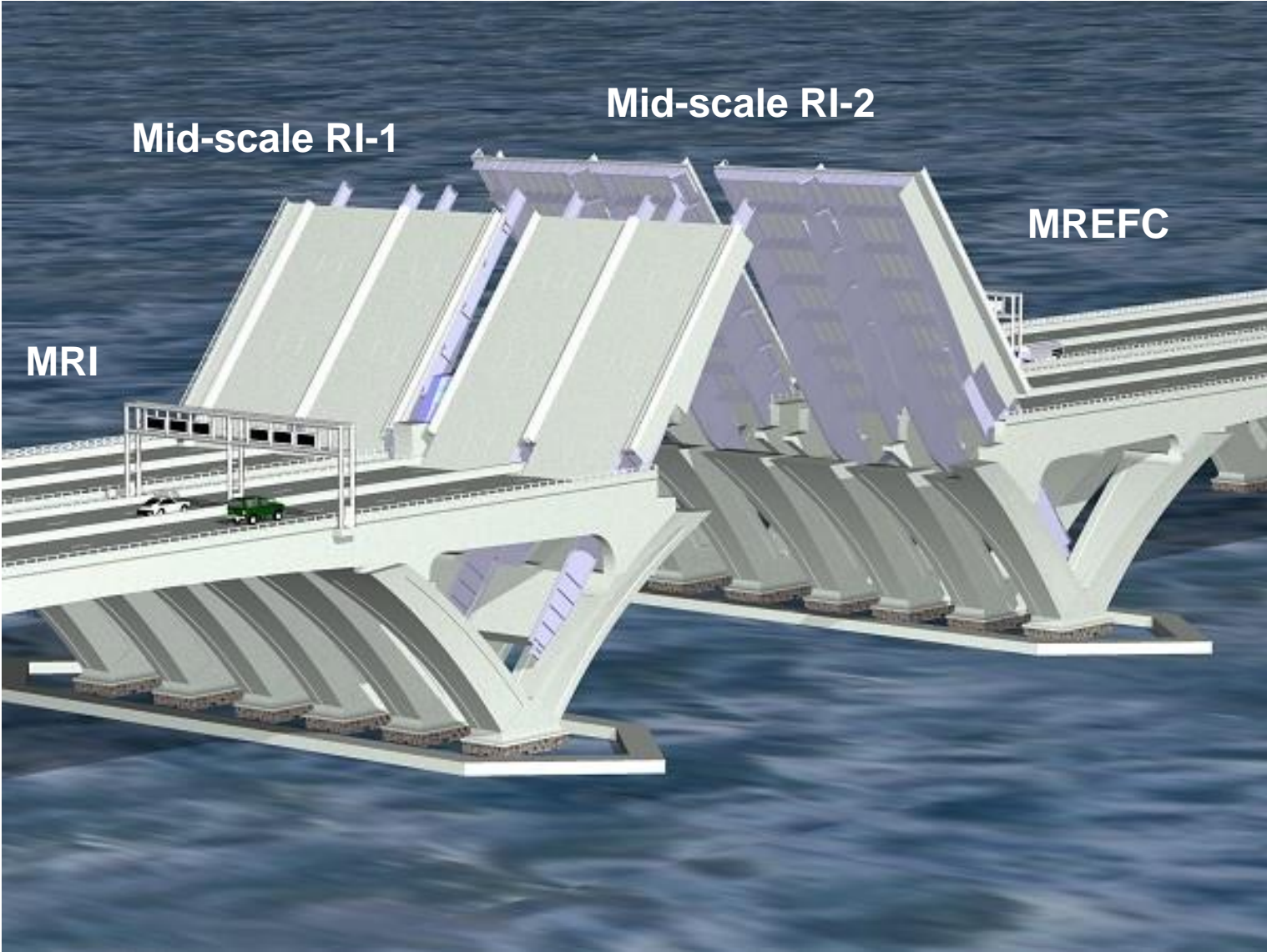


Mid-scale Research Infrastructure



Mid-Scale Research Infrastructure

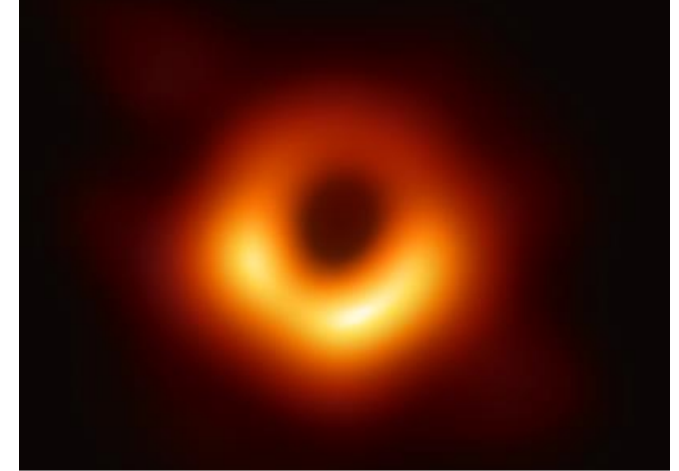
- Mid-Scale is a new, agile program for funding research capabilities
- Many important potential research projects and facilities cannot be funded by existing NSF programs
 - Major research instrumentation projects are limited to less than \$6M (with cost sharing)
 - Major research equipment and facilities construction have a minimum of \$100M
- This gap results in missed opportunities that may leave essential science undone.

Mid-Scale Research Infrastructure before MSRI

High Performance Outdoor Shake Table



Event Horizon Telescope



9-meter Geotechnical Centrifuge



Mid-scale RI

– Key Elements of Proposals –

- Infrastructure! Not centers! Not buildings!
- Intellectual merit and broader impacts,
- Potential to significantly advance the Nation's research capabilities,
- Relevance to research community priorities,
- Potential to train the next generation of leaders in technological innovation,
- Technical readiness,
- Demonstration of appropriately robust project management and cost estimation plans.

Potential Mid-Scale Research Infrastructure Projects

- Infrastructure that supports high-priority research
- Cyberinfrastructure that addresses community and national-scale computational and data-intensive science and engineering
- Major shared community infrastructure and resources that enable community-scale research.
- Upgrades of infrastructure for existing and major new infrastructure for existing facilities

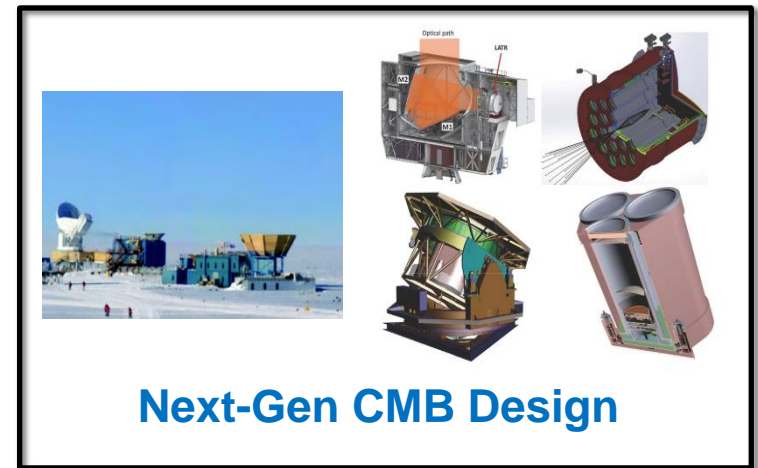
Mid-Scale Design Projects

- Design projects are a distinguishing feature of the Mid-Scale RI-1 Solicitation
- Design projects may cover Preliminary or Final Design
- Prepare a future project to a level of readiness that allows for a determination of the feasibility for implementation.
- Future implementation project could be Mid-Scale or MREFC (or other NSF-funded project)
- Budget from \$600,000 to \$20,000,000

Mid-Scale Implementation Projects

- 1) Enable well-defined, limited-term research experiments with broad community buy-in and shared data resources
- 2) (Or) Shared-use infrastructure for broad community use.
 - Includes Procurement, Assembly, Construction and Commissioning
 - Budget from \$6,000,000 to \$20,000,000 (RI-1) or \$20,000,000 to \$70,000,000 (RI-2)

Mid-scale RI-1 FY 2019 Awards - I



Mid-scale RI-1 FY 2019 Awards - II

Zettawatt-Equivalent Ultra-short Pulse Laser System (ZEUS)

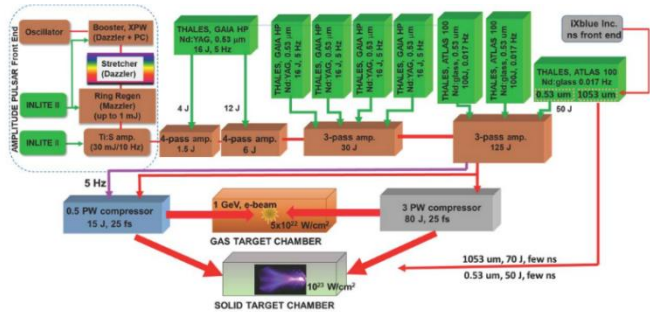
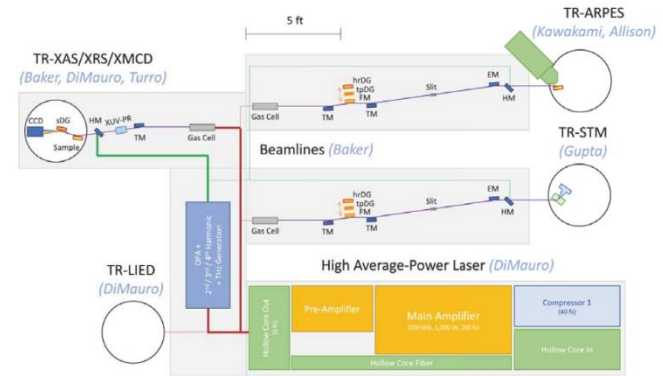
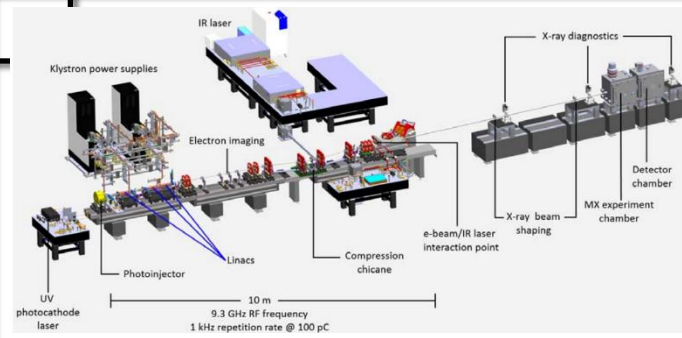


Table-top particle acceleration “equivalent to the 2-mile SLAC accelerator being reduced to a meter in length”

Attosecond Soft X-ray User Facility



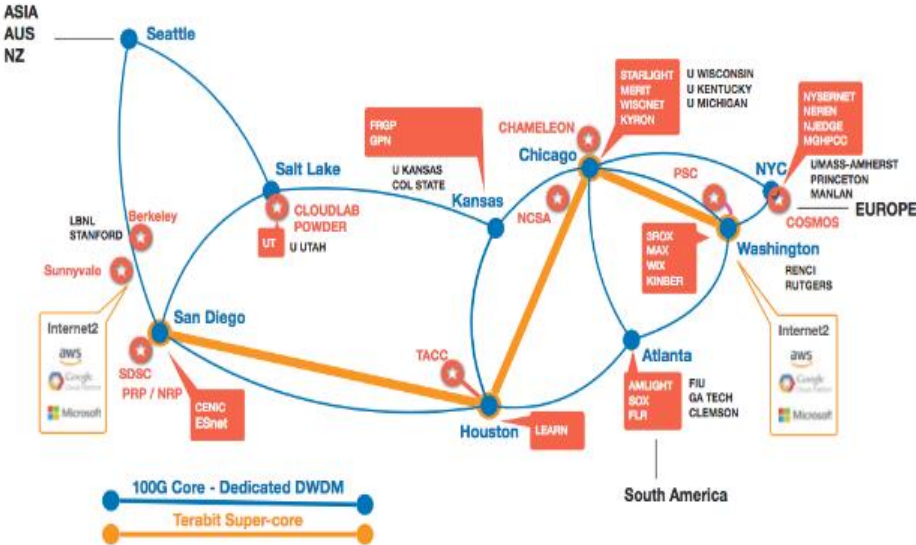
National-user light source enabling measurements unique in the world



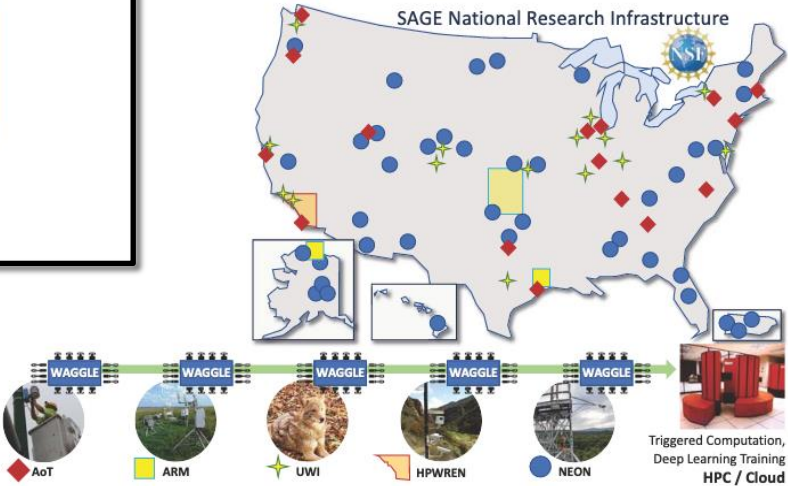
Room-size Compact X-ray Free-electron Laser (CXFEL) Design

Mid-scale RI-1 FY 2019 Awards - III

FABRIC: Next-Gen Network Testbed



SAGE: A Software-defined Sensor Network



Reusable network to quickly analyze massive amounts of environmental and disaster data.

Mid-scale Research Infrastructure – Questions –

What types of mid-scale research infrastructure would enable researchers to make transformative advances?

How can research communities get ready for the next Mid-Scale Research Infrastructure solicitation?