

HPC4Mfg: Partnering National Laboratory Computational Scientists with U.S. Industry | AMMTO / IEDO

Aaron Fisher LLNL

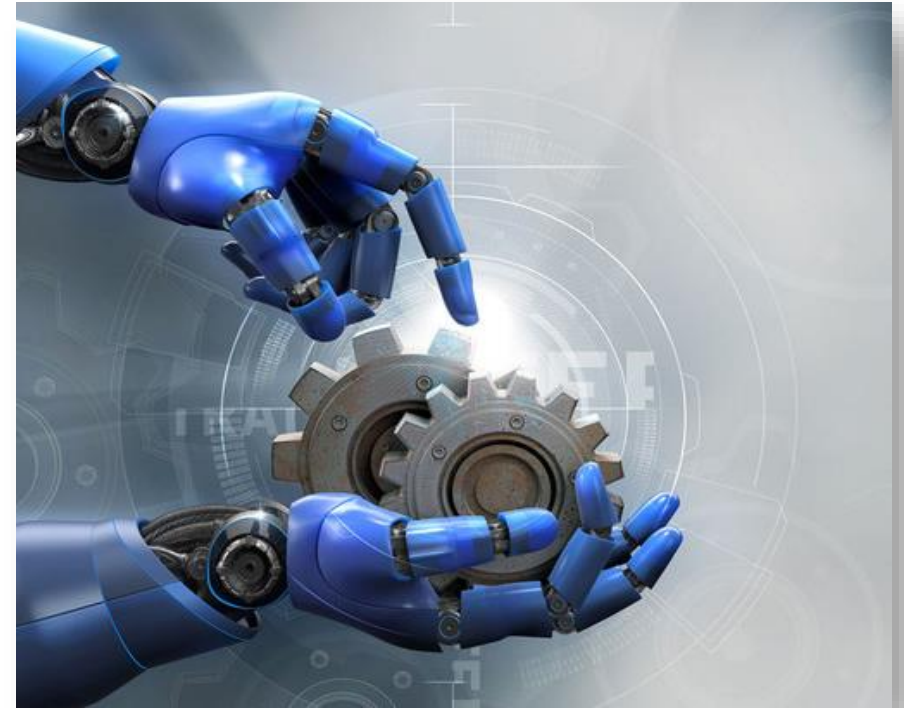
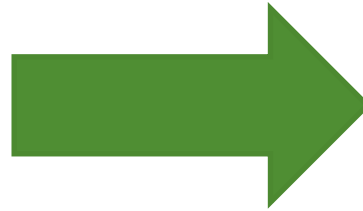
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U.S. industry is undergoing a technological revolution



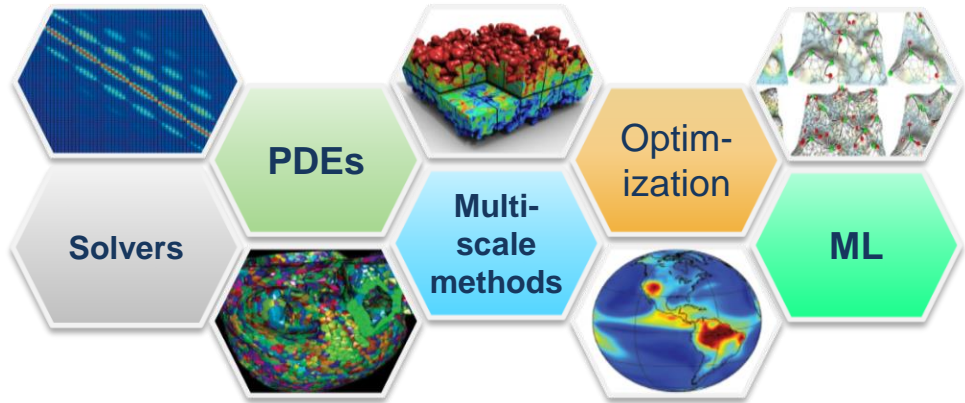
Computer Simulation — Data Analytics/AI — Material Discovery

We are advancing the energy agenda through advanced simulation



Computer Simulation shortcuts the Edisonian approach

Labs partner with industry to lower risk of High Performance Computing (HPC) adoption

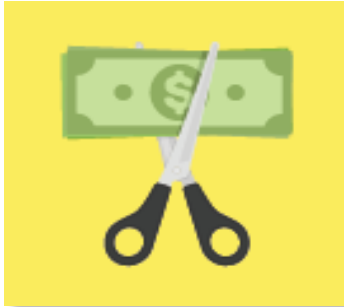


World-class supercomputers
Unique software
Subject Matter Experts



Access to deep talent pool at 11 national laboratories

The program operates through a solicitation process



- 2 Solicitations run every year
- \$400k / Project funded
- ~\$6M /yr Budget
- 11 National laboratories participating

Concept
paper

PI Match
Full Proposal

Technical
Review

Signed
Agreement

PI obtains HPC
resources



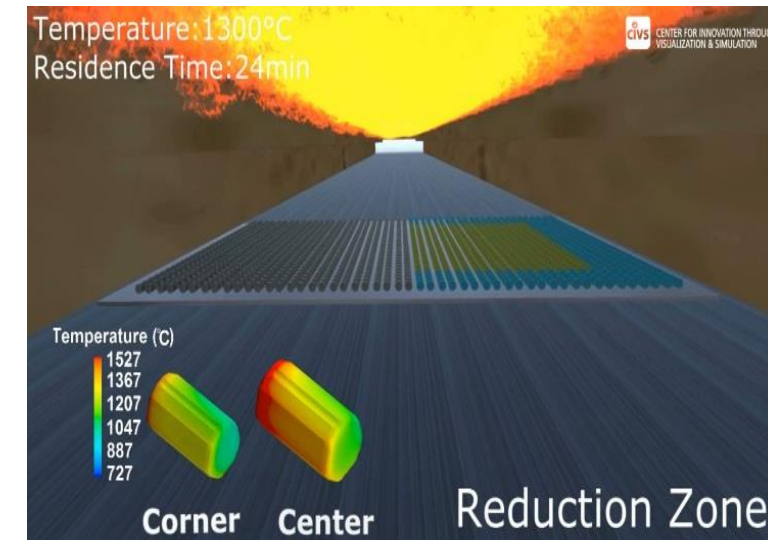
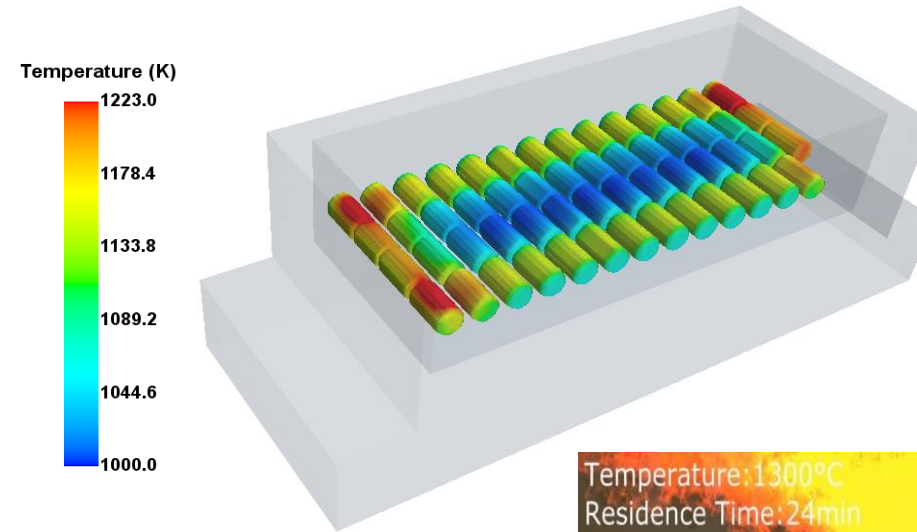
Over 150 projects have been funded with over 90 manufacturers in US



- Small, medium, and large companies
- Companies with significant experience with HPC
- Wide variety of industries

Example project: Scaling up a low carbon Iron Smelting Technology

- Carbontec has developed a bench scale iron smelting technology utilizing biomass in place of coal.
- LLNL worked with Carbontec and Purdue university to simulate and tune this process at industrial scale.
- Work informed Carbontec's large scale furnace designs.
- Carbontec is working toward building their first 100,000 T/yr production plant.



Congressional study on expanding HPC usage by small to medium manufacturers



HPC4EI program featured in the report

“HPC4EI private-sector participants unanimously praised the expertise of the national laboratories.”

“The avoided experimental runs saved time, money, and materials, enabling a faster time to market and reduced expenditures”

Benefits reported by manufacturers included:

- **Increased competitiveness**
- **Reduced costs**
- **Lower energy consumption**
- **Lower emissions,**
- **Increased material efficiency**
- **Reduced waste**

Toward the future: Soliciting input for improvement/expansion

- In the process of sending out an RFI to US manufacturers
- In the process of planning a workshop with US manufacturers, DOE leaders, and national laboratory PIs
- Happy to meet and talk with potential industry and DOE partners.

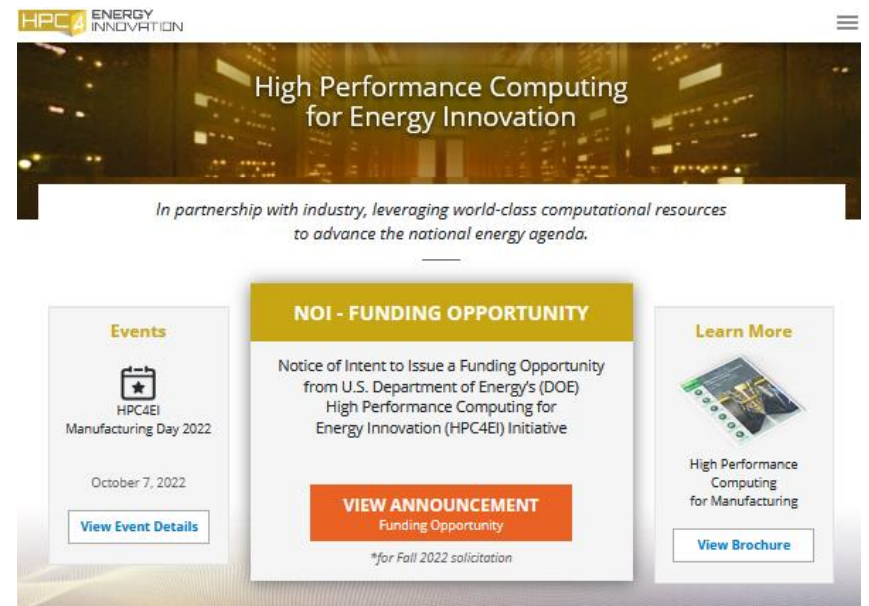
Questions?

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