# How to Write a Competitive NSF CAREER Proposal

January 29, 2026

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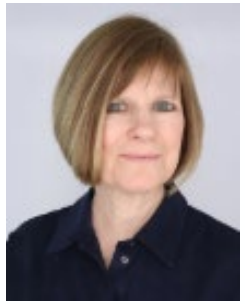
# *Our Team*

**Jessica Lawrence**
Assistant VP, Strategic Interdisciplinary Research
*jlawrenc@purdue.edu*



**Sally Bond**
Director, Proposal Strategy and Development
*sbond@purdue.edu*

**Aimee Jo Gibney, PhD**
Assistant Director, Proposal Strategy and Development
*ajgibney@purdue.edu*

**Jackie Thompson**
Senior, Proposal Strategy and Development Specialist
*jkrogme@purdue.edu*

**Allison Troutner**
Senior, Proposal Strategy and Development Specialist
*atroutne@purdue.edu*

## Office of Strategic Interdisciplinary Research – Proposal Strategy and Development

Grant Help: Intake Form

Grant Writing Resources:

# *Our Mission*

The **Strategic Interdisciplinary Research** team in the Office of Research equips faculty with the tools and guidance needed to pursue high-impact research. We provide integrated support from **early-stage planning and team building to proposal management and project launch.**

**Strategic Visioning & Planning**

- Internal Funding
- Workshops, Resources, Training
- Concept Paper Visioning
- Cost Share Planning and More!

**Proposal Strategy & Support**

- Proposal/Project Management
- Proposal Review & Editing
- Grant Writing
- Broader Impacts Consultation...

**Center Launch & Sustainability**

- Site Visit Strategy
- Post-Submission Planning
- Project Launch Support
- Sustainability Planning and More!

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# *Agenda*

Parts I & II: 1:30-3:30 pm

## PART I: CAREER Workshop

Welcome & Overview

Visioning & Integration

Broader Impacts vs. Education (Activity 1)

Institutional Resources

PO Engagement & Concept Paper (Activity 2)

Outlining & Templates

Final Tips

**BREAK @ 2:25**

## PART II: Faculty Awardee Panel

Panelist Insights

Q&A

Brief Survey

**End @ 3:30**

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# *Workshop Outcomes*

By the end of this workshop, you should have:

1. Stronger first drafts
2. More strategic writing approaches
3. Better program officer engagement
4. Practice with key components
5. New momentum for writing

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# OVERVIEW

## NSF Faculty Early Career Development Program (CAREER)

CAREER Proposals

- 5 years
- ~80k-100K/year
- Single-PI
- Department commitment to PI
- Education Plan and Rationale
- Research Path and Rationale
- Synergy between education and research
- Broader Impacts of research and education

My long-term goal is… The PI's long-term goal

Core Program Proposals

- 3 years
- ~100k/year
- Allows for Co-PIs
- No department endorsement needed
- Research Plan and Rationale
- Broader Impacts only

Our goal is…

**NSF Solicitation Link: CAREER 2026**
**NSF PAPPG: Proposal/Policy Guide**

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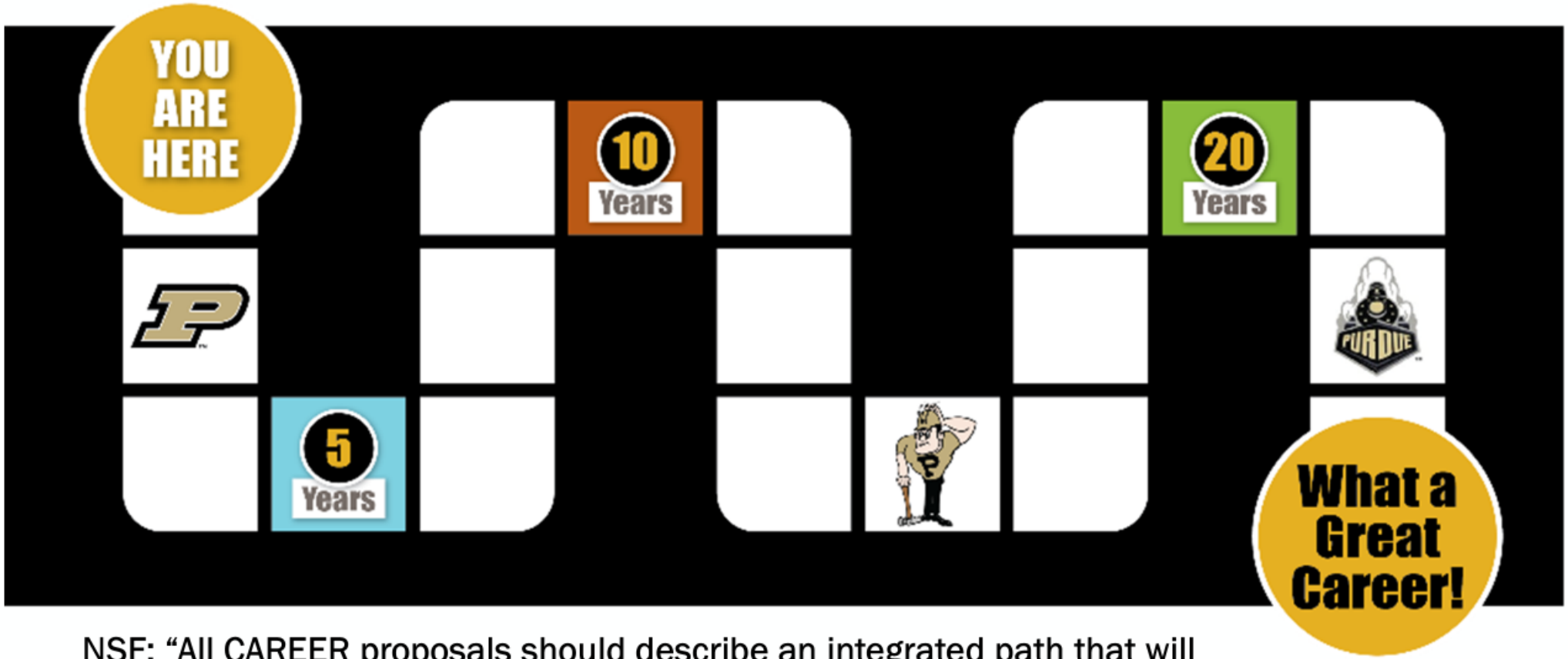
# *Vision: Career Pathway as Scholar and Educator*

## Career Path Not Project




NSF: "All CAREER proposals should describe an integrated path that will lead to a successful career as an outstanding researcher and educator."

# *Vision: Career Pathway as Scholar and Educator*

## What Makes a Good CAREER Proposal?

- More “path” than project
- Strategic fit with institution
- Clearly transformative research direction
- Creative and well-integrated education plan

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# *Long-term Career Goal?*

## The shiny object problem

- Become a recognized thought leader in my field?
- Be internationally known for my research?
- Be a billionaire entrepreneur from my research discoveries and products?
- Publish in top journals?

**What problem is this solving?**

Image Source: GreekBoston.com

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# *Long-term Career Goal?*


Source: Billion Dollar Code 2021 (English)

"Use software [to] erase borders between countries and nations" – Source: BDC Review: AIN

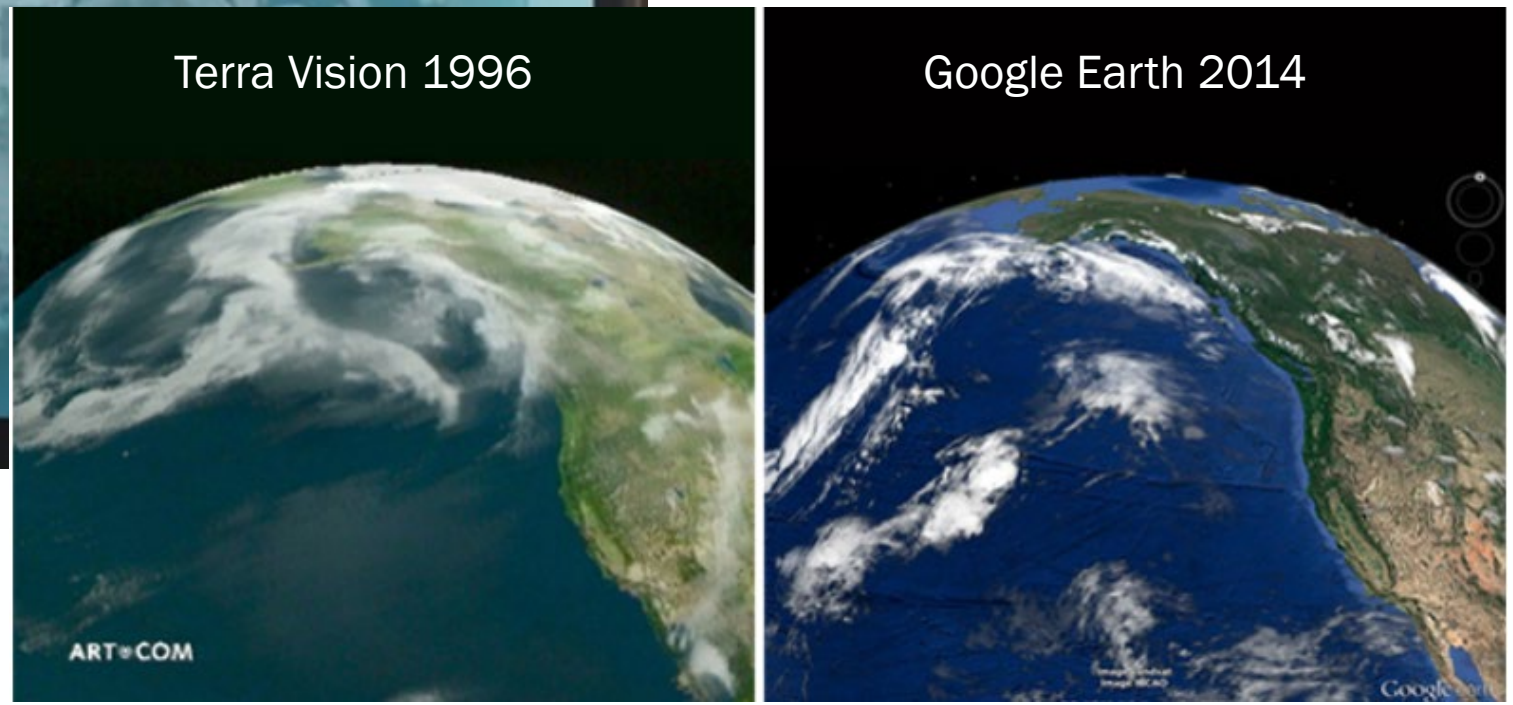


Image: Art + Com/Source: BDC Review: AIN

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# *Long-term Career Goal?*

## Careers are built on solving problems

- Careers emerge from questions
- Impact comes from persistence
- Recognition follows contribution

# *Long-term Career Goal?*

**Before**: My long-term career goal is to lead innovative research in renewable energy systems.

**Better**: My long-term career goal is to transform real-time control of decentralized energy systems while helping engineers understand system-level tradeoffs so renewable integration becomes more stable and scalable.

**DIRECTIONS**: Complete Section 1: Long-Term Career Goal - WORKSHEET

# *Identifying the Research Gap*

Finish this sentence: *A persistent problem in my field is…*

This matters because:

**DIRECTION:**

1. Share responses with the person next to you – take notes

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# *Identifying the Research Gap*

## A Need is Not the Same as a Problem

**I need new shoes!**

- **My shoes are worn out** → *functional problem* (they no longer do their job)
- **My feet hurt** → *comfort / physical problem*
- **My style feels dated** → *identity / image problem*
- **Everyone at work dresses sharper than me** → *status / belonging problem*
- **My sister took them and I literally have none** → *resource problem*

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# *Identifying the Research Gap*

**DIRECTION:** Complete Section 2: Identifying the Research Gap - WORKSHEET

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# *Transformative*

## Transformative, not incremental

- Needs to be solved now?
- Says who?
- Radical change in understanding
- Facts and figures of cost to country/industry/communities
- Industries/communities positively impacted by your work

# *Transformative*

## Why is this work essential?

"This research will have far-reaching effects, delivering new tools to tailor transformative mobility solutions to citizens' needs, decongest urban networks and expand mobility to… communities."

Amanda Stathopoulos CAREER 2019

Civil and Environmental Engineering

Northwestern University

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# *Institutional Fit*

INSPIRE!™

**INSPIRE Research Institute for Pre-College Engineering**


**Purdue unveils comprehensive AI strategy; trustees approve 'AI working competency' graduation requirement**


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# *Integration: Research & Education Plan Best Practices*

## What is the education gap area?

Finish this sentence: *A persistent problem in my field is…*

This matters because:

+

Learning barrier: A concept that is hard for my students to understand is….Or current education is constrained by…

# *Education Gap*

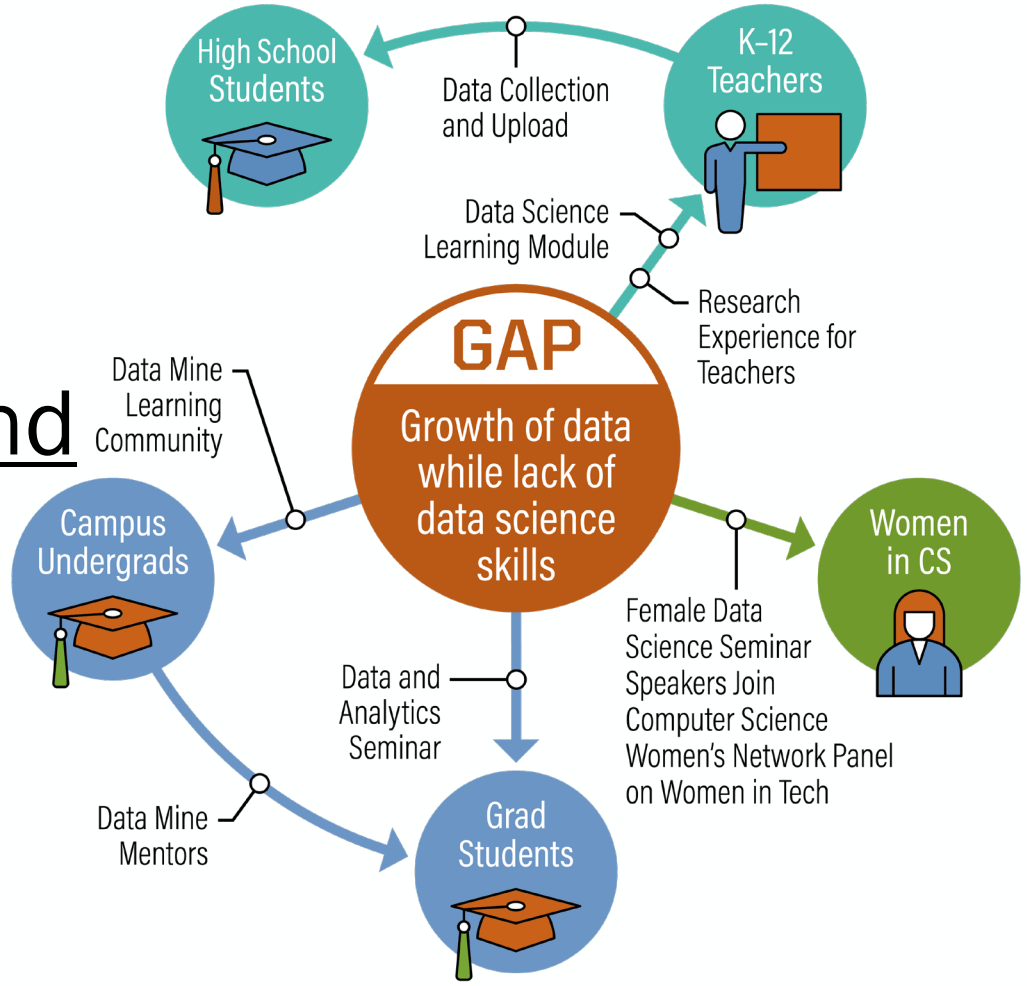
Key is to identify a gap area then build a strategy around addressing it

**Gap Area:** A key problem in current database education is the reliance on legacy hardware models, which no longer reflect how data systems are built or used today.

**Evidence:** This gap has been highlighted by the research community in (X conference proceedings, journal article, etc.).

# *Education Plan*

- Targets a documented gap
- Builds on your track record
- Does not “reinvent the wheel”
- Includes both long-standing and creative initiatives
- Will be sustainable
- Uses best practices
- Will be a reasonable workload

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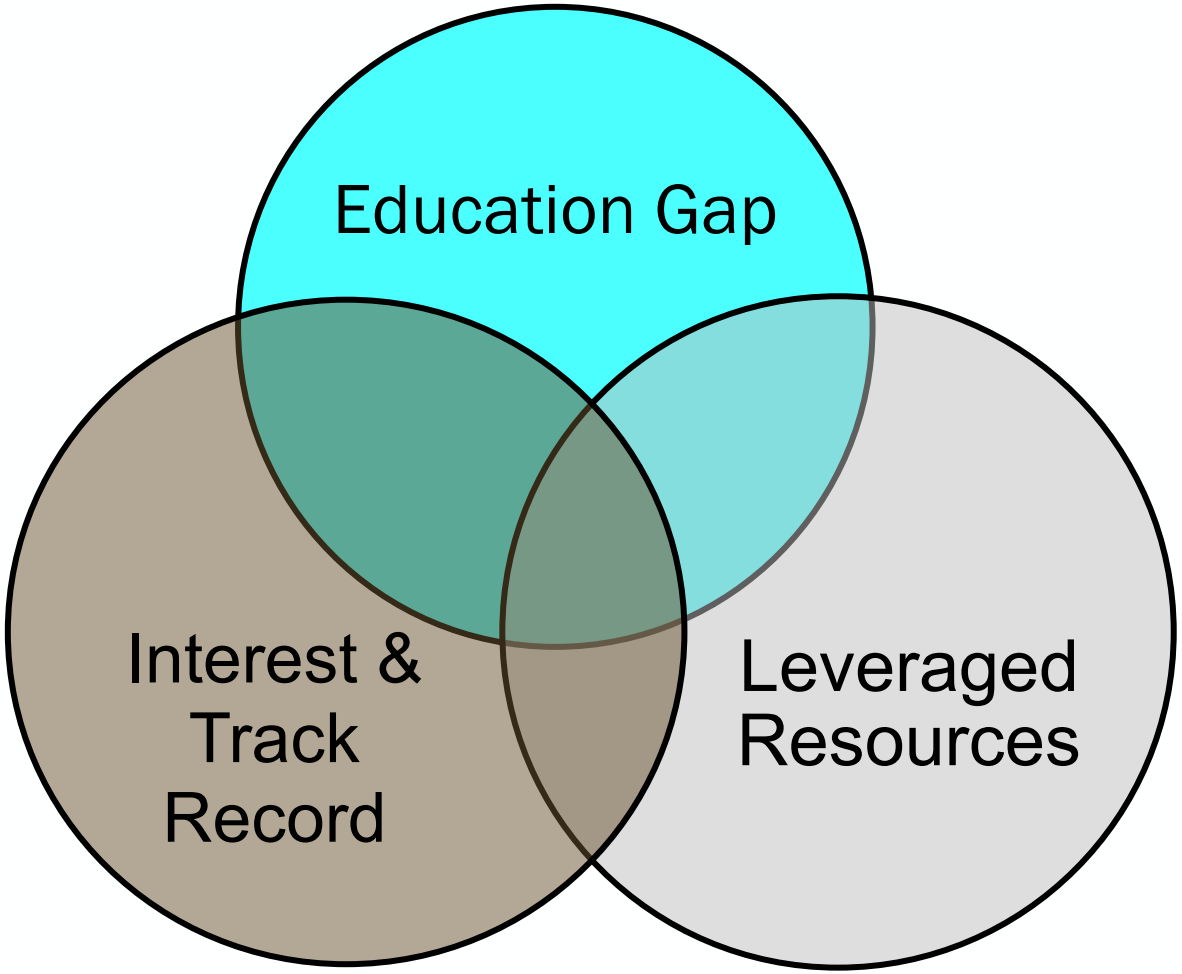
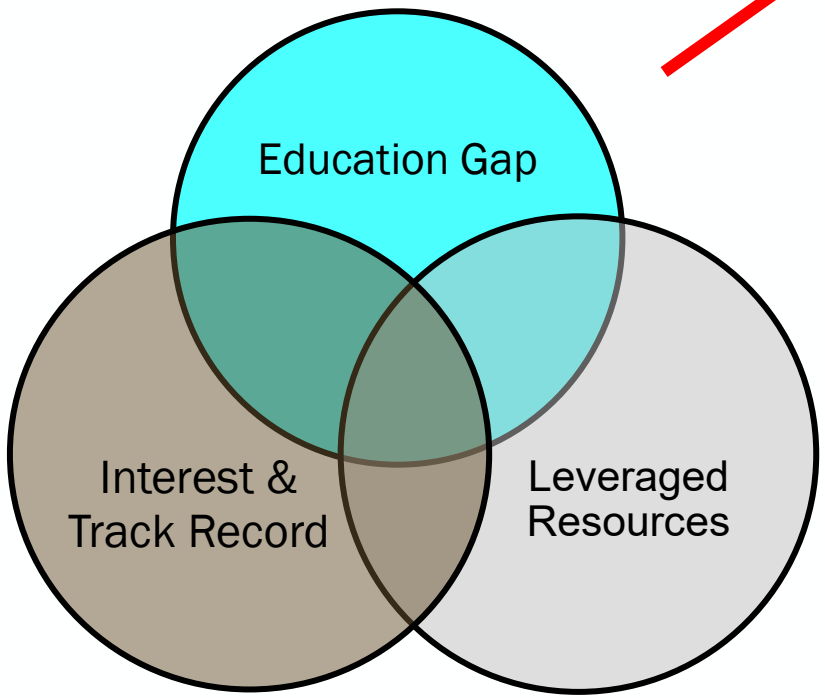
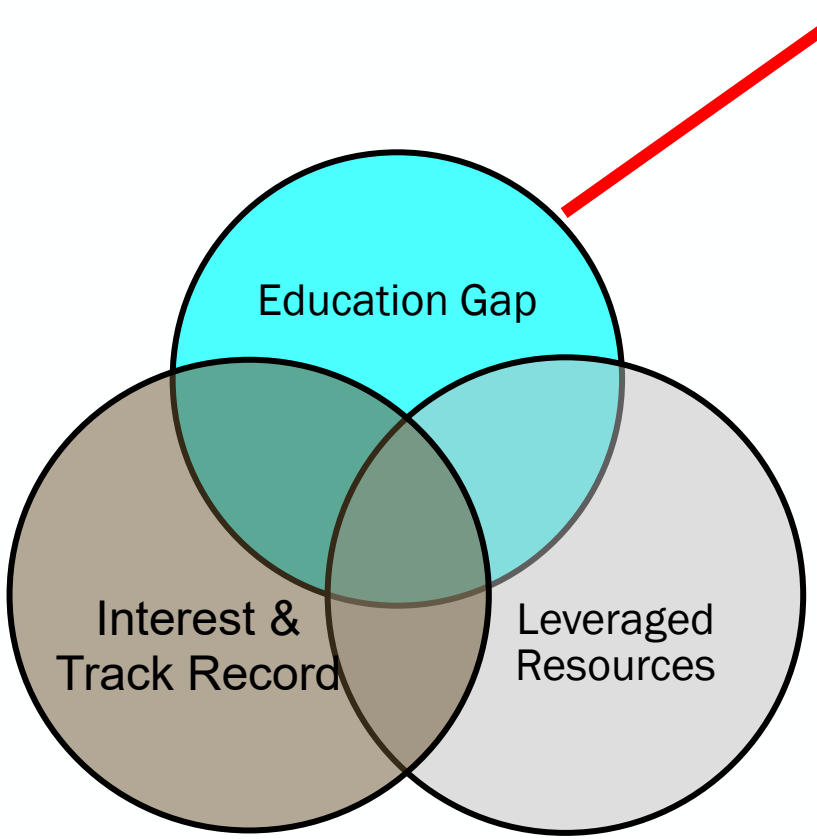
# *Example: Building an Education Plan around a Gap*






**Grad students learn “microethics” of responsible research conduct such as publishing norms but lack “macroethics” of ethical and cultural issues surrounding their work’s impacts on society.**

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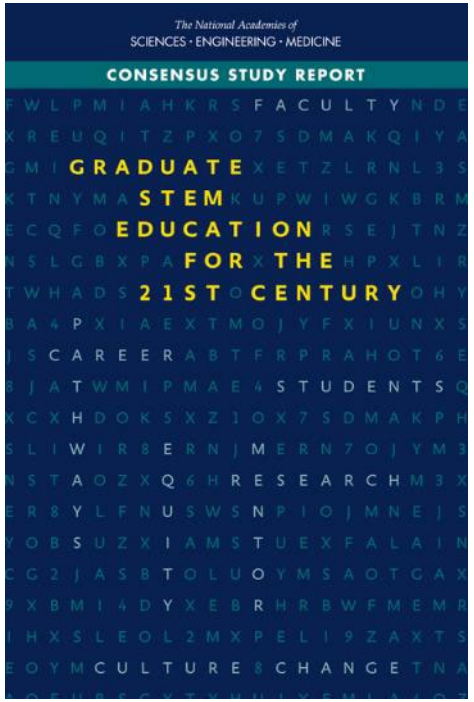
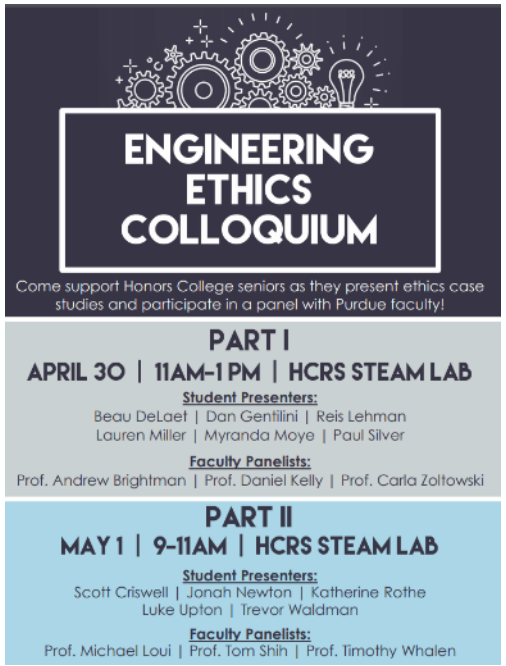
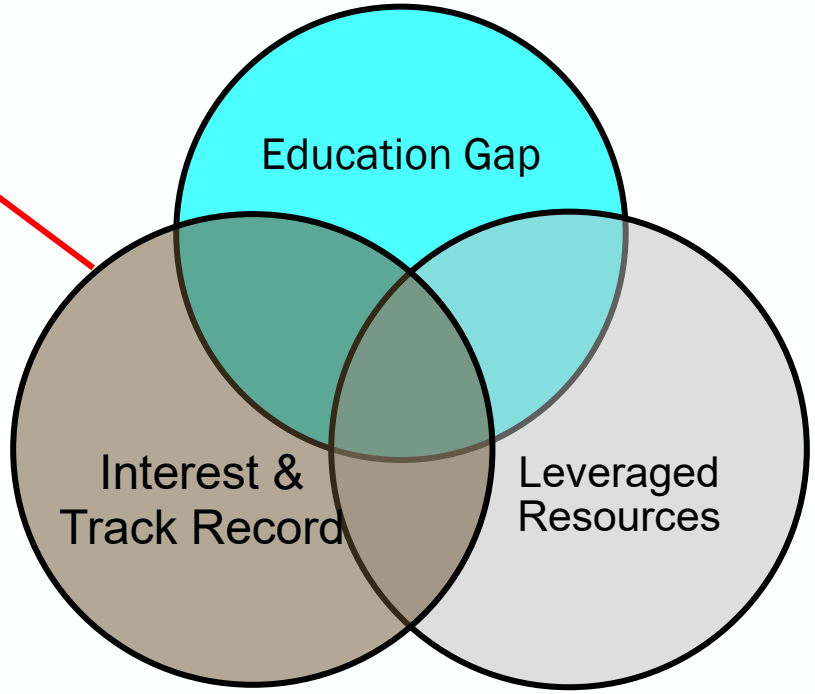


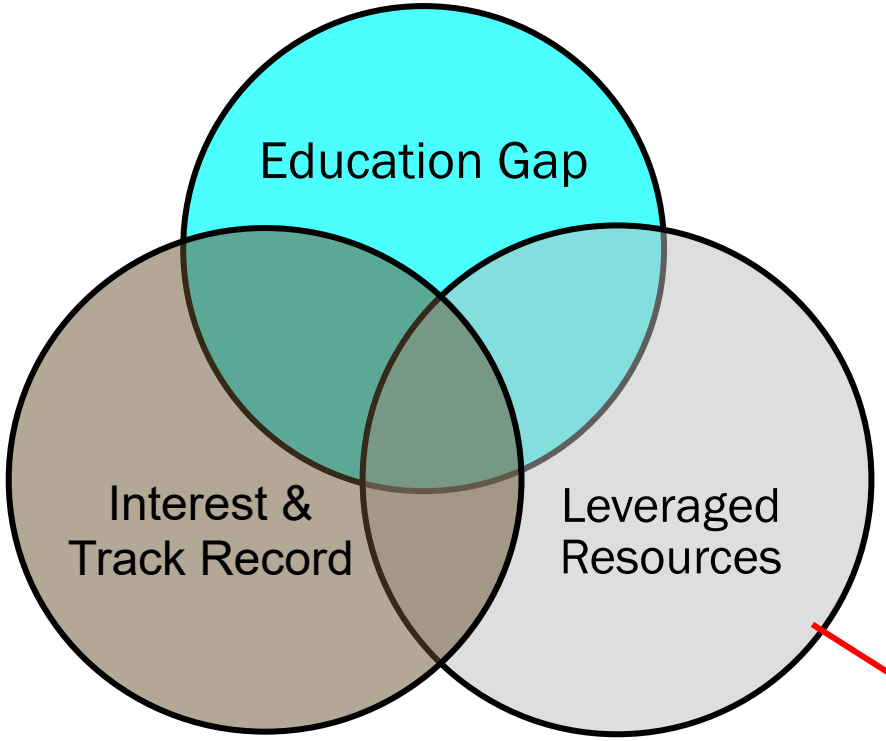

National Academies of Sciences, Engineering, and Medicine 2018. *Graduate STEM Education for the 21st Century.* Washington, DC: The National Academies Press.

**Previously collaborated (guest speaker) to incorporate societal implications and economic analysis into my undergrad engineering course.**

**Served as faculty panelist for Engineering Ethics Colloquium**



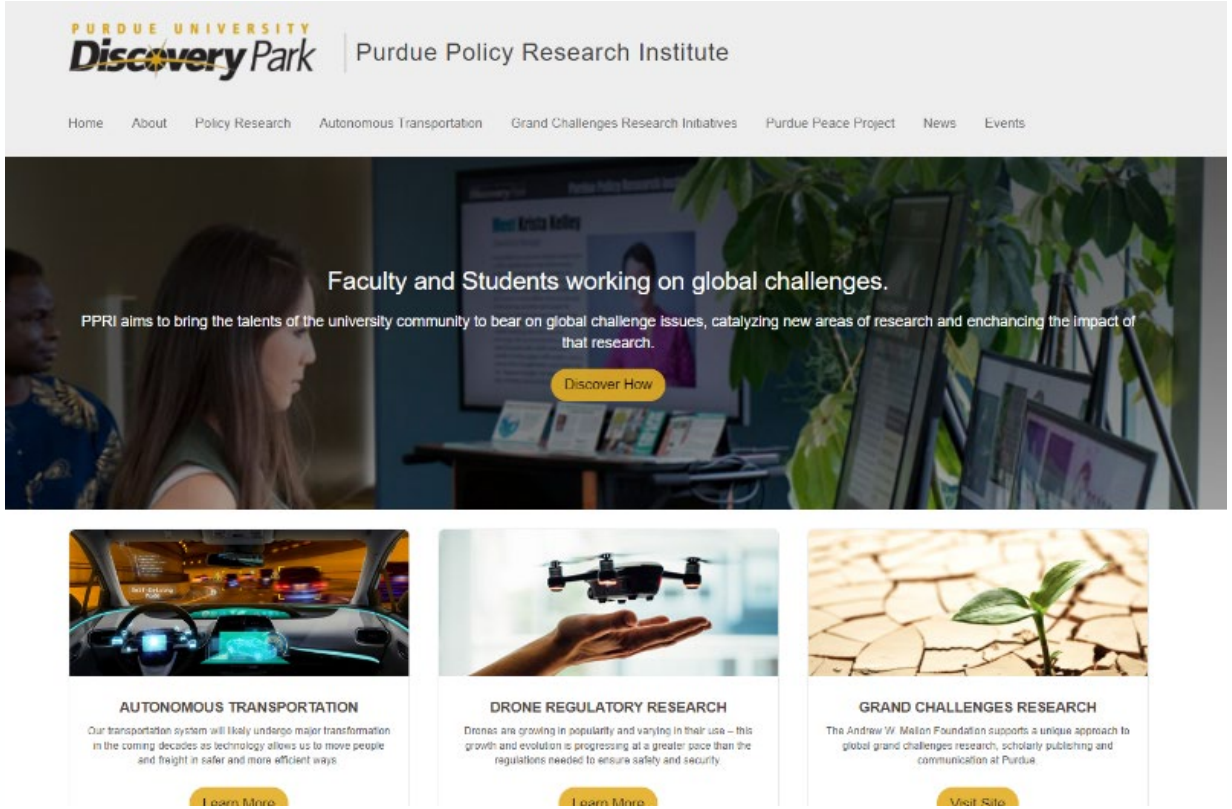



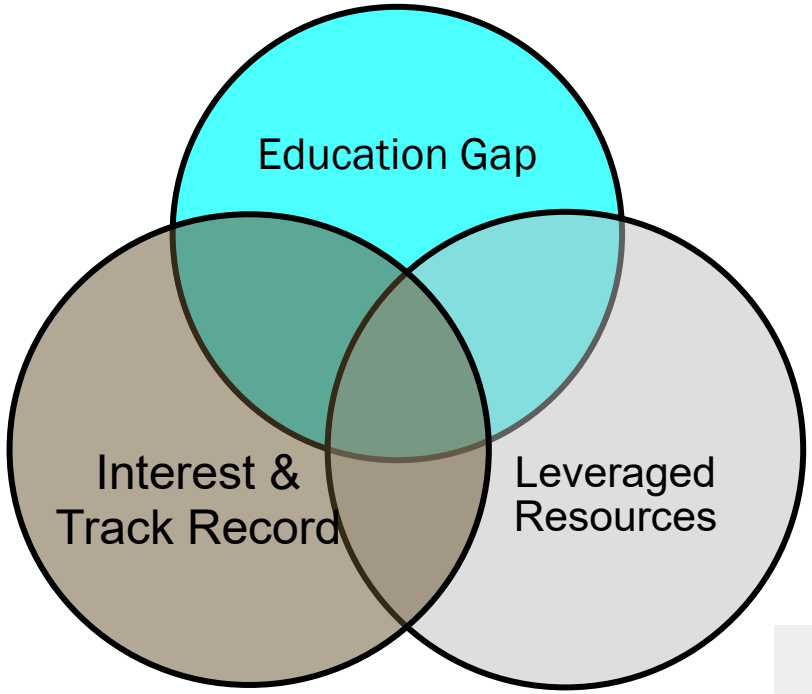



**Purdue Policy Lab undergraduate honors class on *Policy Alternatives for Grand Challenges***

- **Collaborate to develop case study**
- **Grad students help as part of professional development**

**Collaborate with PPRI (with grad students) to author policy brief**



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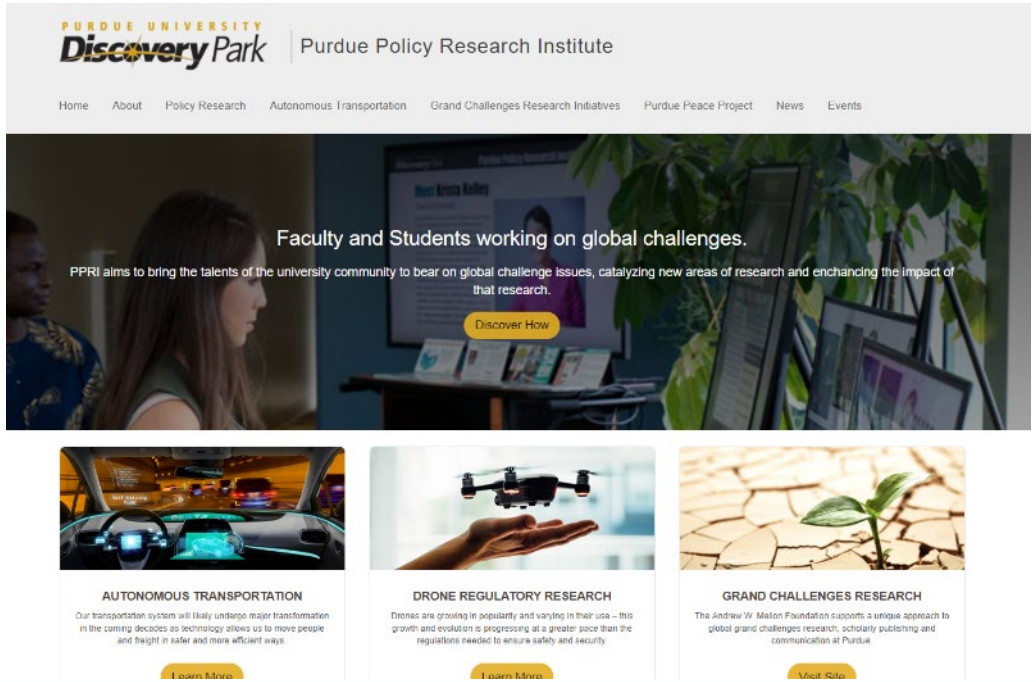
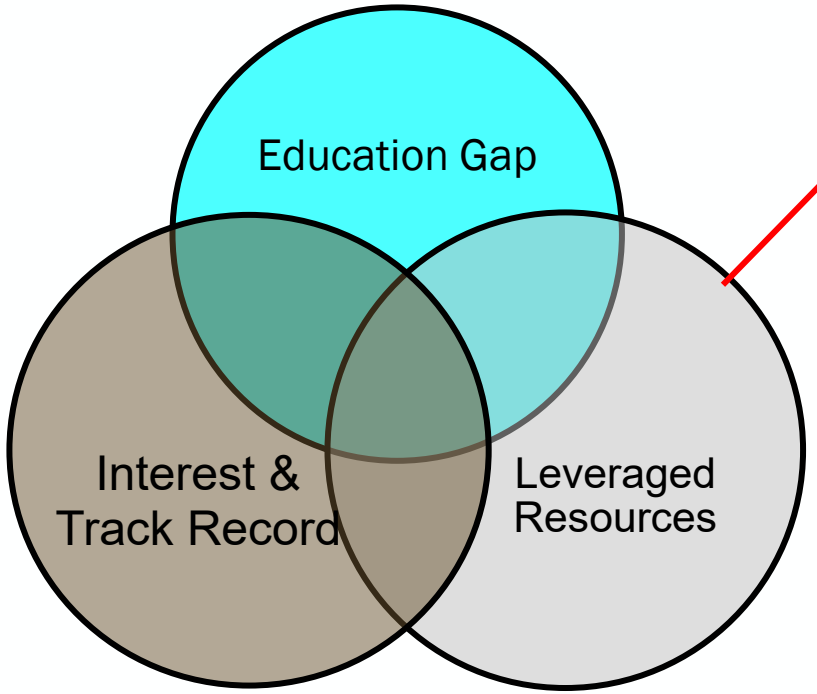
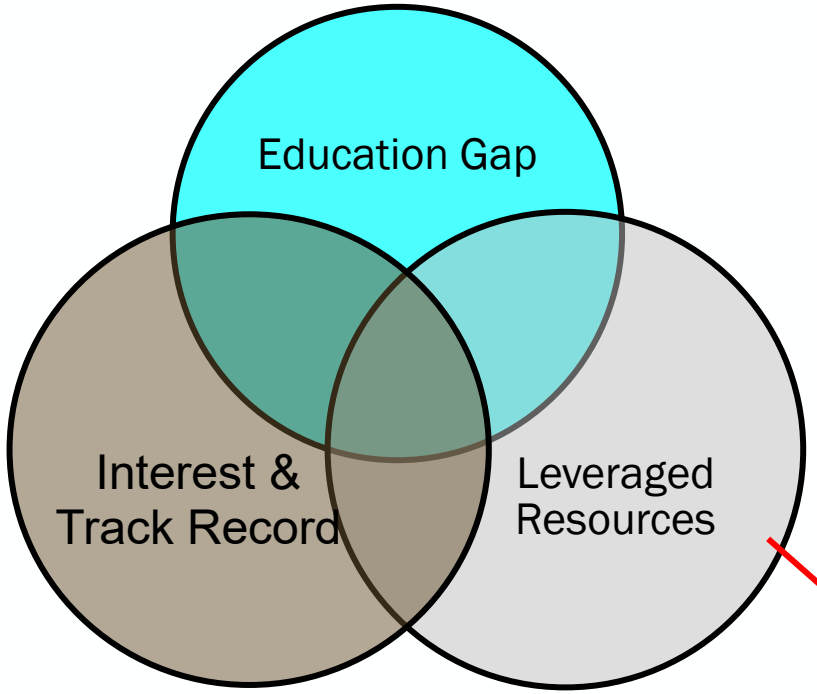




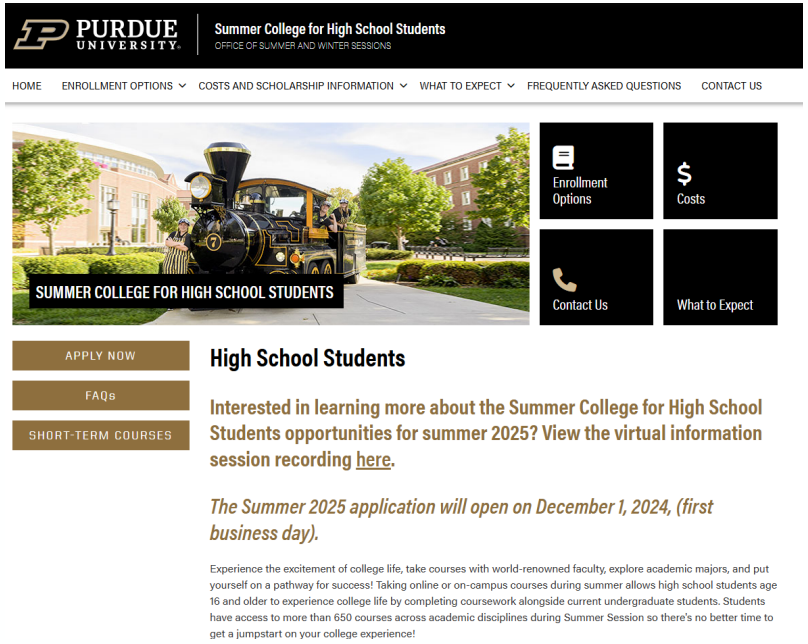

**Best-practice undergraduate research as Discovery Park provides:**

- **Cohort experience that includes professional development**
- **Recruitment**
- **Assessment**
- **Research poster and undergraduate research journal**

*Evidence for apprentice-style research experience with separate research groups that meet together as a cohort focused on learning about research.* National Academies of Sciences, Engineering, and Medicine. (2017), etc.




## Case study-based learning incorporated into course with Purdue Summer College for High School Students




It is suggested that to motivate learners to engage in STEM, apart from focusing on the scientific content and processes, its contributions to solving societal problems must also be emphasized (Belanger et al., 2017).

# *Education Gap*

**DIRECTION**: Complete Section 3: Education Gap (Conceptual, Not Activities):

Identify a learning or reasoning challenge related to your research gap. Focus on what learners struggle to understand, not on activities you might engage in.

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# *Broader Impacts vs. Education Plan*

Broader Impacts  Education Activities

If my research and education efforts succeed, what changes?

This work will change _____

by improving _____

for _____

# *Broader Impacts*

Education activities describe what you do.

Broader impacts describe what changes as a result of your research and education efforts.

| Education Activities | Broader Impacts |
| --- | --- |
| Mentoring students | Improved scientific reasoning |
| Hands-on learning | Better judgment under uncertainty |
| Workshops / mobile labs | Expanded access and preparedness |

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# *Broader Impacts*

## Grant Writer's Website:

- What are Broader Impacts?
- Steps to Develop an Education and Workforce Development Plan
- Example Broader Impact Statements (login required)
- Other Broader Impact Resources
- Request a Broader Impact Consultation

## What are Broader Impacts?

Broader impacts are the potential to benefit society and contribute to the achievement of specific, desirec societal outcomes. They may be accomplished through:

1. the research itself
2. activities directly related to research projects
3. activities supported by and complementary to the project

A broader impact **statement** describes benefits and outcomes—not logistics.


"Cords" of research, education and outreach, and diversity-related activities integrate through your project to deliver **broader impacts.** For instance:

- Fuller Participation of Women, Persons with Disabilities, and Underrepresented Minorities in STEM
- Improved STEM Education and Educator Development
- Increased Public Scientific Literacy
- Improved Well-Being of Individuals
- Development of a Diverse, Globally Competitive Workforce
- Increased Partnerships among Academia, Industry, Government, and Non-Profits
- Improved National Security
- Increased U.S. Economic Competitiveness
- Informed Public Policy
- Enhanced Research and Education Infrastructure

(Coming Soon!)

**Example Broader Impact Statements from Funded NSF Proposals**

**Steps to Develop an Education and Workforce Development Plan**

**Tips for Broadening Participation and Diversity, Equity, and Inclusion Plans**

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# *Education Plans: Beyond Business as Usual*

**Business as Usual**

- "I will integrate my research into my assigned courseload"
- Standard practice undergraduate instruction
- Broader impacts contained to the classroom

- One-time interactions with K-12 students
- Undergraduate research opportunities

- Material designed exclusively for lectures

**vs. that "*Je Ne Sais Quoi*"**

vs. co-developed/cross-listed/online courses with broader reach

vs. innovative teaching methods and modalities

vs. service-learning projects, partnerships with informal science and learning organizations, citizen science and public STEM literary that reaches beyond academia

vs. K-12 teacher workshops

vs. graduate students taking leadership role in mentoring undergraduate students

vs. "hands-on" experiential learning projects and entrepreneurship opportunities (tip: include NSF I-Corps!)

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# *Leveraging Institutional Resources*

## College of Science

### Kids STEM Degree Program

- 3–5-minute videos that allow K-12 students to earn various "degrees"
- Published on the "Superheroes of Science" YouTube channel (almost 65k subscribers, many of whom are K-12 teachers)

Contact: Bill Bayley, Director of Science K-12 Outreach
wbayley@purdue.edu

### STEM Career Repository

- Creates awareness for potential STEM careers
- Your graduate students can contribute!

### Hands-on lab experiences (HOPs)

- Faculty present to middle/high school students at school, students sign up based on interest

# *Leveraging Institutional Resources*

## College of Education

**Gifted Education Research & Resource Institute (GER$^2$I)**

- Offers enrichment programs for youth, professional development for educators, graduate programming for future leaders
- Conducts innovative research in fields related to development of human potential
- Native American Research Initiative focuses on gifted & talented students among the Native American/Indigenous populations
- Project HOPE+ provides scholarships to Native American students to attend summer programs

**Contact:** Nielsen Pereira, Executive Director, npereira@purdue.edu

# *Leveraging Institutional Resources*

## Summer College for High School Students

**Residential Summer College**

- Propose short, one to two- week courses
- Existing mechanism for recruitment
- Graduate students can be involved in teaching

**Contact:** Pamela Dexter, Assistant Director of Summer Pre-College Pathways, pdexter@purdue.edu

# *Leveraging Institutional Resources*

## Office of Undergraduate Research (OUR)

### Summer Research Program

- Undergrads engage with research projects across various disciplines and are provided stipends

Contact:

Amy Childress, Director of Purdue OUR, childres@purdue.edu

JJ Sadler, Associate Director of Student-Focused Programming, jjsadler@purdue.edu

### Undergraduate Research Roundtable

- Research mentors can register for a booth at this fall/spring event to engage undergraduate mentees

### Undergraduate Research Conference

- Students present posters and attend research seminars and presentations

# *Leveraging Institutional Resources*

## Office of Undergraduate Research (OUR)

### Undergraduate Research Mentor Consultations and Training

- Consultations on various UR topics (as mentors) available upon request
- "Mentormaking" training (Purdue's adaption of the *Entering Mentoring* seminar) available synchronously or asynchronously, self-study or in a group

**Tip: Subscribe to the OUR Newsletter.**


# *Leveraging Institutional Resources*

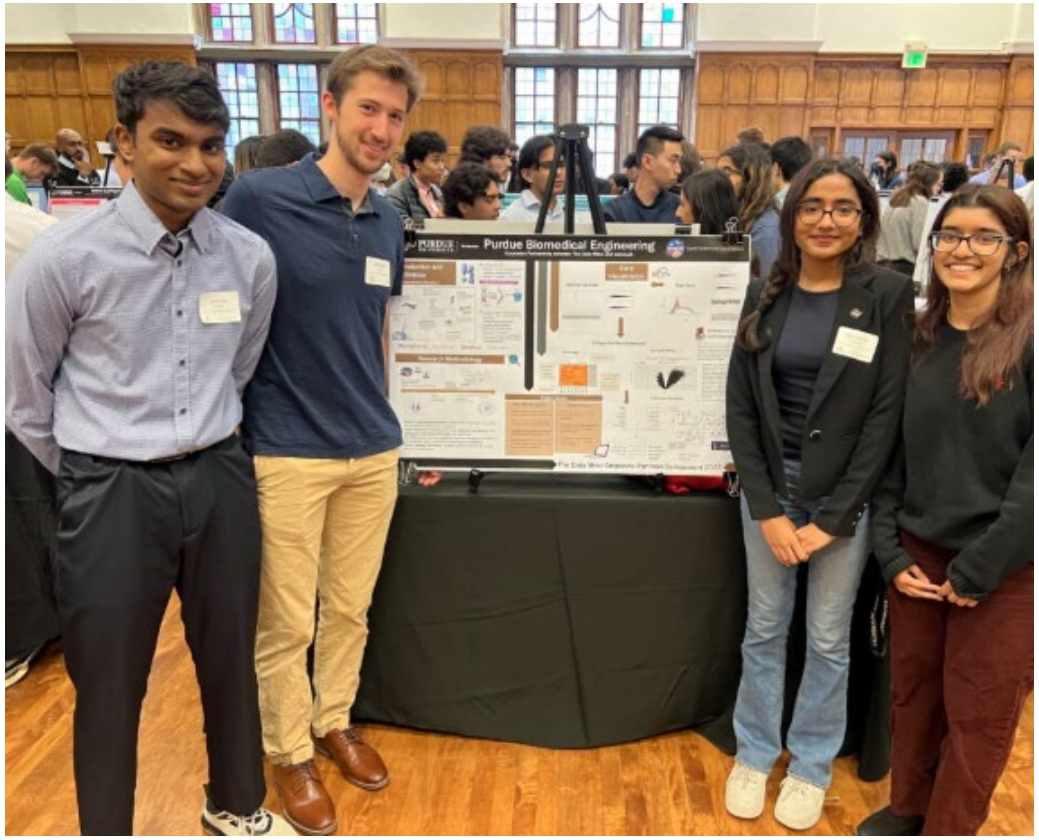
## The Data Mine

**An Interdisciplinary Living-Learning Community centered around Data Science**

- Open to all colleges, programs, and majors
- Over 60 corporate partnerships
- Students gain access to data science tools, software, and training
- Faculty mentor students, lead research projects
    - Projects can be co-designed with industry partners

Contact: datamine@purdue.edu

or Executive Director, Prof. Mark Ward: mdw@purdue.edu



# *Leveraging Institutional Resources*

## RCAC Cyberinfrastructure eXPerience (CI-XP) Student Programming

### Envision Center

- AR/XR/VR research concepts

### High Performance Computing

- Everything else that is research computing and HPC-related

Contact: rcac-help@purdue.edu for 1:1 consultation on RCAC programming

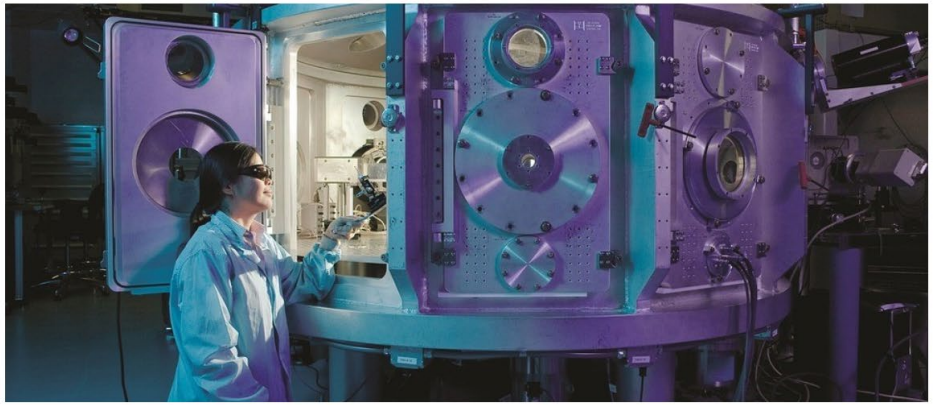
CI-XP STUDENT PROGRAM

# *Leveraging Institutional Resources*

## Discovery Park

### Discovery Undergraduate Interdisciplinary Research Internship (DUIRI)

- Promotes interdisciplinary research among Purdue undergraduates
- Faculty may propose projects that combine two or more disciplinary strengths
  - Fall, Spring, and Summer cycles
  - Once approved, students apply and faculty select candidates
- Provides structured educational components such as learning contracts, poster presentations, and publication through Purdue e-Pubs
- Contact: duiri@purdue.edu



# *Leveraging Institutional Resources*

## Discovery Park

### Purdue Policy Research Institute

- Convenes researchers and policy influencers for data-driven policymaking and assessment
- Three strategic areas of focus:
  - Defense, Security, Space
  - Health, Wellbeing, Future of Work
  - Sustainability, Development, Peacebuilding
- Project-based, ad-hoc and programmatic internship and fellowship opportunities for undergrads and grads

**Contact:** Stacey Connaughton, Director, sconnaug@purdue.edu

# *Leveraging Institutional Resources*

## College of Engineering

### Engineering Projects in Community Service (EPICS)

- Purdue-founded in 1995, has since expanded to numerous universities and programs
- Service-learning design program that pairs undergraduate students with community organizations to complete projects that fall into four broad areas:
  - Human services
  - Access and abilities
  - Education and outreach
  - Environment
- Faculty may already have a community partner or seek new connections
- Faculty and students span all disciplines (not restricted to College of Engineering)
- Contact: Assistant Director Jorge Martinez, martinezj@purdue.edu

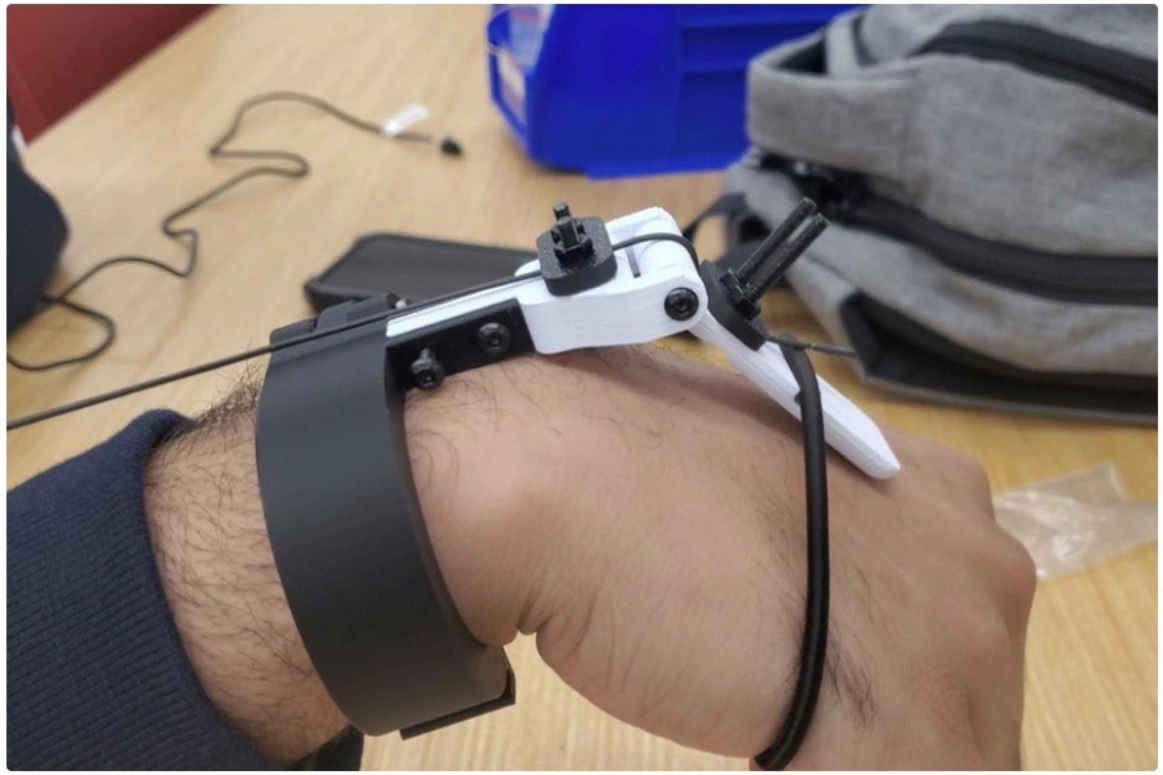

# *Leveraging Institutional Resources*

## College of Engineering

### Vertically Integrated Projects (VIP)

- Long-term, high investment program that integrates undergraduates across all four years of study with faculty and graduate student mentors
- Projects address real-world research and design challenges and span multiple semesters
- Layered mentorship model: faculty and grads guide teams; more experienced undergrads mentor newcomers
- To become a faculty mentor, complete intake form on the website and send to Cyndi Lynch or Carla Zoltowski

**Contacts:** Cyndi Lynch, Senior Program Manager, clynch@purdue.edu or Carla Zoltowski, VIP Director, cbz@purdue.edu



*Taran Kamireddy's VIP team works to create an effective and objective test for post-stroke mobility through fingers and wrists.*

# *Always remember…*

- Plan ahead: seek relationships, not transactions
- Begin at the department and college-level
- Favor a few, meaningful activities over many, less meaningful activities
- Include a plan to broadly recruit participants
- Include a plan to evaluate impact/success of educational initiatives

# *Evaluation on Campus*

## Evaluation and Learning Research Center (ELRC)

Housed in College of Education; Director Willie Burgess

- Conducts original research on learning and educational best practices
- Can function as independent project evaluation
- Expertise in:
  - Logic models and strategic planning
  - Theoretical frameworks
  - Theories of change
  - Qualitative/Quantitative evaluation and research methods
  - Facilitation, group reflection, organizational learning about evaluation and adaptive management

**Tip:** Reach out early and schedule an informal conversation to discuss project evaluation needs- the ELRC seeks to fit YOUR budget through customizable offerings

Contact: 765-464-4555 or learningcenter@purdue.edu

# *Engaging with a Program Officer*

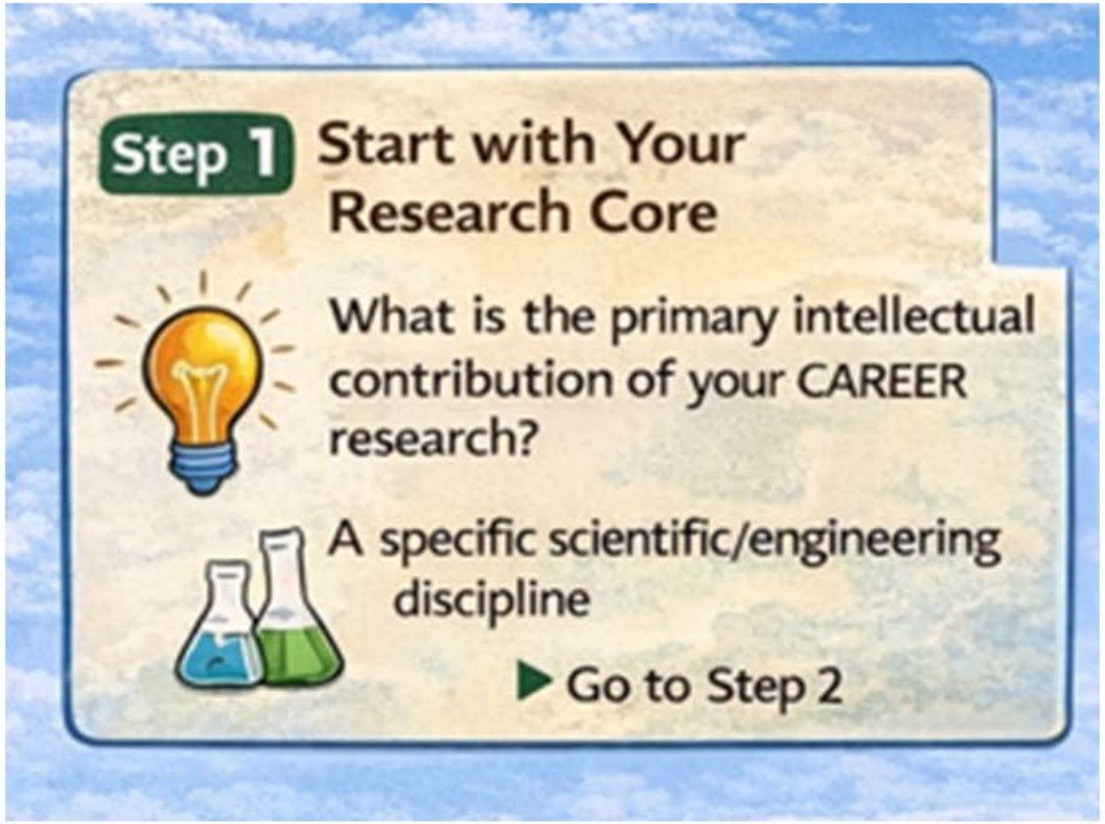
## Concept Paper and Communication

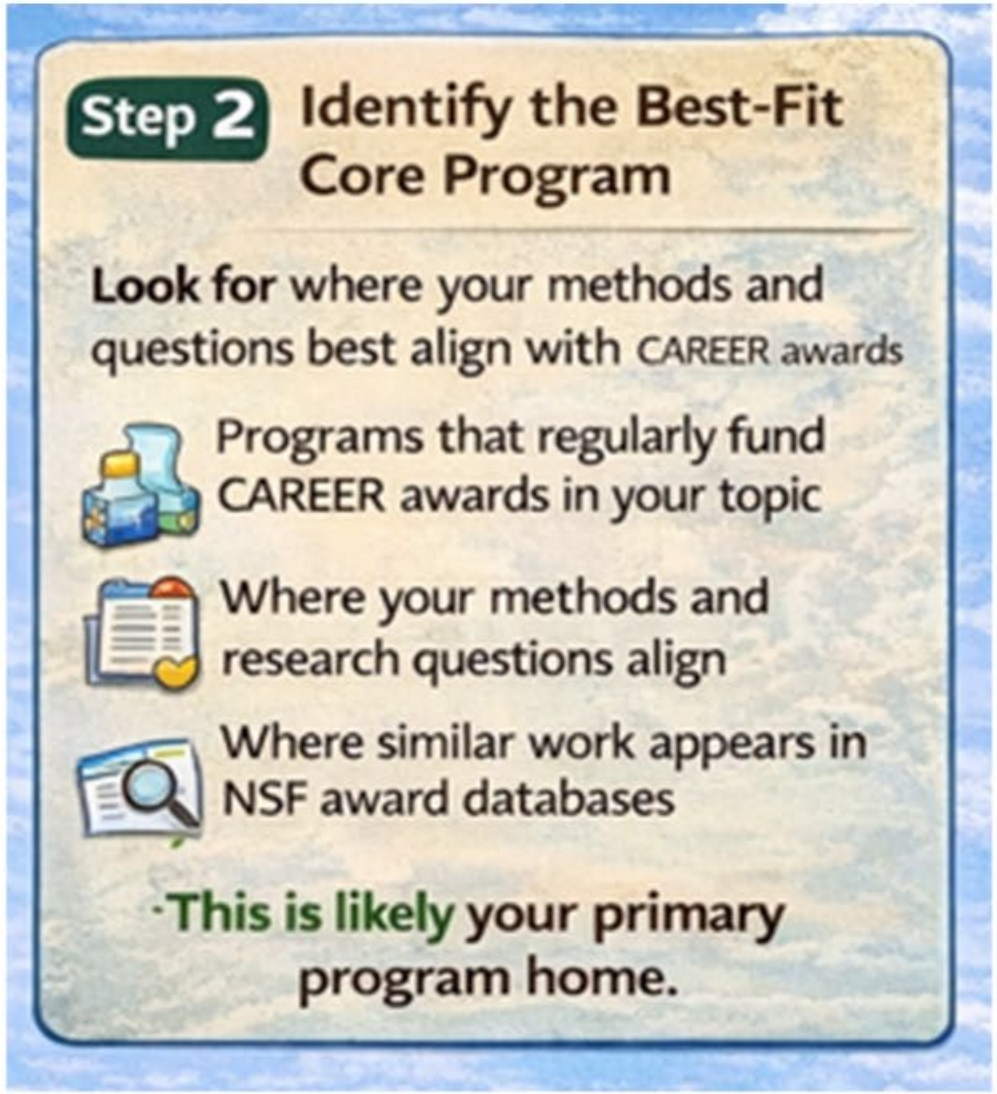
Storyline is Basis for PO Discussion

https://www.purdue.edu/research/funding-and-grant-writing/grant-writing-support.php

# *Where does my work fit?*

How to navigate program fit and interdisciplinary work

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# *Where does my work fit?*

How to navigate program fit and interdisciplinary work

## Step 3 Work Spans Multiple Fields?

- Does one field clearly anchor the research methods or theory?
- Is one community more likely to evaluate my work fairly?

## Step 4 Contact Program Officers (POs)


Send a brief project summary to

- Your primary candidate's PO

- Secondary candidate's PO if needed

**Ask:**

- Will my project align with your priorities?

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# *Where does my work fit?*

How to navigate program fit and interdisciplinary work

## Step 5 Decide on Submission Strategy

**Clear disciplinary fit**

Submit to that core program

Strong interdisciplinary overlap

Request co-review

Unsure after PO feedback

Follow PO guidance

## COMMON MISTAKES TO AVOID

- ✗ Guessing without talking to POs
- ✗ Write two different versions
- ✗ Being vague to 'hedge'
- ✗ Assuming interdisciplinary = automatic advantage

**KEY TAKEAWAY**

If you have **two possible directorates**, talk to **both program officers**, ask about **fit** and **co-review,** and **choose one clear primary audience** for your proposal.

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# *Concept Paper*

## WORKSHOP PACKET
## ACTIVITY 2

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# *Contacting Your Program Officer*

Don't make a cold call

- ✓ Identify your program officer(s): CAREER Contacts by Directorate
- ✓ Contact Primary PO via email to request Teams/Zoom or phone conversation

**Include in your email**:

- ✓ One-page concept paper
- ✓ NSF-compliant biographical sketch

**NOTE: IN YOUR MEETING, LISTEN MORE THAN TALK**

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# *Questions to Ask Program Officer*

## When? No later than mid-May

1. Does my research goal fit well with your program?

2. Is this the right scope? Do I need more preliminary data?

3. What is the typical award size?

4. Is review ad hoc or panel? (see NSF review process: **animation)**

5. What is the preference for RET/REUs?

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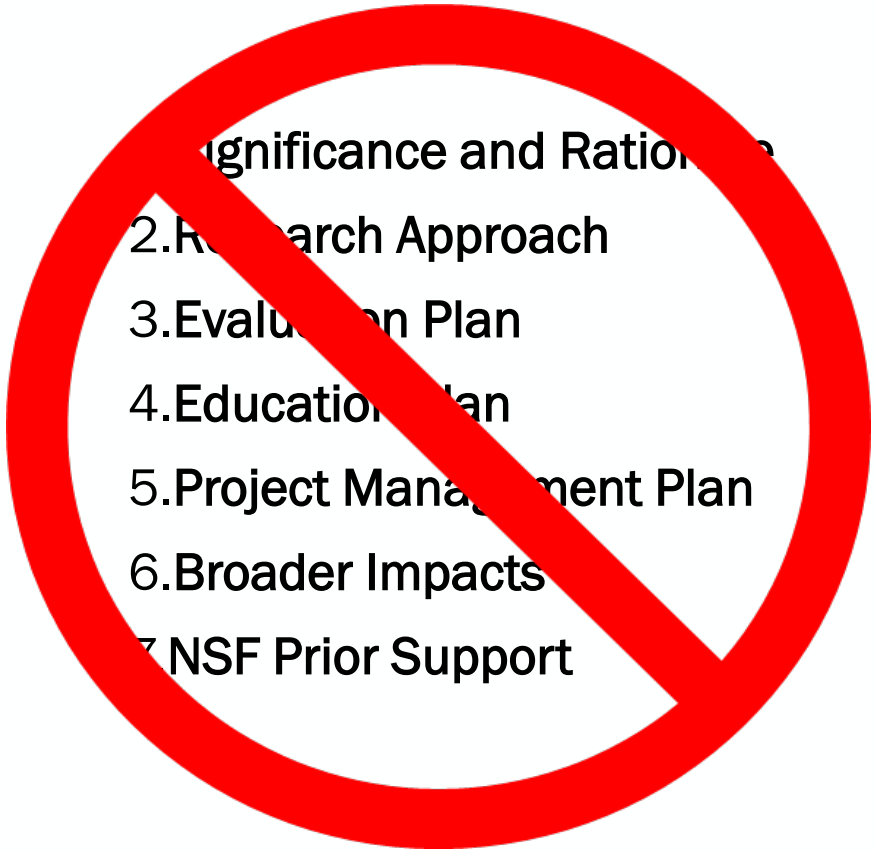
# *Putting It Together*

## Outlines and Templates: Planning Vs. "Pantsing"

# *Be Responsive To Program Requirements*

## Map CAREER Requirements to an Outline, Not a Table of Contents



# *Always Outline Before Writing*

**Possible Outline for CAREER Project Description 2026**

- Use "I" instead of "we" or "our" because this is about YOUR five-year career path. (However, the one-page summary is required to be in the third person.)
- 15 pages maximum for project narrative
- No URLs allowed except in the references. No et al. in references.
- Avoid passive voice whenever possible
- Include quality graphics. Do not just label: Use the caption to walk the reviewers through the visual and/or provide the takeaway point.

**1. Significance and Rationale (~1 page)**

- Provide a compelling storyline that excites your reviewers. Use the logic flow of:
  - What is the problem?
  - What has been done already to address this problem?
  - What is the gap that remains?
  - How do you propose to address this gap?
- State your vision for how this will launch you into novel contributions in your career
  - Do not propose incremental advances
- Include both research and education goals
- Include a summary sentence on the impact of your project's success

**2. Broader Impacts (at least ½ page)**

- **Suggest you put this section early on instead of the end**. Reviewers read more carefully at the outset, and this BI text builds a case for the significance of your proposed work. You want them to read it as a lens for the rest of your proposal.
- State how your project will benefit society through both research and educational efforts. Can include translational potential.
- Refer to Broader Impacts resources on the grant writing website at: https://www.purdue.edu/research/oevprp/funding-and-grant-writing/grant-writing-support/broader-impacts.php for BI ideas

**3. Approach**

- Provide a short paragraph overview of your research plan approach as a section roadmap

**3.1 Background**

- Not a literature review. Cite key references strategically, particularly in light of "What has been done already to address this problem?"

**3.2 Preliminary Data**

- Three options for where to describe preliminary data: embedded within the background section, a separate subsection such as this 3.2 (most common), or per objective.

**3. 3 Research Objectives**

- Include 2-4 sentences providing a roadmap for objectives and how they integrate.
  - If you have any collaborators, clearly explain their roles
  - If you will need special equipment or instruments, include text on how you will acquire these resources or gain access to existing ones, e.g., national labs

*[Objective /Phase Title for each obj/phase]*

- Technical gap or research questions addressed
- Methods and procedures
  - Point out innovation
- Potential problems and alternative solutions (e.g., risk mitigation)
- Expected outcomes
  - State significance

*[Objective /Phase Title for each obj/phase]*

- Technical gap or research questions addressed
- Methods and procedures
  - Point out innovation
- Potential problems and alternative solutions (e.g., risk mitigation)
- Expected outcomes
  - State significance

*Evaluation Plan*

- If appropriate for your research, consider an evaluation section that describes the metrics/benchmarks/criteria for success and evaluation methodology

**4. Integration of Education and Research [~ 2 pages long]**

- State the education problem/gap you are addressing and how this motivates your plan
- Include an education goal (see section 1)
- Provide an overview of your suite of educational activities and make it clear how it will integrate with the research component
  - Note: Make sure you have budgeted for your activities
  - Include student/participant recruitment mechanisms for broad participation

*[Education Activity Title per Activity]*

- Be creative. If you have existing or basic educational initiatives, show how you are expanding in new ways
- Include a description of your preliminary work in the educational arena. Have you already revised or created a new course? Have you led a workshop for undergraduates or high school students? Include text regarding your experience and motivation.
- Cite key educational documents as rationale for why these activities are a best practice.
  - Leverage institutional resources and expertise. Do not reinvent the wheel.

*Education Plan Evaluation*

- Include a clear assessment plan/evaluation mechanism either per activity or in a distinct subsection.

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# *Always Outline Before Writing Cont'd*

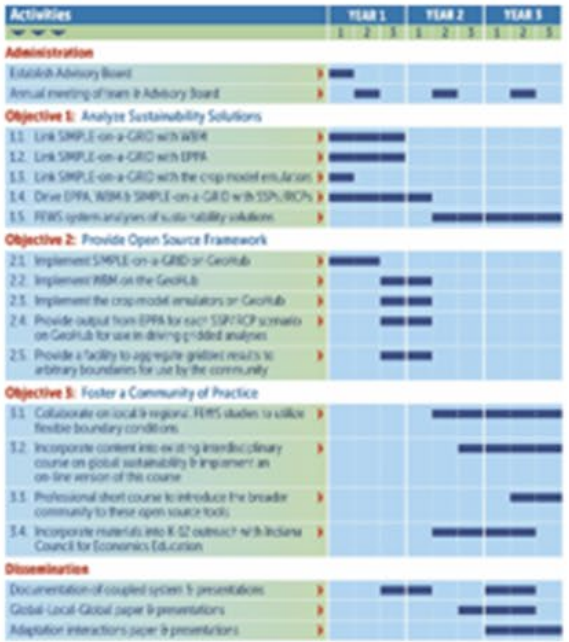
**5. Prior NSF Support**

- If you have received NSF funding (as PI, co-PI, senior personnel) in the past five years, you must report on one award most relevant to this CAREER proposal.
- Use the prescribed format given in the NSF Grant Proposal Guide, especially regarding separate subheadings of *intellectual merit* and *broader impacts* and referencing resulting products/publications from this previous award. Here is an example:

*NEES Operations* (0927178; $81,761,788; 10/2009-9/2014). PI: J. Ramirez. Purdue University will lead, manage, operate, and maintain George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES) with 14 earthquake engineering and tsunami experimental facilities locally operated by universities across the U.S. and NEEShub cyber platform for collaboration, NEEShub. ***Intellectual merit***: NEES Community and Communication Center's four-year tenure as headquarters for NEES Operations has facilitated an unprecedented cultural change in how research is performed in earthquake engineering in a new outside-the-university collaboration model using improved data sharing capabilities and tool co-location at NEEShub. Serves as both as an intellectual and practical model for all disaster-related fields that involve distributed sites. ***Broader impacts***: NEEShub provides broader access to experimental data, extensive simulation resources, and research-grade inquiry tools and streamlined data sharing capabilities. NEEShub now has 5700 registered users, thousands of data downloads from the Project Warehouse per quarter, and more than 55,000 contributors from over 182 nations. Example publications, products, tools from this effort: NEEShub platform for cyber collaboration; Buckle and Ramirez, 2010, Ramirez, 2010; and Browning et al, 2013.

**6. Project Management**

- Include a timeline of activities (research and education)
- If appropriate, consider using an advisory board
  - Provide feedback on your progress and offer risk mitigation input
  - Must have letters of commitment from any named board members
- Consider using a Gantt chart, e.g., this style:




**7. Dissemination**

- For both research and education results

**8. Career Development and Success Factors (optional)**

- Could include a five-year overview of your career development and deliverables
- Briefly state where you see your teaching, research, and service in 5, 10, and 20 years
- Make a summary statement about how well-positioned you are to build on a record of success as a researcher and educator, align with institutional strategic plans, and leverage significant institutional resources
- Build a case for why you are an outstanding researcher/educator who will use this

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# *Proposal Preparation Timeline*

## Start Early and Thank Yourself Later

# Proposal Preparation Timeline

## Map to Key Milestones

**CAREER 2025 Proposal Preparation Timeline (Due July 22)** * Red denotes should do this before writing any proposal text

| By: | Mon 2/9 | Mon 2/23 | Mon 3/9 | April | | | | May | | | Mon 6/8 | Mon 6/22 | Mon 7/6 | Mon 7/13 | Mon 7/20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Analysis and Planning** | | | | | | | | | | | | | | | |
| Read abstracts of funded CAREERS for directorate fit and identify appropriate program/PO | | | | | | | | | | | | | | | |
| Notify Pre-Award Center for assigned specialist | | | | | | | | | | | | | | | |
| Storyline Development<br>• What is the problem?<br>• What has been done already to address this problem?<br>• What is the gap that still remains?<br>• How do you propose to address this gap? | | | | | | | | | | | | | | | |
| Map out long-term pathway and vision | | | | | | | | | | | | | | | |
| Research and education goals | | | | | | | | | | | | | | | |
| Identify win themes/discriminators | | | | | | | | | | | | | | | |
| **Program Officer Input** | | | | | | | | | | | | | | | |
| Draft concept paper for PO | | | | | | | | | | | | | | | |
| Concept paper reviewed internally | | | | | | | | | | | | | | | |
| Revise concept paper | | | | | | | | | | | | | | | |
| Email one-pager to PO/ request appt | | | | | | | | | | | | | | | |
| Revise storyline based on PO feedback | | | | | | | | | | | | | | | |
| **Proposed Outline** | | | | | | | | | | | | | | | |
| Develop detailed outline | | | | | | | | | | | | | | | |
| Identify graphics needed | | | | | | | | | | | | | | | |
| **Partnerships** | | | | | | | | | | | | | | | |
| Recruit any collaborators, if needed | | | | | | | | | | | | | | | |
| Recruit advisory board members, if needed | | | | | | | | | | | | | | | |
| Identify assessment partner, if needed | | | | | | | | | | | | | | | |
| Collect letters of commitment (TEMPLATE) | | | | | | | | | | | | | | | |
| Request dept head letter and provide bullet points | | | | | | | | | | | | | | | |
| **Proposal Writing and Editing** | | | | | | | | | | | | | | | |
| Develop NSF bio on SciENcv to reflect research & education | | | | | | | | | | | | | | | |
| Use outline to write sections | | | | | | | | | | | | | | | |
| Edit | | | | | | | | | | | | | | | |
| Give near final draft to internal reviewers | | | | | | | | | | | | | | | |
| Revise based on review | | | | | | | | | | | | | | | |
| Write data management plan | | | | | | | | | | | | | | | |
| Complete Collaborators and Other Affiliations | | | | | | | | | | | | | | | |
| Write mentoring plan | | | | | | | | | | | | | | | |
| Write budget justification | | | | | | | | | | | | | | | |
| Write facilities document (use epubs) | | | | | | | | | | | | | | | |
| Write one-page summary | | | | | | | | | | | | | | | |
| Final check of references | | | | | | | | | | | | | | | |
| Final budget/draft narrative to PreAward | | | | | | | | | | | | | | | |
| Submit all final supplementary documents to PreAward | | | | | | | | | | | | | | | |
| Submit project narrative to PreAward | | | | | | | | | | | | | | | |

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# *Required Departmental Letter*

## Key Considerations for a Strong Letter

**Purpose:** To affirm departmental support for the PI's career development and commitment to integrating research and education under the CAREER award.

**The two-page letter should describe:**

- ✓ Eligibility
- ✓ Departmental Commitment
- ✓ Career Fit & Mentoring

**Important Considerations:**

- ✓ **Be specific**: Provide a rough draft with specific examples! DON'T just send a write-up about your project, or you'll get a vague letter.
- ✓ **Be collaborative:** Schedule a meeting with the department head to talk through career fit, mentoring strategies, etc.
- ✓ **Use strong language**: Use language that endorses, is confident, and forward-looking
- ✓ **Think like a reviewer:** Make sure the letter clearly answers the question, "*Why is this PI and this project a strong long-term investment for NSF?*

# *Putting It Together: Departmental Letter*

## Template

<<Purdue/Dept Letterhead>>

<<Date>>

Review Panel, CAREER Award
The National Science Foundation
Directorate(s) for <<insert>>
2415 Eisenhower Avenue
Alexandria, Virginia 22314

Dear Panel Members,

On behalf of the << dept. name>> of Purdue University, I am pleased to provide this institutional letter of support for Dr. XX's application entitled <<title of CAREER>>.

How project fits with/advances departmental education and research goals.

Dr. XX has proposed <<XXX>> research and education plan that is well aligned with <<XXX>

*Dept Letter must provide "An indication that the PI's proposed CAREER research and education activities are supported by and advance the educational and research goals of the department and the organization, and that the department is committed to the support and professional development of the PI."*

The School of X is fully committed to providing Dr. XX with …

<<Give further description and details of the specifics of support, including discussion of specifics of start up, TA and RA support, laboratory and office space, etc. Describe the ways in which the signer of the letter will ensure the appropriate mentoring of the PI, in the context of the PI's career development and his/her efforts to integrate research and education throughout the period of the award and beyond. What mentoring will be provided?>> In addition, I am providing mentoring support to Dr. XXX and have met with him/her regularly to discuss this proposal. I agree to continue at least <<once every two months>> to discuss a wide range of topics related to teaching, research, and promotion and tenure.

Statement on departmental commitment to support PI via mentoring and resources.

Confirmation of PI eligibility.

As required, Dr. XXX is eligible for the NSF CAREER award: Dr. XXX received his/her doctoral degree in <<xxx (Discipline)>>, is untenured, has not previously received a CAREER award, and is employed as an Assistant Professor in a tenure-track position at Purdue University. I look forward to continuing to support this exciting work and his/her academic career.

Sincerely,

Name
Title

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# *Note on NSF Reviews*

## Key Review Changes Affecting CAREER Proposals +

- **Minimum reviews** reduced to 2 and external reviewers not always required
- **More proposals triaged** – strong proposals may be funded without panel, weaker proposals may be declined without discussion
- **Panel summaries are shorter** (3 – 5 sentences, bullets allowed)
- **Minimal pre-award negotiation** – Program officers are discouraged from extensive back and forth or budget reshaping
- **More proposals may be returned without review** for insufficient content regardless of all sections addressed

# *Top 10 Mistakes & Final Tips*

Planning is Key!

**10. Difficult to read** with small fonts, illegible figures, too many acronyms

**9. Unsubstantiated** use of “innovative,” “novel,” “transformative”

**8. Poor distinction** between preliminary results and proposed work

**7. Incremental research** with narrow focus

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# *Top 10 Mistakes & Final Tips*

6. **Long sentences and unclear writing**
5. **Too similar to PhD work**
4. **Business-as-usual** education plan
3. **Little impact** in broader impacts
2. **Treating** as a regular proposal instead of long-term trajectory
1. **Research plan lacks cohesion & integration:** Collection of loosely related ideas; No gap rationale

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# *NSF Policy On the Use of AI*

- AI may be used in writing proposals
- Disclose in the Project Description if used and how
- You are fully responsible for accuracy, originality, and integrity of AI-generated content
- Do not upload confidential or proprietary information into public AI systems
- Reviewers are prohibited from using AI on proposal materials

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# *NSF Policy On the Use of AI*

Examples – End of Project Description:

“AI Assistance Disclosure: Portions of this proposal’s text were drafted with the help of generative AI tools. The PI reviewed, verified, and revised all content for accuracy, originality, and alignment with NSF and institutional policies.”

“AI Assistance Disclosure: Generative AI was used for grammar and refinement of original writing only. All intellectual content originates from the PI.”

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# *5-Minute BREAK*

# NSF EARLY CAREER AWARDEES

JOSEPH MAKIN, PhD
Assistant Professor, Elmore Family School of Electrical & Computer Engineering

**NSF CAREER** 10/1/2024 – 9/30/2029

*Brain-Machine Interfaces for Speech*

LAUREN ANN METSKAS, PhD
Assistant Professor, Biological Sciences & Chemistry

**NSF CAREER** 6/1/2025 – 5/31/2030

*Assembly and supramolecular organization of bacterial microcompartments*

ELIZABETH PARKINSON, PhD
Assistant Professor, Organic Chemistry

**NSF CAREER** 2/1/2023 – 1/31/2028

*A Multidisciplinary Approach for the Discovery and Characterization of Hormone Inducers of Natural Product Biosynthetic Gene Clusters.*

BRANDON PITTS, PhD
Associate Professor, Industrial Engineering

**NSF CAREER** 8/15/2023 – 12/31/2028

*With Age Comes Wisdom: Leveraging Older Adults' Crystallized Decision-Making Abilities to Develop Adaptive Human-Automation Interfaces for Dynamic Environments*

# NSF EARLY CAREER AWARDEES

KIRSTEN DAVIS, PhD
Assistant Professor, Engineering Education

**NSF CAREER** 8/1/2025 – 7/31/2030

*Characterizing the Process of Global Formation for Engineers*

DANIAL DAVARNIA, PhD
Associate Professor, Global Optimization, Transportation, and Network Interdiction

**NSF CAREER** 8/15/2025 – 12/31/2028

*Novel Parallelization Frameworks for Large-Scale Network Optimization with Combinatorial Requirements: Solution Methods and Applications*

# *Q&A*

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# *Survey – Thank you!*

## And follow us on LinkedIn for federal funding updates, helpful resources, and much more

CAREER Post-Workshop Survey

Follow SIR on LinkedIn!


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THANK YOU!

Link to our office for Strategic Interdisciplinary Research (SIR):

https://www.purdue.edu/research/oevprp/research-innovation/

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