



U.S. DEPARTMENT OF
ENERGY

Office of
Science

BES Early Career Research Program

BESAC Meeting

July 14, 2022

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BES Lead for the SC Early Career Research Program

Office of Science (SC) Early Career Research Program

- ▶ The SC Early Career Research Program (ECRP) was established as an SC-wide program in FY 2010, with subsequent annual FOAs/Lab Announcements.
- ▶ The goal is to bolster the nation's scientific workforce by providing support to exceptional researchers during the crucial early career years when many scientists do their most formative work and to stimulate research careers in the areas supported by SC.
- ▶ Expansion of early career PI engagement and opportunities had been recommended by BES and BESAC reports, Committees of Visitors (COVs), and other advisory groups.
- ▶ SC Presidential Early Career Award for Scientists and Engineers (PECASE) candidates are selected from ECRP awardees.

Program Description

- ▶ The ECRP invites proposals for topics in all SC program offices
- ▶ The SC ECRP provides a central solicitation process (common FOA), with uniform program requirements and award parameters
 - ❖ Programs own the topic areas, proposal peer review processes, and selection recommendations
- ▶ Program Office-specific technical scope is developed annually
 - ❖ 25 BES program research topics in the three BES Divisions: CSGB, MSE, and SUF
 - ❖ To improve the award success rate for applications, starting in FY 2015, some BES program areas began alternating topics every other year
 - ❖ Based on strong recommendations from COV input to further improve success rates, starting in FY 2019 program areas with large numbers of preapplications use a three federal program manager review of preapplications to encourage submission of proposals with the highest likelihood of success. Goals – increase success rate, help proposers to best use their 3 opportunities for applications, and to reduce reviewer workload.

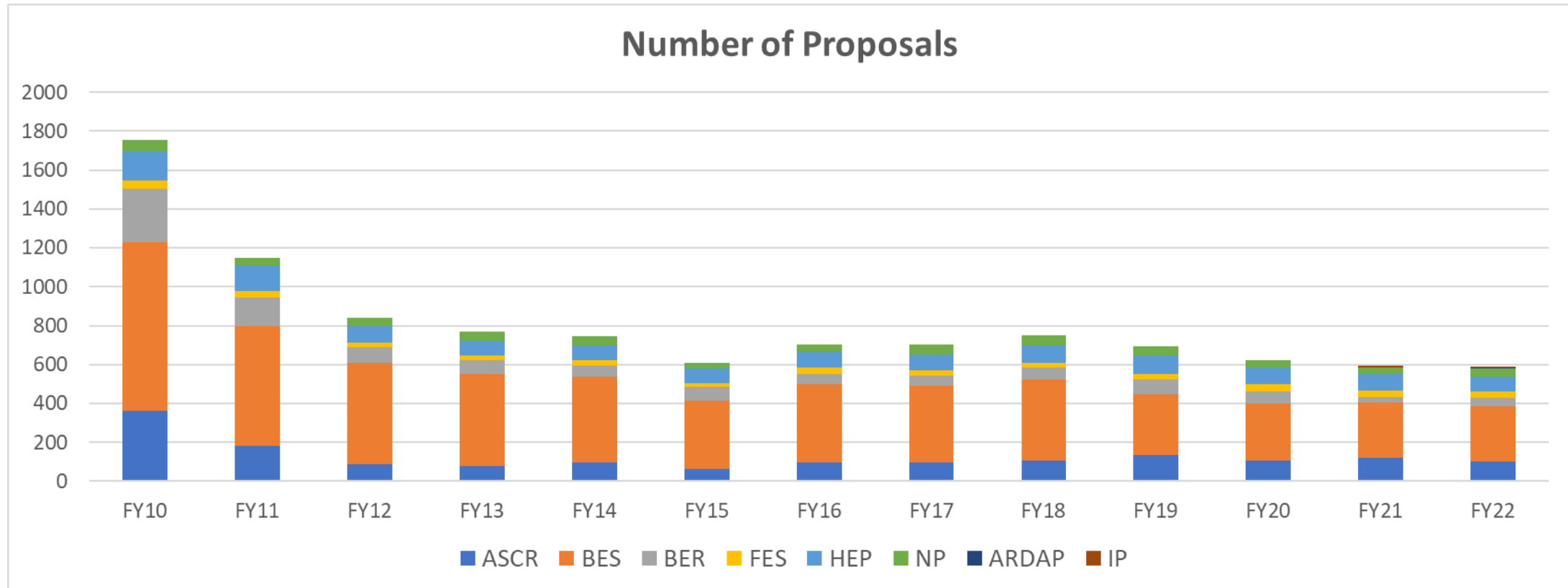


ECRP Eligibility and Funding Levels

- ▶ **U.S. Academic Institutions:** Assistant or untenured Associate Professors on the tenure track
- ▶ **DOE National Laboratories:** Full-time, permanent, non-postdoctoral employees
- ▶ **Early Career:** No more than **10 years** can have passed between the year the PI's Ph.D. was awarded and the calendar year in which the ECRP FOA is released.
 - ❖ Starting in FY 2020, SC considers requests to extend the eligibility time for qualified "life events" (e.g., parental leave, military service), verified by institutional letter
 - ❖ Each PI can apply up to three times within their eligibility period
- ▶ **Funding Levels:**
 - ❖ Five-year awards
 - ❖ University awards: \$150K/year* (fully funded)
 - ❖ National Lab awards: \$500K/year*

**Historical averages; funding above the average for universities and National Labs is possible but requires justification*

Office of Science ECRP Application History (2010-2022)

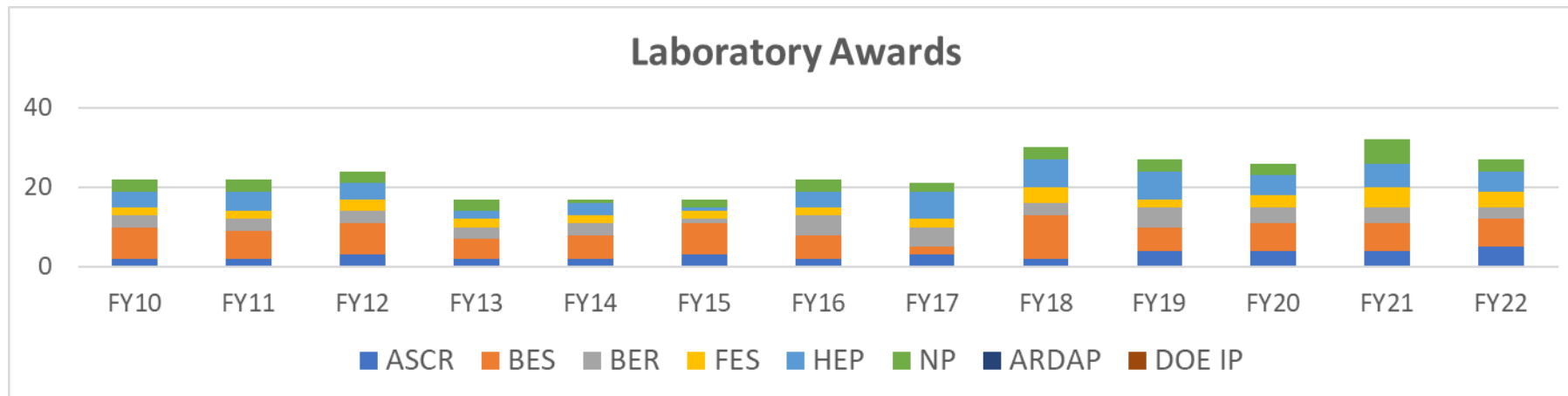
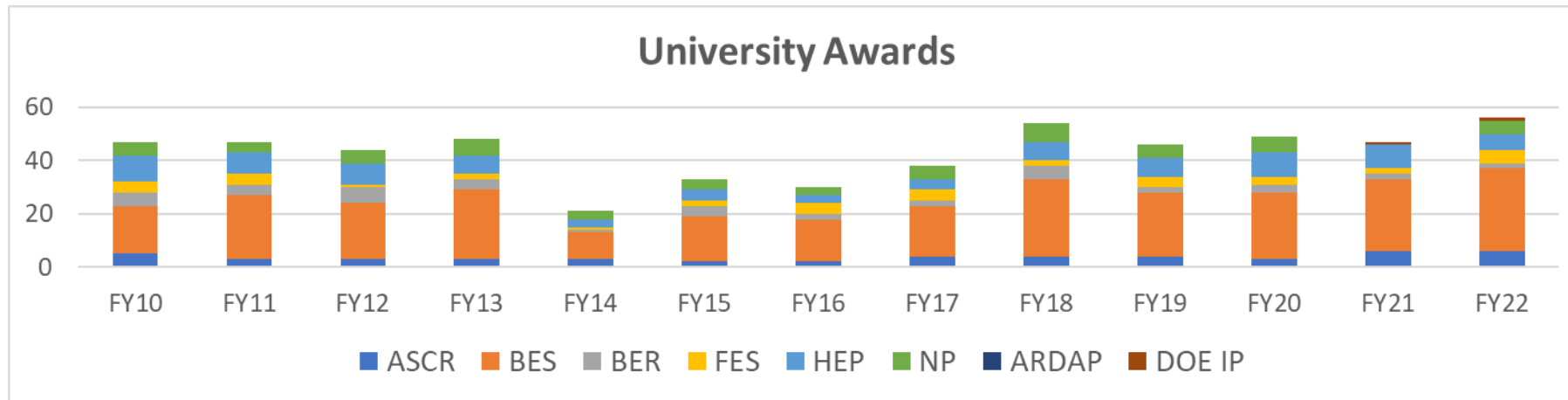


*Advanced Scientific Computing Research (ASCR) and Biological and Environmental Research (BER) reduced the number of topics included in the solicitation after fiscal year 2011.

*Some BES program areas began alternating year topics in 2015.

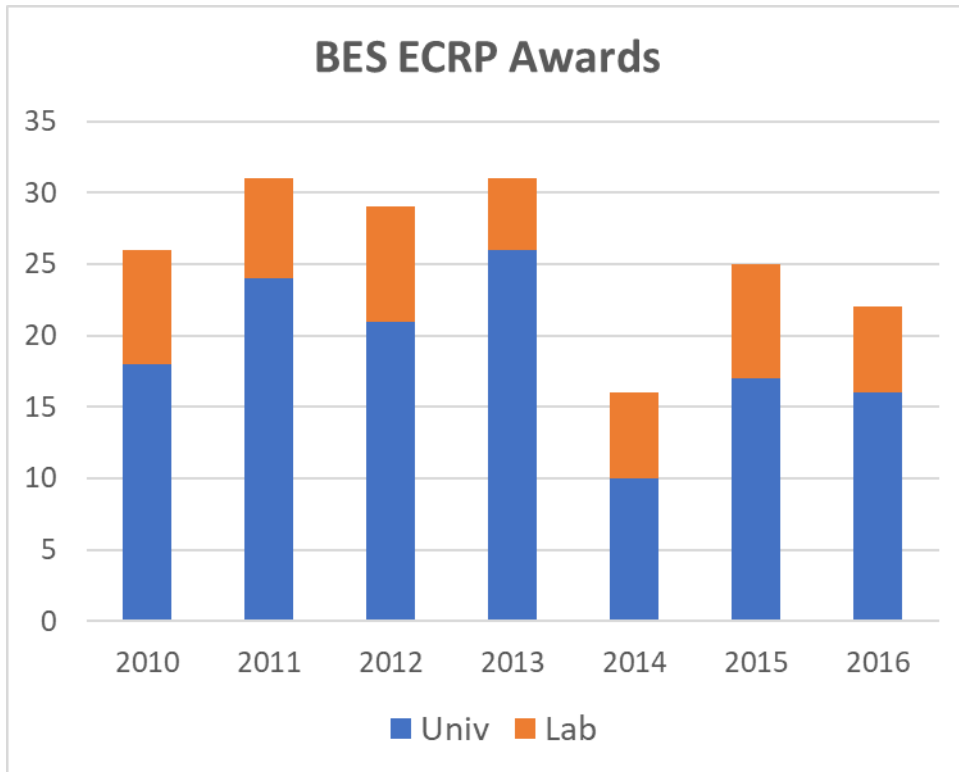
*FY 2019 included program manager review of preproposals in BES and other SC offices as appropriate.

Office of Science ECRP Award History (2010-2022)



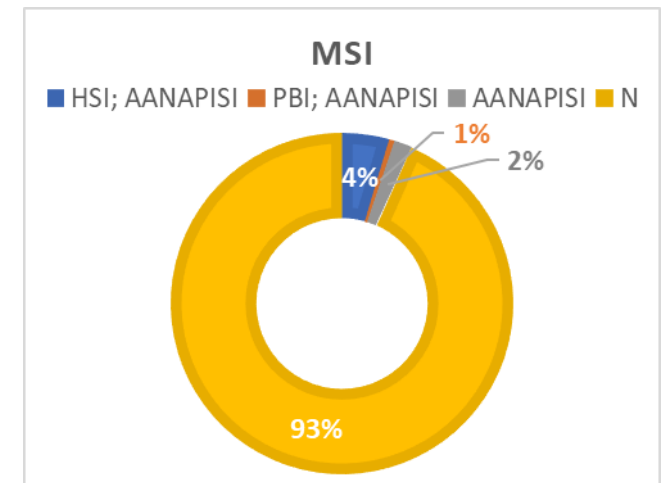
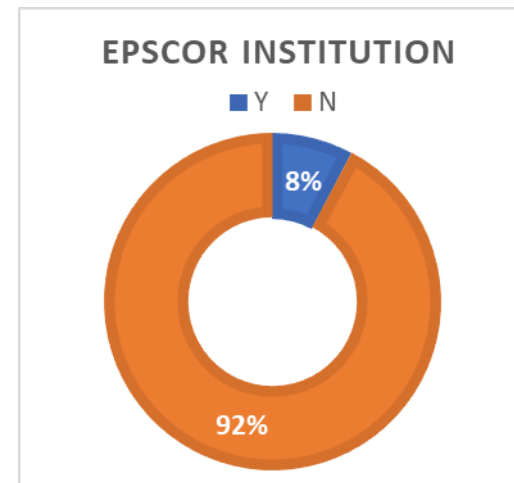
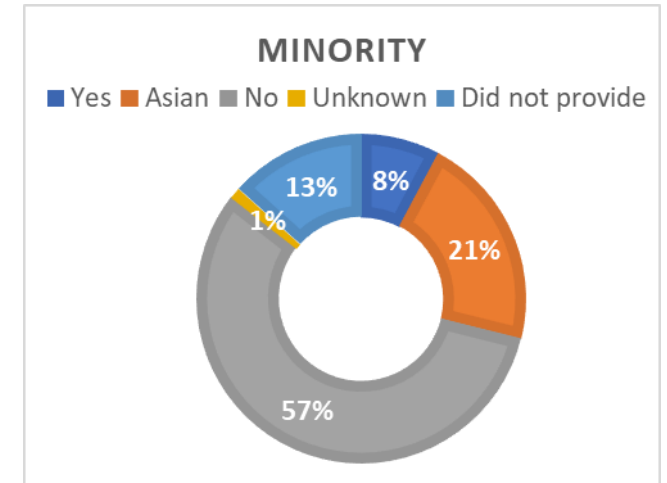
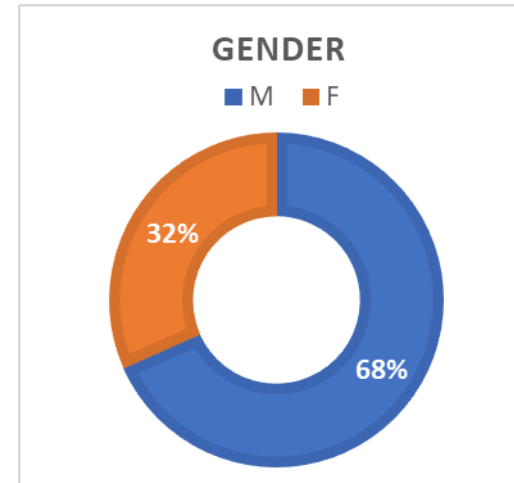
Full funding (mandated by Congress) of University awards starting in FY 2014

BES ECRP Awards: FY 2010 – FY 2016



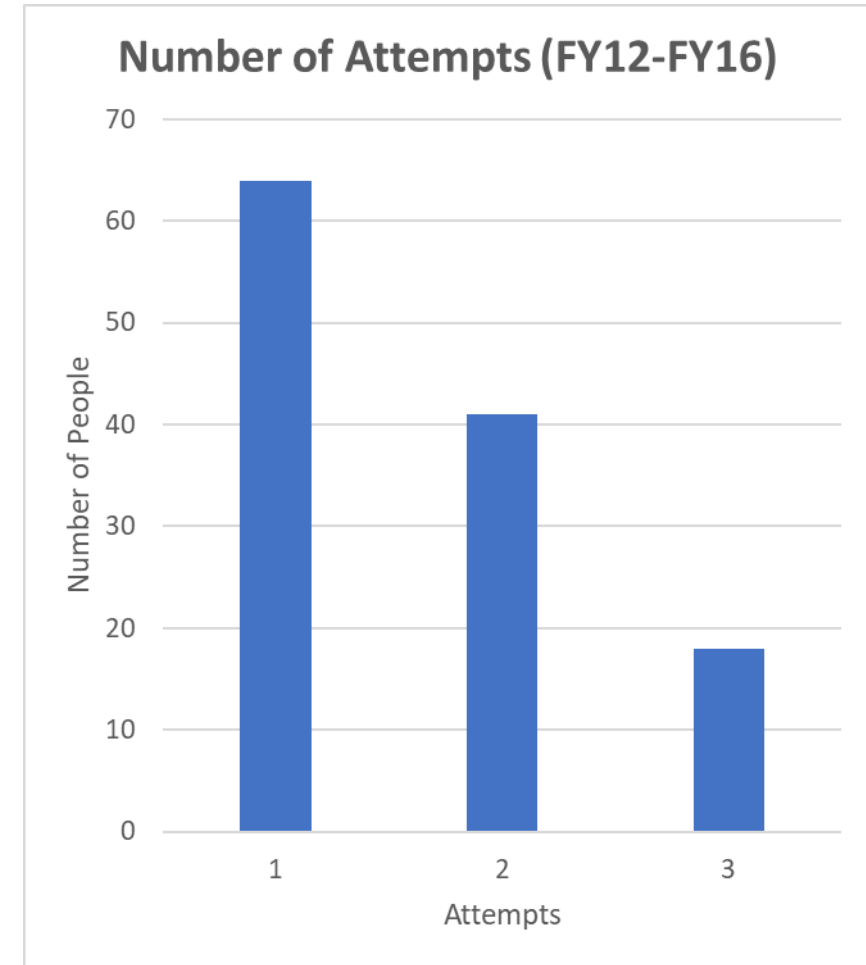
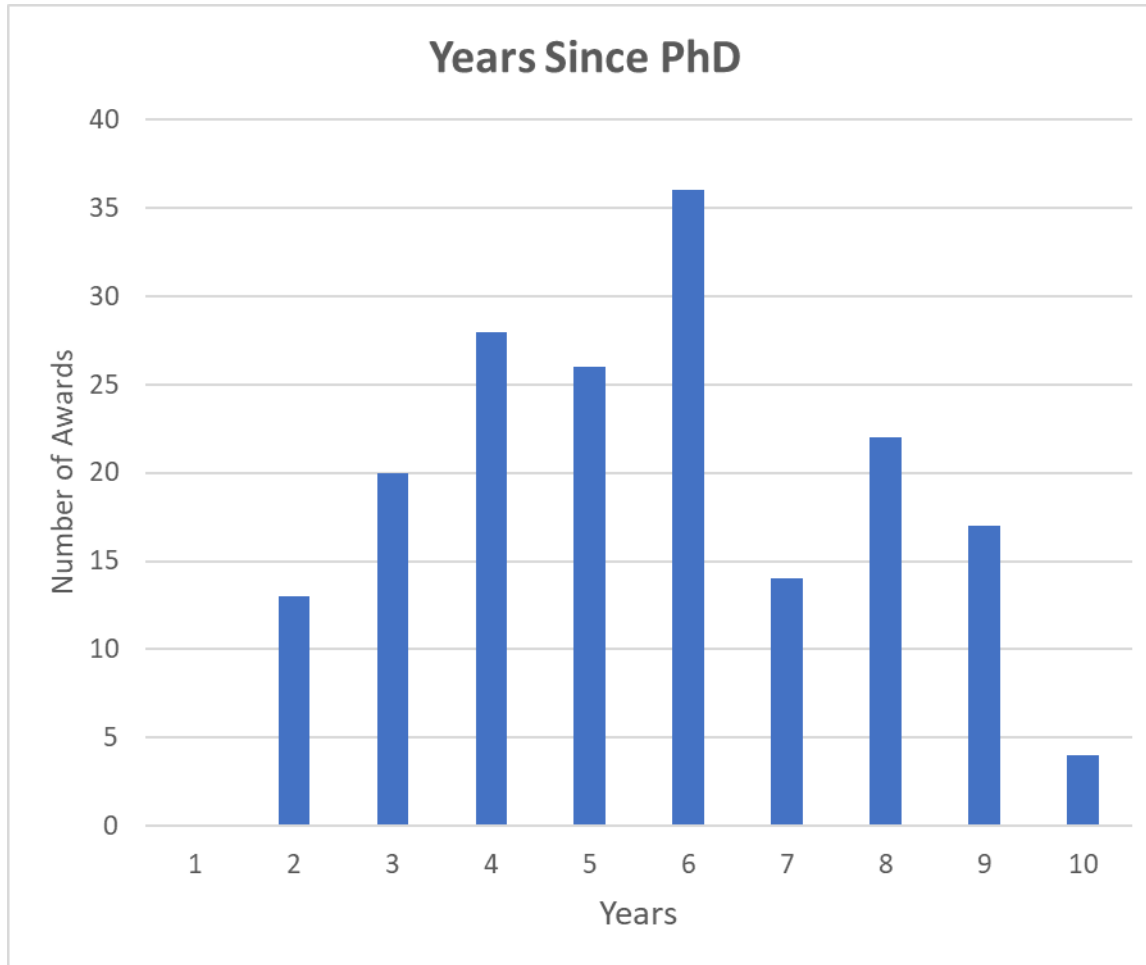
180 Awards in FY10 - FY16. 132 University/48 Lab

Award success rate in 2010 was ~3%, increasing to ~5.5% by 2016. For 2022 it was ~13%.



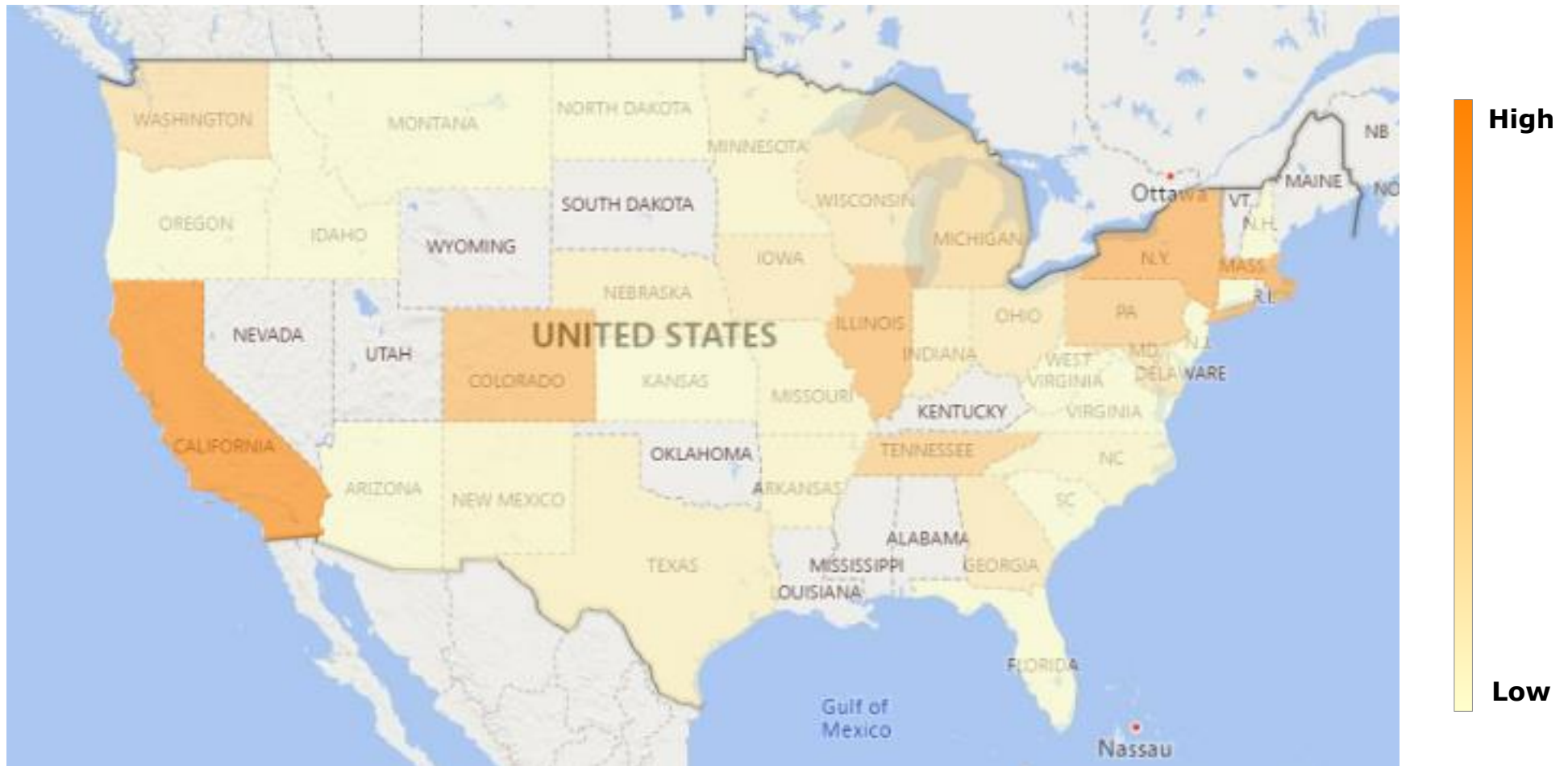
MSI eligibility based on the 2021 Dept. of Education eligible matrix.
 HSI = Hispanic Serving Institution; PBI = Predominantly Black Institution
 AANAPISI = Asian American and Native American Pacific Islander-Serving Institution

Applicant Career Stage



* ECRP started in FY 2010, so FY 2012 is the first year where a 3rd attempt is possible

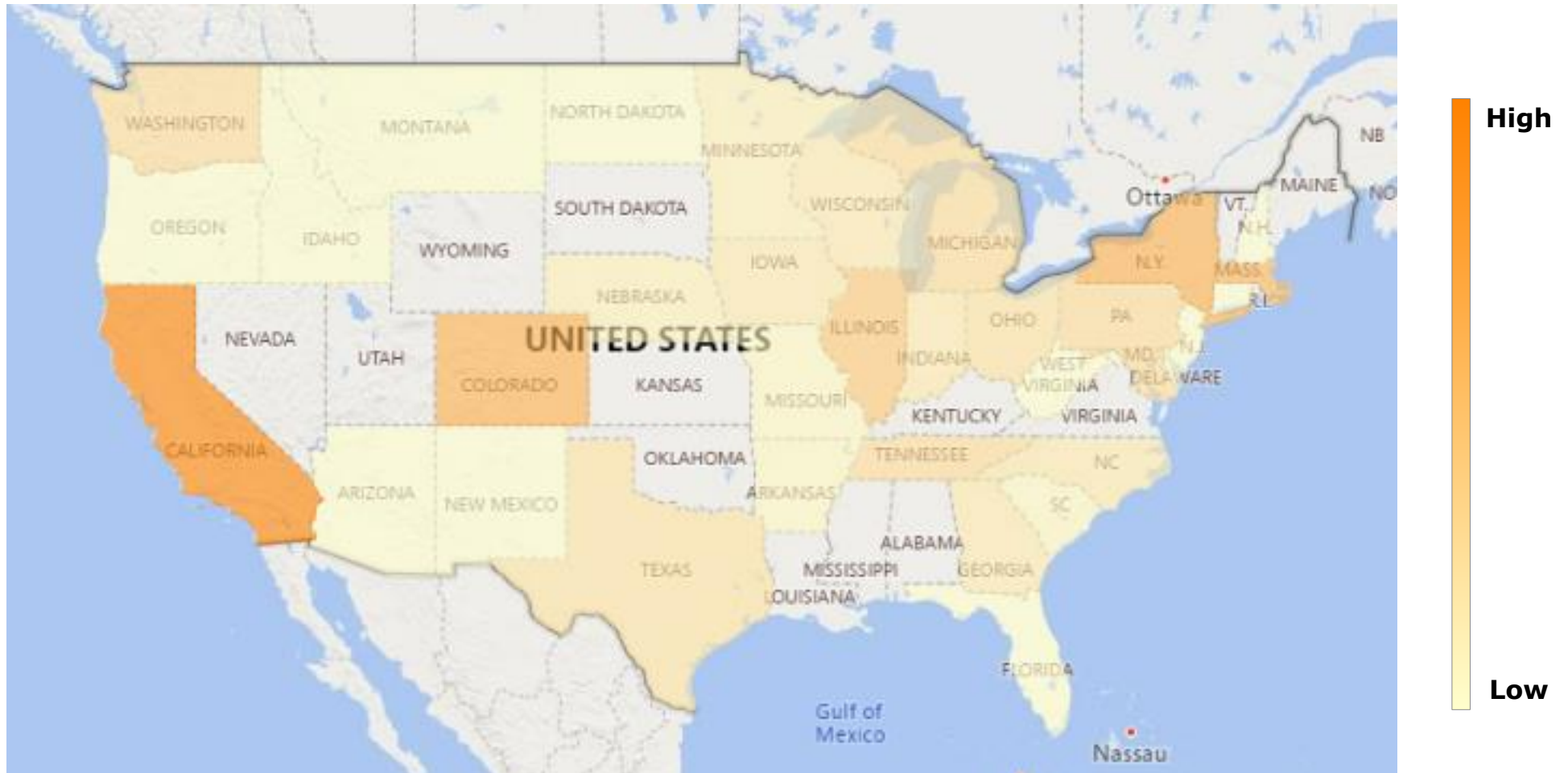
Location of Awards (BES 2010 – 2016)



12 DOE laboratories and 68 Universities in 36 States

Today, all states have had BES EC awards except Maine, Vermont, Hawaii, and Alaska

Where are ECRP Awardees Now? (BES Awardees 2010-2016)

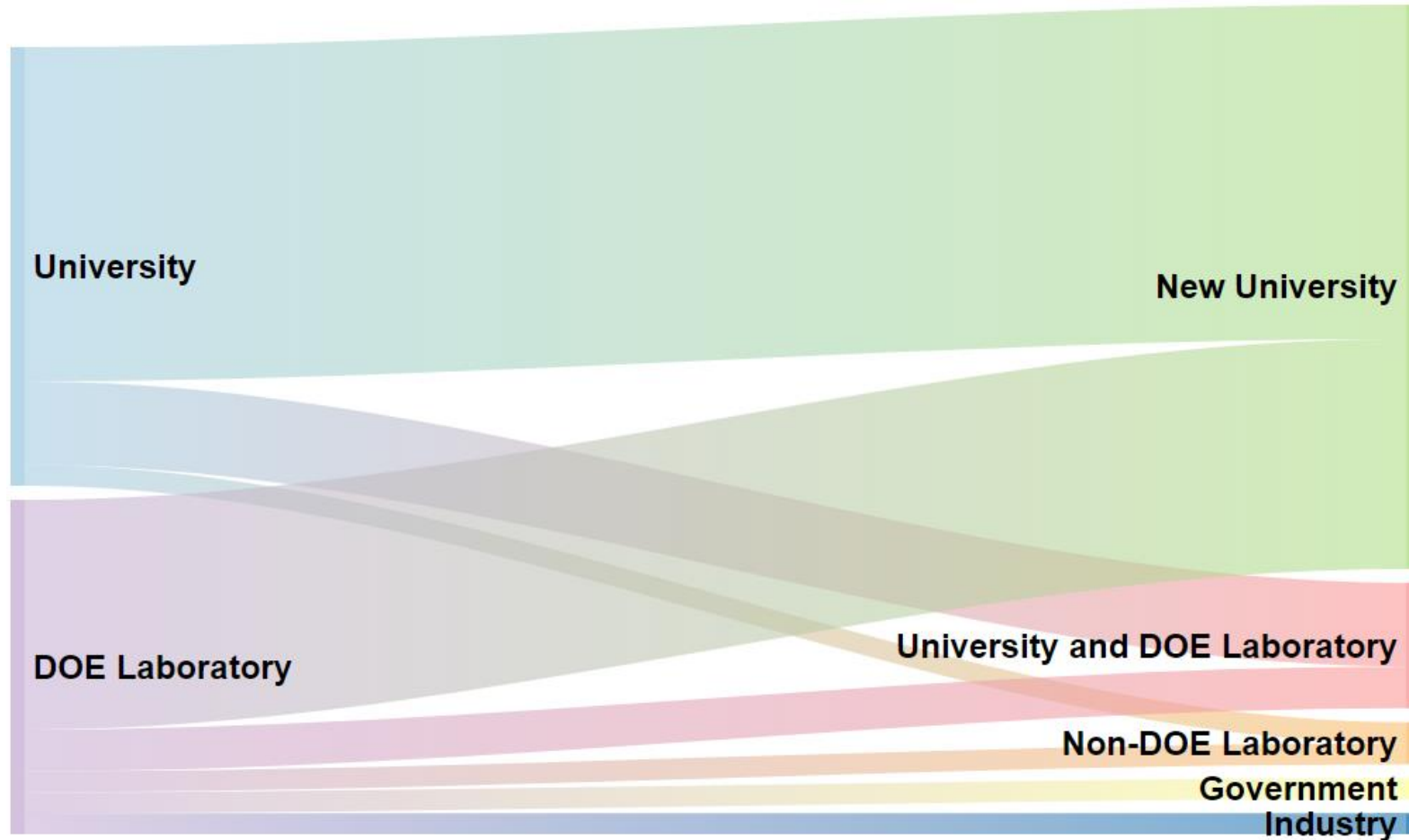


11 DOE labs, 74 Universities, 1 Industry, 1 Government, and 2 Non-DOE Labs in 34 States, DC, and 3 foreign countries

Where did ECRP Awardees Move?

(BES Awardees 2010-2016)

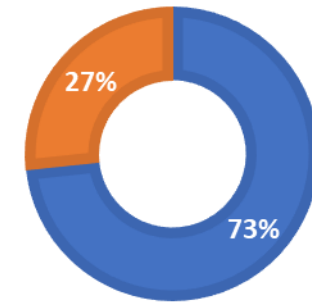
37 Awardees (~20% Awardees) moved institutions during or after their award



All Awardees

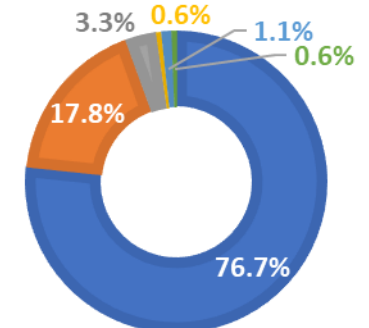
INSTITUTION TYPE AT AWARD

■ Univ ■ Lab



INSTITUTION TYPE NOW

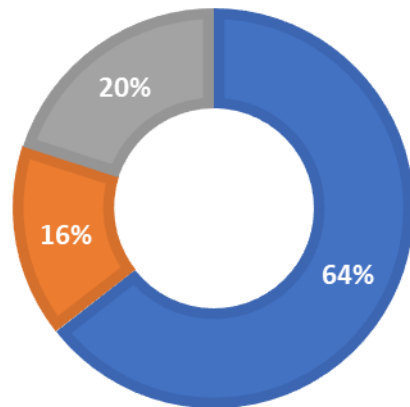
■ Univ ■ Lab
 ■ Univ / Lab ■ Government
 ■ Lab - Not DOE ■ Industry



Did Awardees Receive Additional BES Funding? (BES Awardees 2010-2016)

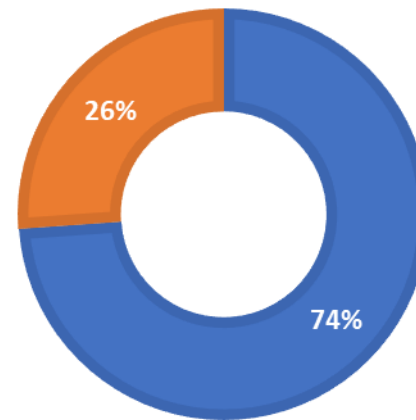
**BES FUNDING AFTER ECRP AWARD
AS A PI OR ON AN FWP**

■ Awarded ■ Declined or Under Review ■ Did not Apply

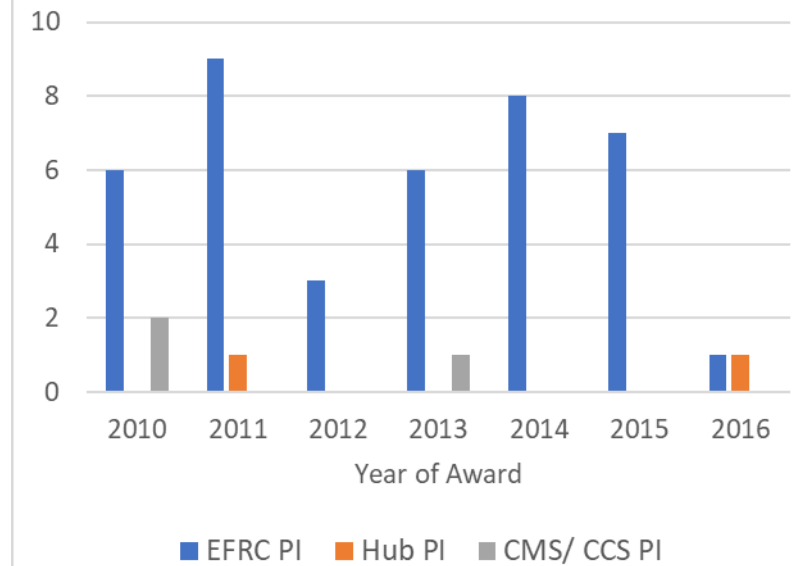


ANY BES FUNDING

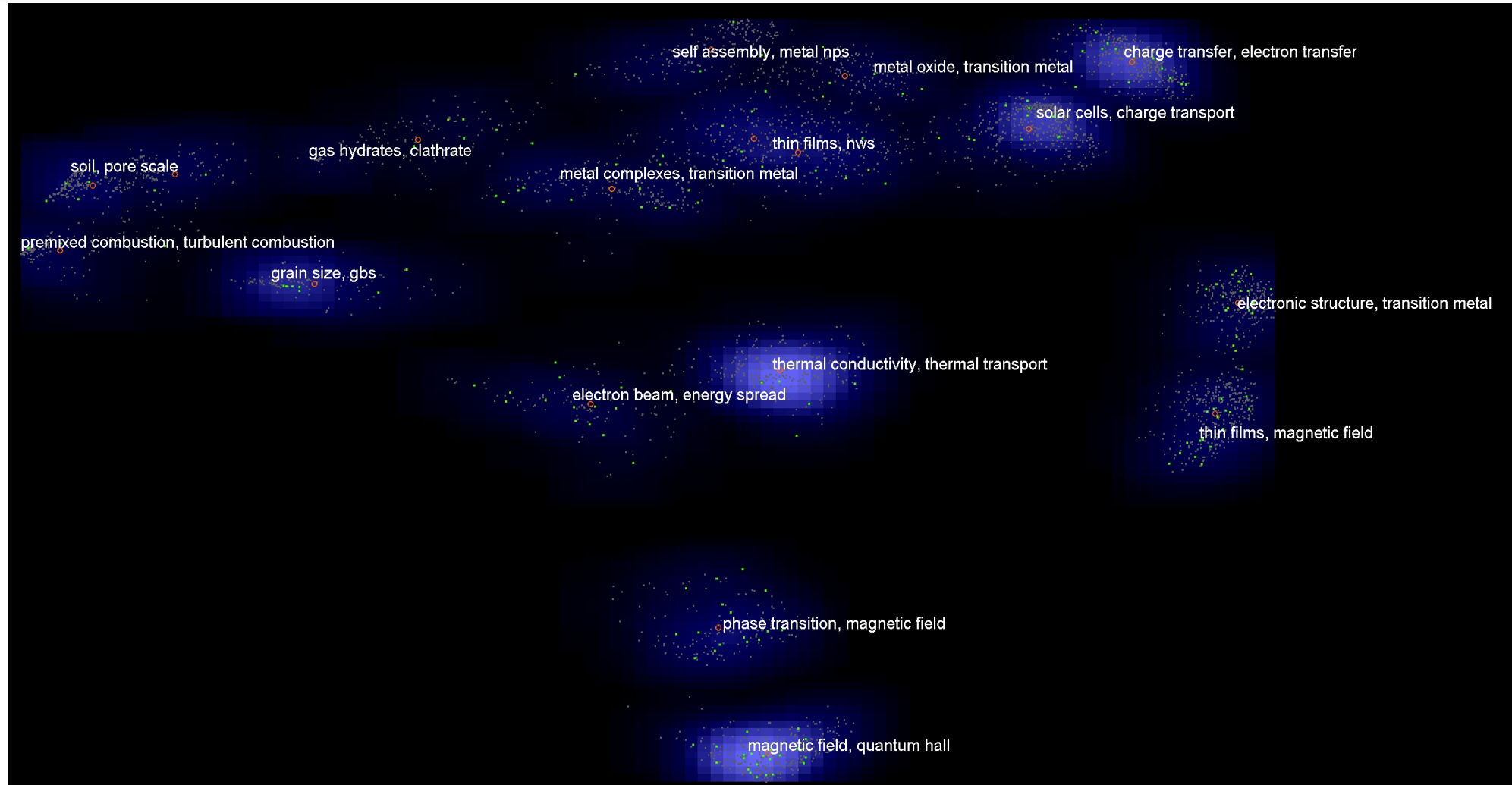
■ Yes ■ No



SENIOR INVESTIGATOR IN A BES CENTER



Topic Analysis of Proposal Text is On-going

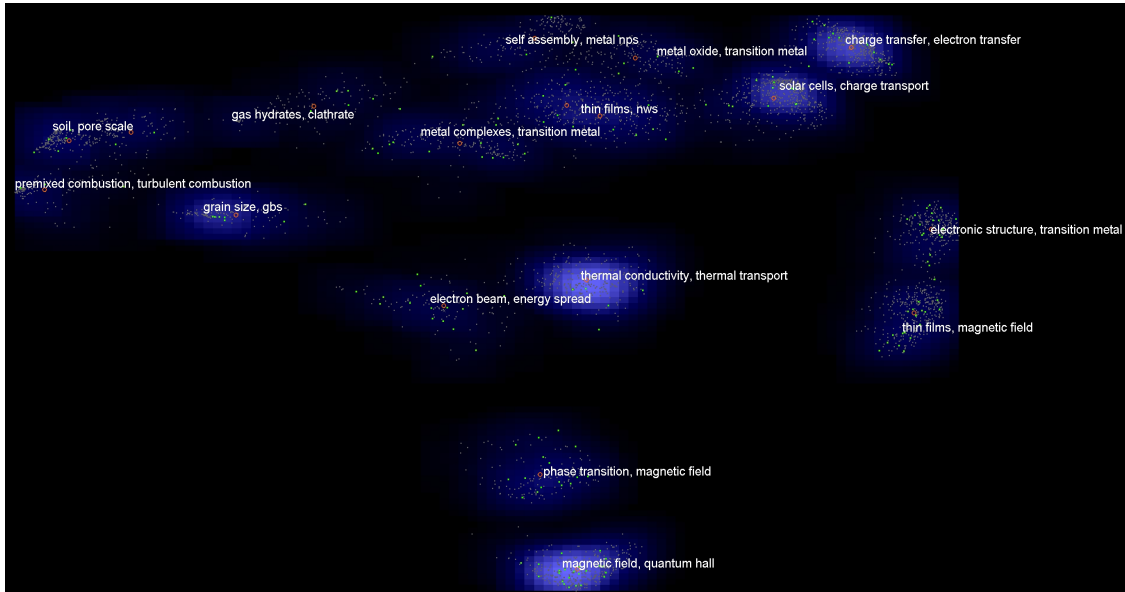


Green markers highlight the 180 awarded projects from FY10-FY16. Blue clouds are proportional to document concentration in a clustered area.



On-going ECRP Analysis

Natural Language Processing of Proposal Text



- ▶ **Opportunities:** Cluster the proposals by textual similarities to reveal the distribution of submitted and awarded proposals.
- ▶ **Challenges:** Obtaining scientifically meaningful categories for clustered proposals.

Publication Analysis Using Data Analytics Tools

On-going collaboration with the DOE Office of Scientific and Technical Information (OSTI)

▶ Opportunities

- ❖ Gain insight into the scientific impact of an ECRP award
- ❖ Evaluate a PI's collaborative network
- ❖ Track the evolution of their scientific ideas in the literature

▶ Challenges

- ❖ Disambiguating authors without a personal identifier (e.g., ORCID)
- ❖ Automatically determining which publications are attributed to the ECRP award

Questions and Suggestions

Thank you!

