

Alec D. Gallimore, Ph.D.

University of Michigan
 Office of the Dean
 College of Engineering
 Ann Arbor, MI, 48109
 Tel: (734) 647-7010, FAX: (734) 647-7009
alec.gallimore@umich.edu

Professional Interests:

Higher education administration and leadership; corporate governance; entrepreneurship; national security; diversity, equity and inclusion; Research on advanced spacecraft (electric) propulsion, plasma physics, plasma diagnostics (probe, microwave, optical, laser based), and nanoparticle physics.

Professor Gallimore is founder and co-director of the Plasmadynamics and Electric Propulsion Laboratory (PEPL).

Qualifications and Experience

<p>Jul. 2016 to Present</p>	<p>Robert J. Vlasic Dean of Engineering, University of Michigan: Chief academic and executive officer of Michigan Engineering, one of the nation’s largest and highest ranked engineering colleges with over 11,000 students and postdocs, 1,600 employees (faculty and staff) and 90,000 living alums. The College has an annual budget in excess of \$600M and an annual research expenditure approaching \$300M. Provides leadership and is responsible for all matters relating to the administration of the College of Engineering, including academic programs, personnel, budgets, alumni engagement, government and industry relations, and fundraising. Works collaboratively with faculty and staff to advance the College’s mission. Represents the College within the University and manages a wide range of external constituencies. Plays a major leadership role across the University as dean of one of Michigan’s largest and highest ranked academic units.</p>
<p>Oct. 2015 to Present</p>	<p>Richard F. and Eleanor A. Towner Professor of Engineering: Endowed professorship in recognition of research excellence of a distinguished faculty member.</p>
<p>Jan. 2014 to June 2016</p>	<p>Associate Dean for Academic Affairs, College of Engineering, University of Michigan: Responsibilities related to the faculty, including oversight of the hiring, promotion, and tenure processes; merit review and overall budget review and planning; and space allocation and management. Works in close cooperation with the dean, the other associate deans and the department chairs to sustain and advance the academic mission of the College of Engineering.</p>
<p>Sept. 2011 to Dec. 2013</p>	<p>Associate Dean for Research and Graduate Education, College of Engineering, University of Michigan: Oversees research and the large-scale research support facilities within the College of Engineering, manages all cost-sharing funds in support of sponsored research, and serves as the chief academic officer for graduate education in the College of Engineering.</p>
<p>Feb. 2006 to Present</p>	<p>Arthur F. Thurnau Professor: Named professorship in honor of undergraduate teaching excellence.</p>

Sept. 2005 to Aug. 2011	Associate Dean for Academic Programs and Initiatives, Horace H. Rackham School of Graduate Studies, University of Michigan: Plays a leadership role in developing and implementing Graduate School activities in engineering and the physical sciences at the University of Michigan.
Sept. 2004 to Present	<p>Professor, Department of Aerospace Engineering, University of Michigan (Also holds an appointment in the Applied Physics Program)</p> <p>Professor Gallimore is founder and co-director of the Plasmadynamics and Electric Propulsion Laboratory, which is housed in the Department of Aerospace Engineering at the University of Michigan. Professor Gallimore directed the NASA-funded Michigan Space Grant Consortium (2000-2018), and the USAF-funded MACEEP Center of Excellence in Electric Propulsion (2009-2016). Professor Gallimore is an experimental plasma physicist who specializes in advanced spacecraft propulsion. He has extensive experimental experience with a number of electric propulsion devices including ion thrusters, Hall thrusters (SPTs, TALs, and end-Hall thrusters), arcjets, MPD thrusters and multi-megawatt pulsed coaxial plasma accelerators. He has implemented a variety of plasma probe, microwave, optical and laser diagnostics. His current interests include high-power electric propulsion thruster development; advanced time-resolved plasma diagnostics; cubesat electric propulsion; and plasma-wall interactions in electric propulsion devices. His leadership at PEPL led to the development of the X3 nested-channel Hall thruster, in partnership with NASA and the USAF. The X3 is the world's most powerful Hall thruster and is considered the prototype plasma propulsion unit for sending humans to Mars via nuclear-electric propulsion.</p>
Sept. 1998 to Aug. 2004	Associate Professor, Department of Aerospace Engineering, Applied Physics Program, University of Michigan
Jan. 1992 to Sept. 1998	Assistant Professor, Department of Aerospace Engineering, University of Michigan

Education:

- Ph.D. in Aerospace Engineering, October 1992, Princeton University
- M.A. in Aerospace Engineering, May 1988, Princeton University
- B.S. in Aeronautical Engineering, May 1986, Rensselaer Polytechnic Institute

Ph.D. Dissertation Title:

- Anode Power Deposition in Coaxial MPD Thrusters — Advisor: Professor Robert G. Jahn

Awards & Honors:

- NASA Faculty Fellows Award, 1993
- Silver Shaft Award (Instructor of the Year), by the University of Michigan Sigma Gamma Tau chapter, 1994 and 1996
- Faculty Fellowship Award, by the University of Michigan Horace H. Rackham Graduate School, 1994
- Crystal Image Award for Technical Achievement from the National Technical Association (NTA) for 1994 Science Educator of the Year, July 23, 1994
- Class of '38E Junior Faculty Outstanding Achievement Prize by the University of Michigan College of Engineering, 1996
- Best Paper Award in Electric Propulsion at the 1998 Joint Propulsion Conference, by the American Institute of Aeronautics and Astronautics (AIAA), 1999
- Faculty Career Development Award, by the University of Michigan, 2000

- The Aerospace Engineering Award for Outstanding Accomplishment, 2002
- Outstanding Achievement in Academia, National GEM Consortium, 2004
- Trudy Huebner Service Excellence Award, by the University of Michigan College of Engineering, 2005
- Harold R. Johnson Diversity Service Award, by the University of Michigan, 2005
- Decoration for Meritorious Civilian Service, by the United States Air Force, 2005
- Arthur F. Thurnau Professorship, by the University of Michigan, 2006
- Exemplary Diversity Engagement Award, National Center for Institutional Diversity, the University of Michigan, 2009
- Fellow — American Institute of Aeronautics and Astronautics (AIAA), 2010
- Phi Kappa Phi, 2014
- Richard A. and Eleanor F. Towner Professor of Engineering, 2015
- Robert J. Vlasic Dean of Engineering, 2016
- Elected to the National Academy of Engineering, “For advanced spacecraft electric propulsion, especially Hall thruster technology,” 2019
- Real McCoy Award for Engineering, Detroit Area Pre-College Engineering Program (DAPCEP) 2019
- 2020 AIAA Wyld Propulsion Award, “For groundbreaking achievements and leadership in technology and workforce development...spacecraft electric propulsion systems.”
- 2022 Stuhlinger Medal, “For exemplary contributions to the understanding of EP physics and greatly expanding the scale of EP educational capabilities.”

Professional Service:

- Member of the AIAA International Electric Propulsion Technical Committee, 1994-2017
- Member of the Institute for Defense Analyses (IDA) Defense Science Study Group (DSSG), 1996-1997
- Holder of a Department of Defense Security Clearance, since 1996
- Associate Editor, Journal of Propulsion and Power (AIAA), 1997-2021
- Member, Defense Science Board (Force Modernization Taskforce study), 1999
- Member, National Academy of Engineering Naval Studies Board (Undersea Weapons Science & Technology panel), 1999-2000
- Director, Michigan Space Grant Consortium (NASA), 2000-2018
- Member, United States Air Force Scientific Advisory Board, 2001-2005
- Member, High-Power Electric Propulsion Technology Assessment Group (NASA), 2001-2002
- Member, NRC Panel on NASA’s In-Space Propulsion, and High-Energy Nuclear Power and Propulsion Capability Roadmaps, in preparation for the Moon/Mars Initiative, 2005
- Member, NRC Air Force Studies Board – Stealth vs. Speed Trade-off for Future Combat Aircraft, 2005-2006
- Member, NRC Board on Army Science and Technology – Solid-State Lasers for Battlefield Protection, 2006-2007
- Member, NRC Naval Studies Board – Conventional Prompt Global Strike, 2007-2008
- Member, Space and Missile Propulsion Science and Technology: Independent Review Team, Institute for Defense Analyses on behalf of the Office of the Deputy Under Secretary of Defense, 2008
- Guest Editor, Special Issue on Plasma Propulsion, IEEE Transaction on Plasma Science, 2008
- Associate Editor, JANNAF Journal, 2009
- Chair, International Electric Propulsion Conference, Ann Arbor, MI, 2009
- Section Editor, Encyclopedia of Aerospace Engineering, John Wiley & Sons Ltd, 2009-2010
- Member, NRC Committee for an Assessment of Concepts and Systems for U.S. Boost-Phase Missile Defense in Comparison with Other Alternatives, 2010-2011
- Member, NASA Study to Evaluate the use of the International Space Station as an Electric Propulsion Testbed, 2011
- Member, NRC NASA Technology Roadmap: Propulsion and Power Panel, 2010-2012

- Member, NRC Space Technology Industry-Government-University Roundtable (STIGUR), 2014-2016 and 2017-2021
- Member, Board of Directors for the Engineering Society of Detroit, since 2016
- Member, Georgia Institute of Technology's College of Engineering External Advisory Board, since 2016
- Member, the University of Colorado, Boulder's College of Engineering & Applied Science External Advisory Council, 2016-2021
- Member, Case Western Reserve University's School of Engineering Visiting Committee, 2016-2019
- Member, University of Michigan School of Nursing Board for Science and Innovation, since 2017
- Member, Board of Directors for ANSYS, Inc. (NASDAQ: ANSS), since 2017
- Member, Board of Directors for the University Musical Society, since 2018
- Member, University of Michigan School of Education Dean's Advisory Council, since 2018
- Member, Board of Directors for Lightweight Innovations for Tomorrow (LIFT), 2019-2021
- Member, National Association of Corporate Directors (NACD), since 2018
- Attendee, NACD Director Professionalism, Westlake, CA, 14-17 August 2018
- Member, Institute for Defense Analyses (IDA) Board of Trustees, since 2020
- Member, Board of Directors for PagerDuty, Inc. (NYSE: PD), since 2020
- Member, the University of Michigan Center for Educational Outreach Advisory Board, since 2020
- Member, AIAA Journal Editorial Advisory Board, since 2021
- Member, AIAA Journal of Propulsion and Power Editorial Advisory Board, since 2021
- Member, Science and Technology Advisory Council, Dow, since 2021
- Member, Board of Directors for Bechtel Corporation, since 2021

Professional and Honor Societies:

- National Academy of Engineering
- American Institute of Aeronautics and Astronautics (Fellow)
- American Society for Engineering Education
- Electric Rocket Propulsion Society
- Phi Kappa Phi
- Sigma Gamma Tau
- Sigma Xi
- Tau Beta Pi

Single-Author Classified Government Report (DOD):

- "Use of Hypervelocity, Supercavitating Projectiles for Submarine Defense," Institute for Defense Analyses Technical Report (SECRET), Dec. 1997.

Book Chapters:

- Marrese, C. M., Polk, J. E., Jensen, K. L., **Gallimore, A. D.**, Spindt, C., Fink, R. L., and Devereux, W., "Performance of Field Emission Cathodes in Xenon Electric Propulsion System Environments," Chapter 11 in Micropropulsion for Small Spacecraft, Michael M. Micci and Andrew D. Ketsdever, Editors, Paul Zachan, Editor-in-Chief, Progress in Astronautics and Aeronautics, Volume 187, AIAA, ISBN 1-56347-448-4, 2000.
- Marrese, C. M., Wang, J., **Gallimore, A. D.**, and Goodfellow, K. D., "Space-Charge-Limited Emission from Field Emission Cathodes for Electric Propulsion and Tether Applications," Chapter 18 in Micropropulsion for Small Spacecraft, Michael M. Micci and Andrew D. Ketsdever, Editors, Paul Zachan, Editor-in-Chief, Progress in Astronautics and Aeronautics, Volume 187, AIAA, ISBN 1-56347-448-4, 2000.

Special Issue Editor:

- M. Keidar, **A. D. Gallimore**, Y. Raitses and J.P. Bouef, Editors, **Special Issue on Plasma Propulsion**, IEEE Transaction on Plasma Science, November 2008.
- W. Hargus, J. Blandino, and **A. Gallimore**, **JANNAF Special Section for the BHT-200 on the USAF TacSat-2 Mission**, 2010
- Encyclopedia of Aerospace Engineering, John Wiley & Sons Ltd, Editor of the *Alternative Space Propulsion* section, 2010

Patents:

- *LINEAR GRIDLESS ION THRUSTER*, **A. D. Gallimore** and B. Beal, U.S. Patent No. 6,640,535, Issued: Nov. 4, 2003.
- *SCALABLE FLAT-PANEL NANOPARTICLE MEMS/NEMS THRUSTER*, B. E. Gilchrist, **A. D. Gallimore**, M. Keidar, L. Musinski, and T. M. Lui, U.S. Patent No. 7,516,610, Issued: April 14, 2009.
- *NANOPARTICLE FIELD EXTRACTION THRUSTER*, B. E. Gilchrist, **A. D. Gallimore**, T. M. Lui, L. Musinski, and J. Mirecki-Mullunchick, U.S. Patent No. 8,453,427, Issued: June 24, 2013.
- *ELECTRODELESS PLASMA THRUSTER*, **A. D. Gallimore**, B. W. Longmeier, J. P. Sheehan, U.S. Patent No. 11,365,016, Issued: June 21, 2022.

Television/Video Appearances:

- Panel Member in the 1993 GEM annual telecast entitled "**Graduate School: The Role of the Advisor**," broadcast from the Georgia Institute of Technology, Atlanta, GA on October 28, 1993.
- American Society for Engineering Education (ASEE) Webinar "Building Your Female Leadership Pool: Insights for Success from the University of Michigan," on September 11, 2019.
- Numerous YouTube videos (and podcasts) on electric propulsion and space exploration.

Op-eds:

- "An Engineering School with Half Its Leadership Female? How Did That Happen?," A. D. Gallimore, The Chronicle of Higher Education, 1 May 2019.
- "A Friend at the Front of the Room," Alec D. Gallimore, Robert D. Braun and Steve McLaughlin, Insider Higher Ed, 2 December 2019.
- "It's Time for Engineering to be Equity-Centered," Alec D. Gallimore, Inside Higher Ed, 30 August 2021

Educational Compact Disc Appearance:

- Described the principles of momentum conservation in terms of spacecraft propulsion in an educational compact disc (CD) geared for high school physics students in the San Diego, CA school district. The CD is entitled "**Physics for the Computer Age**" and was produced by Maxwell Laboratories Inc. S-Cubed Division with Glencoe / McGraw-Hill serving as the publisher (1995).

Entrepreneurship:

Co-founder of *ElectroDynamic Applications, Inc.* (EDA), a high-tech engineering firm in Ann Arbor, MI that specializes in plasma device engineering and defense-related R&D.

Leadership Positions, University of Michigan:

Robert J. Vlasic Dean of Engineering, College of Engineering (Jul. '16 - Present)

Chief academic and executive officer of the College. Provides leadership and is responsible for all matters relating to the administration of the College, including academic programs, personnel, budgets, alumni engagement, government and industry relations, and fundraising. Works collaboratively with faculty and staff to advance the College's mission. Represents the College within the University and manages a wide range of external constituencies.

- It is my belief that engineering spans all endeavors of the human experience, including the arts, education, healthcare, national security, and scientific exploration and discovery. Shortly after becoming Dean, I led the creation of Michigan Engineering's Vision, Mission and Values statements that reflect this belief, and the establishment and launch of our 2020 Strategic Vision, with its three pillars of:
 - Education – *To educate intellectually curious and socially conscious engineers who are wise beyond their years of experience:* A recommitment to hands-on learning with the launch of our IMMERSED (#Practice Your Purpose) framework, which provides structure to our myriad experiential learning offerings; CARE (Consultation, Assistance and Resources in Engineering) Center, our central hub to provide genuine and practical support for our students both inside and outside the classroom (e.g., mental wellness, financial aid assistance, food insecurities); and enhanced online and professional education offerings through our new Nexus office.
 - Research – *In service to society by tackling wicked problems that matter to many, where the solutions require new technology, but advanced technology alone is not enough:* Provided a comprehensive faculty research support program that includes graphic artists and technical writers, “red team” reviews, and a series of internal funding programs ranging from MCubed (described below) to our Blue Sky Mega Grant competition (\$2.5M over three years) to stimulate large-scale collaborative research that extends beyond the College of Engineering.
 - Culture – *Establishing a diverse community where all members of our College can be heard, thrive and achieve at their full potential:* Created substantial programming around DEI, unconscious bias and bystander intervention training, a comprehensive DEI strategic plan, and numerous activities to reinforce our values and celebrate the diversity of our community. An important element of this pillar is to empower constituencies of the College to take ownership by developing programming that best serves their community. Oversaw a sweeping change in College leadership where now half of our department chairs and associate deans are women (there were no women chairs when I started as Dean).
- Developed a Strategic Facilities Master Plan for the College that identified facility needs (new construction as well as a maintenance of our current facilities) out to 2033. This plan helped us secure \$150M to build a new computer science and information building (slated to open in 2024/25).
- Successfully closed out our most recent “Victors for Michigan” fundraising campaign by raising more than \$1 billion in external resources, including more than \$440 million in philanthropic gifts (exceeding our \$400 million target).
- Saw the continuous growth in the College's enrollment, faculty and staff size, physical plant (currently at 60 buildings), rankings (reaching #4 last year and the year before in graduate rankings with all graduate and undergraduate programs in the top ten), endowment (\$590M → \$800M), and overall financial health.

- Launched major cross-campus initiatives such as the Precision Health Initiative (with Medicine, Public Health and Pharmacy), eHail (AI in healthcare) with Michigan Medicine, and the Augmented, Mixed and Virtual Reality teaching initiative (with Information, Education, and LSA).

Associate Dean for Academic Affairs, College of Engineering (Jan. '14 - June '16)

The Office of the Associate Dean for Academic Affairs (ADAA) has primary responsibilities related to the oversight of the hiring, merit review and promotion (including granting tenure) processes associated with over 420 tenured and tenure-track professors, 130 research scientists and research professors, and 120 lecturers in the College of Engineering. The ADAA assists the Dean in the overall budget review and planning for all departments and offices in the College and has the primary responsibility for space allocation and management. The ADAA works in close cooperation with the Dean, the other associate deans and the department chairs to sustain and advance the academic mission of the College. Recent ADAA-sponsored initiatives that I led or helped lead include:

- Faculty Development Efforts:
 - Established the CoE Faculty Fellows Program, where five associate and full professors spent a year at 20% effort working in the Dean's office
 - Designed and implemented faculty pathways to national leadership workshop
 - Organized multiple events with the Center for Research, Learning and Teaching performance group (CRLT Players), including facilitated discussion
- Three-Year Faculty Hiring Process – to enhance faculty excellence/diversity: Allocated faculty hiring slots for a three-year period with annual reviews of progress.
- Re-Focus of CoE IT on Business Processes: Took a student/research focused IT organization and revamped its mission to include business processes, to reduce the administrative burden on the faculty and staff.
- Played an active role in the formation of the campus-wide Advanced Research Computing Office
- Transitioned Space Physics Research Laboratory (SPRL) into College-wide resource for research and education: Applied SPRL's unique engineering talent in the space arena to assist major research initiatives to support the College's educational mission
- College of Engineering Diversity Strategic Plan Co-Lead: Co-led extensive Diversity, Equity and Inclusion strategic planning process for the College
- Re-focused mission of the Center for Engineering Diversity and Outreach (CEDO): Conducted a review of the office, and developed assessment metrics for its programs, a fundraising plan and a leadership transition process.

Associate Dean for Research and Graduate Education, College of Engineering (Sept. '11 - Dec. '13)

The Associate Dean for Research and Graduate Education (ADRGE) reports to the Dean of Engineering and oversees the College's >\$280M/year research enterprise and is responsible for the education and welfare of the College's >3,700 graduate students and 250 postdoctoral fellows. The ADRGE establishes and enforces policies to manage the College's research and postgraduate education enterprises. The Office of the Associate Dean for Research and Graduate Education is led by the ADRGE and includes a professional staff for government relations, corporate relations, foundation relations, international relations (for research and graduate education), graduate student matters, including recruiting, management of the College's postdoctoral fellows, and implementation of the College's Responsible Conduct for Research and Scholarship (RCRS) programming. The ADRGE manages the

College's cost-sharing funds (>\$3M/year) and all college-wide research facilities such as the \$60M Lurie Nanofabrication Laboratory (LNF) and the Michigan Center for Materials Characterization (MC2). The ADRGE develops research initiatives to support the College strategically, assists the Dean in preparing the annual budget document for the Provost, in fundraising and campaign planning, and plays a central role in implementing the College's strategic plan, especially with regard to major research initiatives, graduate student fellowships and facilities/infrastructure needs. Recent ADRGE-sponsored initiatives that I led or helped lead include:

- Center Proposal Enhancement Program: Offers seed funding and assistance in the form of technical writers, graphic artists, and seasoned budget developers to teams pursuing major research centers such as NSF Engineering Research Centers.
- Graduate Recruitment: Developed a suite of activities to recruit outstanding graduate students to the College. The last entering Ph.D. class of ~230 while I was the ADRGE had an average undergraduate GPA of 3.75, was 57% domestic and 25% women. Underrepresented minorities (URMs) made up 19% of the domestic student body.
- MCubed: Co-created a unique \$15M campus-wide interdisciplinary seed-funding program where two or more schools or colleges are represented in a single three-person "cube." MCubed became the first program in Michigan's Third Century Initiative program to mark the University's bicentennial in 2017.
- Foundation Relations Focus: To diversify the College's sponsored research portfolio, I hired the College's first fulltime staff member to be dedicated to research fundraising from foundations.
- International Focus: Using data-driven reasoning, I added an international component to the College's research development portfolio with a focus on three countries/regions of strategic interest to the College.
- Research Initiatives: advanced manufacturing, robotics and autonomous systems (which led to the formation of the Robotics Institute), and transportation.
- NextProf: Developed and led a number of diversity initiatives for faculty recruitment including this unique "future faculty" workshop for URMs and women.
- Master's Fellowship Program: Used the findings and recommendations of the Master's Taskforce report to create new initiatives for the College's master's programs including the establishment of over \$1M in master's fellowships.

Associate Dean for Academic Programs and Initiatives, Horace H. Rackham School of Graduate Studies (Sept. '05 - Aug. '11)

Coordinates all graduate school activities in the physical sciences and engineering throughout the Ann Arbor campus and served as the liaison to the engineering school on the Dearborn campus. Leads the \$6 million NSF-funded Alliances for Graduate Education and the Professoriate (AGEP) project to increase the number of URM (African American, Hispanic and American Indian/Alaskan Native) students receiving doctoral degrees in STEM in order to diversify the professoriate. Serves on the Provost's campus-wide Promotion and Tenure committee, which reviews casebooks after they have cleared the schools and colleges. I served as a senior representative for Rackham on campus, nationally and internationally, and developed a number of new initiatives and programs, including:

- Mentoring Others Results in Excellence (MORE): A committee of faculty members I founded that offers workshops on graduate student mentoring to faculty members and graduate students.
- AGEP Diversity Initiatives: Developed a number of programs, workshops and conferences to enhance the recruitment and retention of URM graduate students and postdocs with an eye towards convincing them to enter academia.

- College of Engineering Graduate Initiatives: Worked with the College of Engineering's Associate Dean for Research and Graduate Education of the time to transition engineering to a fully funded Ph.D. program, and to increase its emphasis and effectiveness on domestic/URM student recruitment.
- Program Review: Extensively reviewed all 25 graduate programs in the physical sciences and engineering division over the course of a four-year cycle. Offered grants and worked with departments to improve their graduate programs.
- Graduate Student Cost-Sharing: Initiated a pilot program with the College of Engineering and University of Michigan Office of the Vice President for Research (OVPR) to run a \$3M three-year graduate student cost-sharing program for large centers.

Director, Michigan/AFRL Center of Excellence in Electric Propulsion (MACEEP) (Sept. '09 - Aug. '16)

The MACEEP was the first USAF Center of Excellence dedicated to advanced spacecraft propulsion. The \$6M (for 5 years) center comprised the University of Michigan (lead), UCLA, Michigan Tech, Penn State, and Colorado State, and focused on four thrust areas: 1) Advanced Plasma Propulsion Systems for large spacecraft; 2) Plasma-Wall/Electrospray Processes; 3) Time-Resolved Probe and Optical Diagnostics; and 4) Modeling and Simulation, to support the Center's experimental efforts.

Director, Michigan Space Grant Consortium (MSGC) (Sept. '00 - May '18)

The NASA-funded MSGC's mission is to create, develop, and promote programs that support STEM education and public outreach in areas of NASA's strategic interests. The MSGC issues ~90 grants a year to students, professors, teachers and citizen STEM activists. The MSGC comprises the University of Michigan (lead), Calvin College, Central Michigan University, Eastern Michigan University, Grand Valley State University, Hope College, Michigan State, Michigan Tech, Oakland University, Saginaw Valley State University, Wayne State University, and Western Michigan University. The MSGC's annual funding ranged between \$600K to \$850K.

Founder/Co-director, Plasmadynamics and Electric Propulsion Laboratory (PEPL) (Sept. '00 - Present)

Founded in 1992, the Plasmadynamics and Electric Propulsion Laboratory is one of the world's leading electric propulsion research centers. The centerpiece of the laboratory is the Large Vacuum Test Facility (LVTF), a 9-m-long by 6-m-diameter cylindrical stainless-steel clad vacuum chamber. The Chicago Bridge and Iron Company built the chamber in 1961 for the Bendix Corporation. The chamber was donated to the University of Michigan in 1982 and remained dormant until I came to the University to turn the facility into a state-of-the-art electric (advanced spacecraft) propulsion laboratory. The chamber's original oil diffusion pumps have been replaced by a series of nineteen cryogenic pumps that reach a base pressure of 0.02 microTorr with a combined pumping speed of over 1,000,000 liters/sec on air, making it one of the ten most capable vacuum chambers by pumping speed in the world and the largest at any university. The LVTF is used mostly for research on Hall thrusters and ion thrusters. PEPL also houses a number of smaller vacuum chambers for plasma physics and electric propulsion research that range in size from a 30-cm UHV spherical chamber, to a 3-m by 1-m chamber for cubesat propulsion development. PEPL deploys among the most comprehensive suite of plasma diagnostics of any laboratory in the world — a variety of probes (time-averaged and time-resolved), energy analyzers, optical (including high-speed), microwave, electron-beam, and laser-based (time-averaged and time-resolved).

Journal Publications:

1. **Gallimore, A. D.**, Kelly, A. J., and Jahn, R. G., "Anode Power Deposition in Quasi-steady MPD Thrusters," *Journal of Propulsion and Power (AIAA)*, Vol. 8, No. 6 Nov. - Dec. 1992, 1224-1231.
2. **Gallimore, A. D.**, Kelly, A. J., and Jahn, R. G., "Anode Power Deposition in MPD Thrusters," *Journal of Propulsion and Power (AIAA)*, Vol. 9, No. 3 May - June 1993, 361-368.
3. **Gallimore, A. D.**, Myers, R. M., Kelly, A. J., and Jahn, R. G., "Anode Power Deposition in an Applied-Field Segmented Anode MPD Thruster," *Journal of Propulsion and Power (AIAA)* Vol. 10, No. 2 March - April 1994, 262-268.
4. Tilley, D. L., **Gallimore, A. D.**, Kelly, A. J., and Jahn, R. G., "The Adverse Effect of Ion Drift Velocity Perpendicular to a Cylindrical Triple Probe," *Review of Scientific Instruments (AIP)*, Vol. 65, No. 3 March 1994, 678-681.
5. **Gallimore, A. D.**, Kelly, A. J., and Jahn, R. G., "Power Deposition in a Hall Parameter Suppression Anode," *Journal of Propulsion and Power (AIAA)*, Vol. 10, No. 4 July - Aug. 1994, 554-561.
6. Ohler, S. G., Gilchrist, B. E., and **Gallimore, A. D.**, "Non-intrusive Electron Number Density Measurements in the Plume of a 1 kW Arcjet Using a Modern Microwave Interferometer," *IEEE Transactions on Plasma Science*, Vol. 23, No. 3, June 1995, 428-435.
7. **Gallimore A. D.**, Kim, S. W., King, L. B., Foster, J. E., and Gulczinski III, F. S., "Near and Far-Field Plume Studies of a 1 kW Arcjet," *Journal of Propulsion and Power (AIAA)*, Vol. 12, No. 1, Jan.--Feb. 1996, 105-111.
8. Foster, J. E., and **Gallimore, A. D.**, "An Investigation into the Role that a Transverse Magnetic Field Plays in the Formation of Large Anode Sheath Potentials," *Physics of Plasmas*, **3** (11) November 1996, 4239-4249.
9. King, L. B., and **Gallimore, A. D.**, "Approximating Collisional Free-stream Attenuation at Transitional Knudsen Numbers," *AIAA Journal*, Vol. 35, No. 3, Mach 1997, 574-576.
10. King, L. B., and **Gallimore, A. D.**, "A Gridded Retarding Pressure Sensor for Ion and Neutral Particle Analysis in Flowing Plasmas," *Review of Scientific Instruments*, Vol. 68, No. 2, February 1997, 1183-1188.
11. Gilchrist, B. E., Ohler, S. G., and **Gallimore, A. D.**, "Flexible Microwave System to Measure the Electron Number Density and Quantify the Communications Impact of Electric Thruster Plasma Plumes," *Review of Scientific Instruments (AIP)*, Rev. Sci. Inst., Vol. 68, No. 2, February 1997, 1189-1194.
12. Foster, J. E., and **Gallimore, A. D.**, "The Effect of an Auxiliary Discharge on Anode Sheath Potentials in a Transverse Discharge," *Journal of Applied Physics*, April 1997, 3422-3432.
13. Kusamoto, D., Mikami, K., Komurasaki, K., and **Gallimore A. D.**, "Exhaust Beam Profiles of Hall Thrusters," *Transactions of Japanese Society for Aeronautical and Space Sciences*, Vol. 40, No. 130, 1998, 238-247.
14. King, L. B., **Gallimore, A. D.**, and Marrese, C. M., "Transport Property Measurements in the Plume of an SPT-100 Hall Thruster," *Journal of Propulsion and Power (AIAA)*, Vol. 14, No. 3, May - June 1998, 327- 335.
15. Domonkos, M. T., **Gallimore, A. D.**, and Bilen, S., "A Hall Probe Diagnostic for Low Density Plasma Accelerators," *Review of Scientific Instruments (AIP)*, Vol. 69, No. 6, June 1998, 2546-2549.
16. Ohler, S. G., Gilchrist, B. E., **Gallimore, A. D.**, "Microwave Plume Measurements of a Stationary Plasma Thruster," *Journal of Propulsion and Power (AIAA)*, Vol. 14, No. 6, Nov.-Dec. 1998, 1016-1021

17. Ohler, S. G., Gilchrist, B. E., and **Gallimore, A. D.**, "Electromagnetic Signal Modification in a Localized High-Speed Plasma Flow: Simulations and Experimental Validation of a Stationary Plasma Thruster (SPT)," *IEEE Transactions on Plasma Science*, Vol. 27, No. 2, April 1999, 587-593.
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331. Lobbia, R. B., Brown, D. L., Sekerak, M. J., Hartley, K. D., King, D. Q., Peterson, P. Y., Dale, E., Cusson, S., **Gallimore, A. D.**, "The XR-5 and XR-5A Hall Thrusters, Part 3: Time-Resolved Plasma Measurements," 7th JANNAF SPS Joint Subcommittee Meeting, Nashville, TN, June 1-5, 2015.
332. Hartley, K. D., Lobbia, R. B., Brown, D. L., Beal, B. E., King, D. Q., Peterson, P. Y., Dale, E., Cusson, S., **Gallimore, A. D.**, "The XR-5 and XR-5A Hall Thrusters, Part 4: Plume Properties," 7th JANNAF SPS Joint Subcommittee Meeting, Nashville, TN, June 1-5, 2015.
333. Hall, S.J., Florenz, R.E., **Gallimore, A.D.**, Kamhawi, H., Brown, D.L., Peterson, P.Y., Polk, J.E., and Hofer, R.R., "Design Details of a 100-kW class Nested-channel Hall Thruster", 62nd Joint Army Navy NASA Air Force Propulsion Meeting, Nashville, TN, June 1-5, 2015.
334. Hall, S.J., Cusson, S.E., and **Gallimore, A.D.**, "30-kW Performance of a 100-kW Class Nested-channel Hall Thruster", IEPC-2015-125, 34th International Electric Propulsion Conference and Exhibit, Kobe, Japan, July 6-10, 2015.
335. Ebersohn, F.H., Sheehan, J.P., **Gallimore, A.D.**, Shebalin, J.V., "Quasi-one-dimensional particle-in-cell simulation of magnetic nozzles," IEPC-2015-357, 34th International Electric Propulsion Conference, Kobe, Japan, July 4-10, 2015.
336. Georgin, M., Durot, C., and **Gallimore, A. D.**, "Preliminary Measurements of Time Resolved Ion Velocity Distributions Near a Hollow Cathode," IEPC-2015-106, 34th International Electric Propulsion Conference, Kobe, Japan, July 4-10 2015.
337. Dale, E., **Gallimore, A.**, Huang, W., "High-Speed Image Analysis and Filtered Imaging of Nested Hall Effect Thruster Oscillations," IEPC-2015-90369, 34th International Electric Propulsion Conference, Hyogo-Kobe, Japan, July 4-10, 2015.
338. Cusson, S., Dale, E., and **Gallimore A.**, "Investigation of Channel Interactions in a Nested Hall Thruster Part II: Probes and Performance" AIAA-2016-5029, 34th International Electric Propulsion Conference, Hyogo-Kobe, Japan, July 4-10, 2015.

339. Collard T.A, Sheehan, J.P., and **Gallimore, A.D.** "Pressurized Xenon Propellant Management System for the CubeSat Ambipolar Thruster", IEPC-2015-364/ISTS-2015-b-364, presented at the Joint Conference of 30th International Symposium on Space Technology and Science, 34th International Electric Propulsion Conference and 6th Nano-satellite Symposium, Hyogo-Kobe, Japan, 2015.
340. Collard, T.A., Ebersohn, F.H., Sheehan, J.P., **Gallimore, A.D.**, "Ion Acceleration Modes in a Miniature Helicon Thruster," presented at the 68th Annual Gaseous Electronic Conference/9th International Conference on Reactive Plasma/33rd Symposium on Plasma Processing, Honolulu, HI, 2015.
341. Hall, S.J., Florenz, R.E., **Gallimore, A.D.**, Kamhawi, H., Brown, D.B., Peterson, P.Y., Polk, J.E., Hofer, R.R., "Design Details of a 100-kW class Nested-Channel Hall Thruster," 62nd Joint Army Navy NASA Air Force (JANNAF) Propulsion Meeting/10th MSS/8th LPS/7th SPS Joint Subcommittee Meeting, Nashville, TN, June 1-5, 2015.
342. Georgin, M., Dhaliwal, V., **Gallimore, A.** "Investigation of Channel Interactions in a Nested Hall Thruster Part I: Acceleration Region Velocimetry," 52nd Joint Propulsion Conference, Salt Lake City, UT, July 25-27, 2016.
343. Hara, K., Boyd, D., Sekerak, M., and **Gallimore, A.**, "Discharge oscillation mode transition of a Hall thruster", 41st IEEE International Conference on Plasma Science and the 20th International Conference on High-Power Particle Beams, Washington D.C., May 25-29, 2014.
344. Hara, K., Sekerak, M., **Gallimore, A.**, and Boyd, D., "Breathing mode in Hall effect thrusters," IEPC-2015-283, 34th International Electric Propulsion Conference, Hyogo-Kobe, Japan, July 4-10, 2015.
345. S. Cusson, E. Dale, and **Gallimore, A.**, "Investigation of Channel Interactions in a Nested Hall Thruster," 52nd Joint Propulsion Conference, Salt Lake City, UT, July 25-27, 2016.
346. Hall, S.J., Jorns, B., **A. Gallimore, A.D.**, Kamhawi, H., Peterson, P.Y., "High-Power Performance of a 100-kW class Nested Hall Thruster", IEPC-2017-228, 35th International Electric Propulsion Conference, Atlanta, GA, October 8-12, 2017.
347. Collard, T.A., Sheehan, J.P., and **Gallimore, A.D.**, "A Miniature Magnetic Nozzle Plasma Source for Investigation of Plume Detachment," presented at the 53rd AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Atlanta, GA, 2017.
348. Collard, T.A., Sheehan, J.P., and **Gallimore, A.D.**, "Plasma Detachment from a Miniature Magnetic Nozzle Source," IEPC-2015- 335, presented at the 35th International Electric Propulsion Conference, Atlanta, GA, 2017.
349. Dale, E.T., Jorns, B.A., **Gallimore, A.D.**, "Experimental investigation of the stability criteria for the breathing mode in Hall Effect Thrusters", IEPC 2017-265, 35th International Electric Propulsion Conference, Atlanta, Georgia, October 8-12, 2017.
350. Cusson, Sarah. E, Hofer, Richard R., Lobbia, Robert, Jorns, Benjamin A., and **Gallimore, Alec D.**, "Performance of the H9 Magnetically Shielded Hall Thrusters," 35th International Electric Propulsion Conference, Atlanta, GA, October 8-12, 2017.
351. Cusson, Sarah. E, Hall, Scott J., Hofer, Richard R., Jorns, Benjamin A., and **Gallimore, Alec D.**, "The Impact of Magnetic Field Coupling Between Channels in a Nested Hall Thruster," 35th International Electric Propulsion Conference, Atlanta, GA, October 8-12, 2017.
352. Georgin, M., Byrne, M., Jorns, B., and **Gallimore, A.**, "Passive High-speed Imaging of Ion Acoustic Turbulence in a Hollow Cathode," 53rd AIAA/SAE/ASEE Joint Propulsion Conference, Atlanta, Georgia, July 10-12, 2017.

353. Georgin, M., Sarver-Verhey, T., Jorns, B., **Gallimore, A.D.**, "Low Frequency Hollow-Cathode Plume Mode Oscillations", IEPC 2015-106 35th International Electric Propulsion Conference, Atlanta, Georgia, October 8-12, 2017.
354. Cusson, S., Durot, C., Jorns, B., and **Gallimore, A.**, "Impact of Cathode Flow Fraction on the Location of the Acceleration Region," 53rd AIAA/SAE/ASEE Joint Propulsion Conference, 2017 AIAA Propulsion and Energy Forum and Exposition.
355. Cusson, S., Hofer, R., Lobbia, R., Jorns, B., **Gallimore, A.**, "Performance of the H9 Magnetically Shielded Hall Thrusters", 35th International Electric Propulsion Conference, Atlanta, GA, October 8-12, 2017.
356. Hofer, R., Cusson, S., Lobbia, R., **Gallimore, A.**, "The H9 Magnetically Shielded Hall Thruster", 35th International Electric Propulsion Conference, Atlanta, GA, October 8-12, 2017.
357. Cusson, S., Hall, S., Hofer, R., Jorns, B., **Gallimore, A.**, "The Impact of Magnetic Field Coupling Between Channels in a Nested Hall Thruster", 35th International Electric Propulsion Conference, Atlanta, GA, October 8-12, 2017.
358. Cusson, S., Jorns, B., **Gallimore, A.**, "Simple Model for Cathode Coupling Voltage Versus Background Pressure in a Hall Thruster", 53rd AIAA/SAE/ASEE Joint Propulsion Conference, Atlanta, GA, July 10-12, 2017.
359. Jorns, B., **Gallimore, A.**, Hall, S., Peterson, P., Gilland, J., Goebel, D., Hofer, R., Mikellides, I., "Update on the Nested Hall Thruster Subsystem for the NextSTEP XR-100 Program", 54th AIAA/ASME/SAE/ASEE Joint Propulsion Conference, Cincinnati, OH, July 9-11, 2018.
360. Georgin, M., Jorns, B., **Gallimore, A.**, "Plasma Instabilities in the Plume of a Hollow Cathode", 54th AIAA / ASME / SAE / ASEE Joint Propulsion Conference, Cincinnati, OH, July 9-11, 2018.
361. Cusson, S., Jorns, B., **Gallimore, A.**, "Ion Acoustic Turbulence in the Hollow Cathode Plume of a Hall Effect Thruster", 54th AIAA/SAE/ASEE Joint Propulsion Conference, Cincinnati, OH, July 9-11, 2018.
362. Georgin, M., Cusson, S., Bayer, V., Budd, C., Huff, A., Oldani, K., Reid, K., Shapiro, N., Woldd, K., Jorns, B., **Gallimore, A.**, "Development of a Mobile Electric Propulsion Demonstration for STEM Outreach", 54th AIAA/SAE/ASEE Joint Propulsion Conference, Cincinnati, OH, July 9-11, 2018.
363. Cusson, S., Jorns, B., **Gallimore, A.**, "Impact of Cathode Flow Fraction on the Location of the Acceleration Region", Space Propulsion Conference, Seville, Spain, May 14-18, 2018.
364. Cusson, S., Hofer, R., Goebel, D., Georgin, M., Vazsonyi, A., Jorns, B., **Gallimore, A.**, Boyd, I., "Development of a 30-kW Class Magnetically Shielded Nested Hall Thruster", 36th International Electric Propulsion Conference, Vienna, Austria, September 15-20, 2019.
365. Cusson, S., Jorns, B., **Gallimore, A.**, "Impact of Neutral Density on the Magnetic Shielding of Hall Thrusters", 36th International Electric Propulsion Conference, Vienna, Austria, September 15-20, 2019.
366. Vigas, E., Jorns, G., **Gallimore, A.**, Sheehan, J.P., "University of Michigan's Upgraded Large Vacuum Test Facility", 36th International Electric Propulsion Conference, Vienna, Austria, September 15-20, 2019.

Selected Conference Posters and Presentations:

1. "Experiments with High-Pressure Field Emission Cathodes for Electric Propulsion Application," presentation by C. M. Marrese, **A. D. Gallimore**, W. A. Mackie, and D. E. Evans, at the 24th IEEE International Conference on Plasma Science (ICOPS), San Diego, CA, May 1997 AND at the JPL Workshop on Advanced Propulsion Concepts on May 21, in Pasadena, CA.
2. "Very-Near-Field Magnetic Field Measurements of an Anode Layer Thruster," presentation by M. T. Domonkos, **A. D. Gallimore**, and S. Bilen, 24th IEEE International Conference on Plasma Science (ICOPS), San Diego, CA, May 1997.
3. "Enhanced current collection characteristics of the Tethered Satellite System missions: prospects for laboratory simulation," Gilchrist, B. E., N. Stone, W.J. Raitt, C. Bonifzai, M. Dobrowolny, J. Laframboise, **A. Gallimore**, IPELS, Maui, HI, June, 1997.
4. "Laboratory experiments to investigate the effects of high speed bulk plasma drift on current collection physics in a space magnetoplasma: a feasibility assessment," Gilchrist, B.E., J. Laframboise, **A. Gallimore**, URSI National Radio Science Meeting, Boulder, CO, Jan. 5-9, 1998.
5. "Field-Emitter Array Cathodes (FEACs) for Space-Based Applications," presentation by B. E. Gilchrist, K. L. Jensen, **A. D. Gallimore**, and J. Severns, 26th IEEE International Conference on Plasma Science (ICOPS), Monterey, CA, June 1999.
6. "Plasma Density Measurements Inside a Laboratory Model Hall Thruster Using Resonance Probe Diagnostic," presentation by J. M. Haas, B. E., Beal, and **A. D. Gallimore**, 27th IEEE International Conference on Plasma Science (ICOPS), New Orleans, Louisiana, June 2000.
7. "Experimental Investigation of Hall Thruster Magnetic Field Topography," presentation by P. Y. Peterson, J. M. Haas, and **A. D. Gallimore**, 27th IEEE International Conference on Plasma Science (ICOPS), New Orleans, Louisiana, June 2000.
8. "Spectroscopic Characterization of FMT-2 Discharge Ionization Processes," presentation by T. B. Smith, G. J. Williams, and **A. D. Gallimore**, 27th IEEE International Conference on Plasma Science (ICOPS), New Orleans, Louisiana, June 2000.
9. "Optimization of Hall Thruster Magnetic Field Topography" poster presented by R. R. Hofer, P. Y. Peterson, and **A. D. Gallimore**, 27th IEEE International Conference on Plasma Science (ICOPS), New Orleans, Louisiana, June 2000.
10. "Performance Comparison of a Hall Thruster Operating with Xenon and Krypton, presented by J. A. Linnell and **A. D. Gallimore**, 46th Annual Meeting of the Division of Plasma Physics – American Physical Society, Savannah, GA, November 2004.
11. Smith, T. B., Nguyen, S., Tang, R., and **Gallimore, A. D.**, "Breakdown and ignition limits in LaB₆ hollow cathode discharges," ICOPS-2006-89141, 33rd IEEE International Conference on Plasma Science, Traverse City, MI, June 2006.
12. Smith, T. B., Ngom, B. B., and **Gallimore, A. D.**, "Optogalvanic spectroscopy of the Zeeman effect in singly-ionized xenon," ICOPS-2006-6882, 33rd IEEE International Conference on Plasma Science, Traverse City, MI, June 2006.
13. Lemmer, K. M., **Gallimore, A. D.**, Morris, D. P., Davis, C., Boyd, I., and Keidar, M. "Development, Fabrication and Testing of a 15 cm Diameter Helicon Source," 8th Asia Pacific Conference on Plasma Science and Technology, Cairns, Queensland, Australia, July 2006.

14. Lemmer, K. M., **Gallimore, A. D.**, Morris, D.P., Davis, C., Boyd, I., and Keidar, M. "Development, Fabrication and Testing of a 15 cm Diameter Helicon Source," 33rd IEEE International Conference on Plasma Science, Traverse City, MI, June 2006.
15. Lemmer, K. M., **Gallimore, A. D.**, Smith, T. B., Nguyen, S., Austin, D. R., Morris, D., Davis, C., and Zigel, J., "Simulating Hypersonic Atmospheric Conditions in a Laboratory Setting Using a 6-in-Diameter Helicon Source." ICOPS 2007 Oral Presentation, Albuquerque, NM, June 2007.
16. Nguyen, S. V. T., Lemmer, K. M., **Gallimore, A. D.**, and Thompson, L. T., "An Experimental Study of Hydrogen Production by Dissociation of Water Vapor in a Helicon Plasma Source," ICOPS 2007 Oral Presentation, Albuquerque, NM, June 2007.
17. Nguyen, S. V. T., Foster, J. E., and **Gallimore, A. D.**, "Characterization of a Water Vapor Radio-Frequency Plasma —An Experimental Investigation," ICOPS 2009 Oral Presentation, San Diego, CA, June 2009.
18. Nguyen, S. V. T., Kushner, M. J., and **Gallimore, A. D.**, "Study of Reaction Kinetics of a Water Plasma Using a 0-D Global Model," ICOPS 2009 Oral Presentation, San Diego, CA, June 2009.
19. Liang, R. and **Gallimore, A.D.**, "A 6-kW Laboratory Hall Thruster with Two Concentric Discharge Channels," 31st International Electric Propulsion Conference Poster Session, Ann Arbor, Michigan, 20-24 September 2009.
20. Spencer, L. F. and **Gallimore, A. D.**, "Mass Spectrometric Analysis of CO₂/Ar Plasma in a Radio Frequency Discharge," 37th IEEE International Conference on Plasma Science, Norfolk, VA, June 2010.
21. "Erosion Characterization via Ion Power Deposition Measurements in a 6-kW Hall Thruster," poster by R. Shastry, **A. D. Gallimore**, and R.R. Hofer, 1st Annual MIPSE Graduate Student Symposium, Ann Arbor, Michigan, September 2010.
22. McDonald, M.S., **Gallimore, A.D.**, Hofer, R.R., and Goebel, D.M., "Development of A Monte Carlo Hall Thruster Electron Trajectory Model," 63rd Annual Gaseous Electronics Conference and 7th International Conference on Reactive Plasmas, Paris, France, October 2010.
23. McDonald, M.S., **Gallimore, A.D.**, "On the Relation Between Rotating Spokes and Electron Transport in a Crossed-Field Plasma", 52nd Annual Meeting of the APS Division of Plasma Physics, Chicago, IL, November 2010.
24. Spencer, L. and **Gallimore, A.**, "Mass Spectrometric Analysis of CO₂/Ar and CO/Ar Plasma in a Radio Frequency Discharge," 37th International Conference on Plasma Science, Norfolk, VCA, June 20 - June 24, 2010.
25. C. J. Durot and **A. D. Gallimore**, "Development of a Novel Time-Resolved Laser-Induced Fluorescence Technique," 54th Meeting of the APS Division of Plasma Physics, Providence, RI, Oct. 29-Nov. 2, 2012.
26. M. Sekerak, **A. Gallimore**, and J. Polk, "High-speed Dual Langmuir Probe with Ion Saturation Reference (HDLP-ISR) for Hall Thruster Plume Measurements," Poster presented at the NASA Technology Days, Cleveland, OH, November 28-30, 2012.
27. C. J. Durot and **A. D. Gallimore**, "Development of a Novel Time-Resolved Laser-Induced Fluorescence Technique," 40th IEEE International Conference on Plasma Science, San Francisco, CA, June 16-21, 2013.
28. M. Sekerak, B. Longmier, A. Gallimore, "**Hall Effect Thruster Oscillatory Modes**," Poster presented at the 4th Michigan Institute for Plasma Science and Engineering Student Symposium, Ann Arbor, MI, September 25, 2013.

29. C. Durot, A. Gallimore, "**Development of a Novel Time-Resolved Laser-Induced Fluorescence Technique**," *Poster* presented at the 4th Michigan Institute for Plasma Science and Engineering Student Symposium, Ann Arbor, MI, September 25, 2013.
30. M. Georgin, V. Dhaliwal, and **A. Gallimore**, "Acceleration Region Measurements in a Nested Channel Hall Thruster," *Poster* presented at the International Conference On Plasma Science, Banff, Alberta, Canada, June 19-23, 2016.
31. S.E. Cusson, S.J. Hall, E.T. Dale, and **A.D. Gallimore**, "Performance Analysis of Nested Hall Thrusters", *Poster* presented at the 43rd IEEE International Conference on Plasma Science, Banff, Alberta, Canada, June 19-23, 2016.
32. T.A. Collard, J.P. Sheehan, **A.D. Gallimore**, "Ion Energetics of the Modes of the CubeSat Ambipolar Thruster," *Poster* presented at the 6th Annual Michigan Institute of Plasma Science and Engineering Graduate Student Symposium, Ann Arbor, MI, 2015.
33. S. Hall, R. Florenz, **A. Gallimore**, "Initial Observations of Channel Interaction in a 100-kW-Class Nested-Channel Hall Thruster", *Poster* Presented at the 5th Annual Michigan Institute of Plasma Science and Engineering Graduate Student Symposium, Ann Arbor, MI, October 8, 2014.
34. S. Hall, R. Florenz, **A. Gallimore**, "Channel Interaction in a 100-kW-Class Nested-Channel Hall Thruster", *Poster* presented at the University of Michigan Engineering Graduate Symposium, Ann Arbor, MI, November 14, 2014.
35. S. Hall, S. Cusson, **A. Gallimore**, "30-kW Constant-Current-Density Performance of a 100-kW-Class Nested Hall Thruster", *Poster* presented at the 6th Annual Michigan Institute of Plasma Science and Engineering Graduate Student Symposium, Ann Arbor, MI, October 7, 2015.
36. Collard, T.A., Sheehan, J.P., **Gallimore, A.D.**, "Ion Energetics of the Modes of the CubeSat Ambipolar Thruster," *Poster* presented at the 6th Annual Michigan Institute of Plasma Science and Engineering Graduate Student Symposium, Ann Arbor, MI, 2015.

Doctoral Students Graduated:

1. Foster, J. E., Dissertation Title — "An Investigation of the Influence of a Transverse Magnetic Field on the Formation of Large Anode Fall Voltages in Low-Pressure Arcs," 1996. *Currently Professor of Nuclear Engineering, University of Michigan.*
2. King, L. B., Dissertation Title — "Transport-Property and Mass Spectral Measurements in the Plasma Exhaust Plume of a Hall-Effect Space Propulsion System," 1998. *Currently the Ron and Elaine Starr Professor in Space Systems Engineering, Michigan Technical University, director of the Ion Space Propulsion (ISP) Laboratory.*
3. Marrese, C. M., Dissertation Title — "Compatibility of Field Emission Cathodes and Electric Propulsion Technologies; Theoretical and Experimental Performance Evaluations and Cathode Requirements," 1999. *Currently Technical Staff Member in electric propulsion, NASA Jet Propulsion Laboratory.*
4. Kim, S. W., Dissertation Title — "Experimental Investigations of Plasma Parameters and Species-Dependent Ion Energy Distribution in the Plasma Exhaust Plume of a Hall Thruster," 1999. *Currently Chief Engineer in electric propulsion, Advanced Technology Institute, Japan.*
5. Gulczinski III, F. S., Dissertation Title – "Examination of the Structure and Evolution of Ion Energy Properties of a 5 kW Class Laboratory Hall Effect Thruster at Various Operational Conditions," 1999. *Currently Deputy Chief Energy, Power, and Thermal Division, Air Force Research Laboratory (Wright Patterson AFB).*

6. Van Noord, J. L., Dissertation Title — “Thermal Model of an Ion Thruster,” 1999. *Currently Member of the Technical Staff, Space Physics Research Laboratory, College of Engineering, University of Michigan.*
7. Domonkos, M. T., Dissertation Title — “Evaluation of Low-Current Orificed Hollow Cathodes,” 1999. *Recently Research Scientist in electric propulsion at NASA Glenn Research Center. Currently Technical Staff Member in directed energy, Air Force Research Laboratory (Kirtland AFB)*
8. Williams Jr., G. J., Dissertation Title — “The Use of Laser-Induced Fluorescence to Characterize Discharge Cathode Erosion in a 30 cm Ring-Cusp Ion Thruster,” 2000. *Currently Technical Staff Member in electric propulsion, NASA Glenn Research Center.*
9. Haas, J. M., Dissertation Title — “Low-Perturbation Interrogation of the Internal and Near-field Plasma Structure of a Hall Thruster using a High-Speed Probe Positioning System,” 2001. *Currently Member of the Technical Staff, Air Force Research Laboratory (Wright Patterson AFB).*
10. Smith, T. B. Dissertation Title — “Deconvolution of Ion Velocity Distributions from Laser Induced Fluorescence Spectra of Xenon Electrostatic Thruster Plumes,” 2002. *Currently Lecturer, Department of Aerospace Engineering, University of Michigan.*
11. Beal, B. E. Dissertation Title — “Clustering of Hall Effect Thruster for High-Power Electric Propulsion,” 2004. *Currently Technical Staff Member, Air Force Research Laboratory (Edwards AFB).*
12. Hofer, R. R. Dissertation Title — “Development and Characterization of High-Efficiency, High Specific Impulse Xenon Hall Thrusters,” 2004. *Currently Group Leader, Electric Propulsion Section, NASA Jet Propulsion Laboratory.*
13. Peterson, P. Y. Dissertation Title — “The Development and Characterization of a Two-Stage Hybrid Hall/Ion Thruster,” 2004. *Currently a member of the technical staff in electric propulsion, NASA Glenn Research Center.*
14. Walker, M. L. R., Dissertation Title — “Effects of Facility Backpressure on the Performance and Plume of a Hall Thruster,” 2005. *Currently Professor of Aerospace Engineering, Georgia Institute of Technology, director of the High-Power Electric Propulsion Laboratory.*
15. Herman, D. A., Dissertation Title — “The Use of Electrostatic Probes to Characterize the Discharge Plasma Structure and Identify Discharge Cathode Erosion Mechanisms in Ring-Cusp Ion Thrusters,” 2005. *Currently Technical Staff Member in electric propulsion, NASA Glenn Research Center.*
16. Rovey, J. L., Dissertation Title — “A Multiple-Cathode, High-Power, Rectangular Ion Thruster Discharge Chamber for Increasing Thruster Lifetime,” 2005. *Currently Associate Professor of Aerospace Engineering, Missouri University of Science and Technology, (formerly University of Missouri, Rolla), conducting electric propulsion research in his laboratory.*
17. Victor, A. L., Dissertation Title — “Design and Utilization of a Top Hat Analyzer for Hall Thruster Plume Diagnostics,” September 2006. *Currently Senior Member of the Technical Staff, Aerospace Corporation, Los Angeles, CA (co-advised with T. Zurbuchen).*
18. Linnell, J. A., Dissertation Title — “An Evaluation of Krypton Propellant in Hall Thrusters,” February 2007. *Currently Member of the Technical Staff, Sandia National Laboratory, Albuquerque, NM.*
19. Kirtley, D. E., Dissertation Title — “Study of the Synchronous Operation of an Annular Field Reversed Configuration Plasma Device,” Ph.D. Dissertation, University of Michigan, 2008: *Currently Propulsion Research Scientist at MSNW, LLC, Seattle, WA.*

20. Musinski, L., Dissertation Title — “Investigation of a Micro- and Nano-Particle In-Space Electrostatic Propulsion Concept,” Ph.D. Dissertation, University of Michigan, 2009: *Currently Member of the Technical Staff, MIT Lincoln Laboratory, Lexington, MA* (co-advised with B. Gilchrist).
21. Reid, B. M. Dissertation Title — “The Influence of Neutral Flow Rate in the Operation of Hall Thrusters,” Ph.D. Dissertation, University of Michigan, 2009: *Currently Member of the Technical Staff, MIT Lincoln Laboratory, Lexington, MA*.
22. Lemmer, K. M. Dissertation Title — “Use of a Helicon Source for Development of a Re-Entry Blackout Amelioration System,” Ph.D. Dissertation, University of Michigan, 2009: *Currently Assistant Professor of Mechanical Engineering, Western Michigan University*.
23. Brown, D. L. Dissertation Title — “Investigation of Low Discharge Voltage Hall Thruster Characteristics and Evaluation of Loss Mechanisms,” 2009. *Currently Technical Staff Member in rocket propulsion, Air Force Research Laboratory (Edwards AFB)*.
24. Nguyen, S. V. T. Dissertation Title — “Hydrogen Production in a Radio-Frequency Plasma Source Operating on Water Vapor,” 2009. *Currently Member of the Technical Staff, MIT Lincoln Laboratory, Lexington, MA* (co-advised with J. Foster).
25. Ngom, B. B. Dissertation Title — “Magnetic Field Simulation and Mapping Based on Zeeman-Split Laser-Induced Fluorescence Spectra of Xenon in the Discharge Channel of 5-6 kW Co-Axial Stationary-Plasma Hall Thrusters,” 2009.
26. Lobbia, R. B. Dissertation Title — “A Time-Resolved Investigation of the Hall Thruster Breathing Mode,” 2010. *Currently Member of the Technical Staff in electric propulsion, NASA Jet Propulsion Laboratory*.
27. Liu, T. M. Dissertation Title — “The Design Space of a Micro/Nano-Particle Electrostatic Propulsion System,” 2010. *Currently a research scientist at the High-Power Electric Propulsion Laboratory, Georgia Institute of Technology*, (co-advised with B. Gilchrist).
28. Shastry, R. Dissertation Title — “Experimental Characterization of the Near-Wall Region in Hall Thrusters and its Implications on Performance and Lifetime,” 2011. *Currently Technical Staff Member in electric propulsion, NASA Glenn Research Center*.
29. Tang, R. Dissertation Title — “Study of the Gasdynamic Mirror (GDM) Propulsion System,” 2011 (co-advised with T. Kammash).
30. Huang, W. Dissertation Title — “Use of Cavity Ring-Down Spectroscopy to Characterize Hall Thruster Erosion,” 2011. *Currently Technical Staff Member in electric propulsion, NASA Glenn Research Center*.
31. Spencer, L., Dissertation Title — “The Study of CO₂ Conversion in a Microwave Plasma/Catalyst System,” 2012. *Currently Technical Staff Member at Federal Mogul*.
32. McDonald, M., Dissertation Title — “Electron Transport in Hall Thrusters,” 2012. *Currently Technical Staff Member at the U.S. Naval Research Laboratory*.
33. Shabshelowitz, A., Dissertation Title — “Study of RF Plasma Technology Applied to Air-Breathing Electric Propulsion,” 2012. *Currently Member of the Technical Staff, MIT Lincoln Laboratory, Lexington, MA*.
34. Liang, R., Dissertation Title — “The Combination of Two Concentric Discharge Channels into a Nested Hall-Effect Thruster,” 2013. *Currently Technical Staff Member at Space Systems/Loral*.
35. Florenz, R., Dissertation Title — “The X3 100-kW Class Nested-Channel Hall Thruster: Motivation, Implementation, and Initial Performance,” 2014. *Currently serving his country in the U.S. Marine Corps*.

36. Sekerak, M., Dissertation Title — “Plasma Oscillations and Operational Modes in Hall Effect Thrusters,” 2014. *Currently Technical Staff Member in spacecraft systems engineering, NASA Goddard Space Flight Center.*
37. Trent, K., Dissertation Title – “Control of the Electron Energy Distribution Function (EEDF) in a Hall Thruster Plasma,” 2016. *Currently a postdoc with the Plasmadynamics and Electric Propulsion Laboratory.*
38. Durot, C., Dissertation Title – “Development of a Time-Resolved Laser-Induced Fluorescence Technique for Nonperiodic Oscillations,” 2016. *Currently a postdoc with the Plasmadynamics and Electric Propulsion Laboratory.*
39. Ebersohn, F., Dissertation Title – “Kinetic Method for Quasi-One-Dimensional Simulation of Magnetic Nozzle Plasmadynamics,” 2016. *Currently an Aerospace Engineer at Lockheed Martin Skunk Works.*
40. Hall, S., Dissertation Title – “Characterization of a 100-kW class Nested Hall Thruster,” 2017. *Currently Technical Staff Member in electric propulsion, NASA Glenn Research Center (co-advised with B. Jorns).*
41. Collard, T., Dissertation Title – “Performance Characterization of a Low Power Magnetic Nozzle,” 2019. *Currently at Lincoln Laboratory, Lexington, MA (co-advised with B. Jorns).*
42. Cusson, S., Dissertation Title – “Impact of Neutral Density on the Operation of High-Power Magnetically Shielded Hall Thrusters,” 2019. *Currently Morgan Stanley, OH (co-advised with B. Jorns).*
43. Georgin, M., Dissertation Title – “Ionization Instability of the Hollow Cathode Plume,” 2019. *Currently at the Naval Research Laboratory, DC (co-advised with B. Jorns).*
44. Dale, E., Dissertation Title – “Investigation of the Hall Thruster Breathing Mode,” 2019. *Currently a postdoctoral fellow at the Plasmadynamics and Electric Propulsion Laboratory, University of Michigan (co-advised with B. Jorns).*

Master’s Students Graduated:

1. Clauss, C., September 1991 - May 1993, Research Topic - “Arcjet operations & PEPL build-up,” (graduation date: May 1993) *Currently a Technical Staff Member at the Naval Center for Space Technology at the U.S. Naval Research Laboratory.*
2. Rudra, D., January 1992 - December 1993, Research Topic - “Thrust measurement of electric thrusters,” (graduation date: December 1993). *Currently an engineer at the Daimler-Chrysler Company.*
3. Spieth, J., September 1992 - December 1993, Research Topic - “Arcjet performance measurements,” (graduation date: December 1993). *Currently an engineer at the Boeing Airplane Company.*
4. Reichenbacher, M., September 1992 - December 1994, Research Topic - “End-Hall thruster plume diagnostics,” (graduation date: December 1994). *Currently an engineer at Detroit Diesel Corporation.*
5. Majumdar, N., January 1996 - May 1997, Research Topic - “Development of a single-aperture retarding potential analyzer for Hall thruster plume characterization.” *Currently an engineer at Space Systems/Loral working on electric propulsion.*
6. Malone, S., September 1997 - May 1998, Research Topic - “Development of a neutral particle flux probe for Hall thruster plume characterization.” *Currently at Space Systems/Loral.*
7. Craig, L., September 2000 - September 2001, Research Topic - “ExB probe operations,” *Currently an engineer in the NASA Mars exploration program, NASA Jet Propulsion Laboratory.*
8. McFarlane, D., September 2002 - December 2003, Research Topic - “Supporting tests to make internal ion engine.” *Currently an engineer in family-owned general aviation aircraft parts supplier.*

9. Talerico, L., September 2002 - December 2003, Research Topic - "Supporting plasma-wind tunnel tests on the NASA URETI project." *Currently a development engineer at Blue Origins in Seattle, WA.*
10. Stindl, T., June 2003 - November 2003, Visiting Graduate Student from the University of Stuttgart, M.S. Thesis Research Topic - "Plasma temperature and number density measurements in the plume of a high-power Hall thruster plume." [U.S. ADVISOR, Professor Monika Auweter-Kurtz of the University of Stuttgart is the PRINCIPAL ADVISOR].
11. Gritter, L., January 2003 - May 2005, Research Topic - "Plasma-wind tunnel measurements for the NASA SVETI project." *Currently an engineer at Accurate Automation Corporation, Chattanooga, TN.*
12. Li, Y., September 2006 - December 2007, Research Topics - "Numerical Simulation of Hall Thruster Anode Injection," and "NanoFET PIC Modeling," *Currently an engineer at Space Exploration Technologies (SpaceX), Hawthorne, CA.*
13. Bellant, C., September 2009 – January 2013, Research Topic – "Plasma-Material Interactions for Electric Propulsion Devices," *Currently in the Advanced Flight Planning group for Human Space Exploration, NASA Johnson Space Center, Houston, TX.*
14. Goglio, I., September 2012 – May 2014, Research Topic – "Cubesat Ambipolar Thruster development," *Currently at Los Alamos National Laboratory, Los Alamos, NM.*