



SAND2016-4185PE

# CINT User Program Overview

Heather Brown  
User Program Manager

FY13-FY15 Peer Review

May 10, 2016

**SAND Number: XXXX**



# CINT User Program

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**CINT is achieving a productive and satisfied user community by:**

- Executing a fair and effective proposal review process;**
- Delivering balanced capability allocation & scheduling;**
- Attracting a broad user community;**
- Managing a robust communication & outreach plan.**



# CINT User Program

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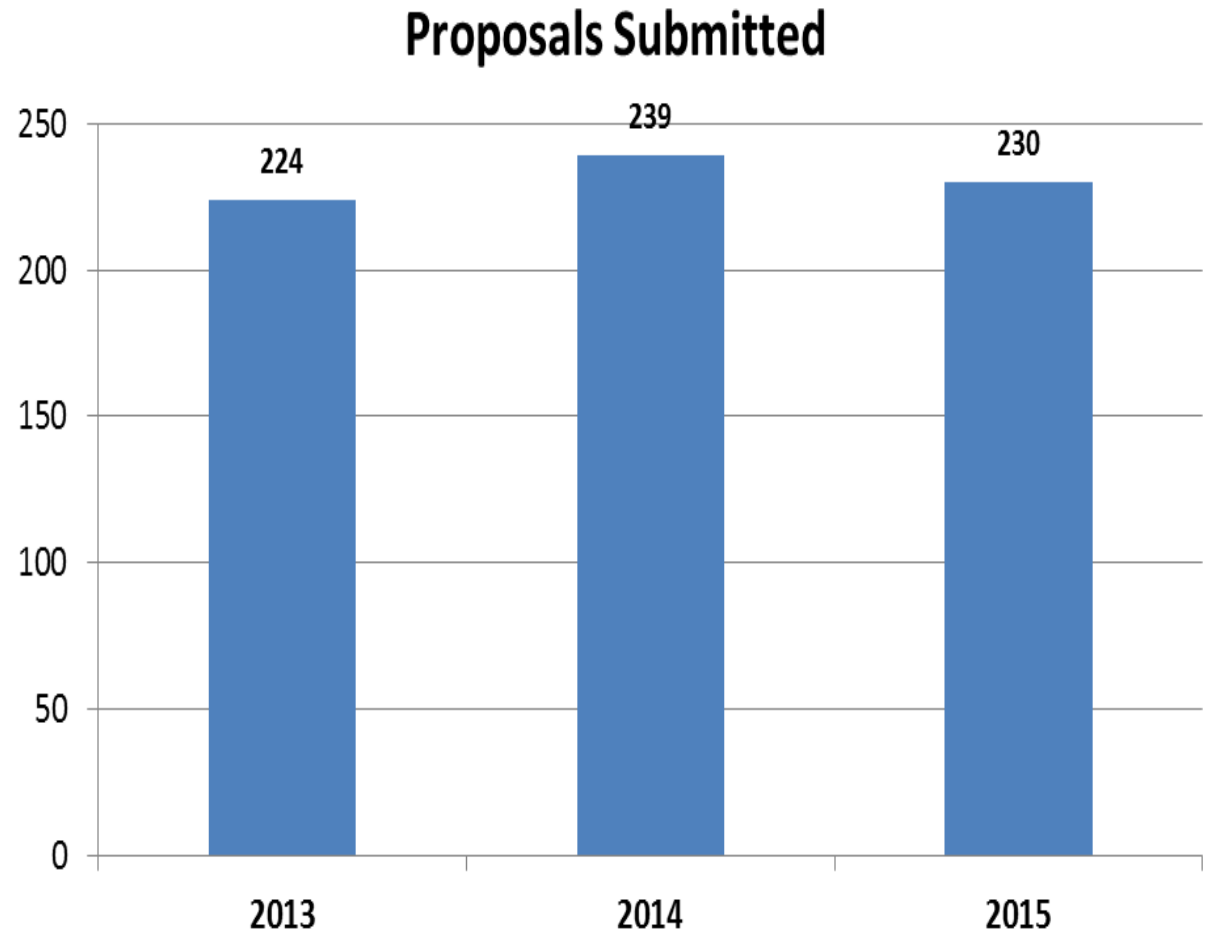
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# User Proposal Submissions

- **2 Call for proposals a year in March & September**
- **Receive ~230 proposals per year**





# Proposal Template

All CINT User proposals are expected to use the CINT template and explicitly contain the following six elements within the 2-page limit:

- Main scientific question
- How work is advancing the field of research
- Expected impact(s) of user project
- Specific prep work to be performed at the user's institution
- Specific work to be performed with CINT
- Key References

THE CENTER FOR INTEGRATED NANOTECHNOLOGIES

Welcome hdbrown! [Log Out]

Proposal Home Profile Proposals My Reviews Scientist Menu Admin Menu Review Downloads

### NEW TO CINT?

You have reached the Center for Integrated Nanotechnologies user proposal submission site. To learn more about CINT, or to browse the main CINT site, please click [here](#).

HOW TO GET STARTED:

- **Create an account:** This will give you secure access to both your past and current proposals.
- **Create or Update your Profile:** This will ensure that CINT has the latest information for you and the proposals you are part of. Click [here](#) to manage your profile.
- **Gather your information:** The site is designed to guide you through the proposal submission process. You may stop at any point and return later to complete your proposals. Each step is saved as you progress. Click [here](#) for a proposal submission guide.
- **Proposal Template:** Click [here](#) for a proposal template in Microsoft Word. All proposals are required to use this template. Any proposal submission not using the approved CINT template will not be considered for review. CINT user proposals are evaluated by external reviewers based on six specific proposal elements. Proposals lacking any of that information will be at a competitive disadvantage for access to CINT. CINT User proposals are expected to explicitly contain the following six element within the 2-page limit: 1. What is/are the main scientific question(s) being addressed in this user project including the connection to nanoscience? (suggested length - 200 words) 2. Briefly describe the state of research in this area and how your work is advancing the field. (suggested length - 150 words) 3. What is/are the expected impact(s) of this user project? (suggested length - 150 words) 4. What specific work will be performed at the user's institution in preparation for, or in support of, the proposed CINT work? (sample preparation, complementary characterization, calculation) 5. What specific tasks will be performed by the user(s) in conjunction with CINT? For each task, include task duration, expected task outcome, requested instrument(s) and CINT staff engagement. (This should be the longest and most detailed section.) 6. Key References.
- **Create an online proposal:** Log-in to your account using your email address and password. Follow the electronic step-by-step proposal submission links. Each proposal question has context-sensitive "help" to guide you through the process, and you may click [here](#) for a step-by-step guide. Click [here](#) to view your proposals or create a new proposal.
- **Complete and submit:** After completing your proposal and entering all information, click the "submit" button on the review and submit page to submit your proposal.
- **Review Process:** Consists of scientific feasibility, ESH, external proposal committee evaluation, and final committee consideration of all applicable scientific merit, technical feasibility, impact on field, and CINT capabilities.
- **Contracts:** For approved proposals, identified contract officers will be contacted for user agreement execution in preparation for your project start.
- **Proposal Notification:** You will receive formal notification via email of the decision regarding your User Proposal.
- **Guest Processing:** If our proposal is approved and you will be visiting the either of the CINT facilities, you will need to get an ID badge. Please contact your scientific liaison or CINT@lanl.gov for forms and information.

ANNOUNCEMENTS:

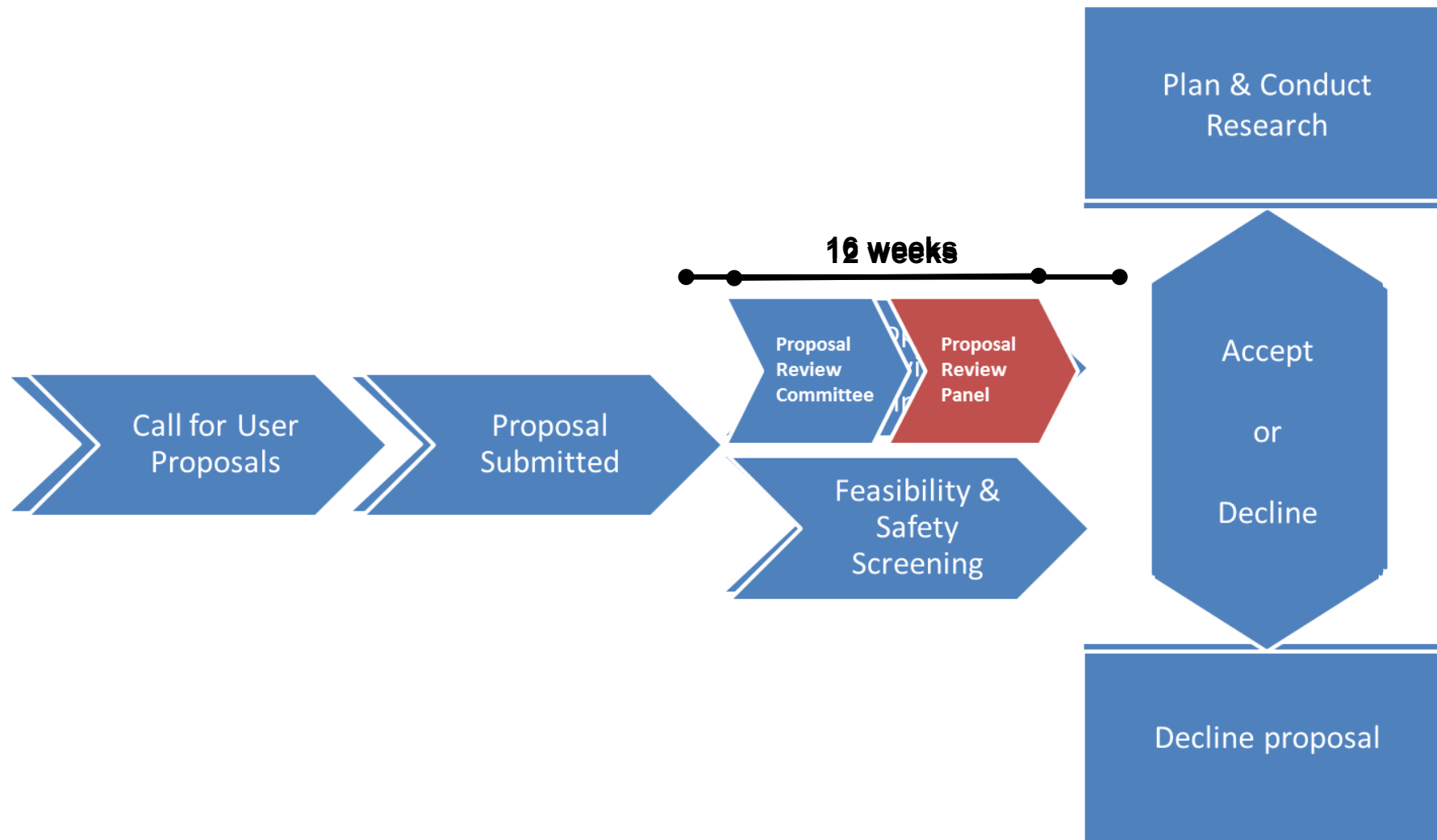
Click [here](#) to view your proposals.

AT A GLANCE

You currently have 12 proposals in draft, and have submitted 4. Click [here](#) to view or create proposals.



# Proposal Review Process





# External Proposal Review Committee

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- Three individual external reviews
- Score along with strengths and weaknesses comments returned to CINT electronically
- A list of PRC members and review guidance in Appendix

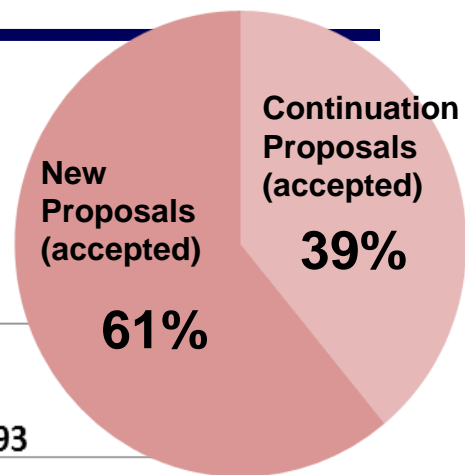
Score Range	Relative Priority	Qualitative Assessment <i>(Supported by reviewer comments)</i>
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# CINT Projects

## Proposal Submitted / Accepted

■ Proposals Submitted ■ Proposals Accepted

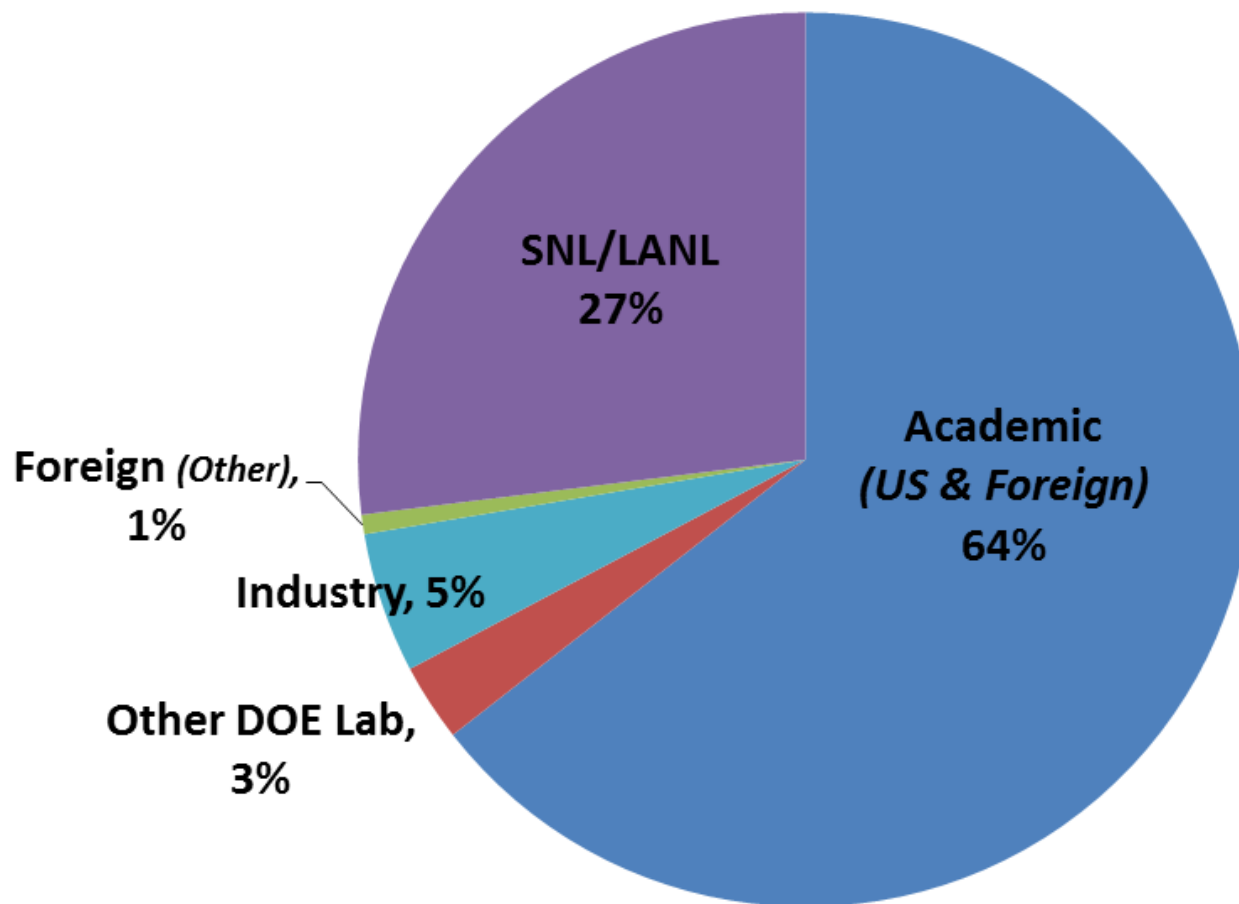






# Project Institutions

## FY13-FY15 Accepted User Projects by Institution Type

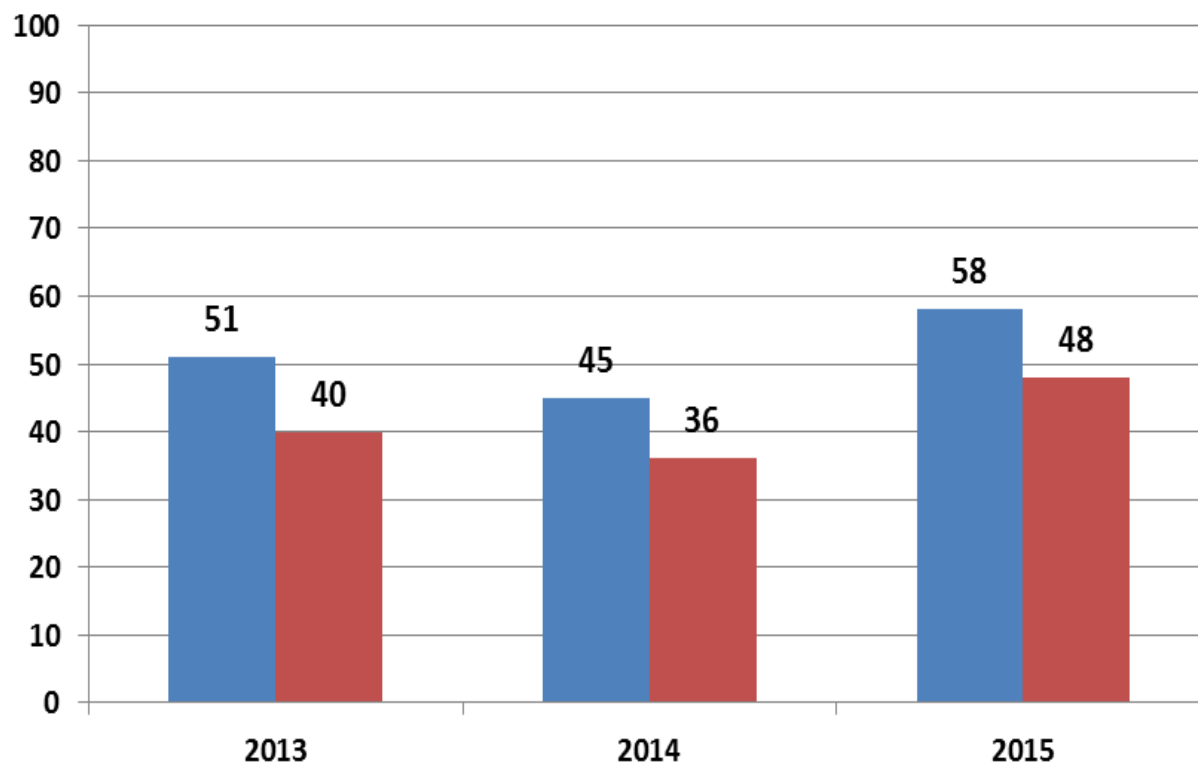




# Rapid Access (RA) User Proposals enable “just-in-time” CINT access

## FY13-FY15 Rapid Access Proposals

■ Submitted RA ■ Accepted RA



- Access to CINT between regular proposal cycles for time-critical, focused, high-impact research.
- Expedited feasibility screening & technical review (2 weeks)
- RA user projects are granted up to 3 months access.



# CINT User Program

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# Resource Allocation & Scheduling

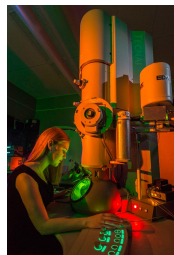
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Most users come to CINT to work with our scientists. Typically, we are limited only by staff time, not tools.

- Priority scheduling is considered when granting user access time and is based on:
  - External Proposal Review Committee score
  - Traveling external user with limited visit dates
  - Time-sensitive deliverables stated in proposal

Exceptions include:

- Technai F30 TEM , JEOL E-Beam Lithography and the Integration Laboratory (IL)

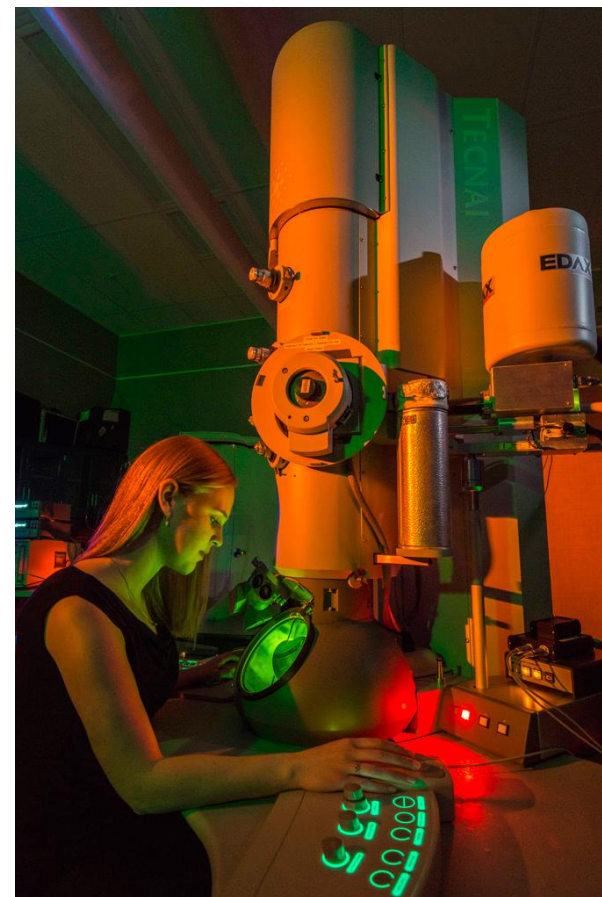




# Resource Allocation & Scheduling

## Technai F30 TEM allocation – **specific to proposal**

- Katie Jungjohann (TEM capability owner) works with the user to determine time needed to complete research and who will be doing a majority of the work (trained user, untrained user, CINT staff)
- Proposals are given a session allotments per month in their approval notification
- Average allocation between two and four 4 hr sessions/month
- These allotments are for peak hours (8am-5pm) when CINT scientists are available
- Off-peak hours can be granted for trained users





# Resource Allocation & Scheduling

## JEOL E-Beam Lithography Scheduling – **applies to all proposals**

- The planned allocation of available tool time is 70% User Proposals, 20% CINT Science and 10% maintenance
- Time allowed per proposal varies with the number of active projects
- Based on 100% utilization, policy gives 3-4 hours per week per proposal on the tool in addition to training time.



## Integration Lab (IL) Scheduling – **applies to all proposals**

- A maximum of 2 users may work in the IL per proposal
- To be trained on the IL instruments users must commit to work in the IL for a minimum of 3 months to avoid training bottleneck





# CINT User Program

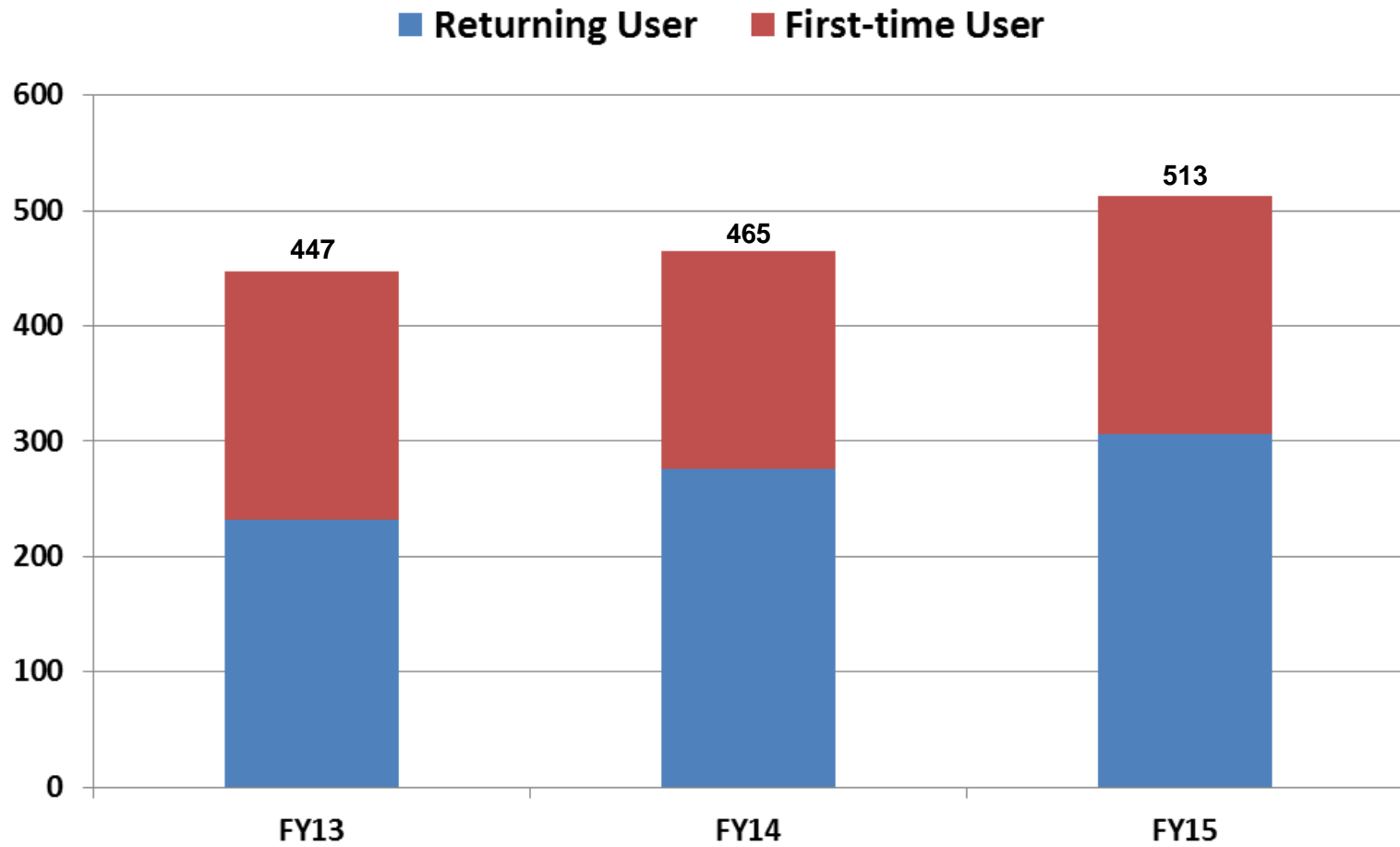
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# Steady User Growth

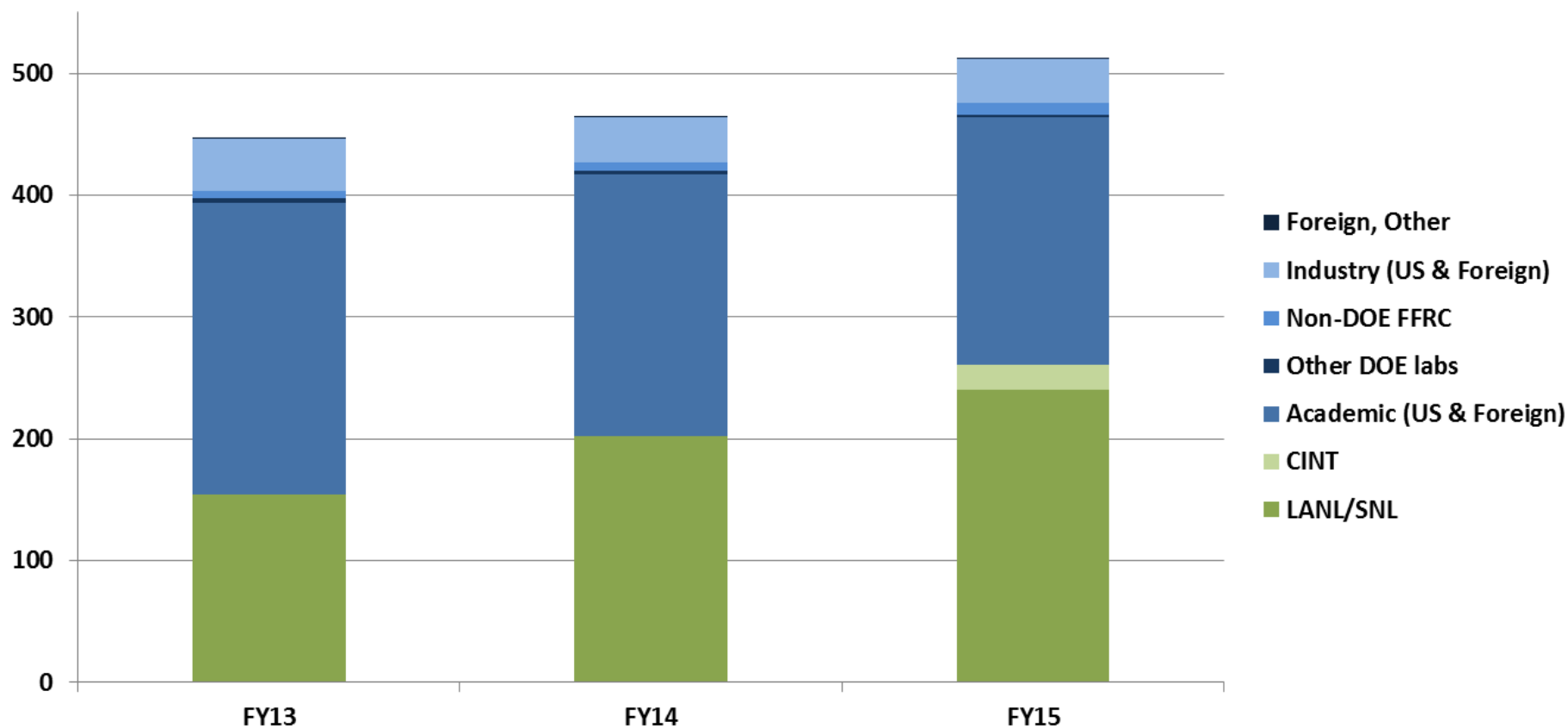






# CINT attracts a broad community of users

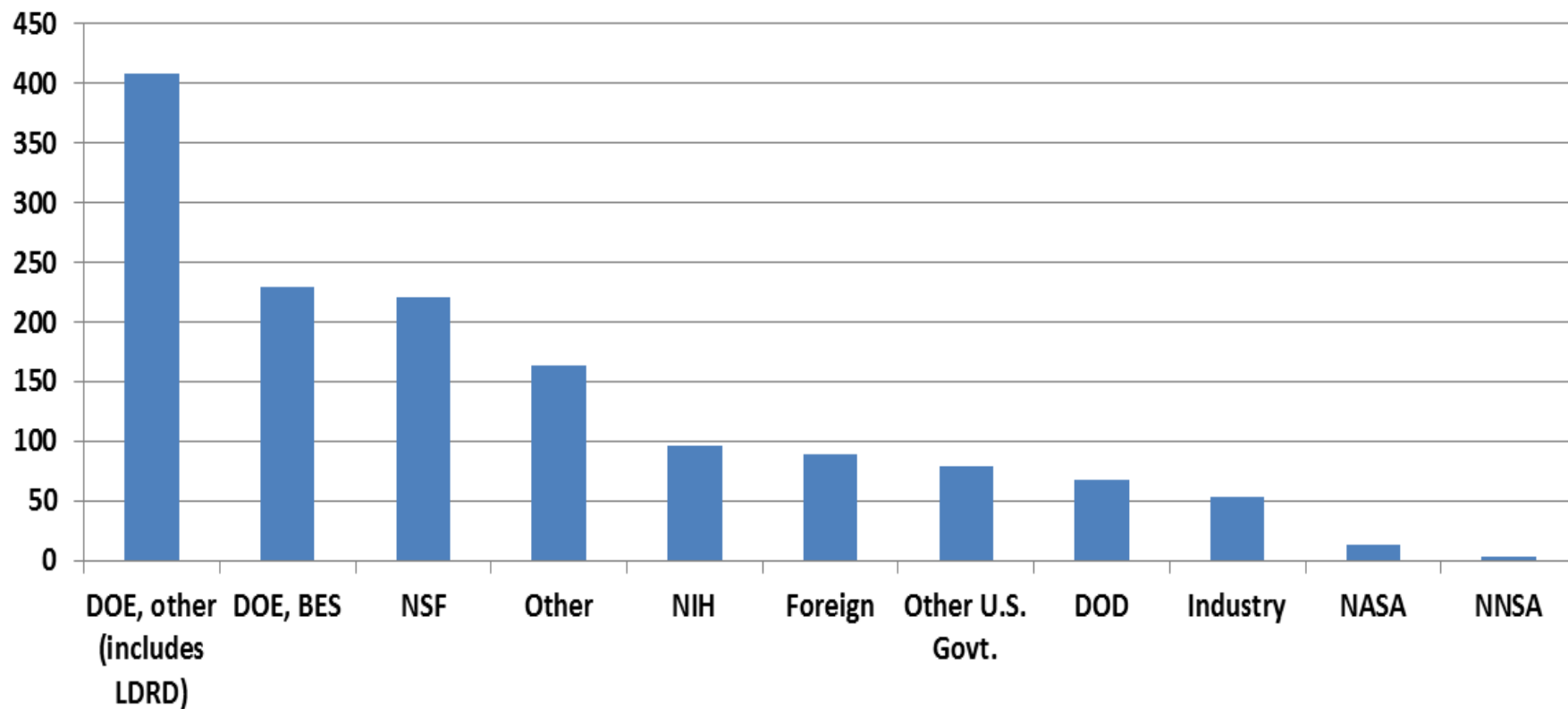
**FY13-FY15 User Affiliations**





# CINT attracts a broad community of users

**FY13-FY15 User Main Funding Source**





# CINT is attracting users from both domestic and international institutions

**CINT offers world-leading capabilities and expertise that attracts a broad and diverse User community**



**Users from 38 of 50 United States**



**User projects from 53 foreign institutions  
within 23 unique countries**



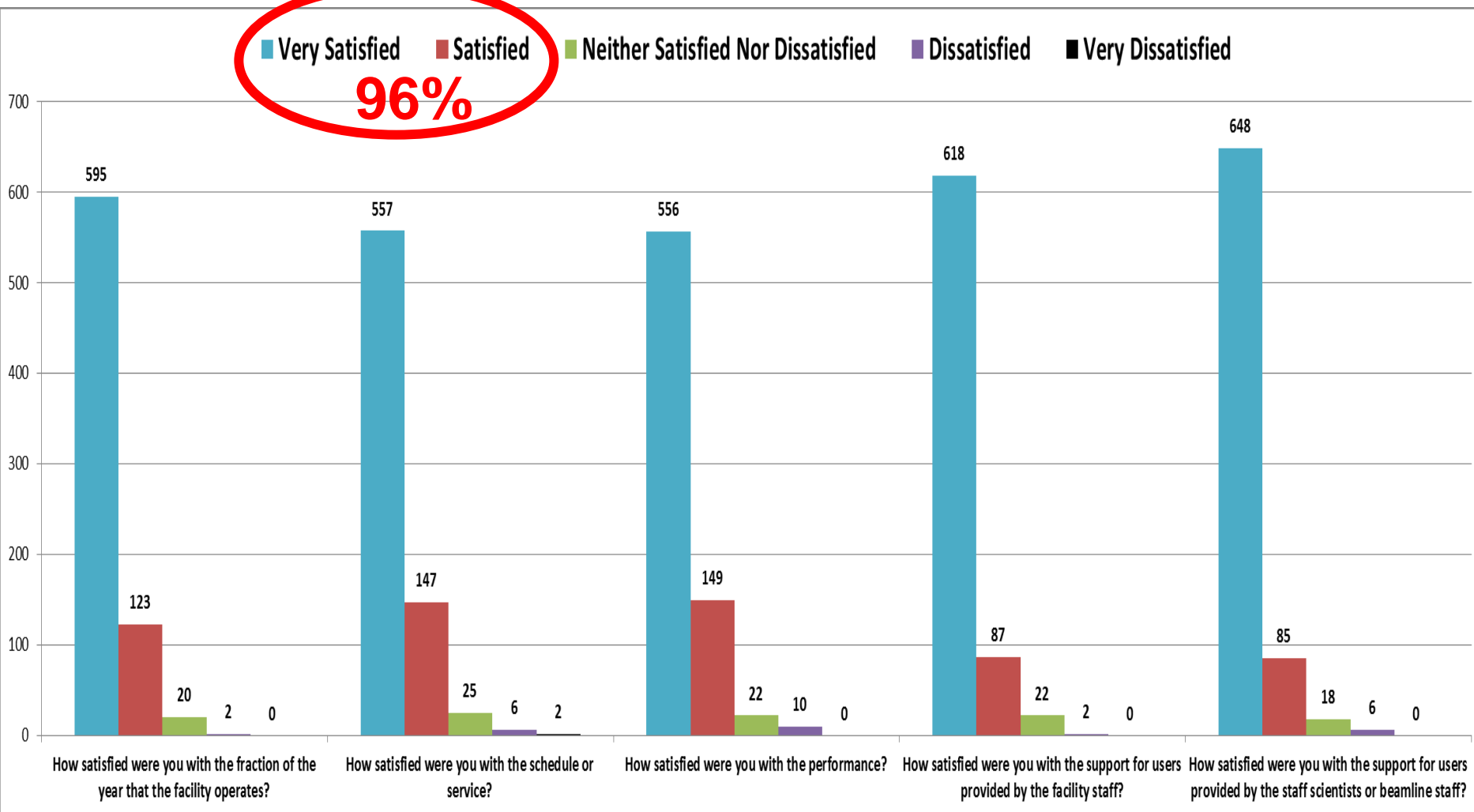
# CINT users are “very satisfied” with CINT

## *FY13-FY15 BES User Satisfaction Survey Results*

FY13 – FY15 = 821 User responses

■ Very Satisfied ■ Satisfied ■ Neither Satisfied Nor Dissatisfied ■ Dissatisfied ■ Very Dissatisfied

**96%**





# Users gain many benefits from CINT

## *FY13-FY15 CINT User Satisfaction Survey Results*

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- **73%** - Obtained access to unique capabilities not available elsewhere  
*(e.g., forefront experiments; one-of-a-kind instruments; distinctive materials or services)*
- **71%** - Facilitated collaborative interactions  
*(e.g., stimulated new ideas for future experiments, increased multidisciplinary work; enabled a new approach within your discipline)*
- **45%** - Furthered the goals of the Department of Energy
- **40%** - Trained students  
*(e.g., undergraduate, graduate or postdoctoral associate)*



# What has CINT done with our user feedback?

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- User feedback: decrease proposal notification lead time
- *CINT action: adjusted review process to shorten notification time, 16 weeks to 12 weeks.*
- User feedback: grant training reciprocity between the sites
- *CINT action: training reciprocity granted for NANO101 and RAD210. More courses in process.*
- User feedback: create a mechanism to search for capabilities & expertise available at the facilities
- *CINT action: CINT led the effort to develop the NSRC portal website.*

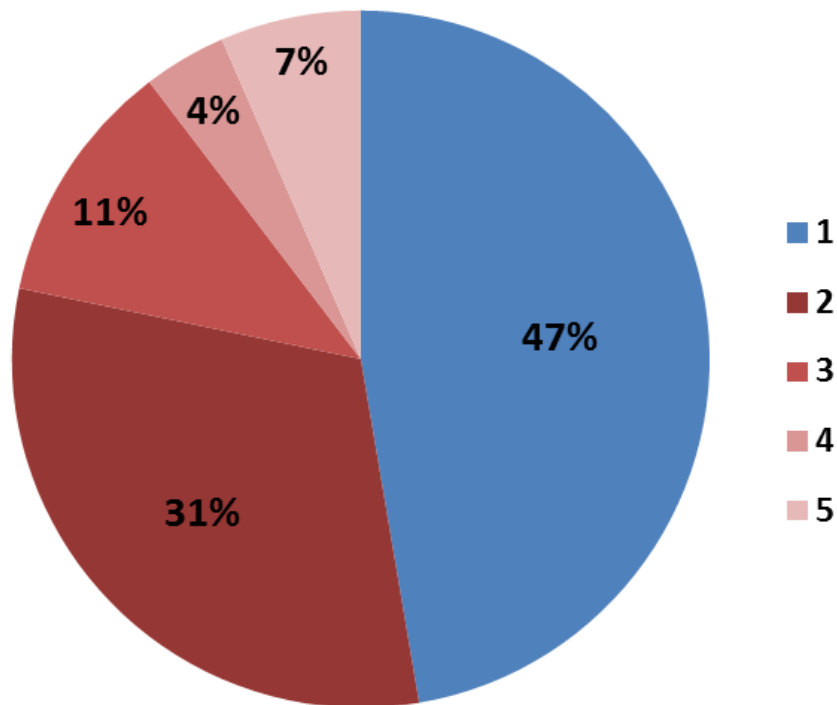
## Other feedback:

- Requests for travel funding – *unallowable per BES*
- Increase approved project duration – *18 months an appropriate duration with continuation option*

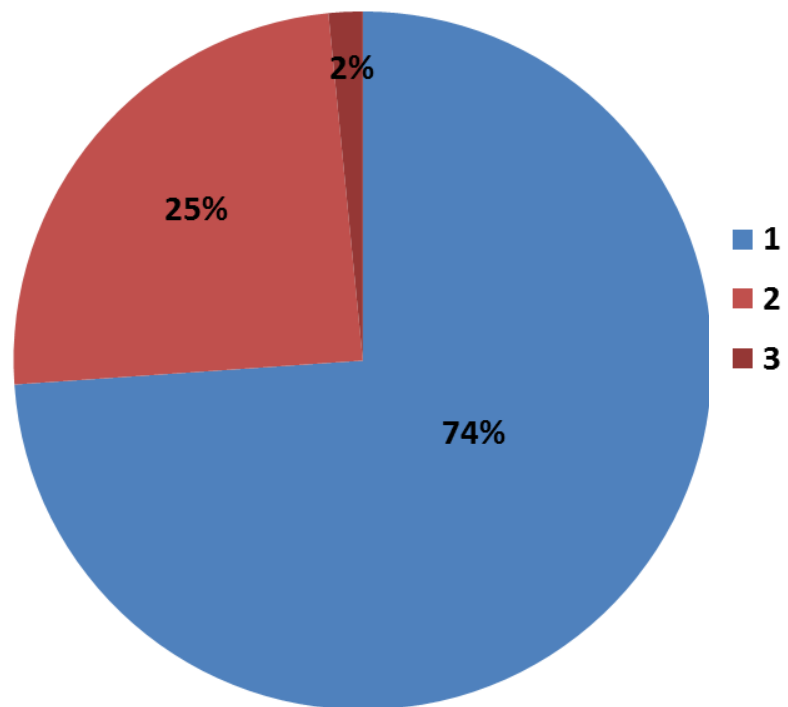


# CINT user projects are interactive and multidisciplinary

Over 50% of projects request  
**2+ scientists**



Over 25% of projects span  
**2+ thrusts**



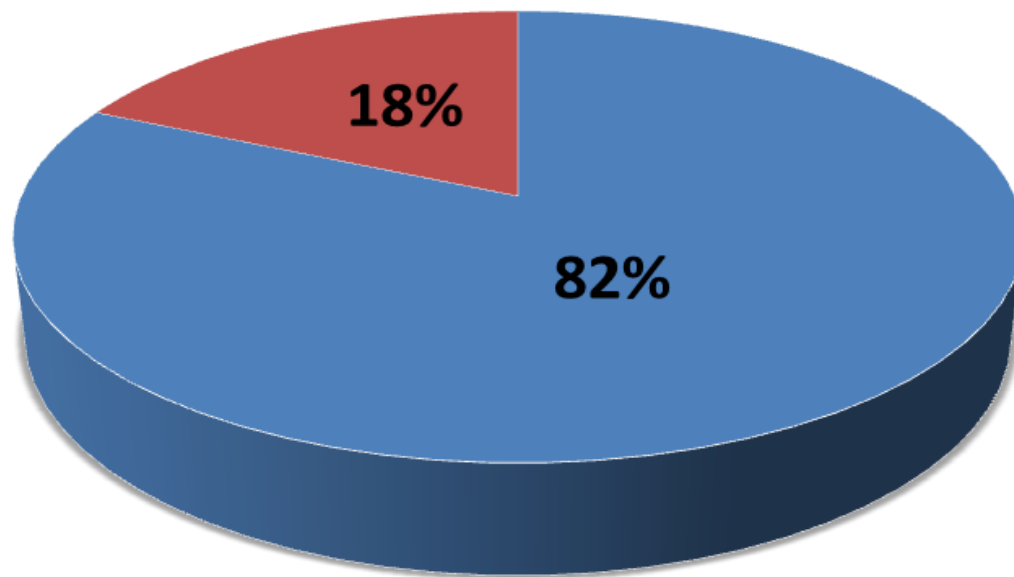


# The value of our interactions is also evident in user publications

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## CY13–CY15 User Publications

■ With CINT co-author      ■ Without CINT co-author







# CINT User Program

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# ***What do we want to accomplish?***

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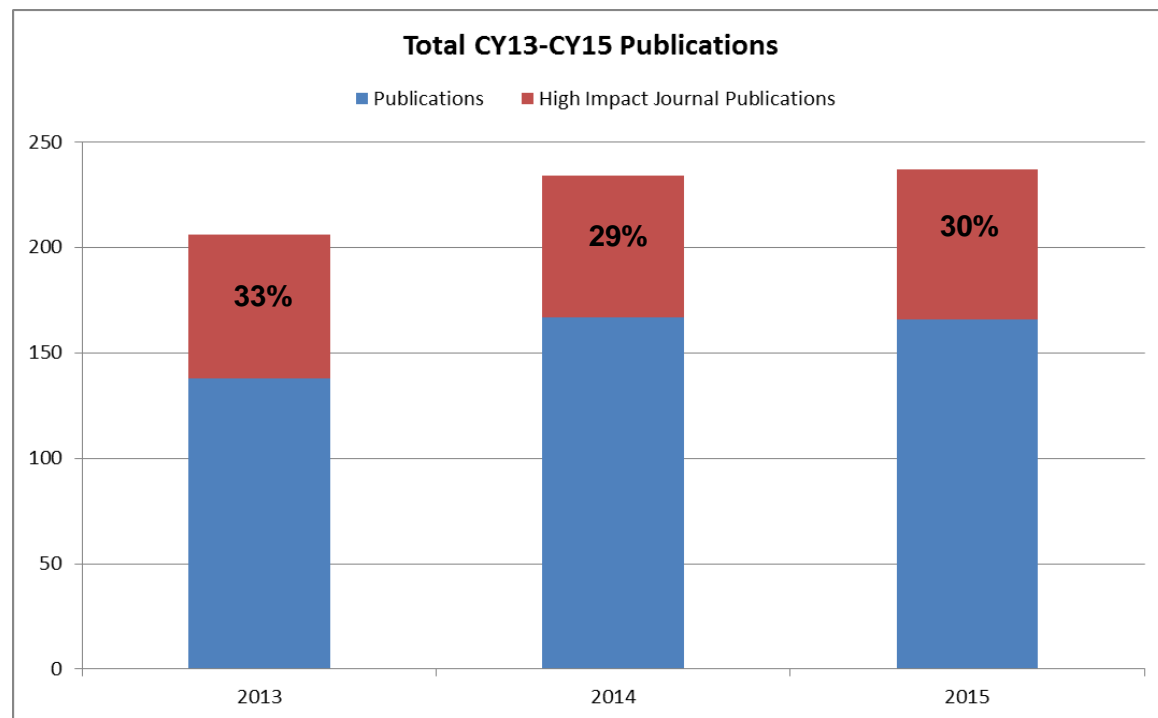
## **Communications & Outreach objectives**

- 1. To increase CINT's brand recognition among peers**
- 2. To recruit a vibrant, national user community including industry**
- 3. To enhance interactions among our external and internal communities, and**
- 4. To share our commitment to nanoscience integration through educational outreach**



# Increase brand recognition among peers: Scientific leadership

- 19 journal covers
- over 200 publications a year
- 30% in high impact journals





# *Increase brand recognition among peers:* **National meetings and Society leadership**

## Workshop & Symposia Organized by CINT staff:

-The International Chemical Congress of Pacific Basin Societies conference (Pacifichem 2015)

Symposia Organizer: **Sergei Tretiak**



-In Situ Electrochemical Electron Microscopy Conference, Sponsored by the Joint Center for Energy Storage Research

Workshop Organizer: **Katie Jungjohann**



-Materials Research Society Meetings, 2013, 2014 and 2015

Symposia Organizers: **Quanxi Jia, Rohit Prasankumar, Wally Paxton**



-The Minerals, Metals and Materials Society (TMS) 2014 annual meeting

Workshop Co-Organizer: **Nate Mara**

## **Over 60 meetings and symposia organized**

### Society leadership:

**Sean Hearne**, Materials Research Society (MRS) Secretary

**Quanxi Jia**, Chair of the Electronics Division of the American Ceramics Society

**Gabe Montano**, Board of Directors President, Society for the Advancement of Hispanics/Chicanos & Native Americans in Science (SACNAS)





# Recruit a vibrant, national user community: strategic outreach

## • Joint NSRC activities

- 2015 ACS Meeting NSRC Director's hosted NSRC symposia
- Big, Deep, and Smart Data Analytics in Materials Imaging Workshop
- CLEO Workshop on Nanophotonics Research at the DOE Nanoscale Science Research Centers 2013
- TechConnect 2016 Industrial User Panel & Expo (*upcoming*)



## • CINT Industrial Seminar Series

- Michelle Ostraat, Aramco Research Centers, *“Leveraging nanotechnology to address complex materials challenges in the oil & gas industry”*
- Northrup-Grumman (*upcoming*)
- IBM (*upcoming*)







# ***Recruit a vibrant, national user community:*** **CINT User Executive Committee (UEC)**

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**Don Lucca, *Chair***

Oklahoma State University



**Judith Driscoll**

University of Cambridge



**John Grey**

University of New Mexico



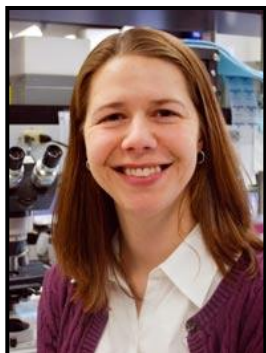
**Karen Winey**

University of Pennsylvania



**Tito Busani**

University of New Mexico



**Diane Lidke**

University of New Mexico



**Erika Vreeland**

Senior Scientific

***Industrial Advisor***



**Meenakshi Singh**

Sandia National Laboratories

***Postdoc Representative***



**Eric Shaner**

Sandia National Laboratories

***Internal Lab Representative***



# ***Recruit a vibrant, national user community: User Meetings coupled with satellite workshops***

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## **2013 User Meeting**

### **Satellite Workshop: Membrane Nanocomposite IFA**

Plenary Speakers: Zhenan Bao (Stanford), Ichiro Takeuchi (Univ. of Maryland), and Axel Scherer (CalTech)

*Symposia: Dynamics of Soft and Biological Nanocomposites: Manipulation and Integration, Complex Metal Oxides and Unconventional Interfaces, Light emission and interaction with Si and Ge nanostructures*



## **2014 User Meeting**

### **Satellite Workshop: 6<sup>th</sup> International Workshop on Electromagnetic Metamaterials (IWEM-VI)**

Plenary Speakers: William Gerberich (Univ. of Minnesota), Federico Capasso (Harvard), and Michael Rubenstein (UNC)

*Symposia: IWEM-VI, Nanostructure in Polymers, Nanomechanical Response of Composite, Complex, and Thin Structures*

## **2015 User Meeting**

Plenary Speakers: Ian Robertson (UW-Madison), Carlo Montemagno (Alberta Ingenuity Lab), and Claus Ropers (Univ. of Göttingen)

*Symposia: Real-time imaging of controlled nanoscale phenomena using S/TEM, Hybrid Photonic Materials Interactions for Integration and Novel Response, Nanomotors & Molecular Machines: Understanding and Controlling the Catalytic Transport of Matter*

## **2016 User Meeting (September 19-20)**

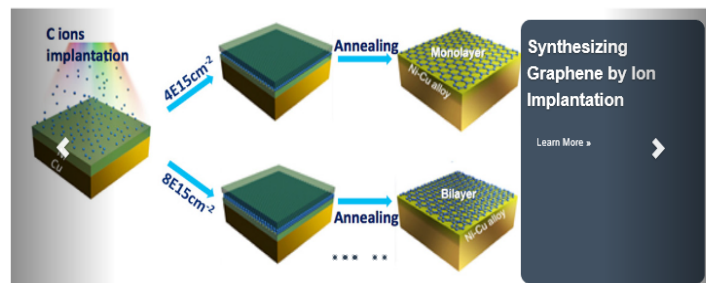
**Satellite Meeting: Nanostructures for Electrical Storage (NEES) Energy Frontier Research Centers (EFRC) focused symposia (Rubloff) and External Advisory Board meeting (Hemminger)**



# Recruit a vibrant, national user community: NSRC Portal



## Nanoscale Science Highlights & News



## About the NSRC Program

The Nanoscale Science Research Centers (NSRCs) are a set of DOE Office of Science sponsored research user facilities available for use by the international science community to advance scientific and technical knowledge in the areas of nanoscale science. The NSRC Program is a major component of the Department of Energy's (DOE) Office of Science contribution to the U.S. Government National Nanotechnology Initiative (NNI). NNI involves twenty departments and agencies that collaborate toward "a future in which the ability to understand and control matter at the nanoscale leads to a revolution in technology and industry that benefits society." The Office of Science supports five NSRCs that are strategically located in DOE national laboratories across the U.S. The nanoscience centers are co-located with other major nanoscience-related user facilities such as neutron or synchrotron light sources.

The mission of the NSRCs is twofold: to enable the external scientific community to carry out high-impact nanoscience projects through an open, peer-reviewed user program, and to conduct in-house research to discover, understand, and exploit functional nanomaterials for society's benefit. To fulfill this mission, the NSRCs house the most advanced facilities for nanoscience research and employ world-class scientists who are experts in nanoscience and enjoy working with external users.

The NSRCs complement each other with their instrumentation and capabilities, the different thrusts of their in-house research programs, and the technical expertise of their staffs.

### The NSRC Program

- Operates a national network of geographically distributed Facilities that leverage other facilities and expertise at DOE National Laboratories.
- Has world-leading capabilities and scientific expertise to create, characterize and understand novel nano-structured materials.
- Provides state-of-the-art nanoscience tools and expertise for research by non-profit or business organizations, whether small or large, for use-inspired research.
- Is available free-of-charge for non-proprietary work if the user intends to publish the research results in open literature.
- Serves users from all U.S. states and many countries around the world.
- Enables thousands of scientists to perform cutting edge nanoscience research each year.
- Contributes to the success of America's current and future research leaders.

The complementary capabilities of the NSRCs and their synergy with other facilities in the hosting national laboratories make the NSRC Program unique in the world.



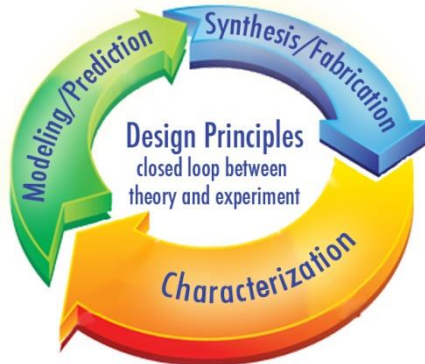
Center for Functional Nanomaterials  
at Brookhaven National Laboratory, New York

Center for Integrated Nanotechnologies  
at Los Alamos & Sandia National Laboratories, New Mexico

Center for Nanophase Materials Sciences  
at Oak Ridge National Laboratory, Tennessee

Center for Nanoscale Materials  
at Argonne National Laboratory, Illinois

The Molecular Foundry  
at Lawrence Berkeley National Laboratory, California



- In response to user feedback and in partnership with BES and other NSRCs, CINT led the development of the NSRC portal
- Primary function:
  - Searchable capabilities database
  - Listing of technical expertise
  - Highlight specialties
  - Information on NSRC collaborators

<https://nsrcportal.sandia.gov/>





# Enhance interactions with external and internal communities

## CINT outreach videos

NBC Nightly News



Rohit Prasankumar:  
Ultrafast Science - Quicker  
Than a Blink of the Eye



Portable anthrax testing  
with a lab-in-a-pocket



Encouraging More  
Students To Pursue STEM  
Careers

## Facility Tours



Senator Martin Heinrich using the CINT nanomanipulator at the Core.



# ***Enhance interactions with external and internal communities***

## **LANL Institute for Materials Science**

Los Alamos National Laboratory

National Security Education Center

**Institute for Materials Science**

*Incubate – Innovate – Integrate*

- Interdisciplinary research and educational center focused on fostering the advancement of materials science at LANL.
- Aids in defining research directions and serves as a focal point for materials research collaboration inside and outside the laboratory.

**Institute Director:**

Alexander (Sasha) Balatsky, former CINT thrust leader

**Deputy Directors:**

Jennifer Martinez (CINT scientist)

Nate Mara (partner science leader)





# *Share our commitment to nanoscience integration through educational outreach*

Career Fair,  
Santa Fe High School



Bradbury Science  
Museum, CINT display

National User Facility Organization  
user science exhibition for  
Congress, 2014



DOE National Lab Day, 2016







## Looking ahead: strategic directions

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- Develop additional partner user agreements, adding capabilities with national user appeal
- Target industrial users focused on nanoscience integration
  - Seminar series
  - Outreach at industrial events
- Continuous improvements of operational efficiencies to enhance User experience
  - Proposal review length
  - Further reciprocity agreements between SNL and LANL



## Looking ahead: strategic directions

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- Increased exposure of CINT at national meetings
  - Organized symposium highlighting CINT staff and user science
  - Staff highlighting user facility within invited talks
- Outreach with other NSRCs
  - Host joint workshops
  - Participate in joint outreach efforts



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*“We received unexpectedly good samples. The ability to both make and characterize the samples was a major benefit. Could not have done my experiment without these capabilities.”*

*“CINT is a unique and valuable resource to scientists working in a broad spectrum of fields.”*

*“I think the work we are undertaking with CINT collaborators is among the most exciting in my labs portfolio. CINT is an excellent resource for academic research collaborations. It makes projects possible that I would otherwise have difficulty realizing.”*



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# Questions



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# Back up Slides

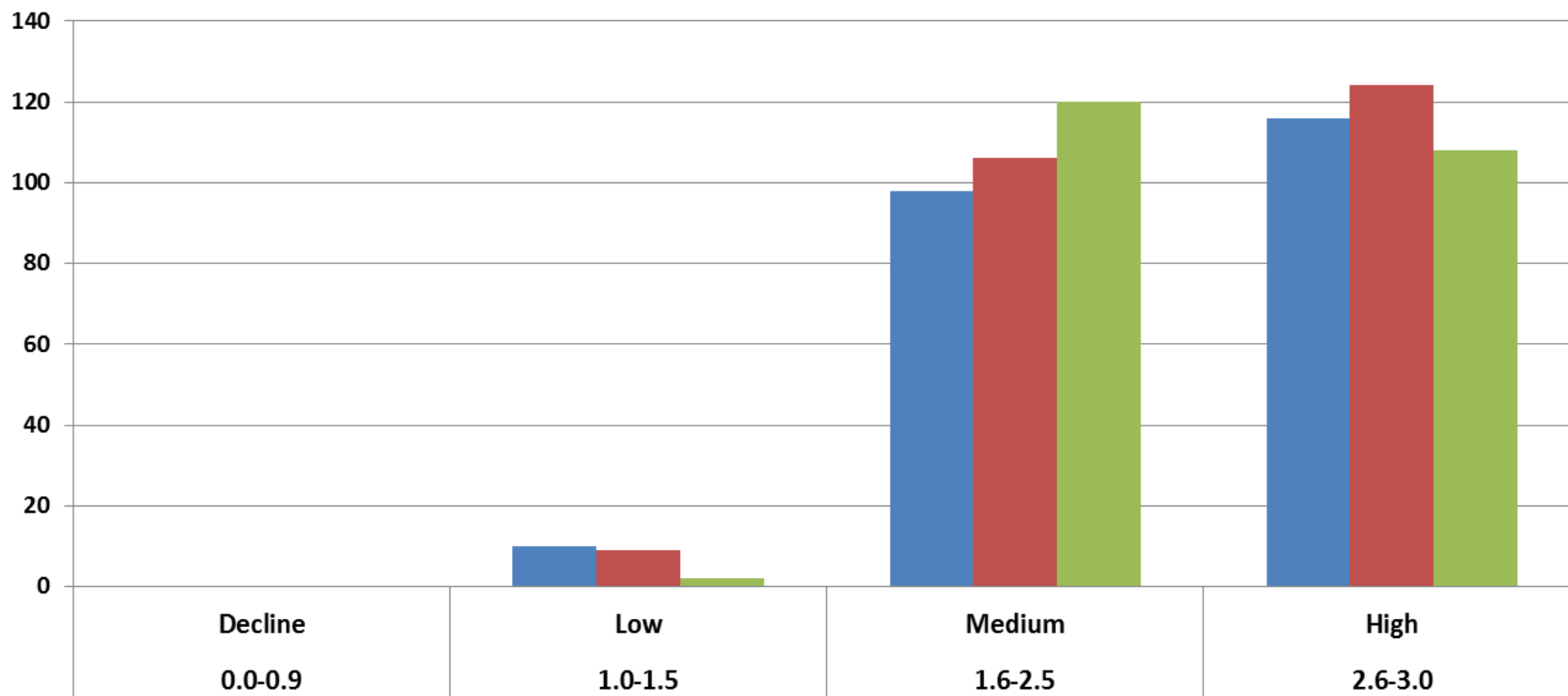




# CINT Proposals are reviewed as excellent

## scoring of user proposals submitted

■ 2013 ■ 2014 ■ 2015

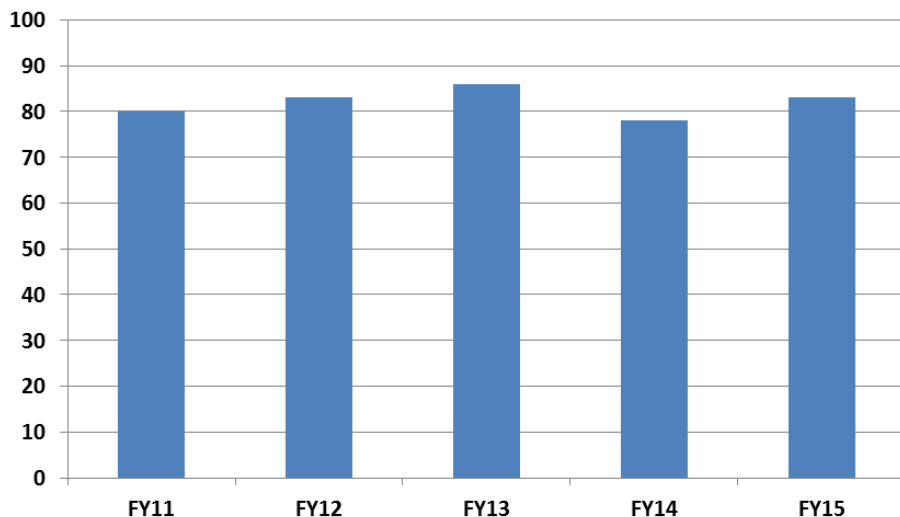




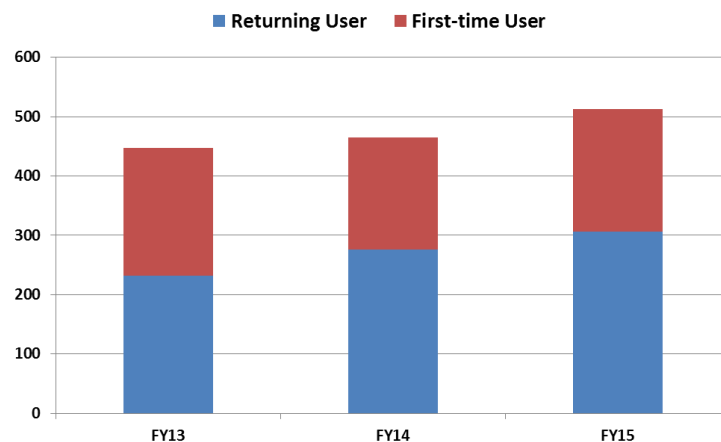
# High Impact Projects

Managing the acceptance rate.....

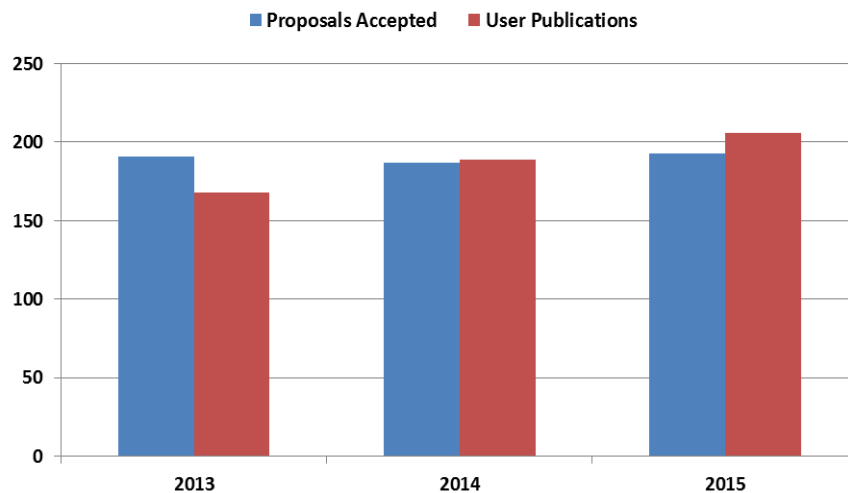
Proposal Acceptance Rate



...While Ensuring Access to New Users



And Focusing on Project Impact





# External Proposal Review Committee scoring

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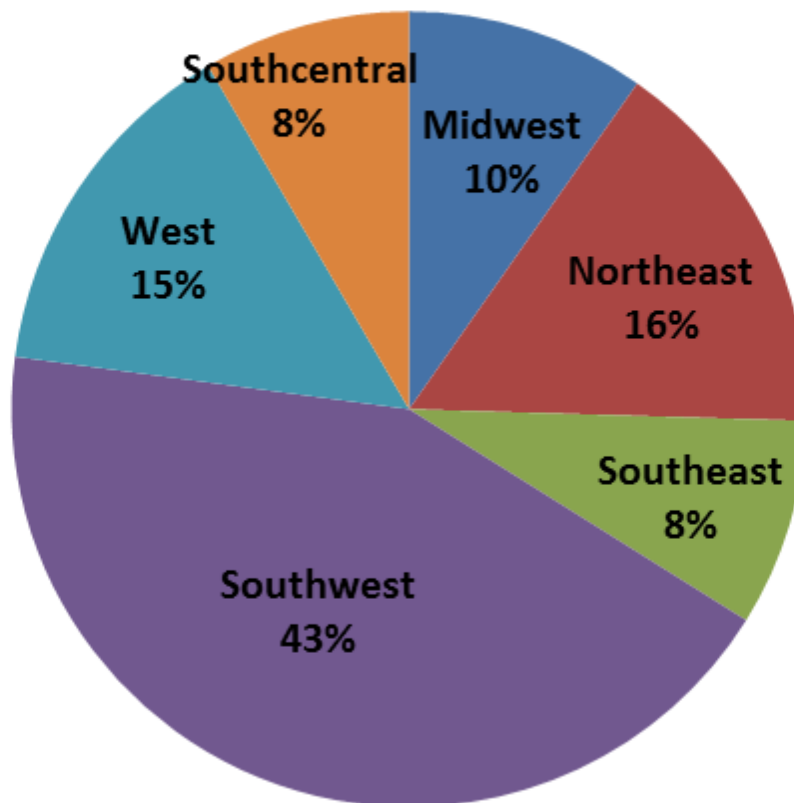
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# External US Users by region

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## FY13-FY15 External US Users

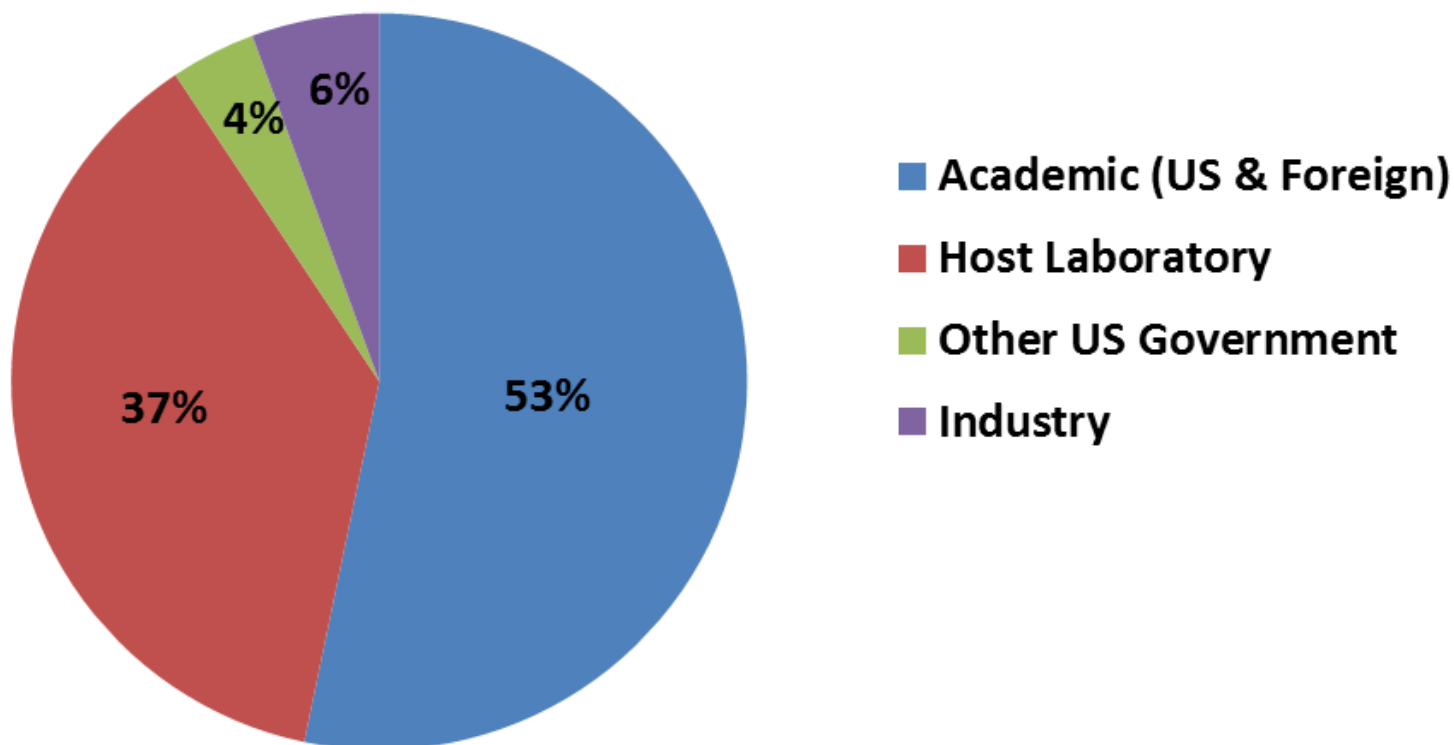




# Rapid Access Proposal Institutions

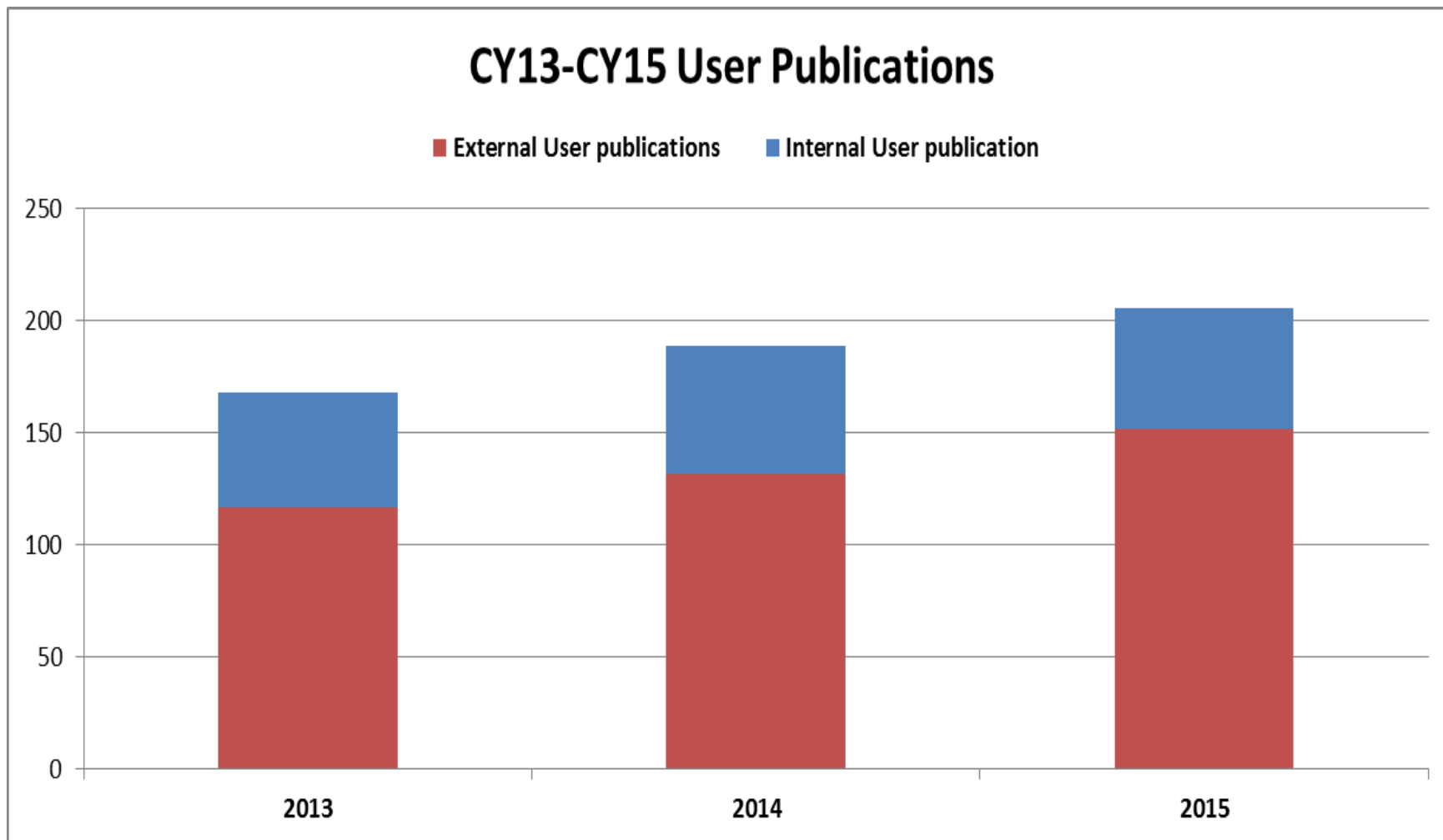
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## FY13-FY15 Accepted Rapid Access Proposal Institution Type





# Productive User Community





# How BES defines a User

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- \* Users are researchers who propose and conduct peer-reviewed experiments at a scientific facility.
- The primary type of user is a Badged User, i.e., a researcher who conducts experiments within the facility.
- There are two other types of users who conduct experiments: (1) Remote User — a researcher who has been granted authority to remotely produce data (this excludes persons who can “look at data”); and (2) Off-Site User — a researcher to whom the facility provides custom-manufactured materials, tools, or devices that the facility has unique or unusual capabilities to fabricate (this applies only to such activities at Nanoscale Science Research Centers). For both types of these users, **only one user** is to be counted per proposal **regardless of the number of co-investigators, and only if no individual is counted in any user category the other categories under the same proposal.**
- For annual totals, an individual is counted as 1 user at a particular facility no matter how often or how long the researcher conducts experiments at the facility during the fiscal year. A Badged User cannot also be counted as another type of user. Users must submit a successful, peer-reviewed research proposal and conduct experiments, as described above. Therefore, users do not include individuals who only send in samples to be analyzed, even if such activities are part of a peer-reviewed experiment. Users do not include individuals who pay to have specialty services performed or visit the facility for tours or educational purposes. Users also do not include researchers who collaborate on the proposal or subsequent research papers but do not conduct experiments at the facility.