

David Pugmire

Distinguished Research Scientist
Oak Ridge National Laboratory

pugmire@ornl.gov

[Google Scholar](#) — [ORCID: 0000-0003-0647-2634](#)

Education

2000 Ph.D. in Computer Science. University of Utah, Salt Lake City, UT
1992 B.S. Computer Science. University of Utah, Salt Lake City, UT

Professional Experience

2021–Present Distinguished Research Scientist, Oak Ridge National Laboratory
2020–Present Visualization Group Lead, Oak Ridge National Laboratory
2016–Present Joint Faculty Professor, EE and CS Department, University of Tennessee
2015–2021 Senior Research Scientist, Oak Ridge National Laboratory
2013–2020 Visualization Team Lead, Scientific Data Group, Oak Ridge National Laboratory
2011–2015 Research Scientist, Scientific Data Group, Oak Ridge National Laboratory
2011–2013 Visualization Team Lead, Scientific Computing Group, Oak Ridge National Laboratory
2007–2011 Research Scientist, Scientific Computing Group, Oak Ridge National Laboratory
2003–2007 Research Scientist, High Performance Computing Group, Los Alamos National Laboratory
2000–2003 Design Manager, IronCAD, LLC
1997–2000 Lead Software Engineer, IronCAD, LLC

Awards

- **2025** - Best Paper Award, 2025 IEEE Workshop on Uncertainty Visualization: Unraveling Relationships of Uncertainty, AI, and Decision-Making Paper: "Efficient Probabilistic Visualization of Local Divergence of 2D Vector Fields with Independent Gaussian Uncertainty"
- **2025** - Best Paper Award, Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis Paper: "ORBIT-2: Scaling Exascale Vision Foundation Models for Weather and Climate Downscaling"
- **2024** - Best Paper Award Honorable Mention, 2024 IEEE Workshop on Uncertainty Visualization: Applications, Techniques, Software, and Decision Frameworks Paper: "FunMC²: A Filter for Uncertainty Visualization of Multivariate Data on Multi-Core Devices"
- **2021** - Best Short Paper Award, Eurographics Symposium on Parallel Graphics and Visualization (EGPGV) Paper: "HyLiPoD: Parallel Particle Advection Via a Hybrid of Lifeline Scheduling and Parallelization-Over-Data"
- **2019** - Honorable Mention Best Paper, IEEE Symposium on Large Data Analysis and Visualization (LDAV) Paper: "A Lifeline-Based Approach for Work Requesting and Parallel Particle Advection"

- **2018** - Best Paper Award Finalist, Eurographics Symposium on Parallel Graphics and Visualization (EGPGV) Paper: "Performance-Portable Particle Advection with VTK-m"
- **2018** - Long Term Paper Impact, Computer Science and Mathematics Division Award: Extreme scaling of production visualization software on diverse architectures
- **2016** - Best Paper Award Finalist, Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis Paper: "Performance Modeling of In Situ Rendering"
- **2016** - Significant Event Award, Oak Ridge National Laboratory Project: In Transit Visualization of Fusion Simulations
- **2011** - Juried Award for Best Visual Aesthetics, Scientific Discovery through Advanced Computing (SciDAC) "Magnetic Field Outflows from Active Galactic Nuclei"
- **2011** - People's Choice Award, Scientific Discovery through Advanced Computing (SciDAC) "Magnetic Field Outflows from Active Galactic Nuclei"
- **2011** - Significant Event Award, Oak Ridge National Laboratory Project: "Support to DOE in response to the Fukushima Dai-ichi damaged reactors"
- **2011** - Staff Member of the Month, Oak Ridge National Laboratory
- **2010** - People's Choice Award, Scientific Discovery through Advanced Computing (SciDAC) "Clean Energy for the Future with the ITER Reactor"
- **2010** - Science and Technology Award of Excellence, Oak Ridge National Laboratory
- **2006** - Exceptional Contribution Award, Los Alamos National Laboratory
- **2006** - R&D 100 Award, R&D World Magazine Project: "PixelVision: An NPU-Based Image Compositor"
- **2005** - Computing Division Exceptional Contribution Award, Los Alamos National Laboratory
- **2004** - Computing Division Exceptional Contribution Award, Los Alamos National Laboratory

Publications

Journal Articles

1. Wang, Z., Moreland, K., Larsen, M., Kress, J., Childs, H., Li, G., Shan, G., Pugmire, D.. *In Situ Workload Estimation for Block Assignment and Duplication in Parallelization-Over-Data Particle Advection*. *Computer Graphics Forum*, 2025. DOI: [10.1111/cgf.70108](https://doi.org/10.1111/cgf.70108)
2. Wang, Z., Moreland, K., Larsen, M., Kress, J., Childs, H., Pugmire, D.. *Parallelize Over Data Particle Advection: Participation, Ping Pong Particles, and Overhead*. *IEEE Transactions on Visualization and Computer Graphics*, 2025. DOI: [10.1109/tvcg.2025.3557453](https://doi.org/10.1109/tvcg.2025.3557453)
3. Ahrens, J., Arienti, M., Ayachit, U., Bennett, J., Binyahib, R., Biswas, A., Bremer, P., Brugger, E., Bujack, R., Carr, H., Chen, J., Childs, H., Dutta, S., Essiari, A., Geveci, B., Harrison, C., Hazarika, S., Hickman Fulp, M., Hristov, P., Huang, X., et al.. *The ECP ALPINE project: In situ and post hoc visualization infrastructure and analysis capabilities for exascale*. *The International Journal of High Performance Computing Applications*, 2025. DOI: [10.1177/10943420241286521](https://doi.org/10.1177/10943420241286521)

4. Athawale, T., Wang, Z., Pugmire, D., Moreland, K., Gong, Q., Klasky, S., Johnson, C., Rosen, P.. *Uncertainty Visualization of Critical Points of 2D Scalar Fields for Parametric and Nonparametric Probabilistic Models*. *IEEE Transactions on Visualization and Computer Graphics*, 2025. DOI: [10.1109/tvcg.2024.3456393](https://doi.org/10.1109/tvcg.2024.3456393)
5. Athawale, T., Triana, B., Kotha, T., Pugmire, D., Rosen, P.. *A Comparative Study of the Perceptual Sensitivity of Topological Visualizations to Feature Variations*. *IEEE Transactions on Visualization and Computer Graphics*, 2024. DOI: [10.1109/tvcg.2023.3326592](https://doi.org/10.1109/tvcg.2023.3326592)
6. Cui, C., Lei, W., Liu, Q., Peter, D., Bozdağ, E., Tromp, J., Hill, J., Podhorszki, N., Pugmire, D.. *GLAD-M35: a joint P and S global tomographic model with uncertainty quantification*. *Geophysical Journal International*, 2024. DOI: [10.1093/gji/ggae270](https://doi.org/10.1093/gji/ggae270)
7. Moreland, K., Athawale, T., Bolea, V., Bolstad, M., Brugger, E., Childs, H., Huebl, A., Lo, L., Geveci, B., Marsaglia, N., Philip, S., Pugmire, D., Rizzi, S., Wang, Z., Yenpure, A.. *Visualization at exascale: Making it all work with VTK-m*. *The International Journal of High Performance Computing Applications*, 2024. DOI: [10.1177/10943420241270969](https://doi.org/10.1177/10943420241270969)
8. Anirudh, R., Archibald, R., Asif, M., Becker, M., Benkadda, S., Bremer, P., Budé, R., Chang, C., Chen, L., Churchill, R., Citrin, J., Gaffney, J., Gainaru, A., Gekelman, W., Gibbs, T., Hamaguchi, S., Hill, C., Humbird, K., Jalas, S., Kawaguchi, S., et al.. *2022 Review of Data-Driven Plasma Science*. *IEEE Transactions on Plasma Science*, 2023. DOI: [10.1109/tps.2023.3268170](https://doi.org/10.1109/tps.2023.3268170)
9. Athawale, T., Johnson, C., Sane, S., Pugmire, D.. *Fiber Uncertainty Visualization for Bivariate Data With Parametric and Nonparametric Noise Models*. *IEEE Transactions on Visualization and Computer Graphics*, 2023. DOI: [10.1109/tvcg.2022.3209424](https://doi.org/10.1109/tvcg.2022.3209424)
10. Yenpure, A., Sane, S., Binyahib, R., Pugmire, D., Garth, C., Childs, H.. *A Guide to Particle Advection Performance*. *CoRR*, 2022. DOI: [10.48550/arxiv.2201.08440](https://doi.org/10.48550/arxiv.2201.08440)
11. Suchyta, E., Klasky, S., Podhorszki, N., Wolf, M., Adesoji, A., Chang, C., Choi, J., Davis, P., Dominiski, J., Ethier, S., others. *The exascale framework for high fidelity coupled simulations (effis): Enabling whole device modeling in fusion science*. *The International Journal of High Performance Computing Applications*, 2022. DOI: [10.1177/10943420211019119](https://doi.org/10.1177/10943420211019119)
12. Gainaru, A., Wan, L., Wang, R., Suchyta, E., Chen, J., Podhorszki, N., Kress, J., Pugmire, D., Klasky, S.. *Understanding the Impact of Data Staging for Coupled Scientific Workflows*. *IEEE Transactions on Parallel and Distributed Systems*, 2022. DOI: [10.1109/tpds.2022.3179989](https://doi.org/10.1109/tpds.2022.3179989)
13. Alexander, F., Ang, J., Bilbrey, J., Balewski, J., Casey, T., Chard, R., Choudhury, S., Debusschere, B., DeGennaro, A., Dryden, N., Ellis, J., Foster, I., Garcia Cardona, C., Ghosh, S., Harrington, P., Huang, Y., Jha, S., Johnston, T., Kagawa, A., Kannan, R., et al.. *Co-design Center for Exascale Machine Learning Technologies (ExaLearn)*. *The International Journal of High Performance Computing Applications*, 2021. DOI: [10.1177/10943420211029302](https://doi.org/10.1177/10943420211029302)
14. Liang, X., Whitney, B., Chen, J., Wan, L., Liu, Q., Tao, D., Kress, J., Pugmire, D., Wolf, M., Podhorszki, N., others. *MGARD+: Optimizing multilevel methods for error-bounded scientific data reduction*. *IEEE Transactions on Computers*, 2021. DOI: [10.1109/tc.2021.3092201](https://doi.org/10.1109/tc.2021.3092201)
15. Moreland, K., Maynard, R., Pugmire, D., Yenpure, A., Vacanti, A., Larsen, M., Childs, H.. *Minimizing development costs for efficient many-core visualization using MCD3*. *Parallel Computing*, 2021. DOI: [10.1016/j.parco.2021.102834](https://doi.org/10.1016/j.parco.2021.102834)

16. Dominski, J., Cheng, J., Merlo, G., Carey, V., Hager, R., Ricketson, L., Choi, J., Ethier, S., Germaschewski, K., Ku, S., Mollen, A., Podhorszki, N., Pugmire, D., Suchyta, E., Trivedi, P., Wang, R., Chang, C., Hittinger, J., Jenko, F., Klasky, S., et al.. *Spatial coupling of gyrokinetic simulations, a generalized scheme based on first-principles*. *Physics of Plasmas*, 2021. DOI: [10.1063/5.0027160](https://doi.org/10.1063/5.0027160)
17. Godoy, W., Podhorszki, N., Wang, R., Atkins, C., Eisenhauer, G., Gu, J., Davis, P., Choi, J., Germaschewski, K., Huck, K., Huebl, A., Kim, M., Kress, J., Kurc, T., Liu, Q., Logan, J., Mehta, K., Ostrouchov, G., Parashar, M., Poeschel, F., et al.. *ADIOS 2: The Adaptable Input Output System. A framework for high-performance data management*. *SoftwareX*, 2020. DOI: [10.1016/j.softx.2020.100561](https://doi.org/10.1016/j.softx.2020.100561)
18. Qin, Z., Wang, J., Liu, Q., Chen, J., Pugmire, D., Podhorszki, N., Klasky, S.. *Estimating Lossy Compressibility of Scientific Data Using Deep Neural Networks*. *IEEE Letters of the Computer Society*, 2020. DOI: [10.1109/loics.2020.2971940](https://doi.org/10.1109/loics.2020.2971940)
19. Logan, J., Ainsworth, M., Atkins, C., Chen, J., Choi, J., Gu, J., Kress, J., Eisenhauer, G., Geveci, B., Godoy, W., others. *Extending the Publish/Subscribe Abstraction for High-Performance I/O and Data Management at Extreme Scale*. *Bulletin of the IEEE Technical Committee on Data Engineering*, 2020. DOI: [10.22215/etd/2003-05586](https://doi.org/10.22215/etd/2003-05586)
20. Lei, W., Ruan, Y., Bozdağ, E., Peter, D., Lefebvre, M., Komatitsch, D., Tromp, J., Hill, J., Podhorszki, N., Pugmire, D.. *Global adjoint tomography—model GLAD-M25*. *Geophysical Journal International*, 2020. DOI: [10.1093/gji/ggaa253](https://doi.org/10.1093/gji/ggaa253)
21. Reina, G., Childs, H., Matkovič, K., Bühler, K., Waldner, M., Pugmire, D., Kozlíková, B., Ropinski, T., Ljung, P., Itoh, T., Gröller, E., Krone, M.. *The moving target of visualization software for an increasingly complex world*. *Comput. Graph.*, 2020. DOI: [10.1016/j.cag.2020.01.005](https://doi.org/10.1016/j.cag.2020.01.005)
22. Ruan, Y., Lei, W., Lefebvre, M., Modrak, R., Smith, J., Orsvuran, R., Bozdağ, E., Hill, J., Podhorszki, N., Pugmire, D., Tromp, J.. *A New Generation of Earth Mantle Model from Global Adjoint Tomography*. *Acta Geologica Sinica (English Edition)*, 2019. DOI: [10.1111/1755-6724.13991](https://doi.org/10.1111/1755-6724.13991)
23. Bozdağ, E., Peter, D., Lefebvre, M., Komatitsch, D., Tromp, J., Hill, J., Podhorszki, N., Pugmire, D.. *Global adjoint tomography: first-generation model*. *Geophysical Journal International*, 2016. DOI: [10.1093/gji/ggw356](https://doi.org/10.1093/gji/ggw356)
24. Kress, J., Churchill, R., Klasky, S., Kim, M., Childs, H., Pugmire, D.. *Preparing for In Situ Processing on Upcoming Leading-edge Supercomputers*. *Supercomputing frontiers and innovations*, 2016. DOI: [10.14529/jsfi160404](https://doi.org/10.14529/jsfi160404)
25. Moreland, K., Sewell, C., Usher, W., Lo, L., Meredith, J., Pugmire, D., Kress, J., Schroots, H., Ma, K., Childs, H., Larsen, M., Chen, C., Maynard, R., Geveci, B.. *VTK-m: Accelerating the Visualization Toolkit for Massively Threaded Architectures*. *IEEE Computer Graphics and Applications*, 2016. DOI: [10.1109/mcg.2016.48](https://doi.org/10.1109/mcg.2016.48)
26. Huebl, A., Pugmire, D., Schmitt, F., Pausch, R., Bussmann, M.. *Visualizing the Radiation of the Kelvin-Helmholtz Instability*. *IEEE Transactions on Plasma Science*, 2014. DOI: [10.1109/tps.2014.2327392](https://doi.org/10.1109/tps.2014.2327392)
27. Chen, W., Ostrouchov, G., Pugmire, D., Prabhat, Wehner, M.. *A Parallel EM Algorithm for Model-Based Clustering Applied to the Exploration of Large Spatio-Temporal Data*. *Technometrics*, 2013. DOI: [10.1080/00401706.2013.826146](https://doi.org/10.1080/00401706.2013.826146)
28. Smith, B., Maxwell, T., Santos, E., Potter, G., Williams, D., Kindig, D., Williams, S., Shipman, G., Doutriaux, C., Patchett, J., others. *The Ultra-scale Visualization Climate Data Analysis Tools (UV-CDAT): Data Analysis and Visualization for Geoscience Data*. *Computer*, 2013. DOI: [10.2172/1022945](https://doi.org/10.2172/1022945)

29. Williams, D., Bremer, T., Doutriaux, C., Patchett, J., Williams, S., Shipman, G., Miller, R., Pugmire, D., Smith, B., Steed, C., Bethel, E., Childs, H., Krishnan, H., Prabhat, P., Wehner, M., Silva, C., Santos, E., Koop, D., Ellqvist, T., Poco, J., et al.. *Ultrascale Visualization of Climate Data*. *Computer*, 2013. DOI: [10.1109/mc.2013.119](https://doi.org/10.1109/mc.2013.119)
30. Sutter, P., Yang, H., Ricker, P., Foreman, G., Pugmire, D.. *An examination of magnetized outflows from active galactic nuclei in galaxy clusters*. *Monthly Notices of the Royal Astronomical Society*, 2012. DOI: [10.1111/j.1365-2966.2011.19875.x](https://doi.org/10.1111/j.1365-2966.2011.19875.x)
31. Sutter, P., Yang, H., Ricker, P., Foreman, G., Pugmire, D.. *An examination of magnetized outflows from active galactic nuclei in galaxy clusters: Magnetized outflows in galaxy clusters*. *Monthly Notices of the Royal Astronomical Society*, 2011. DOI: [10.1111/j.1365-2966.2011.19875.x](https://doi.org/10.1111/j.1365-2966.2011.19875.x)
32. Green, D., Jaeger, E., Chen, G., Berry, L., Pugmire, D., Canik, J., Ryan, P.. *Simulation of High-Harmonic Fast-Wave Heating on the National Spherical Tokamak Experiment*. *IEEE Transactions on Plasma Science*, 2011. DOI: [10.1109/tps.2011.2160370](https://doi.org/10.1109/tps.2011.2160370)
33. Camp, D., Garth, C., Childs, H., Pugmire, D., Joy, K.. *Streamline Integration Using MPI-Hybrid Parallelism on a Large Multicore Architecture*. *IEEE Transactions on Visualization and Computer Graphics*, 2011. DOI: [10.1109/tvcg.2010.259](https://doi.org/10.1109/tvcg.2010.259)
34. Childs, H., Brugger, E., Whitlock, B., Meredith, J., Ahern, S., Bonnell, K., Miller, M., Weber, G., Harrison, C., Pugmire, D., Fogal, T., Garth, C., Sanderson, A., Bethel, E., Durant, M., Camp, D., Favre, J., Rübel, O., Navrátil, P., Wheeler, M., et al.. *VisIt: An End-User Tool For Visualizing and Analyzing Very Large Data*. *Proceedings of SciDAC 2011*, 2011. DOI: [10.1201/b12985-29](https://doi.org/10.1201/b12985-29)
35. Monroe, L., Pugmire, D.. *A case study of collaborative facilities use in engineering design*. *The Engineering Reality of Virtual Reality 2010*, 2010. DOI: [10.1117/12.839511](https://doi.org/10.1117/12.839511)
36. Childs, H., Pugmire, D., Ahern, S., Whitlock, B., Howison, M., Prabhat, Weber, G., Bethel, E.. *Extreme Scaling of Production Visualization Software on Diverse Architectures*. *IEEE Computer Graphics and Applications*, 2010. DOI: [10.1109/mcg.2010.51](https://doi.org/10.1109/mcg.2010.51)
37. Ahrens, J., Santos, E., Lins, L., Freire, J., Silva, C.. *VISMASHUP: streamlining the creation of custom visualization applications*. *IEEE Transactions on Visualization and Computer Graphics*, 2009. DOI: [10.1109/tvcg.2009.195](https://doi.org/10.1109/tvcg.2009.195)
38. Garth, C., Deines, E., Joy, K., Bethel, E., Childs, H., Weber, G., Ahern, S., Pugmire, D., Sanderson, A., Johnson, C.. *Vector field visual data analysis technologies for petascale computational science*. *SciDAC Review*, 2009. DOI: [10.2172/1020344](https://doi.org/10.2172/1020344)
39. Pugmire, D., Monroe, L., Connor Davenport, C., DuBois, A., DuBois, D., Poole, S.. *NPU-Based Image Compositing in a Distributed Visualization System*. *IEEE Transactions on Visualization and Computer Graphics*, 2007. DOI: [10.1109/tvcg.2007.1026](https://doi.org/10.1109/tvcg.2007.1026)
40. Pugmire, D., Modi, D., Monroe, L.. *Pick-n-Place: A Virtual Reality Assembly Tool*. *Assembly Automation*, 2007. DOI: [10.1108/aa.2007.03327aad.004](https://doi.org/10.1108/aa.2007.03327aad.004)

Conference Papers

41. Wang, X., Choi, J., Kurihaya, T., Lyngaas, I., Yoon, H., Xiao, X., Pugmire, D., Fan, M., Nafi, N., Tsaris, A., Aji, A., Hossain, M., Wahib, M., Wang, D., Thornton, P., Balaprakash, P., Ashfaq, M., Lu, D.. *ORBIT-2: Scaling Exascale Vision Foundation Models for Weather and Climate Downscaling*. *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis*, 2025. DOI: [10.1145/3712285.3771989](https://doi.org/10.1145/3712285.3771989) (Best Paper Award)

42. Senapati, P., Guan, Q., Pugmire, D., Lu, C., Athawale, T.. *Visualization of Noisy and Less Noisy Computational Basis States in Quantum Computing*. *2025 IEEE International Conference on Quantum Software (QSW)*, 2025. DOI: [10.1109/qsw67625.2025.00011](https://doi.org/10.1109/qsw67625.2025.00011)
43. Hammer, J., Hobson, T., Pugmire, D., Klasky, S., Moreland, K., Huang, J.. *A Personalized AI Assistant For Intuition-Driven Visual Explorations*. *2024 IEEE 20th International Conference on e-Science (e-Science)*, 2024. DOI: [10.1109/e-science62913.2024.10678681](https://doi.org/10.1109/e-science62913.2024.10678681)
44. Athawale, T., Wang, Z., Johnson, C., Pugmire, D.. *Data-Driven Computation of Probabilistic Marching Cubes for Efficient Visualization of Level-Set Uncertainty*. *EuroVis 2024*, 2024. DOI: [10.2312/evs.20241071](https://doi.org/10.2312/evs.20241071)
45. Pugmire, D., Moreland, K., Athawale, T., Hammer, J., Huang, J.. *Top Research Challenges and Opportunities for Near Real-Time Extreme-Scale Visualization of Scientific Data*. *2024 IEEE 20th International Conference on e-Science (e-Science)*, 2024. DOI: [10.1109/e-science62913.2024.10678727](https://doi.org/10.1109/e-science62913.2024.10678727)
46. Wang, Z., Athawale, T., Moreland, K., Chen, J., Johnson, C., Pugmire, D.. *FunMC²: A Filter for Uncertainty Visualization of Marching Cubes on Multi-Core Devices*. *Eurographics Symposium on Parallel Graphics and Visualization*, 2023. DOI: [10.2312/pgv.20231081](https://doi.org/10.2312/pgv.20231081)
47. Trinh, A., Sheth, S., Gaihre, A., Ding, C., Chen, J., Wang, F., Pugmire, D., Klasky, S., Liu, H., Wan, L.. *Understanding Node Allocation on Leadership-Class Supercomputers with Graph Analytics*. *2023 IEEE International Conference on High Performance Computing & Communications, Data Science & Systems, Smart City & Dependability in Sensor, Cloud & Big Data Systems & Application (HPCC/DSS/SmartCity/DependSys)*, 2023. DOI: [10.1109/hpcc-dss-smartcity-dependsys60770.2023.00113](https://doi.org/10.1109/hpcc-dss-smartcity-dependsys60770.2023.00113)
48. Bolstad, M., Moreland, K., Pugmire, D., Rogers, D., Lo, L., Geveci, B., Childs, H., Rizzi, S.. *VTK-m: Visualization for the Exascale Era and Beyond*. *ACM SIGGRAPH 2023 Talks*, 2023. DOI: [10.1145/3587421.3595466](https://doi.org/10.1145/3587421.3595466)
49. Han, M., Athawale, T., Pugmire, D., Johnson, C.. *Accelerated Probabilistic Marching Cubes by Deep Learning for Time-Varying Scalar Ensembles*. *2022 IEEE Visualization and Visual Analytics (VIS)*, 2022. DOI: [10.1109/vis54862.2022.00040](https://doi.org/10.1109/vis54862.2022.00040)
50. Suchyta, E., Choi, J., Ku, S., Pugmire, D., Gainaru, A., Huck, K., Kube, R., Scheinberg, A., Suter, F., Chang, C., Munson, T., Podhorszki, N., Klasky, S.. *Hybrid Analysis of Fusion Data for Online Understanding of Complex Science on Extreme Scale Computers*. *2022 IEEE International Conference on Cluster Computing (CLUSTER)*, 2022. DOI: [10.1109/cluster51413.2022.00035](https://doi.org/10.1109/cluster51413.2022.00035)
51. Chen, J., Wan, L., Liang, X., Whitney, B., Liu, Q., Pugmire, D., Thompson, N., Wolf, M., Munson, T., Foster, I., Klasky, S.. *Accelerating Multigrid-based Hierarchical Scientific Data Refactoring on GPUs*. *2021 IEEE International Parallel and Distributed Processing Symposium (IPDPS)*, 2021. DOI: [10.1109/ipdps49936.2021.00094](https://doi.org/10.1109/ipdps49936.2021.00094)
52. Liang, X., Gong, Q., Chen, J., Whitney, B., Wan, L., Liu, Q., Pugmire, D., Archibald, R., Podhorszki, N., Klasky, S.. *Error-controlled, progressive, and adaptable retrieval of scientific data with multilevel decomposition*. *Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis*, 2021. DOI: [10.1145/3458817.3476179](https://doi.org/10.1145/3458817.3476179)
53. Binyahib, R., Pugmire, D., Childs, H.. *HyLiPoD: Parallel Particle Advection Via a Hybrid of Life-line Scheduling and Parallelization-Over-Data*. *Eurographics Symposium on Parallel Graphics and Visualization (EGPGV)*, 2021. DOI: [10.1109/ldav48142.2019.8944355](https://doi.org/10.1109/ldav48142.2019.8944355) (**Best Short Paper Award**)
54. Schwartz, S., Childs, H., Pugmire, D.. *Machine Learning-Based Autotuning for Parallel Particle Advection*. *Eurographics Symposium on Parallel Graphics and Visualization (EGPGV)*, 2021. DOI: [10.1162/99608f92.beeb1183](https://doi.org/10.1162/99608f92.beeb1183)

55. Choi, J., Churchill, M., Gong, Q., Ku, S., Lee, J., Rangarajan, A., Ranka, S., Pugmire, D., Chang, C., Klasky, S.. *Neural data compression for physics plasma simulation. Neural Compression: From Information Theory to Applications – Workshop @ ICLR 2021*, 2021. DOI: [10.1109/dcc50243.2021.00048](https://doi.org/10.1109/dcc50243.2021.00048)
56. Wan, L., Wolf, M., Wang, F., Choi, J., Ostrouchov, G., Chen, J., Podhorszki, N., Logan, J., Mehta, K., Klasky, S., Pugmire, D.. *I/O Performance Characterization and Prediction through Machine Learning on HPC Systems. CUG 2020 Proceedings*, 2020. DOI: [10.4018/978-1-6684-3795-7.ch009](https://doi.org/10.4018/978-1-6684-3795-7.ch009)
57. Kress, J., Larsen, M., Choi, J., Kim, M., Wolf, M., Podhorszki, N., Klasky, S., Childs, H., Pugmire, D.. *Opportunities for Cost Savings with In-Transit Visualization. High Performance Computing: 35th International Conference, ISC High Performance 2020, Frankfurt/Main, Germany, June 22–25, 2020, Proceedings*, 2020. DOI: [10.1007/978-3-030-50743-5_8](https://doi.org/10.1007/978-3-030-50743-5_8)
58. Binyahib, R., Pugmire, D., Yenpure, A., Childs, H.. *Parallel Particle Advection Bake-Off for Scientific Visualization Workloads. 2020 IEEE International Conference on Cluster Computing (CLUSTER)*, 2020. DOI: [10.1109/cluster49012.2020.00048](https://doi.org/10.1109/cluster49012.2020.00048)
59. Pugmire, D., Kress, J., Chen, J., Childs, H., Choi, J., Ganyushin, D., Geveci, B., Kim, M., Klasky, S., Liang, X., Logan, J., Marsaglia, N., Mehta, K., Podhorszki, N., Ross, C., Suchyta, E., Thompson, N., Walton, S., Wan, L., Wolf, M.. *Visualization as a Service for Scientific Data. Smoky Mountains Computational Sciences and Engineering Conference*, 2020. DOI: [10.1109/cluster49012.2020.00048](https://doi.org/10.1109/cluster49012.2020.00048)
60. Binyahib, R., Pugmire, D., Norris, B., Childs, H.. *A Lifeline-Based Approach for Work Requesting and Parallel Particle Advection. IEEE Symposium on Large Data Analysis and Visualization (LDAV)*, 2019. DOI: [10.1109/ldav48142.2019.8944355](https://doi.org/10.1109/ldav48142.2019.8944355) (**Honorable Mention Best Paper**)
61. Kress, J.. *Comparing the Efficiency of In Situ Visualization Paradigms at Scale. High Performance Computing*, 2019. DOI: [10.1109/ldav51489.2020.00009](https://doi.org/10.1109/ldav51489.2020.00009)
62. Klasky, S., Wolf, M., Ainsworth, M., Atkins, C., Choi, J., Eisenhauer, G., Geveci, B., Godoy, W., Kim, M., Kress, J., Kurc, T., Liu, Q., Logan, J., Maccabe, A., Mehta, K., Ostrouchov, G., Parashar, M., Podhorszki, N., Pugmire, D., Suchyta, E., et al.. *A View from ORNL: Scientific Data Research Opportunities in the Big Data Age. 2018 IEEE 38th International Conference on Distributed Computing Systems (ICDCS)*, 2018. DOI: [10.1109/icdcs.2018.00136](https://doi.org/10.1109/icdcs.2018.00136)
63. Choi, J., Chang, C., Dominski, J., Klasky, S., Merlo, G., Suchyta, E., Ainsworth, M., Allen, B., Cappello, F., Churchill, M., Davis, P., Di, S., Eisenhauer, G., Ethier, S., Foster, I., Geveci, B., Guo, H., Huck, K., Jenko, F., Kim, M., et al.. *Coupling Exascale Multiphysics Applications: Methods and Lessons Learned. 2018 IEEE 14th International Conference on e-Science (e-Science)*, 2018. DOI: [10.1109/escience.2018.00133](https://doi.org/10.1109/escience.2018.00133)
64. Kim, M., Klasky, S., Pugmire, D.. *Dense texture flow visualization using data-parallel primitives. Proceedings of the Symposium on Parallel Graphics and Visualization*, 2018. DOI: [10.1109/ldav.2018.8739239](https://doi.org/10.1109/ldav.2018.8739239)
65. Pugmire, D., Yenpure, A., Kim, M., Kress, J., Maynard, R., Childs, H., Hentschel, B.. *Performance-Portable Particle Advection with VTK-m. Eurographics Symposium on Parallel Graphics and Visualization (EGPGV)*, 2018. DOI: [10.2312/pgv.20181094](https://doi.org/10.2312/pgv.20181094) (**Best Paper Award Finalist**)
66. Lu, T., Suchyta, E., Pugmire, D., Choi, J., Klasky, S., Liu, Q., Podhorszki, N., Ainsworth, M., Wolf, M.. *Canopus: A Paradigm Shift Towards Elastic Extreme-Scale Data Analytics on HPC Storage. 2017 IEEE International Conference on Cluster Computing (CLUSTER)*, 2017. DOI: [10.1109/cluster.2017.62](https://doi.org/10.1109/cluster.2017.62)

67. Klasky, S., Suchyta, E., Ainsworth, M., Liu, Q., Whitney, B., Wolf, M., Choi, J., Foster, I., Kim, M., Logan, J., Mehta, K., Munson, T., Ostrouchov, G., Parashar, M., Podhorszki, N., Pugmire, D., Wan, L.. *Exacution: Enhancing Scientific Data Management for Exascale. 2017 IEEE 37th International Conference on Distributed Computing Systems (ICDCS)*, 2017. DOI: [10.1109/icdcs.2017.256](https://doi.org/10.1109/icdcs.2017.256)
68. Pugmire, D., Bozda\{}ug, E., Lefebvre, M., Tromp, J., Komatitsch, D., Peter, D., Podhorszki, N., Hill, J.. *Pillars of the Mantle: Imaging the Interior of the Earth with Adjoint Tomography. Practice and Experience in Advanced Research Computing 2017: Sustainability, Success and Impact*, 2017. DOI: [10.1145/3093338.3104170](https://doi.org/10.1145/3093338.3104170)
69. M. Larsen, C. Harrison, J. Kress, D. Pugmire, J. S. Meredith and H. Childs. *Performance Modeling of In Situ Rendering. Proceedings of the International Conference for High Performance Computing, Networking, Storage and Analysis*, 2016. DOI: [10.1109/SC.2016.23](https://doi.org/10.1109/SC.2016.23) (**Best Paper Award Finalist**)
70. Choi, J., Kurc, T., Logan, J., Wolf, M., Suchyta, E., Kress, J., Pugmire, D., Podhorszki, N., Byun, E., Ainsworth, M., Parashar, M., Klasky, S.. *Stream processing for near real-time scientific data analysis. 2016 New York Scientific Data Summit (NYSDS)*, 2016. DOI: [10.1109/nysds.2016.7747804](https://doi.org/10.1109/nysds.2016.7747804)
71. Tchoua, R., Choi, J., Klasky, S., Liu, Q., Logan, J., Moreland, K., Mu, J., Parashar, M., Podhorszki, N., Pugmire, D., Wolf, M.. *ADIOS Visualization Schema: A First Step Towards Improving Interdisciplinary Collaboration in High Performance Computing. 2013 IEEE 9th International Conference on e-Science*, 2013. DOI: [10.1109/escience.2013.24](https://doi.org/10.1109/escience.2013.24)
72. Krishnan, H., Harrison, C., Whitlock, B., Sanderson, A., Pugmire, D.. *Exploring Collaborative HPC Visualization Workflows using VisIt and Python. Proceedings of the 12th Python in Science Conference*, 2013. DOI: [10.25080/majora-8b375195-00b](https://doi.org/10.25080/majora-8b375195-00b)
73. Camp, D., Krishnan, H., Pugmire, D., Garth, C., Johnson, I., Bethel, E., Joy, K., Childs, H.. *GPU acceleration of particle advection workloads in a parallel, distributed memory setting. Proceedings of the 13th Eurographics Symposium on Parallel Graphics and Visualization*, 2013. DOI: [10.1109/ldav.2013.6675152](https://doi.org/10.1109/ldav.2013.6675152)
74. Meredith, J., Sisneros, R., Pugmire, D., Ahern, S.. *A Distributed Data-Parallel Framework for Analysis and Visualization Algorithm Development. Proceedings of the 5th Annual Workshop on General Purpose Processing with Graphics Processing Units*, 2012. DOI: [10.1145/2159430.2159432](https://doi.org/10.1145/2159430.2159432)
75. Tchoua, R., Abbasi, H., Klasky, S., Liu, Q., Podhorszki, N., Pugmire, D., Tian, Y., Wolf, M.. *Collaborative monitoring and visualization of HPC data. 2012 International Conference on Collaboration Technologies and Systems (CTS)*, 2012. DOI: [10.1109/cts.2012.6261083](https://doi.org/10.1109/cts.2012.6261083)
76. Meredith, J., Ahern, S., Childs, H.. *EAVL: The Extreme-scale Analysis and Visualization Library. Eurographics Symposium on Parallel Graphics and Visualization (EGPGV)*, 2012. DOI: [10.2312/egpgv.egpgv12.021-030](https://doi.org/10.2312/egpgv.egpgv12.021-030)
77. Choi, J., Abbasi, H., Pugmire, D., Podhorszki, N., Klasky, S., Capdevila, C., Parashar, M., Wolf, M., Qiu, J., Fox, G.. *Mining hidden mixture context with ADIOS-P to improve predictive pre-fetcher accuracy. 2012 IEEE 8th International Conference on E-Science*, 2012. DOI: [10.1109/escience.2012.6404418](https://doi.org/10.1109/escience.2012.6404418)
78. Camp, D., Childs, H., Garth, C., Pugmire, D., Joy, K.. *Parallel stream surface computation for large data sets. IEEE Symposium on Large Data Analysis and Visualization (LDAV)*, 2012. DOI: [10.1109/ldav.2012.6378974](https://doi.org/10.1109/ldav.2012.6378974)
79. Pugmire, D., Sutter, P., Ricker, P., Yang, H., Foreman, G.. *Magnetic field outflows from active galactic nuclei. Proceedings of the 2011 Companion on High Performance Computing Networking, Storage and Analysis Companion*, 2011. DOI: [10.1145/2148600.2148668](https://doi.org/10.1145/2148600.2148668)

80. Ahrens, J., Patchett, J., Pugmire, D., Ahern, S.. *Parallel visualization and analysis with paraview on a Cray XT4*. *Cray Users Group Meeting 2009*, 2009. DOI: [10.1142/s0129626409000444](https://doi.org/10.1142/s0129626409000444)
81. Pugmire, D., Childs, H., Garth, C., Ahern, S., Weber, G.. *Scalable computation of streamlines on very large datasets*. *Proceedings of the Conference on High Performance Computing Networking, Storage and Analysis*, 2009. DOI: [10.1145/1654059.1654076](https://doi.org/10.1145/1654059.1654076)
82. Grimm, C., Pugmire, D., Hughes, J., Bloomenthal, M., Cohen, E.. *Visual Interfaces for Solids Modeling*. *UIST*, 1995. DOI: [10.1145/215585.215652](https://doi.org/10.1145/215585.215652) (**Widgets for 3D surface editing**)

Workshop Papers

83. Ouermi, T., Li, E., Moreland, K., Pugmire, D., Johnson, C., Athawale, T.. *Efficient Probabilistic Visualization of Local Divergence of 2D Vector Fields with Independent Gaussian Uncertainty*. *2025 IEEE Workshop on Uncertainty Visualization: Unraveling Relationships of Uncertainty, AI, and Decision-Making*, 2025. DOI: [10.1109/UncertaintyVisualization68947.2025.00006](https://doi.org/10.1109/UncertaintyVisualization68947.2025.00006) (**Best Paper Award**)
84. Sisneros, R., Athawale, T., Pugmire, D., Moreland, K.. *An Entropy-Based Test and Development Framework for Uncertainty Modeling in Level-Set Visualizations*. *2024 IEEE Workshop on Uncertainty Visualization: Applications, Techniques, Software, and Decision Frameworks*, 2024. DOI: [10.1109/uncertaintyvisualization63963.2024.00015](https://doi.org/10.1109/uncertaintyvisualization63963.2024.00015)
85. Hari, G., Joshi, N., Wang, Z., Gong, Q., Pugmire, D., Moreland, K., Johnson, C., Klasky, S., Podhorszki, N., Athawale, T.. *FunMC²: A Filter for Uncertainty Visualization of Multivariate Data on Multi-Core Devices*. *2024 IEEE Workshop on Uncertainty Visualization: Applications, Techniques, Software, and Decision Frameworks*, 2024. DOI: [10.1109/uncertaintyvisualization63963.2024.00010](https://doi.org/10.1109/uncertaintyvisualization63963.2024.00010) (**Best Paper Award Honorable Mention**)
86. Pugmire, D., Choi, J., Klasky, S., Moreland, K., Suchyta, E., Athawale, T., Wang, Z., Chang, C., Ku, S., Hager, R.. *Performance Improvements of Poincaré Analysis for Exascale Fusion Simulations*. *VisGap - The Gap between Visualization Research and Visualization Software*, 2024. DOI: [10.2312/visgap.20241120](https://doi.org/10.2312/visgap.20241120)
87. Saklani, S., Goel, C., Bansal, S., Wang, Z., Dutta, S., Athawale, T., Pugmire, D., Johnson, C.. *Uncertainty-Informed Volume Visualization using Implicit Neural Representation*. *2024 IEEE Workshop on Uncertainty Visualization: Applications, Techniques, Software, and Decision Frameworks*, 2024. DOI: [10.1109/uncertaintyvisualization63963.2024.00013](https://doi.org/10.1109/uncertaintyvisualization63963.2024.00013)
88. Senapati, P., Athawale, T., Pugmire, D., Guan, Q.. *Advancing Comprehension of Quantum Application Outputs: A Visualization Technique*. *Proceedings of the 2023 International Workshop on Quantum Classical Cooperative*, 2023. DOI: [10.1145/3588983.3596689](https://doi.org/10.1145/3588983.3596689)
89. Pugmire, D., Huang, J., Moreland, K., Klasky, S.. *The Need for Pervasive In Situ Analysis and Visualization (P-ISAV)*. *High Performance Computing*. *ISC High Performance 2022 International Workshops*, 2022. DOI: [10.1007/978-3-031-23220-6_21](https://doi.org/10.1007/978-3-031-23220-6_21)
90. Pugmire, D.. *Fides: A General Purpose Data Model Library for Streaming Data*. *High Performance Computing*, 2021. DOI: [10.1007/978-3-030-90539-2_34](https://doi.org/10.1007/978-3-030-90539-2_34)
91. Binyahib, R., Pugmire, D., Childs, H.. *In Situ Particle Advection Via Parallelizing Over Particles*. *Proceedings of the Workshop on In Situ Infrastructures for Enabling Extreme-Scale Analysis and Visualization (ISAV)*, 2019. DOI: [10.1145/3364228.3364235](https://doi.org/10.1145/3364228.3364235)

92. Leventhal, S., Kim, M., Pugmire, D.. *PAVE: An In Situ Framework for Scientific Visualization and Machine Learning Coupling. 2019 IEEE/ACM 5th International Workshop on Data Analysis and Reduction for Big Scientific Data (DRBSD-5)*, 2019. DOI: [10.1109/drbsd-549595.2019.00007](https://doi.org/10.1109/drbsd-549595.2019.00007)
93. Chen, J., Pugmire, D., Wolf, M., Thompson, N., Logan, J., Mehta, K., Wan, L., Choi, J., Whitney, B., Klasky, S.. *Understanding Performance-Quality Trade-offs in Scientific Visualization Workflows with Lossy Compression. 2019 IEEE/ACM 5th International Workshop on Data Analysis and Reduction for Big Scientific Data (DRBSD-5)*, 2019. DOI: [10.1109/drbsd-549595.2019.00006](https://doi.org/10.1109/drbsd-549595.2019.00006)
94. Kress, J.. *Binning Based Data Reduction for Vector Field Data of a Particle-In-Cell Fusion Simulation. High Performance Computing*, 2018. DOI: [10.1007/978-3-030-02465-9_15](https://doi.org/10.1007/978-3-030-02465-9_15)
95. Kim, M.. *In Situ Analysis and Visualization of Fusion Simulations: Lessons Learned. High Performance Computing*, 2018. DOI: [10.1007/978-3-030-02465-9_16](https://doi.org/10.1007/978-3-030-02465-9_16)
96. Lu, T., Suchyta, E., Choi, J., Podhorszki, N., Klasky, S., Liu, Q., Pugmire, D., Wolf, M., Ainsworth, M.. *Canopus: Enabling Extreme-Scale Data Analytics on Big HPC Storage via Progressive Refactoring. 9th USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage 17)*, 2017. DOI: [10.1109/cluster.2017.62](https://doi.org/10.1109/cluster.2017.62)
97. Kim, M., Evans, T., Klasky, S., Pugmire, D.. *In Situ Visualization of Radiation Transport Geometry. Proceedings of the In Situ Infrastructures on Enabling Extreme-Scale Analysis and Visualization*, 2017. DOI: [10.1145/3144769.3144770](https://doi.org/10.1145/3144769.3144770)
98. Sisneros, R., Pugmire, D.. *Tuned to Terrible: A Study of Parallel Particle Advection State of the Practice. 2016 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, 2016. DOI: [10.1109/ipdpsw.2016.173](https://doi.org/10.1109/ipdpsw.2016.173)
99. Kress, J., Pugmire, D., Klasky, S., Childs, H.. *Visualization and Analysis Requirements for In Situ Processing for a Large-Scale Fusion Simulation Code. 2016 Second Workshop on In Situ Infrastructures for Enabling Extreme-Scale Analysis and Visualization (ISAV)*, 2016. DOI: [10.1109/isav.2016.014](https://doi.org/10.1109/isav.2016.014)
100. Pugmire, D., Kress, J., Choi, J., Klasky, S., Kurc, T., Churchill, R., Wolf, M., Eisenhower, G., Childs, H., Wu, K., Sim, A., Gu, J., Low, J.. *Visualization and Analysis for Near-Real-Time Decision Making in Distributed Workflows. 2016 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, 2016. DOI: [10.1109/ipdpsw.2016.175](https://doi.org/10.1109/ipdpsw.2016.175)
101. Kress, J., Klasky, S., Podhorszki, N., Choi, J., Childs, H., Pugmire, D.. *Loosely Coupled In Situ Visualization: A Perspective on Why It's Here to Stay. Proceedings of the First Workshop on In Situ Infrastructures for Enabling Extreme-Scale Analysis and Visualization*, 2015. DOI: [10.1145/2828612.2828623](https://doi.org/10.1145/2828612.2828623)
102. David Pugmire, J.. *Towards Scalable Visualization Plugins for Data Staging Workflows. 5th International Workshop on Big Data Analytics: Challenges, and Opportunities (BDAC-14), held in conjunction with SC14*, 2014. DOI: [10.1101/212654](https://doi.org/10.1101/212654)

Book Chapters

103. Gong, Q.. *Maintaining Trust in Reduction: Preserving the Accuracy of Quantities of Interest for Lossy Compression. Driving Scientific and Engineering Discoveries Through the Integration of Experiment, Big Data, and Modeling and Simulation*, 2022. DOI: [10.1007/978-3-030-96498-6_2](https://doi.org/10.1007/978-3-030-96498-6_2)
104. Bethel, E., Loring, B., Ayachit, U., Duque, E., Ferrier, N., Insley, J., Gu, J., Kress, J., O'Leary, P., Pugmire, D., Rizzi, S., Thompson, D., Usher, W., Weber, G., Whitlock, B., Wolf, M., Wu, K.. *Proximity Portability and in Transit, M-to-N Data Partitioning and Movement in SENSEI. In Situ Visualization for Computational Science*, 2022. DOI: [10.1007/978-3-030-81627-8_20](https://doi.org/10.1007/978-3-030-81627-8_20)

105. Pugmire, D.. *The Adaptable IO System (ADIOS)*. In *In Situ Visualization for Computational Science*, 2022. DOI: [10.1145/1383529.1383533](https://doi.org/10.1145/1383529.1383533)
106. Bethel, E., Loring, B., Ayachit, U., Camp, D., Duque, E., Ferrier, N., Insley, J., Gu, J., Kress, J., O’Leary, P., Pugmire, D., Rizzi, S., Thompson, D., Weber, G., Whitlock, B., Wolf, M., Wu, K.. *The SENSEI Generic In Situ Interface: Tool and Processing Portability at Scale*. In *In Situ Visualization for Computational Science*, 2022. DOI: [10.1007/978-3-030-81627-8_13](https://doi.org/10.1007/978-3-030-81627-8_13)
107. Bethel, E., Camp, D., Childs, H., Garth, C., Howison, M., Joy, K., Pugmire, D.. *Hybrid Parallelism*. *High Performance Visualization - Enabling Extreme-Scale Scientific Insight*, 2012. DOI: [10.1201/b12985-16](https://doi.org/10.1201/b12985-16)
108. Pugmire, D., Peterka, T., Garth, C.. *Parallel Integral Curves*. *High Performance Visualization - Enabling Extreme-Scale Scientific Insight*, 2012. DOI: [10.1201/b12985-8](https://doi.org/10.1201/b12985-8)
109. Childs, H., Brugger, E., Whitlock, B., Meredith, J., Ahern, S., Pugmire, D., Biagas, K., Miller, M., Harrison, C., Weber, G., Krishnan, H., Fogal, T., Sanderson, A., Garth, C., Bethel, E., Camp, D., Rübél, O., Durant, M., Favre, J., Navrátil, P.. *VisIt*. *High Performance Visualization - Enabling Extreme-Scale Scientific Insight*, 2012. DOI: [10.1201/b12985-21](https://doi.org/10.1201/b12985-21)
110. Childs, H., Pugmire, D., Ahern, S., Whitlock, B., Howison, M., Weber, G., Bethel, E.. *Visualization at Extreme Scale Concurrency*. *High Performance Visualization - Enabling Extreme-Scale Scientific Insight*, 2012. DOI: [10.1201/b12985-17](https://doi.org/10.1201/b12985-17)

Technical Reports

111. Moreland, K., Pugmire, D., Chen, J.. *The Exploitation of Data Reduction for Visualization*. *Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (United States)*, 2022. DOI: [10.2172/1881112](https://doi.org/10.2172/1881112)
112. Moreland, K., Pugmire, D., Geveci, B., Lo, L., Childs, H., Bolstad, M., Shah, R., Wu, P.. *The Importance of Scientific Visualization on Novel Hardware*. *Oak Ridge National Laboratory (ORNL), Oak Ridge, TN (United States)*, 2022. DOI: [10.2172/1885308](https://doi.org/10.2172/1885308)
113. Moreland, K., Pugmire, D., Rogers, D., Childs, H., Ma, K., Geveci, B.. *XVis: Visualization for the Extreme-Scale Scientific Computation Ecosystem (Final Report)*. *Sandia National Laboratories (SNL-NM), Albuquerque, NM (United States)*, 2019. DOI: [10.2172/1547341](https://doi.org/10.2172/1547341)
114. Moreland, K., Pugmire, D., Rogers, D., Childs, H., Ma, K., Geveci, B.. *XVis: Visualization for the Extreme-Scale Scientific-Computation Ecosystem: Year-end report FY17*. *Sandia National Laboratories (SNL-NM), Albuquerque, NM (United States)*, 2017. DOI: [10.2172/1408391](https://doi.org/10.2172/1408391)

Presentations

Invited Talks

- *Data Visualization Pathways*, Oak Ridge Leadership Computing Facility (OLCF) User Meeting, Oak Ridge, TN, USA, 2026.
- *Scientific Data Management*, Rensselaer Polytechnic Institute (RPI), Troy, NY, USA, 2026.
- *Tools and Technologies for Scientific Campaign Management*, University of Oregon, Eugene, OR, USA, 2026.
- *In Situ Workload Estimation for Block Assignment and Duplication in Parallelization-Over-Data Particle Advection*, Eurographics 2025, Luxembourg City, Luxembourg, 2025.

- *Visualization Services*, Princeton Plasma Physics Laboratory, Princeton, NJ, USA, 2025.
- *Data-Driven Computation of Probabilistic Marching Cubes for Efficient Visualization of Level-Set Uncertainty*, Eurographics 2024, Odense, Denmark, 2024.
- *Performance Improvements of Poincaré Analysis for Exascale Fusion Simulations*, Eurographics 2024, Odense, Denmark, 2024.
- *Visualization of Scientific Data at the Exascale and Beyond*, Leeds University, Leeds, United Kingdom, 2023.
- *Poincare Analysis for Magnetic Fieldlines in Tokamaks*, Cambridge University, Cambridge, United Kingdom, 2023.
- *FunMC2: A Filter for Uncertainty Visualization of Marching Cubes on Multi-Core Devices*, Eurographics Symposium on Parallel Graphics and Visualization, Leipzig, Germany, 2023.
- *Visualization of Scientific Data at the Exascale and Beyond*, International Workshop on In Situ Visualization, Hamburg, Germany, 2023.
- *Poincare Analysis for Magnetic Fieldlines in Tokamaks*, DOE Computer Graphics Forum, Idaho Falls, USA, 2023.
- *The Need for Pervasive In Situ Visualization: PiSAV*, International Workshop on In Situ Visualization, Hamburg, Germany, 2022.
- *Visualization as a Service for Scientific Data*, Excalibur-SLE: Systems Level Engineering Workshop, Cambridge University, Cambridge, UK, 2021.
- *Visualization and Analysis Services*, ASiMoV Workshop, Cambridge, UK, 2021.
- *Visualization and Analysis Services with Data Staging*, ECP Annual Meeting, Houston, USA, 2021.

Professional Activities

Professional Organizations

- **IEEE**, Senior Member

Conference and Workshop Service

- **EGPGV (Eurographics Symposium on Parallel Graphics and Visualization)**
 - **2023** – Program Co-Chair
 - **2024** – Symposium Chair
- **ISAV (In Situ Infrastructures for Enabling Extreme-scale Analysis and Visualization)**
 - **2021** – General Co-Chair
 - **2022** – General Chair
- **IEEE VIS - Uncertainty Visualization Workshop**
 - **2024** – Workshop Organizer
 - **2025** – Workshop Organizer

- **DOE Computer Graphics Forum**

- 2008 – Technical Program Chair
- 2018 – Site Chair
- 2024 – Site Chair

Program Committee

- **Supercomputing Conference:** 2014, 2015, 2016, 2018, 2019, 2020, 2021
- **IEEE VIS (SciVis):** 2017, 2019

Reviewer

- Supercomputing Conference
- IEEE Visualization Conference
- Cluster Conference
- Transactions on Visualization and Computer Graphics (TVCG)
- EuroVis Conference
- Eurographics Symposium on Parallel Graphics and Visualization (EGPGV)
- Workshop on Large Data Analysis and Visualization (LDAV)
- In situ Infrastructures for Enabling Extreme-scale Analysis and Visualization (ISAV)
- Journal of Parallel and Distributed Computing
- International Symposium on Visual Computing
- IEEE Virtual Reality Conference
- DOE Early Career Research Program (ECRP)
- DOE Small Business Innovation Research (SBIR) Program

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