# Thomas W. Cooley, PhD

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## Summary of Professional Experience & Skills

- ✦ Senior space science and technology executive with 25+ years of leadership across the Department of Defense, Air Force Research Laboratory, and commercial space sector, shaping national space strategy and capability development while leading the execution of multiple space experimental programs.
- ✦ Proven leader of large-scale, high-impact portfolios, directing and aligning $500M+ annually in space science and technology investments across DoD, and managing $200M+ per year in Space Force R&D programs.
- ✦ Deep technical expertise spanning space domain awareness, space-based ISR, hyperspectral imaging, remote sensing, spacecraft systems, autonomy, resiliency, and in-space maneuver and services.
- ✦ Experienced architect of organizational and institutional change, including contributions to the stand-up of the U.S. Space Force and transformation of small business innovation programs managing $900M in funding.
- ✦ Accomplished program executive and principal investigator, leading complex space missions from concept through launch and operations, including successful delivery of a $110M on-orbit demonstration mission.
- ✦ Trusted advisor to government leaders, industry executives, and international partners, with extensive experience in interagency coordination, allied engagement, acquisition strategy, and technology transition.

## Professional Experience

**Chief Scientist, Turion Space** Jun 2025-Present

- Serve as Chief Scientist, setting the technical vision and scientific strategy for Turion Space's on-orbit and space domain awareness missions.
- Lead development of advanced algorithms and models across orbital mechanics, sensor fusion, and space situational awareness to enable autonomous operations in contested environments.
- Oversee end-to-end R&D efforts, translating customer and mission requirements into deployable flight software and operational capabilities.
- Guide architecture decisions for spacecraft autonomy, perception, and decision-making systems, ensuring scalability, robustness, and mission reliability.
- Collaborate closely with engineering, product, and operations teams to integrate scientific innovation into flight hardware and ground systems.
- Act as technical authority for mission concepts, design reviews, and risk assessments across multiple programs and customer engagements.
- Build and mentor a high-performing team of scientists and engineers, establishing best practices in research rigor, testing, and validation.
- Drive technology roadmaps and long-term research investments aligned with national security, commercial, and regulatory priorities.
- Represent Turion Space as a technical leader with government customers, partners, and stakeholders, contributing to proposals, briefings, and strategic discussions.
- Evaluate emerging technologies and external research, incorporating state-of-the-art methods to maintain technical differentiation and competitive advantage.

**President & CEO, TC Space Consulting** 2023-Present

- Serve as President and CEO of TC Space Consulting, advising space technology companies, academic institutions, and enterprises on translating advanced concepts into operational capabilities.
- Provide strategic guidance at the intersection of technology, policy, and organizational execution, enabling clients to navigate complex government, regulatory, and acquisition environments.
- Leverage senior-level government and technical expertise to develop actionable roadmaps that accelerate innovation across the space ecosystem.

- Advise on a broad portfolio of space domains including launch, space operations, advanced remote sensing, communications, space situational awareness, resiliency, and in-space maneuver and services.
- Act as a trusted executive advisor to founders, technical leaders, and stakeholders, shaping investment, partnership, and go-to-market strategies for emerging space capabilities.

**Chief Scientist and Various Roles** 1998-2023
United States Air Force Research Laboratory

- Served as the Department of Defense's senior space science and technology leader, representing DoD on White House interagency committees and shaping national space policy and priorities.
- Led development of the DoD Space S&T framework supporting the stand-up of the U.S. Space Force and coordinated space technology investments across Air Force, Army, Navy, DARPA, MDA, and USSF.
- Acted as OSD Space Community of Interest lead, overseeing and aligning more than $500M/year in space science and technology investments across the Department of Defense.
- Served as Chief Scientist for AFRL's Space Vehicles Directorate, directing technical strategy and quality for an annual $\tilde{\$}$200M Space Force S&T portfolio and >$100M in external R&D funding.
- Provided senior technical leadership for a workforce of 600+ civilian and military personnel as a member of the SES Scientific and Technical cadre for the Space Force.
- Led Department of the Air Force small business innovation strategy as Senior Technical Advisor to AFWERX and SpaceWERX, guiding organizational reform and stewardship of $\tilde{\$}$900M in innovation funding.
- Directed DoD Space Domain Awareness (SDA) science and technology efforts, integrating spaceflight experiments, ground-based sensing, data processing, and allied/commercial data sources.
- Initiated and led SDA programs that significantly improved space surveillance capabilities through collaboration with academia, international partners, acquisition organizations, and operational units.
- Served as Space ISR Mission Lead for AFRL, managing a $\tilde{\$}$50M investment portfolio and supporting major acquisition efforts including OPIR, missile defense, and weather architectures.
- Principal Investigator and Program Manager for TacSat-3/ARTEMIS, leading a $110M program from design through launch, on-orbit operations, and a highly successful validation campaign.
- Recognized world leader in hyperspectral imaging and remote sensing, authoring roadmaps, military utility studies, and advising DoD and IC leaders on critical technology investments and partnerships.
- Led U.S. government and international consortia on imaging spectroscopy, atmospheric modeling, and sensor fusion, advancing next-generation space-based ISR capabilities.

**Senior Member Technical Staff, Nichols Research Corporation**, Albuquerque, NM 1995-1998

- Conducted advanced research at Air Force Phillips Laboratory on passive remote sensing satellite systems for next-generation DoD imaging architectures.
- Developed and evaluated "smart sensor" focal plane array concepts using analog neural networks, validated through software simulations and optical testbeds.
- Designed robust atmospheric compensation and discrimination algorithms for multispectral (MSI) and hyperspectral (HSI) imaging systems spanning visible through long-wave infrared (LWIR) bands.
- Led data fusion research integrating MSI and HSI imagery to enhance detection and discrimination performance.
- Provided technical leadership for a spectral sensing research program, directing the work of two programmers and three engineers.

**Post-Doctoral Research Scientist, Centre d'Études et de Recherches de Toulouse (CERT now ONERA)**, Toulouse, France 1995

- Performed CNES-funded research on the effects of measurement scale in remote sensing calibration and operational analysis for future spaceborne instruments.
- Developed physics-based computer models of passive remote sensing phenomena in the visible and infrared spectral regions.
- Collaborated with CERT, CNES, and other French government organizations to create improved radiative transfer and calibration models for multispectral sensors, including applications to the SPOT Image satellite program.

## Education

**PhD** **University of Arizona Department of Optical Sciences**, Tucson, AZ 1995

- **Atmospheric optics and remote sensing** Dissertation: *A New Technique to Find both Real and Imaginary Index of Refraction of Atmospheric Aerosols from Clear Sky Radiance Measurements*

**MS** **California Institute of Technology, Electrical Engineering**, Pasadena, CA 1991

- **Specialization** in Electromagnetics, Microwave, and Optical systems

**BS** **Rensselaer Polytechnic Institute**, Troy, NY 2015

- **Major: Electrical Engineering, Minor: Music;** Internship at IBM, Manassas, VA

## Selected Awards and Honors

- Fellow, Air Force Research Laboratory (2011)
- Fellow, Society of Photographic Instrumentation Engineers (SPIE) (2016); Associate Editor, *Optical Engineering*
- Associate Fellow, American Institute of Aeronautics and Astronautics (AIAA) (2006); Space Systems Technical Committee
- AIAA Top Space Experiment Award (2011)
- C4ISR Journal "Big 25" Award, Overall Winner for Tactical Satellite-3 (2010)
- AFRL Commander's Cup Team Award (2010, 2001)
- Harold Gardiner Director's Cup Award, AFRL/RV (2009)
- AFRL International Team Award — Team Lead & Program Manager (2008)
- Division International Award, 1st Quarter (2007)
- Division Technology Transfer Achievement Award, Team Lead (2006)
- AFRL Annual Scientific/Technical Management Individual Award Finalist (2005)
- AFRL Space Vehicles Directorate Annual Scientific/Technical Management Award (2004)
- Directorate Outstanding Leadership Award, 3rd Quarter (2002)
- AFRL Space Vehicles Directorate Annual Scientific/Technical Achievement Team Award (2001)
- Directorate Leadership Award, 4th Quarter (2000)
- NASA Graduate Fellowship (1991–1994)
- U.S. Patent: *Miniature Modular Microwave End-to-End Receiver* (Granted June 8, 1993)
- Multiple NASA Certificates of Recognition (1990–1992)
- Rensselaer Scholastic Scholarship Recipient (1988–1994)

## Professional and Related Activities

- Earth System Observatory (ESO) Independent Review Board (IRB) Member (May–October 2022)
- Advisory Board Member and Subject Matter Expert, New Space New Mexico (2018–Present)
- Fellow, Society of Photographic Instrumentation Engineers (SPIE)
- Associate Editor, *Optical Engineering* — Space Optical Systems (2014–2017)
- Member, SPIE Technical Committee for Imaging Spectroscopy Conference (multiple years)
- Associate Fellow and Invited Speaker, American Institute of Aeronautics and Astronautics (AIAA)
- Senior Member, Institute of Electrical and Electronics Engineers (IEEE)
- Independent Reviewer, Department of Energy Remote Sensing Programs
- Invited Panel Member, National Academy of Sciences — Small Satellite Programs Review (2010)
- Contributor, U.S. Strategic Command (STRATCOM) Scientific Advisory Panel (2012–2015)
- Lead Author and Technical Lead for Multiple Agency Studies