



National Science Foundation



INDUSTRY UNIVERSITY COOPERATIVE RESEARCH CENTERS (IUCRC) PROGRAM

CAFS IAB Meeting

June 9, 2020

Dr. Gregory Reed – IUCRC Program Director

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NSF IUCRC Updates

- ***New IUCRC website:***

<http://iucrc.nsf.gov>

- ***New Solicitation (NSF 20-570):***

<https://nsf.gov/pubs/2020/nsf20570/nsf20570.htm>

- ***Solicitation 20-750 FAQ:***

<https://www.nsf.gov/pubs/2020/nsf20080/nsf20080.jsp>

- ***COVID-19 DCL:***

<https://www.nsf.gov/pubs/2020/nsf20095/nsf20095.pdf>

National Science Foundation – Mission



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

NSF – Vision and Overview

NSF's Vision

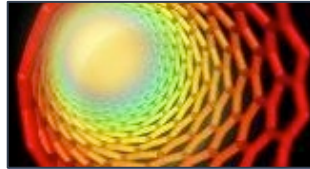
A Nation that is the Global Leader in Research and Innovation

- ~\$8 Billion Budget
- 230+ Nobel Laureates supported
- Overall: 350,000+ researchers, postdoctoral fellows, trainees, teachers, and students involved
- ~400 startups/small businesses funded each year



NSF Directorates

NSF is Engaged in All Fields of Science & Engineering



Engineering



**Computer &
Information
Science &
Engineering**



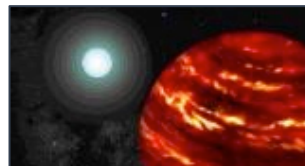
**Education &
Human
Resources**



**Geosciences
(including Polar
Programs)**



**Biological
Sciences**



**Mathematical
& Physical
Sciences**



**Social,
Behavioral &
Economic
Sciences**

IUCRC ROLE AT NSF

IUCRC – Represented Across 4 Directorates

NSF Directorates Supporting IUCRC Centers

- Engineering (ENG)
- Computer & Information Science and Engineering (CISE)
- Geosciences (GEO)
- Social, Behavioral, and Economic Sciences (SBE)

<https://iucrc.nsf.gov>

ENG – Industrial Innovation and Partnerships

NSF's Vision - A Nation
that is the Global Leader
in Research and Innovation



\$8B

Basic Research



**ENG Division of
Industrial Innovation
and Partnerships (IIP)**

\$270M

Translational Research



**Programs for Tech
Translation,
Partnership, and
Commercialization
Driven Activities**

IUCRC – Role within the IIP Division

Use-Inspired
Basic Research

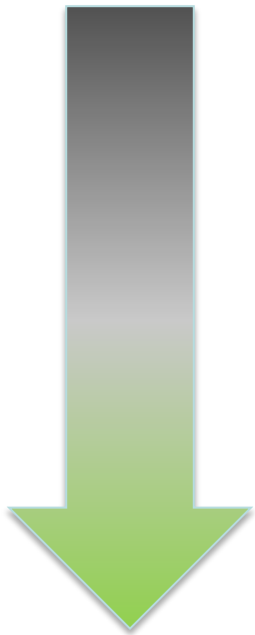
Industry University Cooperative Research Centers
<https://iucrc.nsf.gov>

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

Grad 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>

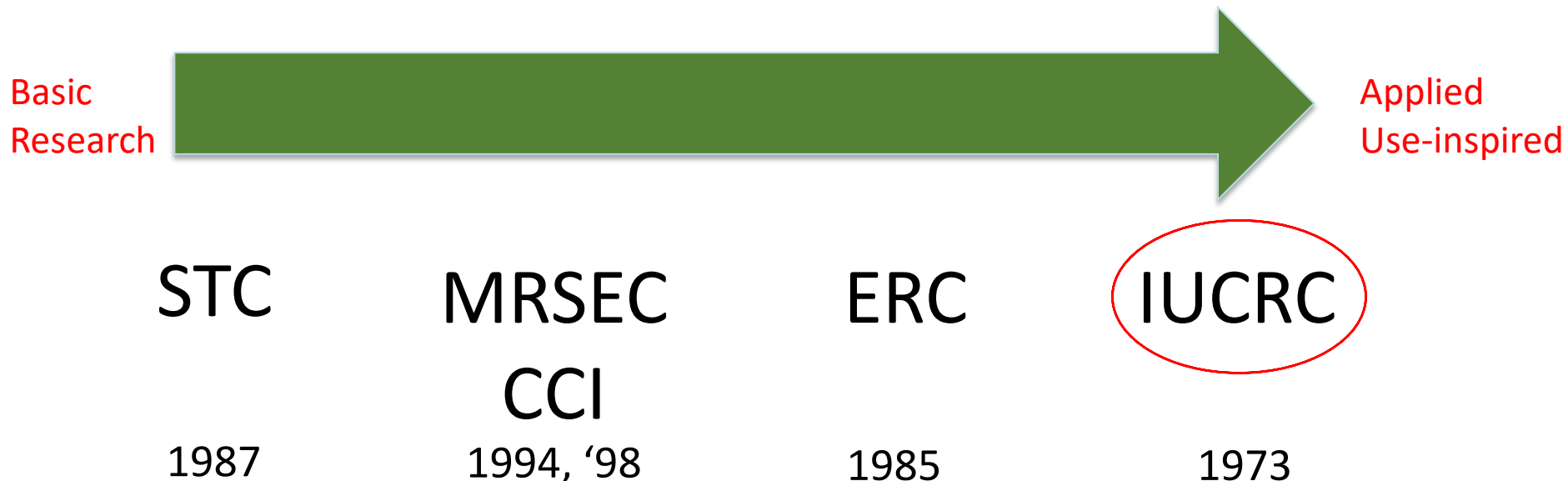


Commercial
Development

Focus is on Use-Inspired Basic Research

NSF Funded Research Centers – Key Investments

- **STC**: Science and Technology Centers
- **MRSEC**: Materials Research Science and Engineering Centers
- **CCI**: Centers for Chemical Innovation
- **ERC**: Engineering Research Centers
- **IUCRC**: Industry/University Cooperative Research Centers

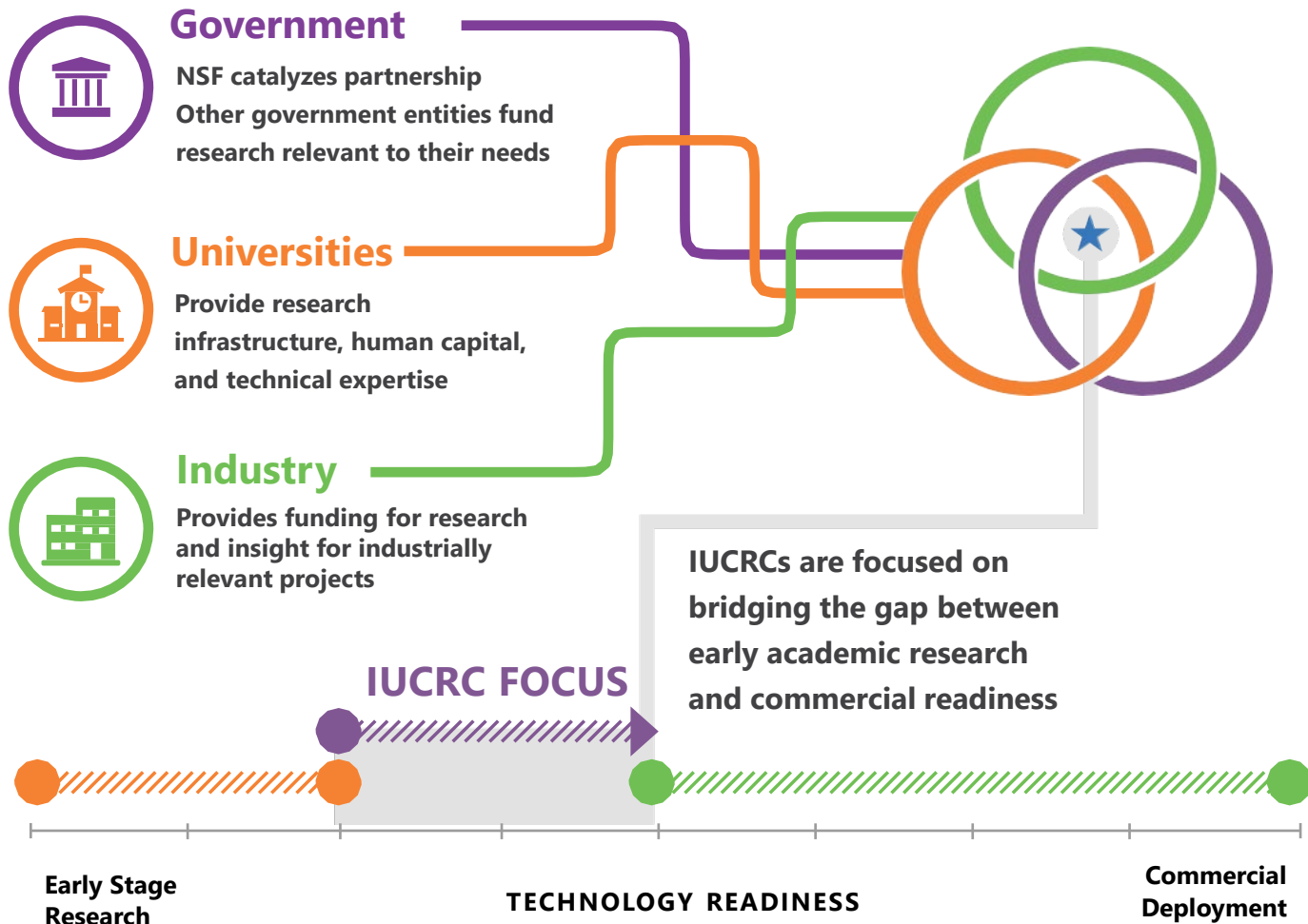


IUCRC – Program Overview

IUCRC – Program Mission

- **The IUCRC program catalyzes pre-competitive use-inspired research, by enabling close and sustained engagement between industry innovators, world-class academic teams, and government agencies.**
- **IUCRCs help industry partners and government agencies connect directly and efficiently with university researchers to achieve three primary objectives:**
 - 1) **Conduct high-impact use-inspired university research to meet shared and critical industry needs among companies of all sizes;**
 - 2) **Enhance U.S. global leadership in driving innovative technology development;**
 - 3) **Identify, mentor and develop a diverse, highly skilled science and engineering workforce.**

IUCRC – A Collaborative Partnership



Perform cutting-edge pre-competitive basic research in science & engineering to drive innovation and societal impact

IUCRC – NSF Role



NSF provides
\$ for administrative
and management costs



Members provide
\$ for research
(only 10% overhead)



Universities provide
infrastructure and
people to conduct
research



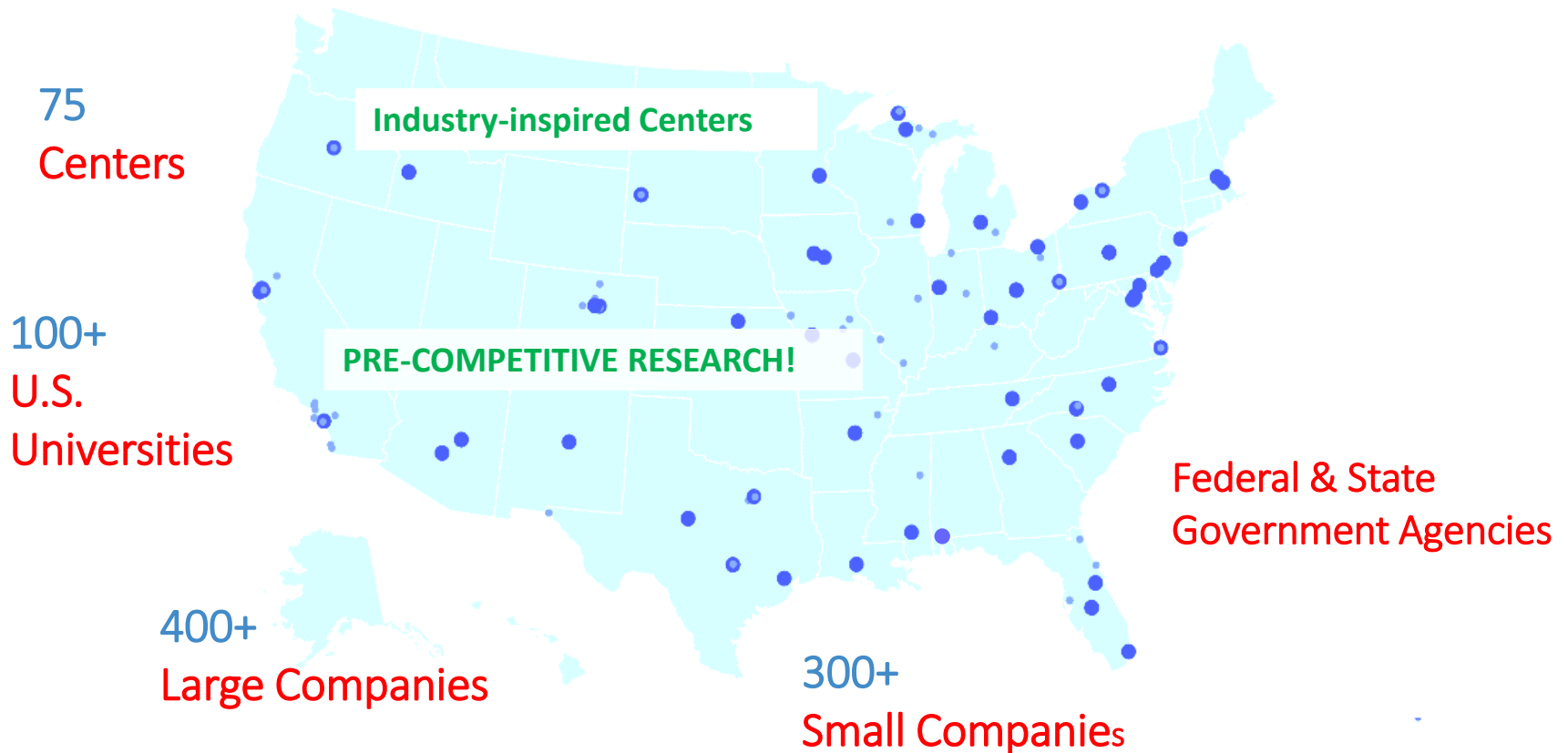
Members gain access
to pre-competitive
research and highly-
skilled workforce
(only 10% overhead)

IUCRC – Model for Success

- **Successful IUCRCs require:**
 - A capable research/management team with an entrepreneurial mindset;
 - Universities, faculty, and students interested in engaging in research of interest to industry;
 - A community of industry partners seeking pre-competitive, use-inspired research projects.
- **Each IUCRC is expected to grow and become independently sustainable by the end of the NSF support.**

IUCRC – Nationwide Portfolio

Collaborate Strongly with Industry
Leverage Industry Funding and Resources
Provide Industry Exposure to Students and Faculty



IUCRC – Broad Areas and Research Themes

- **Advanced Electronics and Photonics**
- **Advanced Manufacturing**
- **Advanced Materials**
- **Biotechnology**
- **Civil Infrastructure Systems**
- **Energy and Environment**
- **Forensic science**
- **Geosciences**
- **Health and Safety**
- **IT, Communication, and Computing**
- **System Design and Simulation**



IUCRC – Value Proposition for Members

IUCRC Program Funding Benefit

Every \$1 in
member
contributions
leverages an
integral multiple of
additional dollars in
research funding



Access to Talent

Opportunity to mentor and train students to attain desired skills for work in your industry



De-Risk R&D

Share risks of early stage research leading to disruptive business opportunities



Research Cost Avoidance

Save internal research dollars through access to facilities, infrastructure, and lower human capital costs



Leverage Research Dollars

Earn higher return on investment when research is jointly funded



Access to Network

Learn from interacting with center participants within your technology sector



Access to Intellectual Property

Gain royalty-free, non-exclusive licenses on intellectual property produced in the center

Facilities & Administrative overhead rate not to exceed 10%

IUCRC – Value Proposition for Universities

Student Training / Workforce Dev.

~6,500*

Center-trained
students nationwide

~ 25%*

Center-trained
students hired
by member
organizations

*(10-year data)



Student Support

Enhance resources available
for student training, skills
development, and job placement



Broader Impact

Work with industry
to address societal
challenges



Funding

Increase and diversify
research funding through
industry-driven research



Feedback

Receive industry guidance
on research projects



Collaboration

Build relationships
and develop industry
partnerships for
technology transfer

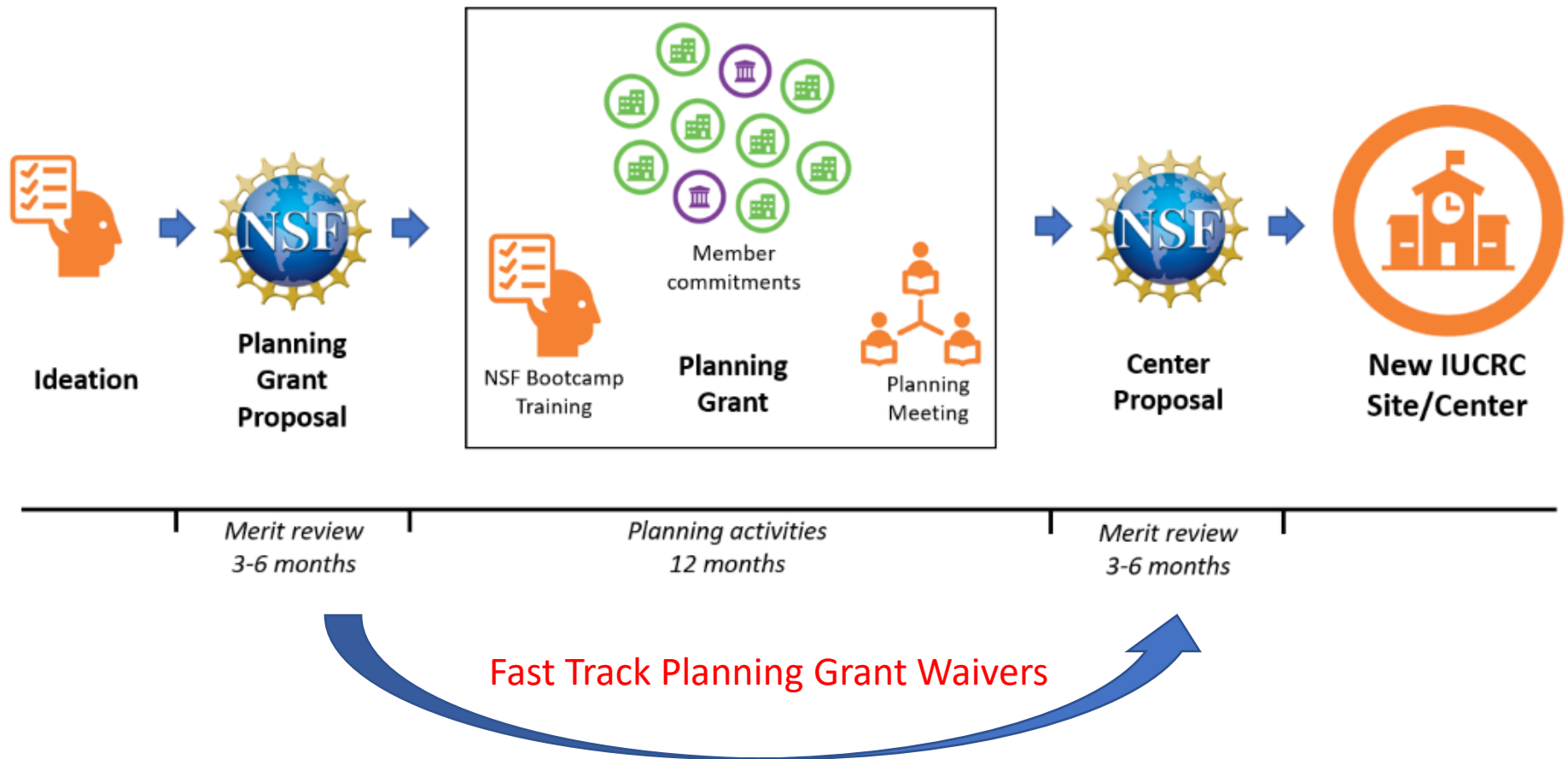


Access

Access to industry
information to spur
innovation

IUCRC – Establishing a Center

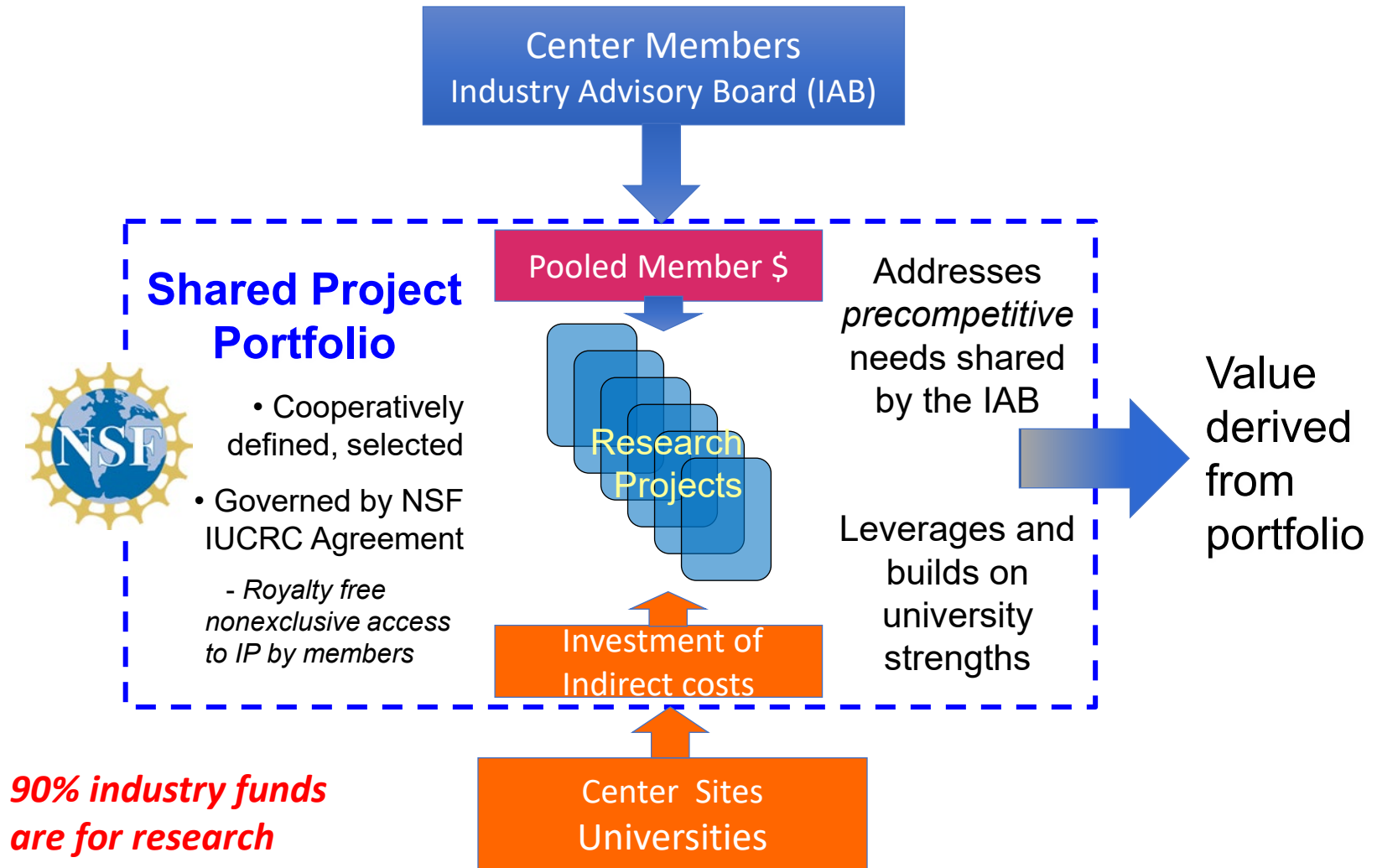
Path and Timeline to IUCRC Creation



IUCRC – Key Outcomes from Planning Workshop

- Strong Convergence between academia and industry on **broad cutting edge, high impact** Center research thrusts
- Industry engagement via **financial commitments** to support a new center
- A **competitive proposal** to NSF for creation of a Phase I IUCRC Center

IUCRC – Program Model



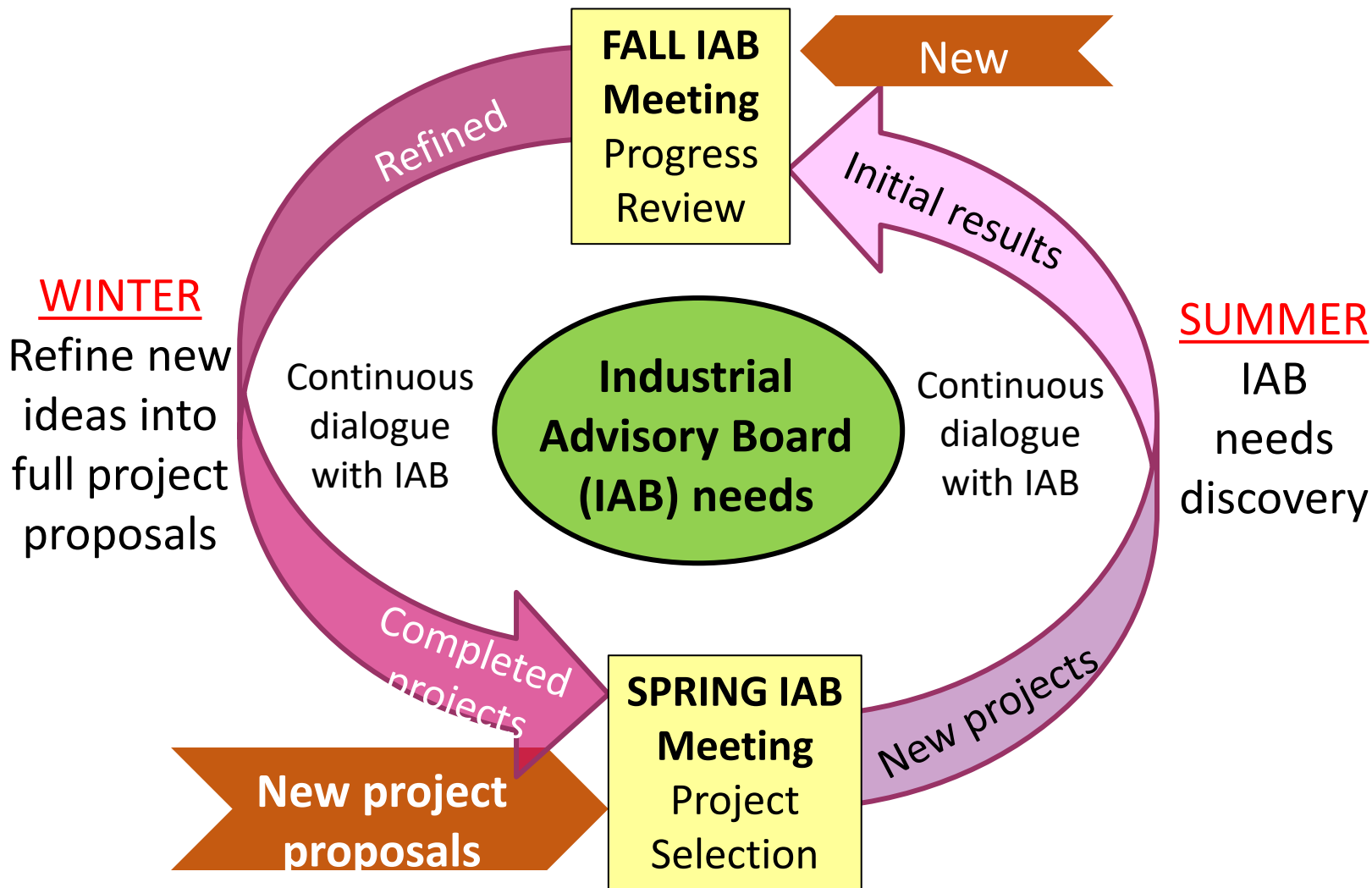
IUCRC – Membership Agreement

- **Parties to Agreement: University and Center Members**
- **Annual membership fee structure**
- Industrial Advisory Board – one representative from each company per membership
- Patent rights held by university, with royalty-free, non-exclusive rights to center members
- Companies wishing to exercise rights to a royalty-free license pay for the costs of patent application
- If only one company seeks a license, that company may obtain an exclusive fee-bearing license
- NSF has March-in Rights under Bayh-Dole
- Publication delay policy – typical 90 days

Widely
accepted by
1,000's of firms
across the
entire IUCRC
Program

All Members sign the NSF agreement upon Center Award
ONE center, and ONE membership agreement

IUCRC – Member Role in Project Selection



IUCRC – Supplements

- **Supplemental Funding Opportunities:**
 - Research Experiences for Undergraduates (REU): ~\$8K/Student
 - Research Experiences for Teachers (RET): ~\$10K/teacher
 - Research Experiences for Veterans in (VRS): ~\$10k/Veteran
 - Graduate Student Internships (INTERN): up to \$55K/Student
- **Addition of New University Sites**
 - Grow the center's research capacity and geographical reach
 - Build partnerships with international research Institutions

IUCRC – Building/Launching a Successful Center

- Takes an entrepreneurial mindset. Challenges are similar to launching a startup.
- Build a strong leadership team. Pull together a dedicated group of core faculty researchers
- Develop strong cross-institutional support
- Engage in extensive customer discovery
- Bring on a key team member with strong and deep industrial experience to guide the academic team
- **Network, Network, and Network some more.....**

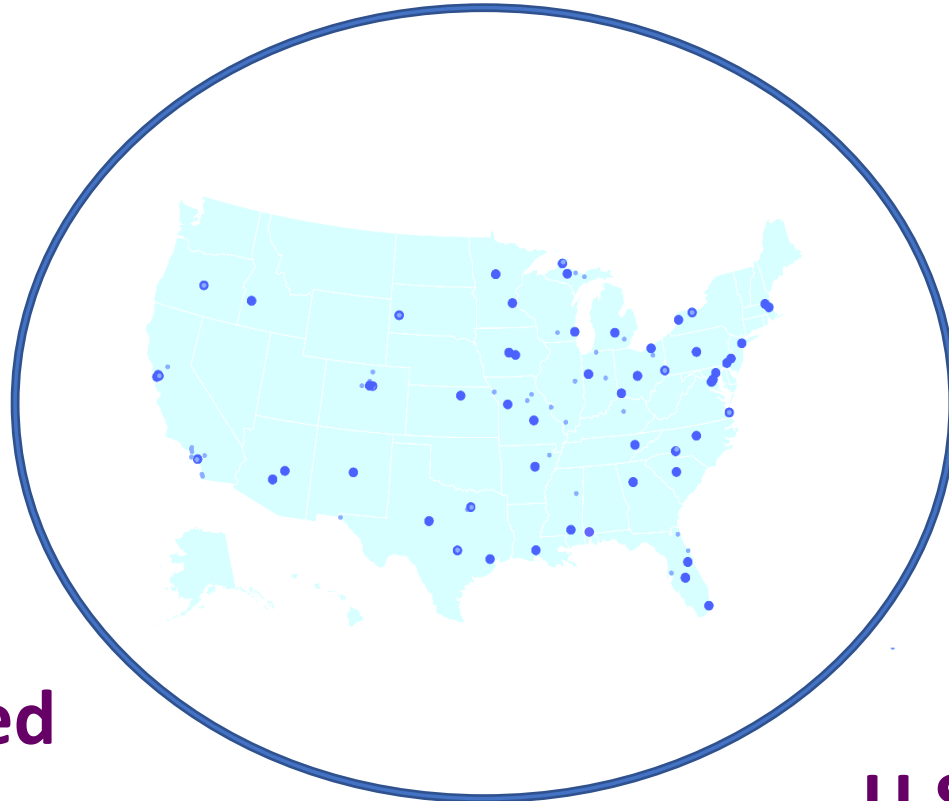
IUCRC – Leveraging the Center

- **Bring the biggest upstream basic research challenges to the table**
- **Mentor and engage with center projects**
- **Involve top talent with the center**
- **Work collaboratively as a unified, single advisory board for the Center**
- **Help grow the member base and funding pool of the center**

IUCRC – Summary

~ 800

**Unique
Members**



75

**Centers
Nationwide**

~ 6,500

**Center-trained
students
(2009-2018)**

100+

U.S. Universities

Q&A – IUCRC Program Directors

ENGINEERING

CISE

SBE

GEO



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