

Broader Impacts Identity: BI Framework & *Proposal Design* Workshops

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OFFICE OF SPONSORED PROGRAMS & RESEARCH DEVELOPMENT
OFFICE OF FACULTY DEVELOPMENT & DIVERSITY



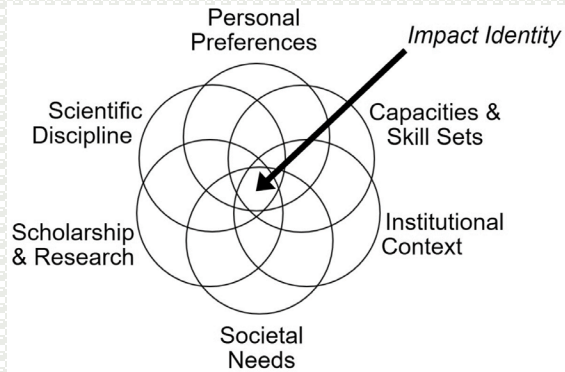
BID

Partnerships for
Broader Impacts Design

Today: Strategy & Action Plan

Part 1:

BI Identity Framework for Connecting Science and Society



Part 2:

Connecting the Framework to NSF Proposal Design



Workshop 2: Broader Impacts Proposal Design

	AGENDA
11:00 am	Welcome, Purpose & Agenda
11:05 am	BI Identity Framework Exercise: Impact Identity Statements
11:20 am	BI Proposal Design Overview: Case Study
11:50 am	Wrap Up Discussion & Next Steps
12:00 pm +5	Workshop Feedback (-5 min.)

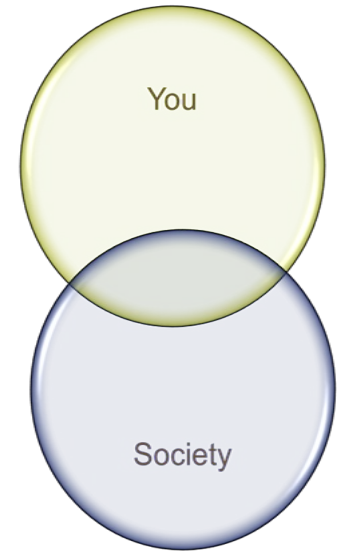
Exercise 1: Your Research & Society (10 min)

Research Impacts Elevator Pitch: In groups of two, share at a high level the present, and possible future impacts of your research and teaching.

- How might your work make a larger societal impact, who might your work directly impact?

(Take 5 minutes to write this down and then in Breakout Rooms: 2-3 minutes giving pitch, then switch).

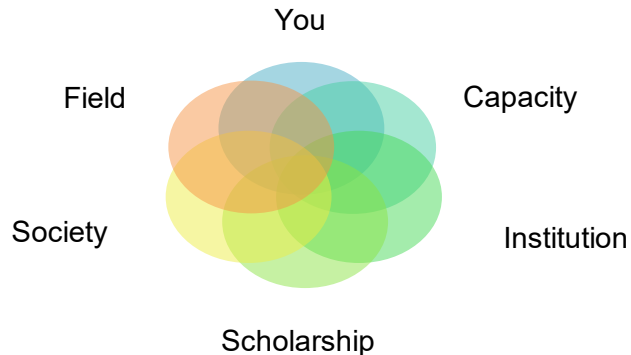
Write down one thing that you would like to refine about your pitch.



Proposal Design Process

Clear Impact Identity and Impact Strategy

Broader Impacts Identity



(Risien, J. et al. 2018)

Broader Impacts Strategy

Alignment with NSF's Strategic Aims:

- PAPPG/RFP
- NSF Merit Review Criteria
- NSF Strategic Plan 2018-2022
- NSF 2030 Vision
- Directorates –
 - Strategic Plans
 - Dear Colleague Letters
 - Funded Colleagues and Projects

CASE STUDY: Broader Impacts Project Summary, V1

Broader Impacts 1) The PI will teach an advanced topics course for graduate students and postdocs at Cornell. With the help of a hired research assistant, the PI will edit these notes into a publishable manuscript which can serve as the basis for graduate courses on moduli problems at other universities. 2) The PI will run a “hot topics” seminar on subjects related to the research project. Graduate student and postdoctoral participants will present papers in the seminar and post on a research blog organized by the PI. The goal of the blog posts is to explain the motivation and background for the papers, perhaps through some interesting examples, to pique the interest of other graduate students and researchers and provide useful context for reading the papers. 3) The PI will run two workshops on subjects closely linked to the proposed research. The first will be a graduate summer school, and the second will be a traditional research workshop. In addition to fostering collaboration and exchange of ideas between leading experts in the subject, we hope the second workshop will host (perhaps as speakers) many of the graduate students who attended the first workshop.

What have you learned about the PI's Impact Identity?
What have you learned about the PI's Impact Strategy?

<https://cornell.box.com/s/urb9z0syuak7xoohfgtx8t0qtjzc8tcb>

SHARE OUT, DISCUSSION, COMMENTS, AND Q&A

How might this plan hold up in Merit Review?

NSF Merit Review Criteria

The following elements should be considered in the review for both criteria:

1. What is the potential for the proposed activity to:
 - a. Advance knowledge and understanding within its own field or across different fields (Intellectual Merit); and
 - b. Benefit society or advance desired societal outcomes (Broader Impacts)
2. To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
3. Is the plan for carrying out the proposed activities well-reasoned, well-organized, and based on a sound rationale? Does the plan incorporate a mechanism to assess success?
4. How well qualified is the individual, team, or organization to conduct the proposed activities?
5. Are there adequate resources available to the PI (either at the home organization or through collaborations) to carry out the proposed activities?

CASE STUDY: BI Project Summary, V1

Broader Impacts 1) The PI will teach an advanced topics course for graduate students and postdocs at Cornell. With the help of a hired research assistant, the PI will edit these notes into a publishable manuscript which can serve as the basis for graduate courses on moduli problems at other universities. 2) The PI will run a “hot topics” seminar on subjects related to the research project. Graduate student and postdoctoral participants will present papers in the seminar and post on a research blog organized by the PI. The goal of the blog posts is to explain the motivation and background for the papers, perhaps through some interesting examples, to pique the interest of other graduate students and researchers and provide useful context for reading the papers. 3) The PI will run two workshops on subjects closely linked to the proposed research. The first will be a graduate summer school, and the second will be a traditional research workshop. In addition to fostering collaboration and exchange of ideas between leading experts in the subject, we hope the second workshop will host (perhaps as speakers) many of the graduate students who attended the first workshop.

Case Study: Broader Impacts Project Summary, V5

Broader impacts. A robust and diverse educational pipeline in mathematics is crucially important to meet the demand for quantitative skills in the US workforce, and to promote basic science and innovation in the many fields touched by mathematics. Mathematics education currently has significant bottlenecks in the transition from secondary to university level, and again from university to graduate level, in which many students are discouraged and abandon their mathematics studies. The PI will engage in several activities to help address these bottlenecks: presentations to high-school students and professional development workshops for high-school teachers to help smooth the transition to university mathematics; a Research Experience for Undergraduates (REU) program with the goal of encouraging students from diverse backgrounds to continue their mathematics studies; and innovating in graduate mentorship to emphasize practical, transferrable skills, such as communication of mathematical ideas. The PI will also develop connections between computational algebra and machine learning.

What can we learn from this Project Summary?

SHARE OUT, DISCUSSION, COMMENTS, AND Q&A



Key Elements to BI Proposal Design

- Project Summary Statement Tells a Compelling Story
- Approach aligns with funders desired outcomes (i.e STEM Edu at all levels, STEM Workforce Pipeline).
- Clear Direction, Purpose, Goal
- Demonstrated Need (i.e. Bottleneck)
- Proposed activities offer a solution to address the needs
- Proposed activities leverage existing resources
- Proposed activities are based on best practices (REU, literature)
- Plausible
- Aligns with PI's genuine interests, leverages existing resources
- Builds on past experiences (he has some expertise in these domains)
- Impacts are measurable

Tips for Broader Impacts Proposal Design

Develop a BI Identity & Strategy

- Make sure your interests, abilities, aims, and capacity aligns with funder priorities
- Gain experience in BI areas that truly interest you/build on things you have enjoyed doing
- Expand your skill set: What are best practices in STEM mentoring, teaching, communications, diversity, inclusion, K-12 programs?
- Engage your Resources- OEI, Sciencenter, CTI Grad School PD, Professional Societies
- Build BI plan over time and alongside research and education career aims

Know your partners

- Reach out early, often
- Know what you can do for them
- Establish shared goals
- Budget for their time and expertise
- Be proactive in creating and sustaining these relationships

Integrate Research, BI, PB and Education

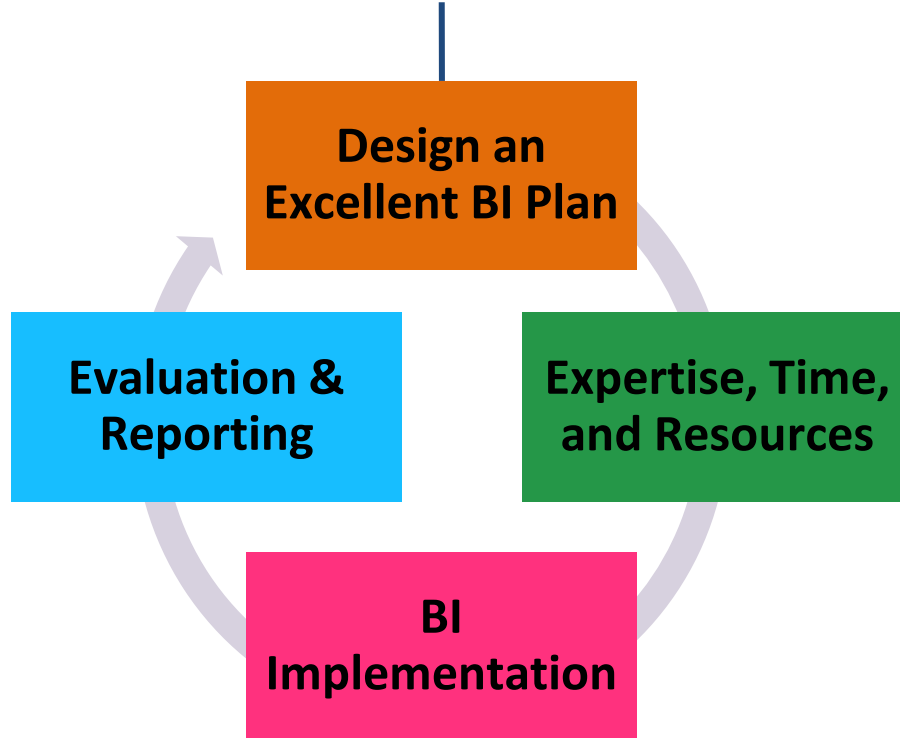
Integrate Student Development at all levels in IM, BI and BP Plans

Approach BI like a research problem

- Choose a problem that interests you
- Address a challenge, societal issue, or need
- Be clear about your objectives and design a plan that allows you to measure progress/impact
- What's being done now? Baseline data?
- Use data (theory/scholarship/NSF publications) to justify the need and the approach for the project
- What's the best approach and why?
- Pilot and grow over time
- Allocate adequate resources
- Build a diverse team
- Engage your students in the work
- Track results
- Share outcomes broadly

Timeline: Your BI identity & your proposal(s)

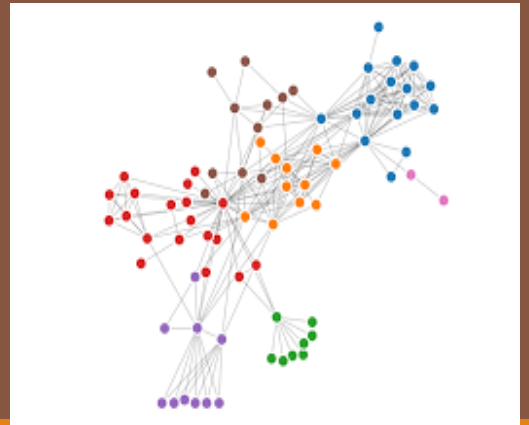
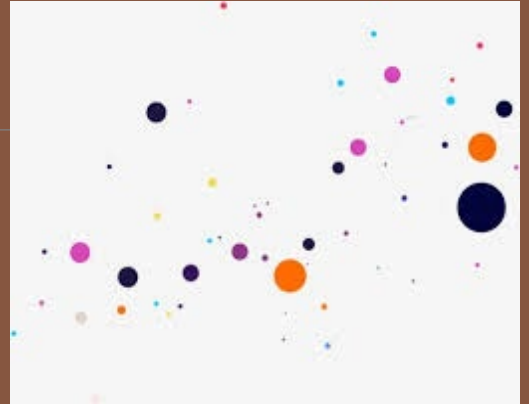
You are here for the next few months!



Resources

What's out there now?

How do you connect to the right resources?



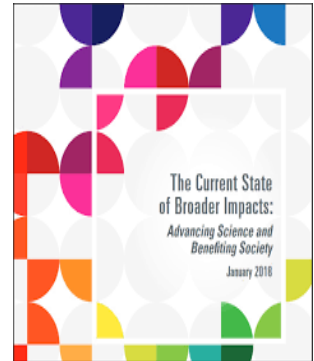
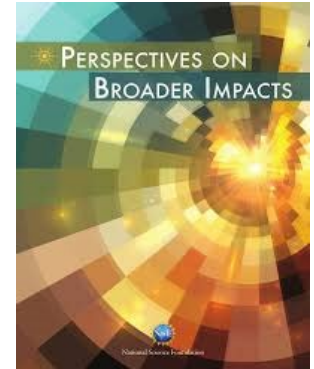
Resources at a Glance

INTERNAL

- OSP/CALS- Research Development Teams
- BID project staff and toolkit
- Office of Faculty Development & Diversity
- Center for Teaching Innovation
- Einhorn Center for Community Engagement
- Public Service Center
- McCormick Center for Teaching Excellence in Engineering
- The Graduate School
- K-12 Outreach Programs
- Sci. Communication Trainings
- Peers: Case Studies
- Existing BI programs on campus
- This network

EXTERNAL

- NSF Resources
 - NSF data/reports on Societal Trends and Indicators
 - NSF - Portal to the Public
- ARIS - fellowships, PD, assessment
- **Community Based Organizations**
- National and International Collaborators
- Professional Societies





Advancing Research Impact in Society



- Merit Review Guide:
<https://researchinsociety.org/wp-content/uploads/2021/02/GuidingPrinciplesDoc2020.pdf>
- Resources:
<https://researchinsociety.org/resources/>

- **NSF's BI webpage:**
<http://www.nsf.gov/od/oia/special/broaderimpacts/>
- **NSF Merit Review webpage:**
http://www.nsf.gov/bfa/dias/policy/merit_review/
- **NABI website:** www.broaderimpacts.net
- **ARIS:** <https://researchinsociety.org/wp-content/uploads/2021/02/GuidingPrinciplesDoc2020.pdf>

Publications:

- -NSF's *Perspectives on Broader Impacts*
- -NSB's *NSF Merit Review Criteria – Task Force on Merit Review*
- -NSF's *Proposal and Award Policies and Procedures Guide PAPPG Guide*)
- -NABI's *BI Guiding Principles and Questions for NSF Proposals*
- -Tankersley and Bourexis (2013) "Broader Impacts 2.0 Frequently Asked Questions about Revisions to NSF's BI Criterion"

Next Steps

Clarify Impact Identity & Strategy: Re-write your Impact Statements

Define where your Impact Identity aligns with NSF Strategy, and the Specific NSF grant you are applying for


Define your BI Goals

Know and grow your capacity

RD resources: <https://researchservices.cornell.edu/resources/nsf-broader-impacts-resources>

Reach out to schedule BI consultation and proposal development support: proposal-adv-osp@cornell.edu

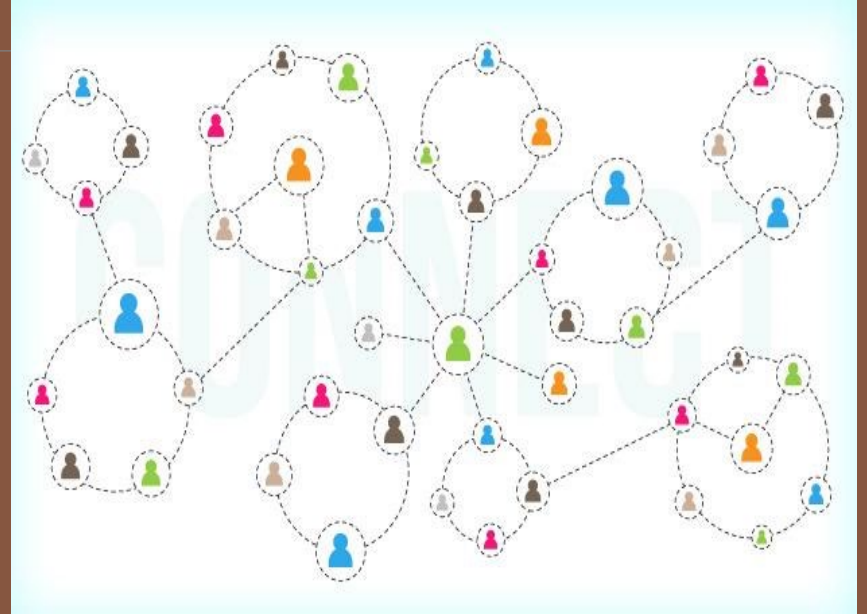
Share out, discussion,
comments, and Q&A



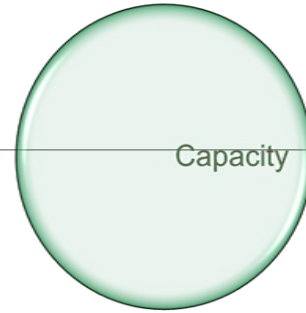
Thank you. Let's stay connected.

Book a consultation during the weekly *Research Impacts & Partnerships Consultation* office hours here:

<https://outlook.office365.com/owa/calendar/ResearchDevelopmentOfficeHours@cornellprod.onmicrosoft.com/bookings/>



Exercise 5: identifying your impact capacity & assets (5 minutes)



Explore, discuss and record:

- What people, programs, expertise, partners, institutions, tools do you already have access to that can help you reach your impact goals?
- What other people, programs, institutions, partnerships, etc. do you need?