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WHERE DISCOVERIES BEGIN

Science Europe Workshop:  
Cross-border Collaboration and Portfolio Management of Research Infrastructures (RIs):

- Balancing Out Support to Infrastructures of Different Sizes, Serving Different Communities – U.S. Case Study

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Dublin Castle – Dublin, Ireland

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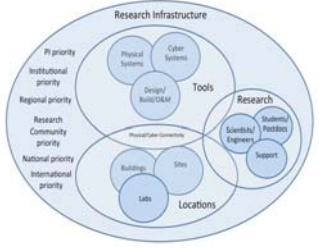
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### "The Research Infrastructure Ecosystem"

- Where does one want to play?
  - "Tools"
  - "Locations"
  - "Research"
  - "Cyberinfrastructure"
- "Scale" is driven by stakeholders
  - Local
  - Regional
  - Science Community
  - National/International
- "(Multi)Discipline" is driven by research communities...




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### Different Programs / Different Scale

- Existing NSF programs are based on (multi)disciplinary needs, as well as scale:
  - "Small"**
    - Few remaining discipline-specific instrumentation programs
    - Foundation-wide "Major Research Instrumentation" (MRI) Program
  - "Large"**
    - Foundation-wide "Major Research Equipment and Facilities Construction" (MREFC) account
  - "Mid-scale"**
    - Very few discipline-specific "in-between-scale" ("mid-scale) activities
    - No Foundation-wide "mid-scale" activity

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## The Major Research Instrumentation (MRI) Program

- Acquisition (ACQ) or Development (DEV) of a scientific research instrument
- Maximum request from NSF: \$4 million. Minimum request from NSF \$100,000 (with caveats)
- Cost sharing at 30% of total project cost is mandated by U.S. Congress
- Allows for:
  - ACQ: Operations/Maintenance during award period (salary/service contract, ,etc.)
  - DEV: Salary support for those involved in development, commissioning costs
- **Institutional submission limits (3 max)** → 800+ MRI proposals
- Centrally coordinated by NSF OD/OIA
- **Proposals distributed to Divisions based on PI preference**
  - Institutions determine the mix of disciplines MRI receives
- MRI \$\$ allocated based on \$\$ value of proposals being reviewed by a unit
- Funds further parsed based on 1) institution type, 2) size of request

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## MRI Aspirational Goals

- Provides state-of-the-art research instrumentation up to \$4 million
- Develops next generation instrumentation
- Supports research across all NSF Directorates
- Catalyzes new knowledge and discoveries
- Empowers the Nation's scientists and engineers
- Enables research-intensive learning environments
- Builds capacity for a diverse workforce
- Develops next generation instrumentation
- Promotes academic/private sector partnerships



Seattle University, a primarily undergraduate institution, credits MRI in part with transformative institutional changes.

- Increased Scholarly Activity
- Active grants from \$3 million to \$13 million
- Office of Research established
- Creation of NMR & laser labs
- New science building planned



"SeaBED", developed using MRI funds, can produce high-resolution, three-dimensional maps of Antarctic ice line.



"The Array of Things", a project supported by MRI and recently announced as part of the White House's "Smart Cities Initiative", serves as a tool for researchers to rapidly deploy sensors, embedded systems, computing and communications systems at scale in an urban environment.

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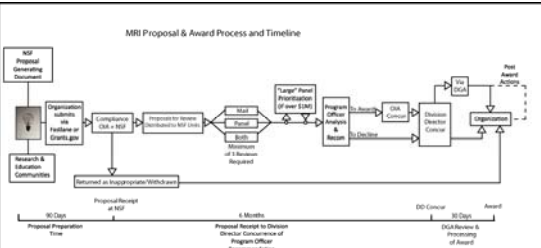
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## The Major Research Instrumentation (MRI) Program

- A messy flowchart.....

MRI Proposal & Award Process and Timeline



The flowchart details the process from proposal preparation to award. Key steps include: Proposal Preparation (SI Date), Proposal Receipt at NSF, Compliance Check, Review by NSF, Proposal Receipt to Division, Division Review & Recommendation (6 Months), DD Council, and Award (SI Date). It also shows a feedback loop for proposals returned as inappropriate/withdrawn.

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## Major Research Equipment and Facilities Construction (MREFC)

- There is a "gap" at the Foundation-level between MRI and MREFC.
- A few NSF Divisions have programs to "fill the gap", but little \$\$.
- Part of the NSF's "10 Big Ideas" involves "Mid-scale Research Infrastructure".
- Stay tuned.....




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# Thank You!

Questions: [rphelps@nsf.gov](mailto:rphelps@nsf.gov)

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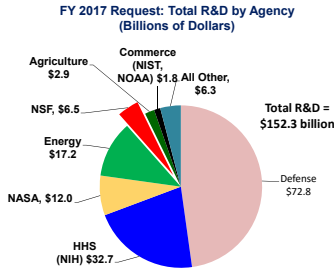
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## NSF in the U.S. Federal Context

- Who pays?



Agency	Amount (Billions of Dollars)
Defense	\$72.8
HHS (NIH)	\$32.7
NASA	\$12.0
Energy	\$17.2
NSF	\$6.5
Agriculture	\$2.9
Commerce (NIST, NOAA)	\$1.8
All Other	\$6.3
<b>Total R&amp;D</b>	<b>\$152.3 billion</b>

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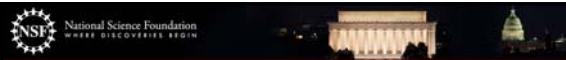
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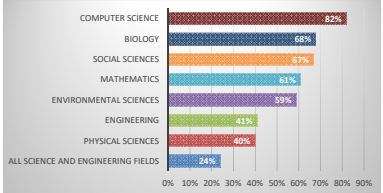
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### NSF in the U.S. Federal Context

- NSF

#### NSF Support of Academic Basic Research in Selected Fields (as a percentage of total federal support)



Field	Percentage
COMPUTER SCIENCE	82%
BIOLOGY	68%
SOCIAL SCIENCES	67%
MATHEMATICS	61%
ENVIRONMENTAL SCIENCES	59%
ENGINEERING	41%
PHYSICAL SCIENCES	40%
ALL SCIENCE AND ENGINEERING FIELDS	24%

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