Computation Institute

# Hybrid Strategies for Research Data Management

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Argonne NATIONAL LABORATORY

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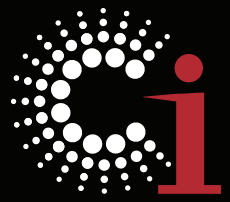

**The Computation Institute**

= UChicago + Argonne

= Cross-disciplinary nexus

= Home of the Research Cloud

Genetics

**High energy physics**

Molecular biology

**Climate change**

Cosmology

*Linguistics*

**Metagenomics**

Visual arts

**Economics**

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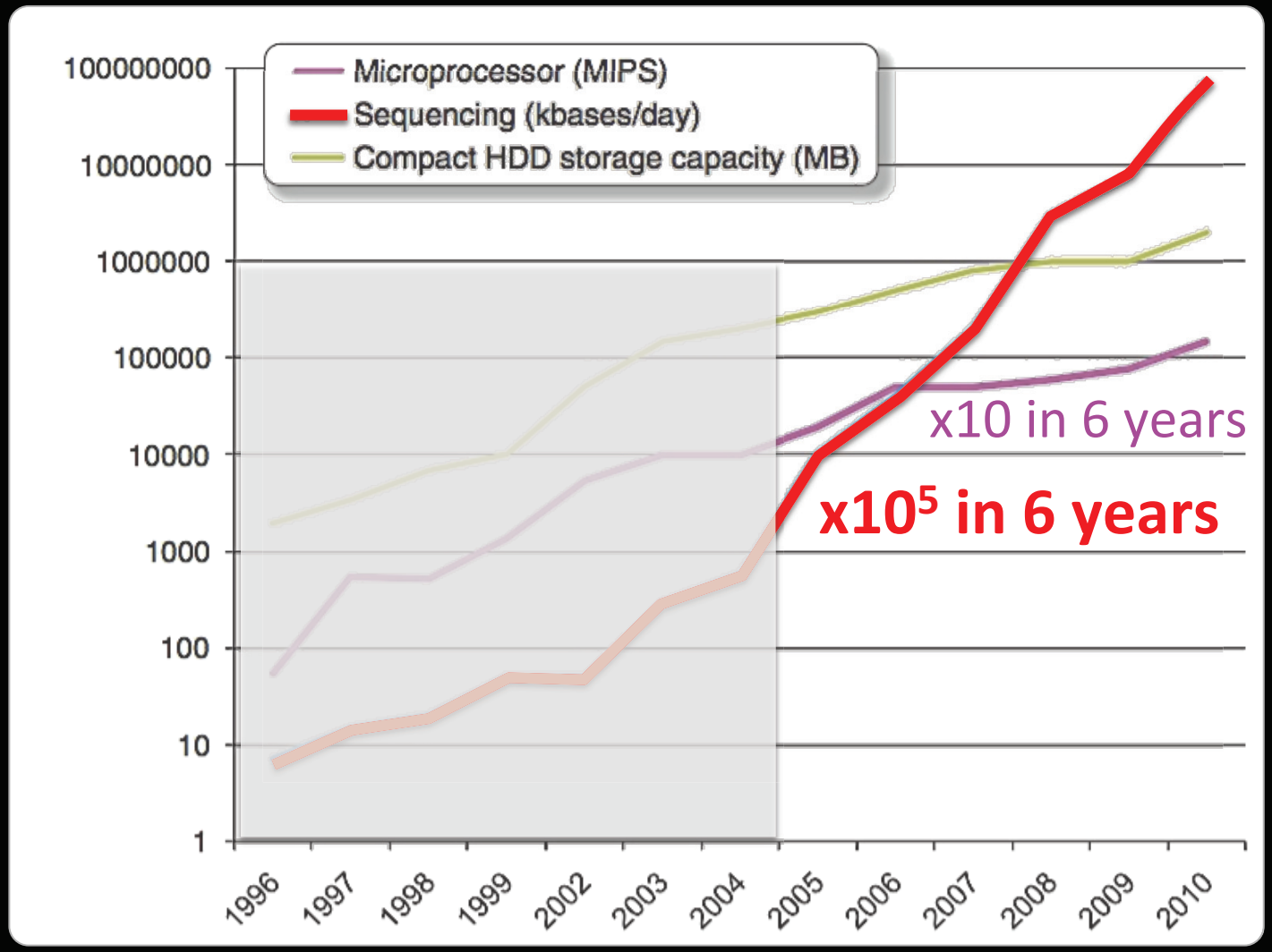
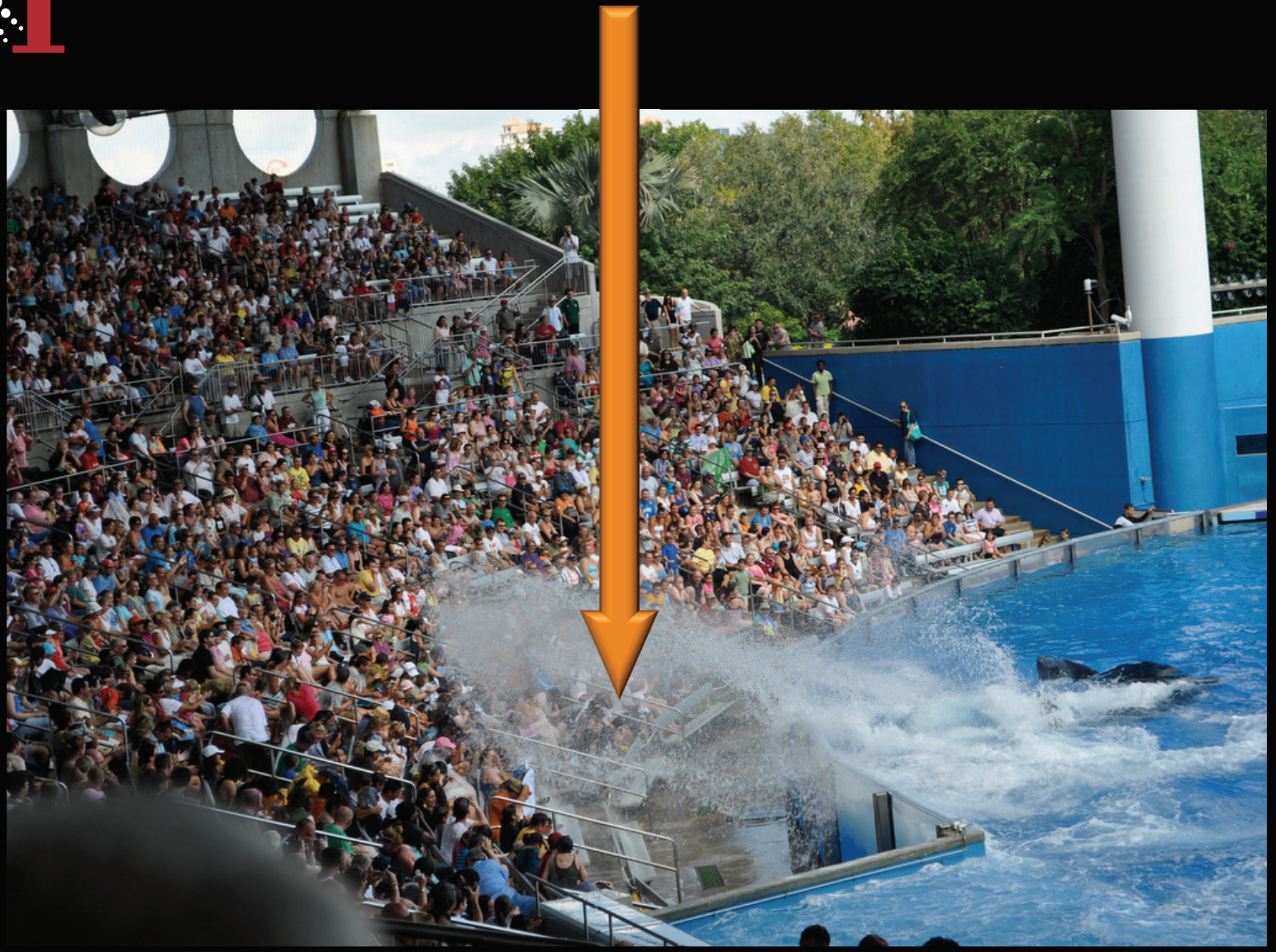

Microprocessor (MIPS)
Sequencing (kbases/day)
Compact HDD storage capacity (MB)
100000000
10000000
1000000
100000
10000
1000
100
10
1
1996
1997
1998
1999
2002
2003
2004
2005
2006
2007
2008
2009
2010
x10 in 6 years
x10^5 in 6 years


1 PB data in last experiment
Accessed by 800 scientists worldwide


# 1.2 PB of climate data
# Delivered to 23,000 users



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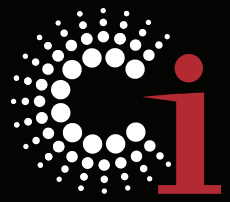
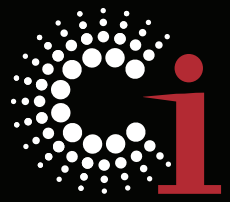
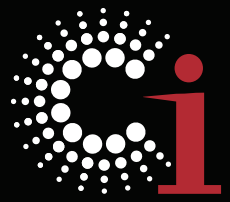


We have exceptional infrastructure for the 1%

How can the 99% manage this?



# What would a “dropbox for science” look like?



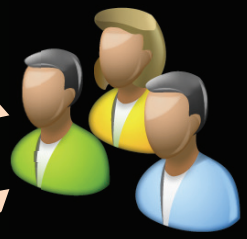
- Collect
- Move
- Replicate
- Share
- Analyze
- Catalog
- Publish
- Search
- Archive
- Backup

…among distributed research groups

Staging Store

Ingest Store

Registry



Analysis Store

Community Store

Archive

Mirror

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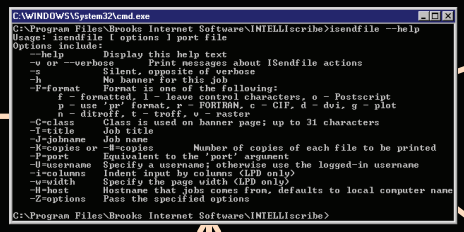
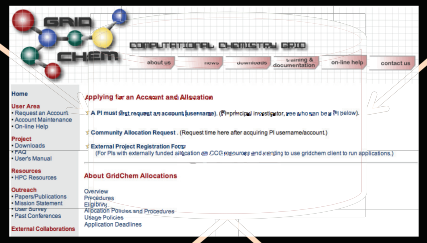
Staging Store




Registry


Archive

Mirror

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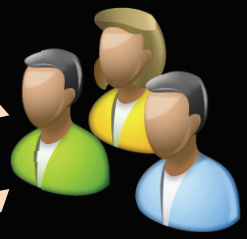
Staging Store

Ingest Store

Registry



Community Store

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- Collect
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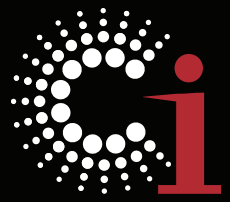
-as-a-Service



Security

Privacy

Reliability

Scalability

Control

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# A great user experience

# www.globusonline.org

## Research Data Management-as-a-Service

globus online

| | |
|---|---|
| **Globus Transfer** | SaaS |
| **Globus Storage** | |
| **Globus Collaborate** | |
| **Globus Catalog** | |
| **Globus Integrate** (Globus Nexus, Globus Connect) | PaaS |

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# Communities using Globus


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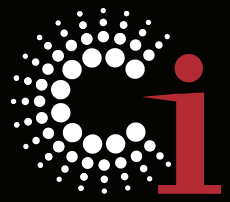
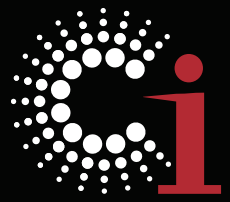


# What does it mean for us as IT resource managers?



# installers → brokers

ITServices

amazon web services™

red cloud

Drupal

SDSC Cloud

JIRA

zendesk

ATLASSIAN CONFLUENCE®

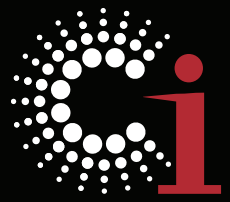
# developers → integrators


InCommon®


Shibboleth®


MyProxy
Credential Management Service

GSI-OpenSSH



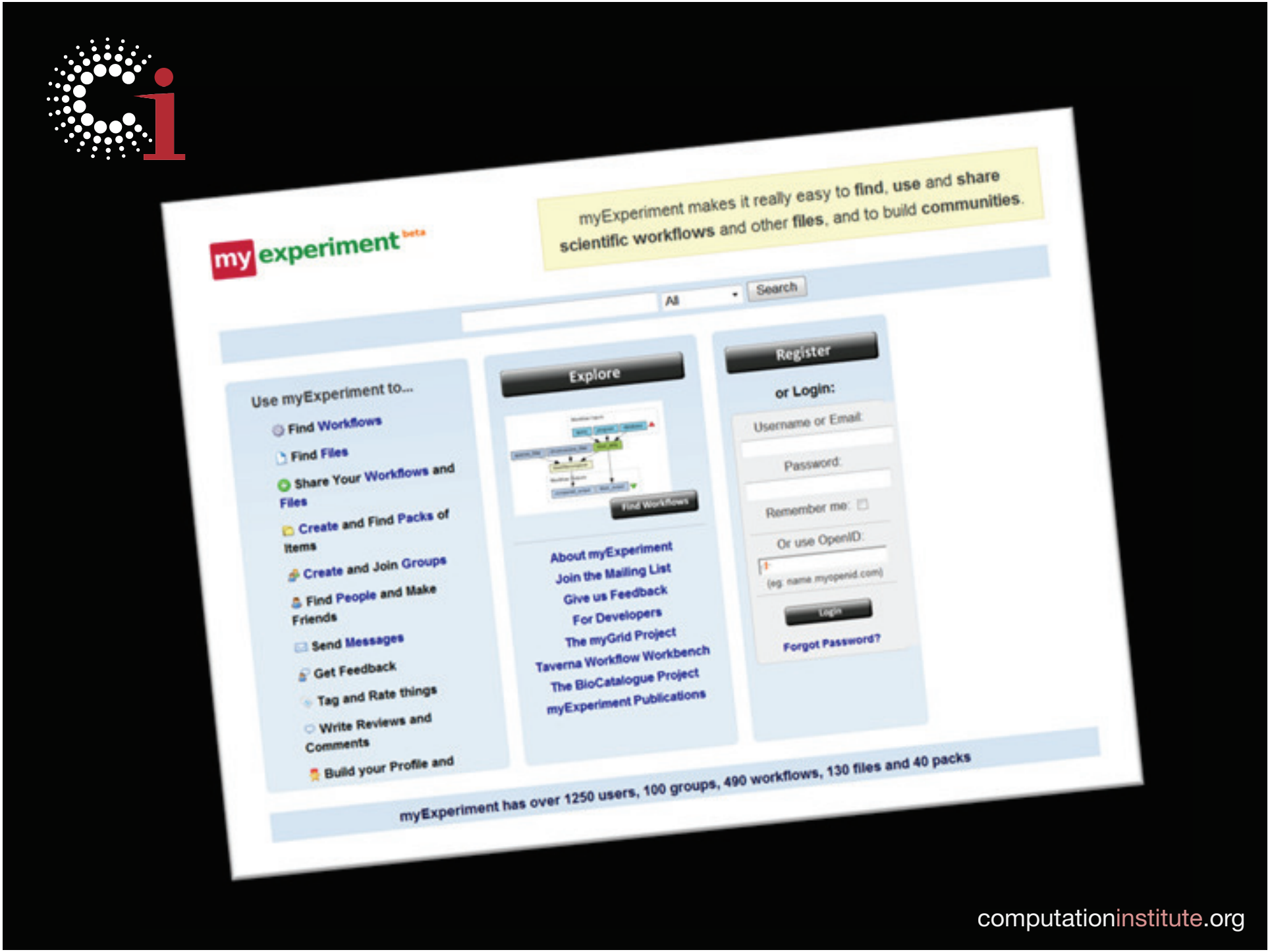
administrators → curators

(of the user experience)

Cloud? What cloud?

**1 : 1 : 0**

UX : Dev : Ops

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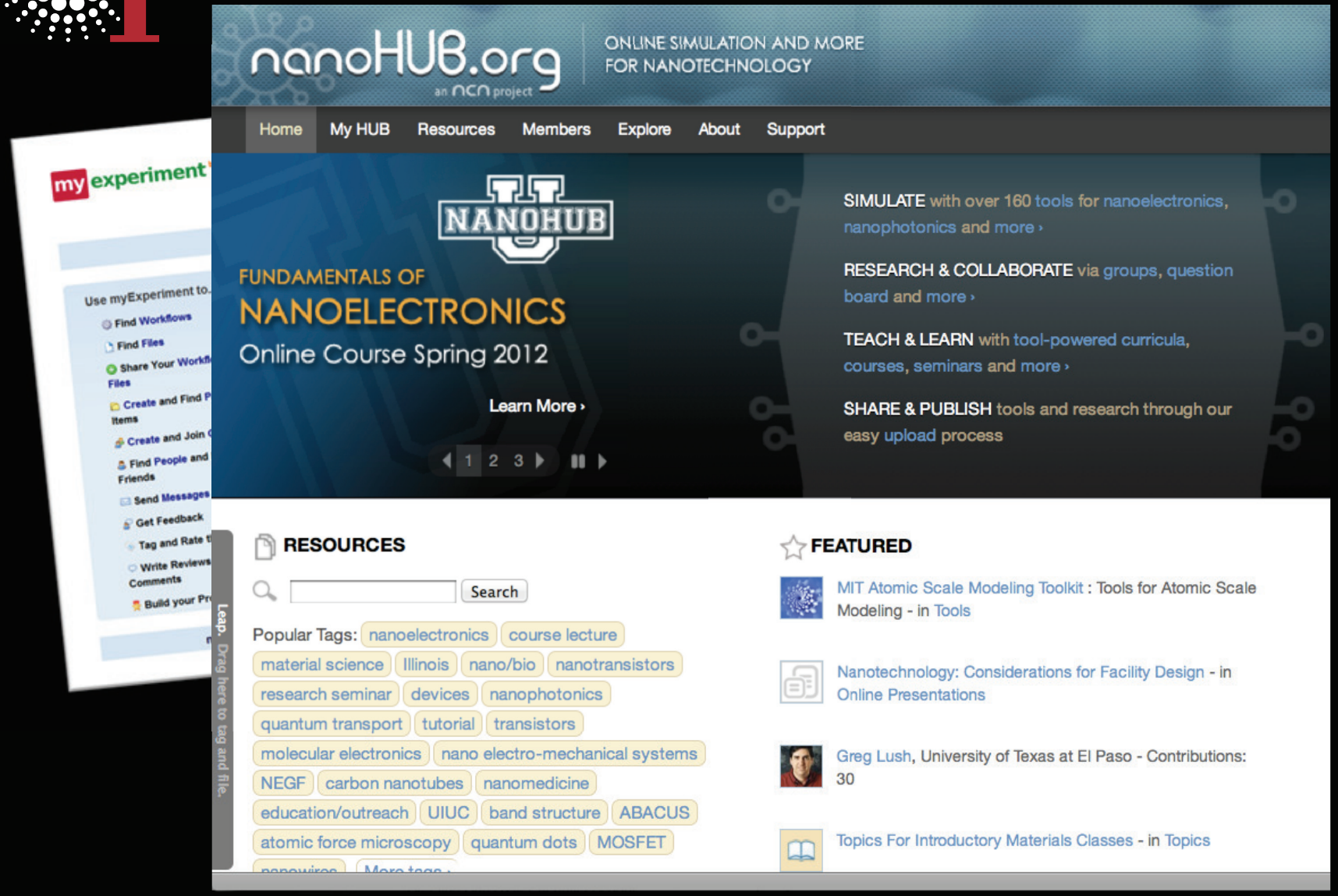


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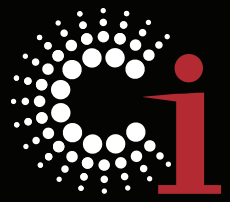
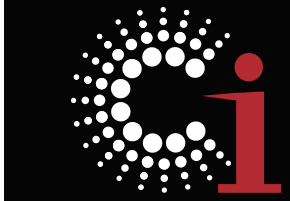


# Our vision for a 21st century cyberinfrastructure

To provide **more** capability for **more** people at **substantially lower cost** by creatively **aggregating** (“cloud”) and **federating** (“grid”) resources in a **hybrid world**



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CardioVascular Research Grid

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