contract tasks for simulation, modeling, and analysis of Forward Based X-Band - Transportable (FBX-T) and AN/TPY-2 Radar systems.
- Prepared, compiled, and installed various releases of CRUSHM on-site at customer locations.

Publications

- E. Alerstam, R. Rogalin, E. Wollman, S. Meenehan, M. Shaw, A. E. Velasco, A. Biswas, N. Richard, D. Cho, V. Garkanian, J. Allmaras, R. O'Brient, G. Miles, E. Grigorian, and M. Srinivasan. "Ground laser receivers for the deep space optical communications demonstration: performance and lessons learned from first year of operations". In: *Free-Space Laser Communications XXXVII*. vol. 13355. International Society for Optics and Photonics. SPIE, 2025, 133550N
- S. Meenehan, A. Velasco, M. Wright, Y. Beregovski, M. Brewer, W. Buehlman, N. Richard, E. Alerstam, A. Biswas, R. Rogalin, G. Ortiz, V. Garkanian, K. Matthews, J. Allmaras, and M. Srinivasan. "Operational results from the deep space optical communications project ground laser transmitter". In: *Free-Space Laser Communications XXXVII*. vol. 13355. International Society for Optics and Photonics. SPIE, 2025, 133550K

- B. Duckett, K. Havelund, and L. Stewart. “Space Telemetry Analysis with Py-Contract”. In: *Applicable Formal Methods for Safe Industrial Products: Essays Dedicated to Jan Peleska on the Occasion of His 65th Birthday*. Springer Nature Switzerland, 2023, pp. 272–288
- M. Srinivasan, E. Alerstam, E. Wollman, R. Rogalin, S. Meenehan, M. Shaw, A. E. Velasco, A. Biswas, N. Richard, D. Cho, V. Garkanian, J. Allmaras, G. Miles, and E. Grigorian. “The Deep Space Optical Communications project ground laser receiver”. In: *Free-Space Laser Communications XXXV*. vol. 12413. International Society for Optics and Photonics. SPIE, 2023, 124130R
- L. Walker, J. Austin, A. Kennett, and D. Born. “Actuator and Motor Control End-to-End V&V on the Mars 2020 Rover”. In: *2022 IEEE Aerospace Conference (AERO)*. 2022, pp. 1–18

Special Activities and Awards

NASA Awards

- **2025 NASA Group Achievement Award** – MGSS Collaborative Mission Control Evaluation and Testing Team
- **2023 NASA Voyager Individual Achievement Award** – Psyche DSOC Ground Data System Design, Development, Testing, and Deployment
- **2023 NASA Group Achievement Award** – Exceptional System Engineering, Planning, Coordination, Software Development, and Testing of AMPCS Python 3 Migration
- **2021 NASA Group Achievement Award** – Outstanding Contributions to the Successful Development, Test, and Delivery of the Psyche Flight Software

Personal

- Auburn University Honors College, 2006
- Eta Kappa Nu – Xi Chapter, 2005
- Auburn University Solar Car Team, 2004
- Boy Scouts of America Eagle Scout, 1999