National Science Foundation
and
National Oceanic and Atmospheric Administration

INDUSTRY UNIVERSITY COOPERATIVE RESEARCH CENTER (IUCRC) PROGRAM

Addressing the Needs of the Financial/Insurance-Related Industries for Climate and Catastrophic Natural Disasters

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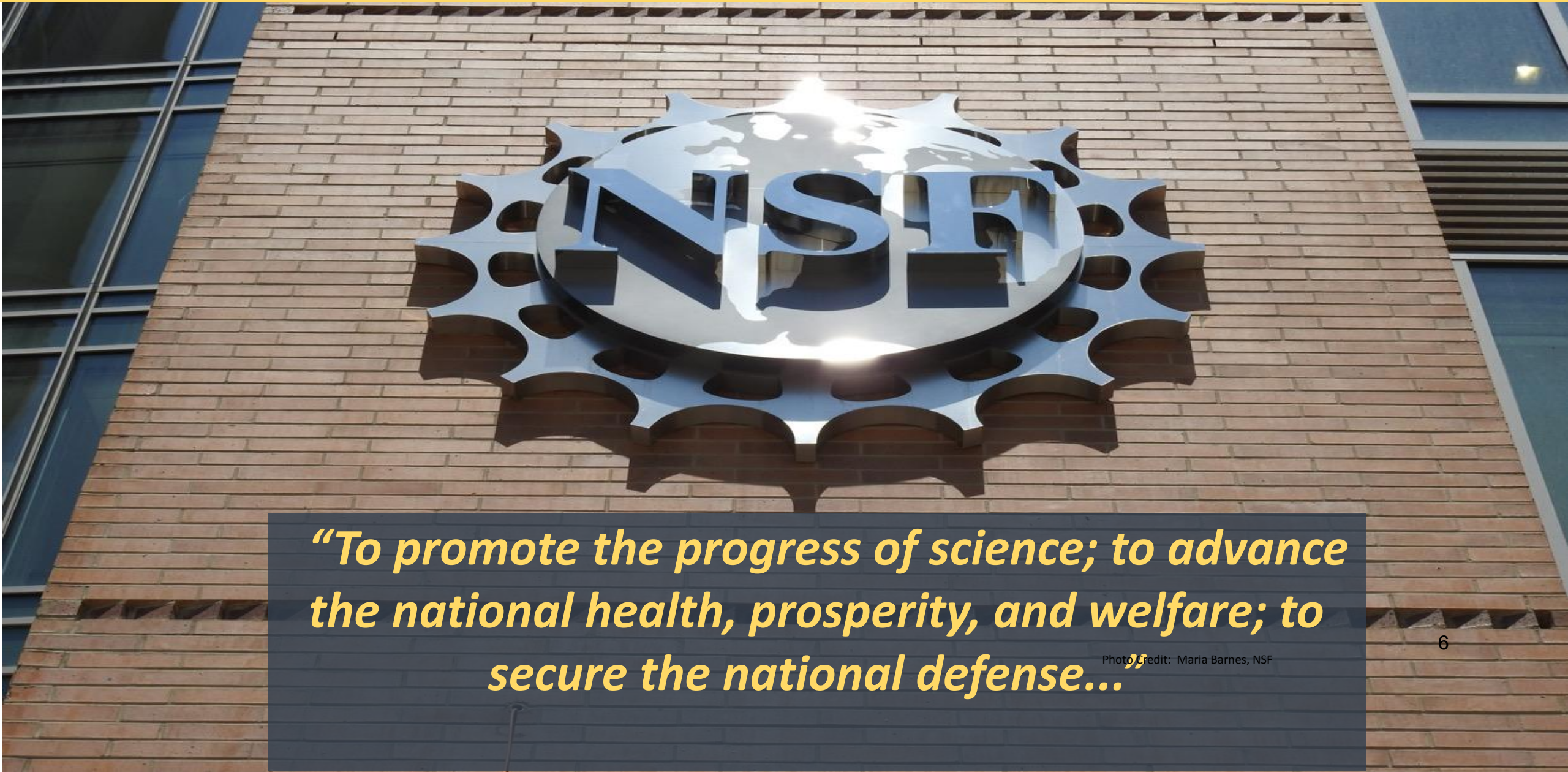
Barbara Ransom: NSF/GEO IUCRC Program Director
Karen Hyun: NOAA Chief of Staff

Mission: NSF



"To promote the progress of science; to advance the national health, prosperity, and welfare; to secure the national defense..."

Photo Credit: Maria Barnes, NSF

Mission: NOAA

"To understand and predict changes in climate, weather, oceans, and coasts; to share knowledge and information with others;..."

NSF: Quick Facts

$8.5B budget, anticipated to double in the next 5 years.

Supports 24% of all federally funded academic research - ~57% if don't count NIH funding.

240+ Nobel Laureates supported.

310,000+ people engaged (faculty, researchers, postdocs, students, trainees, and teachers.

Initiates/funds ~400 startups/ small businesses each year.

NSF: Supports all Areas of Science and Engineering

Biological Sciences

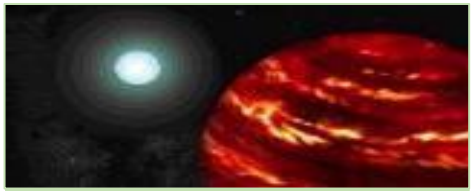
Computer & Information Science & Engineering

Engineering

Geosciences

Integrative Activities

International Science and Engineering



Mathematical & Physical Sciences

Social, Behavioral & Economic Sciences

STEM Education

Technology, Innovation & Partnerships

NSF: Driving Toward Societal Impact

NSF's Vision – Creating a Nation that is the global leader in research and innovation

$8.5B

Basic Research

Investment in Technology, Innovation, and Partnerships

~$800M

Translational Research

Moving research innovation toward commercialization

NSF Translational Research Programs

Use-Inspired Basic Research

Commercial Development

Grant Opportunities for Academic Liaison with Industry
https://www.nsf.gov/pubs/policydocs/pappg20_1/pappg_2.jsp#IIE4

Partnerships for Innovation : Technology development
https://www.nsf.gov/PFI

Industry University Cooperative Research Centers
https://iucrc.nsf.gov

Graduate Student INTERN Program : <55k, 6 months
https://www.nsf.gov/INTERN

I-Corps™ - Entrepreneurial Education
www.nsf.gov/icorps

Small Business Innovation Research
https://seedfund.nsf.gov

NSF: A Catalyst for Partnerships

Industry

Academia

National Labs

Foundations

States

International

Other Federal Agencies

Professional Societies

IUCRC – A Collaborative Partnership

Government
NSF catalyzes partnership; other agencies join as Members or co-fund the Center

Universities
Provide research infrastructure, human capital, and technical expertise.

Industry
Members provide funds for research and insight into needs of the economic sector.

IUCRCs bridge the gap between academic curiosity-driven research and commercial readiness.

NSF IUCRCs – Portfolio Snapshot and Facts

84
Active Centers

400+
Large Firms

300+
Small Firms

110+
Universities

20+
Government Entities

In 2021: **$47M** in non-NSF funds generated to support Center research.

~1/4 of graduating IUCRC-involved students hired by Center members.

Sampling of Participating IUCRC Members

IUCRC - Value Proposition for Members

IUCRC

Member ROI:
Each member dollar leverages **~23** additional dollars

Access to Talent

Able to scout and Mentor student talent with skills for work in Industry.

Reduce R&D Risk

R&D risk for developing early-stage disruptive tech shared with others.

Research Cost Avoidance

Low human capital cost.
Access to facilities.
Save on internal research money.

R&D Leverage

High ROI due to joint project funding model

Network Access

Collaborative venue for Interaction with other Members, competitors, regulators

Access to IP

Royalty-free, non-Exclusive licenses on IP produced in the Center.

IUCRC – Value Proposition for Universities

Student Training & Workforce

6,500*
Center-trained students nationwide

25%*
Center-trained students hired by member organizations

*(10-year data)

Student Support
Enhance resources for student training, skill development & job placement

Funding.
Increase & diversify research funding via industry-driven research.

Collaboration
Build relationships, develop industry partnerships for tech transfer.

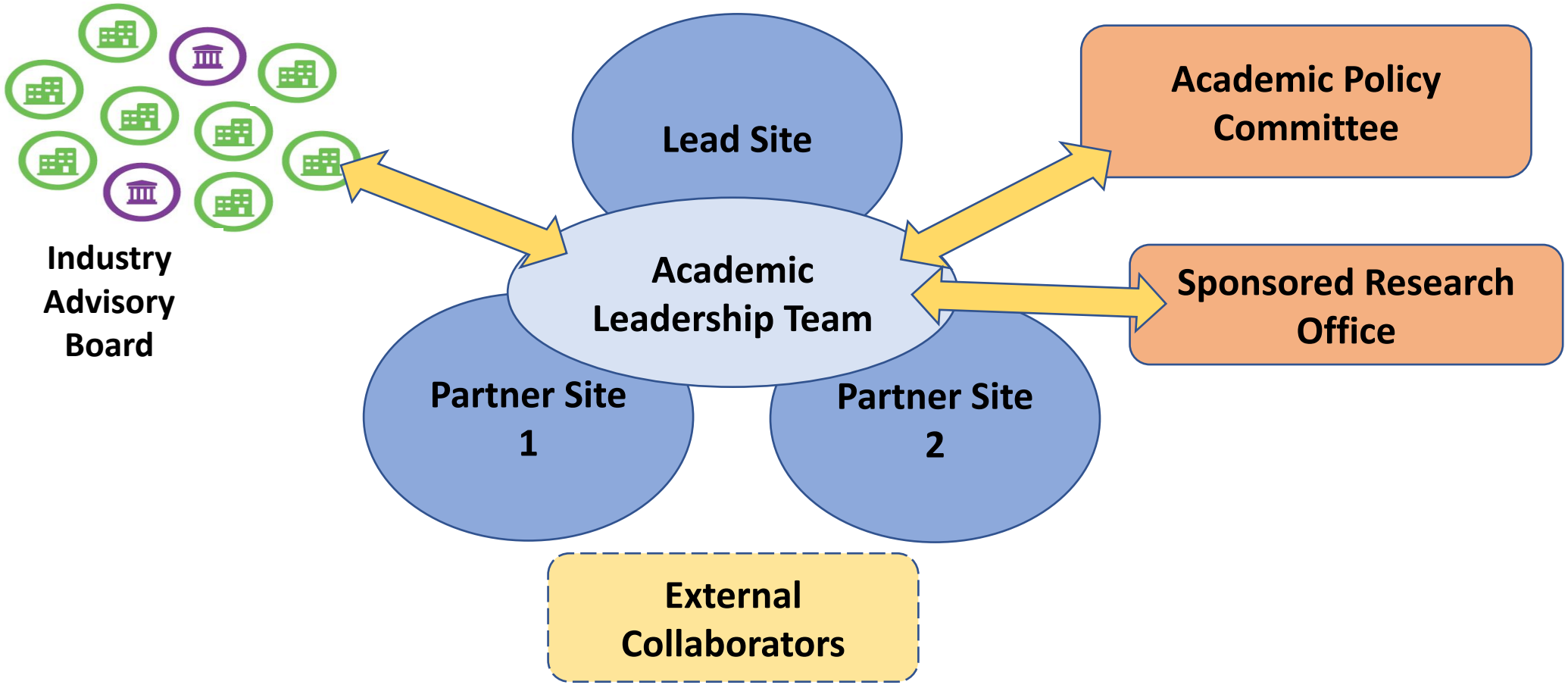
Broad Impact
Work with industry to address societal Challenges.

Feedback
Get industry guidance on research problems.

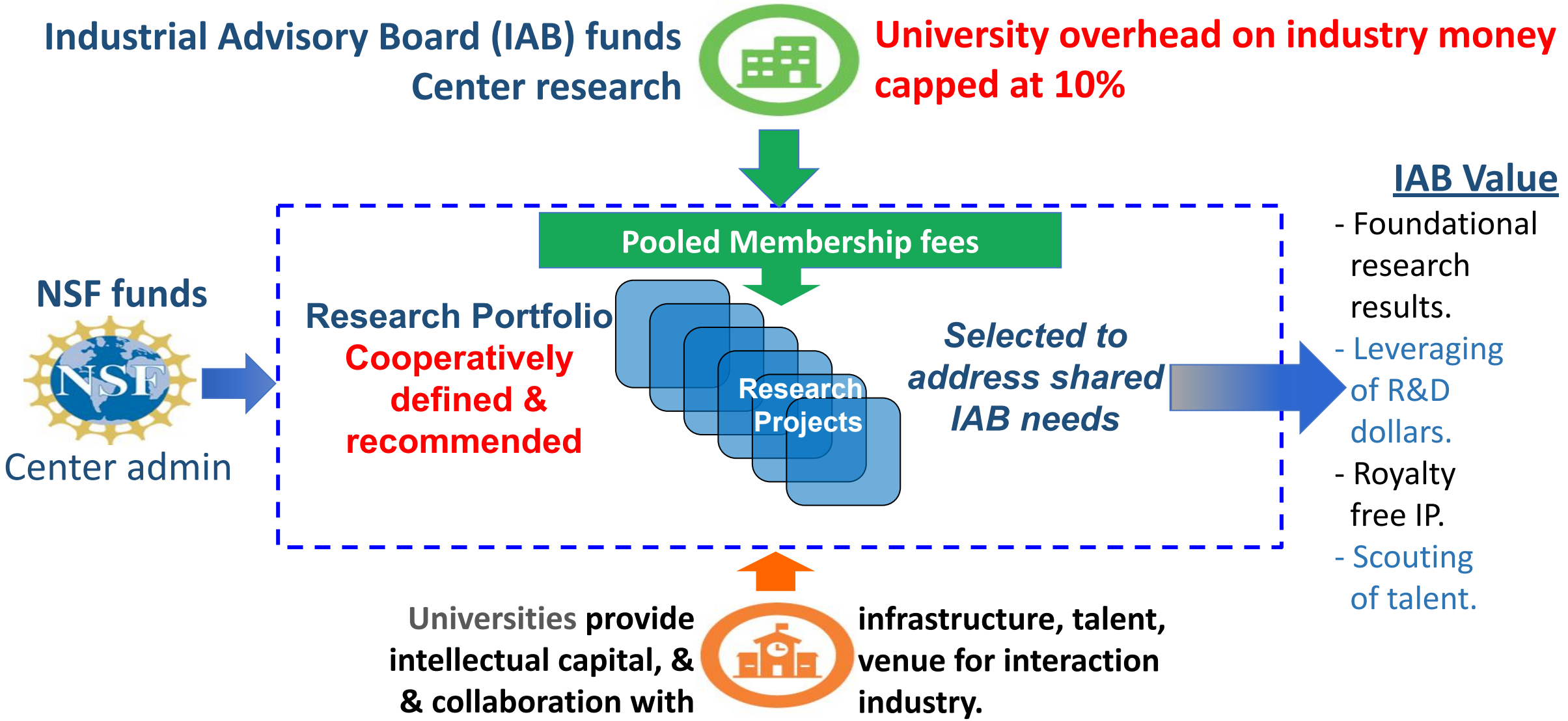
Access
Access to industry information to Spur innovation.

IUCRC Center Structure and Operations

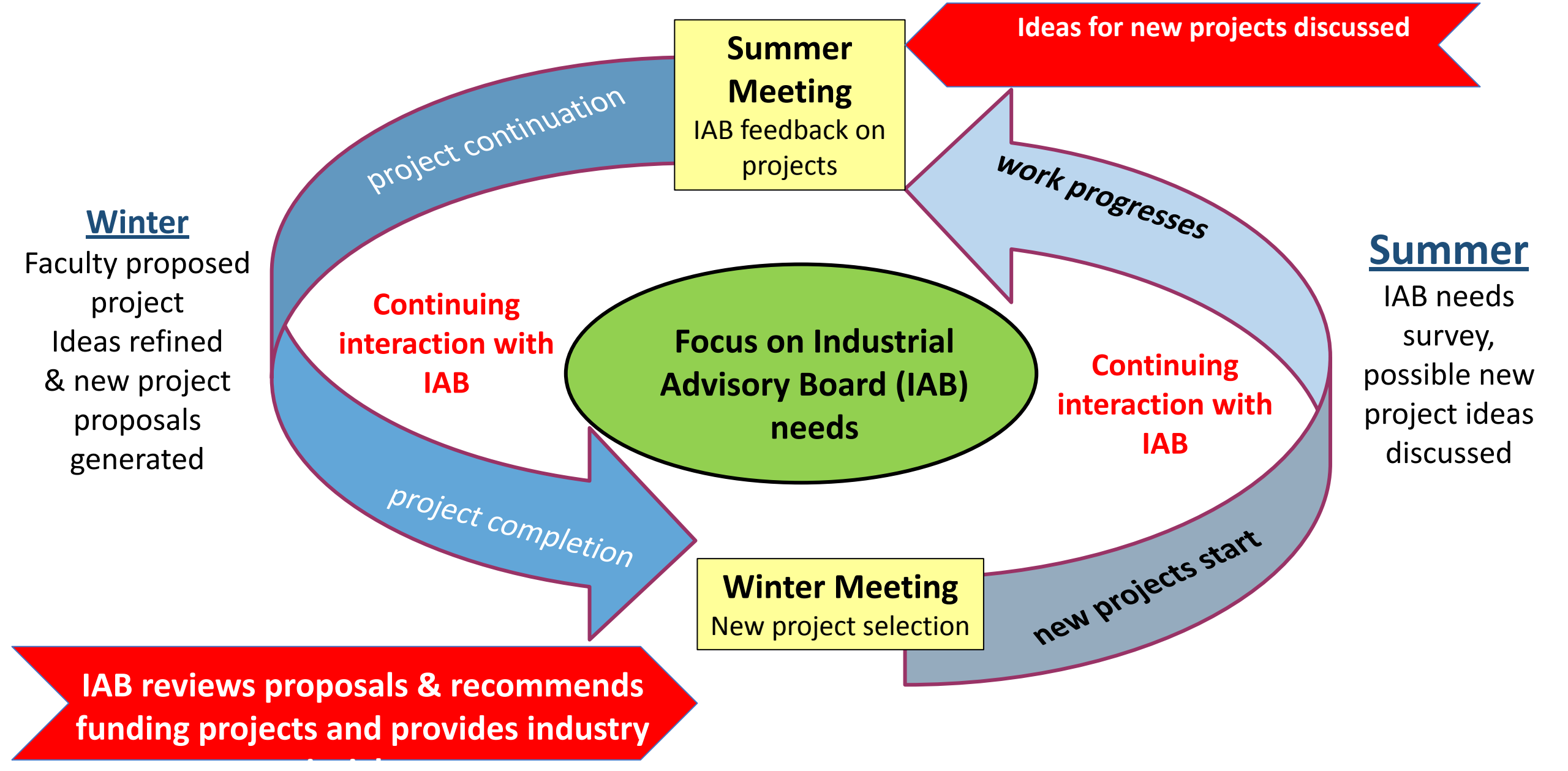
IUCRC – Center Structure



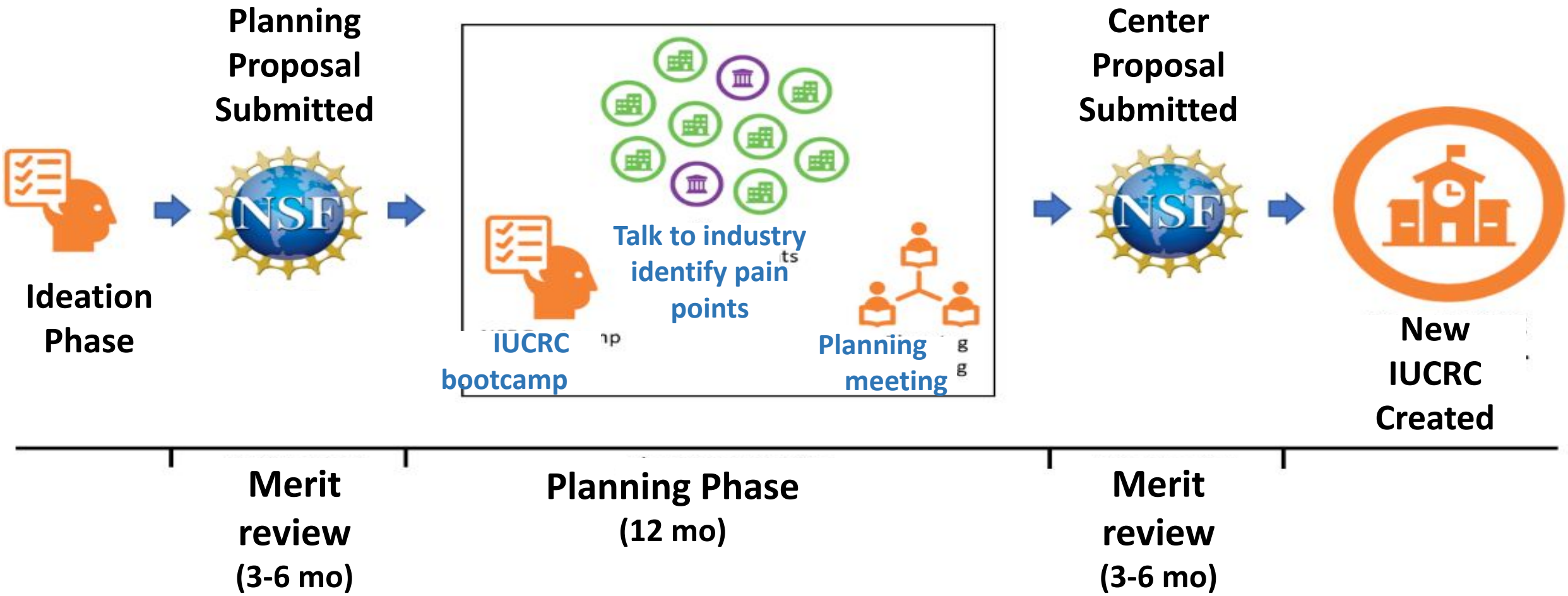
IUCRC – Program Operational Essentials



IUCRC - Member Role in Project Selection



IUCRC Center Creation Path and Timeline



IUCRC Characteristics and Must-Haves

Key for a Successful Partnership & Center

Center, Center Members, and Member Eligibility

IUCRC Criteria for Viability: All Centers must retain a minimum number of Members, at the full membership rate and a minimum amount of contributed Member cash in the form of a membership fee.

IUCRC Goal: To advance a technology or targeted sector of the economy, employing cutting-edge research ideas & technology

Membership Eligibility* - Anyone can join, if they sign the IUCRC Membership agreement.

- Private sector companies (large, small, startups, international).
- Government agencies & public sector entities (federal, state, local).
- National labs, FFRDCs.
- Non-profits, foundations.

**NSF encourages Members of all types, with emphasis on the private sector to ensure translation of research to commercial uses for societal impact.*

IUCRC – Controlling Documents

- **Membership Agreement**
  - Same for all.
  - Must be signed prior to becoming a Center member.
  - Identifies types of memberships and fee structure.
  - Codifies rights for Center derived IP.
    - University owns IP.
    - All Members have royalty free licensing rights
    - Possibility of exclusive rights (if no other Member interested)
- **Center Bylaws**
  - Defines how Center will operate.
  - Describes research project consideration and voting practices.
  - Sets faculty/student Center research publication policies/delays.
  - Written jointly by university and IAB, can be amended as needed.
  - NSF approval required - ensures adherence to IUCRC model.

Signed by 100's of firms involved in IUCRCs

What an IUCRC Is and What It Is Not

- IUCRCs are engines of innovation to help Members overcome the collective conceptual and technological hurdles of the sector through fundamental use-inspired research projects focused on industry needs. **IUCRCs are NOT contract or service organizations: no one-on-one or hand-in-hand projects allowed.**

- IUCRC research is to provide ground-breaking research results of mutual interest where faculty learn industry pain points and pitch projects to address them with Members recommending funding for those of highest priority. **IUCRCs are not for faculty simply wanting to augment their funding, motivation should be for understanding and the collective needs of the sector.**

- The first word in IUCRC is “industry” which NSF takes to mean “private sector product producers”. Center research is focused on carrying out research that has the potential to help Members boost the national economy. Public sector, government entities and non-profits are welcome, but should not dominate Center membership. **IUCRCs are not places dominated by non-product producing entities.**

Is and Is Not (cont.)

- IUCRCs provide companies opportunities for serious talent scouting, to find students who are creative, resourceful, and understand industry needs and how to communicate and effectively in a private sector-like environment. **IUCRCs are not simply research engines, they can provide access to talent, infrastructure, research capacity, etc. missing from your organization.**

- Any party who shares the same interests and who wants to join the Center, agrees to abide by its bylaws, and signs the membership agreement can become a Member with the same rights as every other member. **IUCRCs are not exclusive ”clubs” with membership controlled by the IAB or faculty.**

- IP in an IUCRC is owned by the university and shared among Members. Private contracts and one-on-one arrangements can be made with Center faculty. But, those must be done outside the Center using the normal university process and overhead. **IUCRCs are not places where a company can develop Intellectual Property (IP) restricted to its exclusive use.**

NSF IUCRC Geoscience Portfolio Summary

2 Site: $400k

OCE - 2013
Marine Fisheries

- 17 REU
- 5 INTERN

2 Site: $900k

EAR - 2018
Mines & Mining

- 13 REU
- 16 INTERN
- 2 GOALI
- 1 START

1 Site: $400k

EAR - 2018
Geomechanics& Geohazards

- 3 REU

1 Site: $600k

AGS – 2021
WIRC Wildfire

- 6 REU

Share w/ BIO

4 Site: $600k

EAR - 2023
NEW: Soil Sensing

Share w/ ENG

to be proposed

AGS – NOAA-NSF Climate/Cat Model Integration

- AGS: Division of Atmospheric and Geospace Science
- EAR: Division of Earth Science
- OCE: Division of Ocean Sciences

Questions?

Please feel free to share with your corporate colleagues or with other potentially interested private or public sector parties – it takes many players to make IUCRCs deliver maximum impact!

Barbara Ransom, PhD: bransom@nsf.gov

For more information see
NSF IUCRC solicitation 20-570