Ari Edward RAPPAPORT

Curriculum vitae

aerappa.github.io

Career Timeline

2026 **Postdoctoral Researcher**, *Laboratoire Jacques-Louis Lions*, Paris, France

2024–2026 **Postdoctoral Researcher**, *ENSTA Paris*, Palaiseau, France

2024–2026 **Teaching Assistant (Tutorials)**, *ENSTA Paris*, Palaiseau, France

2021–2024 **PhD Candidate**, *Inria Paris*, Paris, France

2018–2020 **Master's Degree**, *University of New Mexico*, Albuquerque, United States

Education

2021–2024 **PhD in Applied Mathematics**, *Sorbonne University*, Paris, France, *SERENA Team*
Dissertation: *A posteriori error estimates and adaptivity in numerical approximation of PDEs: regularization, linearization, discretization, and floating-point accuracy*
Advisor: Martin Vohralík
Co-advisor: François Févotte

2018–2020 **Master's Degree in Applied Mathematics**, *University of New Mexico*, Albuquerque, United States
Thesis: *An a posteriori error analysis of stationary incompressible magnetohydrodynamics*
Advisors: Jehanzeb Chaudhry and John Shadid

2013–2018 **Bachelor's Degree in Computational Mathematics**, *University of New Mexico*, Albuquerque, United States
Thesis: *Exploration of Black Box Multigrid for Linear Systems Modelling Resistive MHD*
Advisors: Jehanzeb Chaudhry, Raymond Tuminaro, and John Shadid

Publications

Published Articles

1. Rappaport, A. E., Chaumont-Frélet, T., and Modave, A. A hybridizable discontinuous Galerkin method with transmission variables for time-harmonic electromagnetic problems. *SIAM Journal on Scientific Computing* **48**(4) (2026), B629–B650.
DOI: 10.1137/25M1756818

2. Harnist, A., Mitra, K., Rappaport, A., and Vohralík, M. Robust augmented energy a posteriori estimates for Lipschitz and strongly monotone elliptic problems. *IMA Journal of Numerical Analysis*, drag036 (2026).
DOI: 10.1093/imanum/drag036

3. Févotte, F., Rappaport, A., and Vohralík, M. Adaptive regularization for the Richards equation. *Computational Geosciences* **28**(6) (2024), 1371–1380.
DOI: 10.1007/s10596-024-10309-7

4. Févotte, F., Rappaport, A., and Vohralík, M. Adaptive regularization, discretization, and linearization for nonsmooth problems based on primal–dual gap estimators. *Computer Methods in Applied Mechanics and Engineering* **418** (2024), 116558.
DOI: 10.1016/j.cma.2023.116558

5. J. H. Chaudhry, A. E. Rappaport, and J. N. Shadid, An a posteriori error analysis for the equations of stationary incompressible magnetohydrodynamics, *SIAM Journal on Scientific Computing* **43** (2021), no. 2, B354–B380.

DOI: 10.1137/20M1342975

Submitted Articles and Preprints

1. Bonazzoli, M., Ciarlet Jr., P., Modave, A., and Rappaport, A. E. Analysis of a two-level domain decomposition preconditioner for the time-harmonic Maxwell equations in anisotropic media. HAL Preprint 05572507, 2026.

2. Févotte, F., A. Rappaport. A thread-parallel implementation of equilibrated flux reconstruction in Julia. HAL Preprint 04537446, 2024.

Research and Teaching Experience

Sep 2026–Present **Postdoctoral Researcher**, *Laboratoire Jacques-Louis Lions, Sorbonne Université*, Paris, France, Research on phase-space methods within the ERC Synergy project PSINumScat (Phase-space-inspired Numerical Methods for High Frequency Wave Scattering).

Sep 2024–Sep 2026 **Teaching Assistant (Tutorials and Labs)**, *ENSTA Paris*, Palaiseau, France, Prepared and led tutorial and laboratory sessions, developed pedagogical materials and problem sets, delivered theoretical summaries, and graded student assessments.

Nov 2017–Oct 2020 **Research Intern**, *Sandia National Laboratories*, Albuquerque, United States, Department 1442, Computational Mathematics. Research on a posteriori error analysis for stationary incompressible magnetohydrodynamics. Project on using Long Short Term Memory (LSTM) methods to enhance POD-based reduced-order models in MHD.

May 2015–Jun 2018 **Research Intern**, *Voss Scientific*, Albuquerque, United States, Extension of a numerical viscosity algorithm for a PIC code. Development of interfaces for multigrid Maxwell solvers and adaptation of a preconditioner for an augmented Maxwell system.

Aug 2017–May 2018 **Teaching Assistant (Laboratory Sessions)**, *Department of Computer Science, University of New Mexico*, Albuquerque, United States, Designed and led computer laboratory sessions, developed progressive hands-on exercises, and provided individual student support to address technical and conceptual difficulties.

International Conference Presentations

- WAVE-NED Conference on Analysis, Modeling and Numerics of Waves (Delft, The Netherlands, 2026).
- International Conference on Computational Methods in Applied Mathematics (CMAM) (Vienna, Austria, 2026).
- CANUM – Congrès National d'Analyse Numérique (Saint-Jacut-de-la-Mer, France, 2026).
- 29th International Conference on Domain Decomposition Methods (Milan, Italy, 2025).
- International Conference on Computational Methods in Applied Mathematics (Bonn, Germany, 2024).
- International Conference on Spectral and High Order Methods (Seoul, South Korea, 2023).
- SIAM Conference on Mathematical and Computational Issues in the Geosciences (Bergen, Norway, 2023).
- World Congress on Computational Mechanics (Yokohama, Japan, 2022).
- SIAM Conference on Computational Science and Engineering (Spokane, United States, 2019).

Invited Team and Laboratory Seminars

- Seminar of the Laboratoire de Mathématiques d'Orsay (Orsay, France, 2026)
- Seminar of the Institut de Mathématiques de Marseille (Marseille, France, 2026)
- Seminar of the Jean Kuntzmann Laboratory (Grenoble, France, 2026)

- Seminar of the AGM Laboratory (Cergy, France, 2025)
- Joint LJLL / Inria Seminar (Paris, France, 2025)
- IMAG Team Seminar (Montpellier, France, 2025)
- UNM Applied Mathematics Seminar Series (Albuquerque, United States, 2020)

Honors and Awards

- SIAM CSE Student Travel Award (2019).
- UNM Departmental Honors: Mathematics (2018).
- UNM Van Dyke Computer Science Scholarship (2017).
- UNM Leonard Engineering Scholarship (2016).

Computing Skills and Programming

- **Programming Languages:** Julia, Python, C/C++, MATLAB, Java, Fortran 90.
- **Operating Systems:** Linux, macOS.
- Advanced proficiency with `vim`, `slurm`, `make`, etc.

Languages

- English: Native
- French: Fluent
- Spanish: Basic knowledge
- Chinese: Basic knowledge