Neil G. **Rogers, PhD**

Contact

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- 🔗 neil-rogers-usafa
- 🎓 Google Scholar

Value Added

I am a **technology builder** with proven expertise in tackling the **hardest problems**, by **collaborating and elevating others** along the way. I look at everything I see and ask, "how can I make this better?" - **adding value** to everything I touch is my greatest professional passion. I excel in a team environment and bring a proactive, positive attitude to every situation.

Professional Skills

Software Designed Radios

GNURadio, SDRAngel, URH, GQRX, SCEPTRE

multimon-ng, fldigi, direwolf, UHD

RADAR & Electronic Warfare

Secure Communications

Signal Detection & Reverse Engineering

Electromagnetics

Electromagnetic Measurements

Electromagnetic theory & Simulation

Material characterization

Radiation and scattering in complex media

Metamaterials & Applications

Antennas

Design, analysis, novel applications

Other

High Powered Microwave systems

Counter small Unmanned Aerial Systems

Robotics and autonomy

Linux, MacOS, Windows, WSL2

Python, MATLAB, ROS, Bash

HFSS, CST Microwave Studio

Technical Writing, LaTeX

TS/SCI Clearance

Highlights

Objective

I aim to contribute to meaningful, high-impact R&D while cultivating a team culture rooted in technical depth, integrity, and trust.

Technical

- Proven record of **technical excellence**
- Multiple publications in applications of **Software Defined Radios** & **electromagnetics**.
- **Multi-domain technical** expertise

Software Defined Radios

- Experience in prototyping using all types of SDRs
- Developed autonomous passive RFDF cUAS system
- Built low-cost prototype Qi demodulator/decoder
- Created SDR-based RF reverse-engineering curriculum for undergraduate course
- Transitioned novel video detector-jammer from COTS hardware to SDR platform

Feedback

- **Dept Head:** "Neil is the heart & soul of the ECE dept..."
- **Senior Leader:** "Peerless leader with tech depth!"
- **GNURadio President:** "Neil is a key driver in the GNURadio community..."

GNURadio

- Recognized throughout community for technical proficiency & instructional expertise.
- Developed GNURadio implementation of secure communications protocol
- Generated dozens of GNURadio prototype flowgraphs to illustrate key communications applications

Intangibles

- **Trusted advisor and mentor** for tomorrow's brightest
- **Visionary:** excels at generating buy-in & momentum
- **Connector:** brings people, teams, and processes together to solve problems.
- **Everyday learner:** constantly seeks new challenges

Education

PhD in Electrical Engineering

Air Force Institute of Technology, OH

DISSERTATION: "NONDESTRUCTIVE ELECTROMAGNETIC CHARACTERIZATION OF UNIAXIAL MATERIALS"

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- Developed rigorous theory, model, simulation, and novel measurement technique to extract constitutive parameters from complex media.
- Characterized various materials to evaluate for stealth applications.

MS in Electrical Engineering

Air Force Institute of Technology, OH

THESIS: "ELECTRON MULTIPACTOR: THEORY REVIEW, COMPARISON AND MODELING OF MITIGATION

TECHNIQUES IN ICEPIC"

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- Developed simulation to evaluate electron avalanche in HPM sources.
- Work is the cornerstone for developing mitigation techniques for destructive phenomenon.

BS in Electrical Engineering

Tulsa, OK

UNIVERSITY OF TULSA

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Professional Experience

Analog Devices, Inc.

Colorado Springs, CO

RF FIELD APPLICATIONS ENGINEER

2025 - Present

- Supports RF-focused Aerospace and Defense customers in developing distruptive solutions to RADAR, communications, and EW problems.
- Develops and proposes new products to Product Teams to fill customers' needs.
- Trains customers on ADI solutions and prodcuts.

Electromagnetic Applications

Lakewood, CO

PRINCIPAL SCIENTIST I

June 2025 - Sept 2025

- Guides long-term strategy on $4.2M in RF-focused engineering consulting, simulation, and development projects.
- As senior technical lead for RF, provides guidance and advice to scientists on one-of-a-kind Electromagnetic Environmental Effects (E3) engineering projects, including direct and indirect effects of lightning, EMI/EMC, HIRF, antenna development/characterization, and antenna cosite characterization/mitigation.
- Develops and maintains new customer relationships by developing proposals and delivering software, consulting, measurement, and analysis tools to support design and certification of aerospace & defense platforms.
- Plans, executes, and reports on tests to support E3 certification of customer systems, in accordance with MIL-HDBK-516C, ARP-5416, MIL-STD-461G, MIL-STD-464D, etc.
- Mentors young engineers to build technical proficiency, systems engineering acumen, critical thinking, technical writing, and presentation/public speaking skills.

United States Air Force Academy

USAFA, CO

SENIOR MILITARY FACULTY AND ASSISTANT PROFESSOR OF ECE

2021 - 2025

- Guides long-term military, academic, and research strategies to keep the department aligned with Air Force operational needs and ABET accreditation requirements.
- Directs department's research efforts; forges and maintains relationships for dozens of commercial and DoD organizations – prepares cadets for rigorous summer research and beyond.
- Mentors senior design capstone team in developing autonomous radio frequency direction finding system to provide attribution of enemy drone operators.
- Develops and maintains innovative research pipeline from cadet entry to graduation to prepare over 100 cadets for conducting graduate-level research and careers beyond.
- Directs 6 ECE courses from intro to senior level, as Course Director and Senior Course Mentor.
- Revamping/modernizing Communications Systems curriculum to meet emerging EW needs & provide cadets with critical radio skills.
- Advises dozens of ECE cadets and undeclared freshmen to ensure maximum academic success and officer development.
- Supervises 3 technicians responsible for $3M worth of equipment, 8 physical labs, 10 courses, and over 900 cadets per year.

United States Air Force Academy

USAFA, CO

ASSISTANT PROFESSOR OF ELECTRICAL AND COMPUTER ENGINEERING

2018 - 2021

- Directed all aspects of the Department's largest course–led 10+ instructors to teach survey course for over 1150 cadets per year. Ensured all course objectives met and breezed through ABET certification.
- Rewrote over 75% of USAFA core course to better prepare cadets for leadership in the most technologically advanced Air Force in the world. Developed 5 new lessons, edited 35, built over 30 new assessments.
- Advised and mentored 22 cadets; ensuring graduation requirements met and mentoring future generations of USAF officers.

- Mentored counter-Unmanned Aerial System (cUAS) senior capstone project, led to successful development of framework to integrate and fuse multi-sensor data for target identification, tracking, and mitigation.
- Personally introduced new grading software to USAFA; trained several departments and secured yearly funding–cadets and faculty rave about it, reduced grading time by at least 50%.

Theater Battle Management, AF Life Cycle Management Center
Hanscom AFB, MA

DEPUTY DIRECTOR OF ENGINEERING, JSTARS RECAPITALIZATION
2014 - 2018

- Led 120-member division's technical efforts and advised Senior Program Manager on $8.2B JSTARS Recap program.
- Drove assessment of three $25M designs, convinced Air Force leadership of technical maturity and secured milestone B decision.
- Developed and implemented benchmark Model-Based Systems Engineering plan for $3.2B procurement, ensured traceability of over 900 requirements to design specifications.

379 Air Expeditionary Wing
Al Udeid, QT

DIRECTOR OF INSPECTIONS AND EXERCISES
2016

- Led all inspection activities for 5 groups and 22 squadrons in busiest CENTCOM Wing.
- Shepherded 124-member exercise team; simulated KC-135 mishap and verified effectiveness of multi-national response procedures.
- Completely revamped IG processes by developing brand new reporting and tracking tools–closed 311 deficiencies and slashed report time by 45%.

Air Force Institute of Technology
WPAFB, OH

PHD STUDENT
2011 - 2014

- Developed benchmark technique for the nondestructive electromagnetic evaluation of complex media, enabling design/verification of next-generation systems.

Directed Energy Directorate, Air Force Research Laboratory
Kritland AFB, NM

CHIEF, COMPUTATIONAL PHYSICS SECTION
2010 - 2011

- Supervised 20-person in-house team of military, civilian and contractors in performing cutting edge modeling and simulation on High Power Microwave (HPM) Sources and Systems. Responsible for day-to-day operations and providing strategic guidance.
- Managed/Directed $2.2M/year DoD-level software institute to develop novel end-to-end modeling and simulation capability for high performance computing assets.
- Performed advanced modeling and simulation on HPM sources using FDTD and FEFD code.

Directed Energy Directorate, Air Force Research Laboratory
Kirtland AFB, NM

CHIEF, ACTIVE DENIAL SECTION
2009 - 2010

- Led 16-person in-house team of military, civilian and contractors to manage all acquisition, research, test and transition activities.
- Served as Active Denial Technology Engineer—provided technical expertise to the program manager across a diverse spectrum of engineering disciplines; led $250k per year R&D effort to expand system use cases.

Air Force Institute of Technology
WPAFB, OH

MASTERS STUDENT
2007 - 2009

- Graduate research involved development of mitigation techniques for destructive phenomena in HPM Devices.
- Academic specialties include Electromagnetics, Plasma Physics and Directed Energy Weapons.
- Graduated with honors.

National Air and Space Intelligence Center
WPAFB, OH

PROJECT MANAGER, THERMAL INFRARED EXPLOITATION TOOLS
2005 - 2007

- Responsible for management and implementation of $15M contract to develop multidisciplinary software tools for Intelligence, Surveillance and Reconnaissance exploitation systems, including thermal infrared data collection and analysis.

National Air and Space Intelligence Center
WPAFB, OH

THERMAL INFRARED ANALYST
2004 - 2005

- Derived scientific/technical performance parameters of foreign weapon systems for use by the operational, acquisition and national decision-making communities.
- Performed software testing and evaluation for $10M exploitation package for national level use.

Extracurricular Activities

My Family

- Kristi: wife of 20 years
- Judah: son, 15 years old
- Ezra: son, 13 years old
- Luka: son, 10 years old
- Aviana: daughter, 8 years old

Interests & Activities

- Crossfit, Snowboarding
- Watching Premier League Soccer
- Working on my truck
- Playing Guitar
- GNURadio tinkering

Community Involvement

- GNURadio Conference Technical Chair, 2025
- USAFA Falcon Crossfit Officer-in-Charge, 2021-2025
- Band Member (2006-Present), Church Band Leader (2006-2009, 2015)
- Small Group Leader (2005-2022)
- Led collection of 1k+ Operation Christmas Child Boxes (2016-2018)
- Youth Ministry Leader (2005-2007)
- Youth Soccer Coach (2014-2015, 2018-2019)
- Led and organized STEM outreach for 7k+ students at annual SpaceFest (2013)
- Elementary math tutor (2011-2014)
- Monthly volunteer at Target Dayton Homeless Shelter (2005-2009)

Honors & Awards

2025	**Winner**, Team of the Year (Quantum Engineering Minor), DF	*USAFA, CO*
2021	**Winner**, Outstanding Educator of the Year, DFEC	*USAFA, CO*
2017	**Winner**, Division Field Grade Officer of the Year, AFLCMC	*Hanscom AFB, MA*
2017	**Winner**, Base Field Grade Officer of the Quarter	*Hanscom AFB, MA*
2016	**Winner**, Wing Field Grade Officer of the Quarter & Team of the Quarter, 379 AEW	*Al Udeid, QT*
2015	**Winner**, Wing Field Grade Officer of the Year, AFLCMC	*Hanscom AFB, MA*
2010	**Winner**, Directorate Tech Team of the Quarter, AFRL	*Kirtland AFB, NM*
2010	**Honorable Mention**, Directorate Tech Team of the Year, AFRL	*Kirtland AFB, NM*
2009	**Induction**, Tau Beta Pi Honor Society, AFIT	*WPAFB, OH*
2008	**Induction**, Eta Kappa Nu Honor Society, AFIT	*WPAFB, OH*
2006	**Winner**, Company Grade Officer of the Quarter, NASIC	*WPAFB, OH*
2003	**Winner**, John L. Luggenheim Award for Outstanding Achievement in EE	*Tulsa, OK*

Scholarship

Peer-Reviewed Journal Articles

Nondestructive Electromagnetic Characterization of Uniaxial Sheet Media Using a Two-Flanged Rectangular Waveguide Probe

IEEE
2019

N. Rogers, M. Havrilla, M. Hyde, A. Knisely

IEEE Transactions on Instrumentation and Measurement, DOI: 10.1109/TIM.2019.2925408, July 2019

Dyadic Green's Functions for a Parallel Plate Waveguide Filled with Anisotropic Uniaxial Media

PIER-B
2015

N. Rogers and M. Havrilla

Progress in Electromagnetics Research-B (PIERB), Vol. 63, 249-261

Refereed Conference Papers (abstract reviewed)

Applying an Alternative Grading Methodology to an Advanced Engineering Mathematics Course

Montreal, Quebec, Canada
June 2025

N. Rogers and K. Fair

American Society of Engineering Educators Conference

A Modern, Two-Course Undergraduate Communications Sequence

N. Rogers and G. Dudevoir

GNURadio Conference

Enhanced Learning by Visualization Applying Embedded Hands-On in Electromagnetics Class

H. Kim, N. Rogers, G. York, P. Leiffer

ASEE Annual Conference and Exposition

Novel Implementation of a Keyless Concurrent Codes Spread-Spectrum (CCSS) Jam-Resistant Method in GNU Radio

N. Rogers, J. Morrison, and W. Bahn

GNURadio Conference

A Nondestructive Technique for Determining Complex Permittivity and Permeability of Uniaxially Anisotropic Sheet Materials Using Two Flanged Rectangular Waveguides

N. Rogers, M. Havrilla, and M. Hyde

URSI National Radio Science Meeting

Transmission Correction Term for Oblique Incidence Free-Space Measurements

N. Rogers

Material Measurement Working Group

Dyadic Green's Functions for a Parallel Plate Waveguide Filled with Uniaxial Media

N. Rogers and M. Havrilla

URSI National Radio Science Meeting

2.5 MW Active Denial Technology Gyrotron: Background and Updates

P. Mardahl and N. Rogers

13th Annual Directed Energy Symposium

Two technical posters (titles unreleasable)

N. Rogers

13th Annual Directed Energy Symposium

Multipactor Discharge Mitigation in High Powered Microwave (HPM) Systems

N. Rogers and W. Bailey

American Physical Society, 2008 Joint Meeting

Short Courses

Reverse Engineering Signals with GNURadio

GNURadio Conference

Getting Started with GNURadio in the Classroom

GNURadio Conference

High Powered Microwave High Performance Short Course

14th Annual Directed Energy Symposium

ICEPIC Short Course

Air Force Institute of Technology

Teaching

United States Air Force Academy

ECE 315

Principles of AF Electronic and Cyber Systems

- Instructor: Fall 2018, Spring 2019, Fall 2024
- Course Director: Fall 2019, Spring 2020, Fall 2020
- Rewrote 75% of the course materials

ECE 215

Principles of AF Electronic and Cyber Systems

- Instructor: Fall 2022
- Course Director: Spring 2023

ECE 448

Introduction to Software Defined Radios

- Instructor: Spring 2021-Spring 2025
- Course Director: Spring 2022-Spring 2025
- Senior Course Mentor
- Developed course from scratch

ECE 346

Advanced Engineering Math with ECE Applications

- Instructor: Fall 2018-Fall 2024
- Course Director: Fall 2019-Fall 2024
- Senior Course Mentor
- Assisted in development of course from scratch

ECE 343

Electromagnetics

- Instructor: Spring 2021-Spring 2025
- Course Director: Spring 2022-Spring 2025
- Senior Course Mentor
- Pioneered brand-new hands-on labs

ECE 447

Introduction to Communication Systems

- Instructor: Fall 2023-Fall 2024
- Senior Course Mentor
- Introduced practical SDR applications ($\approx$ 15 lessons)