# Teresa Portone

Senior Member of the Technical Staff
Optimization and Uncertainty Quantification, Sandia National Labs
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## EDUCATION

**M.S., Ph.D.**, Computational Science, Engineering and Mathematics. University of Texas at Austin

**B.S.**, Mathematics. Minor in Italian. University of Alabama

## PROFESSIONAL INTERESTS

Developing and applying advanced UQ methodologies for practical (large-scale) science and engineering problems. Application-area experience in subsurface transport, material modeling, and disease modeling. Experience in Bayesian inference, Bayesian model selection, global sensitivity analysis, multifidelity UQ, and model-form uncertainty/model discrepancy.

## EXPERIENCE

### Sandia National Laboratories, Albuquerque, NM

SENIOR MEMBER OF THE TECHNICAL STAFF, JANUARY 2020 - PRESENT

Developing and deploying state-of-the-art uncertainty quantification (UQ) methods to practical application problems, including nuclear waste repository performance assessment, nuclear deterrence applications, and disease modeling. Particular focus on multifidelity UQ, Bayesian inference, sensitivity analysis, and model-form uncertainty.

### Center for Predictive Engineering and Computational Science, UT Austin

GRADUATE RESEARCH ASSISTANT, AUGUST 2014 - DECEMBER 2019

Advisor: Dr. Robert D. Moser. Developed a novel model-form uncertainty representation for an upscaled model of contaminant transport through heterogeneous porous media.

### Sandia National Laboratories, Albuquerque, NM

GRADUATE INTERN, OCTOBER 2017 - DECEMBER 2017

Supervisors: Laura Swiler, John Niederhaus, Jason Sanchez. Applied Bayesian model selection to closure models for yield strength of hardened steel.

## PUBLICATIONS

**Portone, T.** and Moser, R.D. “Bayesian Inference of an Uncertain Generalized Diffusion Operator.” *SIAM/ASA Journal on Uncertainty Quantification*, February 7, 2022, 151–78. https://doi.org/10.1137/21M141659X.

**Portone, T.**, Niederhaus, J., Sanchez, J., & Swiler, L. (2020). “Bayesian model selection for metal yield models in high-velocity impact.” *International Journal of Impact Engineering*, *137*, 103459. https://doi.org/10.1016/j.ijimpeng.2019.103459

**Portone, T.** (2019) “Representing Model-Form Uncertainty from Missing Microstructural Information.” *Dissertation, The University of Texas at Austin*. http://dx.doi.org/10.26153/tsw/10112

**Portone, T.**, Moser, Robert D. (In preparation). Computational spectroscopy for statistically-invariant systems.

## PRESENTATIONS

*Learning Missing Mechanisms in a Dynamical System from a Subset of State Variable Observations.* T. Portone, E. Acquesta, R. Dandekar, C. Rackauckas. USNCCM16, Virtual, July 2021.

*Application of Multifidelity Uncertainty Quantification Methods to a Subsurface Transport Model.* T. Portone, M.S. Eldred, G. Geraci, L.P. Swiler. SIAM CSE21. Virtual, March 2021.

*Characterizing model-form uncertainty in an inadequate model of anomalous transport.* T. Portone, R.D. Moser. SIAM UQ 2020. Virtual minisymposium, May 2020.

*Bayesian model selection for metal yield models in high-velocity impact.* T. Portone, J.H. Niederhaus, J.J. Sanchez, L.P. Swiler. 2019 Hypervelocity Impact Symposium, Destin, Florida, April 2019.

*An Uncertainty Representation for Model Inadequacy in a Field-scale Contaminant Transport Model.* T. Portone, R.D. Moser. SIAM CSE 2019. Spokane, WA. February 2019.

*A Whirlwind Tour of Uncertainty Quantification and Model Inadequacy.* T. Portone. Invited talk, NREL, September 2018.

*A Stochastic Operator Approach to Representing Model Inadequacy*. T. Portone, R.D. Moser, ICES Student Forum, February 2018.

*A Stochastic Operator Approach to Model Inadequacy with Applications to Contaminant Transport.* T. Portone, D. McDougall, R.D. Moser, SIAM CSE 2017, Atlanta, GA, February 2017.

*Uncertainty Due to Inadequate Models of Scalar Dispersion in Porous Media.* T. Portone, D. McDougall, J. Rigelo, T. Oliver, R.D. Moser. SIAM UQ 2016, Lausanne, Switzerland, April 2016.

## AWARDS

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| 2021 | Technical Excellence Sandia Employee Recognition Award, DOE COVID Epidemiology Modeling Team. |
| 2019 | Rising Stars in Computational & Data Sciences Attendee |
| 2015 | Honorable Mention, NSF Graduate Research Fellowship Program |
| 2013-2017 | CSEM Fellowship, UT Austin, Oden Institute for Computational Engineering and Sciences |
| Undergraduate Honors | B.B. Comer Math Prize two-time recipient, awarded to one student annually by the University of Alabama's mathematics department; Distinguished Undergraduate Scholar (awarded to eight seniors in 2013); Phi Beta Kappa; Pi Mu Epsilon. |

## LEADERSHIP & SERVICE ACTIVITIES

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| 2021-Present | Rising Stars Organizing Committee. |
| 2020-Present | Black Leadership Committee's Research Partnerships Awareness & Engagement committee member. Sandia recruiting team member. Organizer, Sandia UQ Working Group. Co-organizer, Sandia UQ Seminar Series. |
| 2020-2021 | Co-founder and co-organizer of 1463 Early-Career Group. Sandia D1000 Workplace Enhancement Council Member. |
| Reviewed for | Journal of the Royal Society Interface; Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences; ASME Journal of VVUQ |
| Student Leadership | CSEM Student Representative, UT Austin SIAM Student Chapter Representative (2014-2016). Graduate Student Assembly Representative (2015-2016). Secretary of Pi Mu Epsilon University of Alabama chapter (2012-2013). |

## PROFESSIONAL MEMBERSHIPS

Member, Society for Industrial and Applied Mathematics (SIAM)

Member, Society of Women Engineers (SWE)

Member, U.S. Association for Computational Mechanics (USACM)