

# COMPUTING AT ARGONNE

**VALERIE TAYLOR**

Division Director

Mathematics and Computer Science Division

# COMPUTING AT ARGONNE

IoT/Edge

Fog

HPC/Cloud/Instrument



**MCS**

**DSL**

**CPS**

**ALCF**

- Computational Methods from building models to large-scale computing
- AI from data collection and curation to building predictive models
- Math and Computer Science to support the computing continuum and AI-enabled Science

# AI FOR SCIENCE REQUIRES NEW RESEARCH AND INFRASTRUCTURE

## Applications

AI applications across science and engineering. Transformative approaches to simulation and experimental science.

## Learning systems

AI software. Software infrastructure for managing data, models, workflows etc., and for delivering AI capabilities to 1,000s of scientists and engineers.

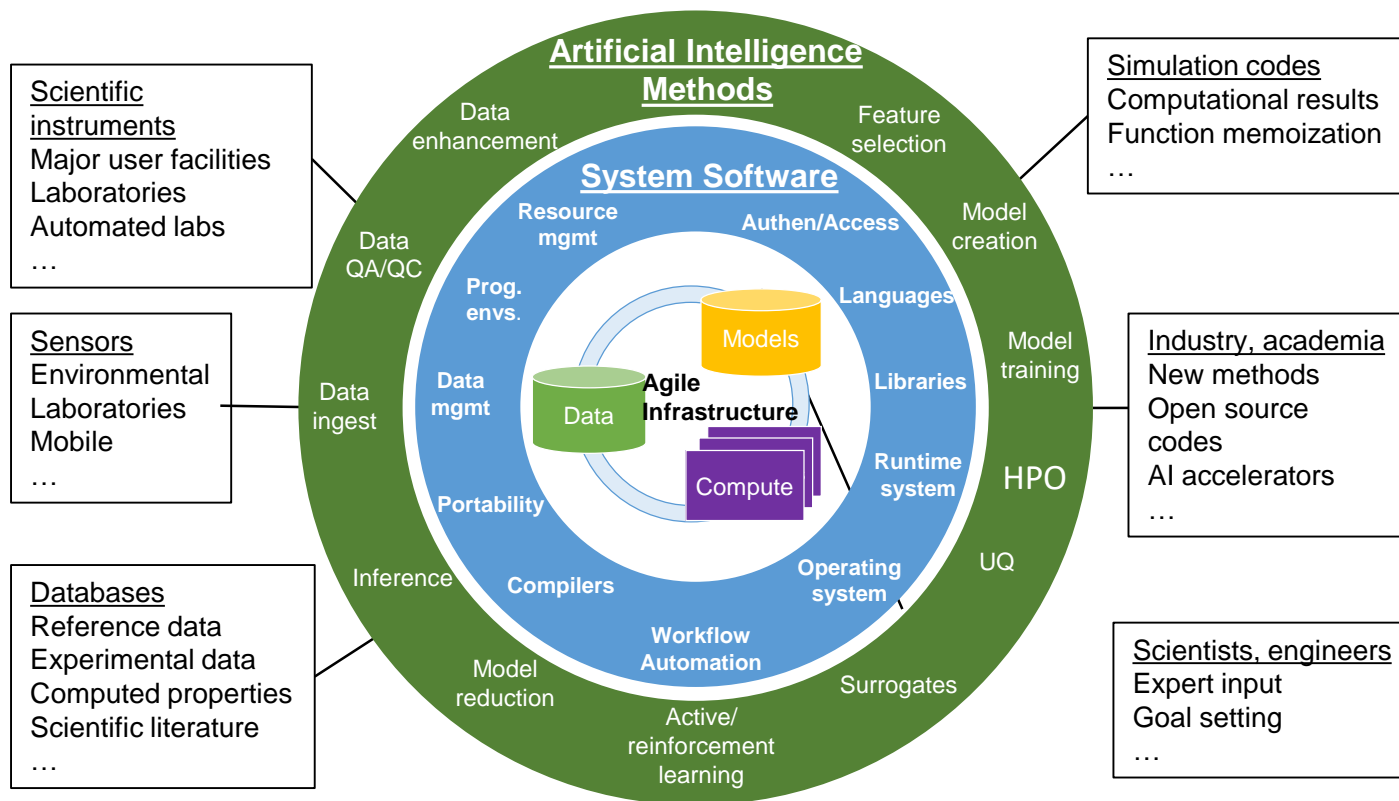
## Foundations

Mathematics, algorithms; general AI, reinforcement learning, uncertainty quantification, explainability, etc.

## Hardware

Advanced hardware to support AI. Evaluation of new architectures and systems; exploration of neuromorphic and quantum as long term accelerators for AI.

# INFRASTRUCTURE FOR AI-ENABLED SCIENCE



# AURORA: HPC AND AI



- > ExaFlops/s for HPC
- >> Exaops/s for AI



## Architecture supports three types of computing

- Large-scale Simulation (PDEs, traditional HPC)
- Data Intensive Applications (scalable science pipelines)
- Deep Learning and Emerging Science AI (training and inferencing)



# THANKS!



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