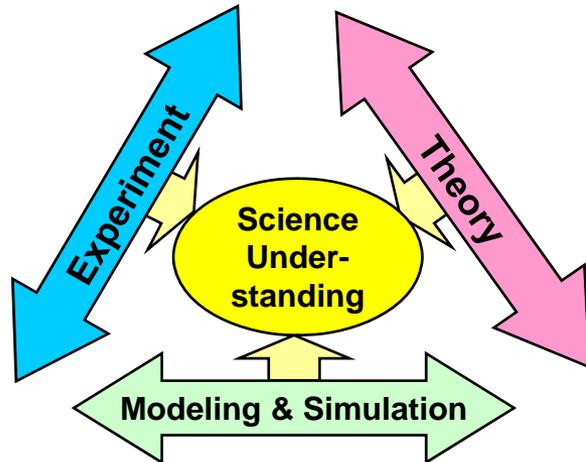
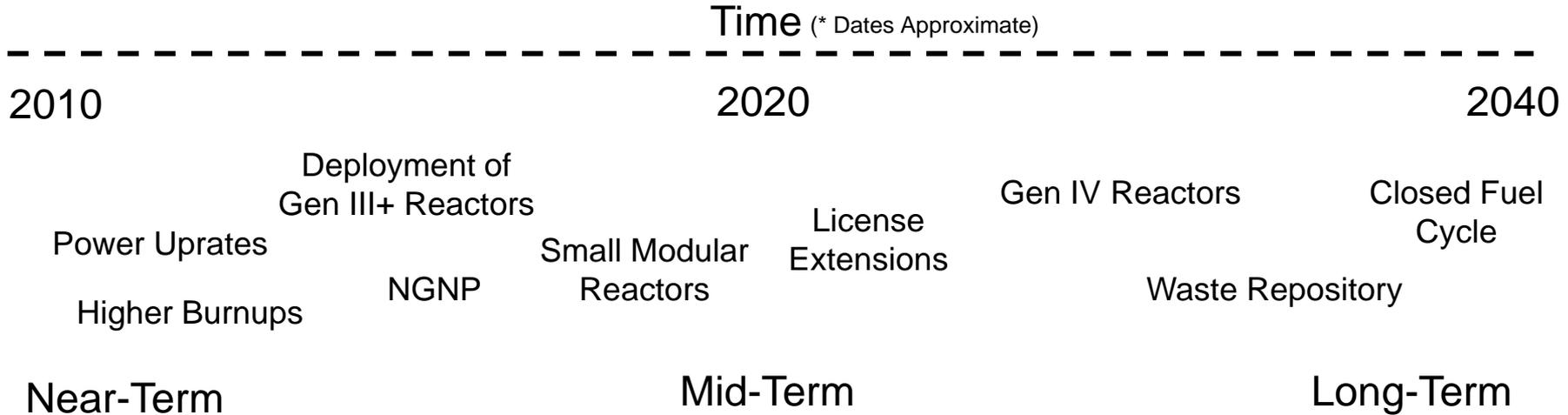




# Nuclear Energy Will Benefit from Modeling and Simulation in the Near, Mid, and Long Terms

Nuclear Energy Issues



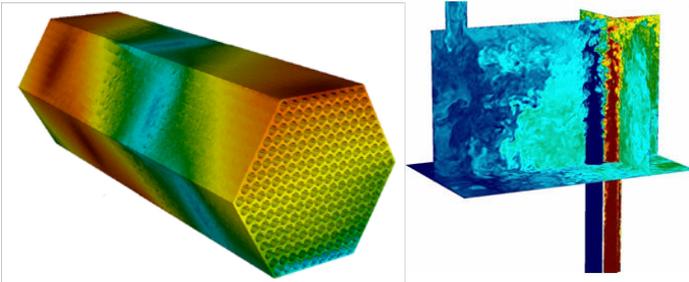
**New Ways of Understanding Nuclear Energy**

**Modeling and simulation has become a peer to theory and experiment to develop science insight**



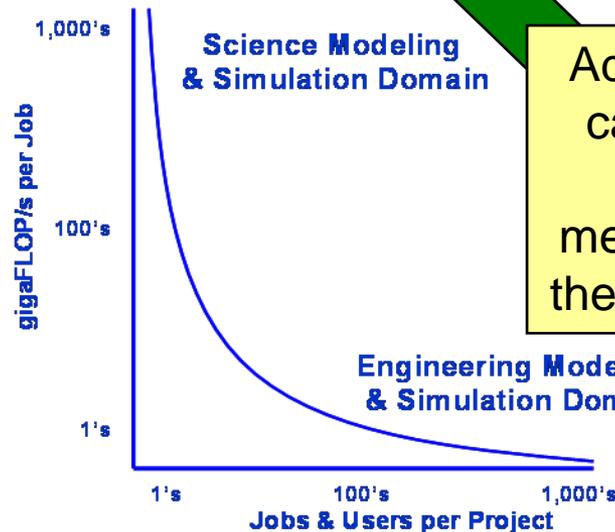
# How Can the NE Modeling and Simulation (M&S) Hub Change the Game?

## Existing Advanced Modeling and Simulation Capabilities



## Currently in the Science Domain

- Few users
- Few jobs
- Very big computers/job
- Long runtime



Adapt **Science Domain** capabilities to address issues for the near, medium and long term in the **Engineering Domain**

**Change the Game** by Accelerating the Use of Advanced Modeling and Simulation to Address Near Term Nuclear Energy Issues

## Engineering analysis is different

- Short, high pressure timelines
- Requirement for many, short jobs
- Many users
- User environment straightforward



# NE Modeling and Simulation Hub Fills an Important Gap

Time

2010

2020

2040

M&S Insights Needs

Power Upgrades

Deployment of Gen III+ Reactors

Higher Burnups

NGNP

Small Modular Reactors

License Extensions

Gen IV Reactors

Waste Repository

Closed Fuel Cycle



M&S Capability

NE M&S Hub

Existing M&S Capabilities

NEAMS  
(Nuclear Energy Advanced Modeling & Simulation)

Near-Term

Mid-Term

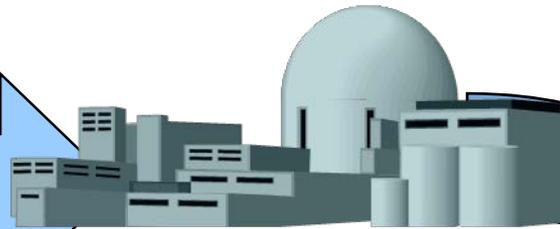
Long-Term



# Achieving the Promise of the Hub Requires a Mission Focus

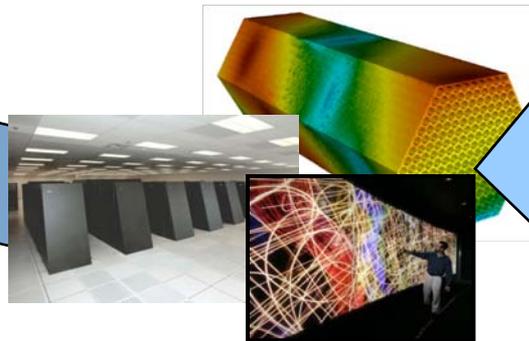
Create an “end to end”  
simulation of an  
Operating Reactor

Operating Reactor



Improved  
Scientific  
Understanding of  
Important  
Technology  
Issues

Data for  
validation from  
instrumented  
plant



Advanced Modeling and Simulation  
of the Operating Reactor