

Luciano G. Silvestri

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Education

2019 Ph.D. Boston College
2011 B.Sc. University of Massachusetts Boston (Summa cum Laude)

Work Experience

2022–Present **Assistant Professor (Fixed Term)**, Michigan State University, East Lansing, MI
2019–2022 **PostDoctoral Research Associate**, Michigan State University, East Lansing, MI
2016 **Research Intern**, Lawrence Livermore National Laboratory, Livermore, CA
2015 **Research Intern**, Wigner Research Centre for Physics, Budapest, Hungary
2009–2010 **Research Assistant**, Northeastern University, Boston, MA

Teaching

- CMSE 492: Applied Machine Learning (Fall 23, Fall 24) (UG Course)
- CMSE 201: Introduction to computational modeling and data analysis I (Spring 20, Spring 23, Spring 24) (UG Course)
- CMSE 202: Computational modeling and data analysis II (Spring 22, Fall 22, Spring 25) (UG Course)
- CMSE 801: Introduction to computational modeling and data analysis I (Fall 23) (Grad Course)
- CMSE 802: Methods in computational modeling and data analysis (Fall 24, Spring 25) (Grad Course)

Mentorship

Mentored undergraduate students from underrepresented groups during summer internships, guiding them through independent research projects and the application of machine learning in physics and data science.

- Google Summer of Code 2020 [GSoC2020](#),
- Explore Computational Research Experience [ECRE 2021](#),
- Advanced Computational Research Experience [ACRES REU 2024](#)

Service

- **Judge** of [SpartaHack 9](#)
- **Reviewer:** NSF grant applications, Physical Review journals, Computer Physics Communication
- **Departmental committees:** Undergraduate Program Committee, Colloquium & Seminar Committee; Diversity, Equity and Inclusion Committee.
- **Scientific Secretary:** As a graduate student at Boston College I co-organized four NATO-funded Advanced Summer Institutes (ASI's) in nano-optics and nano-photonics and three workshops in spectroscopy and luminescence.

Refereed research papers

1. Johnson, Z. A., L. G. Silvestri, G. M. Petrov, L. G. Stanton, and M. S. Murillo. Comparison of transport models in dense plasmas. *Physics of Plasmas* **31**(8) (2024), 082701. doi: [10.1063/5.0204226](#).

2. Kalman, G. J., K. I. Golden, and L. G. Silvestri. Correlation induced out-of-phase plasmon in an electron liquid. *Contributions to Plasma Physics* **64**(6) (2024), e202300129. doi: <https://doi.org/10.1002/ctpp.202300129>. eprint: <https://onlinelibrary.wiley.com/doi/pdf/10.1002/ctpp.202300129>.
3. Stanek, L. J. et al. Review of the second charged-particle transport coefficient code comparison workshop. *Physics of Plasmas* **31**(5) (2024), 052104. doi: [10.1063/5.0198155](https://doi.org/10.1063/5.0198155).
4. Silvestri, L. G., L. J. Stanek, G. Dharuman, Y. Choi, and M. S. Murillo. Sarkas: A fast pure-python molecular dynamics suite for plasma physics. *Computer Physics Communications* **272** (2022), 108245. doi: [10.1016/j.cpc.2021.108245](https://doi.org/10.1016/j.cpc.2021.108245).
5. Sprenkle, R. T., S. D. Bergeson, L. G. Silvestri, and M. S. Murillo. Ultracold neutral plasma expansion in a strong uniform magnetic field. *Physical Review E* **105**(4) (2022), 045201. doi: [10.1103/PhysRevE.105.045201](https://doi.org/10.1103/PhysRevE.105.045201).
6. Sprenkle, R. T., L. G. Silvestri, M. S. Murillo, and S. D. Bergeson. Temperature relaxation in strongly-coupled binary ionic mixtures. *Nature Communications* **13**(1) (2022), 15. doi: [10.1038/s41467-021-27696-5](https://doi.org/10.1038/s41467-021-27696-5).
7. Silvestri, L. G., R. T. Sprenkle, S. D. Bergeson, and M. M. Murillo. Relaxation of strongly coupled binary ionic mixtures in the coupled mode regime. *Physics of Plasmas* **28**(6) (2021). Publisher: American Institute of Physics, 062302. doi: [10.1063/5.0048030](https://doi.org/10.1063/5.0048030).
8. Silvestri, L. G., G. J. Kalman, Z. Donkó, P. Hartmann, M. Rosenberg, K. I. Golden, and S. Kyrkos. Sound speed in Yukawa one-component plasmas across coupling regimes. *Physical Review E* **100**(6) (2019), 063206. doi: [10.1103/PhysRevE.100.063206](https://doi.org/10.1103/PhysRevE.100.063206).
9. Golden, K., G. Kalman, and L. Silvestri. Is the Vlasov equation valid for Yukawa plasmas? *Physical Sciences and Technology* **4**(1) (2017), 9–14. doi: [10.26577/phst-2017-1-117](https://doi.org/10.26577/phst-2017-1-117). arXiv: [1806.08431](https://arxiv.org/abs/1806.08431).
10. Korolov, I., G. J. Kalman, L. Silvestri, and Z. Donkó. The Dynamical Structure Function of the One-Component Plasma Revisited: The Dynamical Structure Function of the One-Component Plasma Revisited. *Contributions to Plasma Physics* **55**(5) (2015), 421–427. doi: [10.1002/ctpp.201400098](https://doi.org/10.1002/ctpp.201400098).
11. Silvestri, L., G. J. Kalman, Z. Donkó, P. Hartmann, and H. Kählert. Fano-like anti-resonances in strongly coupled binary Coulomb systems. *EPL (Europhysics Letters)* **109**(1) (2015), 15003. doi: [10.1209/0295-5075/109/15003](https://doi.org/10.1209/0295-5075/109/15003).
12. Silvestri, L., K. Jacobs, V. Dunjko, and M. Olshanii. Typical, finite baths as a means of exact simulation of open quantum systems. *Physical Review E* **89**(4) (2014), 042131. doi: [10.1103/PhysRevE.89.042131](https://doi.org/10.1103/PhysRevE.89.042131).
13. Dubey, S., L. Silvestri, J. Finn, S. Vinjanampathy, and K. Jacobs. Approach to typicality in many-body quantum systems. *Physical Review E* **85**(1) (2012), 011141. doi: [10.1103/PhysRevE.85.011141](https://doi.org/10.1103/PhysRevE.85.011141).

Edited Books

1. Di Bartolo, B. and J. Collins, eds. *Nano-Optics for Enhancing Light-Matter Interactions on a Molecular Scale: Plasmonics, Photonic Materials and Sub-Wavelength Resolution*. NATO Science for Peace and Security Series B: Physics and Biophysics. Dordrecht: Springer Netherlands. doi: [10.1007/978-94-007-5313-6](https://doi.org/10.1007/978-94-007-5313-6).
2. Di Bartolo, B., J. Collins, and L. Silvestri, eds. *Nano-Optics: Principles Enabling Basic Research and Applications*. NATO Science for Peace and Security Series B: Physics and Biophysics. Dordrecht: Springer Netherlands. doi: [10.1007/978-94-024-0850-8](https://doi.org/10.1007/978-94-024-0850-8).
3. Di Bartolo, B., J. Collins, and L. Silvestri, eds. *Nano-Structures for Optics and Photonics: Optical Strategies for Enhancing Sensing, Imaging, Communication and Energy Conversion*. NATO Science for Peace and Security Series B: Physics and Biophysics. Dordrecht: Springer Netherlands. doi: [10.1007/978-94-017-9133-5](https://doi.org/10.1007/978-94-017-9133-5).

Recent Talks and Posters

1. **TCCW2** Second Charged-Particle Transport Coefficient Comparison Workshop, LLNL, Livermore, CA July 2023
(Talk) *Self-consistent QSP based plasma transport*
2. **CMU2023** Central Michigan University, Mount Pleasant, MI, March 2023
(Colloquium) *Ultracold Neutral Plasmas: a new platform to study extreme states of matter on a table-top*

3. **NNP2022** 13th International Workshop on Non-Neutral Plasmas,
Milan, Italy September 2022
(Invited Talk) *Temperature relaxation in strongly coupled binary ionic mixtures*
4. **SCCS2022** Strongly Coupled Coulomb Systems,
Goerlitz, Germany July 2022
(Poster) *Exchange effects in plasmon dispersion*,
(Poster) *Low frequency second plasmon in an electron liquid*,
(Poster) *Sarkas: A Pure Python Molecular Dynamics Suite for Non-Ideal Plasmas*,
(Poster) *Temperature relaxation in strongly coupled binary ionic mixtures*,
5. **ICOPS2021** IEEE International Conference on Plasmas,
Virtual, September 2021
(Contributed Talk) *Temperature relaxation in strongly-coupled binary ionic mixtures*
(Contributed Talk) *Sarkas: A Pure Python Molecular Dynamics Suite for Non-Ideal Plasmas*
6. **SCCS2017** Strongly Coupled Coulomb Systems,
Kiel, Germany August 2017
(Invited Talk) *Collective Behavior of Yukawa Systems*