Research Overview
for Engineering Advisory Board

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Bechtel Engineering Building

Berkeley
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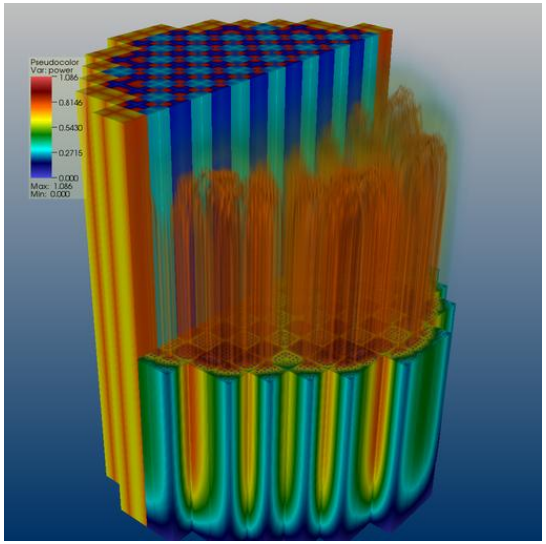
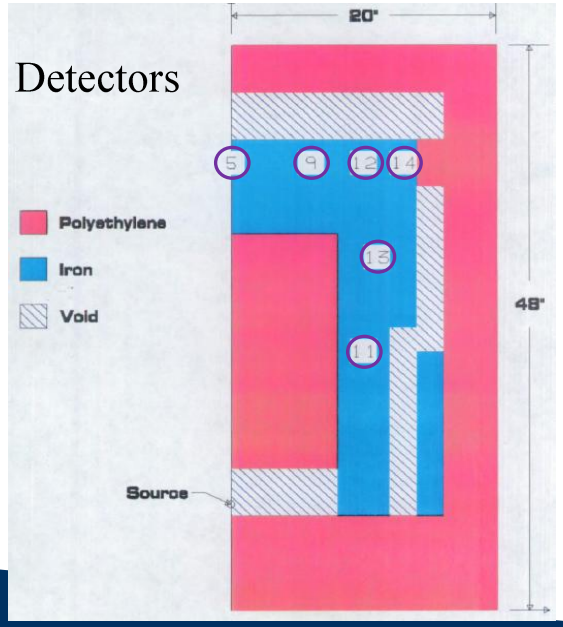
What: Tools for Design and Analysis



Existing and next generation reactors

Nuclear security

Shielding

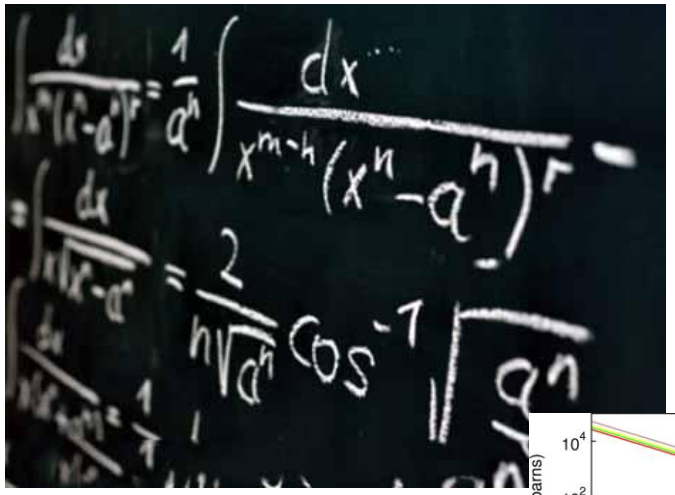


How: Numerical Methods

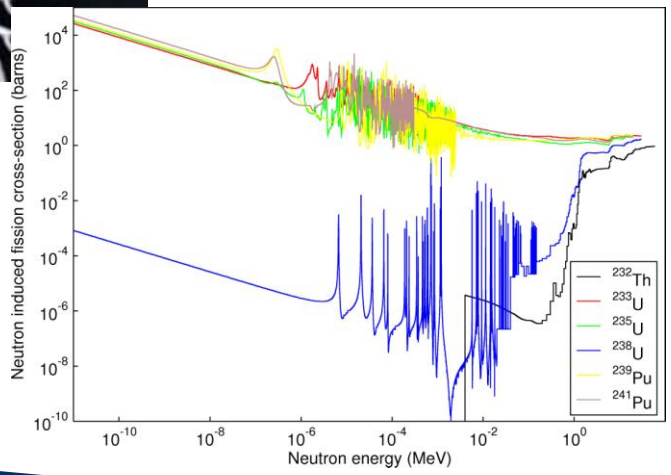
- Deterministic, Monte Carlo, Hybrid
- High performance computing; advanced architectures
- Software development best practices

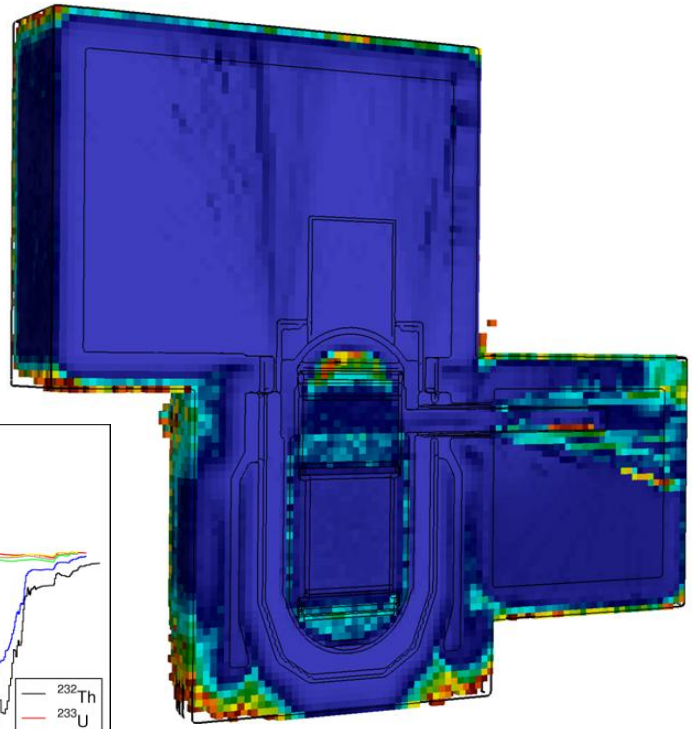
$$[\hat{\Omega}\cdot\nabla+\Sigma(\vec{r},E)]\psi(\vec{r},\hat{\Omega},E)=$$
$$\int dE'\int d\hat{\Omega}'\,\Sigma_s(\vec{r},E'\rightarrow E,\hat{\Omega}'\cdot\hat{\Omega})\psi(\vec{r},\hat{\Omega}',E')$$
$$+\frac{\chi(E)}{k}\int dE'\,\nu\Sigma_f(\vec{r},E')\int d\hat{\Omega}'\,\psi(\vec{r},\hat{\Omega}',E')$$

Applied Math Informed by Physics



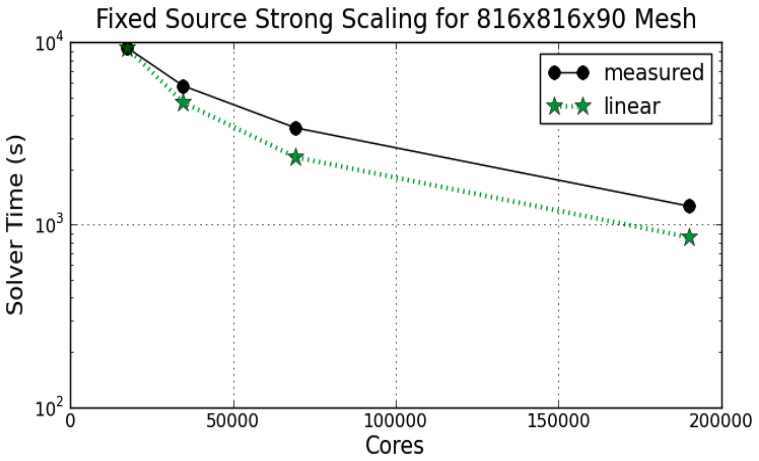
Nuclear data needs and limitations

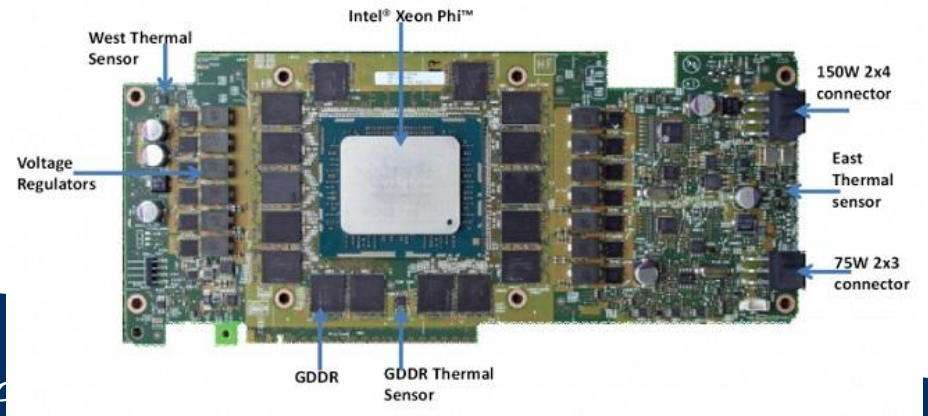




Nuclear system-specific challenges

Algorithms + Architecture

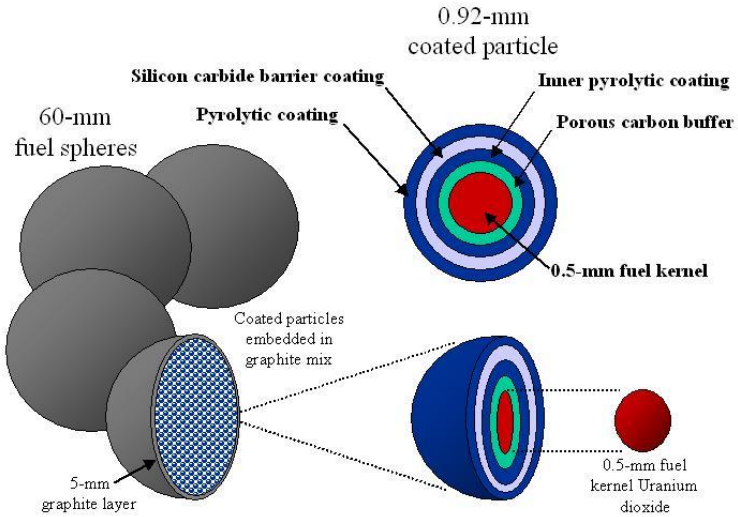




Driven by Application

Nuclear submarines

Advanced fuels



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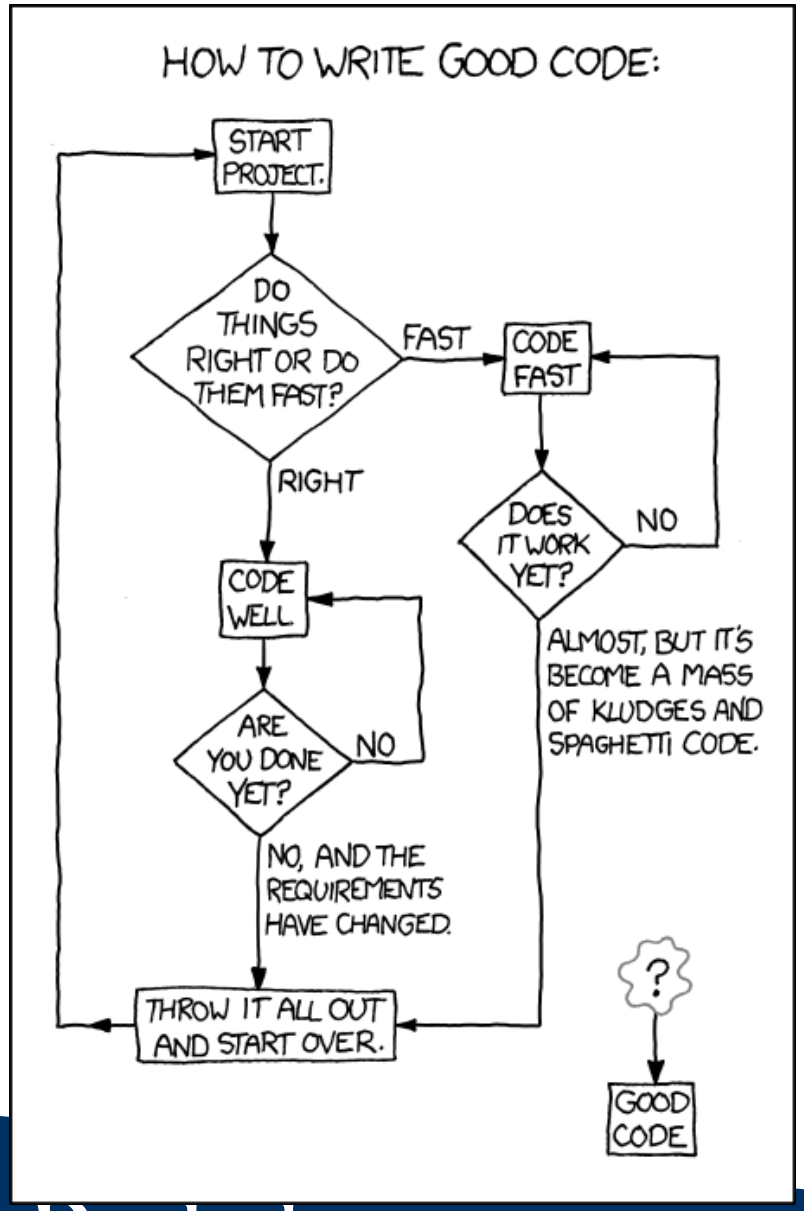
Quality Software Required



Thank You!