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Team Science and Convergent Research

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Agenda

- About McAllister & Quinn
- Overview and Definitions
- Teaming Approach
- Best Practices for Developing a Center-Level Team
- Center-Level Opportunities and Resources
- Next Steps and Questions

About McAllister & Quinn

Washington, DC-based consulting firm

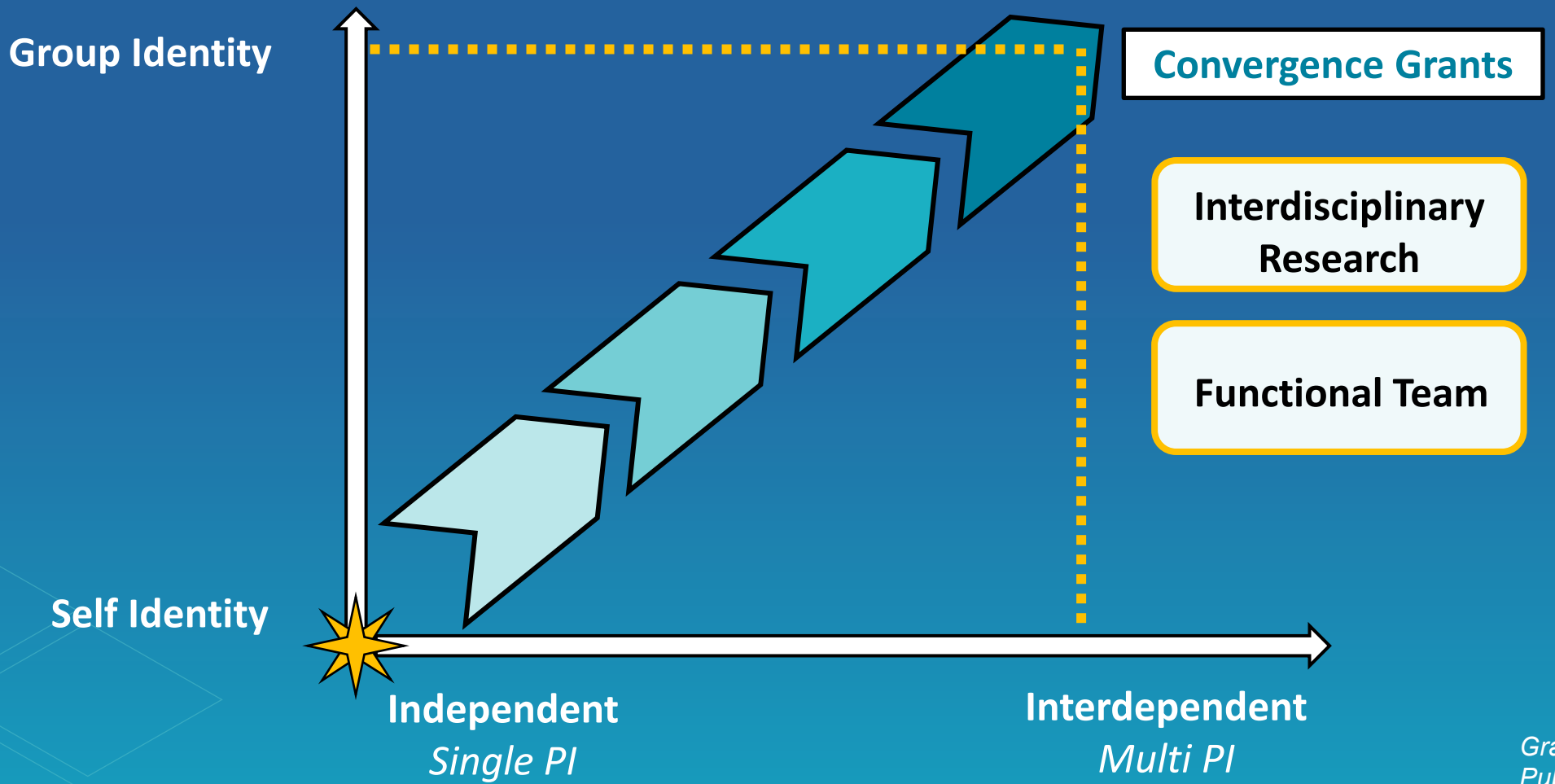
- Founded in 2004
- Specialize in securing funding for a wide range of organizations
- Practice areas: Higher Education, Advanced Technology, Healthcare, Non-Profit & Public Agencies

Team of grants experts

- 90+ staff from Legislative and Executive branches, Academia, Non-profits, & Industry
- Network of more than 250 grant writers, consultants & subject matter experts

Overview and Definitions

Pathway to Team Science and Convergence Research



Graphic adapted from NIH Publication No.18-7660

What is Interdisciplinary Research?

NATIONAL ACADEMY OF SCIENCES

- Advances fundamental understanding or solves problems whose solutions transcend the scope of a single discipline or area of research practice.
- Integrates information, data, techniques, tools, perspectives, concepts or theories from two or more disciplines or bodies of specialized knowledge.

NSF

NSF's support of interdisciplinary research and education is essential for accelerating scientific discovery and preparing a workforce that addresses scientific challenges in innovative ways

Definitions

Uni-disciplinary	Multi-disciplinary	Inter-disciplinary	Trans-disciplinary / Convergence
			
Researchers from a single discipline work together to address a common research problem	Researchers in different disciplines work in a **sequential, yet independent** process, with a goal of eventually combining efforts to address a common research problem	The process is **interactive** and researchers work jointly to draw from his or her own disciplinary-specific perspective to address a common research problem	An **integrative** process in which researchers work jointly to develop and use a shared conceptual framework that synthesizes and extends discipline-specific theories, concepts, or methods, to create new models and language to address a common research problem

Convergence Research

Focuses on complex and compelling problems with pressing societal need

Involves deep integration of methods, knowledge, expertise from different disciplines and forming novel frameworks

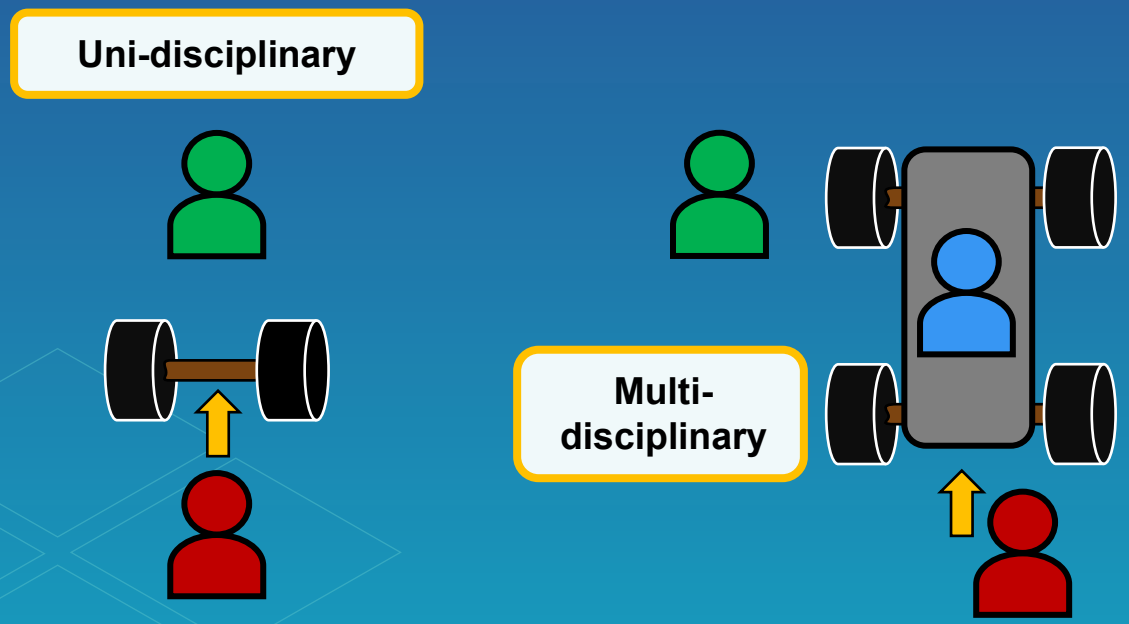
Includes a variety of non-academic partners (community and industry involvement)

Accelerates research impact. New frameworks, paradigms or even disciplines can emerge from research/results

Teaming Approach

What is a team?

In a team, two or more people work and interact together to solve a problem through a shared vision, purpose, and goals.



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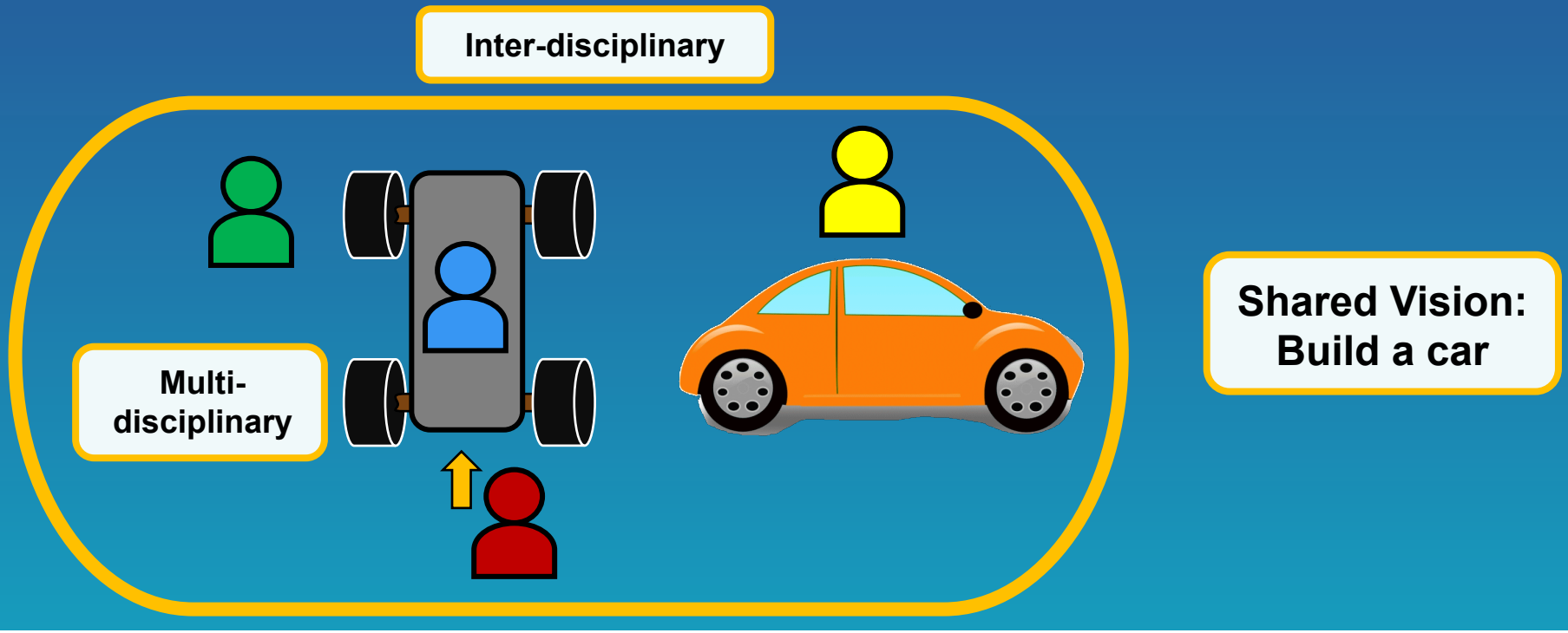

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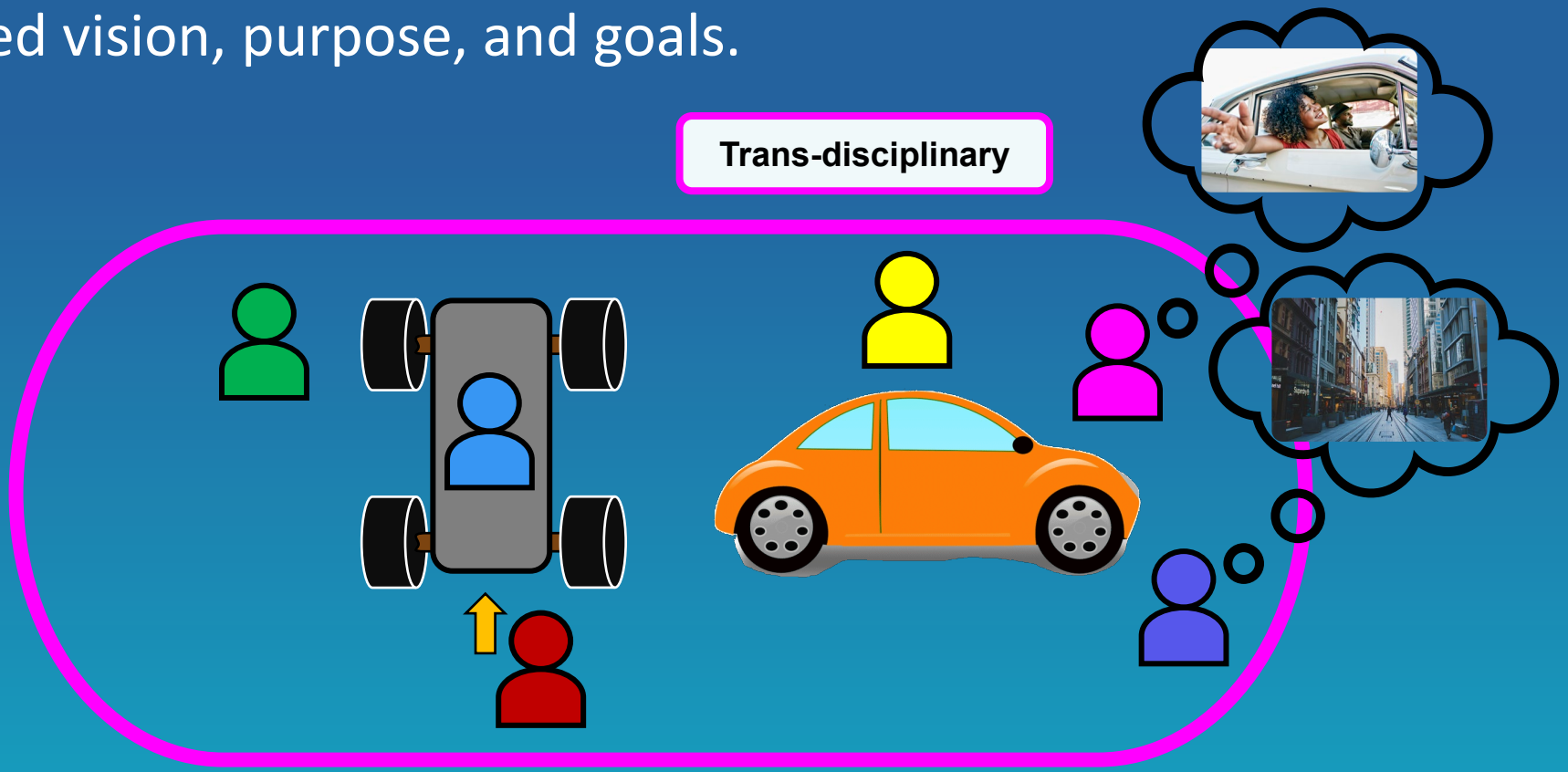
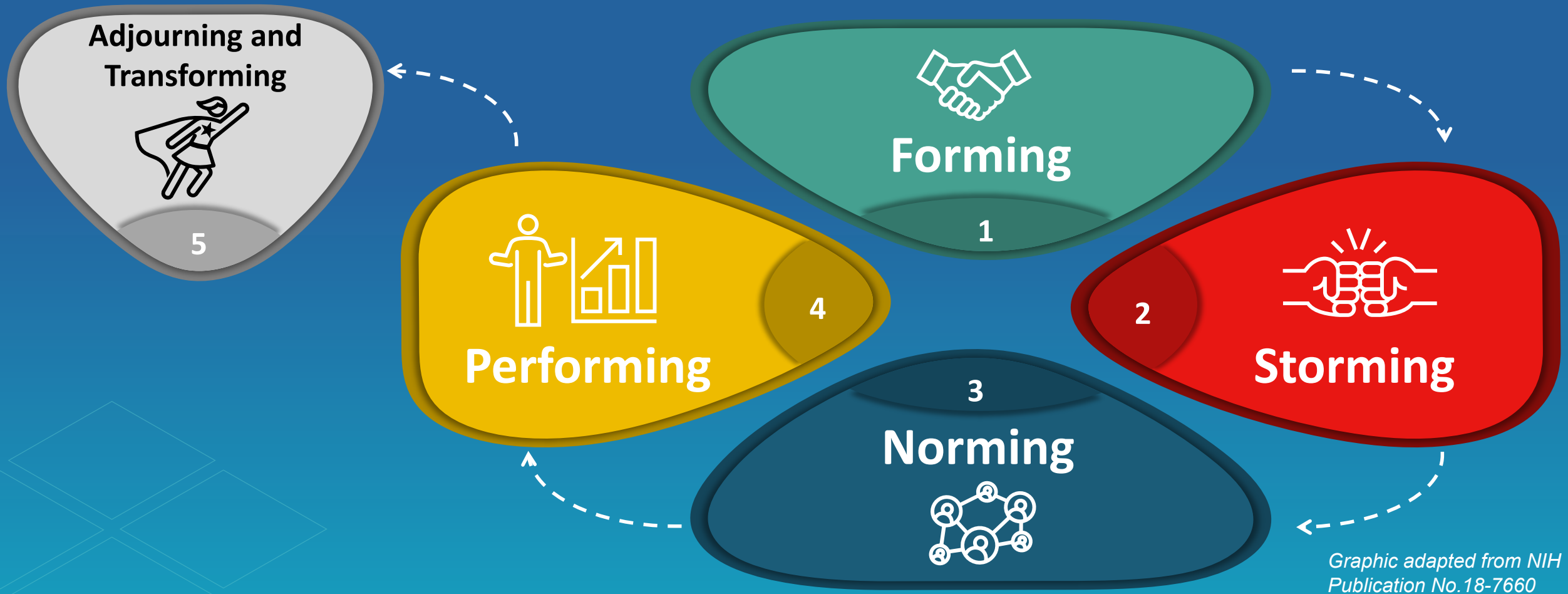
Shared Vision: develop an autonomous vehicle and reimagine urban planning and roadway design to increase safety



Understanding team evolution



Graphic adapted from NIH Publication No.18-7660

Are you ready to be on a team?

01 Can I thrive as a member of a highly collaborative team?

02 What would I gain? What do I most hope to gain?

03 Do I have anything to lose? What is my biggest worry about being on a team?

04 Am I willing to share data and credit with team members?

05 Am I willing to accept constructive feedback and training from team members?

06 Am I willing to provide constructive feedback and training to team members?

07 Can I openly discuss issues and concerns with team members?

Leading research teams

Team leaders should be able to:

- **Build consensus** around goals and problem definition
- Empower all team members to contribute **regardless of status and power differences**
- Bolster a culture of **collaboration and inclusion**
- **Facilitate communication** among all stakeholders
- **Resolve conflicts**
- Continuously **improve and inspire** individual and team performance.

Teaming Approach

Ineffective leadership styles

Absentee Leadership

Unavailable or insufficiently involved

Inhibited Leadership

Conflict avoidant; reluctant to handle difficult people or situations

Defensive Leadership

Resistant to feedback; tendency to blame others

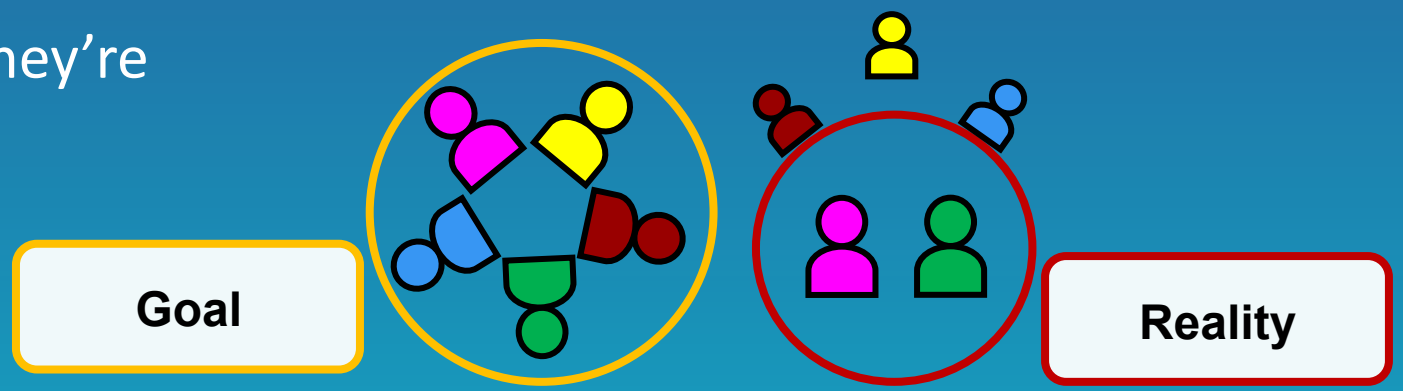
Hostile Leadership

Actively promotes competition and conflict

Are you ready to lead a team?

Importance of diverse interdisciplinary teams

- Successful teams have people who work together but who think and communicate in very different ways
- Discipline, gender, race, education, language, other dimensions of lived experience
- Members of a diverse team bring different perspectives and creativity
- Teams solve problems faster when they're more cognitively diverse



Teaming approach questions

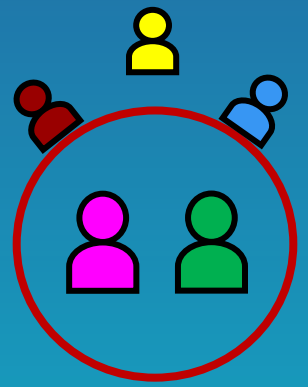
- How will the team leadership, management, and administration function?
- How will you manage essential team processes?
- Do you have the required technology and resources?
- How will you communicate and coordinate?
- How will you ensure psychological safety for all members?
- How will you resolve conflict?
- How will you evaluate your collaboration?
- Who is your **institutional level advocate who can be a supporter of the project** when hurdles or issues develop?

Why teams underperform

Common challenges that arise within research teams incl

- Silo thinking within the team
- Underutilization or lack of acknowl… the diversity of knowledge/experience wit…
- Unclear or in… …nance
- Lac… …e goals
- Failure to instill psychological safety in team members

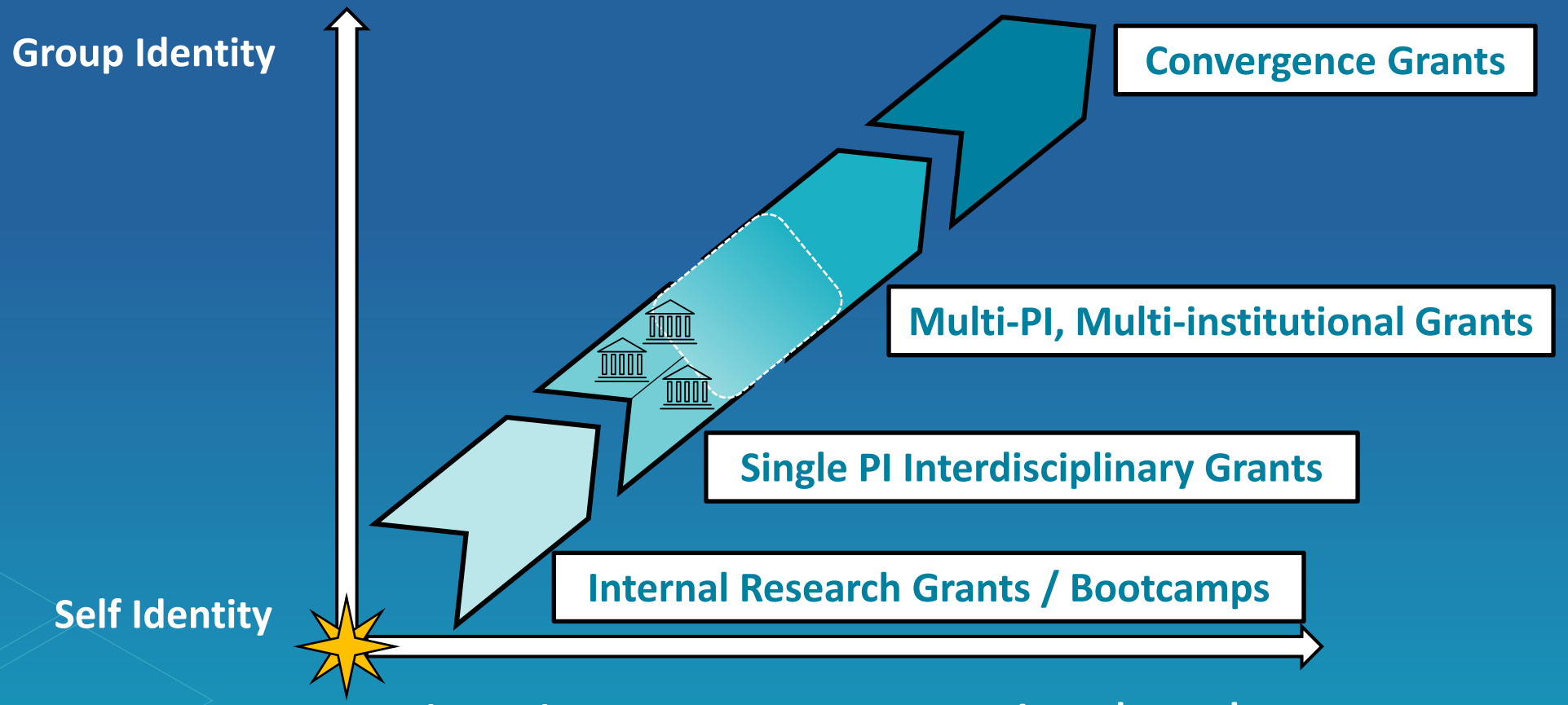
Decreased Productivity and Morale



Institutional factors that impact teams

- Will your institution recognize team members' input and contributions during a performance review?
- What resources (people, equipment, other infrastructure) are available to teams to help fast track and support teaming efforts and proposal development?
- What resistance, obstruction, or complacency might the team face when members interact with institutional policies and processes?

Pathway to team science and convergence



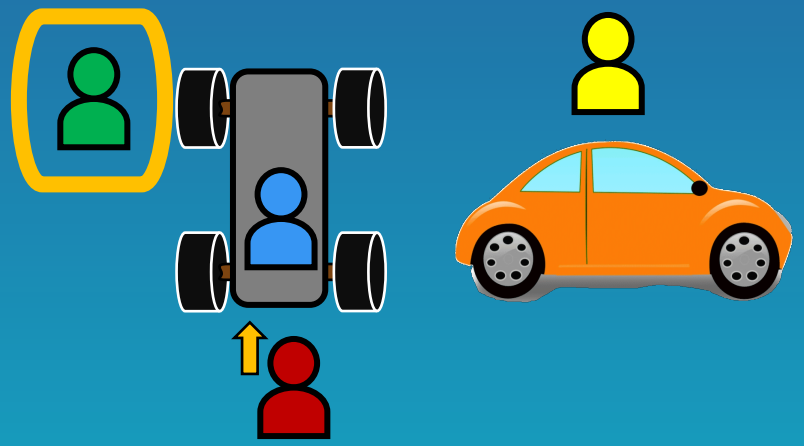
Graphic adapted from NIH Publication No.18-7660

Teaming Best Practices

Best Practices: Timeline and Planning

Best Practices: Team Dynamics

- Partnerships should be based upon a shared vision – outcome based
- Continually evaluate partnerships
- Prevent silo thinking with a Portfolio Governance Team (PGT)
- Maximize (and use) diversity
- Ensure psychological safety for all members
- **Start planning early**



Best Practices: Engagement and Impact

- Establish connections with diverse communities outside academia that can bring about new ideas and opportunities
- Involve groups who will be impacted by the outcomes of research
- Understand the range of possible collaborative approaches and adapt to fit the community culture
- Respect all viewpoints
- **Start planning early**

Best Practices: Institutional Considerations

- Utilize your resources on campus (DEIA, Office of Community Engagement, Office of Technology Transfer)
- Is your organization committed to advancing the proposed partnerships?
- Identify your high-level institutional advocate for the project
- **Start planning early**

Best Practices: Proposal Development

- Use institutional resources
- Have a consistent layout plan for the document and supplemental materials
- Define acronyms early, and use consistently by all parties
- Speak the same language, especially when you have multiple writers
- Review drafts both internally and externally

Best Practices: Strategy

- Don’t get discouraged, and DO NOT disband your team
- Remember your goals
- Explore different opportunity cycles
- Pivot the team for further opportunities
- How do merit review criteria differ between solicitations?
- Assemble required information beforehand

to solve vexing research problems, especially those focusing on societal needs.

Best Practices: Decoding Solicitations

NSF ERC Solicitation:

- How does the proposed Center's research **benchmark against the state-of-the-art**?
- **Why is the proposed research competitive** when benchmarked against the state-of-the-art?

Your team will need to address the following questions:

- What is state-of-the-art?
- How to quantify and what benchmark to use?
- How to determine competitiveness?

Convergence Research: A Different Mindset

- Must be proactive.
- Know typical review criteria and assemble documents beforehand.
- Nurture team.
- Solve other people's research questions, not your own.

"My epiphany came when I realized that grant programs do not exist to make me successful, but rather my job is to make those programs successful."

Porter, R. (2007). Why academics have a hard time writing good grant proposals. The Journal of Research Administration, 38, 161-167.

Characteristics of Successful Convergence Projects

Compelling case for a convergent approach

Involvement of the **next generation** of convergence researchers

Deep **integration** of knowledge, tools and techniques, while demonstrating a **novel research approach**

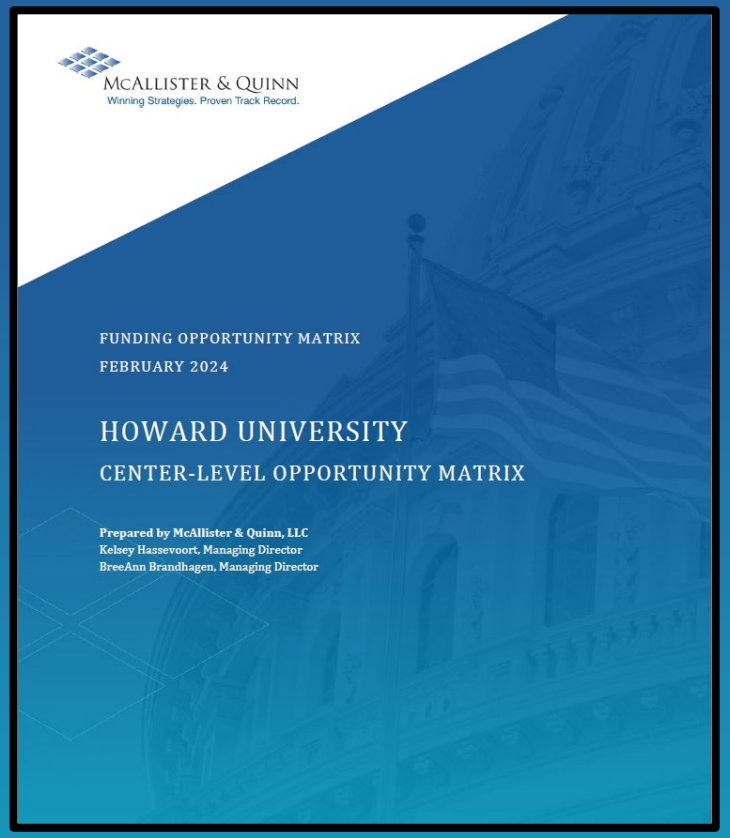
Team readiness to engage in convergence research.

Center-Level Opportunities and Resources

Center-Level Opportunity Examples

Program	Materials Research Science and Engineering (MRSEC)	Energy Frontier Research Centers (EFRC)	Multidisciplinary Research Program of the University Research Initiative (MURI)	Advanced Laboratories for Accelerating the Reach and Impact of Treatments for Youth and Adults with Mental Illness (ALACRITY)
Focus	Supports university-based centers that collaborate with industry and other sectors on **multidisciplinary materials research and education**.	Brings together diverse world-class teams of scientists to perform energy relevant, basic research with a **scope and complexity beyond what is possible in single investigator or small-group awards**.	Involves teams of researchers investigating high priority topics and opportunities that intersect more than one traditional technical discipline. For many military problems this **multidisciplinary approach** serves to stimulate innovations, accelerate research progress and expedite transition of results into defense-related applications.	Aims to support innovative research ideas and **collaborations across disciplines** that could transform the care of children, adolescents, and adults with serious mental illnesses.
Next Solicitation	Expected in Q3 of 2024 [Every 3 years]	Q1 of 2024 [Every 2 years]	Q1 of 2024 [Every year]	Applications due in Q2 2024 [Every Year]
Funding Level	2-IRG:$18M 3-IRG: $27M	$8M-$16M	$6.25M-$7.5M	$7.5M

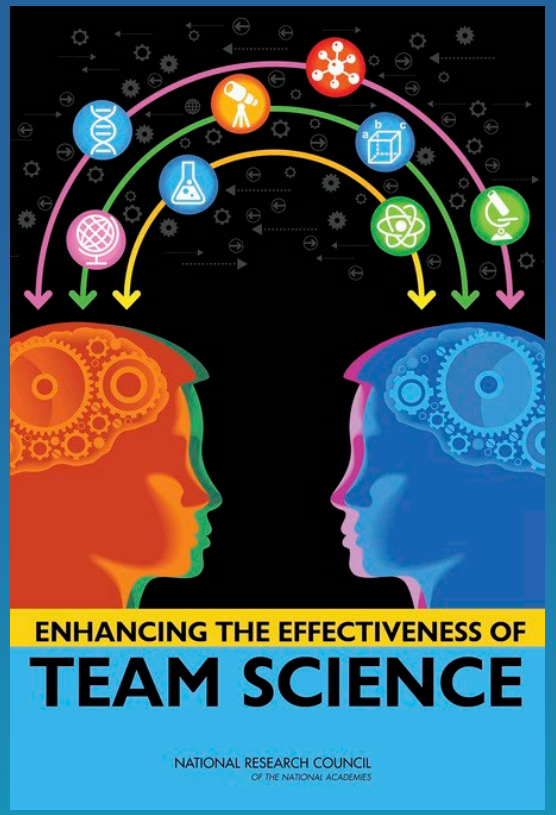
Resource: Center-Level Funding Opportunity Matrix



Provides an overview of forecasted/recurring center-level federal funding opportunities

Additional Resources

- Science of Team Science listserv
- Growing Convergence Research at NSF Lecture Series
- Enhancing the Effectiveness of Team Science
  (ISBN 978-0-309-31682-8)
- NIH National Cancer Institute Collaboration and Team Science Field Guide
- USDA National Institute of Food and Agriculture Leading Transdisciplinary Projects Resources
- Interpersonal relationships drive successful team science: an exemplary case-based study



Next Steps

Explore the funding opportunity matrix and additional resources

Contact Pamela Clarke (Director of Research Development) to discuss support needs

Questions?

McAllister & Quinn

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