

# Justin Weinmeister

Oak Ridge National Laboratory, PO Box 2008 MS-6003, Oak Ridge, TN 37803-6003  
(865) 574-8806 • [weinmeisterj@ornl.gov](mailto:weinmeisterj@ornl.gov)  
[www.linkedin.com/in/jweinmeister](http://www.linkedin.com/in/jweinmeister)

---

## Profile

I am an engineer with expertise in computational fluid dynamics, heat transfer, optimization, and uncertainty quantification. My work also covers model verification and validation and experimental fluid dynamics. I currently support projects ranging from the Proton Power Upgrade of the Spallation Neutron Source to the Materials Plasma Exposure Experiment using advanced computational models, design optimization studies, and experimental investigation.

## Education

### University of Tennessee, Knoxville, TN

Ph.D. Mechanical Engineering 2021-Present

### Colorado State University, Fort Collins, CO

M.S. Mechanical Engineering 2017 - 2018

*Thesis: Development of Reduced Polynomial Chaos-Kriging Metamodel for Uncertainty Quantification of Computational Aerodynamics*

B.S. Mechanical Engineering 2013 - 2017

## Experience

### Oak Ridge National Laboratory

*Thermal Hydraulics Engineer*

2018 - Present  
Oak Ridge, TN

- Support development of 2 MW target for the Spallation Neutron Source through computational modeling and experimentation on gas injection strategies
- Designed and optimized Transformational Challenge Reactor fuel form coolant channels
- Support Materials Plasma Exposure Experiment using analytic and computational modeling of radio frequency equipment and high heat flux vacuum vessel components
- Designed mercury check filter for helium venting of Spallation Neutron Source mercury loop

### Computational Fluid Dynamics and Propulsion Laboratory

*Graduate Research Assistant*

2016 - 2018  
Fort Collins, CO

- Developed novel surrogate modeling tool in MATLAB for uncertainty quantification
- Conducted detailed simulations of various aerodynamic bodies
- Automated data-handling processes through Bash shell-scripting in Linux
- Teaching assistant for undergraduate numerical methods course

## Professional Activities

- Member, American Nuclear Society 2020 - Present
- Member, American Society of Mechanical Engineers 2020 - Present  
Fluids Engineering Division Multiphase Flow Technical Committee  
Fluids Engineering Division Computational Fluid Dynamics Technical Committee

## Awards and Honors

- American Nuclear Society Winter 2021 Young Professional Thermal-Hydraulics Research Competition, Honorable Mention
- American Society of Mechanical Engineers 2021 Robert T. Knapp Award, Co-author

## Skills

- Computational Fluid Dynamics Solvers: STAR-CCM+ • FLUENT • CFD++
- Meshing Software: STAR-CCM+ • FLUENT • Pointwise • ICM-CFD
- Computer Languages: Python • MATLAB • Bash • Java
- Other Software: Job Management-PBS/Slurm/OGE • Paraview • ImageJ • NX
- Experimental: High Speed Videography • Photography • Particle Image Velocimetry

## Publications

### Journal Articles

**J. Weinmeister** et al., *Coolant Channel Design for Additively Manufactured Reactor Cores*, Nuclear Science and Engineering, (2022) doi:10.1080/00295639.2022.2096999.

C. Barbier, E. Dominguez-Ontiveros, J. Weinmeister, J. Slade, D. Ottinger, and R. Sangrey, *A Compact Gas Liquid Separator for the Spallation Neutron Source Mercury Process Loop*, ASME J. Fluids Eng., 144(3):031402 (2022) doi:10.1115/1.4052241.

**J. Weinmeister**, X. Gao, and S. Roy, *Analysis of a Polynomial Chaos-Kriging Metamodel for Uncertainty Quantification in Aerodynamics*, AIAA Journal, 57(6):2280-2296 (2019) doi:10.2514/1.J057527.

### Conference Proceedings

B.J. Ade et al. [including J. Weinmeister], *Transformational Challenge Reactor Design Characteristics*, Proceedings of PHYSOR 2022, :2471 (2022) doi:10.13182/PHYSOR22-37543.

**J. Weinmeister**, A.S. Sabau, and P. Jain, *Additively Manufactured Surface Heat Transfer Enhancements for the Transformational Challenge Reactor*, Proceedings of the 19th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-19), 34157 (2022) ISBN: 9789076971261.

P.K. Jain, J. Weinmeister, B.J. Ade, and C. Jesse, *CFD Modeling for the Transformational Challenge Reactor Preliminary Design*, Proceedings of the 19th International Topical Meeting on Nuclear Reactor Thermal Hydraulics (NURETH-19), 35935 (2022) ISBN: 9789076971261.

**J. Weinmeister**, *Surface Roughness Modeling for Transformational Challenge Reactor Fuel Form*, Transactions of the American Nuclear Society, 125(1):1310-1313 (2021) doi:10.13182/T125-36642.

### **Honorable Mention, Young Professional Thermal-Hydraulics Research Competition Award**

C.J. Jesse, J. Weinmeister, P. Jain, and B.J. Ade, *Flattening the Radial Temperature Profile across the Transformational Challenge Reactor Core*, Transactions of the American Nuclear Society, 125(1):1300-1303 (2021) doi:10.13182/T125-37027.

**J. Weinmeister**, D. Ottinger, and C. Barbier, *Helium Degassing Filter for Mercury Process Gas Liquid Separator*, Proceedings of the 2021 ASME International Mechanical Engineering Congress and Exposition, 10:V010T10A039 (2021) doi:10.1115/IMECE2021-72699.

B.J. Ade, P.K. Jain, J. Weinmeister, and B.R. Betzler, *The Impact of Temperature Modeling Assumptions for the Transformational Challenge Reactor*, Transactions of the American Nuclear Society, 124(1):616-619 (2021) doi:10.13182/T124-35185.

C. Barbier, J. Weinmeister et al., *Bubble Generation in the SNS 2 MW Mercury Target*, IPAC 2021 - 12th International Particle Accelerator Conference, ISSN 2673-5490:3567-3570 (2021) doi:10.18429/JACoW-IPAC2021-WEPAB367.

**J. Weinmeister**, C. Jesse, and P. Jain, *Gas Coolant Channel Optimization for Transformational Challenge Reactor*, Transactions of the American Nuclear Society, 123(1):1627-1630 (2020) doi:10.13182/T123-33107.

F. Rasheed, E. Dominguez-Ontiveros, J. Weinmeister, and C. Barbier, *Deep Learning for Intelligent Bubble Size Detection in the Spallation Neutron Source Visual Target*, Proceedings of the 2020 ASME International Mechanical Engineering Congress and Exposition, 10:V010T10A001 (2020) doi:10.1115/IMECE2020-23164. **2021 Robert T. Knapp Award**

**J. Weinmeister** and P. Jain, *Cooling Channel Optimization in Additively Manufactured Gas Cooled Reactor Core*, Transactions of the American Nuclear Society, 122(1):855-858 (2020) doi:10.13182/T122-31977.

**J. Weinmeister**, C. Barbier, and E. Dominguez-Ontiveros, *Gas Wall Layer Experiments for Spallation Neutron Source Target*, Proceedings of the ASME-JSME-KSME 2019 8th Joint Fluids Engineering Conference, 3A:V03AT03A048 (2019) doi:10.1115/AJKFluids2019-5101.

**J. Weinmeister**, N. Xie, X. Gao, A. Prasad, and S. Roy, *Analysis of a Polynomial Chaos-Kriging Metamodel for Uncertainty Quantification in Aerospace Applications*, 2018 AIAA/ASCE/AHS/ASC Structures, Structural Dynamics, and Materials Conference, AIAA 2018-0911 (2018) doi:10.2514/6.2018-0911.

**J. Weinmeister**, N. Xie, X. Gao, A. Prasad, and S. Roy, *Combining a Reduced Polynomial Chaos Expansion Approach with Universal Kriging for Uncertainty Quantification*, 8th AIAA Theoretical Fluid Mechanics Conference, AIAA 2017-3481 (2017) doi:10.2514/6.2017-3481.

### **Reports**

B.J. Ade, J. Weinmeister, et al., *Iterative Design Incorporating As-Built Tolerances from Additive Manufacturing of Metal and Ceramic Structures*, Oak Ridge National Laboratory, ORNL/TM-2021/2248 (2021).

B.R. Betzler et al. [including J. Weinmeister], *Transformational Challenge Reactor Preliminary Design Report*, Oak Ridge National Laboratory, ORNL/TM-2020/1718 (2020).

B.R. Betzler et al. [including J. Weinmeister], *Transformational Challenge Reactor Conceptual Design Report*, Oak Ridge National Laboratory, ORNL/SPR-2020/1433 (2020).

### **Other Presentations**

**J. Weinmeister**, X. Gao, A. Prasad, and S. Roy, *Uncertainty Quantification for Combined Polynomial Chaos Kriging Surrogate Models*, 70th Annual Meeting of the APS Division of Fluid Dynamics, 62:14 (2017) <http://meetings.aps.org/link/BAPS.2017.DFD.Q34.5>.