James Ahrens – Vita

CONTACT INFORMATION
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PROFESSIONAL EXPERIENCE
- 1997–present, Los Alamos National Laboratory (LANL)
- Summer 1993–1994, Los Alamos National Laboratory
- Summer 1991, Thinking Machines Corporation
- Summer 1987–1989, General DataComm Incorporated

EDUCATION
- Ph.D. Computer Science, University of Washington, Seattle, 1996.
- M.S. Computer Science, University of Washington, Seattle, 1992.
- B.S. Computer Science, University of Massachusetts, Amherst, 1989.

RESEARCH AREAS/EXPERTISE
- Technical expertise in the areas of data science, visualization and parallel systems.
- Management experience as R&D program manager and team leader.

CONTRIBUTIONS TO OPEN-SOURCE SOFTWARE

Founder and design lead of ParaView, an open–source visualization tool designed to handle extremely large data (http://paraview.org). Developed parallel VTK, a parallel visualization software infrastructure. ParaView is built upon parallel VTK (http://vtk.org/parallel–processing). Co–creator of PISTON a cross–platform software library providing hardware accelerated versions of frequently used operations for scientific visualization and analysis. Founder and design lead of Cinema, an open–source image–based in situ visualization and analysis tool (http://cinemascience.org).

RESEARCH FUNDING

Successful proposed research projects to numerous agencies including Department of Energy (DOE) Accelerated Computing (ASC), DOE Office of Science, Biology and Energy Research (BER) and Advanced Scientific Computing Research (ASCR) Offices, LANL Laboratory Directed Research and Development (LDRD) and NSF over the past decade. Successful managed long–term multi–person visualization research and development projects to produce both research publications and usable open–source software solutions to complex problems of interest to the Department of Energy.

Funding organization:	DOE, Exascale Computing Project, Software Technology
Role:	Principal Investigator
Project title:	ECP ALPINE: Algorithms and Infrastructure for In Situ Visualization and Analysis
Dates of the project:	1/2017–1/2020
Annual funding:	$2000K (650K to LANL)

Funding organization:	DOE, Exascale Computing Project, Software Technology
Role:	Principal Investigator
Project title:	Cinema: Image–based Visualization and Analysis
Dates of the project:	1/2017–1/2020
Annual funding:	$1200K

Funding organization:	DOE, Exascale Computing Project, Software Technology
Role:	Principal Investigator, Analysis Co-Lead
Project title:	BEE: Virtual Environments Project
Dates of the project:	1/2017–1/2020
Annual funding:	$1100K

Funding organization: DOE, Exascale Computing Project, Applications
Role: Co-Investigator, Analysis Co-Lead
Project title: Computing the Sky at Extreme Scales
Dates of the project: 10/2016-10/2019
Annual funding: $2500K (500K to Los Alamos National Laboratory (LANL) for Analysis)

Funding organization: DOE, Los Alamos National Laboratory, LDRD
Role: Principal Investigator
Project title: "Real-time Adaptive Acceleration of Dynamic Experimental Science"
Dates of the project: 10/2016-10/2019
Annual funding: $1650K

Funding organization: DOE, EERE-Geothermal Technologies Office and Office of Fossil Energy
Role: Co-Investigator
Project title: Big Data and Analytics for Induced Seismicity
Dates of the project: 10/2015-10/2016
Annual funding: $50K/year

Funding organization: DOE, Office of Science, SciDAC HEP / ASCR
Role: Co-Investigator
Project title: Computing the Sky: Simulation and Analysis for Cosmological   Surveys
Dates of the project: 10/2015-10/2016
Annual funding: $150K/year

Funding organization: DOE, Office of Science, Advanced Scientific Computing Research (ASCR)
Role: Principal Investigator
Project title: Optimizing the Energy Usage and Cognitive Value of Extreme Scale Data   Analysis
Dates of the project: 10/2014-10/2017
Annual funding: $500K/year (management total of 1000K: U. Texas, Virginia Tech and   UNH)

Funding organization: Department of Energy, Accelerated Strategic Computing (ASC)
Role: Project Leader
Project title: Visualization Research, Development and Production for ASC Simulations
Dates of the project: 10/2013-10/2016
Annual funding: $4500K

Funding organization: DOE, Office of Science, Advanced Scientific Computing Research (ASCR)
Role: Principal Investigator
Project title: Exploration and Evaluation of Exascale In Situ Visualization and Analysis Approaches
Dates of the project: 10/2012-10/2015
Annual funding: $725K/year

Funding organization: DOE, Office of Science, Advanced Scientific Computing Research (ASCR)
Role: Principal Investigator
Project title: SciDAC Scalable Data Management and Analysis and Visualization Institute
Dates of the project: 10/2012-10/2017
Annual funding: $400K/year (co-management role of Visualization portion of grant)

Funding organization: DOE, Office of Science, Advanced Scientific Computing Research (ASCR)
Role: Co-Investigator
Project title: SciDAC Computation-Driven Discovery for the Dark Universe
Dates of the project: 10/2012-10/2015
Annual funding: $115K/year

Funding organization: DOE, Office of Science, Advanced Scientific Computing Research (ASCR)
Role: Co-Investigator
Project title: SciDAC Plasma Surface Interactions: Bridging from the Surface to the
Micron Frontier through Leadership Class Computing
Dates of the project: 10/2012-10/2015
Annual funding: $80K/year

Funding organization: DOE, Office of Science, Advanced Scientific Computing Research (ASCR)
Role: Co-Investigator
Project title: Center for Exascale Simulation of Advanced Reactors (CESAR)
Dates of the project: 10/2011-10/2016
Annual funding: $100K/year

Funding organization: DOE, Office of Science, Advanced Scientific Computing Research (ASCR)
Role: Co-Investigator
Project title: Exascale Co-Design Center for Materials in Extreme Environments
Dates of the project: 10/2011-10/2016
Annual funding: $200K/year

Funding organization: DOE, Los Alamos National Laboratory, LDRD
Role: Co-Investigator
Project title: Cocomans – Co-design of Next Generation Simulations
Dates of the project: 10/2011-10/2014
Annual funding: $200K/year

Funding organization: DOE, Office of Science, Biology and Energy Research (BER)
Role: Co-Investigator
Project title: Ultra-scale Visualization Climate Data Analysis Tools (UV-CDAT)
Dates of the project: 6/2010-6/2013
Annual funding: $300K/year

Funding organization: DOE, Office of Science, Advanced Scientific Computing Research (ASCR)
Role: Principal Investigator
Project title: Remote Visualization for Petascale and Exascale Simulations
Dates of the project: 10/2009-10/2012
Annual funding: $750K/year

Funding organization: DOE, Accelerated Strategic Computing (ASC)
Role: Principal Investigator
Project title: Visualization Research for ASC Simulations
Dates of the project: 10/2009-10/2012
Annual funding: $1300K

Funding organization: DOE, Los Alamos National Laboratory, LDRD
Role: Co-Investigator
Project title: The Dark Universe
Dates of the project: 10/2009-10/2012
Annual funding: $350K/year

Funding organization: DOE, Los Alamos National Laboratory, LDRD
Role: Co-Investigator
Project title: Intelligent Wind Turbines
Dates of the project: 10/2009-10/2012
Annual funding: $100K/year

PROFESSIONAL ACTIVITIES & WHITE PAPERS

• IEEE Visualization, General Chair, 2017.

• Exascale Computing Project, Software Technology Area, Visualization and Data Analysis Lead, 2016-present.

• IEEE Visualization, SciVis Papers Co-Chair, 2015-2016.

• As LANL IS&T Data Science at Scale lead, met with NM Senate Staffers and NM University representatives at "HPC, Big Data, CyberSecurity" meeting in Albuquerque to discuss improved collaboration across NM institutions. Ideas around a NM data science center were well received and could form the start of a new collaboration, 2016.

- Participated in an ASCR planning meeting on the convergence of HPC and data intensive science. Our work resulted in an ASCR report entitled, "Science 2030 – Convergence of Data–Intensive and High–Performance Computing". Participated in an ASCR planning meeting resulting in a report entitled, "Management, Analysis and Visualization of Experimental and Observational Data" that is available from ASCR. This report strongly supports ASCR data–oriented future directions, 2016.

- Led visualization researchers to gather requirements from experimentalists as part of a DOE Experimental and Observational Data Workshop, 2015.

- Invited to "Frontiers of Visualization" a NITRD (Networking and Information Technology Research and Development) workshop to help set future funding directions in visualization, 2014.

- Lead for Data Visualization and Analytics Exascale Planning for DOE ASC/ASCR. This activity includes help to define an exascale strategy and writing a national white paper that set the scope, schedule and budget of an exascale visualization and data analysis activity for a successful exascale program. Communicated/defended this plan to red team reviewers. Provided leadership for this activity over the past five years, 2011–2015.

- Helped Dimitri Kusnezov, Senior Advisor to the Secretary of Energy, prepare DOE's Big Data and Privacy briefing for John Podesta's White House 90-day study. This briefing included describing the relationship between big data and exascale. An article entitled, "The Big Data – High Performance Computing Convergence" is in submission to Innovations magazine on this topic, 2014.

- Area lead (Data Science at Scale) for the Los Alamos National Laboratory – Information and Knowledge Sciences Capability Review, 2008, 2011, 2014.

- Delivered in situ analysis to the ASC program as a Level 2 milestone. Technical Report – J. Patchett, J. Ahrens, B. Nouanesengsy, P. Fasel, P. Oleary, "LANL ASC Level 2 Milestone: Case Study of In Situ Data Analysis in ASC Integrated Codes", 2013.

- Co–led a data science summer school to mentor and guide a set of 15+ summer students to develop state of the art data science solutions to laboratory problems of interest. Collaborated with professors from NYU–Poly, JHU and other universities to present to laboratory community about data science topics. Summers 2013–2016.

- Review committee member – Review of the Computing Environment and Life Sciences Directorate (CELS) at Argonne National Laboratory, 2012.

- Executive Committee Member, SciDAC Scalable Data Management and Analysis and Visualization Institute, 2012–present.

- Executive Committee Member, Large Data Analysis and Visualization Symposium, 2012–present.

- Visualization collaboration lead, for the DOE NNSA / Commissariat à l'Énergie Atomique (CEA) High Performance Computing collaboration. This U.S./French collaboration discusses high–performance topics as part of a treaty agreement between the two nations, 2009–2012.

- Responding to a request by Tom Kalil, White House – Office of Science and Technology Policy Deputy Director to create a white paper and presentation on DOE–focused data–intensive science to present to Undersecretary Koonin in August 2010. J. Ahrens, B. Hendrickson, G. Long, S. Miller, R. Ross, D. Williams, "Data Intensive Science in the Department of Energy". A white paper for the Office of Science and Technology Policy, Technical Report LA–UR–10–07088.

- Delivered alternative rendering approaches including ray–tracing to the ASC program as a Level 2 milestone. James Ahrens, John Patchett, Li–Ta Lo, David DeMarle, Carson Brownlee, and Christopher Mitchell, "A Report Documenting the Completion of the Los Alamos National Laboratory Portion of the ASC Level II Milestone "Visualization on the Supercomputing Platform", 2010.

- Organizing a DOE Office of Science Advanced Scientific Computing Research (ASCR) PI meeting for Scientific Data Management, Analysis and Visualization for Lucy Nowell, DOE Office of Science Program Manager in Santa Fe, New Mexico, August 16–19, 2010.

• Guest Editor, IEEE Computer Graphics and Applications – Special Issue on Ultrascale Visualization, 2010.

• Co-Program Chair, Eurographics Symposium on Parallel Graphics and Visualization, May 2-3, 2010.

• DOE SciDAC Ultrascale Institute Advisory Board Member, 2006-2010.

• Helped organize the DOE Office of Science SciDAC 2008 conference. This conference is an important Office of Science yearly meeting. Helped arrange a number of events at the conference including a movie night; poster and paper sessions focused on Office of Science visualization activities.

• Refereed manuscripts for IEEE Transaction on Visualization and Graphics and reviewed grant proposals for many Offices of the US Department of Energy (DOE).

• Member of the International Program Committee for IEEE Visualization 2006-8.

• Planned for the future visualization activities by co-chairing a data analysis and visualization breakout at an Office of Science Workshop on "Simulation and Modeling for Advanced Nuclear Energy Systems" in August 2006 and by leading a section of Office of Science ASCR Visualization and Data Discovery Workshop producing a report entitled, "Recommendations for a Visual Analysis and Data Exploration Research Program for the Future Exascale Era" in June 2007.

SELECTED PUBLICATIONS
Book Chapters and Journal Articles

P. O'Leary, J. Ahrens, S. Jourdain, S. Wittenburg, D. Rogers, M. Petersen, "Cinema image-based in situ analysis and visualization of MPAS-ocean simulations", Parallel Computing 55, pgs. 43-48, 2016.

A. Bauer, H. Abbasi, J. Ahrens, et al, "In situ methods, infrastructures, and applications on high performance computing platforms", Computer Graphics Forum 35 (3), pgs. 577-597, 2016.

K. Myers, E. Lawrence, M. Fugate, C. Bowen, L. Ticknor, J. Woodring, J. Wendelberger, J. Ahrens, "Partitioning a Large Simulation as It Runs", Technometrics, 58, 3, pgs. 329-340, 2016.

J. Pulido, D. Livescu, J. Woodring, J. Ahrens, B. Hamann, "Survey and analysis of multiresolution methods for turbulence data", Computers & Fluids 125, pgs. 39-58, 2016.

J. Ahrens, "Increasing Scientific Data Insights about Exascale Class Simulations under Power and Storage Constraints", IEEE Computer Graphics and Applications, March/April 2015.

J. Woodring, M. Petersen, A. Schmeier, J. Patchett, J. Ahrens, H. Hagen, "In Situ Eddy Analysis in a High-Resolution Ocean Climate Model", IEEE Transactions on Visualization and Computer Graphics & IEEE Visualization Conference, Chicago, Illinois, October 2015.

Y. Su, G. Agrawal, J. Woodring, K. Myers, J. Wendelberger, J. Ahrens, "Effective and efficient data sampling using bitmap indices", Cluster Computing (2014).

S. Williams, M. Petersen, M. Hecht, M. Maltrud, J. Patchett, J. Ahrens, B. Hamann, "Interface Exchange as an Indicator for Eddy Heat Transport", Computer Graphics Forum 31(3): 1125-1134 (2012).

S. Williams, M. Hecht, M. Petersen, R. Strelitz, M. Maltrud, J. Ahrens, M. Hlawitschka, B. Hamann, "Visualization and Analysis of Eddies in a Global Ocean Simulation", Computer Graphics Forum 30(3): 991-1000 (2011).

J. Woodring, J. Ahrens, J. Figg, J. Wendelberger, S. Habib, K. Heitmann, "In-situ Sampling of a Large-Scale Particle Simulation for Interactive Visualization and Analysis", Computer Graphics Forum 30(3): 1151-1160 (2011).

S. Williams, M. Petersen, P.T. Bremer, M. Hecht, V. Pascucci, J. Ahrens, M. Hlawitschka, B. Hamann,

"Adaptive Extraction and Quantification of Geophysical Vortices", IEEE Transactions on Visualization and Computer Graphics 17(12): 2088–2095 (2011)

J. Ahrens, B. Hendrickson, G. Long, S. Miller, R. Ross, D. Williams: Data-Intensive Science in the US DOE: Case Studies and Future Challenges. Computing in Science & Engineering, 13, 14–24 (2011)

J. Ahrens, K. Heitmann, M. Petersen, J. Woodring, S. Williams, P. Fasel, C. Ahrens, C.H. Hsu, B. Geveci, "Verifying Scientific Simulations via Comparative and Quantitative Visualization". IEEE Computer Graphics and Applications 30(6): 16– 28 (2010).

E. Santos, L. Lins. J. Ahrens, J. Freire, C. Silva, "VISMASHUP: Streamlining the Creation of Custom Visualization Applications", IEEE Transactions on Visualization and Computer Graphics, Volume 15, Issue 6, pp. 1539–46, November–December 2009.

S. Habib, A. Pope, Z. Lukic, D. Daniel, P. Fasel, N. Desai, K. Heitmann, C. Hsu, L. Ankeny, G. Mark, S. Bhattacharya, J. Ahrens, "Hybrid petacomputing meets cosmology: the Roadrunner Universe project", Journal of Physics: Conference Series – Scientific Discovery Through Advanced Computing, Volume 180, 2009.

M. Graf, J. Ahrens, J. Patchett, H. Dahal, A. Balatsky, D. Modl, L. Monroe, N. Brown, E. Akhadov, "Integrated Nanotechnologies: To See is to Know: Visualization", SciDAC Review, Issue 10, Winter 2008.

E. Anderson, J. Ahrens, K. Heitmann, S. Habib, C. SIlva, "Provenance in Comparative Analysis: A Study in Cosmology", Computing in Science and Engineering, Volume 10, Issue 3, pgs. 30–37, May–June 2008.

K. Heitmann, Z. Lukic, P. Fasel, S. Habib, M. Warren, M. White, J. Ahrens, L. Ankeny, R. Armstrong, B. O'Shea, P.M. Ricker, V. Springel, J. Stadel, and H. Trac, "The Cosmic Code Comparison Project", Computational Science and Discovery, Volume 1, Issue 1, 2008.

P. McCormick, J. Inman, J. Ahrens, J. Mohd-Yusof, G. Roth, S. Cummings, "Scout: A Data Parallel Programming Environment for Graphics Processors", Parallel Computing, 33(10–11), pgs. 648– 662, 2007.

J. Ahrens, K. Heitmann, S. Habib, L. Ankeny, P. McCormick, J. Inman, R. Armstrong and K.L. Ma, "Quantitative and comparative visualization applied to cosmological simulations", Journal of   Physics: Conference Series – Scientific Discovery Through Advanced Computing, Volume 46, 2006.

J. Ahrens, B. Geveci, C. Law, "ParaView: An End User Tool for Large Data Visualization", Visualization Handbook, Academic Press, 2005.

P. McCormick, J. Ahrens, "Large Data Visualization and Rendering: A Problem Driven Approach", Visualization Handbook, Academic Press, 2005.

J. Ahrens, K. Brislawn, K. Martin, B. Geveci, C. Law, M. Papka, "Large Scale Data Visualization Using Parallel Data Streaming", IEEE Computer Graphics and Applications, July–August 2001.

J. Kniss, P. McCormick, A. McPherson, J. Ahrens, J. Painter, A. Keahey, C. Hansen, "TRex: Interactive Texture Based Volume Rendering for Extremely Large Datasets", IEEE Computer Graphics and Applications, July–August 2001.

Conference and Workshop Publications

C. Ware, D. Bolan, R. Miller, D. Rogers, J. Ahrens, "Animated versus static views of steady flow patterns", ACM Symposium on Applied Perception 2016, pgs. 77–84, 2016.

F. Samsel, S. Klaassen, M. Petersen, T. Turton, G. Abram, D. Rogers, J. Ahrens, "Interactive Colormapping: Enabling Multiple Data Range and Detailed Views of Ocean Salinity", CHI – Extended Abstracts on Human Factors, 2016.
C. Sewell, K. Heitmann, H. Finkel, G. Zagaris, S.T. Parete-Koon, P. Fasel, A. Pope, N. Frontiere, L. Lo, B. Messer, S. Habib, J. Ahrens, "Large-Scale Compute-Intensive Analysis via a Combined In- situ and Co-

scheduling Workflow Approach. Proceeding of International Conference for High Performance Computing, Networking, Storage, & Analysis (SC), Supercomputing 2015, November 2015.

C. Sewell, L. Lo, K. Heitmann, S. Habib, J. Ahrens, "Utilizing Many-Core Accelerators for Halo and Center Finding within a Cosmology Simulation", Proceedings of the IEEE Symposium on Large Data Analysis and Visualization (LDAV), October 2015.

W. Widanagamaachchi, K. Hammond, L. Lo, B. Wirth, F. Samsel, C. Sewell, J. Ahrens, V. Pascucci, "Visualization and Analysis of Large-Scale Atomistic Simulations of Plasma-Surface Interactions". Proceedings of EuroVis (short paper), May 2015.

X. Adhinarayanan, W. Feng, J. Woodring, D. Rogers, J. Ahrens, "On the Greenness of In-Situ and Post-Processing Visualization Pipelines", The Eleventh Workshop on High-Performance, Power- Aware Computing at IPDPS 2015, May 2015.

F. Samsel, G. Abram, M. Petersen, J. Wendelberger, T. Geld and J. Ahrens, "Colormaps that Improve Perception of High-Resolution Ocean Data", CHI EA 2015, April 2015.

J. Ahrens, S. Jourdain, P. O'Leary, J. Patchett, D. Rogers, M. Petersen, "An Image-based Approach to Extreme Scale In Situ Visualization and Analysis", Proceeding of International Conference for High Performance Computing, Networking, Storage, & Analysis (SC), Supercomputing 2014, November 2014.

B. Nouanesengsy, J. Woodring, J. Patchett, K. Myers, and J. Ahrens, "ADR Visualization: A Generalized Framework for Ranking Large-Scale Scientific Data using Analysis-Driven Refinement", IEEE Symposium on Large-Scale Data Analysis and Visualization (LDAV), 2014.

W. Widanagamaachchi, P-T. Bremer, C. Sewell, L. Lo, J. Ahrens, V. Pascucci, "Data-Parallel Halo Finding with Variable Linking Lengths", IEEE Symposium on Large-Scale Data Analysis and Visualization (LDAV), 2014.

Yu Su, Gagan Agrawal, Jonathan Woodring, Kary Myers, Joanne Wendelberger, James P. Ahrens: Taming massive distributed datasets: data sampling using bitmap indices, HPDC 2013.

Christopher Sewell, Li-Ta Lo, James P. Ahrens: Portable data-parallel visualization and analysis in distributed memory environments, LDAV 2013.

Boonthanome Nouanesengsy, John Patchett, James Ahrens, Andrew Bauer, Aashish Chaudhary, Berk Geveci, Ross Miller, Galen M. Shipman, and Dean N. Williams, "Optimizing File Access Patterns through the Spatio-Temporal Pipeline for Parallel Visualization and Analysis". Proceedings of the Workshop on Ultrascale Visualization at SC13, 2013.

Jonathan Woodring, James Ahrens, Timothy J. Tautges, Tom Peterka, Venkatram Vishwanath, Berk Geveci, "On-Demand Unstructured Mesh Translation for Reducing Memory Pressure during In Situ Analysis". Proceedings of the Workshop on Ultrascale Visualization at SC13, 2013.

Yu Su, Gagan Agrawal, Jonathan Woodring, Kary Myers, Joanne Wendelberger, James Ahrens, "Taming Massive Distributed Datasets: Data Sampling Using Bitmap Indices", HPDC 2013.

Uliana Popov, Eddy Chandra, Katrin Heitmann, Salman Habib, James P. Ahrens, Alex Pang: Analyzing the evolution of large scale structures in the universe with velocity based methods, PacificVis 2012.

Li-Ta Lo, Christopher Sewell, James P. Ahrens: PISTON: A Portable Cross-Platform Framework for Data-Parallel Visualization Operators, EGPGV 2012.

Christopher Sewell, Jeremy Meredith, Kenneth Moreland, Tom Peterka, Dave DeMarle, Li-ta Lo, James Ahrens, Robert Maynard, and Berk Geveci. "The SDAV Software Frameworks for Visualization and Analysis on Next-Generation Multi-Core and Many-Core Architectures". Proceeding of the Workshop on Ultrascale Visualization at SC12, 2012.

Carson Brownlee, John Patchett, Li-Ta Lo, David E. DeMarle, Christopher Mitchell, James P. Ahrens, Charles

D. Hansen: A Study of Ray Tracing Large-scale Scientific Data in Two Widely Used Parallel Visualization Applications, EGPGV 2012.

Christopher Sewell, Jeremy S. Meredith, Kenneth Moreland, Tom Peterka, David E. DeMarle, Li-Ta Lo, James P. Ahrens, Robert Maynard, Berk Geveci: The SDAV Software Frameworks for Visualization and Analysis on Next-Generation Multi-Core and Many-Core Architectures. Proceeding of the Workshop on Ultrascale Visualization at SC12, 2012.

J. Bent, S. Faibish, J. Ahrens, G. Grider, J. Patchett, and J. Woodring, "Jitter-Free Co-Processing on a Prototype Exascale Storage Stack", Proceedings of 28th IEEE Symposium on Massive Storage Systems and Technologies, Pacific Grove, CA, April 2012.

Christopher M. Brislawn, Jonathan Woodring, Susan M. Mniszewski, David E. DeMarle, James P. Ahrens: Subband coding for large-scale scientific simulation data using JPEG 2000, SSIAI 2012.

Boonthanome Nouanesengsy, James P. Ahrens, Jonathan Woodring, Han-Wei Shen: Revisiting Parallel Rendering for Shared Memory Machines, EGPGV 2011.

Christopher Mitchell, James P. Ahrens, Jun Wang: VisIO: Enabling Interactive Visualization of Ultra- Scale, Time Series Data via High-Bandwidth Distributed I/O Systems, IPDPS 2011.

Jonathan Woodring, Susan M. Mniszewski, Christopher M. Brislawn, David E. DeMarle, James P. Ahrens: Revisiting wavelet compression for large-scale climate data using JPEG 2000 and ensuring data precision, LDAV 2011.

J. Woodring, K. Heitmann, J. Ahrens, P. Fasel, C.-H. Hsu, S. Habib and A. Pope. "Analyzing and Visualizing Cosmological Simulations with ParaView", The Astrophysical Journal Supplement Series, Volume 195, Issue 11, June 2011.

C. Hsu, J. Ahrens, K. Heitmann, "Verification of the Time Evolution of Cosmological Simulations via Hypothesis-Driven Comparative and Quantitative Visualization", PacificVis 2010.

J. Ahrens, J. Woodring, D. DeMarle, J. Patchett, M. Maltrud, "Interactive Remote Large-Scale Data Visualization via Prioritized Multi-resolution Streaming", Workshop on Ultrascale Visualization, Nov. 2009.

J. Patchett, J. Ahrens, S. Ahern, D. Pugmire, "Parallel Visualization and Analysis with ParaView on a Cray XT4", CUG 2009, May 2009.

J. Ahrens, J. Woodring, D. DeMarle, J. Patchett, M. Maltrud, "Interactive Remote Large-Scale Data Visualization via Prioritized Multi-resolution Streaming", Workshop on Ultrascale Visualization, Nov. 2009.

J. Ahrens, L. Lo, B. Nouanesengsy, J. Patchett and A. McPherson, "Petascale Visualization: Approaches and Initial Results", Ultrascale Visualization Workshop, November 2008.

Emanuele Santos, Lauro Lins, James P. Ahrens, Juliana Freire and Claudio Silva, " A First Study on Clustering Collections of Workflow Graphs", International Provenance and Annotation Workshop, 2008.

James Ahrens, Nehal Desai, Patrick McCormick, Ken Martin, Jonathan Woodring, "A Modular Extensible Visualization System Architecture For Culled Prioritized Data Streaming", Visualization and Data Analysis 2007, Proceedings of the SPIE - The International Society for Optical Engineering, Volume 6495, Jan. 2007.

Andy Cedilnik, Berk Geveci, Kenneth Moreland, James Ahrens, and Jean Favre, "Remote Large Data Visualization in the ParaView Framework", Eurographics Symposium on Parallel Graphics and Visualization, pg. 163-170, May 2006.

N. Fout, K-L. Ma, and J. Ahrens, "Time-Varying Multivariate Volume Data Reduction", ACM SAC 2005, March 2005.

P. McCormick, J. Inman, J. Ahrens, G. Roth and C. Hansen, "Scout: A Hardware-Accelerated System for Quantitatively Driven Visualization and Analysis" Proceedings of the IEEE Visualization 2004 Conference , October 2004.

A. Stompel, K-L. Ma, E. Lum, J. Ahrens, J. Patchett, "Scheduled Linear Image Compositing for Parallel Volume Rendering", IEEE Symposium on Parallel and Large-Data Visualization and Graphics, October 2003.

C.C. Law, A. Henderson, J. Ahrens, "An Application Architecture for Large Data Visualization: A Case Study", IEEE Symposium on Parallel and Large-Data Visualization and Graphics, October 2001.

T.A. Keahey, P. McCormick, J. Ahrens, K. Keahey, "Qviz: a Framework for Querying and Visualizing Data", Proceedings of SPIE Vol. 4302 - Visual Data and Exploration and Analysis VIII, January 2001.

K. Keahey, P. Beckman and J. Ahrens, "Ligature: Component Architecture for High-Performance Applications", 1st NASA Workshop on Performance-Engineered Information Systems, September 1998.

J. Ahrens and J. Painter, "Efficient Sort-Last Rendering Using Compression-Based Image Compositing", Second Eurographics Workshop on Parallel Graphics and Visualization, September 1998.

J. Ahrens, P. McCormick, J. Bossert, J. Reisner, J. Winterkamp, "Case Study: Wildfire Visualization", Proceedings of IEEE Visualization 1997, pp. 451-454, October 1997.

J. Ahrens and C. Hansen, "Cost-Effective Data-Parallel Load Balancing", International Conference on Parallel Processing, Vol. 2, pp. 218-21, August 1995.

L. Shapiro, S. Tanimoto, J. Brinkley, J. Ahrens, R. Jakobovits and L. Lewis, "A Visual Database System for Data and Experiment Management in Model-Based Computer Vision", Second CAD- Based Vision Workshop, pp. 64-72, February 1994.

F. Ortega, C. Hansen and J. Ahrens, "Fast Data Parallel Polygon Rendering", IEEE Supercomputing, pp. 709-18, November 1993.

Invited Panels, Tutorials and Presentations

Invited Presentation, "Envisioning Human-in-the-loop Interactions with Massive Scientific Simulations and Experiments in the Age of Exascale HPC and Big Data", HPC Italy, June 2016.

Invited Presentation, "Real-time Adaptive Acceleration of Dynamic Experimental Science", Materials Science and Data Technology Nexus, September 2016.

Invited Presentation, "Exascale Data Science", NYU Center for Data Science, New York, New York, September 2016.

Invited Keynote Presentation, "Towards a scalable, platform independent, user-friendly analysis framework for scientific and information oriented applications", Chesapeake Large Scale Analytics Conference, October 2016.

Invited Presentation, "Supercharging the Scientific Process Via Data Science at Scale", International Research Training Group (IRTG) - Physical Modeling for Virtual Manufacturing Systems and Processes, University of Kaiserslautern, June 15, 2015.

Invited Plenary Talk, "Supercharging the Scientific Process Via Data Science at Scale", University of Groningen Centre for Data Science & Systems Complexity Opening Symposium, June 11, 2015.

Invited Presentation, "Accelerating Time to Insight in the Exascale Ecosystem Through the Optimization of Scientific Workflows", Big Data and Extreme-Scale Computing Conference Barcelona, Spain, January 29-30, 2015.

Invited Plenary Talk, "Implications of Numerical and Data Intensive Technology Trends on Scientific Visualization and Analysis", SIAM Conference on Computational Science and Engineering, March 14-18, 2015.

Invited Presentation, "Implications of Data and Numerically Intensive Computing on Scientific Visualization", Texas Advanced Computing Center Seminar, August 2014.

Invited Presentation, "Implications of Data and Numerically Intensive Computing on Scientific Visualization", Dagsthul, June 2014. From the Dagsthul website, "Dagstuhl is the world's premier venue for informatics. Dagstuhl enables the international elite, promising young researchers and practitioners alike to gather together to discuss their views and research findings."

Invited Presentation, "Increasing Scientific Data Insights About Exascale Class Simulations Under Power and Storage Constraints" Big Data and Extreme-Scale Computing Conference in Fukuoka, Japan, Feb. 26-28,2014. Also described in a podcast interview with HPCWire. http://www.hpcwire.com/soundbite/re-routing-exascale-simulation-storage-power-concerns/, 2014.

 Invited Presentation to JASON Committee on the Relationship between Data Intensive and Exascale Computing, 2012.

Member of Panel, "The Impact of Future Hardware on Visualization", IEEE Visualization 2009.

 Panel Organizer, "Challenges in Large Data Visualization: A Visualization Community Call to Action", IEEE Visualization 2009.

Invited Luncheon Speaker, "Data-intensive Applications on Numerically-Intensive Supercomputers", Los Alamos Computer Science Symposium, October 2009.

Invited Presentation, "Visualization of Petascale Data: Data-Intensive Computing on Numerically-Intensive Supercomputers", Los Alamos CCS High-Performance Computing Review, June 2009.

Invited Presentation, "Visualization of Petascale Data: Data-Intensive Computing on Numerically-Intensive Supercomputers", Dagsthul, June 2009.

Invited Presentation, "Petascale Visualization: Approaches and Initial Results", SOS13 – Sandia, ORNL and the Swiss (SOS) supercomputing meeting, March 2009.

Invited Presentation, "Challenges and Opportunities: Data Analysis and Visualization for Materials Science", Decadal Challenges for Predicting and Controlling Materials Performance in Extremes – A Los Alamos MARIE planning workshop, Feb. 2009.

Roadrunner Technical Seminars, Panel on Future Platforms,"Data Intensive Architectures", June   2008.

Tutorial, CEA/EDF/INRIA summer school, "Methodes Avancees en Visualisation Scientifique", ParaView, 18-21 June 2007, Saint-Lambert-des-Bois, France.

Invited Presentation, LANL Earth and Environmental Sciences Division, Frontiers in Geoscience Colloquium, "Scientific Visualization from Desktops to Petaflops", November 2006.

Invited Presentation, SC06 Workshop on Ultra-Scale Visualization, "Quantitative and Comparative Visualization Applied to Cosmological Simulations", November 2006.

Invited Presentation, Office of Science – Scientific Discovery Through Advanced Computing Conference, "Quantitative and Comparative Visualization Applied to Cosmological Simulations", June 2006.

Member of panel on "Interoperability of Visualization Software and Data Models is Not an Achievable Goal", at IEEE Visualization 2003.

K. Martin, G. Abram, J. Ahrens, R. Frank, P. Moran, "Tutorial on Large Scale Data Visualization and Rendering", IEEE Visualization, October 2001.

Member of panel on "Next-Generation Visualization Displays" at IEEE Visualization 2000.

 Invited presentation, "Using Linux Clusters for Parallel Visualization and Rendering", Extreme Linux

Workshop, USENIX, June 1999.

Invited presentation, "An Evolving Infrastructure to Support Accelerated Strategic Computing Initiative (ASCI) Multi-Source Visualization and Data Analysis Needs", Ninth SIAM Conference on Parallel Processing for Scientific Computing, March 1999.

Invited article, A. McPherson, J. Painter, P. McCormick, J. Ahrens, C. Ragsdale, "Visualizations of Earth Processes for the American Museum of Natural History", Vol. 33, No. 1, Computer Graphics, February 1999.

Member of panel on "Multi-Source Data Analysis Challenges" at IEEE Visualization 1998.