

BERKELEY RESEARCH DEVELOPMENT OFFICE



Science and Technology Centers: Integrative Partnerships (STC)

Discovery and Innovation to Address Vexing Scientific and Societal Challenges

NSF 22-521

BRDO INFO SESSION FOR UC BERKELEY FACULTY

Introduction

- STCs: exceptionally innovative, complex research and education projects
 - Create new scientific paradigms
 - Establish new scientific disciplines
 - Develop transformative technologies
- Topics may include any area in science & engineering that NSF funds
- Funding: \$6M/year for 5 years (5 more possible); up to 5 new STCs will be funded

Objectives & Characteristics of STCs

- Conduct **highly innovative research, integrated with education**
- Multi-institutional partnerships are expected
 - Inclusion of MSIs is required
 - International collaborations are encouraged
- Encourage participation of groups underrepresented in STEM across all parts of Center, e.g., leadership, research, training
- Develop next generation of scientists/engineers
- External knowledge transfer is expected

Scope

- STCs are a vehicle for collaborative, transformative research
- Make significant advances in your field
- Results need to be greater than sum of parts
- Outline your legacy!
 - Funding is for 5 years, with 5 more possible
 - Proposal should focus on 5 year research plan for grant, BUT with a **vision** for a full 10 years of funding

Innovative Research

- Focused, ambitious research; yet, achievable within timeframe
- Research that requires long-term, large-scale investment to shift field paradigms or create new ones
- Think about convergence research, defined by the NSF as *the merging of innovative ideas, approaches, and technologies from a wide and diverse range of sectors and expertise*
- Integrate research and education across Center activities

Education plan

- Research and Education plan should be integrated
- Education activities may include: research experiences for undergraduates, specialized courses (undergrad/grad), majors/minors, training postdocs, workshops/bootcamps, summer programs
- External outreach to non-partner institutions, inc. MSIs, community colleges, high schools, museums, laboratories, state/local governments
- Educational activities for the public, teachers, parents, other relevant groups
- All partners should offer these educational activities (not just lead)

Building partnerships

- Funded STCs have 3–12 partners (average: 7) of many types
 - Universities (inc. MSIs), national labs, gov. agencies, industry, other public or private partners
- Leverage existing collaborations
- Consider reaching out to colleagues to build new partnerships and add new disciplinary expertise to your team
- Make partnerships across all components of STC (e.g., workforce dev.)
- Partners may change from pre-proposal to full proposal

Workforce Development

- Workforce development is a key theme
- Think of innovative ways to engage students/future workforce
 - Innovative teaching and learning methods
 - Undergraduate and advanced degree focus
 - Recruit & engage students underrepresented in STEM
 - Internships
 - Professional placements
 - Outreach within and external to UC Berkeley (inc. MSIs, Community Colleges, et al.)
- Consider educators as key partners (internal or external)
- Reach out to BRDO for help!

Knowledge Transfer

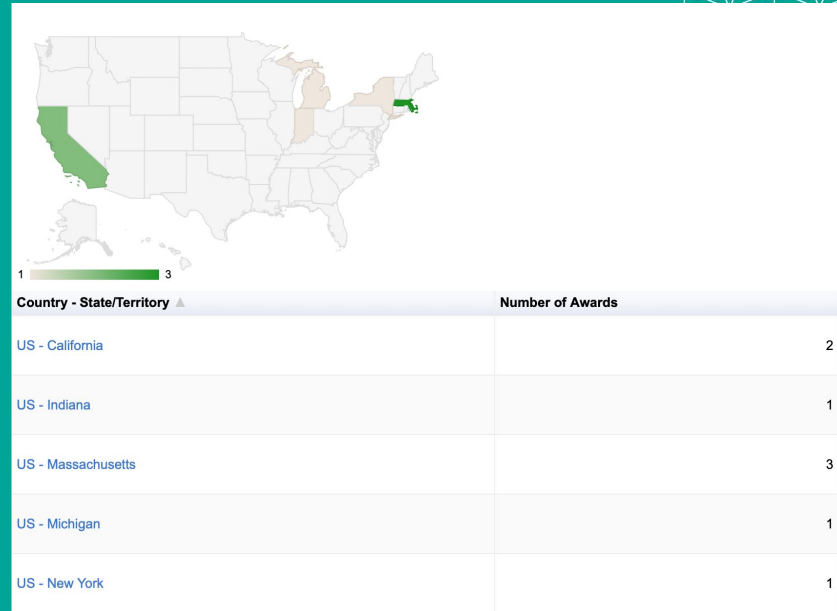
- STCs facilitate exchange of information between Center and external stakeholders, who can then apply the knowledge to create further advances
 - Provide key information to make policy
 - Establish spin-off companies
 - Tech transfer to support innovation
- Establish formal partnerships
- Host visiting scholars
- Place students at external academic/industrial sites
- Cyberinfrastructure

Broadening Participation

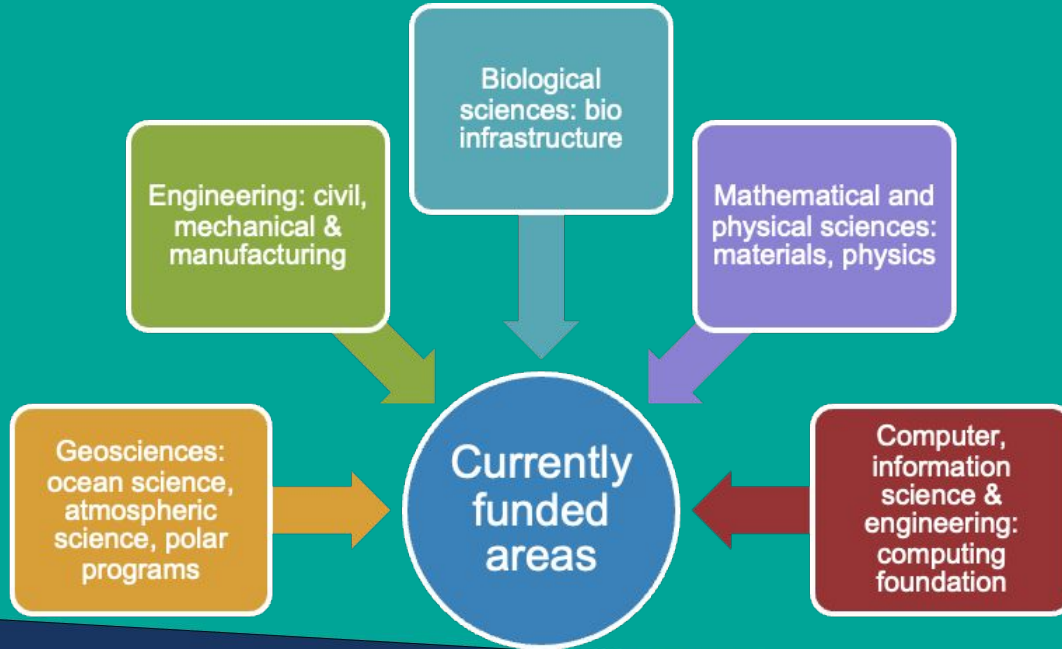
- NSF places increasing emphasis on not only recruitment and retention of minority students underrepresented in STEM (URM), but also on the inclusion of URM people in all parts of the Center
- Consider URM colleagues in Center partnerships/leadership
- URM may include any and all populations underrepresented in STEM, e.g., racial/ethnic minorities, women, people with disabilities, undocumented immigrants, older people, veterans, residents of rural communities
 - Be aware of which URMs are relevant to your field (e.g., not all ethnic minorities are underrepresented in STEM)

Funding Landscape/Previous STC Awards

- 13 active STCs, 17 previously funded
- UC Berkeley has led 3 STCs
 - Center for Energy Efficient Electronics Science (Center for E3S)
 - Team for Research in Ubiquitous Secure Technology (TRUST)
 - Center for Particle Astrophysics
- Highly competitive; in previous rounds from approx. 250 preliminary proposals, 40–50 invited for full proposal, 10 site visits, 3–6 new awards



Funding Landscape/Previous STC Awards



Preliminary Proposal Overview

- Preliminary proposal **required** – may lead to invitation for full proposal
- Evaluated on vision and potential impact of proposed research, partners, research & education integration, broad participation
- 12 page Project Description:
 - Center Rationale
 - Center Plan
 - Team Description
 - Integration Strategies
 - Institutional Commitment to Diversity and Inclusion

Preliminary Proposal Strategies

- Strategy for pre-proposal should be distinct from full proposal
- Focus on required sections. Most important:
 - Idea and long-term vision
 - Impact (inc. Broader Impacts!)
 - Structure of team/collaborations and skills/expertise each partner brings to the Center
- Key to success at this stage is a **clear and compelling vision** (vs. extreme detail)
- May be assessed by multidisciplinary reviewers; write for audience with potentially less field-specific expertise

BRDO advice

Reach out to relevant Program Officer to discuss your idea/fit/plan

Focus on multidisciplinary team formation, while considering diversity - reach out to potential partners early

Focus on being responsive to FOA goals and criteria - address them all

Check out BRDO STC webpage for more information, inc. a proposal outline



Limited Submission

- UC Berkeley is allowed to lead **THREE** applications
- VCRO Limited Submission Deadline: **December 6th, 2021**
- NSF Preliminary Proposal Deadline: February 1st, 2022
- NSF Full Proposal Deadline (by invitation only): August 29th, 2022

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Any questions?

Reach out to BRDO at brdo@berkeley.edu for support!