

Dr. Greg Severn
Professor of Physics, Dept. of Physics & Biophysics
University of San Diego
severn@sandiego.edu

Education

- Ph.D. ('87) Physics, University of Wisconsin, Madison. Thesis in experimental plasma physics, *Experimental Studies of the Rotational Stability of the Phaedrus Tandem Mirror*
- M.S. ('82) Physics, University of Wisconsin, Madison.
- B.S. ('79) Physics, University of California, Los Angeles. Elected to $\Sigma\Pi\Sigma$, '79, National Physics Honor Society

Appointments

- Professor of Physics, University of San Diego, 1994 to present (selected Faculty Mentor of the Year, 2010, McNair Scholars program, and Professor of the Game, 24 Feb. 2011)
- Associate Professor of Physics, University of San Diego, 1991-1994
- Assistant Professor of Physics, University of San Diego, 1987-1991
- Dept. Chair, 2003-2016¹
- Honorary Research Fellow, College of Engineering, Dept. of Engineering Physics, University of Wisconsin-Madison, 2006-
- Visiting Professor of Engineering Physics, University of Wisconsin, Madison, 2001
- Visiting Research Scientist, University of California, San Diego, 1993-1994

Extramural Research Grants Awarded

13. National Science Foundation, PHY-1804240 *Collaborative Research (RUI): Understanding Potential Structures and Ion Dynamics Near Sheaths in Electronegative and Electropositive Multi-Species Bounded Plasma* PI Greg Severn, USD; 2018-2021, \$ 272,300, continuing and new research on sheath formation in multiple ion species plasma, both electronegative and electropositive plasma, 2 supported summer research students! This is a continuing collaboration with Dr. Hershkowitz in Engineering-Physics at UW-Madison, however, Dr. Severn is now the lead PI.
12. US Department of Energy, DOE-DE-SC0014226 *Collaborative Research: Understanding Sheaths and Pre-Sheaths in Magnetized and Unmagnetized Plasmas*, PI Greg Severn, USD; collaborating with Noah Hershkowitz and Oliver Schmitz, UW-Madison. 2015-2018 \$ 165,000, a proposal to continue existing experiments along with new explorations in plasma boundary layer physics. USD Grant id: PHYS1211
11. National Science Foundation, PHY-1464838 *Collaborative Research: Understanding Sheaths and Pre-Sheaths in Magnetized and Unmagnetized Plasmas*, PI Greg Severn, USD; 2015-2018, \$ 15,000, a proposal to continue existing experiments along with new explorations in plasma boundary layer physics. The NSF piece of this funding is for undergraduate student research support.
10. National Science Foundation, S-STEM Grant for undergraduate scholarships, *Supporting Students for Success in Mathematics, Computer Science and Physics at the University of San Diego*, PI Perla Myers, along with Eric Jiang, Jane E. Friedman, Lukasz Pruski, Rae Anderson, and myself-\$ 609,811. Involved part of the grant writing, and will involve recruiting, mentoring students, 2015-2019. Grant id: DUE-1458252.

¹w. sabbatical leaves in 07, 14-15; also from 2003-2006 I was an area coordinator

9. National Science Foundation, PHY-1206421, *Collaborative Research: Ion Losses to Plasma Boundaries-Sheaths and Presheaths* 2012-2015 \$ 165,000; My third renewal! My work has been productive (3 peer reviewed publications this year, with one undergraduate attending my main research conference, along with one invited talk at another international research conference)
8. National Science Foundation, CBET-0903832, *Collaborative Research: Understanding of Presheaths and Sheaths in Plasmas*, 2009-2012 \$ 175,000;
7. National Science Foundation, S-STEM Grant for undergraduate scholarships, DUE-0965940, *Attracting students to Computer Science, Mathematics and Physics at USD*, PI's Cameron Parker, Eric Page, Lukasz Pruski, Simon G. M. Koo, and Eric Jiang, along with Jane E. Friedman, and myself—\$ 597,774. Involved part of the grant writing, along with recruiting, mentoring students, 2010-2015.
6. US Department of Energy, DOE DE FG02-03ER54728, *Collaborative Understanding presheaths and sheaths in plasmas* 2006-2009 \$135,000;
5. National Science Foundation, CHE0321326, *MRI/RUI: Acquisition of Laser Instrumentation for Undergraduate Research and Teaching*, \$ 198,000, Co-PI with Dr. Jim Bolender (Chemistry), and Dr. Michel Boudrias (MARS).
4. US Department of Energy, DOE DE FG02-03ER54728, *Collaborative Understanding presheaths and sheaths in plasmas* 2003-2006, \$165,000
3. National Science Foundation, PHY-9722658, Research in Undergraduate Institutions (RUI), *Experimental Studies in Chaotic Dynamics and Transport in plasmas using Laser-Induced Fluorescence* 1997-2000, \$ 131,000; this was the first research grant in the Physics Department to bring indirect costs back to the University.
2. The Research Corporation, CC4358, *Experimental Studies of Chaotic Dynamics using LIF in plasmas* 1996-1998, \$ 29,285
1. National Science Foundation, USE9052344, Instrumentation and Laboratory Improvement Grant, 1990-1993 *Vacuum Apparatus for Study of Vacuum Technology and Plasma Physics*; this grant served to create the Physics Department's first upper division experimental physics course.

Synergistic Activities

- Teaching innovations: My background in (and enjoyment of!) diagnostic development led me to think of new ways diode lasers could be used to try old experiments. One of my undergraduate research students and I worked on a project involving Ruchardt's method for measuring the ratio of specific heats of air using diode lasers as switches. Our paper was published in the American Journal of Physics. Presently, our funded work has led to the inclusion of new experiments in our upper division experimental physics course (PHYSICS 480W, Experimental Modern Physics), one of which was an ion acoustic waves experiment in a two ion species plasma. Undergraduates get the feel of doing experiments at current forefront of research in plasma physics. I have submitted a paper about the physics of the plasma sheath to the American Journal of Physics, and in this way I have reached the general physics teaching community with news of research in plasma physics, an underrepresented subject in that important journal for physics teachers. Member American Association of Physics Teachers, 1987-2002, 2006-
- Creation of Research tools: I participated in the work of searching for LIF schemes in ArII suitable accessible by diode lasers. I collaborated with Roger McWilliams group at UCI and helped field the first diode laser based LIF instrument for use in plasma physics. I wrote the paper describing our work in the Reviews of Scientific Instruments. Our work has been influential in the plasma physics community; many researchers now use diode laser based LIF and many cite our paper. Member American Physical Society. I have been sought out as a consultant on the implementation of diode laser systems by research groups at West Virginia University, University of Wisconsin-Madison, and KAIST, Daejeong, Republic of Korea.

- Service to science and engineering communities: I have served on the executive committee of the American Physical Society's Gaseous Electronics Conference, 2012-2014. I have served AAPT as a local host for 2 national meetings (organized spaces, transportation, personnel, etc. for Workshops, 2015, 2018). I am a peer reviewer for the following peer reviewed journals and publishing houses:
 1. Physics of Plasmas², the main archival journal for the discipline of plasma physics in the United States.
 2. Reviews of Scientific Instruments,
 3. Measurement Science and Technology
 4. Physica Scripta
 5. Journal of Applied Physics,
 6. American Journal of Physics³
 7. Journal of Physics D: Applied Physics⁴
 8. Journal of Fusion Energy
 9. Plasma Sources, Science and Technology⁵
 10. Canadian Journal of Physics
 11. IEEE Transactions on Plasma Science,
 12. National Science Foundation (MRI Grant reviewer, Plasma Physics Grant reviewer)
 13. U.S. Dept. of Energy; I recently served on a panel for low temperature plasma proposals—I was the only reviewer from a principally undergraduate institution, and earlier was a reviewer for Fusion energy research proposals
 14. Thomson, Brooks-Cole; I have served as a reviewer (chapter reviewer for 3rd Ed. and chapter reviewer and final copy reviewer for 4th Ed.) for *Principles of Physics*, Serway & Jewett, one of the most popular texts in the U.S. for courses like our General Physics courses, and a text which USD has adopted since I began reviewing for the them.

Peer Reviewed Physics Journal Publications

29. *Building Langmuir probes and emissive probes for plasma potential measurements in low pressure, low temperature plasmas*, Peixuan Li¹, Noah Hershkowitz¹, and Greg Severn; Accepted for publication in *JoVE*, the peer-reviewed scientific video journal on 17 Sept. 2020.
28. *Experimental studies of the difference between plasma potentials measured by Langmuir probes and emissive probes in presheaths*, Li, Peixuan; Hershkowitz, Noah; Wackerbarth, Eugene; and Severn, Greg, Plasma Sources Sci. Technol. 29 025015 Feb (2020).
27. *Exploiting Zeeman Effect Symmetries to Measure Ion Velocities in Magnetized Plasmas*, Green, Jonathan; Schmitz, Oliver; Severn, Greg; Winters, Victoria, Meas. Sci. Technol, **30** 055202 (2019).
26. *Experimental studies of ion flow near the sheath edge in multiple ion species plasma including Argon, Xenon, and Neon* by Severn, Greg; Yip, Chi-Shung; Hershkowitz, Noah; Baalrud, Scott D, Plasma Sources Sci. Technol. 26 055021 May (2017).
25. *Ion velocity-locking in the neighborhood of virtual cathodes via instability enhanced collisional friction* Chi-Shung Yip, Noah Hershkowitz, and Greg Severn, Plasma Sources Sci. Technol. **26** 015008, (2017).
24. *Laser-induced fluorescence measurements of argon and xenon ion velocities near the sheath boundary in 3 ion species plasmas* Chi-Shung Yip, Noah Hershkowitz, Greg Severn and Scott D. Baalrud Phys. Plasmas 23, 050703 (2016).
23. *Free Falling Magnetic Dipole in a Superconducting Tube.*, Tim Welsh ('14) and Greg Severn, submitted (4 May 2015) and in review, The Physics Teacher.

²Published by the American Institute of Physics (AIP), College Park MD, 20740-3845

³Published by the American Association of Physics Teachers, member society of AIP, College Park, MD 20740-3845

⁴Published by the Institute of Physics, Bristol, England

⁵Published by the Institute of Physics, Bristol, England

22. *Comment on The use of dc glow discharges as undergraduate education tools*, Chi-Shung Yip and Greg Severn, Am. J. Phys. **83**, 654 (2015).
21. *Verifying effects of instability enhanced ion-ion Coulomb collisions on ion velocity distribution functions near the sheath edge in low temperature plasmas*, Chi-Shung Yip, Noah Hershkowitz, and Greg Severn, Plasma Sources Sci. Technol. **24** 015018, (2015).
20. *Measurements of the ion Drift Velocities in the Presheaths of Plasmas with Multiple ion Species*, Severn, G., Yip, C.-S., Hershkowitz, N.; Journal of Instrumentation, **8** C11020 (2013).
19. *A note on the gyromagnetic properties of the hydrogens*, G.D. Severn, and J.P., Bolender, AMERICAN JOURNAL OF PHYSICS **81** 873-874 (2013).
18. *Mackenzie's Demon with Instabilities*, Chi-Shung Yip, Sheehan, J.P., Hershkowitz, N., and Severn, G.; Plasma Sources Science and Technology, **22**, 065002, (2013);
17. *Comment on "Ar + and Xe + Velocities near the Presheath-Sheath Boundary in an Ar/Xe Discharge"*, Hershkowitz, N., Severn, G.D., Baalrud, S.D., Hegna, C.C., Callen, J.D., Physical Review Letters **108**, 139501 (2012).
16. *Experimental test of instability enhanced collisional friction for determining ion loss in two ion species plasmas*, N. Hershkowitz, C.-S. Yip, and G. D. Severn, Phys. Plasmas **18**, 057102 (2011).
15. *Experimental Test of Instability-Enhanced Collisional Friction for Determining Ion Loss in Two Ion Species Plasmas*, C.-S. Yip, Noah Hershkowitz, and Greg Severn, Phys. Rev. Lett. **104**, 225003 (2010)
14. *Experimental studies of transverse metastable ion velocity distribution functions in the presheath of a weakly collisional argon plasma*, Dongsoo Lee, Noah Hershkowitz, and Greg Severn, Phys. Plasmas **15**, 083503 (2008)
13. *Xenon ion laser-induced fluorescence using a visible tunable diode laser near 680nm*, Greg Severn, Dongsoo Lee, and Noah Hershkowitz, Review of Scientific Instruments, **78** 116105 NOV (2007)
12. *Measurements of Ar⁺ and Xe⁺ velocities near the sheath boundary of Ar-Xe plasma using two diode lasers*, Dongsoo Lee, Noah Hershkowitz, and Greg Severn, Applied Physics Letters, v 91, n 4, p 041505, 2007.
11. *A note on the plasma sheath and the Bohm Criterion*, G.D. Severn, Am. J. Phys. **75**, 92 (2007)
10. *Laser-induced fluorescence measurements of argon ion velocities near the sheath boundary of an argon-xenon plasma*, Dongsoo Lee, G.D. Severn, L. Oksuz, and Noah Hershkowitz, Journal of Physics D: Applied Physics, v 39, n 24, Dec 21, p 5230-5235, 2006
9. *Ion flow and sheath physics studies in multiple ion species plasmas using diode laser based laser-induced fluorescence*, G. D. Severn, Xu Wang, N. Hershkowitz, M. Turner, R. McWilliams, Solid Thin Films, **506,507**, p.674-678, 2004
8. *Experimental studies of the Bohm Criterion in a two ion species plasma using laser induced fluorescence*, G.D. Severn, Xu Wang, Eunsuk Ko, and N.Hershkowitz, Physical Review Letters, April 11, volume 90, No.14 (145000), 2003
7. *A simple extension of Ruchardt's method for measuring the ratio of specific heats of air using microcomputer based laboratory sensors*, G.D. Severn and T. Steffensen⁶, American Journal of Physics, **69**, 387, (2001)
6. *Argon ion laser-induced fluorescence with diode lasers*, G.D. Severn, D.A. Edrich, and R. McWilliams, Rev. Sci. Instrum. **69** 10 (1998)
5. *Radial control of the electrostatic potential in a tandem mirror with quadrupole end cells*, G.D. Severn, N. Hershkowitz, Phys. Fluids B, **4**, 3210 (1992)
4. *Experimental studies of the rotational stability of a tandem mirror with quadrupole end cells*, G.D. Severn, N. Hershkowitz, R.A. Breun, and J.R. Ferron, Phys. Fluids B, **3**, 114 (1991)
3. *Electrostatic End Plugging Accompanied by a Central-Cell Density Increase in an Axisymmetric Tandem Mirror*, J.R. Ferron, R. Goulding, B.A. Nelson, T. Intrator, En Yao Wang, G. Severn, N. Hershkowitz, D. Brouchous, J. Pew, R.A. Breun, R. Majeski, Phys. Fluids **30**, 2855 (1987)
2. *Application of Secondary Emission-Capacitive Probes for plasma potential measurements in plasmas with hot electrons* En Yao Wang, N. Hershkowitz, D. Diebold, T. Intrator, R. Majeski, H. Persing, G. Severn, and B. Nelson, J. Appl. Phys. **61**, 4786 (1987)

⁶undergraduate student author

1. *Stabilization of MHD modes in an axisymmetric magnetic mirror by applied RF waves and initial results of Phaedrus-B*, Breun, R.A. (Dept. of Nucl. Eng., Wisconsin Univ., Madison, WI, USA), Brooker, P.; Brouchous, D., Browning, J., Butz, G., Conrad, J., Dales, E., Ferron, J., Goulding, R., Hershkowitz, N., Intrator, T., Litwin, C., Majeski, R., Meassick, S., Nelson, B., Peranich, L., Persing, H., Radtke, J., Roberts, D., Severn, G., Sing, D., Wang, E., D'Ippolito, D.A., Myra, J.R., Francis, G.L., Nuclear Fusion Supplement, v 2, p 263-71, (1987)

Invited Talks

28. *Plasma Two Ways: Foundations of Kinetic and Fluid Models of Plasma, a Tutorial*, Gregory Severn (Dept. of Physics & Biophysics, Univ. of San Diego) Steve Shannon (Dept. Nuclear Engineering, North Carolina State University-Raleigh) Scott Baalrud (Dept. of Physics & Astronomy, Univ. Iowa) Venkattraman Ayyaswamy (Mechanical Engineering, Univ. California-Merced) Ben Yee (Sandia National Laboratories) 73rd Annual Gaseous Electronics Virtual Conference MondayFriday, October 5, 2020
27. *Sheath Physics Initiative: critical next steps for experiments, theory, and simulation development to understand sheath formation in multiple ion species plasma, in both electropositive and electronegative, unmagnetized and magnetized plasma* Discovery Plasma Science Workshop, APS-DPP-CPP, July 23-25, 2019, University of Wisconsin-Madison, Madison WI
26. *First experimental studies of ion flow in 3 ion species plasmas at the presheath-sheath transition*, Greg Severn, 69th Annual Gaseous Electronics Conference, October 10 2016; Bochum, Germany
25. *First laser-induced fluorescence measurements of argon and xenon ion velocities near the sheath boundary in 3 ion species plasmas*, 18th International Congress on Plasma Physics (ICPP), Kaohsiung, Taiwan, June 29, 2016
24. *First experimental studies of ion flow in 3 ion species plasmas at the presheath-sheath transition*, Plasma Physics Seminary, July 1, 2016 Hanyang University Seoul, KOREA
23. *How might Quantum Physics inform our Faith?*, All Soul's Episcopal Church, Point Loma, CA, 22 November, 2015
22. *Langmuir's Paradox and ion dynamics: can the ion acoustic instability thermalize ions at the plasma sheath edge?— how Batman may be involved :)*, Greg Severn, Plasma Physics Seminar, University of Iowa, Department of Physics, Iowa City, IA, 23 March, 2015
21. *Assumptions vs. experimental answers in 2 realistic plasma boundary experiments: # 1-Bohm velocities in multi-ion species plasmas, and # 2 ion dynamics in magnetic presheaths*, Greg Severn and Noah Hershkowitz, Northrop Grumman Workshop on Basic Plasma Science, Northrop Grumman, Los Angeles, CA, 23 April 2015
20. *LIF studies of Discharge Plasma Sheaths*, Greg Severn, 45th Annual Meeting of the APS Division of Atomic, Molecular and Optical Physics; MondayFriday, June 26, 2014; Madison, Wisconsin
19. *Measurements of the ion Drift Velocities in the Presheaths of Plasmas with Multiple ion Species*, Greg Severn, 16th International Symposium on Laser Aided Plasma Diagnostics, Madison WI, 22-26 September 2013
18. *John Henry Newman, a new star rising in the west*, Graduate Christian Fellowship, UCSD, Jan.4, 2011
17. *Plasma physics from fusion to plasma processing: cool ideas in the physics of hot stuff*, Spring meeting of the Southern California American Association of Physics Teachers Meeting, Nov.14 2009
16. *An experimental study of what happens to ions at the plasma boundary in multiple-ion species plasmas: how diode lasers help illumine the problem of sheath formation*, Plasma Physics Seminar (Plasma Theory and Simulation Group), University of California, Berkeley, 22 June, 2009.
15. *What happens to ions at the plasma boundary in multiple-ion species plasmas? How diode lasers help illumine the problem of sheath formation*, Plasma Physics Seminar at UC Irvine, 27 May 2009
14. *The Quantum Mechanics of Belief, being a consideration of 4 Models of relating Science to Faith*, Graduate Christian Fellowship, UCSD, Nov. 20, 2008
13. *Is the Bohm Criterion satisfied in multiple ion species plasmas? Adventures with fluorescence (LIF) and Extremum Principles*, National Center for Plasma Science and Technology, Dublin City University, Dublin, Ireland, Jan.18, 2008
12. *Experiments in Science and Faith: to what extent are scientific experiments possible in the realm of Faith, and does Scripture furnish examples either by precept or described experience?* Graduate Christian Fellowship, UCSD, Oct. 18, 2007
11. *Is the Bohm Criterion satisfied in multiple ion species plasmas? Adventures with laser-induced fluorescence (LIF)*, Plasma Physics Seminar, University of Colorado, Boulder, Center for Integrated Plasma Studies, Oct. 1, 2007
10. *How to integrate Academic Life with (respect to) "deefaitth"*, Graduate Christian Fellowship, UCSD, September 28, 2006
9. *Being the right kind of Fool*, Graduate Christian Fellowship, UCSD, March 16, 2006
8. *Diode Lasers for Ion Flow and Sheath Physics Studies in Multiple Ion Species Plasmas*, 7th APCPST (Asian Pacific Conference on Plasma Science and Technology) and 17th SPSM (Symposium on Plasma Science for Materials), Fukuoka International Congress Center, Japan, June 29- July 2, 2004

7. *Science & Faith and the search for certainty: ideas from the sermons of John Henry Newman*, Greg Severn, Intervarsity Christian Fellowship of the University of Wisconsin, Madison, September 21 2001
6. *How fast do ions fall into the sheath in a multiple ion species plasma? A progress report.*, Center for Plasma Aided Manufacturing, Fall 2001 Seminar Series, University of Wisconsin-Madison, Madison, WI, 21 September, 2001
5. *Diode lasers for laser-induced fluorescence diagnosis of distribution functions and transport coefficients in ArII plasmas, relevant for sheath physics problems of interest to the plasma processing industry and for fundamental physics problems of interest to all physical scientists everywhere.* Center for Plasma Aided Manufacturing, Spring 2001 Seminar Series, University of Wisconsin-Madison, Madison, WI, 2 February, 2001
4. *Diode lasers for laser-induced fluorescence in ArII plasmas and the search for connections between chaos and diffusion*, Physics Seminar, 25 Sept. 2000, Dept. of Physics, San Diego State University
3. *Argon ion laser induced fluorescence with Diode Lasers*, Engineering Research Center for Plasma-Aided Manufacturing, Winter Seminar Series, Jan. 23, 1998
2. *Contact: Boundaries between Physics and Faith*, Dr. Greg Severn, Faith and Science Series, Sponsored by University Ministry, University of San Diego, March 24, 1998
1. *Science & Faith*, Dr. Jack Crumley, Dr. Greg Severn, Passport to Success Program, Sponsored by University Ministry, University of San Diego, Oct. 20, 1998

Conference Papers

110. *DOLI-II upgrades at UW-Madison*, Peixuan Li (Dept. of Engineering-Physics, University of Wisconsin-Madison) Noah Hershkowitz (Dept. of Engineering-Physics, University of Wisconsin-Madison) Greg Severn (Dept. of Physics & Biophysics, University of San Diego) 73rd Annual Gaseous Electronics Virtual Conference MondayFriday, October 59, 2020
109. *Automated I-V trace fitting: Automated electron temperature fitting of Langmuir probe I-V traces in multi-Maxwellian eedf plasmas*, Chenyao Jin (Institute of Plasma Physics Chinese Academy of Sciences: Hefei, Anhui, CN) Chi-Shung Yip (Institute of Plasma Physics Chinese Academy of Sciences: Hefei, Anhui, CN) Noah Hershkowitz (Dept. of Engineering-Physics, University of Wisconsin-Madison) Greg Severn (Dept. of Physics & Biophysics, University of San Diego) 73rd Annual Gaseous Electronics Virtual Conference MondayFriday, October 59, 2020
108. *Does the discrepancy between Langmuir Probe and emissive probe measurements of plasma potential depend on ion flow and sheath formation?*, Michael Shahin (Dept. of Physics & Biophysics, University of San Diego) Peixuan Li (Dept. of Engineering-Physics, University of Wisconsin-Madison) Noah Hershkowitz (Dept. of Engineering-Physics, University of Wisconsin-Madison) Greg Severn (Dept. of Physics & Biophysics, University of San Diego) 73rd Annual Gaseous Electronics Virtual Conference MondayFriday, October 59, 2020
107. *Experimental studies of electronegative plasma in a DC-discharge device (EPaX) designed to study internal sheaths and boundary sheath formation*, Lena Belvin (Dept. of Physics & Biophysics, University of San Diego) Peixuan Li (Dept. of Engineering-Physics, University of Wisconsin-Madison) Noah Hershkowitz (Dept. of Engineering-Physics, University of Wisconsin-Madison) Greg Severn (Dept. of Physics & Biophysics, University of San Diego) 73rd Annual Gaseous Electronics Virtual Conference MondayFriday, October 59, 2020
106. *Deconvolving Kr II laser-induced fluorescence signals for a test of Bohm's Criterion near negatively biased grid in a single ion species Kr plasma*, Cooper Kent (Dept. of Physics & Biophysics, University of San Diego) Peixuan Li (Dept. of Engineering-Physics, University of Wisconsin-Madison) Noah Hershkowitz (Dept. of Engineering-Physics, University of Wisconsin-Madison) Greg Severn (Dept. of Physics & Biophysics, University of San Diego) 73rd Annual Gaseous Electronics Virtual Conference MondayFriday, October 59, 2020
105. *On the Difference between plasma potentials measured by cylindrical Langmuir probes and emissive probes in the presheath* Greg Severn, Eugene Wackerbarth (University of San Diego, Dept. Physics & Biophysics), Peixuan Li (University of Wisconsin-Madison, Dept. Engineering Physics) Noah Hershkowitz (University of Wisconsin-Madison, Dept. Engineering Physics), 72nd Annual Gaseous Electronics Conference MondayFriday, October 28November 1 2019, Texas A&M, College Station, Texas
104. *Measurement of supersonic plasma flow using Mach probe under grid bias*, Insun Park, InJe Kang, Min-Keun Bae, MinJi Lee, Kyu-Sun Chung (Department of Electrical Engineering, Hanyang University), and Greg Severn (Department of Physics & Biophysics, University of San Diego) 72nd Annual Gaseous Electronics Conference MondayFriday, October 28November 1 2019, Texas A&M, College Station, Texas

103. *On the difference of plasma potentials measured by Langmuir probes and emissive probes in the presheath*, Peixuang Li, and Noah Hershkowitz (Dept. of Engineering-Physics, University of Wisconsin-Madison), Eugene Wackerbarth, and Greg Severn (Dept. of Physics & Biophysics, University of San Diego), 61st Annual Meeting of the APS Division of Plasma Physics MondayFriday, October 21-25, 2019; Fort Lauderdale, Florida
102. *Development of Spectroscopic Diagnostics for Assessing the Role Neutral Fueling Plays in the Production of High Density Helicon Plasmas*, Jonathan Green, Patrick J Leonard (Univ of Wisconsin, Madison), Nicholas I Arnold, Stuart David Loch (Auburn Univ), Gregory D Severn, and Oliver Schmitz (Univ of Wisconsin, Madison) , 60th Annual Meeting of the APS Division of Plasma, Physics, APS-DPP, November 5-9, 2018; Portland, Oregon
101. *Is Bohm's criterion satisfied near a negatively biased grid in a single ion species Krypton Plasma?* Eugene Wackerbarth (Dept. Physics & Biophysics, University of San Diego), Noah Hershkowitz (Dept. Engineering Physics, University of Wisconsin, Madison), and Greg Severn (Dept. Physics & Biophysics, University of San Diego), 60th Annual Meeting of the APS Division of Plasma Physics, APS-DPP, November 5-9, 2018; Portland, Oregon
100. *Emissive probe measurements in sheath, presheath, and virtual cathode*, Peixuan Li , Noah Hershkowitz , Sirous Nourgostar , Lutfi Oksuz , Gregory D Severn, 60th Annual Meeting of the APS Division of Plasma Physics, APS-DPP, November 5-9, 2018; Portland, Oregon
99. *Experimental studies of sheath formation in multiple ion species plasma, electronegative and electropositive* Greg Severn (Dept. Physics & Biophysics, University of San Diego), Noah Hershkowitz (Dept. Engineering Physics, University of Wisconsin, Madison), 71st Annual Gaseous Electronics Conference, November 5-9, 2018; Portland, Oregon
98. *Spectroscopic Plasma Diagnostics and Plasma Fueling Experiments for Improved Axial Density Uniformity in Helicon Plasmas Considered for Plasma Wakefield Accelerators*, J. Green, P.J. Leonard, O. Schmitz (Univ of Wisconsin, Madison), I. Arnold, S. Loch (Auburn University, Auburn, AL), G. Severn (University of San Diego, San Diego, CA) A. Caldwell (Max Planck Institute for Physics, Munich, Germany), E. Gschwendtner (CERN, Geneva, Switzerland), O. Grulke (Max Planck Institute for Plasma Physics, Greifswald, Germany), 18th Advanced Accelerator Concepts Workshop, Breckenridge, CO, Aug 12 - 17 2018
97. *Acting like an experimentalist: Transforming post-lab reports into in-lab notebooks*, Chad Kishimoto and Greg Severn, 2018 Conference on Laboratory Instruction Beyond the First Year, BFY III: 3D Physics: Integrating Experiment, Theory, and Computation, Loyola University, Baltimore MD, July 25-27 2018
96. *Progress Towards Spectroscopic Diagnostics of Plasma Parameters and Neutral Dynamics in Helicon Plasmas*, Jonathan Green, Oliver Schmitz (Univ of Wisconsin, Madison), Greg Severn (University of San Diego), Lars van Ruremonde (Eindhoven University of Technology), Victoria Winters (University of Wisconsin, Madison), 59th Annual Meeting of the APS Division of Plasma Physics, APS-DPP, October 23-27, 2017; Milwaukee, Wisconsin
95. *Measurement of sheath potential by three emissive-probe methods in DC filament plasmas near a biased grid*, In-Je Kang, In-Sun Park, Min-Keun Bae, Kyu-Sun Chung (Dept. Electrical Engineering, Hanyang University, Seoul, Republic of Korea), Noah Hershkowitz (Dept. Engineering Physics, University of Wisconsin, Madison), Eugene Wackerbarth, Greg Severn (Dept. Physics & Biophysics, University of San Diego), 59th Annual Meeting of the APS Division of Plasma Physics, October 23-27, 2017; Milwaukee, Wisconsin
94. *Is Bohm's Criterion satisfied in a weakly ionized Kr discharge, in the vicinity of a biased grid that permits counter streaming ion flow?* Eugene Wackerbarth, Greg Severn (Dept. Physics & Biophysics, University of San Diego), In-Je Kang, In-Sun Park, Min-Keun Bae, Kyu-Sun Chung (Dept. Electrical Engineering, Hanyang University, Seoul, Republic of Korea), Noah Hershkowitz (Dept. Engineering Physics, University of Wisconsin, Madison), 59th Annual Meeting of the APS Division of Plasma Physics, October 23-27, 2017; Milwaukee, Wisconsin
93. *Are the things you read in theory papers that have not been experimentally validated true?*, Greg Severn, University of San Diego, and Noah Hershkowitz, University of Wisconsin-Madison, 20th Anniversary NSF/DOE Plasma Partnership Workshop, NSF , Arlington VA, 9-11 January 2017
92. *Ion transport and entrapment in electrostatic virtual cathodes*, Chi-Shung Yip, Noah Hershkowitz, University of Wisconsin Madison, and Greg Severn, University of San Diego, 58th Annual Meeting of the APS Division of Plasma Physics, October 31-November 4 2016; San Jose, California
91. *Ion loss in weakly collisional three ion species plasmas*, Chi-Shung Yip, Noah Hershkowitz, University of Wisconsin Madison, and Greg Severn, University of San Diego, 58th Annual Meeting of the APS Division of Plasma Physics, October 31-November 4 2016; San Jose, California

90. *Upgrades to the MARIA Helicon Experiment at UW-Madison*, Jonathan Green, Noah Hershkowitz, Victoria Winters, and Oliver Schmitz, University of Wisconsin Madison, and Greg Severn, University of San Diego, 58th Annual Meeting of the APS Division of Plasma Physics, October 31-November 4 2016; San Jose, California
89. "MEASUREMENT OF AXIAL ION FLOW PROFILES IN A LINEAR HELICON PLASMA WITHOUT EXPLICIT DE-CONVOLUTION OF THE MEASURED LINE SHAPES" J. Green, O. Schmitz, V. Winters, University of Wisconsin - Madison, Department of Engineering Physics, Madison, WI, USA, G. Severn, University of San Diego, Department of Physics and Biophysics, San Diego, CA, USA, 19th International Conference on Atomic Processes in Plasmas, (APiP) Paris, April 2016
88. *BP12.00058 : The MARIA Helicon Plasma Experiment at UW Madison: Upgrade, Initial Scientific Goals Mission and First Results*, Victoria Winters, Jonathan Green, Noah Hershkowitz, and Oliver Schmitz, University of Wisconsin Madison, Greg Severn, University of San Diego, 57th Annual Meeting of the APS Division of Plasma Physics, November 16-20, 2015; Savannah, Georgia
87. *GT1.00037 : Is the Bohm Criterion satisfied in magnetized plasmas, and how does ion-neutral collisionality matter?* Greg Severn, Dept. of Physics, University of San Diego, Jonathan Green, Victoria Winters, Chi-Shung Yip, Noah Hershkowitz, Oliver Schmitz, Dept. of Engineering Physics, University of Wisconsin-Madison) 68th Annual Gaseous Electronics Conference/9th International Conference on Reactive Plasmas/33rd Symposium on Plasma Processing, October 12-16, 2015; Honolulu, Hawaii
86. *NR3.00006 : Virtual Cathodes near small electrodes biased near the plasma potential and its effects on Langmuir probes*, Chi-Shung Yip, Noah Hershkowitz, Dept. of Engineering Physics, University of Wisconsin-Madison, Greg Severn, Dept. of Physics, University of San Diego, 68th Annual Gaseous Electronics Conference/9th International Conference on Reactive Plasmas/33rd Symposium on Plasma Processing, October 12-16, 2015; Honolulu, Hawaii
85. *Investigation of possible sheath disappearance near a electrode biased at the plasma potential* PO7.00006: oral, Chi-Shung Yip, Noah Hershkowitz, and Severn, Greg, 56th Annual Meeting of the APS Division of Plasma Physics, October 27-31, 2014; New Orleans, Louisiana
84. *Does the Bohm Criterion have meaning for collisional plasmas?* GT1.00015: Poster, Severn, Greg, Chi-Shung Yip, Noah Hershkowitz, 67th Annual Gaseous Electronics Conference. November 27, 2014; Raleigh, North Carolina
83. *Investigation of possible sheath disappearance near a electrode biased at the plasma potential* Chi-Shung Yip, Hershkowitz, N., and Severn, G. IEEE 41st International Conference on Plasma Sciences (ICOPS) Location: Washington, DC, USA Date: 25-29 May 2014
82. *Kr ion Laser-Induced Fluorescence using a tunable diode laser near 729nm for Sheath experiments*, HW1.00040: Poster, Greg Severn and Chris Yip('14)⁷, Noah Hershkowitz, 66th Annual Gaseous Electronics Conference, 30 October 4 2013; Princeton, New Jersey
81. *The Langmuir Paradox: Can the Ion Acoustic Instability at the Sheath Edge Thermalize the Ions Too?* NR#.00004; C.-S. Yip, N. Hershkowitz, G. Severn, 66th Annual Gaseous Electronics Conference, 30 October 4 2013; Princeton, New Jersey
80. *The Langmuir Paradox: Can the Ion Acoustic Instability at the Sheath Edge Thermalize the Ions Too?*, 6B-5; C.-S. Yip, N. Hershkowitz, G. Severn, 40th Annual International Conference on Plasma Science, June 16-21, San Francisco, CA
79. *The Maxwell Demon and its instabilities*, LW2.00002 poster, Chi-Shung Yip, J.P. Sheehan, Umair Suddiqui, Noah Hershkowitz, Greg Severn, 65th Annual Gaseous Electronics Conference, October 22-26, 2012; Austin, Texas
78. *Experimental Studies of Laser-Induced Fluorescence of Kr⁺*, NW1.00065, Greg Severn, Tim Welsh('14)⁸, Noah Hershkowitz, 65th Annual Gaseous Electronics Conference, October 22-26, 2012; Austin, Texas
77. *What's missing from the traditional explanation of NMR experiments?* Greg Severn, Jim Bolender, ALPhA (Advanced Laboratory Physics Association) 2012 Topical Conference on Laboratory Instruction: Beyond the First Year (BFY), University of Pennsylvania and Drexel University, July 25-27, 2012
76. *Will a magnet fall freely in a superconducting tube?*, Greg Severn, Tim Welsh (USD '14)⁹, ALPhA (Advanced Laboratory Physics Association) 2012 Topical Conference on Laboratory Instruction: Beyond the First Year (BFY), University of Pennsylvania and Drexel University, July 25-27, 2012

⁷undergraduate student author

⁸undergraduate student author

⁹undergraduate student author

75. *The Langmuir Paradox: can the ion acoustic instability at the sheath edge thermalize the ions too?* AM1.00009–oral presentation, Hershkovitz, N.; Chi-Shung Yip; Severn, G.D., 64th Annual Gaseous Electronics Conference November 1418, 2011; Salt Lake City, Utah
74. *Kr ion Laser-Induced Fluorescence using a tunable diode laser near 729nm*, AM1.00021–oral presentation, Severn, G.D., Welsh, T.(USD, '14)¹⁰, 64th Annual Gaseous Electronics Conference November 1418, 2011; Salt Lake City, Utah
73. *Kr ion Laser-Induced Fluorescence using a tunable diode laser near 729nm*, FTP1.00095–poster presentation, Severn, G.D., Welsh, T.(USD, '14)¹¹, 64th Annual Gaseous Electronics Conference
72. *Experimental Test of Instability Enhanced Collisional Friction for Determining Ion Loss in Two Ion Species Plasmas*, Greg Severn, Chi-Shung Yip, and Noah Hershkovitz, 7th ICRP and 63rd GEC, October 4-8, 2010, Paris, France
71. *Experimental test of the role of ion-ion instability in determining ion loss from a two-species plasma* Hershkovitz, N. (Univ. of Wisconsin-Madison, Madison, WI, United States); Chi-Shung Yip; Severn, G.D. Source: 2010 IEEE 37th International Conference on Plasma Sciences (ICOPS 2010)
70. *Measurement of stream instability of argon-xenon plasma* Hershkovitz, N. (Univ. of Wisconsin - Madison, Madison, WI, United States); Chi-Shung Yip; Severn, G.D. Source: 2010 IEEE 37th International Conference on Plasma Sciences (ICOPS 2010), p 1 pp., 2010
69. *JO6.00005 : Experimental test of Baalrud's model for ion velocity at the sheath edge for a two ion species plasma* Noah Hershkovitz, Chi-Shung Yip, Greg Severn, 51st Annual Meeting of the APS Division of Plasma Physics, November 26, 2009; Atlanta, Georgia
68. *JP8.00053 : An experimental study of ion acoustic waves (IAW) in electronegative plasmas: can IAW measurements calibrate diagnostics for the measure of the negative ion fraction?*, Camron Proctor, Greg Severn, 51st Annual Meeting of the APS Division of Plasma Physics, November 26, 2009; Atlanta, Georgia
67. *NP6.016: The role of presheaths in establishing anisotropy at the sheath edge*, Noah Hershkovitz, Dongsoo Lee, Greg Severn, American Physical Society, 50th Annual Meeting of the Division of Plasma Physics, November 17-21, 2008
66. *VF3.00003 : Experimental studies of transverse metastable ion velocity distribution functions in the presheath of a weakly collisional argon plasma*, Greg Severn, Dongsoo Lee, and Noah Hershkovitz, American Physical Society, 61st Annual Gaseous Electronics Conference, October 13-17, 2008
65. *VF3.002: Presheaths are a useful concept; their role in establishing anisotropy at the sheath edge*, Noah Hershkovitz, Greg Severn, American Physical Society, 61st Annual Gaseous Electronics Conference, October 13-17, 2008
64. *FTP1.00021 : Xenon ion Laser-Induced Fluorescence using a tunable diode laser near 680nm*, Greg Severn (Dept. of Physics, University of San Diego), Dongsoo Lee, and Noah Hershkovitz (University of Wisconsin-Madison), 60th Gaseous Electronics Conference; Arlington, Virginia, TuesdayFriday, October 25, 2007
63. *VF2.00006 First experimental test of the generalized Bohm criterion using Ar⁺ and Xe⁺ LIF in Ar-Xe plasmas*, Dongsoo Lee, Noah Hershkovitz (University of Wisconsin-Madison), and Greg Severn (Dept. of Physics, University of San Diego), 60th Gaseous Electronics Conference; Arlington, Virginia, TuesdayFriday, October 25, 2007
62. *2E3: LIF Measurements of Ar⁺ and Xe⁺ in Ar-Xe Plasmas near the Sheath Boundary with Tunable Diode Lasers* D. Lee, N. Hershkovitz (Dept. of Engineering Physics, University of Wisconsin-Madison, Madison, WI, USA), G. Severn (Dept. of Physics, University of San Diego, San Diego, CA, USA), IEEE International Conference on Plasma Science, 2007, Albuquerque NM, June 17-22, 2007
61. *JP1.00101 : How fast are ions lost from plasma with two ion species?* Noah Hershkovitz Dongsoo Lee, University of Wisconsin-Madison, Greg D. Severn, University of San Diego, Lutfi Oksuz, Suleyman Demirel Univ, Isparta, Turkey, 48th Annual Meeting of the Division of Plasma Physics, October 3, 2006; Philadelphia, Pennsylvania
60. *SRP2.00006 : LIF Measurement of Argon in Ar-Xe Plasma Sheath Boundary with Tunable Diode Laser*, Dongsoo Lee, Noah Hershkovitz, University of Wisconsin-Madison, G.D. Severn, University of San Diego, 2006 59th Annual Gaseous Electronics Conference, Oct. 12, 2006, Ohio State University, Columbus, OH.

¹⁰undergraduate student author

¹¹undergraduate student author

59. *SRP2.00002 A new scheme for laser-induced fluorescence measurements in Xe II plasmas*, G.D. Severn, University of San Diego, Dongoo Lee, Noah Hershkowitz, University of Wisconsin-Madison, 2006 59th Annual Gaseous Electronics Conference, Oct. 12, 2006, Ohio State University, Columbus, OH.
58. *Studies of sheath physics in two ion species plasmas with diode laser LIF*, Greg Severn (University of San Diego), Noah Hershkowitz (University of Wisconsin-Madison), M.M. Turner (Dublin City University, Dublin Ireland), 58th Gaseous Electronics Conference Sunday/Thursday, October 17, 2005; San Jose, California
57. *Asymmetry reversal of ion collection by Mach probe in flowing unmagnetized plasma*, Eunsuk Ko, Xu Wang, Noah Hershkowitz (Dept. of Engineering Physics, University of Wisconsin - Madison), Gregory Severn (Dept. of Physics, University of San Diego), 58th Gaseous Electronics Conference Thursday, October 17, 2005; San Jose, California
56. *Diode lasers for ion flow and sheath physics studies in multiple ion species plasmas* Greg Severn (University of San Diego), Xu Wang, Eunsuk Ko, Noah Hershkowitz (University of Wisconsin-Madison), Miles Turner (Dublin City University), USD-UW Collaboration, USD-UW-DCU Collaboration, 57th Gaseous Electronics Conference, Shannon, The Republic of Ireland, September 26-29, 2004
55. *Measurement of Ion velocity by Mach probes in flowing unmagnetized plasmas*, E. Ko, X. Wang, N. Hershkowitz (Dept. of Engineering Physics, University of Wisconsin), G. Severn (Dept. of Physics, University of San Diego), 57th Gaseous Electronics Conference, Shannon, The Republic of Ireland, September 26-29, 2004
54. *Diode lasers for ion flow and sheath physics studies in multiple ion species plasmas* Greg Severn (University of San Diego), Xu Wang, Eunsuk Ko, Noah Hershkowitz (University of Wisconsin-Madison), Miles Turner (Dublin City University), USD-UW Collaboration, USD-UW-DCU Collaboration, 57th Gaseous Electronics Conference, Shannon, The Republic of Ireland, September 26-29, 2004
53. *on drift velocity measurement by Mach probes in unmagnetized plasmas*, Eunsuk Ko, Xu Wang, Noah Hershkowitz (Dept. of Engineering Physics, University of Wisconsin - Madison), Greg Severn (Dept. of Physics, University of San Diego), 46th Annual Meeting of the Division of Plasma Physics November 15-19, 2004 Savannah, GA
52. *(NWP 47) Ar ions fall out faster than 'Bohm' a multiple ion species plasma. Why?*, Greg Severn, Noah Hershkowitz, Xu Wang, Eunsuk Ko (Dept. of Engineering Physics, University of Wisconsin-Madison), UW-Madison Collaboration. 56th Gaseous Electronics Conference, San Francisco, California October 21-24, 2003
51. *FT1-1: Overview of our recent experiments and thoughts about plasma presheaths* Noah Hershkowitz, Eunsuk Ko, Xu Wang, (University of Wisconsin-Madison), Greg Severn (University of San Diego), 56th Gaseous Electronics Conference, San Francisco, California October 21-24, 2003
50. *How LIF has helped to understand ion loss at the boundaries of weakly collisional plasmas* Noah Hershkowitz, Eunsuk Ko, Xu Wang, L. Oksuz, A. Hala (Dept. of Engineering Physics and Center for Plasma-Aided Manufacturing University of Wisconsin-Madison), Greg Severn (University of San Diego), 45th Annual Meeting of the Division of Plasma Physics, Albuquerque, New Mexico, October 27-31, 2003
49. *LIF Measurements of the Bohm Criterion for two ion species plasmas*, G.D. Severn, USD, GEC02 Special Workshop on Plasma Sheaths. 55th Annual Gaseous Electronics Conference, Minneapolis, MN, 16 October 2002.
48. *LIF measurements of the Bohm Criterion for two ion species*, Greg Severn, University of San Diego, Xu Wang, and Noah Hershkowitz, University of Wisconsin-Madison, Special Workshop on Plasma Sheaths, 55th Annual Gaseous Electronics Conference, Minneapolis, MN, 15 October 2002.
47. *How fast do ions fall into the sheath in a multiple ion species plasma?* Greg Severn, University of San Diego, Xu Wang, and Noah Hershkowitz, University of Wisconsin, Madison, Poster QWP.057, 55th Annual Gaseous Electronics Conference, Minneapolis, MN, 16 October 2002.
46. *The Measurement of Ion Drift Velocities in Presheath in Single and Two Ion Species Plasmas*, Xu Wang, Eunsuk Ko, and Noah Hershkowitz, University of Wisconsin, and Greg Severn, University of San Diego, QWP.056, 55th Annual Gaseous Electronics Conference, Minneapolis, MN, 16 October 2002.
45. *FT1.005: How fast do ions fall out of a weakly collisional two species plasma?* Noah Hershkowitz, Xu Wang, Eunsuk Ko (University of Wisconsin-Madison), Greg Severn (University of San Diego). Talk, 55th Annual Gaseous Electronics Conference, Minneapolis, MN, 16 October 2002.
44. *Ion Drift Velocities at Sheath/Presheath Boundary in Weakly Collisional Plasmas with Two Ion Species* Noah Hershkowitz, Eunsuk Ko, Xu Wang (Dept. of Engineering Physics and Center for Plasma-Aided

Manufacturing University of Wisconsin-Madison), Greg Severn (University of San Diego). 44th Annual Meeting of the Division of Plasma Physics, November 11-15, 2002; Orlando, Florida

43. *Presheaths in weakly collisional plasmas with two ion species*, Noah Hershkowitz, Xu Wang, Eunsuk Ko (University of Wisconsin-Madison, USA), Greg Severn (University of San Diego, USA), Joint Conference ESCAMPIG 16. Sixteenth European Conference on Atomic and Molecular Physics of Ionized Gases. ICRP 5 Fifth International Conference on Reactive Plasma. Conference Proceedings, 2002, pt. 1, p 31-2 vol.1
42. *Presheaths in weakly collisional plasmas with two ion species*, Noah Hershkowitz, Xu Wang, Eunsuk Ko (University of Wisconsin-Madison), Greg Severn (University of San Diego). IEEE International Conference on Plasma Science, 2002, p 165
41. *Synthesis and Separation in Science & Faith: Ideas and Opinions of James Clerk Maxwell*, G.D. Severn, 57th annual conference of the ASA Pepperdine University, Aug 3, 2002
40. *How fast do ions fall into the sheath in a multiple ion species plasma?*, Greg Severn, Noah Hershkowitz, and Xu Wang, KP1.071, Proceedings of the 43rd Annual Meeting of the American Physical Society-DPP01, Oct. 31 2001, Long Beach CA.
39. *How fast do ions fall into the sheath in multiple ion species plasmas?*, Greg Severn, Noah Hershkowitz, and Xu Wang, Conference Proceedings of the 54th Gaseous Electronics Conference, GEC01, Penn State University, State College, PA, Oct. 12, 2001
38. *Does it make sense to talk about presheaths?* Noah Hershkowitz, Lutfi Oksuz, Greg Severn, Xu Wang, F1.004, Conference Proceedings of the 54th Gaseous Electronics Conference, GEC01, Penn State University, State College, PA, Oct. 12, 2001
37. *LIF Diagnostic Development for Diffusion Coefficient Measurements in Low Temperature ArII plasmas using Diode Lasers*, G.D. Severn, Conference Proceedings of the 28th IEEE International Conference on Plasma Science, Las Vegas, June 17-21, 2001
36. *Diagnostic Development of a Mach Probe and Laser-Induced Fluorescence Instrument for Diffusion Measurements in a Low Temperature Plasma*. J.A. Langton, J. Tallant¹², and G.D. Severn, American Association of Physics Teachers Winter Meeting, 10 January 2001.
35. *Diagnostic development of a diode laser based LIF instrument for velocity space diffusion measurements in quiescent and chaotic low temperature thermionic discharge plasmas*, G.D. Severn, Poster 3P27, 27th, IEEE International Conference on Plasma Science, New Orleans, LA, June 4-7, 2000.
34. *Experimental Studies of Nonlinear Dynamics and Diffusion in Low Temperature Plasmas* Tom Steffensen, Michael Leonard¹³, and Greg Severn, Poster RP01.132, Centennial Meeting of the American Physical Society, Atlanta Georgia, March 24, 1999
33. *Chaos in Couette Flow*, Greg Wong and¹⁴ Greg Severn, USD Undergraduate Research Conference, Spring 1998. I directed Greg's research work during his Physics 196 course. He reported on his work both in the poster session at the Undergraduate Research Seminar during the spring, but also in his Senior Seminar.
32. *Measuring the Ratio of Specific Heats, C_p/C_v* , Tom Steffensen and Greg Severn, USD Undergraduate Research Conference, Spring 1998. I have been developing a new laboratory physics experiment with Tom's help; he presented the data that he took at the research conference at USD, I presented my ideas at the joint APS/AAPT research conference, at we are working now on a manuscript for publication.
31. *Ruchardt's Experiment Revisited: a new C_p/C_v Measurement*, G.D. Severn, Poster H24.11, Joint American Physical Society, American Association of Physics Teachers Meeting, Ohio, April 19th, 1998
30. *Experimental Studies of Diffusion and Lyapunov Exponents*, G. D. Severn, Poster pThpP1.10, 39th Annual Meeting of the American Physical Society, Nov. 7-12, 1997, Pittsburgh PA.
29. *Diode lasers for ion transport measurements*, G.D. Severn, D.A. Edrich, and R. McWilliams, 38th Annual American Physical Society, Division of Plasma Physics Meeting, Denver, CO, 11/12/96, Poster 4Q12
28. *Ion diffusion due to electrostatic turbulence*, G.D. Severn, D.A. Edrich, and R. McWilliams, 38th Annual American Physical Society, Division of Plasma Physics Meeting, Denver, CO, 11/12/96, Poster 4Q12
27. *Diode Lasers for Plasma Physics*, G.D. Severn, D.A. Edrich, and R. McWilliams, 43rd Annual Western Spectroscopy Association Conference, Monterey CA, Jan. 31, 1996, poster # 15

¹²undergraduate student authors; The truth is, only Mr. Langton gave the talk—Mr. Tallant was unable to attend the conference.

¹³undergraduate student authors

¹⁴undergraduate student author

26. *Long Ion Confinement Times Using a 'Rotating Wall'* , F.A. Anderegg, X-Pei. Huang, C.F. Driscoll, G.D. Severn, and E. Sarid, Aip Conference Proceedings 331, Non-neutral Plasma Physics II, J. Fajans, D.H.E. Dubin, Eds., AIP Press, p.1, 1995
25. *Ion plasma diagnosed by LIF* , F. Anderegg, X.-P. Huang, E. Sarid, G.D. Severn, and C.F. Driscoll, American Institute of Physics Nonneutral Plasma Workshop, University of California, Berkeley, July 17, 1994
24. *In Situ LIF Measurements of a Pure Ion Plasma* , F. Anderegg, X.-P. Huang, G.D. Severn, and C.F. Driscoll, 36th Annual Meeting, American Physical Society Division of Plasma Physics, Minneapolis, Mn, Sept. 7-11, 1994
23. *Spin-up of Nonneutral Plasmas by Rotating Walls* , X.-P. Huang, F. Anderegg, R.E. Pollack, T.M. O'neil, G.D. Severn, and C.F. Driscoll, 36th Annual Meeting, American Physical Society Division of Plasma Physics, Minneapolis, Mn, Sept. 7-11, 1994
22. *Why Not Use Passive Sign Conventions for Elementary Electrical Circuit Theory?* AH6, American Association of Physics Teachers Announcer, **22**, 55 (1992)
21. *Plasma Physics and Vacuum Science for an Upper Division Undergraduate Experimental Physics Course* EF3, American Association of Physics Teachers Announcer, **22**, 85 (1992)
20. *Experimental results from Phaedrus-B* , Hershkowitz, N. (Dept. of Nucl. Eng. & Eng. Phys., Wisconsin Univ., Madison, WI, USA); Majeski, R.; Ferron, J.; Breun, R.; Brooker, P.; Brouchous, D.; Browning, J.; Diebold, D.; Goulding, R.; Intrator, T.; Keil, D.; Meassick, S.; Nelson, B.; Persing, H.; Probert, P.; Radtke, J.; Roberts, D.; Severn, G.; Wen, Y. Source: Physics of Mirrors, Reversed Field Pinches and Compact Tori. Proceedings of the Course and Workshop (EUR-11335-EN), p 855-71 vol.2, 1988
19. *Ponderomotive stability of MHD modes in mirrors* , Hershkowitz, N. (Dept. of Nucl. Eng. & Eng. Phys., Wisconsin Univ., Madison, WI, USA); Majeski, R.; Ferron, J.; Bruen, R.; Browning, J.; Chun, S.T.; Goulding, R.; Intrator, T.; Litwin, C.; Severn, G.; Meassick, S.; Yasaka, Y. Source: Physics of Mirrors, Reversed Field Pinches and Compact Tori. Proceedings of the Course and Workshop (EUR-11335-EN), p 751-69 vol.2, 1988
18. *Rotational Stability of the Axisymmetric Phaedrus Tandem Mirror Stabilized by RF Ponderomotive Force* , G.D. Severn, N. Hershkowitz, S.T. Chun, J. Pew, and J.R. Ferron, Bull. Am. Phys. Soc. **32**, 1781 (1987)
17. *The use of secondary emissive capacitive probes to determine plasma potential-a new diagnostic technique* , Hershkowitz, N. (Dept. of Nucl. Eng. & Eng. Phys., Wisconsin Univ., Madison, WI, USA); Wang, E.Y.; Diebold, D.; Intrator, T.; Majeski, R.; Persing, H.; Severn, G.; Nelson, B.; Wen, Y.J., IEEE Conference Record - Abstracts. 1987 IEEE International Conference on Plasma Science (Cat. No.87CH2451-3), p 73, 1987
16. *Experimental Studies of the Rotational Stability of the Phaedrus Tandem Mirror* , G.D. Severn, N. Hershkowitz, J. Pew, and J.R. Ferron, E.Y. Wang, S.T. Chun, Bull. Am. Phys. Soc. **31**, 1489 (1986)
15. *Stabilization of MHD Modes in an Axisymmetric Magnetic Mirror by Applied RF Waves and Initial Results of Phaedrus B* R.A. Breun, P.A. Brooker, J. Browning, D. Brouchous, G. Butz, J. Conrad, E. Dales, J. Ferron, R. Goulding, N. Hershkowitz, T. Intrator, C. Litwin, R. Majeski, S. Meassick, B. Nelson, L. Peranich, H. Persing, J. Radtke, D. Roberts, G. Severn, D. Sing, En Yao Wang, and D.A. D'Ippolito, J.R. Myra, and G.L. Francis, in the Proceedings of the Eleventh International Conference on Plasma Physics and controlled Nuclear Fusion Research (I.A.E.A., Kyoto, Japan, 1986)
14. *Ponderomotive Force and Rotational Effects on the Stability of Plasmas in a Tandem Mirror* , S.T. Chun, J.D. Callen, M.W. Phillips, G. Severn, Bull. Am. Phys. Soc. **31**, 1621 (1986)
13. *End plugging with central cell buildup in the Phaedrus axisymmetric tandem mirror* , J.R. Ferron, R. Goulding, B.A. Nelson, T. Intrator, En Yao Wang, G. Severn, N. Hershkowitz, D. Brochous, R.A. Breun, and R. Majeski , Bull. Am. Phys. Soc. **30**, 1490 (1985)
12. *Plasma potential and end loss measurements in the high density axisymmetric mode of the Phaedrus tandem mirror* , R. Goulding, J.R. Ferron, B.A. Nelson, T. Intrator, En Yao Wang, G. Severn, N.Hershkowitz, D. Brouchous, R.A. Breun, and R. Majeski, Bull. Am. Phys. Soc. **30**, 1490 (1985)
11. *Phaedrus Upgrade Facility* , R.A. Breun, P. Brooker, J. Browning, D. Brouchous, G. Butz, J. Conrad, J. Ferron, R. Goulding, N. Hershkowitz, T. Intrator, S. Meassick, R. Majeski, B. Nelson, P. Nonn, L. Peranich, H. Persing, J. Pew, G. Severn, and D. Sing, Bull. Am. Phys. Soc. **30**, 1492 (1985)
10. *Rotational Stability of the Phaedrus Tandem Mirror* , G. Severn, N. Hershkowitz, J. Pew, and J. Ferron, Bull. Am. Phys. Soc. **30**, 1490 (1985)
9. *Radial Potential Control in Phaedrus Using End Ring Bias* , G.D. Severn, N. Hershkowitz, B.A. Nelson, and J. Pew, Bull. Am. Phys. Soc. **29**, 1423 (1984)

8. *ICRF Potential Modification in a Tandem Mirror* , B.A. Nelson, N. Hershkowitz, G. Severn, and J. Pew, Bull. Am. Phys. Soc. **29**, 1423 (1984)
7. *Plasma Potential Control and MHD Stability Experiments in the Phaedrus Tandem Mirror* , N. Hershkowitz, R.A. Breun, D. Brouchous, J.D. Callen, C. Chan, J. Conrad, J. Ferron, S.N. Golavato, R. Goulding, S. Horne, S. Kidwell, B. Nelson, H. Persing, J. Pew, S. Ross, G. Severn, D. Sing, in the Proceedings of the Tenth International Conference on Plasma Physics and controlled Nuclear Fusion Research Vol. 2, p.265 (I.A.E.A., London, England, 1984)
6. *RF drift pumping designs for Phaedrus upgrade* , Breun, R.A. (Wisconsin Univ., Madison, WI, USA); Golovato, S.N.; Nonn, P.; Severn, G.; Siebert, K. Source: Conference Record of the 1984 IEEE International Conference on Plasma Science (papers in summary form only received) (Cat. No. 84CH1958-8), p 55, 1984
5. *Magnetic Field Mapping Experiments* , G.A. Butz, R.A. Breun, D. Brouchous, N. Hershkowitz, J. Pew, and G. Severn, Bull. Am. Phys. Soc. **29**, 1423 (1984)
4. *Radial Potential Modification Experiments in the Phaedrus Tandem Mirror Machine* , G. Severn, N. Hershkowitz, B.A. Nelson, and J. Pew, Bull. Am. Phys. Soc. **28**, 1202 (1983)
3. *Axial and Radial Plasma Potential Profiles in Tandem Mirror End Cells* , B. Nelson, C. Chan, N. Hershkowitz, J. Pew, and G. Severn, Bull. Am. Phys. Soc. **28**, 1203 (1983)
2. *Scaling of RF Sustained Tandem Mirror Parameters with Central Cell Heating Power including a Central Cell Stand Alone Mode* , J.R. Ferron, R.A. Breun, S.N. Golovato, R.H. Goulding, N. Hershkowitz, B. Nelson, and G. Severn, Bull. Am. Phys. Soc. **27**, 959 (1982) DOE DE FG02-03ER54728
1. *Measurements of Low Frequency Fluctuations in the Phaedrus Tandem Mirror* , R.A. Breun, J.R. Ferron, G. Severn, B. Nelson, and N. Hershkowitz, Bull. Am. Phys. Soc. **27**, 958 (1982)