

Fission Gas SciDAC

Advancing Understanding of Fission Gas Behavior in Nuclear Fuel through Leadership Class Computing







We have a new SciDAC-4 project that builds on this work: [Simulation of Fission Gas in Uranium Oxide Nuclear Fuel](#)

Project Summary

The objective of this project is to develop high-performance simulation tools capable of predicting fission gas bubble evolution in nuclear fuel, and to demonstrate a Scientific Discovery through Advanced Computing (SciDAC) partnership project between the Department of Energy (DOE) Office of Advanced Scientific Computing Research (ASCR) and the Office of Nuclear Energy (NE). Deployment of such tools will require the utilization of high performance computing resources and the development of a leadership-class computational code capable of spanning the multiple length and time scales needed to address the complex physical and computational challenges associated with accurately modeling nuclear fuel.

This pilot project has a duration of 18 months (2016-08-15/2018-02-14).

Team

	Institution	Principal Investigator	Additional Participants
	ANL	Barry Smith (bsmith@mcs.anl.gov)	Shashi Aithal
	INL	Giovanni Pastore (giovanni.pastore@inl.gov)	
	LANL	Blas Uberuaga (blas@lanl.gov)	David Andersson, Li-Ta "Ollie" Lo, Danny Perez, Wathsala Widanagamaachchi
	ORNL	David E. Bernholdt (bernholdtde@ornl.gov)	James Kress, David Pugmire, Philip C. Roth <i>Alumni: Valmor F. de Almeida, Ozgur Cekmer</i>
	PNNL	Rick Kurtz (rj.kurtz@pnnl.gov)	Kenny Roche, Wahyu Setyawan
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Sponsor

This project is supported by the [U. S. Department of Energy](#) (DOE), [Office of Nuclear Energy](#) (NE) and [Office of Science](#) (SC), [Office of Advanced Scientific Computing Research](#) (ASCR) through the [Scientific Discovery through Advanced Computing](#) (SciDAC) program.

External Advisory Committee

Name	Institution	Key Programs Represented
Steven L. Hayes	INL	Nuclear Energy Advanced Modeling and Simulation (NEAMS)
Kurt A. Terrani	ORNL	Fuel Cycle R&D
Chris Stanek	LANL	Nuclear Energy Advanced Modeling and Simulation (NEAMS)

Key Partners

Program or Sponsor	Project	Project Point(s) of Contact	Partner Point(s) of Contact
SciDA-3 Institutes (no longer active)	FASTMath – Frameworks, Algorithms, and Scalable Technologies for Mathematics	Barry Smith (ANL)	
	SUPER – Institute for Sustained Performance, Energy and Resilience	Phil Roth (ORNL)	
	SDAV—Scalable Data Management, Analysis and Visualization	Ollie Lo (LANL), David Pugmire (ORNL)	
SciDAC-4 Institutes	FASTMath – Frameworks, Algorithms, and Scalable Technologies for Mathematics	Barry Smith (ANL)	
	RAPIDS - Resource and Application Productivity through computing, Information, and Data Science	David Bernholdt (ORNL), James Kress (ORNL), David Pugmire (ORNL), Phil Roth (ORNL)	
DOE Office of Nuclear Energy	Nuclear Energy Advanced Modeling and Simulation (NEAMS)		Steven L. Hayes (INL), Chris Stanek (LANL)
DOE Office of Nuclear Energy	Fuel Cycle R&D		Kurt A. Terrani (ORNL)

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