Ryan H. Allaire

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EDUCATION

Ph.D.	Mathematical Sciences	New Jersey Institute of Technology	May 2021*
M.S.	Pure and Applied Mathematics	Montclair State University Montclair, NJ	May 2015
B.A.	Mathematical Sciences	Rutgers University New Brunswick, NJ	May 2012
A.S.	Mathematical Sciences	Mercer County Cmty College West Windsor, NJ	May 2010

**Expected Date of Graduation*

PROFESSIONAL EXPERIENCE

New Jersey Institute of Technology, Research Assistant	9/17-Present
University of Tennessee, Knoxville, Non-UT Student Assistant	5/19-9/19
Oak Ridge National Laboratory, DOE SCGSR Intern	6/18-9/18
New Jersey Institute of Technology, Teaching Assistant	9/15-8/17
Montclair State University, Adjunct Professor	7/15-8/15
Montclair State University, Graduate Assistant	9/13-5/15
Rutgers Learning Center, Mathematics Tutor	11/11-8/13
Rutgers, the State University of NJ, Mathematics Grader	9/11-12/11

PUBLICATIONS

1. Allaire, R. H., Cummings, L. J., Kondic, L., On efficient asymptotic modelling of thin films on thermally conductive substrates. Under review in *J. Fluid Mech*. (2020). arXiv:2009.06536.
2. Allaire, R. H., Kondic, L., Cummings L. J., Rack, P.D., Fuentes-Cabrera, M., The role of phase separation on Rayleigh-Plateau type instabilities in alloys. Under review in *the J. Phys. Chem. C*. (2020) (preprint available at https://web.njit.edu/~rha25/files/JPC_Allaire.pdf).
3. Allaire, R. H., Abhijeet, D., Emery, R., Ganesh, P., Rack P. D., Kondic, L., Cummings L. J., Fuentes-Cabrera, M., Surface, Interface, and Temperature Effects on the Phase Separation and Nanoparticle Self Assembly of Bi-Metallic Ni0.5Ag0.5: A Molecular Dynamics Study, *Nanomaterials*, **9**, 1040 (2019).
4. Nita, B., Allaire, R., On the Three Dimensional Interaction between Flexible Fibers and Fluid Flow. *Fluids*, **2**, 4 (2017).
5. Allaire, R. H., Vaidya, A., Nita, B., Nolan, P., Guerron, P., On the Equilibrium Configurations of Flexible Fibers in a Flow. *Int. J. Nonlin. Mech*. **12**, 5 (2015).

PRESENTATIONS

Conferences

- *Simulating instabilities of liquid metal alloys on nanoscale using molecular dynamics simulations,* ***72nd Annual Meeting of the APS Division of Fluid Dynamics*** (11/2019, Oral)
- *Thermal effects in Nanoscale Liquid Metal Assembly,* ***The Dana Knox Student Research Showcase, 2019*** *(04/2019, Poster)*
    - Bronze medal poster recipient.
- *Including thermal effects in computing dynamics of thin films on thermally conductive substrates*, **71st Annual Meeting of the APS Division of Fluid Dynamics** (11/2018, Oral)
- *Molecular Dynamics Simulations of Liquid Metal Assembly at the Nanoscale*, **2018 Center for Nanophase Materials Sciences User Meeting** (08/2018, Poster)
- *On the 3-dimensional fluid-structure interaction of flexible fibers in a flow*, **9th Annual Student Research Symposium, Montclair State University** (04/2015, Oral)

Invitations

- Invited address to the board of trustees, provost, and university president representing all graduate students at NJIT (04/2019).

Selected Contributing

- Emery, R., Rack, P. D., Allaire, R., Dhakane, A., Ganesh, P., Kondic, L., Cummings, L., Fuentes-Cabrera, M. *Surface, Interface, and Temperature Effects on the Phase Separation and Nanoparticle Self Assembly of Bi-Metallic Ni0.5Ag0.5: A Molecular Dynamics Study*. **The Minerals, Metals & Materials Society 2020 Annual Meeting,** (02/2020).
- Kondic, L., Allaire, R., Cummings, L., Metal films of nanoscale thickness: from targeted experiments to predictive modeling and accurate simulations, **13th European Coating Symposium**, Heidelberg, Germany, (09/2019).
- Garfinkel, D., Rack, P. D., Allaire R., Fowlkes, J., Kondic, L., Fuentes-Cabrera, M., and Emery R. *Directed and Self-Assembly of Elemental and Bimetallic Thin Films in the Au-Ag-Ni System via Pulsed Laser Dewetting,* **2018 MRS Fall Meeting & Exhibit** (11/2018)
- Nita, B., Vaidya, A., Allaire, R. On the three-dimensional interaction between flexible fibers and fluid flow. **AMS Sectional Meeting** (11/2015)

Other

- *GPU Computing of Thermal Effects in Thin Films on Thermally Conductive Substrates.* **Complex Fluids and Soft Matter Group,** NJIT, (11/2020).
- *Molecular Dynamics Simulations of Pulse-Laser Induced Self and Directed Assembly of Nanoscale Thin Liquid Metal Films.* **Complex Fluids and Soft Matter Group**, NJIT, (09/2018)
- *On Temperature Effects in Reacting Porous Media Applications.* **Graduate Student Math Modeling Camp**, Rensselaer Polytechnic Institute, (06/2017)
- *Capstone Laboratory- Thin Liquid Filaments.* **Complex Fluids and Soft Matter Group**, NJIT, (12/2016)

WORKSHOPS

- HPC Summer Workshop, NJIT 06/20-08/20
- Intro to HPC Workshop, ORNL/OLCF 06/18
- Graduate Student Math Modeling Camp (GSMMC) 06/17
- Mathematical Problems in Industry (MPI) 06/17

TEACHING EXPERIENCE

NJIT:

- **Calculus 1** **(*Instructor*[+], F19; Recitation Instructor, F15)**
- Calculus 2 (Recitation Instructor, S15, F17)
- Univ. Math B (Recitation Instructor, S17)
- Teaching Reserve (On Call Lecturer, F17, S18, F19, S20, F20)
- Methods of Appl. Math (Supervised experiments in Laboratory, F16, F18)

MSU:

- **Business Calculus** **(*Instructor*, Summer 2015)**
- Basic Skills Math (Focus Group Instructor, F13, F14)
- Intermediate Algebra (Focus Group Instructor, F13, S14, F14)
- Development of Math (Focus Group Instructor, S14, F14)

[+]Instructor for multi-section course: prepared lectures, created and graded quizzes, contributed to common exam development, maintained course website with written solutions, assisted in grading exams, held regular office hours, facilitated study groups outside normal hours.

MEMBERSHIPS/CLUBS

- American Physical Society (APS)
- Society of Industrial and Applied Mathematics (SIAM)
- SIAM NJIT Chapter- President (F18-S19), Vice President (F17-S18)
- Canadian Society for the History and Philosophy of Mathematics (CSHPM)
- Alpha Epsilon Lambda National Graduate Honor Society

COMPUTER SKILLS

- Finite difference methods for parabolic PDE on domains with moving boundaries.
- GPU parallel programming with CUDA
- LAMMPS for MD simulations
- MATLAB, FORTRAN, Python, C, Maple, and Mathematica
- VMD, OVITO, and TECPLOT
- COMSOL Multiphysics
- Latex and MathType

RESEARCH INTERESTS

Thin Films, Fluid Dynamics, Heat transfer, high-performance computing, software development.