

JAMES HAMILTON COOLEY, Ph.D.

Los Alamos National Laboratory | Los Alamos, NM 87544

jhcooley@lanl.gov | 505-606-0421 | [LinkedIn Profile](#)

EXECUTIVE PROFILE

Senior national security science leader with over two decades of experience at Los Alamos National Laboratory and in the United States Navy, providing strategic analysis and quantitative solutions to the nation's most consequential defense challenges. Currently directs the Strategic Analysis and Assessments Office within LANL's National Security and International Studies directorate, leading teams that advise LANL senior leadership, DOE/NNSA administrators, Department of Defense principals, and Intelligence Community partners on nuclear strategy, weapons effects, and integrated deterrence.

Career spans computational physics, nuclear weapons design, Tri-Laboratory coordination for USSTRATCOM war-plan evaluation, and development of the NNSA's first Net Assessment capability at the direction of the NNSA Administrator. Proven record of building high-performing teams of 60–140+ PhD scientists, securing \$9M+ in program growth, and delivering seven Defense Programs Awards of Excellence. Began career as a commissioned officer in the United States Navy, serving as Lead Nuclear Engineer at Naval Reactors with responsibility for primary nuclear components on submarines and aircraft carriers.

Career Objective: A position leading and developing teams and organizations that provide quantitative solutions to complex national security problems, integrating internal and external resources and capabilities focused on high-impact assessments and solutions in support of senior leaders at LANL and in the U.S. Government.

EDUCATION & CREDENTIALS

Ph.D., Physics — University of Maryland, College Park (2004)

Dissertation: Parametric instabilities in plasma channel formation and high-intensity laser-plasma interactions

M.S., Applied Mathematics — University of Maryland, College Park (2004)

Certificate, Nuclear Engineering — Bettis Reactor Engineering School, Bettis Atomic Power Laboratory, PA (1995)

Naval Nuclear Propulsion Program — one of the most rigorous nuclear engineering curricula in the world

B.S., Physics — University of Texas, Austin (1994)

Maintained active DOE Q security clearance throughout career.

EXECUTIVE CORE QUALIFICATIONS

The following summarizes how career experience maps to the five Executive Core Qualifications required for Senior Executive Service positions.

ECQ 1: Leading Change

- Drove transformation in weapons effects analysis methodology at LANL, modernizing analytical approaches from legacy-era tools to cutting-edge high-performance computing simulations, enabling more rigorous quantitative assessments of nuclear weapons effects and consequences of execution for senior government decision-makers.
- Built and operationalized NNSA's first Net Assessment capability at the direct request of NNSA Administrator Jill Hruby, developing competitive analyses of U.S. and adversary military capabilities inspired by Andrew Marshall's pioneering methodology at the DoD Office of Net Assessment — a fundamentally new analytical function for the nuclear weapons enterprise.
- Led the Tri-Laboratory Nuclear Winter reassessment (LANL, LLNL, SNL) using modern climate and source-term modeling, producing updated scientific findings that challenged decades-old assumptions and directly informed senior government decision-makers on nuclear strategy and posture.

ECQ 2: Leading People

- Managed a workforce of 60+ PhD scientists as Group Leader of Computational Physics and Methods (CCS-2), growing staff from 35 to 45 permanent positions and expanding the postdoctoral pipeline from 6 to 17 researchers over a four-year period, substantially increasing organizational capacity in critical national security disciplines.
- Served as Acting Deputy Division Leader for CCS Division, overseeing a portfolio of 140+ PhD scientists across multiple groups in computational science, statistical science, and high-performance computing — one of LANL's largest technical divisions.
- Cultivated a culture of scientific excellence and mission focus, mentoring early-career scientists through the postdoctoral-to-permanent conversion process and building organizational capacity in nuclear weapons assessment, computational physics, and national security analysis.

ECQ 3: Results Driven

- Delivered multiple Level 1 (L1) milestones for NNSA's Science Campaigns and Stockpile Stewardship programs, including the L1 milestone on Initial Conditions for Boost and the Energy Balance milestone — the highest-priority deliverables in the nuclear weapons program — demonstrating ability to execute complex, time-critical technical programs.
- Achieved \$9M+ in program growth (FY15–FY18) across DOE, DoD, and Intelligence Community mission areas, substantially expanding the group's research portfolio and mission impact through strategic program development and proposal capture.
- Recognized with seven Defense Programs Awards of Excellence and two Distinguished Performance Awards for ground-breaking contributions to verification and validation, weapon design, and national security mission support. Published 821+ cited research papers (h-index 14) in computational physics, plasma science, and nuclear weapons effects.

ECQ 4: Business Acumen

- Managed multi-million-dollar research portfolios spanning DOE, DoD, and Intelligence Community funding streams, integrating programs across LANL divisions and ensuring alignment with national security priorities and NNSA programmatic direction.
- Directed resource development and allocation for the Strategic Analysis and Assessments Office, balancing investments across strategic stability analysis, weapons effects coordination, net assessment development, cislunar security, and interagency support missions to maximize mission impact with available resources.
- Integrated programmatic activities across organizational boundaries at LANL, coordinating weapons effects research that spans multiple divisions and mission areas to deliver coherent, enterprise-level

analytical products to government customers.

ECQ 5: Building Coalitions

- Led Tri-Laboratory coordination (LANL, LLNL, SNL) in support of USSTRATCOM and other U.S. Government agencies, building enduring partnerships across the nuclear weapons complex for war-plan evaluation, strategic stability analysis, and nuclear weapons effects assessment.
- Established and sustained engagements with USSTRATCOM J5 strategic planners, DOE/NNSA leadership, DoD policy offices, and Intelligence Community partners, delivering classified briefings on nuclear strategy, weapons effects, and integrated deterrence to audiences at the most senior levels of the U.S. Government.
- Convened the Nuclear Weapons Effects Community Conversations across LANL and partnered with external think tanks and policy organizations to advance national discourse on deterrence, strategic stability, and consequences of nuclear use. Collaborated across the interagency to strengthen integrated deterrence frameworks.

TECHNICAL COMPETENCIES & DOMAIN EXPERTISE

- **Nuclear Strategy and Policy:** Strategic stability analysis, nuclear posture assessment, consequences of execution, integrated deterrence, net assessment methodology, nuclear war-plan evaluation
- **Nuclear Weapons Science:** Weapon design (primaries, secondaries), weapons effects analysis, implosion hydrodynamics, thermonuclear burn physics, stockpile stewardship, annual assessment reviews
- **Computational Physics:** Radiation transport (deterministic and Monte Carlo), plasma physics, laser-plasma interactions, particle-in-cell simulation, climate modeling, nuclear reactor thermo-hydraulics
- **High-Performance Computing:** Large-scale parallel simulation, verification and validation (V&V), predictive capability frameworks, physics code development, common model methodologies
- **Nuclear Engineering:** Naval nuclear propulsion, reactor operations, submarine reactor plant systems, heat exchanger design, reactor servicing and de-fueling operations
- **National Security Programs:** DOE/NNSA Science Campaigns, Stockpile Stewardship Program, National Technical Nuclear Forensics, nuclear weapons effects coordination, cislunar space security, intelligence community engagement

PROFESSIONAL EXPERIENCE

Director, Strategic Analysis and Assessments (SAA) Office

National Security and International Studies Directorate, Los Alamos National Laboratory | February 2019 – Present

- Provide strategic advice to LANL senior leadership on future programs, threat assessments, and national security priorities across the nuclear weapons enterprise.
- Develop and present classified and unclassified briefings to senior leaders at LANL, DOE, NNSA, Department of Defense, and Intelligence Community organizations on nuclear strategy, weapons effects, and deterrence.
- Lead analysis for future options and understanding consequences of nuclear execution, providing quantitative frameworks for nuclear strategy and posture decisions at the highest levels of government.
- Serve as Lead Nuclear Weapons Effects Coordinator for the LANL Weapons Program, integrating weapons effects research across multiple divisions and ensuring coherent analytical products for DOD

and interagency partners.

- Lead LANL's portion of Tri-Laboratory efforts in support of USSTRATCOM and other U.S. Government agencies, coordinating analytical products across LANL, LLNL, and SNL for war-plan evaluation and strategic stability assessment.
- Lead LANL engagement with USSTRATCOM J5 partners in support of war-plan evaluations and strategic stability assessments, ensuring laboratory analytical capabilities are responsive to combatant command requirements.
- Direct development of NNSA's Net Assessment capability at the request of NNSA Administrator Jill Hruby, applying competitive analysis methodologies to assess U.S. and adversary military capabilities — building a fundamentally new analytical function within the nuclear weapons enterprise.
- Lead Nuclear Winter reassessment — a Tri-Lab effort employing modern computational climate and source-term models to re-evaluate nuclear conflict consequences. Published findings in the Journal of Geophysical Research (49 citations).
- Oversee strategic stability analysis providing quantitative assessment of offensive and defensive nuclear capabilities for U.S. nuclear posture review.
- Direct cislunar space security analysis addressing national security implications of the expanding cislunar domain, and integrated deterrence collaboration with USSTRATCOM and external think tank partners.

Deputy Director, Strategic Analysis and Assessments Office

Associate Laboratory Directorate for Experiments (ALDX), Los Alamos National Laboratory | September 2018 – February 2019

- Supported the Director in establishing the SAA office and its initial programmatic portfolio, defining scope and analytical approaches for strategic stability and weapons effects assessment efforts.
- Transitioned from Computational Physics leadership to national security policy and strategy, bringing deep technical expertise in simulation, weapon physics, and quantitative analysis to senior advisory roles.

Deputy Division Leader (Acting), Computer, Computational, and Statistical Sciences Division (CCS)

Los Alamos National Laboratory | October 2016 – January 2017

- Managed a portfolio encompassing 140+ PhD scientists across multiple groups spanning computational physics, statistical sciences, applied mathematics, and information sciences.
- Provided organizational leadership during a period of division-level transition, ensuring continuity of programmatic commitments, staff development, and mission delivery.
- Coordinated budget planning, hiring priorities, and strategic investments across the division in alignment with LANL institutional priorities.

Group Leader, Computational Physics and Methods (CCS-2)

Los Alamos National Laboratory | January 2015 – September 2018

- Led a group of 60+ PhD scientists conducting research in radiation transport, climate modeling, nuclear reactor thermo-hydraulics, plasma physics, and astrophysics.
- Grew group funding by \$9M+ (FY15–FY18) across DOE, DoD, and Intelligence Community mission areas through strategic program development and proposal capture.
- Expanded staff from 35 to 45 permanent scientists and postdoctoral researchers from 6 to 17, building pipeline capacity in critical computational physics disciplines.
- Managed research areas including deterministic and Monte Carlo radiation transport, coupled multi-physics simulations, advanced numerical methods for HPC platforms, and applied computational physics for national security applications.

- Supervised hiring, performance evaluation, career development, and postdoctoral mentoring for a diverse technical workforce supporting weapons, energy, and national security missions.

Deputy Group Leader, Computational Physics and Methods (CCS-2)

Los Alamos National Laboratory | February 2014 – January 2015

- Assisted the Group Leader in personnel management, programmatic coordination, and strategic planning for CCS-2's research portfolio.
- Supported hiring, postdoctoral mentoring, and integration of new researchers into the group's national security mission areas.

Project Leader — Implosion Hydrodynamics and Ignition, Science Campaign Primary Assessment Technology

Los Alamos National Laboratory | July 2011 – February 2014

- Led research on implosion hydrodynamics and ignition physics for NNSA's Science Campaigns program, advancing predictive capability for nuclear weapon primary performance.
- Contributed to fall-line mix modeling and thermonuclear burn analysis in inertial confinement fusion (ICF) capsules, producing multiple peer-reviewed publications on degraded yield analysis and heterogeneous mix.
- Coordinated experimental and computational efforts to improve understanding of mix effects on thermonuclear burn in ICF implosions at the National Ignition Facility.

Technical Point of Contact — L1 Milestone: Initial Conditions for Boost I

Los Alamos National Laboratory | March 2011 – September 2012

- Served as Technical Point of Contact for a Level 1 NNSA milestone — the highest-priority deliverable category in the Stockpile Stewardship Program — focused on establishing initial conditions for boost physics modeling.
- Coordinated cross-functional teams of physicists, code developers, and experimentalists to deliver milestone products on schedule and to NNSA quality standards.

Program Manager, Verification and Validation (Acting)

Los Alamos National Laboratory | March 2011 – September 2011

- Managed the Verification and Validation program for weapons simulation codes, ensuring rigorous assessment of computational predictions against experimental data and analytical benchmarks.
- Recognized with Defense Programs Award of Excellence for ground-breaking work in V&V and development of the V&V Common Model framework.

Project Leader — Physics Validation, Advanced Scientific Computing

Los Alamos National Laboratory | March 2009 – February 2014

- Led physics validation efforts for advanced scientific computing codes used in nuclear weapons assessment, developing common model frameworks and validation methodologies that became standard practice across the weapons program.
- Recognized with multiple Defense Programs Awards of Excellence for contributions to V&V, common model development, and modern energy balance models and methodologies.
- Contributed to the development of predictive capability frameworks that improved confidence in simulation-based stockpile assessments.

Physicist (Levels 2–4) — Weapon Design and Assessment

Los Alamos National Laboratory | September 2004 – February 2014

- Served as weapon designer with expertise spanning secondary weapon physics, primary weapon design, and counter-terrorism applications.
- Contributed to Annual Assessment Reviews (2008–2014), providing expert analysis of stockpile weapon performance, reliability, and aging effects.
- Served as Design Modeling and Intelligence Community Point of Contact for National Technical Nuclear Forensics (NTNF) program (2013–present), leading the design modeling component that supports U.S. nuclear attribution capabilities.
- Member of LDRD-ER Fluids and High Energy Density committee, reviewing and guiding Laboratory Directed Research and Development proposals.
- Contributed to L1 Milestone team for Energy Balance, recognized with Defense Programs Award of Excellence for modern energy balance models and methodologies.
- Modeling and analysis of high-explosive driven perturbed plate experiments, advancing understanding of material response under extreme conditions.

Directed Energy Scholar

Naval Research Laboratory, Washington, DC | May 2004 – August 2004

- Conducted laser wakefield accelerator modeling including capillary discharge channel simulations for directed energy applications.
- Performed laser pulse propagation simulations in ionizing media, contributing to the understanding of advanced accelerator concepts for defense applications.

Graduate Research Assistant, Institute for Research in Electronics and Applied Physics

University of Maryland, College Park | August 1999 – August 2004

- Conducted doctoral research on parametric instabilities in plasma channel formation and high-intensity laser coupling to plasma channels.
- Developed a fully parallel 3D simulation code for laser-plasma interactions, contributing to the QuickPIC particle-in-cell code — the most highly cited publication in the portfolio (302 citations).
- Investigated 3D structure of laser fields and ionization scattering instability, publishing results in Physical Review E and IEEE Transactions on Plasma Science.

Research Scientist

Icarus Research, Inc., Bethesda, MD | August 2003 – May 2004

- Performed laser wakefield accelerator modeling for defense applications, supporting DoD-funded research on advanced particle acceleration concepts.

Officer, United States Navy — Lead Nuclear Engineer

Naval Reactors, U.S. Department of Energy / U.S. Navy | July 1994 – August 1999

- Served as Lead Nuclear Engineer at Naval Reactors with progressive responsibility for primary nuclear components on U.S. Navy submarines and aircraft carriers.
- Resolved critical operational concerns in submarine reactor plants, including seawater heat exchanger leak resolution and steam generator corrosion program management, directly impacting fleet readiness and submarine operational availability.
- Managed heat exchanger component design for a new submarine class, coordinating engineering analysis, material selection, and design verification.
- Directed aircraft carrier reactor operations changes and managed reactor servicing facility relocation and de-fueling operations.

- Graduate of the Bettis Reactor Engineering School (Naval Nuclear Propulsion Program), one of the most rigorous nuclear engineering training programs in the world, administered by Bettis Atomic Power Laboratory.

KEY NATIONAL SECURITY ACCOMPLISHMENTS

- **Strategic Stability Analysis for U.S. Nuclear Posture:** Developed and led quantitative analysis of offensive and defensive nuclear capabilities for U.S. nuclear posture, providing analytical products that inform senior government decision-makers on strategic stability, deterrence credibility, and the balance of nuclear forces. This work directly supports NNSA's responsibility to advise national leadership on nuclear strategy.
- **Nuclear Winter Reassessment (Tri-Lab):** Led LANL's portion of a Tri-Laboratory effort (LANL, LLNL, SNL) to reassess nuclear winter using modern computational tools — advanced climate models and detailed source-term calculations. Published findings in the *Journal of Geophysical Research: Atmospheres* (49 citations), concluding that a "nuclear autumn" scenario is more likely than the catastrophic nuclear winter previously projected. This work has been widely referenced in nuclear strategy and arms control discussions.
- **Net Assessment Capability Development:** At the direct request of NNSA Administrator Jill Hruby, built NNSA's first Net Assessment capability — developing competitive analyses of U.S. and adversary military capabilities modeled after the methodology pioneered by Andrew Marshall at the DoD Office of Net Assessment. This represents a fundamentally new analytical function for the nuclear weapons enterprise.
- **USSTRATCOM War-Plan Evaluation Support:** Led LANL engagement with USSTRATCOM J5 strategic planners in support of war-plan evaluations, delivering Tri-Lab analytical products that directly inform U.S. nuclear war-planning, targeting analysis, and deterrence posture assessment.
- **Nuclear Weapons Effects Coordination Across LANL:** Served as Lead Nuclear Weapons Effects Coordinator for the LANL Weapons Program, integrating and organizing weapons effects research across the Laboratory and coordinating with Department of Defense partners. Convened the Nuclear Weapons Effects Community Conversations to strengthen cross-division collaboration.
- **Consequences of Execution Analytical Framework:** Led analysis for understanding consequences of nuclear execution, developing quantitative frameworks and analytical support for nuclear strategy and policy decisions at the highest levels of government. Key quote: "Understanding weapons effects is part of developing a stable, well-defined nuclear strategy and policy."
- **Technical Nuclear Forensics Design Modeling:** Served as Design Modeling and Intelligence Community Point of Contact for the National Technical Nuclear Forensics (NTNF) program since 2013, leading the design modeling component that supports U.S. nuclear attribution and deterrence capabilities.

AWARDS & HONORS

- **2015 — Distinguished Performance Award:** Mighty Saber Team contributions — recognized for exceptional performance in support of critical national security mission
- **2012 — Defense Programs Award of Excellence (Lead):** L1 Milestone on Implosion, Predictive Capability Framework — led team to deliver highest-priority Stockpile Stewardship deliverable
- **2011 — Defense Programs Award of Excellence (Lead):** V&V Common Model development — led creation of standardized validation framework adopted across the weapons program

- **2010 — Defense Programs Award of Excellence:** Modern energy balance models and methodologies — advanced state of the art in weapon performance assessment
- **2008 — Distinguished Performance Award:** Oak Phoenix Data Evaluation Team — recognized for outstanding contributions to nuclear test data analysis
- **2007 — Defense Programs Award of Excellence:** Ground-breaking work in Verification and Validation — established new standards for simulation credibility assessment
- **2007 — Defense Programs Award of Excellence:** Altair 4 development team — contributed to advanced weapon design code capabilities

SELECTED PUBLICATIONS

821+ total citations | h-index: 14 | Full publication list: [Google Scholar Profile](#)

1. "QUICKPIC: A highly efficient particle-in-cell code for modeling wakefield acceleration in plasmas," C. Huang, V.K. Decyk, C. Ren, M. Zhou, W. Lu, W.B. Mori, **J.H. Cooley**, et al., Journal of Computational Physics 217(2), 658–679, 2006. **302 citations.**
2. "Quasimonoenergetic electrons from unphased injection into channel guided laser wakefield accelerators," D.F. Gordon, R.F. Hubbard, **J.H. Cooley**, B. Hafizi, A. Ting, P. Sprangle, Physical Review E 71(2), 2005. **63 citations.**
3. "Anomalous yield reduction in direct-drive deuterium/tritium implosions due to H³e addition," H.W. Herrmann, J.R. Langenbrunner, J.M. Mack, **J.H. Cooley**, D.C. Wilson, et al., Physics of Plasmas 16(5), 2009. **56 citations.**
4. "Climate impact of a regional nuclear weapons exchange: An improved assessment based on detailed source calculations," J. Reisner, G. D'Angelo, E. Koo, W. Even, M. Hecht, E. Hunke, D. Comeau, et al., Journal of Geophysical Research: Atmospheres 123(5), 2752–2772, 2018. **49 citations.**
5. "QuickPIC: a highly efficient fully parallelized PIC code for plasma-based acceleration," C. Huang, V.K. Decyk, M. Zhou, W. Lu, W.B. Mori, **J.H. Cooley**, T.M. Antonsen Jr, et al., Journal of Physics: Conference Series 46(1), 190–199, 2006. **39 citations.**
6. "The effects of pre-mix on burn in ICF capsules," D.C. Wilson, G.A. Kyrala, J.F. Benage Jr, et al., Journal of Physics: Conference Series 112(2), 2008. **27 citations.**
7. "Application of fall-line mix models to understand degraded yield," L. Welser-Sherrill, **J.H. Cooley**, D.A. Haynes, D.C. Wilson, et al., Physics of Plasmas 15(7), 2008. **26 citations.**
8. "Experimental quantification of the impact of heterogeneous mix on thermonuclear burn," B.J. Albright, T.J. Murphy, et al., Physics of Plasmas 29(2), 2022. **23 citations.**
9. "Results from single-shock Marble experiments studying thermonuclear burn in the presence of heterogeneous mix on the National Ignition Facility," T.J. Murphy, B.J. Albright, et al., High Energy Density Physics 38, 100929, 2021. **23 citations.**
10. "Detecting surface changes from an underground explosion in granite using unmanned aerial system photogrammetry," E.S. Schultz-Fellenz, et al., Pure and Applied Geophysics 175(9), 3159–3177, 2018. **23 citations.**
11. "Inference of ICF implosion core mix using experimental data and theoretical mix modeling," L. Welser-Sherrill, D.A. Haynes, R.C. Mancini, **J.H. Cooley**, et al., High Energy Density Physics 5(4), 249–257, 2009. **21 citations.**
12. "Trapping and acceleration of nonideal injected electron bunches in laser wakefield accelerators," R.F. Hubbard, D.F. Gordon, **J.H. Cooley**, B. Hafizi, et al., IEEE Transactions on Plasma Science 33(2), 712–722, 2005. **21 citations.**

PROFESSIONAL AFFILIATIONS, SERVICE & CLEARANCES

- **Security Clearances:** Active DOE Q clearance maintained throughout career. Routinely accesses and produces classified analyses at the highest levels relevant to nuclear weapons and national security.
- **United States Navy Veteran:** Served as commissioned officer (1994–1999) in the Naval Nuclear Propulsion Program under Naval Reactors, U.S. Department of Energy / U.S. Navy.
- **Bettis Reactor Engineering School Graduate:** Completed the Naval Nuclear Propulsion Program's rigorous reactor engineering curriculum at Bettis Atomic Power Laboratory (1995).
- **National Technical Nuclear Forensics:** Design Modeling and Intelligence Community Point of Contact (2013–present). Active contributor to the interagency NTNF mission.
- **Annual Assessment Review Team Member:** Contributed to NNSA's annual stockpile weapon assessments (2008–2014), providing expert review and analysis.
- **LDRD-ER Committee Member:** Served on the Fluids and High Energy Density review committee for Laboratory Directed Research and Development proposals.
- **Tri-Laboratory Coordination:** Ongoing leadership of cross-laboratory efforts with Lawrence Livermore National Laboratory and Sandia National Laboratories in support of USSTRATCOM and national nuclear strategy.

References and additional supporting documentation available upon request. Google Scholar: scholar.google.com/citations?user=7jqPcVoAAAAJ | LinkedIn: linkedin.com/in/james-cooley-1827b458