



Engaging with Communities on Broader Impacts Work


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WHAT ARE BROADER IMPACTS (BI)?

- Also referred to as Outreach Efforts by some sponsors
- The potential of a sponsored project to benefit society and contribute to the achievement of specific, desired societal outcomes



Potential Target Outcomes for BI

- Full participation of women, underrepresented minorities in STEM, and persons with disabilities
- Improved STEM education and educator development (at any level)
- Increased public scientific literacy and public engagement with science and technology
- Improved well-being of individuals in society
- Development of a diverse, globally competitive STEM workforce
- Increased partnerships between academia, industry and others
- Improved national security
- Increased economic competitiveness
- Enhanced infrastructure for research and education

Outreach might imply...



Academic work done “for” the public



Applying existing knowledge



Unidirectional flow of knowledge (university → public)



Distinction between knowledge producers & knowledge consumers



Primacy of academic knowledge



University as center of public problem solving

Engagement refers to...

Academic work done “with” the public

Inclusive, collaborative, problem oriented

Multidirectional flow of knowledge (university \leftrightarrow public)

Co-creation of knowledge (university + community – solutions)

Shared authority for knowledge creation (both universities and communities have relevant knowledge & expertise)

University as part of an ecosystem of knowledge production addressing public problem solving

Community change that results from the co-creation of knowledge

Benefits to Society

Co-creation of knowledge

Sustainable transfer of knowledge

Generates true empowerment approaches to community development

Creates mutually beneficial outcomes

Creates public support for solutions-focused partnerships

Creates public support for PreK-12 educational improvements

Potentially involves (impacts) whole community (diffusion)

Creates transdisciplinary partnerships

Creates startup companies, product improvements, innovation and workforce development

Enhances quality of research and evaluation

- Implementation & Fidelity
- Reliability & Validity
- Diffusion & Dissemination

Community Engaged Scholarship is...

Scholarship
focused (Goal
oriented toward
change)

Community-based
(Systems oriented)

Mutually beneficial

Capacity Building

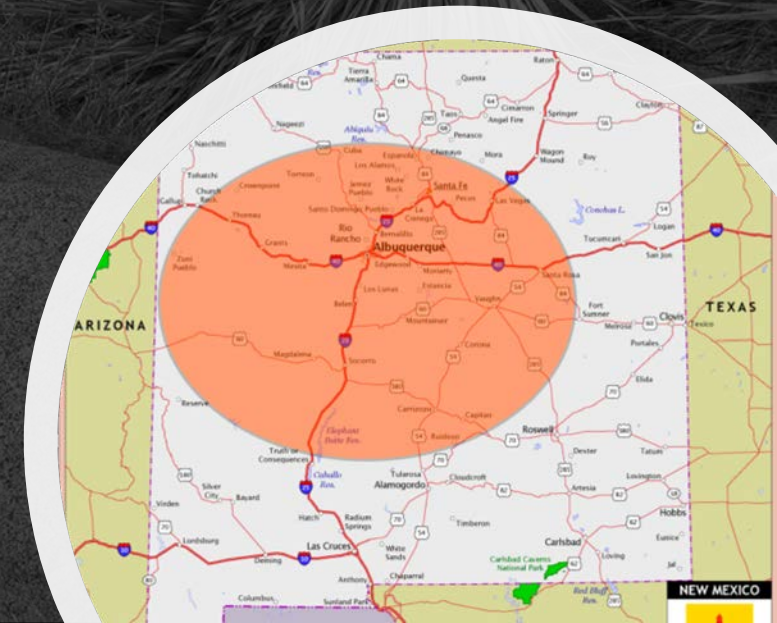
Sustainable

To serve a larger
public good

What do we mean by
“community”?

GEOGRAPHIC

Shared physical space such as a
neighborhood, city, or region.



More
definitions of
“community”

Identity

- Shared race, gender, or other characteristics

Affiliation or Interest

- Shared common set of values or concerns

Circumstances

- Shared common experiences, e.g. surviving natural disaster or managing a disease

Profession or Practice

- Shared specific knowledge to occupation, skill, or trade

Faith

- Shared belief systems, customs, and religious or spiritual practice

Family/Kin

- Shared relationships through family and/or marriage

Engaged Research & Creative Scholarly Approaches to BI



- Use-inspired basic research
- Community-based research
- Community-based Participatory research
- Applied research
- Contractual research (funded by government, NGOs or businesses)
- Demonstration projects
- Needs and assets assessments
- Program Evaluations
- Translational scholarship through presentations, publications and websites
- Exhibitions, performances, and other creative activities

“Engaged” Incorporates Community Knowledge



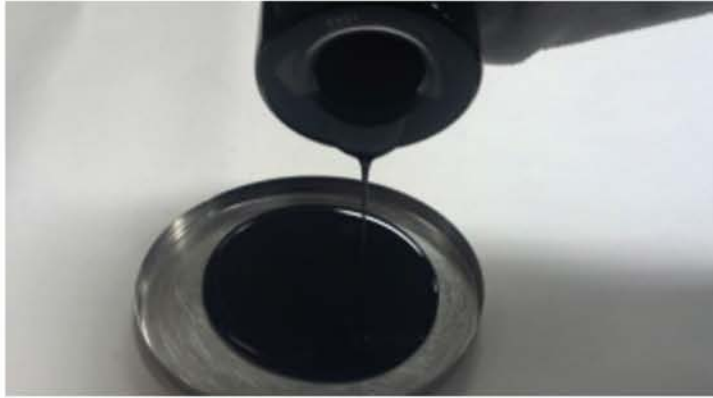
What is the Infrastructure to Support BI?

- ADVANCE Team
- Office of Community Engaged Learning & Research
- Faculty Research Development Office
- UNM Pre-College Programs (CEP, Upward Bound)
- K12 Community Partnerships (APS)
- Museums (Explora, Natural History Museum, ABQ Art Museum, BioPark)
- STEM NM Ecosystem



As a
Researcher,
What Can My
Broader
Impact Be?





Converting solid waste materials into road surfacing material to develop longer-lasting, quieter road surfaces



Using math and statistics to improve predictions of severe weather

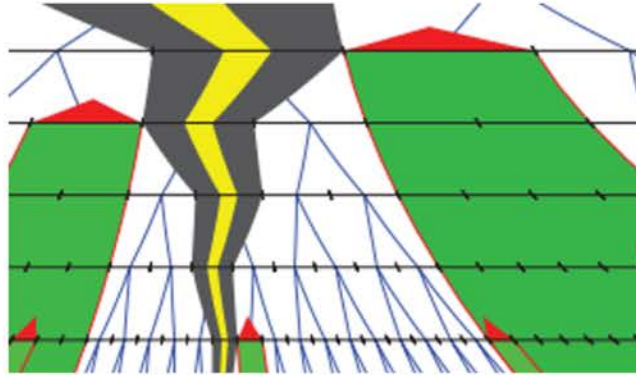


Analyzing evolution of massive storms to develop better understanding and improve forecasting and resilience planning.

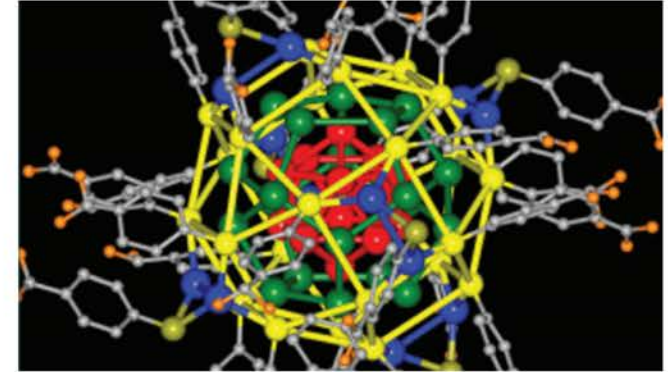
Proposed Research Itself Defines the
Broader Impact



Advancement of computer architecture that could improve energy efficiency and battery life.



Harmonic analysis research with applications in big data, image processing, and wave propagation.



Improve photovoltaic technology with the potential to improve solar cell efficiency and reduce costs.

Proposed Research Directly Contributes to
Broader Impact



Research studies early language and bilingual education. BI is to collaborate with organizations and policymakers to develop science-based programs.



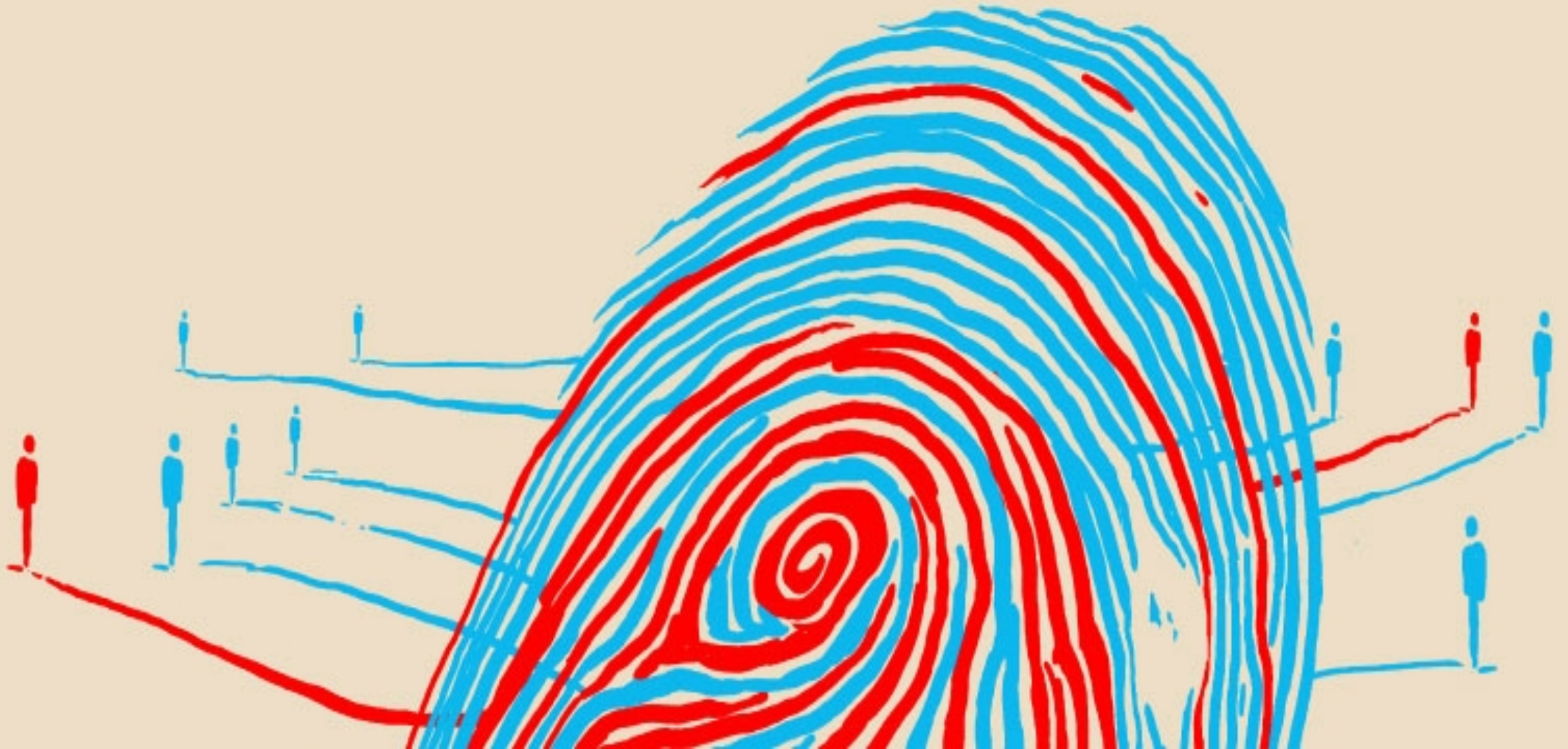
Museum exhibit that displays technological advances being made to restore and extend human abilities. Shares engineer's stories with general public.



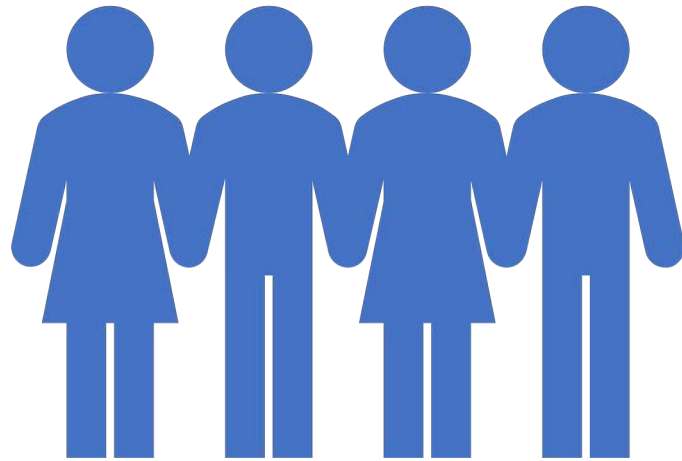
Research studies use of organic semiconductors. BI fosters interest in polymer science with chemistry ambassadors to underrepresented teens.

Proposed Research is Complemented by
Broader Impact Activities

What is your Broader Impact Identity?

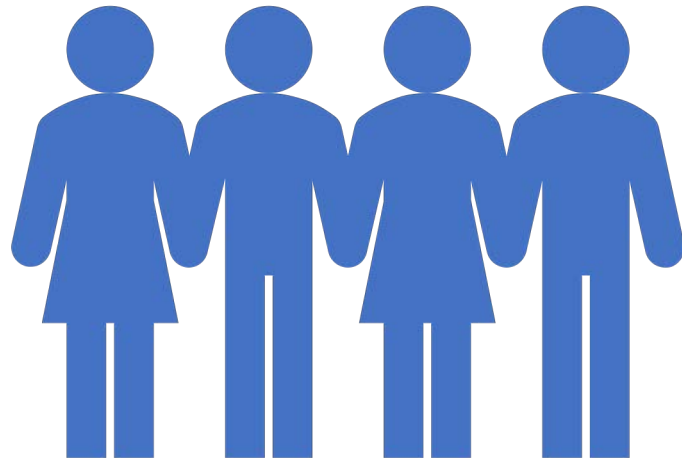


Finding your Broader Impact Niche



- How does your research naturally connect to societal needs and issues?
- Which societal needs and issues **most** connect to *you* and your work?
- What societal change do you want to see as a result of your work and why?

Finding your Broader Impact Niche



Also Known As...
Broader Impact Goal

- How does your research naturally connect to societal needs and issues?
- Which societal needs and issues **most** connect to *you* and your work?
- **What societal change do you want to see as a result of your work and why?**



Examples of Community Engaged Approach to Outreach

UNM THE UNIVERSITY OF NEW MEXICO

UNM A-Z myUNM Directory Help more Search

Refugee Well-being Project

Resources • Home • About • People • News and Events • 2017 Community Report • Donate Now

Around the World in 3.2, 5k Run/Walk fundraiser

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Resources ▶

Home

About ▼

- About RWP
- The History of RWP
- About Refugees
- Our Research
- About the United Voices for Refugee Rights

People

News and Events ▶


2017 Community Report

Donate Now



The Class

The RWP class, *Health and Social Inequalities*, is a two-semester, 9 credit hour course. UNM students spend the first three months in the classroom learning about social inequalities and innovative ways to address them.



The Learning Circles

Beginning in November, students and refugees gather for two hours every week at a community center, enjoying social time, a cultural exchange, and one-on-one learning.



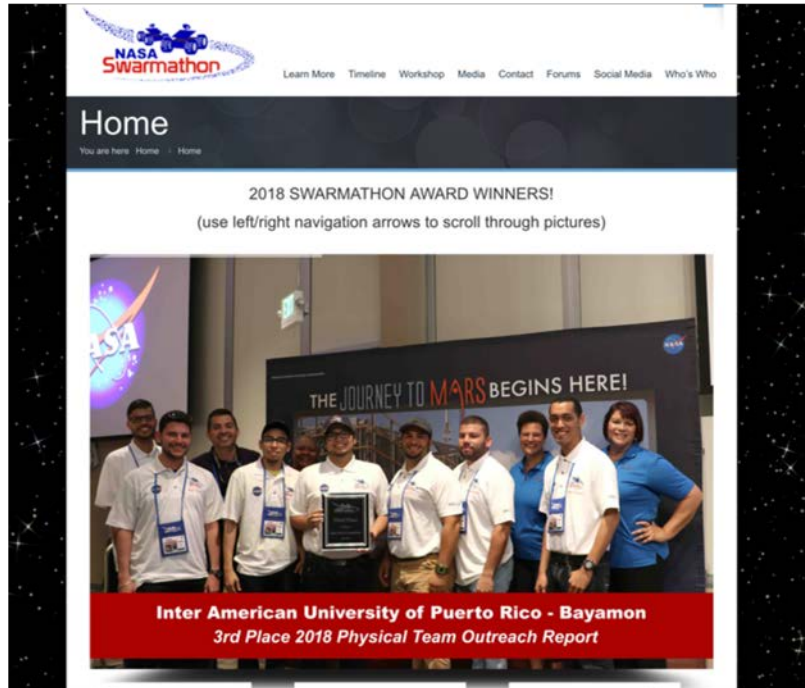
Refugee Advocacy

Students spend 4-6 hours per week with refugee families working on English, healthcare or applying to jobs. Students are closely supervised and supported by experienced instructors.



Refugee Well-Being Project

PI: Jessica Goodkind, Sociology



9 Workshop at Kennedy Space Ce

Home > 2019 Workshop at Kennedy Space Center

NASA Swarmathon Workshop



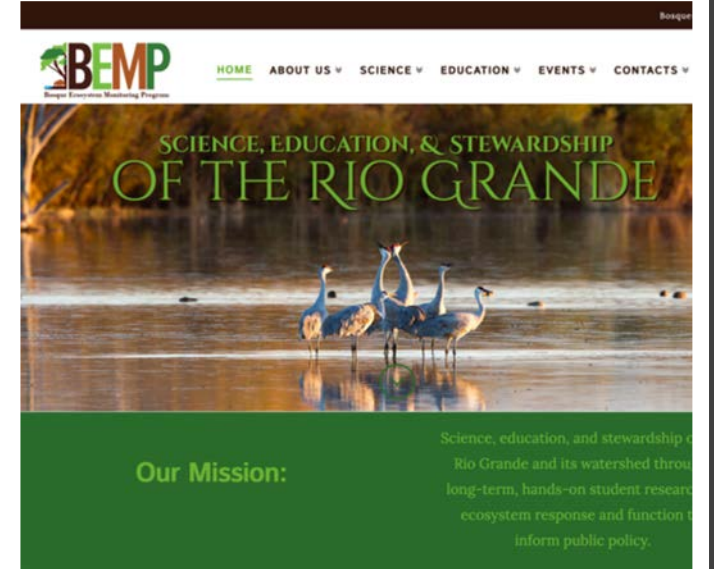
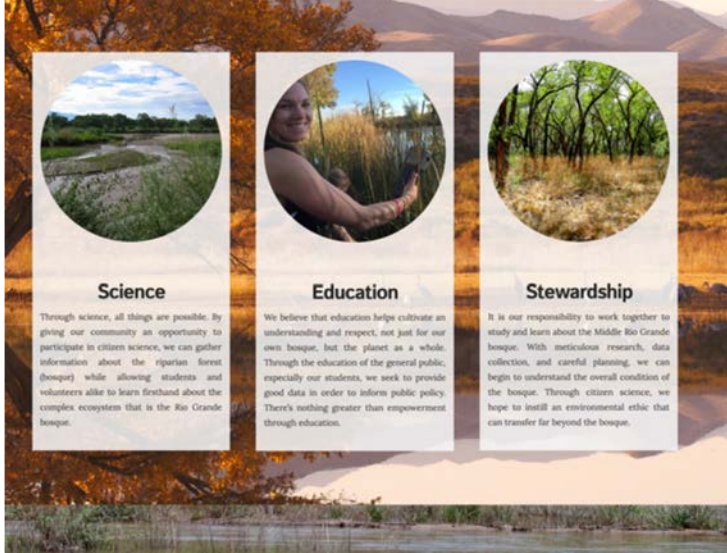
Tue, June 11th, Wed 12th, Thur 13th, 2019
at the John F. Kennedy Space Center Astronaut Memorial Facility

In the 4th and final year of the Swarmathon, we will hold a Swarmathon Workshop and Award Ceremony at the Visitor Complex. This will be an opportunity for students and mentors showcase the best of the Swarmathon, featuring distinguished invited speakers, a poster session, an opportunity to talk to NASA employees and find out more about the future of space exploration. See the schedule below for more details.



NASA Swarmathon

PI: Melanie Moses, Computer Science



Bosque Ecosystem Monitoring Project

PI: Kim Eichhorst, Biology



Albuquerque-Metro

City of ABQ, UNM partner to make restrooms more accessible for homeless

By: Allison Martinez

Posted: Mar 12, 2019 06:15 PM MDT
Updated: Mar 12, 2019 06:15 PM MDT



HIVE

Community of Practice

Reaching your Broader Impact Goal

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



[Home](#) [Support Initiatives](#) [Find Funding](#) [Proposal Support](#) [Limited Comps](#) [Broader Impacts](#) [Workshops](#) [Connect with an FRSO](#)

Tools for Preparing your Broader Impact

- [Developing a Broader Impacts Plan](#)
- [NABI Broader Impacts Guiding Principles and Questions for NSF Proposals](#)
- [NSF Merit Review Broader Impacts Criterion: Representative Activities](#)
- [Journal of STEM Outreach](#)
 - [Journal for researchers who develop and implement programs connecting formal and informal educators with STEM professionals.](#)

Examples of Broader Impacts

- [Publications with undergraduate or minority student authors](#)
- [Community or workforce engagement](#)
- [K-12 education and outreach](#)
- [Undergraduate research experience](#)
- [Industry engagement](#)
- [Instances of improving societal well-being or public awareness](#)
- [Transformative discovery](#)
- [Data sharing](#)

UNM BROADER IMPACTS


The National Science Foundation (NSF) describes Broader Impacts as being the potential of a research project to benefit society and contribute to the achievement of specific, desired societal outcomes. Per the NSF, broader impacts may be accomplished **through the research itself, through activities directly related to specific research projects, or through activities supported by, yet complementary to the project.** Even though the NSF is the only sponsor that specifically names Broader Impacts as an evaluation measure, this desire to improve the world around us through research and other externally funded endeavors is common to most funding opportunities. As a result, the OVPR and FRDO would like to offer their assistance to faculty looking to develop broader impacts strategies to include in their proposals. Use the button below to request support.

[Submit a Request for Proposal Support](#)

NSF Perspectives on Broader Impacts

NSF values the advancement of scientific knowledge and activities that contribute to the achievement of societally relevant outcomes. Such outcomes include, but are not limited to:

- Full participation of women, persons with disabilities, and underrepresented minorities in science, technology, engineering, and mathematics (STEM)
- Improved STEM education and educator development at any level
- Increased public scientific literacy and public engagement with science and technology
- Improved well-being of individuals in society
- Development of a diverse, globally competitive STEM workforce
- Increased partnerships between academia, industry, and others
- Improved national security
- Increased economic competitiveness of the US
- Enhanced infrastructure for research and education



Each year, the National Science Foundation (NSF) receives about 50,000 proposals for funding. Because there are many more worthy proposals than NSF is able to fund, the foundation distinguishes among them through a merit review process that incorporates two criteria: intellectual merit and broader impacts. [Read about more broader impacts examples from the NSF here.](#)

ONLINE TOOLS AVAILABLE

- NSF Perspectives on Broader Impacts - https://www.nsf.gov/od/oia/publications/Broader_Impacts.pdf
- National Alliance on Broader Impacts (NABI) - <https://broaderimpacts.net/>
- Broader Impacts at UNM - http://frdo.unm.edu/unm_broader_impacts

Mission: Graduate



Mission: Graduate is a partnership that brings together educators, employers, educational support providers, government leaders, and citizens to design collaborative projects and align organizational practice and policy toward achieving **common goals**. They seek partners with interest, experience, & expertise needed to successfully realize their **seven core outcomes**.

Girls in STEM Groups



These New Mexico groups are devoted to engaging primarily K-12 girls in STEM. The NM Girls Connection Programs and NM Out-of-School Time Network links includes an assortment of programs.

NM Girls Connection Programs
NM Out-of-School Time Network
Girl Scouts of New Mexico Trails
Expanding Your Horizon (EYH) ABQ
STEM Santa Fe

Industries in NM



Industry collaborations are positive outcomes of some broader impacts. Below are links to some industries in New Mexico already working to improve STEM education and may be productive partners in your proposal.

Key Albuquerque Industries
Boeing
Honeywell
Intel
Northrop Grumman
Raytheon

Research Data Support



Effective open source software and data sharing can be incorporated into **broader impacts**. The Research Data Services provides a variety of services in support of effective research data planning, management, preservation, discovery and use. In addition, the RDS team also provides support for several key research data infrastructure capabilities that are maintained by the Library for use by UNM's research community.

CSTA New Mexico



The Computer Science Teachers Association (CSTA) supports and promotes the teaching of computer science. CSTA provides opportunities for K-12 teachers and their students to better understand computer science and to more successfully prepare themselves to teach and learn. The NM chapter offers a ways to get involved with CS teachers helping to shape CS education in New Mexico.

Albuquerque Museums



Below are links to contact information for local museums.

iExplora!
Albuquerque Museum
Indian Pueblo Cultural Center
International Balloon Museum
Museum of Nuclear Science & History
National Hispanic Cultural Center
NM Natural History Museum

NM STEM Connection



Managed by the UNM STEM-H Center for Outreach, Research and Education with support from the NM Experimental Program to Stimulate Competitive Research (NM EPSCoR), the NM STEM Connection provides information about STEM resources for **K-12 students, teachers, parents, counselors, and administrators** as well as **higher education faculty/staff** and **community members** in New Mexico.

UNM STEM University



STEM University is a collection of **free** outside-of-class activities related to science, technology, engineering and mathematics disciplines (STEM) put on by the STEM Collaboration Center. These events connect UNM students with STEM research, scientists, technology and leadership. Faculty can post STEM events by following this **link**. Click **here** to access the current list of STEM University events.

UNM Outreach Organizations



Organizations on campus devoted to the recruitment, retention, and education of students from minority and underrepresented groups.

African American Student Services
American Indian Student Services
El Centro de la Raza
Native Americans in STEM (NASTEM)
Project for NM Graduates of Color
Ronald E. McNair Scholars Program
Student Support Services
UNM Division of Equity and Inclusion

UNM College Based Outreach



A number of schools and colleges at UNM offer outreach opportunities. These are excellent places to begin your own outreach effort, either as an example to follow or as a collaborative partner. Check out the links to their outreach pages below.

College of Arts & Sciences
College of Education
College of Fine Arts
School of Architecture & Planning
School of Engineering

New Mexico EPSCoR



One mission is to cultivate a well-qualified and diverse Science, Technology, Engineering and Mathematics (STEM) workforce and develop a strong culture of innovation and entrepreneurship. Through collaborations with organizations ranging from afterschool programs to colleges and universities, from museums to business startup accelerators, NM EPSCoR Education and Outreach programs serve a wide range of audiences across the state.

Government Labs in NM



Military and National Labs in New Mexico participate in a variety of outreach efforts. Some of them may provide examples to follow while others will include opportunities for partnerships. Check out the links to their outreach pages below.

Air Force Research Lab
Los Alamos National Laboratory
Sandia National Laboratories

Campus Resources

- K-12 Specialists
- Undergraduate Specialists
- Underrepresented and/or Minority Group Specialists

<http://frdo.unm.edu/>

[Home](#) [Support Initiatives](#) [Find Funding](#) [Proposal Support](#) [Limited Comps](#) [Broader Impacts](#) [Workshops](#) [Connect with an FRSO](#)


Our Mission

The Faculty Research Development Office (FRDO) works in close collaboration with other units of the [Office of the Vice President for Research \(OVPR\)](#) and with research administration personnel in colleges and departments to enable faculty to obtain external funding. FRDO also helps to implement campus research initiatives.

[Submit a Request for Proposal Support](#)


CORE SERVICES

ASSIST WITH LIMITED COMPETITIONS



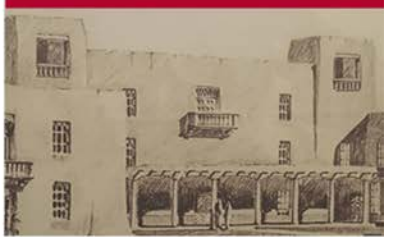
[View Limited Competitions](#)

COORDINATE WORKSHOPS AND SEMINARS




[View all Workshops](#)

ADMINISTER OVPR RESEARCH INITIATIVES




[View Faculty Support Initiatives](#)

PROPOSAL PLANNING & EDITING SUPPORT




[Learn More About These Services](#)

SUPPORT EARLY CAREER INVESTIGATORS



[Find Out More](#)

HELP WITH FUNDING SEARCH



[View Funding Opportunities](#)

Request support from the Faculty Research Development Network by clicking this [link](#).



K-12 SPECIALISTS

- NM STEM-H Center
- [Karen Kinsman](http://nmstemh.org/) (Director)
<http://nmstemh.org/>
- NM MESA
- [Kim Scheerer](http://www.nmmesa.org/) (UNM Contact)
<http://www.nmmesa.org/>
- Engineering Student Success Center
– [Elsa Castillo](https://ess.unm.edu/index.html) (Asso. Director)
<https://ess.unm.edu/index.html>
- ABQ Math Teachers' Circle
- Michael Nakamaye (UNM Prof.)
<http://www.unm.edu/~mathtc/index.php>



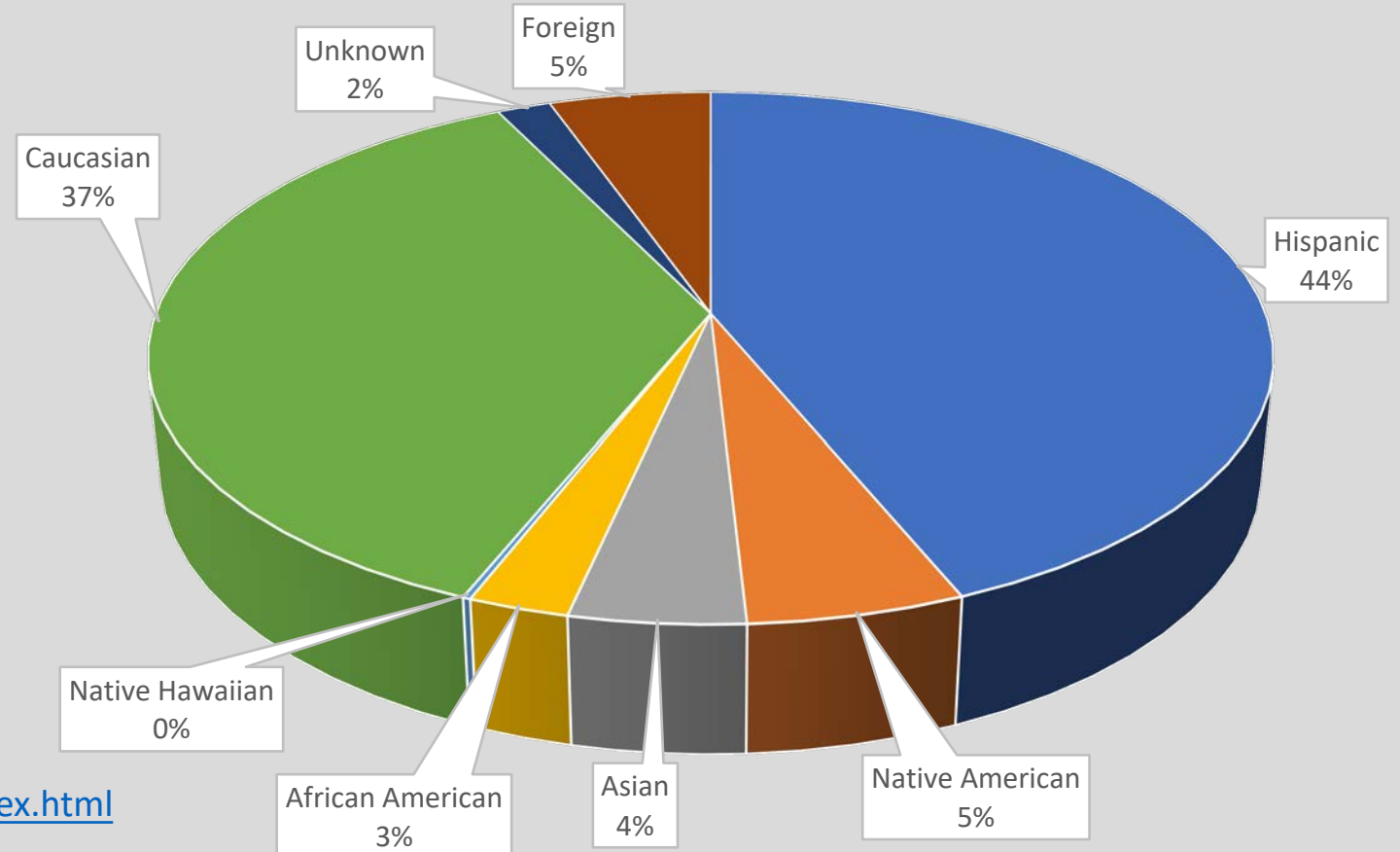
UNDERGRADUATE SPECIALISTS

- Research Experience for Undergrads
 - Nanoscience & Microsystems - <https://reu.unm.edu/>
 - Biology - <https://sevilletareu.wordpress.com/>
 - Physics & Astronomy - <http://physics.unm.edu/pandaweb/undergraduate/reu.php>
- Student Support Services <http://ssstrio.unm.edu/>
- STEM Collaborative Center <https://stem.unm.edu/>
- STEM University <https://stemuniversity.unm.edu/>
- Engineering Student Success Center <https://ess.unm.edu/index.html>

UNDERREPRESENTED/MINORITY GROUPS SPECIALISTS

- Student Support Services
<http://ssstrio.unm.edu/>
 - African American Student Services
<http://afro.unm.edu/>
 - American Indian Student Services
<https://aiss.unm.edu/>
 - El Centro de la Raza
<https://elcentro.unm.edu/>
 - TRIO Program
<http://ssstrio.unm.edu/>
- Ronald E. McNair Scholars Program
<https://mcnair.unm.edu/>
- Project for NM Graduates of Color
<http://pnmgc.unm.edu/>
- Native Americans in STEM (NASTEM)
<https://ess.unm.edu/programs/nastem/index.html>

UNM Spring 2019 Total Enrollment by Ethnicity*



*<http://oia.unm.edu/facts-and-figures/oer-spring-2019.pdf>

UNM + Explora Broader Impacts Partnership



Anthony Salvagno, X Studio Programs Mgr
asalvagno@explora.us

STEM NM Ecosystem



Contact

Mitchell Whittier
STEM-NM Manager
Explora
mwhittier@explora.us

Current



DISCOVER

Math in Real Life!



Initiatives