Michael W. Liemohn

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Curriculum Vita

Summary

My primary research interest is to gain a better understanding of the natural world, particularly the space environment around Earth and other planets. The main emphasis of my work is quantifying charged-particle motion through space. This effort includes the development and application of physics-based computer models used in conjunction with extensive data analysis.

Education

Ph.D. in Atmospheric and Space Science, University of Michigan, Ann Arbor, MI, May, 1997
Dissertation title: "Self-Consistent Coupling of Superthermal Electrons With Thermal Plasma"
Thesis co-chairmen: Dr. George Khazanov and Prof. Tamas Gombosi

M.S. in Atmospheric and Space Science, University of Michigan, Ann Arbor, MI, December, 1995, GPA 7.75 (8.0 scale).

B.S. in Physics and Mathematics (double major), Rose-Hulman Institute of Technology, Terre Haute, IN, May, 1992, GPA 3.83 (4.0 scale).

Professional Employment

2013 - present	*Professor, Climate and Space Sciences and Engineering (formerly the Atmospheric, Oceanic, and Space Sciences (AOSS) Department), University of Michigan, Ann Arbor, MI.*
2006 – 2013	*Associate Professor, AOSS Department, U-M.* 2006-2009: 50-50% research/instructional position
2003 - 2009	*Research Associate Professor, AOSS Department, U-M.*
1998 –2003	*Assistant Research Scientist, AOSS Department, U-M.*
1997 - 1998	*National Research Council Resident Research Associate at NASA Marshall Space Flight Center (MSFC), Huntsville, AL.*
1992 - 1996	*Graduate Student Research Assistant at the AOSS Department, U-M.* Advisors: Dr. George Khazanov and Tamas Gombosi 2004-2007: NASA Graduate Student Researchers Program (GSRP) Fellowship
Summers 1991 and 1992	*Engineering Intern at Rocket Research Corporation (now Aerojet), Redmond, WA, Electric Propulsion Group.* Built and tested a Langmuir probe for arcjet thruster diagnostics.

Research Interests

- Energetic particle transport in planetary space environments
- Physics of geomagnetic storms

- Storm-time inner magnetospheric plasma dynamics and evolution
- Planetary plasma environments
- Energetic - thermal particle interactions
- Mid- and high-latitude ionospheric precipitation and outflow
- Wave-particle interaction theory and plasma instabilities
- Space weather forecasting and impacts

Affiliations

2012 - present	American Astronomical Society (AAS)
2007 - Present	American Society for Engineering Education (ASEE)
1999 - Present	American Association for the Advancement of Science (AAAS)
1993 - Present	American Geophysical Union (AGU)

Honors and Awards

2019	U-M College of Engineering Ted Kennedy Family Team Excellence Award
2018	U-M College of Engineering Monroe-Brown Foundation Education Excellence Award
2011	Certificate of Appreciation, NRC Decadal Strategy for Solar and Space Physics
2008	NASA TIMED Mission Team Group Achievement Award
2002	University of Michigan's Research Scientist Recognition Award
1997 - 1998	NRC Research Associateship at NASA MSFC
1996	AGU Space Physics and Aeronomy Section Outstanding Student Paper, Spring Meeting
1994 - 1997	NASA Graduate Student Researchers Program fellowship

Research Community Service

Present Activities:

- NASA PI Launchpad Workshop Steering Committee (2020 – present). Developing a workshop for training a more diverse set of potential PIs for NASA science spaceflight missions.
- Lead Guest Editor (2021 – present), Frontiers in Astronomy and Space Science special issue on “Driving towards a diverse space physics research community – Perspectives, initiative, strategies, and actions,” with several others
- Science Organizing Committee for the Triennial Earth-Sun Summit 2024 (2023 – present), defining the scope and structure of this ~500-person conference
- Chair (2023 – present), NASA Jack Eddy Steering Committee. Review postdoctoral proposals and set policy for the program.
- AGU SPA Nominating Task Force (2018 – present). Leading and helping others submit award nominations of female and URM scientists.
- Resource Group Co-Leader (2020 – present), Modeling Methods and Validation, NSF Geospace Environment Modeling Program. Define and coordinate community-wide challenges with the focus groups, with Drs. Lutz Rastätter, Adam Kellerman, and Alexa Halford.

Past Activities:

- Chair (2018 – 2022), NASA Heliophysics Advisory Committee. Organize the HPAC agenda, convene the meetings (~3 per year) and write the report, and report to the Science Committee of the NASA Advisory Council.
- NASA Science Committee (2018 – 2022). Advise the NASA Associate Administrator for Science with ~3 meetings per year and telecons as needed.
- Co-Chair of AGU Partnerships Task Force (2020 – 2022). Lead an assessment of AGU's partnership strategy, develop partnering criteria, and identify proactive partnering directions.
- AGU Meetings Committee (2017 – 2022). Editorial liaison to AGU's committee that oversees strategic planning of its conferences. Also, review the workshop proposals for the Fall AGU Meeting.
- Session organizer, Fall AGU 2021 Meeting, on "Cocreation of Useful Science—Listening to Our Partners," with Lora Koenig, Philip Mote, and David Behar.
- Session organizer, Fall AGU 2020 Meeting, on "Processes in the Present-Day Atmosphere of Mars," with Drs. Armin Kleinbohl, Paul Hayne, and Nicholas Heavens.
- NASA Jack Eddy Steering Committee (2018 – 2020). Review postdoctoral proposals and set policy for the program.
- Editor-in-Chief (2013 - 2019), *Journal of Geophysical Research - Space Physics*. Lead the editorial board, promote the journal, and coordinate/conduct the review of ~1100 manuscripts each year.
- AGU Space Physics and Aeronomy Executive Committee (1 Jan 2014 – 31 Dec 2019). As *JGR-Space* EiC, I was on the SPA Exec Comm, contributing to the direction of the section.
- PhD committee member for Eric Grono, University of Calgary, Canada, 2 December 2019.
- Session organizer, Fall AGU 2019 Meeting, on "Processes in the Present-Day Atmosphere of Mars," with Drs. Armin Kleinbohl, Paul Hayne, and Nicholas Heavens.
- Session organizer, Fall AGU 2019 Meeting, on "Forum on University Curricula and Teaching Materials for Space Physics and Heliophysics," with Drs. Nicholas Gross, Steven Cranmer, and Lika Guhathakurta.
- Focus Group Co-Leader (2016 – 2019), Methods and Validation, NSF Geospace Environment Program. Organize sessions at the GEM workshops define and coordinate challenges, with Drs. Katherine Garcia-Sage, Robert Redmon, and Lutz Rastätter.
- Session organizer, Fall AGU 2018 Meeting, on "Processes in the Present-Day Atmosphere of Mars," with Drs. Armin Kleinbohl, Paul Hayne, and Nicholas Heavens.
- Session organizer, Fall AGU 2018 Meeting, on "Predicting Extreme Events to Build Resilience to Natural Hazards" with Drs. Raymond Schmitt and Albert Kettner.
- Focus Group Co-Leader (2013 - 2018), Inner Magnetosphere Cross-Energy/Population Interactions, NSF GEM Program, with Drs. Yiqun Yu, Colby Lemon, and Jichun Zhang.
- Team Leader (2017 – 2018), Geomagnetic Indices Group, International CCMC-LWS Workshop on space weather metrics.
- Session organizer, TESS-2018 Meeting, on " Comparative Physics and Consequences of Celestial Body Atmospheric Loss," with Drs. Shannon Curry, Katherine Garcia-Sage, and Nicholeen Viall.
- Vice-Chair (2015 – 2018), NASA Heliophysics Advisory Committee (formerly the Heliophysics Subcommittee). Help organize the HPAC agenda, assist with running the meetings (~3 per year) and drafting the findings, and take part in reporting to the Science Committee of the NASA Advisory Council.
- PhD opponent for Sanni Holijoki, University of Helsinki, 14 May 2017.

- Session organizer, Fall AGU 2017 Meeting, on "Processes in the Present-Day Atmosphere of Mars," with Drs. Armin Kleinbohl, Paul Hayne, and Nicholas Heavens.
- Session organizer, Fall AGU 2017 Meeting, on "Processes that Couple Inner Magnetospheric Plasma Populations" with Drs. Colby Lemon, Yiqun Yu, and Jichun Zhang.
- Session organizer, Fall AGU 2016 Meeting, on "Processes in the Present-Day Atmosphere of Mars," with Drs. Armin Kleinbohl, Paul Hayne, and Nicholas Heavens.
- Session organizer, Fall AGU 2016 Meeting, on "Interactions Across the Spectrum of Inner Magnetospheric Plasma" with Drs. Colby Lemon, Yiqun Yu, and Jichun Zhang.
- Member (2004-2016), LANL Institute for Geophysics and Planetary Physics (IGPP) External Advisory Committee. Meet annually (June) to advise on the direction of IGPP at LANL and to conduct a panel review of the IGPP "minigrant" proposals.
- Member (2014 - 2016), Science Organizing Committee for the AGU Chapman Conference on "Currents in Geospace and Beyond." Select invited speakers and organize sessions for the meeting. The conference will be held in Dubrovnik, Croatia, in May 2016.
- Member (2014 - 2015), NASA Heliophysics Subcommittee. Advise the NASA Heliophysics Division Director with ~3 meetings per year and telecons as needed.
- Session organizer, Fall AGU 2015 Meeting, on "Processes in the Present-Day Atmosphere of Mars," with Drs. Armin Kleinbohl, Paul Hayne, and Nicholas Heavens.
- Session organizer, Fall AGU 2015 Meeting, on "Cross-Energy Interactions in the Inner Magnetosphere," with Drs. Colby Lemon, Jichun Zhang, and Yiqun Yu.
- Session organizer (2014 - 2015), Third Inner Magnetosphere Coupling Workshop (IMC-III) held in March 2015 at UCLA, on " Coupling among plasmasphere, ring current, and radiation belts," with Dr. Margaret Chen.
- Session organizer, Fall AGU 2014 Meeting, on "Effects of Suprathermal Electrons in Space Plasmas," with Drs. George Khazanov, John Dorelli, and Viviane Pierrard.
- Session organizer, Fall AGU 2014 Meeting, on "Cross-Energy Interactions in the Inner Magnetosphere," with Drs. Colby Lemon, Jichun Zhang, and Yiqun Yu.
- Participant (2014), Participant (2014), Review of NSF's Division of Atmospheric and Geospace Sciences (AGS) Draft Science Goals and Objectives. Attend a two-day meeting and follow-up writing.
- Session organizer, Fall AGU 2013 Meeting, on "Plasma Sources of the Inner Magnetosphere," with Drs. Jichun Zhang, Frank Toffoletto, and Pontus Brandt.
- Member (2012-2013), NSF Geospace Environment Modeling (GEM) Strategic Planning Task Force
- Session organizer, AGU 2013 Meeting of the Americas, on "The Coupled Inner Magnetosphere," with Drs. Raluca Ilie and Amy Keesee.
- Session organizer, EGU 2013 General Assembly, on "Current Systems in Geospace and Other Planetary Space Environments," with Dr. Natalia Ganushkina.
- Session organizer, Fall AGU 2012 Meeting, on "Causes and Consequences of Ionospheric Outflow," with Drs. Elena Kronberg, Elena Grigorenko, and Anderw Yau.
- Organizer/coordinator (2011 - 2012), JGR Space Physics special section on "Response of Geospace to High Speed Streams."
- Member (2010 - 2012), National Academy of Sciences Decadal Survey in Solar and Space Physics, Solar Wind-Magnetosphere Interactions Panel.
- Member (2010 - 2012), National Academy of Sciences Decadal Survey in Solar and Space Physics, Education and Workforce Working Group.

- Session organizer and discussion leader (2011-2012), Inner Magnetosphere Coupling - II Workshop, Los Angeles, CA, March 2012, co-convened with Dr. Margaret Chen.
- Team Leader (2008-2012), NASA LWS TR&T Focused Science Team for Near-Earth Radiation.
- Lead Organizer, LWS Workshop on "Geospace Response to High-Speed Streams," Santa Fe, NM, June 25, 2011, along with the LWS TR&T FST team.
- Chair (2009 - 2011), NSF Geospace Environment Modeling (GEM) Program Steering Committee.
- Session convener, Fall 2010 AGU Meeting in San Francisco, CA, on “Inner Magnetospheric Response to High-Speed Streams, co-convened with Drs. Natalia Ganushkina and Vahe Peroomian.
- Chair-elect (2008 - 2009), NSF Geospace Environment Modeling (GEM) Program Steering Committee.
- Member (2007 -2009), NASA Living With a Star (LWS) TR&T Steering Committee.
- Member (2007-2008), Science Organizing Committee for the Inner Magnetosphere Coupling Workshop, held July 28-August 1, 2008, in Helsinki, Finland.
- Team Leader (2005-2008), NASA LWS TR&T Focused Science Team for Radiation Belt Studies.
- Chair (2003-2008), Inner Magnetosphere/Storms Research Area, NSF Geospace Environment Modeling (GEM) Workshop.
- Chair (2005-2007), NASA Geospace Management Operations Working Group (G/MOWG).
- Member (2006-2007), Science Organizing Committee member for the LWS CDAW on Geo-Storms held March 5-7, 2007 at Florida Institute of Technology (Melbourne, FL).
- Session convener, Spring 2007 AGU Meeting in Acapulco, Mexico, on "Distortions of Inner Magnetospheric Electric and Magnetic Fields", co-convened with Dr. Vania Jordanova.
- Organizer/coordinator, JGR Space Physics special section on "Results from the NSF GEM Inner Magnetosphere/Storms Assessment Challenge", to which there are ~20 manuscript submissions (in print November 2006).
- Session convener, European Geosciences Union (EGU) 2006 General Assembly in Vienna, Austria, on "Particle populations, electric currents and electromagnetic fields in the Earth's inner magnetosphere", co-convened with Drs. Natalia Ganushkina, Anna Milillo, Iaonnis Dandouras, and Paul Song.
- Member (2004-2005), NASA Sun-Solar System Connection (SSSC) Foundation Roadmap Team.
- Member (2003-2005), NASA Geospace Management Operations Working Group (G/MOWG).
- Member (2004-2005), Science Organizing Committee member for the LWS CDAW on Geomagnetic Storms held March 14-16, 2005 at George Mason University (Fairfax, VA).
- Session convener, Fall 2005 AGU Meeting in San Francisco, CA, on "Storms in Geospace: The Coupled Inner Magnetosphere and Sub-Auroral Ionosphere-Thermosphere System", co-convened with Dr. Art Richmond.
- Session convener, Spring 2005 AGU Meeting in New Orleans, LA, on "Solar Cycle Variations of the Magnetosphere: Causes and Consequences", co-convened with Dr. Ruth Skoug of LANL and Dr. Vania Jordanova.
- Session convener, Fall 2004 AGU Meeting in San Francisco, CA, on "The Coupled Inner Magnetosphere", co-convened with Dr. Jerry Goldstein.

- Member (2004), organizing committee for the Huntsville 2004 Workshop on Challenges in Modeling the Sun-Earth System (meeting in November 2004).
- Member (2004), organizing committee for the two IGPP Workshops on Sawtooth Oscillations in Taos, NM, April 2004 and September 2004.
- Co-Chair (2000-2003), Working Group 1 (Plasmasphere and Ring Current), Inner Magnetosphere/Storms Campaign, NSF Geospace Environment Modeling (GEM) Workshop.

Reviewer Activities:

- As Editor-in-Chief of JGR-Space Physics (2013-2019), I regularly reviewed manuscripts as part of the adjudication/decision process
- Journal Referee
  Journal of Geophysical Research
  Geophysical Research Letters
  Reviews of Geophysics
  American Geophysical Union monographs
  Journal of Atmospheric and Solar-Terrestrial Physics
  Annales Geophysicae
  Planetary and Space Sciences
  International Journal of Geomagnetism and Aeronomy
  Advances in Polar Upper Atmospheric Research
  Advances in Space Research
  Nonlinear Processes in Geophysics
  Icarus
  Eos
- Manuscripts Refereed in 2022: 7
- Proposal Reviewer
  National Aeronautics and Space Administration
  National Science Foundation
  Los Alamos National Laboratory's Directors Fund
  Los Alamos National Laboratory's Institute for Geophysics and Planetary Physics (now Center for Space and Earth Sciences)
  NASA Postdoctoral Research Program
  National Academy of Sciences
  Department of Energy INCITE Computing Program
  International Science and Technology Center (grants for scientists in the Independent States of the former Soviet Union)
  Canadian Foundation for Innovation
  Natural Science and Engineering Research Council (Canada)
  Japanese Aerospace Exploration Agency (Japan)
  Wiley Book Proposals
  American Geophysical Union (Chapman Conference proposals)
  University of Michigan (various internal programs)
- Proposals Reviewed in 2022: 45
- Served on various proposal review panels, typically 2 – 4 each year (NASA, NSF, LANL, CFI, NSERC, INCITE, U-M)

Collegiate Service: Courses

- SPACE (was AOSS) 101: Introduction to Rocket Science (Fall 2013, '16, '17, '18), basics of rocket physics and engineering, history of rocketry, and the realism of "space" science fiction
- AOSS 105: Our Changing Atmosphere (Fall 2008, Winter ’10 and ‘11), an introduction to the atmosphere, air pollution, and climate change for non-science majors
- AOSS 370: Solar-Terrestrial Relations (Fall 2009, ‘10, '11, '12, '14, '15): required course for all AOSS undergrads covering the Sun, space weather, and the sun-climate relationship
- SPACE 423 (was 405-002): Data Analysis and Visualization for Geoscientists (Winter 2018, '19, ’20, ’21, ’22, ‘23): course on error propagation, data analysis, curve fitting, hypothesis testing, and visualization (I developed it)
- AOSS 450: Geophysical Electromagnetics (Fall 2005, '06, and '07), a new course for AOSS, required for some senior undergraduates (I developed it)
- AOSS 470: Solar-Terrestrial Relations (Winter 2007, '08, '09): earlier version of AOSS 370
- SPACE (was AOSS) 477: Space Weather Modeling (Winter 2012, '14, '15, '16): space weather modeling numerical algorithms and model usage, data-model comparisons, CCMC familiarity and usage (I developed it)
- AOSS 499/701: Space Weather Modeling (Winter 2008): a new elective for space weather AOSS undergraduates and first-year graduate students, precursor to 477
- CLIMATE/SPACE 501: CLaSP Grad Student Proseminar (Fall 2022): 1-credit discussion series of “life skills” for new PhD students (I developed it, with 4 PhD students)
- AOSS 501: Space Science Journal Club (Fall 2014, '15; Winter 2015, '16): weekly journal club
- SPACE 501: PhD Professional Seminar (Fall 2022; Winter 2023): life skills for ramping up to be a first-year PhD student in our department (I developed it)
- SPACE 551: Advanced Fluid Dynamics (Fall 2020, ’21, ‘22): derivations and usage of the continuity, momentum, and energy equations, including waves and instabilities
- SPACE 590: CubeSat Concept Development (Winter 2022): led a team of a dozen M-Eng students in the design of a CubeSat mission concept
- AOSS 605-006: Space Weather Forecasting (Fall 2010, Winter 2011), space weather forecasting contest participation, paper reviews, and data analysis projects (I developed it)
- AOSS 701: Lightning Physics (Fall 2007), directed study for grad student on lightning E&M
- AOSS 701: Electromagnetics (Winter 2010, Summer 2012, '14), directed study for grad students through the material of AOSS 450 (Geophysical Electromagnetics)
- AOSS 701: Plasma Waves Problem Solving (Winter 2015): guiding students through a weekly problem-solving session using Stix' *Waves in Plasmas* book
- CLIMATE/SPACE (was AOSS) 747: Student Seminar (Winter 2015, '17): discuss good-v-bad scientific presentation techniques with PhD pre-candidates, oversee their practice talks
- CLIMATE/SPACE 749: Departmental Seminar (Fall 2017, Winter 2018): arrange speakers for weekly departmental seminar, lead students in Q&A with speakers and term-end discussion on the elements of good scientific presentations

Collegiate Service: Committees

Present Activities:

- Director, the University of Michigan Space Institute (2019 – present)
- Chair, University of Michigan Space Institute Executive Committee (2019 – present)
- ADVANCE STRIDE Committee, (2019 – present)
- CoE Teaching Engineering Equity (TEE) Center Steering Committee (2022 – present)

- Chair, CLaSP Graduate Admissions Committee (2022 – present)
- Convener, Launch Committee for Wei Hu, CoE-EECS (2022 – present)
- CoE Teaching Engineering Equity (TEE) Center Steering Committee (2023 – present)
- CLaSP DEI rep to CoE (2022 – present)
- Rackham Faculty Recognition Awards Committee (2021 – present)
- UM Library Engineering Faculty Advisory Committee (EFLAC) (2021 – present)
- CLaSP Rackham Diversity Ally (2018 – present)
- CLaSP Diversity Committee (2018 – present) (now JEDI – Justice, Equity, Diversity, and Inclusivity)

Past Activities:

- Convener, Launch Committee for Sabina Tomkins, School of Information (2021 – 2022)
- Rackham Advancing New Directions in Grad Ed Initiative (2020 – 2022)
- CLaSP faculty search committee (2020 – 2021)
- CLaSP Alumni and Friends Committee (member, 2018 – 2020)
- ADVANCE LIFT faculty panel at this workshop for those transitioning to Associate Professor, October 2016, '17, '18, and '19
- Leader, University of Michigan Space Institute creation task force (2016 – 2019)
- CoE Communications and Marketing Office Faculty Feedback Panel (Winter 2019)
- Lindau Travel Grant proposal reviewer (Fall 2018, '19)
- CoE Thematic Year Advisory Committee (Summer 2018)
- CoE DEI Panel for Chair Searches (2018)
- Convener, Launch Committee for Joi-Lynn Mondisa, IOE (2016 – 2018)
- Chair, CLASP Alumni and Friends Committee (2014 - 2018)
- Reappointment Casebook Committee for Xianzhe Jia (2018)
- Chair, Promotion Casebook Committee for Carolyn Kuranz (2017)
- CoE DEI Panel for Chair Searches (2017)
- ADVANCE LIFT faculty panel for those transitioning to Associate Professor, October 2016
- Chair, Promotion Casebook Committee for Susan Lepri (2016)
- Launch Committee for Joshua Spitz, Physics (2015-2016)
- Launch Committee for Shasha Zou, CLASP (2015-2016)
- GradSWE lunch speaker (Dec 2016)
- CLASP Ladies Lunch speaker (April 2016)
- Faculty Mentor for Assistant Research Scientist Orenthal Tucker (2014 - 2016)
- AOSS Executive Committee (2013 - 2016)
- AOSS Qualifying Exam Committee (2014 - 2016)
- Faculty Leading Change Task Force on Grad Student Diversity (2015 – 2016)
- Reappointment Casebook Committee for Justin Kasper (2016)
- Promotion Casebook Committee for Jason Gilbert (2015)
- Chair, AOSS Awards Committee (2013 - 2015)
- Chair, Promotion Casebook Committee for Shasha Zou (2014)
- College of Engineering "I-T Futures" Committee (2014)
- Faculty Mentor for Assistant Research Scientist Rich Frazin (2010 - 2014)
- AOSS Curriculum Committee (2013 -2014)
- Chair, Promotion Casebook Committee for Gabor Toth (2013)

- Promotion Casebook Committee for Enrico Landi (2013)
- AOSS Graduate Program Committee (2006 - 2013)
- Experimental Faculty Search Committee (2012 - 2013)
- Chair, Promotion Casebook Committee for Natalia Ganjushkina (2012)
- Promotion Casebook Committee for Chris Parkinson (2012)
- Master's of Science Assessment Committee (2012)
- Chair, AOSS Graduate Admissions Committee (2006 - 2012)
- CoE Grad Chairs meetings, several times a semester (2006 - 2012)
- Rackham Grad Program Chairs meetings, several times a year (2006 - 2012)
- AOSS Undergraduate Curriculum Committee (2007 - 2012): including large-scale review of the ESSE undergrad program (Fall 2008)
- Tenure/Promotion Casebook Committee for Christiane Jablonowski (2011)
- AOSS Chair Search Advisory Committee (2010-2011)
- AOSS Awards Committee (2010 - 2011)
- Lead organizer for the weekly AOSS space physics student meetings (2004 - 2010)
- Promotion Casebook Committee for Richard Frazin (2010)
- Chair, AOSS Graduate Program Committee (2009 - 2010)
- Chair, Promotion Casebook Committee for Ward (Chip) Manchester (2009)
- AOSS Strategic Plan Committee (2008)
- Chair, AOSS Faculty Search Committee (2007 - 2008)
- AOSS Qualifying Exam Committee (2006 and 2007)
- Chair, AOSS March Major Madness (undergrad recruiting event) (2007)
- Chair, Promotion Casebook Committee for K. C. Hansen (2007)
- Promotion Casebook Committee for Ward (Chip) Manchester (2006)
- AOSS Department Executive Committee (2001-2004)
- AOSS Awards Committee (2002-2003)
- Promotion Casebook Committee for Xiaohong Liu (2001)

Advisorships

- Postdoctoral advisorships

Fall/2004-Wint/2006	Elena Moise (with Dr. Janet Kozyra) TIMED satellite theory-data comparisons
Winter/2006-Sum/07	Xiaohua Fang (with Dr. Janet Kozyra) Precipitation modeling, TIMED satellite theory-data comparisons, Mars pick-up ion modeling
Sum/2010-Fall2010	Raluca Ilie Inner magnetospheric modeling, temporary position while she waited for her LANL postdoc to begin
Sum/2013	Shannon Curry Mars pick-up ion modeling, temporary position while she waited for her UC-Berkeley postdoc to begin
Sum/2014-Sum/2016	Roxanne Katus Inner magnetospheric data analysis and modeling, 25% position to complement her 75% position at West Virginia University
Fall/2019-Sum/2020	Meghan Burleigh

Geospace system modeling, ionosphere-thermosphere physics, ionospheric outflow

Fall/2020-present Sunanda Suresh
Geospace system modeling, ionosphere-thermosphere coupling

- PhD student advisorships (primary advisor, chaired the dissertation committee)
  - Fall/2000-Fall/2005 Xiaohua Fang (with Dr. Janet Kozyra), PhD in 2005
    Precipitation modeling, TIMED satellite theory-data comparisons
  - Fall/2001-Aug 2006 Jichun Zhang, PhD in 2006
    Ring current superposed epoch analysis and MHD modeling
  - Fall/2002-Spr/2007 Xia Cai, PhD in 2007
    Magnetospheric sawtooth oscillation data analysis
    Originally with Dr. Clauer, I funded her from 1/2006 on
  - Fall/2005-Win/2010 Raluca Ilie, PhD in 2010
    Ring current modeling and data analysis
  - Fall/2008-Win/2013 Catherine Walker, PhD in 2013
    Planetary atmosphere and geology modeling and data analysis
    After Year 2, primarily with Prof. Jeremy Bassis
  - Win/2010-Win/2013 Shannon Curry, PhD in 2013
    Mars pick-up ion modeling and atmospheric loss
  - Fall/2009-Win/2014 Roxanne Katus, PhD in 2014
    Ring current modeling and data analysis
  - Fall/2011-Fall/2015 Shaosui Xu, PhD in 2015
    Mars electron data analysis and modeling
  - Fall/2013-Fall/2016 Lois Smith, PhD in 2016
    Inner magnetosphere data analysis and modeling
  - Fall/2011-Win/2018 Blake Johnson, PhD in Jan 2018
    Mars ion data analysis and modeling
  - Fall/2015-Win/2020 Abigail Azari (with Prof. Xianzhe Jia), PhD in Mar 2020
    Saturn magnetospheric kinetic-v-fluid physics
  - Win/2016-Sum/2020 Alicia Schooley (with Prof. Susan Lepri), PhD in Aug 2020
    Solar wind electrons, magnetic topology, CMEs
  - Fall/2017-Fall/2021 Agnit Mukhopadhyay (with Dr. Dan Welling). PhD in Dec 2021
    Ionospheric conductance influences on geospace
  - Fall/2017-Win/2022 Alexander Shane, PhD in Jan 2022
    Mars electron data analysis and modeling
  - Fall/2017-Sum/2022 Brian Swiger (with Dr. Natalia Ganushkina), PhD in July 2022
    Geospace data analysis and modeling
  - Fall/2014-Sum/2022 Huy-Sinh Trung, PhD in Aug 2022 (Physics PhD student)
    Magnetospheric magnetic reconnection modeling
  - Fall/2021-present Kaitlin Doublestein, PhD expected in 2026
    Ionospheric outflow and magnetospheric ion composition
  - Fall/2021-present Erika Hathaway, PhD expected in 2026
    Saturn magnetospheric modeling and data analysis
  - Win/2022-present Nii-Boi Quartey, PhD expected in 2026 (Applied Physics PhD)
    Mars ion loss to deep space
  - Fall/2022-present Stephanie Colon-Rodriguez, PhD expected in 2027
    Ion composition in Earth's magnetosphere
- Ph.D. committees, member:

Deng, Yue	Awarded August 2006
DeJong, Anna	Awarded Winter 2008
Welling, Daniel	Awarded Fall 2008
Yu, Yiqun	Awarded Fall 2010
Najib, Dalal	Awarded Fall 2010
Walker, Catherine	Awarded Winter 2013
Raines, James	Awarded Winter 2013
Meng, Xing	Awarded Winter 2013
Gruesbeck, Jacob	Awarded August 2013
Zhang, Xiangyun	Awarded Winter 2015
Dong, Chuanfei	Awarded Fall 2015
Ellington, Sidney	Awarded Winter 2016
Perlongo, Nick	Awarded Winter 2017
Holijoki, Sanni	Awarded May 2017 (University of Helsinki, served as opponent)
Hegedus, Alex	Awarded August 2019
Grono, Eric	Awarded December 2019 (University of Calgary)
Hua, Michael	Awarded January 2021 (in Nuclear Engineering)
Luengo Vidal, Sergio	Awarded July 2021
McCuen, Brett	Expected May 2023

- Special projects with PhD students

Sum/2022-Win/2023	Erica Whiting, Kaitlin Doublestein, Tim Keebler, Ananyo Bhattacharya: PhD life skills course development

- Master's student advisorships

Fall/2002-Sum/2004	Jacki Smith, MS in 2004, MGS satellite data & modeling
Fall/2007-Sum/2009	Matt Trantham, MS in 2009, MGS satellite data & modeling
Fall/2011-Win/2012	Laura O'Connor, SGUS/MS student, course and career advisor
Summer 2022	Eli Levine, Shun-Yu Yang, Maria Mejia, Sabrina Archer, M-Eng CubeSat mission concept development (engineering design) Summer follow-on to a SPACE 590 project, with 12 students
Summer 2023	Anushree Manwatkar, M-Eng, space weather model analysis

- Undergraduate REU/directed research/hourly advisorships

Summer 2001	John Vann (senior from Univ. of Kansas)
Summer 2002	Tamara Reimer (junior from Harvey Mudd College, CA)
Summer 2003	Jessica Trudeau (senior from Carleton College, MN)
Fall/2004-Fall/2006	Emily Tubman: Polar-TIDE data analysis
Winter 2007	Vernon Butler: ring current simulations
Summer 2007	Matt Onderlinde: ring current and magnetosphere simulations
Fall 2007	Matt Jazowski: ring current simulations
Fall/2008-Win/2009	Amanda Mims: magnetospheric data analysis
Summer 2009	Zsolt Balint (junior from Embry-Riddle Aeronautical Univ., FL)
Fall/2009-Fall/2010	Matt Trantham: Mars electron data analysis
Summer 2010	Andrew De Zeeuw: ring current simulations
Winter 2011	Ava Dupre: Mars electron data analysis
Sum/2011-Fall2011	Shan Yan: radiation belt modeling
Fall/2011-Sum/2012	Nick Perlongo: ring current simulations
Summer 2012	John (Jack) Blears (senior from Washington U in St. Louis, MO)
Winter/2012-Sum/'12	Manan Kocher: Mars electron data analysis
Fall 2012	Tristan Weber: ring current simulations
Fall/2012 - Win/2013	Michael Kawano: Mars electron data analysis
Winter 2014	Michael Constantine, ring current simulations

Win/2015-Sum/2017	Alex Shane, Mars electron data analysis and modeling
Win/2016-Sum/2017	Corinne Florie, Mars electron data analysis
Win/2018-Fall/2018	Rickey Shackelford, Saturn magnetospheric physics
Summer 2018	Hanyun Xu, space storms and space current systems
Sum/2018 & 2019	Timothy Keebler, space current system data analysis (senior from Millersville University, PA)
Summer 2020	Jenna Syposs: Saturn magnetospheric dynamics
Sum/2020-Fall/2020	Graham Fordice: paleomagnetospheric MHD simulations
Summer 2022	Aaron Johnson: plasma sheet electron neural net model analysis
Sum/2020-Fall/2022	Joshua Adam: data-model comparison metrics assessments

Media Relations and Coverage

- Interviewed and quoted by National Public Radio reporter Jeff Gronfeld regarding the MAVEN initial results release, November 5, 2015: http://www.npr.org/sections/thetwo-way/2015/11/05/454594559/researchers-reveal-how-climate-change-killed-mars
- Interviewed and quoted by the New York Times reporter Kenneth Chang regarding the MAVEN initial results release, November 6, 2015: http://www.nytimes.com/2015/11/06/science/space/mars-atmosphere-stripped-away-by-solar-storms-nasa-says.html?_r=0
- Interviewed and quoted in an AGU press release on Pluto's interactions with the solar wind, May 4, 2016: http://news.agu.org/press-release/plutos-interactions-with-the-solar-wind-are-unique-study-finds/
- Interviewed and quoted in *Eos* regarding Thomas Zurbuchen heading NASA's Science Mission Directorate, November 4, 2016: https://eos.org/articles/new-nasa-science-head-foresees-progress-in-search-for-alien-life
- Highlighted in U-M's Washington Update, a weekly newsletter from U-M's office of Government Relations, for my service on the NASA Heliophysics Advisory Committee, September 8, 2017: http://mailchi.mp/e0f5e895b7de/6w2ff9p3pp-1248545
- Reddit Ask Me Anything session on the dangers of space weather, October 5, 2017: https://www.reddit.com/r/science/comments/74fqke/hi_reddit_im_mike_liemohn_a_professor_in_the/
- Interviewed and quoted about the meteor bolide fireball over southeast Michigan, January 16-17, 2018, by WDIV (Detroit channel 4 TV), WXYZ (Detroit channel 7 TV), Ann Arbor News (mlive.com), the Detroit Free Press, and U-M's College of Engineering and Michigan News, and then quoted in other media outlets, like Fortune magazine and Space.com:
  https://www.facebook.com/Local4/videos/10156616389261002/
  https://scout.tveyes.com/media/273763/WDIV/2018-01-17/06/02/20/?ua=1&StartOffset=120&eventid=5e339284-ed55-4abd-86f1-6e181b3c0fd1&Highlight=%22University%20of%20Michigan%22&signature=968E6658229191356FAF9677797BBDA
  https://www.youtube.com/watch?v=SmH8CtWRYT8&feature=youtu.be
  http://www.ns.umich.edu/new/experts-advisories/25376-michigan-meteor-u-m-experts-can-discuss
  https://www.facebook.com/michigan.engineering/videos/10156171519898324/
  http://www.mlive.com/news/index.ssf/2018/01/10_things_to_know_about_the_me.html
  http://www.mlive.com/news/ann-arbor/index.ssf/2018/01/astronomy_professors_from_um_e.html

http://www.crossroadstoday.com/story/37286071/head-of-astronomy-says-meteor-debris-may-have-landed-in-mich
http://www.weny.com/story/37286071/head-of-astronomy-says-meteor-debris-may-have-landed-in-mich
https://www.wxyz.com/news/head-of-astronomy-at-cranbrook-believes-meteor-landed-near-mount-clemens
https://drive.google.com/file/d/1czBebDT7H17WzeXMuJ5EDYfM58wXerzS/view
http://fortune.com/2018/01/17/watch-a-meteor-explode-over-michigan-causing-loud-boom-and-brilliant-flash-of-light/
https://www.freep.com/story/news/local/michigan/2018/01/18/meteorites-deadly-history/1041458001/
https://www.space.com/39431-michigan-meteor-explosion-shook-earth.html

- Interviewed by Sky & Telescope magazine about the impact of the government shutdown on scientific research and publishing, January 18, 2019: https://www.skyandtelescope.com/astronomy-news/government-shutdown-astronomy-financial-woes-uncertain-schedules/
- My PhD student was interviewed by Science Alert about his Fall AGU presentation on paleomagnetospheric numerical modeling results, December 16, 2021: https://www.sciencealert.com/the-laschamp-event-titled-earth-s-magnetic-field-41-000-years-ago-it-took-1-300-years-to-right-itself
- Interviewed by WDIV (Channel 4 TV in Detroit) about the fly-by of a large asteroid past Earth, January 18, 2022: https://www.clickondetroit.com/news/local/2022/01/18/giant-asteroid-to-pass-earth-12-million-miles-away/?utm_source=facebook&utm_medium=social&utm_campaign=snd&utm_content=tutman&fbclid=IwAR3u39xMsBL-fnAPqWu4JwCPmKGBEgvpd6788GPAfhm-Dx0Z_BnnMNV7KDM

Publication and Presentation Record

ISI Web of Science ResearcherID number:	H-8703-2012
ORCID number:	0000-0002-7039-2631
H-index:	39 in Web of Science, 44 in Google Scholar (as of 1/17/23)
Peer-Reviewed Publications	1 textbook, recently accepted (sole author) 241 articles in print, press, or submitted (64 first author) 12 invited review papers (2 first author) 18 submitted/in-print since January 2022 (4 first author)
Other Research Publications	50 in print (32 first author) Technical Reports, GEMStone reports, *International Innovations* article, science blog posts, *Eos* Editors' Vox posts and Editors' Highlights, *JGR-Space Physics* editorials
Editor-in-Chief Blog	300 posts (December 2013 through December 2019) http://liemohnjgrspace.wordpress.com/
Other Social Media	Starting the Michigan Space Institute blog, "Space Connection" First post in mid February 2020, https://space.umich.edu/

	Regular posts on "AGU Space" Facebook page Regular tweets @liemohnspace Sun-climate posts at Ricky Rood's blog (October 2015) http://www.wunderground.com/blog/RickyRood/show.html Member of the Aurorasaurus Scientist Network Space weather posts at the Aurorasaurus blog (January 2016) http://blog.aurorasaurus.org/
Presentations	717 given or co-authored (292 first author) 91 invited presentations at scientific meetings (46 first author)

A complete list of peer-reviewed publications appears at the end of this document

Funding Record (principal investigator only)

- Currently: PI of 7 grants from federal agencies totaling $6.3M (~$1.5M/y)
- Lifetime: PI of 51 grants totaling nearly $18M
- Currently institutional PI of a spaceflight hardware project, a CubeSat led by SwRI
- PI of a soon-to-be-submitted proposal for a NASA Heliophysics Small Explorer mission – MAAX: Magnetospheric Auroral Asymmetry eXplorer – for $156M (~$12M for U-M)

Active Grants and Contracts:

2023-present (1 year)	PI, PI Lanchpad 2023: Getting your mission idea off the ground, NASA Topical Workshops, Symposia, and Conferences Program, $120k
2022-2026 (5 years)	PI, Ionosphere COmposition and Velocity EXperiment (ICOVEX) in the topside ionosphere, NASA Heliophysics Flight Opportunities for Research & Technology, led by Southwest Research Institute (U-M part of Dr. Keiichi Ogasawara's CubeSat project), $2,033k
2021-2026 (5 years)	PI, Gateway to robust HERMES science: Filling the potholes of nonideal accommodations on the road to the moon, NASA HERMES Interdisciplinary Scientist Program, $1,342k
2021-2024 (3 years)	PI, Morphology and Evolution of Hot Ion Injection Events in Saturn's Inner Magnetosphere, NASA Cassini Data Analysis Program, $469k
2020-2023 (3 years)	PI, PAGER: Prediction of Adverse effects of Geomagnetically-induced currents and Energetic Radiation, European Union Horizon 202 Programme, led by GFZ in Germany (U-M part of Dr. Y. Shprits's grant), $307k
2019-2023 (4 years)	PI, Heavy Ions Inside Geosynchronous Orbit, NASA Living With a Star Program, led by Southwest Research Institute (U-M part of Dr. J.-M. Jahn's grant), $116k
2017-2023 (5 years, plus ext.)	PI (with co-PI Dan Welling), PREEVENTS Track 2: Collaborative Research: CHARGED- Comprehensive Hazard Analysis for Resilience to Geomagnetic Extreme Disturbances, NSF Geosciences PREEVENTS Program, $1,958k

Past Grants and Contracts:

2017-2022 (3 years, plus ext.)	PI, Outflow and Geospace: Impact and Feedback of Heavy Ions in the Magnetosphere, NASA Heliophysics Grand Challenge Research Program, 1,043k
2016-2021 (3 years, plus ext.)	PI, Connections Between and Drivers of Inner Magnetospheric Current Densities and Hot Ion Structures, NASA Heliophysics Guest Investigator Program, $452k
2016-2021 (3 years, plus ext.)	PI, Assessing Superthermal Electron Kinetic Processes in Near-Mars Space, NASA Solar System Workings Program, $512k
2016-2020 (3 years)	PI, Understanding Ion Heating and Convection Using TWINS and SWMF, NASA Heliophysics Supporting Research Program, led by WVU then UNH (U-M part of Dr. Amy Keesee's grant), $117k
2016-2017 (1 year)	PI, Stormtime Plasmapause Locations Derived from IMAGE EUV, NASA Heliophysics Infrastructure and Data Environment Enhancements Program, $39k
2014-2017 (3 years)	PI, Planetary Ion Loss From Transition Region Altitudes at Mars and Venus, NASA Planetary Atmospheres Program, $474k
2013-2016 (3 years)	PI, Analysis of Hot Ion Structures in the Inner Magnetosphere, NASA Heliophysics Guest Investigator Program, $358k
2013-2016 (3 years)	PI, Investigating the Influences of Superthermal Electrons in Near-Mars Space, NASA Mars Fundamental Research Program, $398k
2011-2014 (3 years)	PI, Composition and Feedback in Geospace, NASA Heliophysics Theory Program, $1,173k
2011-2014 (3 years)	PI, Collaborative Research: GEM: Investigation of UT Dependence of Magnetic Storm Strength, NSF Magnetospheric Physics Program, led by U of Berkeley (U-M part of Dr. Tom Immel's grant from NSF), $120k
2011-2014 (3 years)	PI, Investigating Processes of Atmospheric Loss at Venus and Mars, NASA Planetary Atmospheres Program, $390k
2010-2015 (5 years)	PI, Synoptic Numerical Modeling of Artificial Radiation Belt Dynamics, Defense Threat Reduction Agency, $838k
2010-2013 (3 years)	PI, Analysis of Pick-Up Ion Loss at Mars, NASA Graduate Student Researchers Program (funding for Ms. Shannon Curry), NASA Goddard Space Flight Center, $90k
2010-2013 (3 years)	PI, Statistical Data-Model Comparisons of the Inner Magnetosphere During Geomagnetic Storms of the IMAGE Mission, NASA Graduate Student Researchers Program (funding for Ms. Roxanne Katus), NASA Marshall Space Flight Center, $90k
2009-2013 (4 years)	PI, Collaborative Research: Global Response of the Martian Thermosphere to Energetic Pick-Up Ions, NSF Astronomy and Astrophysics Program, led by U of Colorado (U-M part of Dr. Xiaohua Fang's grant from NSF), $212k
2009-2013 (4 years)	PI, GEM: Assessing the Storm-Time Magnetic Distortion in the Inner Magnetosphere, NSF Magnetospheric Physics Program, $397k
2009-2013 (4 years)	PI, Statistical Data-Model Comparisons of the Inner Magnetosphere During Storms for the Entire IMAGE Mission, NASA Heliophysics Guest Investigator Program, $486k

2008-2012 (3 years)	PI, Integrated Assessment of Radiation Belt Drivers, NASA LWS TR&T Program, $480k (including $60k for Team Leader responsibilities)
2007-2010 (3 years)	PI, Particle Precipitation Into and Particle Escape From the Mars Thermosphere and Exosphere, NASA Mars Fundamental Research Program, $298k
2007-2010 (3 years)	PI, Analysis of MGS and MEX Electron Observations to Quantify the Solar Wind-Ionosphere Interaction and Atmospheric Escape at Mars, NASA Mars Data Analysis Program, $301k
2007-2010 (3 years)	PI, Particle Precipitation and Escape in the Mars Upper Atmosphere, NASA Planetary Atmospheres Program, $299k
2007-2010 (≤3 years)	PI, Global Geospace Science GGS/POLAR Thermal Ion Dynamics Experiment (TIDE) Co-Investigator Program, NASA MO&DA program, $150k
2005-2008 (3 years)	PI, Understanding Stormtime Ring Current Sources Through Data-Theory Comparisons, LANL IGPP Collaborative Research (minigrant) program, $113k
2005-2008 (3 years)	PI, Quantitative Assessment of Radiation Belt Driver Modeling: The Storm-time Ring Current and Plasmasphere, NASA LWS Targeted Research and Technology Program, $434k (including $60k for Team Leader responsibilities)
2005-2008 (3 years)	PI, Analyzing the Influence of Conductance and Plasma Sheet Characteristics on Inner Magnetospheric Plasma Morphology, NASA Sun-Earth Connection Guest Investigator program, $294k
2005-2008 (3 years)	Co-PI (with J. U. Kozyra), Investigation of Inner Magnetospheric Dynamics Using Magnetospheric Observations and Ionospheric Signatures of Coupling, from the NASA Geospace Science Program, $327k
2005-2008 (3 years)	PI, Development of a Methodology for Examination of Plasma Sheet-Ring Current-Ionosphere Coupling Using Global Magnetic Disturbance Maps, led by Rice University (U-M part of F. Toffo-letto's grant from NSF), $151k
2004-2007 (3 years)	PD, Global Geospace Science GGS/POLAR Thermal Ion Dynamics Experiment (TIDE) Co-Investigator Program, NASA MO&DA program, $150k
2004-2007 (3 years)	PI, A Detailed Study of MGS MAG/ER Data Aided by a Kinetic Transport Model, from the NASA Mars Data Analysis Program, $225k
2004-2007 (3 years)	Co-PI (with J. U. Kozyra), GEM: Impact of Coupling and Feedback Processes in Geospace on Ring Current Dynamics, from the NSF Magnetospheric Physics program, $298k
2001 - 2004 (3 years)	PI, MGS MAG/ER Data Analysis Using a Time and Magnetic Field Dependent Electron Transport Model, from the NASA Mars Global Surveyor Data Analysis program, $270k
2001 - 2004 (3 years)	PI, Superposed Epoch Analysis of Ring Current Geoeffectiveness Related to Solar Wind and Plasma Sheet Drivers, from the NASA Living With a Star program, $322k

2001-2004 (3 years)	Co-PI (with J. U. Kozyra), The Physical Response of the Inner Magnetosphere to Geoeffective Solar Wind Drivers: Electro-dynamic Coupling Effects, Disturbance Magnetic Field, and the Dst Index, from the NSF Magnetospheric Physics program, $358k
1999-2000 (1 year)	PI, Kinetic Modeling of Low-Energy Ion Transport in Near-Earth Space, a Research Seed Grant from the Michigan Space Grant Consortium, $8k
1999-2002 (3 years)	PI, Global Simulation of Core Plasma Densities, Composition, and Temperature, from NASA MSFC (U-M part of D. L. Gallagher's grant from the NASA Geospace Science program), $82k

Michael W. Liemohn
Publications List

There are 3 lists in this document: full books, journal articles, and other technical reports

Refereed Books

1. Liemohn, M. W. (2022). *Data Analysis and Modeling Metrics for the Geosciences.* John Wiley and Sons, Hoboken, N. J., submitted 5 August 2021, resubmitted July 15 2022, accepted 2 October 2022. Manuscript is 515 pages.

Refereed Journal Publications:

241 total, 64 first author (bold #)

Underlined name = postdoc, grad student, or undergrad that Liemohn supervised

1. Khazanov, G. V., M. W. Liemohn, T. I. Gombosi, and A. F. Nagy, Non-steady-state transport of superthermal electrons in the plasmasphere, *Geophys. Res. Lett., 20*, 2821, 1993.
2. Khazanov, G. V., and M. W. Liemohn, Nonsteady state ionosphere-plasmasphere coupling of superthermal electrons, *J. Geophys. Res., 100*, 9669, 1995.
3. Liemohn, M. W., and G. V. Khazanov, Nonsteady state coupling processes in superthermal electron transport, *Cross-Scale Coupling in Space Plasmas, Geophys. Monogr. Ser.,* vol. 93, edited by J. L. Horwitz, N. Singh, and J. L. Burch, p. 181, AGU, Washington, D. C., 1995.
4. Khazanov, G. V., T. E. Moore, M. W. Liemohn, V. K. Jordanova, and M.-C. Fok, Global collisional model of high-energy photoelectrons, *Geophys. Res. Lett., 23*, 331, 1996.
5. Khazanov, G. V., T. E. Moore, E. N. Krivorutsky, J. L. Horwitz, and M. W. Liemohn, Lower hybrid turbulence and ponderomotive force effects in space plasmas subjected to large-amplitude low-frequency waves, *Geophys. Res. Lett., 23,* 797, 1996.
6. Khazanov, G. V., E. N. Krivorutsky, T. E. Moore, M. W. Liemohn, and J. L. Horwitz, Lower hybrid oscillations in multicomponent space plasmas subjected to ion cyclotron waves, *J. Geophys. Res., 102,* 175, 1997.
7. Khazanov, G. V., M. W. Liemohn, and T. E. Moore, Photoelectron effects on the self-consistent potential in the collisionless polar wind, *J. Geophys. Res., 102*, 7509, 1997.
8. Liemohn, M. W., G. V. Khazanov, T. E. Moore, and S. M. Guiter, Self-consistent superthermal electron effects on plasmaspheric refilling, *J. Geophys. Res., 102*, 7523, 1997.
9. Liemohn, M. W., G. V. Khazanov, and J. U. Kozyra, Guided plasmaspheric hiss interactions with superthermal electrons, 1, Resonance curves and timescales, *J. Geophys. Res., 102*, 11,619, 1997.
10. Khazanov, G. V., M. W. Liemohn, E. N. Krivorutsky, and J. L. Horwitz, A model for lower hybrid wave excitation compared with observations by Viking, *Geophys. Res. Lett., 24*, 2399, 1997.

11. Liemohn, M. W., and G. V. Khazanov, Collisionless plasma modeling in an arbitrary potential energy distribution, *Phys. Plasmas, 5*, 580, 1998.
12. Liemohn, M. W., G. V. Khazanov, and J. U. Kozyra, Banded electron structure formation in the inner magnetosphere, *Geophys. Res. Lett., 25*, 877, 1998.
13. Khazanov, G. V., M. W. Liemohn, T. E. Moore, and E. N. Krivorutsky, Generalized kinetic description of steady-state interactions of a plasma with an arbitrary potential energy structure, *J. Geophys. Res., 103*, 6871, 1998.
14. Khazanov, G. V., and M. W. Liemohn, Comparison of photoelectron theory against observations, *Geospace Mass and Energy Flow, Geophys. Monogr. Ser.*, vol. 104, edited by J. L. Horwitz, D. L. Gallagher, and W. K. Peterson, p. 333, AGU, Washington, D. C., 1998.
15. Liemohn, M. W., and G. V. Khazanov, Determining the significance of electrodynamic coupling between superthermal electrons and thermal plasma, *Geospace Mass and Energy Flow, Geophys. Monogr. Ser.*, vol. 104, edited by J. L. Horwitz, D. L. Gallagher, and W. K. Peterson, p. 343, AGU, Washington, D. C., 1998.
16. Khazanov, G. V., M. W. Liemohn, J. U. Kozyra, and T. E. Moore, Inner magnetospheric superthermal electron transport: Photoelectron and plasma sheet electron sources, *J. Geophys. Res., 103*, 23,485, 1998.
17. Khazanov, G. V., M. W. Liemohn, E. N. Krivorutsky, J. U. Kozyra, and B. E. Gilchrist, Interhemispheric transport of relativistic electron beams, *Geophys. Res. Lett., 26*, 581, 1999.
18. Liemohn, M. W., G. V. Khazanov, P. D. Craven, and J. U. Kozyra, Nonlinear kinetic modeling of early stage plasmaspheric refilling, *J. Geophys. Res., 104*, 10,295, 1999.
19. Liemohn, M. W., J. U. Kozyra, V. K. Jordanova, G. V. Khazanov, M. F. Thomsen, and T. E. Cayton, Analysis of early phase ring current recovery mechanisms during geomagnetic storms, *Geophys. Res. Lett., 25*, 2845, 1999.
20. Khazanov, G. V., M. W. Liemohn, E. N. Krivorutsky, J. M. Albert, J. U. Kozyra, and B. E. Gilchrist, Relativistic electron beam propagation in the Earth's magnetosphere, *J. Geophys. Res., 104*, 28,587, 1999.
21. Khazanov, G. V., K. V. Gamayunov, and M. W. Liemohn, Alfvén waves as a source of lower hybrid activity in the ring current region, *J. Geophys. Res., 105*, 5403, 2000.
22. Liemohn, M. W., J. U. Kozyra, G. V. Khazanov, and P. D. Craven, Effects of various transport processes on the streaming ion density during the first stage of plasmaspheric refilling, *J. Atmos. Solar-Terr. Physics 62*, 437, 2000.
23. Khazanov, G. V., N. H. Stone, E. N. Krivorutsky, and M. W. Liemohn, Current-produced magnetic field effects on current collection, *J. Geophys. Res., 105*, 15,835, 2000.
24. Khazanov, G. V., M. W. Liemohn, E. N. Krivorutsky, J. M. Albert, J. U. Kozyra, and B. E. Gilchrist, On the influence of the initial pitch angle distribution on relativistic beam propagation, *J. Geophys. Res., 105*, 16,093, 2000.
25. Khazanov, G. V., M. W. Liemohn, J. U. Kozyra, and D. L. Gallagher, Global energy deposition to the topside ionosphere from superthermal electrons, *J. Atmos. Solar-Terr. Physics, 62*, 947, 2000.
26. Liemohn, M. W., J. U. Kozyra, P. G. Richards, G. V. Khazanov, M. J. Buonsanto, and V. K. Jordanova, Ring current heating of the thermal electrons at solar maximum, *J. Geophys. Res., 105*, 27,767, 2000.

27. Ganguli, G., M. A. Reynolds, and M. W. Liemohn, Recent advances in plasmaspheric research, *J. Atmos Solar.-Terr. Physics, 62*, 1647, 2000. (REVIEW PAPER)
28. Khazanov, G. V., and M. W. Liemohn, Kinetic theory of superthermal electron transport, in *Recent Research Developments in Geophysics*, vol. 3 (part 2), edited by S. G. Pandalai, pp. 181-201, Research Signpost, Trivandrum, India, 2000. (REVIEW PAPER)
29. Pollock, C. J., K. Asamura, M. M. Balkey, J. L. Burch, H. O. Funsten, M. Grande, M. Gruntman, J.-M. Jahn, M. Lampton, M. W. Liemohn, D. J. McComas, T. Mukai, S. Ritzau, M. L. Schattenburg, E. Scime, R. Skoug, P. Valek, and M. Wüest, Initial Medium Energy Neutral Atom (MENA) images of Earth's magnetosphere during substorms and storm-time, *Geophys. Res. Lett., 28*, 1147, 2001.
30. Khazanov, G. V., N. H. Stone, E. N. Krivorutsky, K. V. Gamayunov, and M. W. Liemohn, Current-induced magnetic field effects on bare tether current collection: A parametric study, *J. Geophys. Res., 106*, 10,565, 2001.
31. Liemohn, M. W., J. U. Kozyra, M. F. Thomsen, J. L. Roeder, G. Lu, J. E. Borovsky, and T. E. Cayton, Dominant role of the asymmetric ring current in producing the stormtime Dst*, *J. Geophys. Res., 106*, 10,883, 2001.
32. Nagy, A. F., M. W. Liemohn, J. L. Fox, and J. Kim, Hot carbon densities in the exosphere of Mars, *J. Geophys. Res*., *106*, 21,565, 2001.
33. Liemohn, M. W., J. U. Kozyra, C. R. Clauer, and A. J. Ridley, Computational analysis of the near-Earth magnetospheric current system, *J. Geophys. Res., 106*, 29,531, 2001.
34. Posner, A., N. A. Schwadron, T. H. Zurbuchen, J. U. Kozyra, M. W. Liemohn, and G. Gloeckler, Association of low-charge-state heavy ions far upstream of the Earth's bow shock with space weather, *Geophys. Res. Lett.*, *29*(7), 1099, doi: 10.1029/2001GL013449, 2002.
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36. Liemohn, M. W., J. U. Kozyra, M. R. Hairston, D. M. Weimer, G. Lu, A. J. Ridley, T. H. Zurbuchen, and R. M. Skoug, Consequences of a saturated convection electric field on the ring current, *Geophys. Res. Lett., 29*(9), 1348, doi: 10.1029/2001GL014270, 2002.
37. Khazanov, G. V., and M. W. Liemohn, Transport of photoelectrons in the nightside magnetosphere, *J. Geophys. Res., 107*(A5), 1064, doi: 10.1029/2001JA000163, 2002.
38. Ridley, A. J., and M. W. Liemohn, A model-derived description of the penetration electric field, *J. Geophys. Res., 107*(A8), 1151, doi: 10.1029/2001JA000051, 2002.
39. Kozyra, J. U., M. W. Liemohn, C. R. Clauer, A. J. Ridley, M. F. Thomsen, J. E. Borovsky, J. L. Roeder, and V. K. Jordanova, Two-step Dst development and ring current composition changes during the 4-6 June 1991 magnetic storm, *J. Geophys. Res.*, *107*(A8), 1224, doi: 10.1029/2001JA000023, 2002.
40. Liemohn, M. W., and J. U. Kozyra, Assessing the importance of convective and inductive electric fields in forming the stormtime ring current, in *Sixth International Conference on Substorms*, edited by R. M. Winglee, Univ. Washington, Seattle, p.456, 2002.
41. O'Brien, T. P., R. L. McPherron, and M. W. Liemohn, Continued convection and the initial recovery of Dst, *Geophys. Res. Lett., 29*(23), 2143, doi: 10.1029/2002GL015556, 2002.

42. Liemohn, M. W., and A. J. Ridley, Comment on "Nonlinear response of the polar ionosphere to large values of the interplanetary electric field" by C. T. Russell et al., *J. Geophys. Res.*, *107*(A12), 1460, doi: 10.1029/2002JA009440, 2002.
43. Posner, A., M. W. Liemohn, and T. H. Zurbuchen, Upstream magnetospheric ion flux tube within a magnetic cloud: Wind/STICS, *Geophys. Res. Lett.*, *30*(6), 1346, doi: 10.1029/2002GL016116, 2003.
44. Khazanov, G. V., T. S. Newman, M. W. Liemohn, M.-C. Fok, R. W. Spiro, Self-consistent magnetosphere-ionosphere coupling: theoretical studies, *J. Geophys. Res.*, *107*(A3), 1122, doi: 10.1029/2002JA009624, 2003.
45. Daglis, I. A., J. U. Kozyra, Y. Kamide, D. Vassiliadis, A. S. Sharma, M. W. Liemohn, W. D. Gonzalez, B. T. Tsurutani, and G. Lu, Intense space storms: Critical issues and open disputes, *J. Geophys. Res., 108*(A5), 1208, doi: 10.1029/2002JA009722, 2003. (REVIEW PAPER)
46. Liemohn, M. W., and J. U. Kozyra, Lognormal form of the ring current energy content, *J. Atmos. Solar-Terr. Phys., 65*, 871, 2003.
47. Liemohn, M. W., Yet another caveat to the Dessler-Parker-Sckopke relation, *J. Geophys. Res., 108*(A6), 1251, doi: 10.1029/2003JA009839, 2003.
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