

Neil G. Rogers

SENIOR MILITARY FACULTY
ASSISTANT PROFESSOR OF ELECTRICAL AND COMPUTER ENGINEERING

Contact

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Education

PhD in Electrical Engineering

AIR FORCE INSTITUTE OF TECHNOLOGY *WPAFB, OH*

MS in Electrical Engineering

AIR FORCE INSTITUTE OF TECHNOLOGY *WPAFB, OH*

BS in Electrical Engineering

UNIVERSITY OF TULSA *Tulsa, OK*

Research Interests

Software Designed Radios

SECURE COMMUNICATIONS

DIRECTION FINDING

RADAR APPLICATIONS

ELECTRONIC WARFARE

Electromagnetics

ELECTROMAGNETIC THEORY

MATERIAL CHARACTERIZATION

RADIATION AND SCATTERING IN COMPLEX MEDIA

Antennas

DESIGN AND ANALYSIS

NOVEL APPLICATIONS

Other

HIGH POWERED MICROWAVE SYSTEMS

COUNTER SMALL UNMANNED AERIAL SYSTEMS

ROBOTICS AND AUTONOMY

Value Added

I bring **high-energy** teaching methods coupled with expertise in developing novel, low-cost research solutions. I look at everything I see and ask, **"how can I make this better?"** I love to **collaborate and elevate** others along the way. Teaching and research is my **greatest professional passion**.

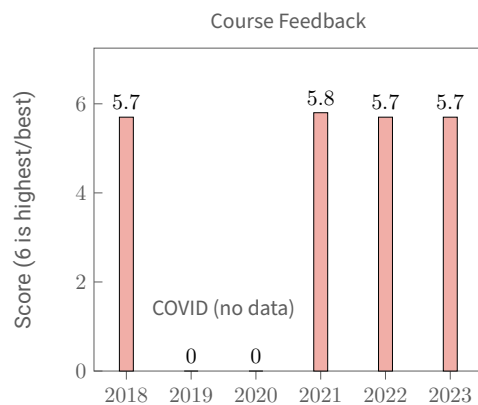
Highlights

Vision

Recruit, mentor, educate, and encourage the next generation of technical leaders and problem-solvers.

Teaching

- Proven record of excellence and course development
- Directed 5 major's courses and senior mentor for X
- Constant improvement and revision for relevance
- Stellar course feedback from 100's of responses



"...easily the best teacher in the ECE Department."

"He cares about students and it shows in his teaching..."

Scholarship

- Multiple IEEE publications and conference papers
- Committed to continuous professional development: Dean's Teaching Cert, Air War College, and more
- Dept research director – integrates senior design projects with multi-disciplinary, novel research

Service

- Institutional leader: implemented grading software to cut grading time in half
- Garnered \$300k for other departments' research
- Squad freshman academic advisor for 3 years
- Falcon CrossFit club OIC for 3 years

Intangibles

- Trusted advisor and mentor for tomorrow's brightest
- Visionary leader shaping the ECE Department's future
- 20+ years of DoD engineering experience

Teaching

UNITED STATES AIR FORCE ACADEMY

ECE 315

PRINCIPLES OF AF ELECTRONIC AND CYBER SYSTEMS

- Instructor: Fall 2018, Spring 2019
- 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 2022, Spring 2023
- Course Director: Spring 2022, Spring 2023
- Senior Course Mentor
- Developed course from scratch

ECE 346

ADVANCED ENGINEERING MATH WITH ECE APPLICATIONS

- Instructor: Fall 2018, Spring 2019, Spring 2020, Fall 2020
- Course Director: Fall 2019, Spring 2020, Fall 2020
- Senior Course Mentor
- Assisted in development of course from scratch

ECE 343

ELECTROMAGNETICS

- Instructor: Spring 2021, Spring 2022, Spring 2023
- Course Director: Spring 2022, Spring 2023
- Senior Course Mentor

ECE 447

INTRODUCTION TO COMMUNICATION SYSTEMS

- Instructor: Fall 2023
- Senior Course Mentor
- Introduced practical SDR applications (≈ 15 lessons)

Honors & Awards

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

N. ROGERS, M. HAVRILLA, M. HYDE, A. KNISELY

2019

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

N. ROGERS AND M. HAVRILLA

2015

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

REFEREED CONFERENCE PAPERS (ABSTRACT REVIEWED)

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

Washington, D.C

N. ROGERS, J. MORRISON, AND W. BAHN

September 2022

GNURadio Conference

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

Memphis, TN

N. ROGERS, M. HAVRILLA, AND M. HYDE
URSI National Radio Science Meeting

July 2014

Transmission Correction Term for Oblique Incidence Free-Space Measurements

N. ROGERS
Material Measurement Working Group

Boulder, CO

March 2014

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

N. ROGERS AND M. HAVRILLA
URSI National Radio Science Meeting

Boulder, CO

January 2014

2.5 MW Active Denial Technology Gyrotron: Background and Updates

P. MARD AHL AND N. ROGERS
13th Annual Directed Energy Symposium

Bethesda, MD

Nov 2010

Two technical posters (titles unreleasable)

N. ROGERS
13th Annual Directed Energy Symposium

Bethesda, MD

Nov 2010

Multipactor Discharge Mitigation in High Powered Microwave (HPM) Systems

N. ROGERS AND W. BAILEY
American Physical Society, 2008 Joint Meeting

Dayton, OH

Oct 2008

SHORT COURSES

High Powered Microwave High Performance Short Course

14TH ANNUAL DIRECTED ENERGY SYMPOSIUM

Monterrey, CA

Nov 2011

ICEPIC Short Course

AIR FORCE INSTITUTE OF TECHNOLOGY

WPAFB, OH

Jan 2011

Professional Experience

United States Air Force Academy

USAFA, CO

SENIOR MILITARY FACULTY AND ASSISTANT PROFESSOR OF ECE

2021 - Present

- 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 Comms/EW needs and 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

Kirtland AFB, NM

CHIEF, COMPUTATIONAL PHYSICS SECTION

2009 - 2010

- 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, COMPUTATIONAL PHYSICS 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.

Aeromet, Inc.

Tulsa, OK

ELECTRO-OPTICAL SYSTEMS ENGINEERING INTERN

2001

- Aided in design, testing and implementation of EO technologies; assisted in integration of EO technologies into commercial airframe.

Williams Communications

Tulsa, OK

FIBER OPTICAL SYSTEMS ENGINEERING INTERN

2000 - 2001

- Performed testing, evaluation, and analysis on fiber optical communications systems.