NINGYU LIU

Education

Pennsylvania State University	Electrical Engineering	Ph.D.	2006
Zhejiang University, China	Electrical Engineering	M.S.	2001
Zhejiang University, China	Electrical Engineering	B.S.	1998

Academic Experience

University of New Hampshire	Professor, Physics and Astronomy	7/19-present
University of New Hampshire	Associate Professor, Physics	8/16-6/19
Florida Institute of Technology	Associate Professor, Physics and Space Sciences	8/12-7/16
Florida Institute of Technology	Assistant Professor, Physics and Space Sciences	1/08-7/12
Pennsylvania State University	NSF CEDAR Postdoc	9/06-12/07
Pennsylvania State DuBois	Adjunct Faculty, Electrical Engineering	8/06-12/06
Pennsylvania State University	Research Assistant, Electrical Engineering	8/01-8/06
Zhejiang University	Research Assistant, Electrical Engineering	9/98-6/01

Research Interests

- Lightning, Thunderstorm Electrification, Thunderstorm Energetic Radiation, Transient Luminous Events, Lower and Upper Atmosphere Coupling, Ionosphere Physics and Chemistry
- Plasma Physics, High Speed Optical Imaging, Radio Measurements and Interferometry, Numerical Modeling, High Performance Computing

Honors and Awards

- Faculty Excellence Award in Research, Florida Institute of Technology, 2016
- NSF CAREER Award, 2010
- Young Scientist Award, International Union of Radio Science (URSI), 2008
- NSF CEDAR Postdoctoral Fellowship, 2006 – 2007
- A. J. Ferraro Award for Excellence in Ph.D. Research, The Pennsylvania State University, 2005
- Outstanding Graduate Student Award, Zhejiang University, 1999

Professional Membership and Activities

- Member of American Geophysical Union (AGU), International Union of Radio Science (URSI), and Sigma Pi Sigma
- Associate Editor, Journal of Geophysical Research: Atmospheres
- Board of Trustees, Northeast Radio Observatory Corporation (NEROC)
- Active convener and participant for lightning physics and effects sessions/workshops at CEDAR, URSI, and AGU Meetings
- AGU ASE Early Career Award selection committee (2018; Chair, 2020; 2022), AGU ASE Benjamin Franklin Lecture Committee (Chair, 2025)
- Ad hoc proposal reviewer for US NSF, NASA, and other US and international funding agencies; Panelist for several US NSF proposal review panels
- Referee for Nature Journals, Physical Review Letters, Geophysical Research Letters, Journal of Geophysical Research, Radio Science, Physical Review E, Journal of Physics D: Applied Physics, Journal of Plasma Physics, IEEE Transactions
- Judge for student paper competition at AGU Fall Meeting, URSI meeting, and CEDAR workshop
- Invited speaker at AGU, URSI, CEDAR, AOGS, GEC, and SIAM Meetings
- Promotion of public interest in science and research. My research group has participated in press releases and interviews for sharing important research results from our work. Our findings have been featured in the news reports of The Washington Post, USA Today, The Huffington Post, New Scientist, TIME Magazine for Kids, BBC, Reuters, etc. We also actively participate in local outreach

activities including giving science talks at the recent Pint of Science events and the New Hampshire High School Physics Teacher Alliance Conference.
- Promoting the participation of the underrepresented groups in STEM. Out of six physics Ph.D. students I have graduated, three are female and they all continue pursuing STEM careers.

Current and Former Graduate Students & Postdoc

M. Motamedi Kouchaksaraei, P. Gough, J. Koile (Ph.D., 2024), J. Tilles (Ph.D., 2020), L. Boggs (M.S., 2016; Ph.D., 2019), M. Salem (Ph.D., 2017), S. Sadighi (Ph.D., 2015), B. Kosar (M.S., 2010; Ph.D., 2015); F. Shi (Postdoc)

Publications

I've published about 90 papers to date and they cover a variety of subjects in atmospheric and space electricity. Many papers are led by my students. Below is a list of representative publications.

1. **Liu, N. Y.**, Adaptive modeling of plasma initiation, filamentation and interaction, *Journal of Computational Physics*, 530, 113887, https://doi.org/10.1016/j.jcp.2025.113887, 2025.
2. **Liu, N. Y.**, O. Scholten, B. M. Hare, J. R. Dwyer, C. F. Sterpka, I. Kolmašová, and O. Santolík, LOFAR observation of lightning initial breakdown pulses, *Geophysical Research Letters*, 49, e2022GL098073, https://doi.org/10.1029/2022GL098073, 2022.
3. Boggs, L. D., D. Mach, E. Bruning, **N. Y. Liu**, O. A. van der Velde, J. Montanya, S. Cummer, K. Pavilec, V. Chmielewski, D. MacGorman, and M. Peterson, Upward propagation of gigantic jets revealed by 3D radio and optical mapping, *Science Advances*, 8, eabl8731, https://www.science.org/doi/abs/10.1126/sciadv.abl8731, 2022.
4. Tilles, J. N., **N. Y. Liu**, M. A. Stanley, P. R. Krehbiel, W. Rison, M. G. Stock, J. R. Dwyer, R. G. Brown, and J. G. Wilson, Fast negative breakdown in thunderstorms, *Nature Communications*, 10:1648, https://doi.org/10.1038/s41467-019-09621-z, 2019.
5. **Liu, N. Y.**, J. R. Dwyer, J. N. Tilles, M. A. Stanley, P. R. Krehbiel, W. Rison, R. G. Brown, and J. G. Wilson, Understanding the radio spectrum of narrow bipolar events, *Journal of Geophysical Research: Atmospheres*, 124, https://doi.org/10.1029/2019JD030439, 2019.
6. Shi, F., **N. Y. Liu**, J. R. Dwyer, and K. Ihaddadene, VHF and UHF electromagnetic radiation produced by streamers in lightning, *Geophysical Research Letters*, 46, 443–451, https://doi.org/10.1029/2018GL080309, 2019.
7. **Liu, N. Y.**, J. R. Dwyer, H. C. Stenbaek-Nielsen, and M. G. McHarg, Sprite streamer initiation from natural mesospheric structures, *Nature Communications*, 6:7540, https://doi.org/10.1038/ncomms8540, 2015.
8. **Liu, N. Y**, N. Spiva, J. R. Dwyer, H. K. Rassoul, D. Free, and S. A. Cummer, Upward electrical discharges observed above Tropical Depression Dorian, *Nature Communications*, 6:5995, https://doi.org/10.1038/ncomms6995, 2015.
9. **Liu, N. Y.**, and J. R. Dwyer, Modeling terrestrial gamma-ray flashes produced by relativistic feedback discharges, *Journal of Geophysical Research*, 118, 2359–2376, https://doi.org/10.1002/jgra.50232, 2013.
10. **Liu, N. Y.**, B. Kosar, S. Sadighi, J. R. Dwyer, and H. K. Rassoul, Formation of streamer discharges from an isolated ionization column at subbreakdown conditions, *Physical Review Letters*, 109, 025002, https://doi.org/10.1103/PhysRevLett.109.025002, 2012.
11. Moss, G. D., V. P. Pasko, **N. Y. Liu**, and G. Veronis, Monte Carlo model for analysis of thermal runaway electrons in streamer tips in transient luminous events and streamer zones of lightning leaders, *Journal of Geophysical Research*, 111, A02307, https://doi.org/10.1029/2005JA011350, 2006.
12. **Liu, N. Y.**, and V. P. Pasko, Effects of photoionization on propagation and branching of positive and negative streamers in sprites, *Journal of Geophysical Research*, 109, A04301, https://doi.org/10.1029/2003JA010064, 2004.