# **GSO** Framework for Global Research Infrastructures and How the MagLab Aligns



Global Research Infrastructures should address the most pressin global research challenges, i.e. those frontiers of knowledge where a global-critical-mass effo to achieve progress is required Science, technology, innovation and advanced research training goals should be fully integrate oughout the infrastructure plant from their early development

Many of the world's materials energy and life challenges are bigger than one scientific discipline can solve. Under the roof of our nearly 400,000-squarefoot headquarters and across our three sites, the MagLab encourages collaboration amor our international user community and talented in-house researcher to produce discoveries on new materials, solve energy challenges and grow our understanding of living things.

Global Research Infrastructures initiatives should explicitly and clearly define, as early as possible the partners through the different phases of a project's full lifecycle planning, construction, operation, decommissioning. Rules for future participation should be defined to allow the inclusion of new partners

> Funded jointly by the National Science Foundation Division of Materials Research and the state of Florida, the MagLab features a unique state-federal partnership. With one user facility hosted at Lo Alamos National Laboratory, the MagLab also features a federalfederal partnership between the Department of Energy and the **National Science Foundation**

The NSF funding sustains operation of the MagLab's user facilities at Florida State University, the University of Florida and Los Alamos National Laboratory, providing continued access for more than 1,700 worldwide researchers each year who use the MagLab's unique instruments to advance basic science, engineering and technology in the 21st century.

Stakeholders should agree upon a shared understanding of the foreseen scope, schedule (including inherent uncertainties and any processes to effectively address

NSF funding accounts for about two-thirds of the lab's total budge and supports the core mission of the lab — to operate a user

The state of Florida and the Department of Energy also make and instrumentation at the MagLab For example, DOE funded the outsert and motor generator for the world-record 100 T pulsed magnet, while NSF dollars supported power

education and outreach activities

supplies and the magnet insert.

Appropriate management structures and professional top level management should be established, consistent with best practices derived from existing recommendations and experience at the international level, to ensure rigorous project management.

The National MagLab is a large institution jointly operated fo the National Science Foundation by Florida State University, the Jniversity of Florida and Los Alamos memos of understanding that establishes the lab's governance goals and objectives. The PIs of the MagLab grant represent all three sites. The lab's scientific direction is overseen by the Science Council, leading MagLab scientists who

work with lab leadership to support

and advance the scientific mission

The development of a Global Research Infrastructure should foresee a careful balance between the minimum acceptable percentage of in-cash in-kind contributions have to be effectively evaluated regarding

This would be more relevant for multinational GRI rather than

quality and schedule.

## Two external committees, the Users Committee and the Externa Advisory Committee, provide advice on issues critical to the successfu management of the lab including

the next year and longer term vision.

for oversight of contributed funds

In addition, the MagLab generate annual reports and receives on-site reviews from NSF-selected peers in the scientific community.

The scientific output and strategic goals of Global Research periodically evaluated and upda if needed throughout the entire excellence of the scientific output quality of the services offered to the to ensure the long-term usefulnes and success of the infrastructur encumbrances on the sponsors at Partnership agreements among the conclusion of operation. funding agencies must enable each nation to fulfill its unique The MagLab hosts a fleet of worldrecord instruments and, as part

develop new, cutting-edge magnet technology to stay at the forefront of magnetic research facilities Magnets are decommissioned when the next-generation magnet becomes available to users. progress over the past year, plans However, language is included in

> our cooperative agreement that, in the case of a future awardee, the MagLab would provide access to documents relevant to the operation and management of the lab for a reasonable period of time during transition.

of our core mission, continues to

Planning for termination or The GRI policies should reflect the decommissioning of a Global global-Excellence-driven Access Research Infrastructure initiativ (gEA) paradigm through publicatio should be established early in of a clear and transparent access the development of the facility goal. The goal should incorporate where possible or relevant, by a peer-reviewed process that defining criteria for the conclusi recommends access based on the of operation, and establishin most promising emergent ideas, regardless of the country of origin exit criteria and procedures for or the ability of the proposer to closing down and recognizing

> All requests for magnet time include a description of the technology development, including broader impacts of the work, a onepage description of the previous relevant work, and a biographic sketch of the Pl. Proposal reviews are based on (1) the scientific and/or technological merit of the proposed research, and (2) the "broader impacts" of the proposed work.

Global Research Infrastructure initiatives should recognize the utility of the integrated use of advanced e-infrastructures, services for accessing and processing, and access to scientific experiments

Understanding that Tallahassee, Gainesville and Los Alamos car be difficult locations to access, the lab has developed processe and systems that provide remote on certain instruments. Remote access has been implemented for many of the lab's NMR spectrometers, enabling even more user access and reducing costs for users.

# Data exchange

Global scientific data infrastructure providers and users should recognize the utility of data exchange and interoperabilit of data across disciplines and broadening the scientific reach of individual data sets.

Our data management practices are driven by our user community and the standards of the associate funding agencies. The policy is with user demands and changes in technology.

Where clustering of complementary Research Infrastructures appears to be consistent with the mission of the Global Research Infrastructure schemes for access and mobilit of researchers, engineers and technicians through the cluster should be actively encouraged.

Five of the world's six leading magnet labs use the MagLab's Florida Bitter technology and th MagLab has collaborated with other magnet labs in both magnet technology and experimental techniques, including building a superconducting outsert for a 45-tesla magnet at the High

Field Magnet Lab in Nijmegen,

High-field magnets are also

the Netherlands.

National Lab.

valuable in neutron scattering and x-ray research. The MagLab designed and built the world's strongest magnet for neutron scattering for the Helmholtz Centre Berlin (HZB). The 26-tesla magnet system is now part of the Extreme **Environment Diffractometer and** is used to study the structure and dynamics of materials, primarily high-temperature superconductors. The MagLab is also working to develop partnerships with US neutron facilities at the Spallation Neutron Source at Oak Ridge National Laboratory and CHESS and with x-ray facilities like the Advanced Light Source at Argonne

Measures to facilitate the and engineers to participate in should be promoted.

In 2017 alone, the MagLab's 1,809 users represented 324 universities, government labs, and private companies around the world. Travel support is available

private sector.

technology transfer activities a

The MagLab works with commercialization teams at each of our three host institutions to transfer technology into the staff at Florida State and the University of Florida partner with our university-based researchers to start up companies or market early stage technologies. The Richard P. Feynman Center for Innovation helps LANL staff transition science and technology to the

In order to facilitate technology The socio-economic impact and transfer activities and the most knowledge transfer issues of Global Research Infrastructures should be productive participation of industry members of the GSO should assessed not only in the beginning but during the lifecycle of the regularly exchange information project. The GSO will refer also to on best practices regarding the OECD Global Science Forum ntellectual property rights work on the socio-economic impact of Research Infrastructure data and technology generated in Global Research Infrastructures, b

Every five years, the National regulations, in order to facilitate MagLab commissions an economic

> analysis to quantify the MagLab's output and other key measures on the state of Florida and across the United States. The most recent analysis, performed by the Center for Economic Forecasting, reports a \$182 million annual economic impact on the United States and \$5.42 returned in economic activity for every \$1 invested by the federal government.

