Criston Hyett

Fields Of Interest

Dynamical Systems & Control, Reduced-Order Modeling,
Physics-Informed Machine Learning, Uncertainty Quantification

Education

2019-2025 (expected) **Ph.D.**, *University of Arizona*, Tucson, AZ.
Applied Mathematics

2019-2021 **M.S.**, *University of Arizona*, Tucson, AZ.
Applied Mathematics

2012-2016 **B.S.**, *University of Arizona*, Tucson, AZ.
Mathematics & Physics

Research

2021-present **Optimal Natural Gas Flows in a Network with Uncertainty**

We work to determine optimal flows on a natural gas network under the coupled gas and energy grids upon inclusion of intermittent renewable energies and under stressing scenarios.

2020-present **Machine Learning Statistical Evolution of the Coarse-Grained Velocity Gradient Tensor**

We use cutting edge machine learning techniques to create physics-informed reduced order models of the inherently chaotic evolution of the velocity gradient tensor in isotropic turbulence.

Work Experience

2020-present **Graduate Research Assistant**, *University of Arizona*, Tucson, AZ.

Summers 2020-22 **Graduate Student Researcher**, *Los Alamos National Labs*, Los Alamos, NM.

2019-2020 **Graduate Teaching Assistant**, *University of Arizona*, Tucson, AZ.

2016-2019 **Software Engineer II**, *Raytheon Missile Systems*, Tucson, AZ.

Computer Languages

Julia	Proficient
C/C++	Proficient
Python	Comfortable
Bash	Comfortable
Matlab	Comfortable
Cuda	Beginner

Computer skills

Open Software	git, LaTeX,
HPC	Slurm, Docker, Singularity
Methodologies	CI, TDD, Agile
Operating Systems	Linux, Windows

Fellowships

Aug 2021 - May 2023 NSF Data-Driven Research Training Group Traineeship — *University of Arizona College of Science, Mathematics*

Jan 2022 - May 2022 Roots for Resilience Data Science Scholarship — *University of Arizona Data Science Institute, Arizona Institute for Resilience*

Service and Leadership

Apr 2023	Organized and presented "Introduction to Parallelization" for NSF Data-Driven Research Training Group
Mar 2023	Graduate Mentor for American Statistical Association DataFest Competition
Quarterly 2021-2022	Organized and presented "Introduction to HPC" seminar for Math PhD students
Aug 2021 - May 2022	SIAM Brownbag Student Colloquium Organizer
Jul 2018 - Jul 2019	Certified Scrum Master: Scaled Agile Framework

Publications

Hyett, Criston et al. **2023a**. "Control of Line Pack in Natural Gas System: Balancing Limited Resources under Uncertainty". In: *PSIG Annual Meeting*. PSIG, PSIG–2314.

Hyett, Criston et al. **2023b**. *Differentiable Simulator For Dynamic and Stochastic Optimal Gas and Power Flows*. arXiv: 2310.18507 [math.OC].

Tian, Yifeng et al. **2022**. "Lagrangian Large Eddy Simulations via Physics Informed Machine Learning". In: *arXiv preprint arXiv:2207.04012*.

Woodward, Michael et al. **2021**. "Physics Informed Machine Learning of SPH: Machine Learning Lagrangian Turbulence". In: *arXiv preprint arXiv:2110.13311*.

Talks

Hyett, Criston et al. **2023**. "Velocity gradient prediction using parameterized Lagrangian deformation models". In: *Bulletin of the American Physical Society*.

Chertkov, Michael et al. **2022a**. "Lagrangian Large Eddy Simulations via Physics-Informed Machine Learning". In: *Bulletin of the American Physical Society*.

Woodward, Michael et al. **2022b**. "Physics Informed Machine Learning with Smoothed Particle Hydrodynamics: Compressiblity and Shocks". In: *Bulletin of the American Physical Society*.

Tian, Yifeng et al. **2022c**. "Physics-informed Machine Learning for Reduced-order Modeling of Lagrangian Turbulence". In: *Bulletin of the American Physical Society*.

Hyett, Criston et al. **2021a**. "Data-Analysis of the Coarse-Grained Velocity Gradient Tensor". In: *APS Division of Fluid Dynamics Meeting Abstracts*, N01–011.

Tian, Yifeng et al. **2021b**. "Machine Learning Lagrangian Large Eddy Simulations with Smoothed Particle Hydrodynamics". In: *APS Division of Fluid Dynamics Meeting Abstracts*, A11–008.

Hyett, Criston et al. **2021c**. "Machine Learning Statistical Evolution of the Coarse-Grained Velocity Gradient Tensor". In: *APS Division of Fluid Dynamics Meeting Abstracts*, E31–009.

Woodward, Michael et al. **2021d**. "Physics Informed Machine Learning of Smooth Particle Hydrodynamics: Solving Inverse Problems using a mixed mode approach". In: *APS Division of Fluid Dynamics Meeting Abstracts*, N01–050.

Woodward, Michael et al. **2021e**. "Physics Informed Machine Learning of Smooth Particle Hydrodynamics: Validation of the Lagrangian Turbulence Approach". In: *APS Division of Fluid Dynamics Meeting Abstracts*, T24–008.

Hyett, Criston, Chertkov, Michael, Tian, Yifeng, and Livescu, Daniel. **2020**. "Machine Learning Statistical Lagrangian Geometry of Turbulence". In: *APS Division of Fluid Dynamics Meeting Abstracts*, S01–024.

Human Languages

English	Native Speaker
Spanish	Basic