Ryan M. Sparks

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Work Experience

Laboratory for Energy And Power Solutions (LEAPS) at ASU Apr 2023 – Present

Engineer Associate

- Facilitated safe operation of power equipment with power hardware in the loop testing and training
- Developed test plans in accordance with standards such as IEEE 2030.7 and performed tests on energy storage devices, inverters, generators, solar generators, building energy management systems, and microgrid controls
- Analyzed data and performed statistical analyses to identify trends and success/failure of equipment tests and justified outcomes with conceptual and numeric rationales
- Developed and implemented computer scripts that solve novel research tasks, particularly around distribution system state estimation and synthetic power transmission network analysis
- Integrated electrical systems to safely connect and test high-current ultracapacitors and battery energy storage devices to demonstrate in fulfillment of DoD-ESTCP project
- Contributed significantly to technical reports for Sandia National Labs, DOD-ESTCP, and ONR
- Developed and facilitated sponsored microgrid trainings reaching over 200 people

Research Assistant

- Performed research in distributed energy resources and infrastructure security with unique knowledge of large-scale power systems simulation
- Developed transmission and distribution system models for testing and analysis of interdependent infrastructures

Ira A. Fulton Schools of Engineering Learning and Teaching Hub Jul 2021 – Apr 2023

Learning Experience Design Associate

- Assisted instructional designers, faculty and/or other subject matter experts in the design and development of learning materials
- Developed courses with multiple instructional technologies while applying best practices in teaching and learning.

Sparks Engineering LLC Jun 2019 – Dec 2022

Product Development Consultant

- Directed development of electronic devices for industrial and laboratory use including PCB design, software and hardware development, supply chain coordination, and manufacturing
- Oversaw FCC certification under 47 CFR Part 15C – intentional radiators, CE declaration of conformity, and NRTL certification for laboratory equipment

Education

Arizona State University

Ph.D. Systems Engineering *Dec 2026 (Expected)*
M.S. Systems Engineering *Dec 2025*
M.S.E. Electrical Engineering *May 2024*
B.S.E Engineering (Electrical Systems) *May 2021*
Summa cum laude, minors in chemistry and applied mathematics, tau beta pi

Publications

- J.R. Wolfinbarger, I. Batur, M. Porto, N. Srivastava, E. Hennessy, S. Roy, M. Kimball, **R.M. Sparks**, S. Fletcher, M.V. Chester, "A Safe Operating Space for Cities: Navigating Tensions Between Emissions Mitigation, Climate Adaptation, and Well-Being in Urban Transformation." Expected 2026

- S. Fletcher, M. Chester, R. Jain, **R. Sparks**, R. Hoff, I. Searles, K. Klise, K. Bonney, S. Rivera, J. Poff, "Challenges and Opportunities for Synthetic Water Distribution Models." Expected 2025
- N. A. Srivastava, **R. Sparks**, M. Chester, M. Porto, N. Johnson, G. Mascaro, "A Coupled Stormwater-Power Model for the Simulation of Cascading Infrastructure Failures: An Application in Phoenix, AZ." Expected 2025
- T. Kemabonta, **R. Spark**s, N. Johnson, "Transmission Planning and Development for the African Single Electricity Market (AfSEM)." Expected 2025
- **R.M. Sparks**, S. Tobias, T. Kemabonta, J. Nelson, N. Johnson, "Microgrid System Sizing and Aggregation of Distributed Energy Resources for Wholesale Market Participation." Applied Energy, vol. 400 no. 126537, 1 Dec. 2025. https://doi.org/10.1016/j.apenergy.2025.126537
- R. Hoff, **R. Sparks**, I. Searles, M. Chester, A. Mustafa, A. Birchfield, R. Li, N. Ahmad, T. McPhearson, N, Johnson, "Cascading Failure Propagation and Perfect Storms in Interdependent Infrastructures." ASCE OPEN: Multidisciplinary Journal of Civil Engineering, vol. 3 no. 1, pp. 04025001, 18 Feb. 2025. https://doi.org/10.1061/AOMJAH.AOENG-0045
- E. Hennessy, R. Wolfinbarger, I. Batur, N. Srivastava, M. Porto, G. Cotlier, M. Horgan, I. Searles, **R. Sparks**, M. Chester, "Changing boundaries, distributed control, and implications for transportation sustainability." npj. Sustain. Mobil. Transp. 1, 12. 29 Nov. 2024. https://doi.org/10.1038/s44333-024-00016-2
- M. Joines, M. Horgan, R. Li, A. Helmrich, A. Dirks, K. Tarr, **R. Sparks**, R. Hoff, M. Kimball, M. Chester, "Cross-boundary Risks of Hinterland Hazards to City Infrastructure." Environmental Research: Infrastructure and Sustainability, 17 Jul. 2024. https://doi.org/10.1088/2634-4505/ad5fb4
- C. Noe, K. Brim, **R. Sparks**, N. Lindquist, D. Bhate, "Reprising Materials Science in the Additive Manufacturing Classroom." JOM, vol. 76, no. 7, pp. 3253-3256, 3 Jun. 2024. https://doi.org/10.1007/s11837-024-06688-y
- **R.M. Sparks**, R. Hoff, N. Johnson, M. Chester, "Cascading Failures on Synthetic Transmission Systems Whitepaper." Arizona State University KEEP Archive, May. 2023. https://hdl.handle.net/2286/R.2.N.188186

Conference Proceedings

- N.A. Srivastava, R. Li, **R. Sparks**, M. Chester, N. Johnson, G. Mascaro, "A Modeling Framework of Cascading Failures in Stormwater and Power Urban Infrastructure: An Application in Phoenix, AZ." AGU Fall Meeting Abstracts 2024, H22E-01. https://ui.adsabs.harvard.edu/abs/2024AGUFMH22E...01S/abstract
- A. Mustafa, A. Springer, M. Chester, **R. Sparks**, T. McPhearson, "Resilience of NYC Power and Water Systems to Flooding: Analyzing Cascading Failures." AGU Fall Meeting Abstracts 2024, GC01-14. https://ui.adsabs.harvard.edu/abs/2024AGUFMGC01...14M/abstract

Patents

U.S. Patent 18,412,491: Heat Press Dual-Zone Temperature Control System 2024
L.G. Lanzrath, R. Sparks

Community Service and Volunteering

- Mentor, Si Se Puede Foundation – Desert Wave Underwater Robotics Team Oct 2025 – Present
- Technical Committee Member, UL 3001, UL Standards and Engagement Oct 2025 – Present

Affiliations

- IEEE Power & Energy Society (since 2023)
- American Society for Engineering Education (since 2023)
- Society of American Military Engineers (since 2025)