

# NSF CAREER Proposal Workshop

*March 21, 2017*

**Faculty Research Development Office (FRDO)**

A Unit of The UNM Office of Research

*Advance*  
at UNM

# NSF Career Awards...

## A Great Place to Start your Career

- 5 year award ➡ 10+ years of academic success
- Develops a lifetime of leadership in integrating education and research.

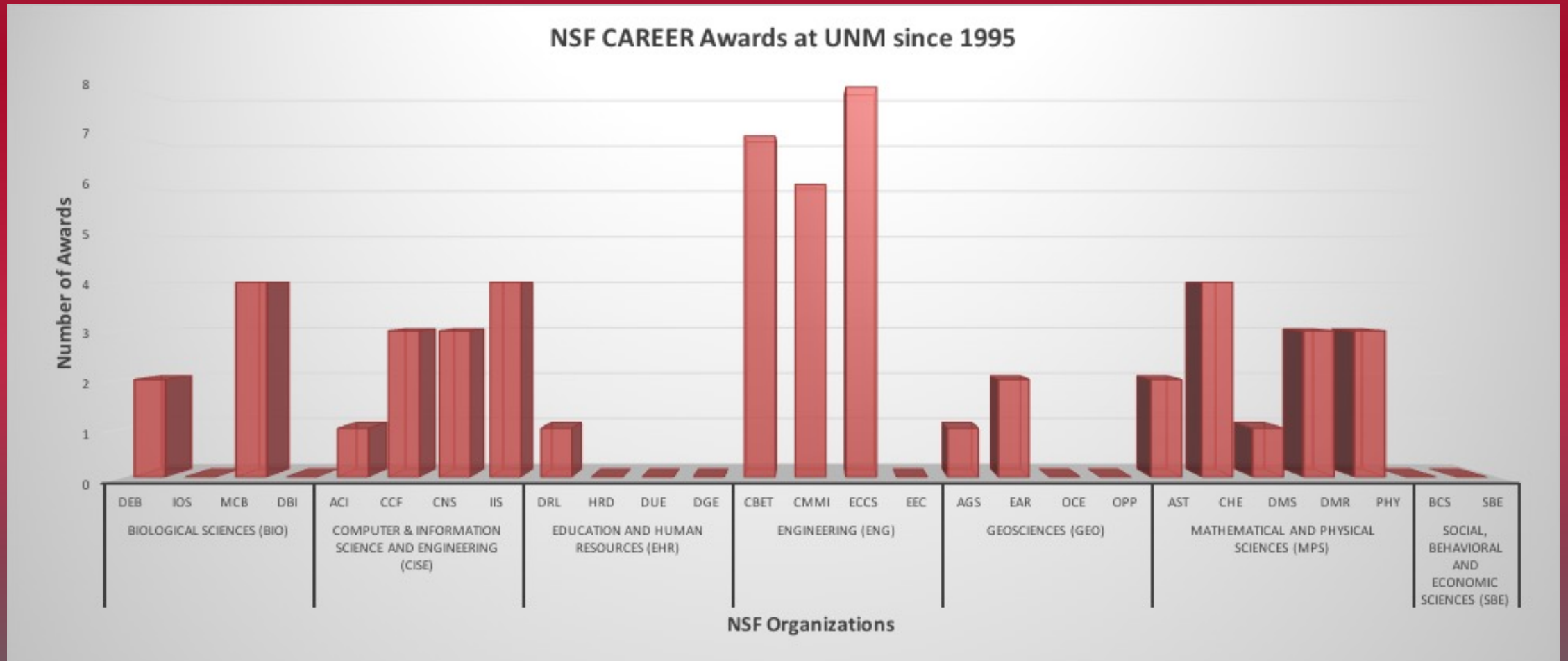


# Goals of the NSF CAREER Award



# UNM CAREER Successes

- 54 projects have been awarded to UNM since 1995





# **NSF CAREER Proposal Experience**

OVPR workshop, 3/21/2017

**Sang Eon Han**, Assistant Professor

Chemical & Biological Engineering

# Timeline

- Tenure Clock Beginning: Sep. 2012
- Proposal Submission: July 23, 2014
- Decline Notification: Dec. 3, 2014  
“I regret to inform you that...”
- Proposal Submission: July 23, 2015
- C&P Update Request: Dec. 4, 2015  
“Please email us an updated version of your current and pending support.”
- Budget Reduction Request: Dec. 4, 2015  
“Please prepare and submit a revised budget for your EPM CAREER proposal within a few days”
- Abstract Revision Request: Dec. 9, 2015
- Official Award Notification: Jan. 6, 2016

# Strategy

- Ask experienced peers to review your proposal
- Distinguish your UNM work from your (post)doctoral work
- Be creative and realistic in integrating your research and teaching
- Show that you will be a leader of the field after executing the proposed work
- Keep writing other proposals (peace of mind)

# Broader Impact (my case)

## 1. Education in Nanoscience

Inclusion of Nanophotonics in my courses (not very creative).

## 2. Outreach to Native American Children

This is a unique part.



**I'm feeling that success depends more on luck than on strategy.**

**Focus on improving quality of your work**





# Mock Review Panel

- **Panelists**

- **Amy Chen – Associate Director, Center for Teaching Excellence**
- **Gabriel Lopez – UNM Vice President for Research**
- **Arash Mafi - Director, Center for High Technology Materials**

- **Facilitator**

- **Mary Jo Daniel – Director of Faculty Research Development Office (FRDO)**

# Break

- **Thank you ADVANCE at UNM for the SUB Satellite coffee and cookies!**

# NSF CAREER: Thriving Proposal Preparation

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José M. Cerrato, Ph.D.

Department of Civil Engineering

Prepared for OVPR NSF CAREER  
Workshop, March 21, 2017



UNM

SCHOOL *of* ENGINEERING

# What is NSF CAREER?

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NSF CAREER is the “Foundation’s most prestigious award in support of junior faculty who exemplify the role of teacher-scholars through **outstanding research**, excellent education and the *integration of education and research* within the context of the mission of their organizations.”



UNM

SCHOOL *of* ENGINEERING



# TO GET STARTED...

- 🦅 Read CAREFULLY the NSF CAREER solicitation/guidelines (pay CLOSE attention to all requirements, including format!!).
- 🦅 Start as early as possible preparing your Project Summary (receive feedback from your Program Manager and Colleagues)!
- 🦅 An **OUTSTANDING/INNOVATIVE RESEARCH PLAN** is necessary for this proposal (“cutting-edge” science, remember that it is an NSF proposal).
- 🦅 Make sure to articulate how *Research* and *Education* are **integrated**.

# NSF CAREER IS ABOUT YOU (it is a career development award)!



🦅 *How will your NSF CAREER award propel your success?*

Your strategic long-term research and education vision should clearly be conveyed clearly in your proposal to know how the NSF CAREER award *activities* will help you get there.

From NSF CAREER website:

*"Such activities should build a firm foundation for a lifetime of leadership in integrating education and research".*

*(Thus, you need to do EVERYTHING and be OUTSTANDING!)*

🦅 Make sure to get the excitement and buy in of your Department Chair (you need THE Letter)!

# Tips for Proposal Writing Process...

- 🦅 Get at least 4 reviewers to help with your process:
  - a) Choose at least 2 reviewers who are TOP experts in your field (*the more they grill you with experimental design and other details, the better!*) or at least from the NSF Program you are applying.
  - b) Get at least 1 reviewer who is not an expert in your area, but who either is an NSF CAREER awardee, or has experience with the NSF CAREER program.
- 🦅 Remember, your odds for success are ranging from less than 10 to maybe 15% (if lucky!). Thus, put a lot of LOVE and CARE (as PERFECT as possible) to:
  - a) “**Title**” (Think about it, it can be your “brand”);
  - b) “**Writing/Grammar**” (get an editorial reviewer to give feedback in the last 2 weeks before submission);
  - c) “**Figures**” (these HAVE TO BE HIGH QUALITY and CLEARLY LEGIBLE!);
  - d) “**Submission**” (Don’t Rush it, submit it to the SRO with enough anticipation!)

# About Research Plan

- 🦅 Make sure to clearly convey right upfront how Research and Education Plans are integrated!
- 🦅 If possible, make the research plan “hypothesis-driven” (not necessary, but interesting hypotheses are always welcome in science!)...
- 🦅 In the Project Description, dedicate significant effort to show as many preliminary data and publications as possible to make a strong case for your qualifications to conduct the proposed RESEARCH PLAN.
- 🦅 Be wise on selecting information for the “Background and Significance/Literature Review” sections (*make it VERY CLEAR that you propose IMPORTANT RESEARCH and YOU KNOW YOUR STUFF!*)...

# About Education Plan and Assessment...

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- 🦅 Define clear objectives for your Education Plan and BE CREATIVE (this will help separate you from others)!
- 🦅 Include citations wherever possible in your Project Description to make a legitimate case for your scholarly interest and knowledge of the proposed Education Plan.
- 🦅 Include a section at the end of the Education Plan for “Assessment” (how will you make sure that you achieved the proposed goals?); NSF now takes this seriously...
- 🦅 If possible, include a Timeline that includes your expected activities and goals for both the Research and Education plans (this will show that you have good Project Management skills)..





# What Makes the CAREER Different?

- Tenure-track, assistant professors ONLY
- No co-PIs allowed
- Veteran PIs are still eligible for the CAREER
- 3 submission max
- **Research + Education**



# CAREER Basics



- Project Description – 15 pg.
  - Research + Education
  - Intended impact of project
- Letters of Collaboration
  - Single sentence on letterhead stationery
- Departmental Letter – 2 pg.
  - Absence will result in return of proposal without review

# **Steve Cabaniss**

Chair of the Department of Chemistry and  
Chemical Biology



**Yang Qin**

“Bottom-Up Approaches for  
Precisely Nano-structuring Hybrid  
Organic/Inorganic Multi-  
Component Composites”



**Ramesh Giri**

“Development of Cross-  
Couplings with Base Metals and  
Organic Electron Donors”



**Terefe Habteyes**

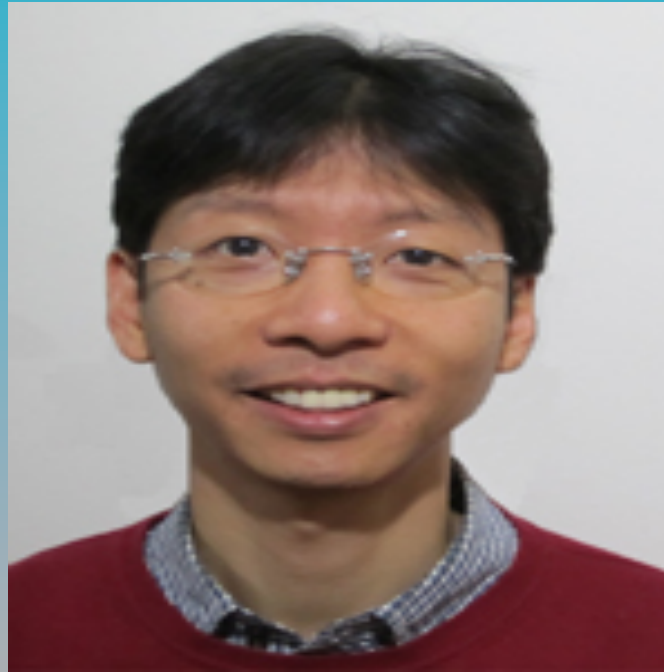
“Near-Field Imaging for Nanoscale  
Visualization of Exciton-Plasmon  
Energy Transfer”

**CAREER Awards in  
Chemistry and Chemical Biology**





Jose Manuel Cerrato  
Civil Engineering



Sang Eon Han  
Chemical & Biological  
Engineering



Anna Skripka  
Mathematics &  
Statistics

## **CAREER- Chair's supporting letter**

|                          |  |
|--------------------------|--|
| <b>Introduction</b>      | Proposal title, employment status                                |
| <b>Background</b>        | PhD & postdoc advisers and areas, awards, hiring                 |
| <b>Research plans</b>    | 1-2 paragraphs on why they are significant                       |
| <b>Role in Dept</b>      | Classroom teaching, advising, collaboration(s)                   |
| <b>Support</b>           | Facilities available for research (UNM, elsewhere)<br>Mentor(s)  |
| <b>Progress to date-</b> | Research progress<br>Teaching performance<br>Outreach activities |

## **CAREER Proposal Timeline**

|                     |  |
|---------------------|--|
| <b>Due Date</b>     | NSF has your proposal  |
| <b>D - 5 days</b>   | OSP should have your final proposal  |
| <b>D - 2 weeks</b>  | Chair must have your draft proposal & cv<br>Proof-reading of proposal by reader(s) |
| <b>D - 3 weeks</b>  | Chair would like your draft proposal and cv  |
| <b>D - 5 weeks</b>  | Polished draft to readers  |
| <b>D - 2 months</b> | Inform your chair of required resources<br>Rough draft to readers                  |
| <b>D - 6 months</b> | Select readers to advise on proposal<br>(Chair should know who they are)           |

# Resources for your CAREER throughout UNM

- STEM Collaborative Center
  - Tim Schroeder – Director
- STEM-H Center for Outreach, Research, & Education
  - Karen Kinsman - Director/Sr. Program Manager
- Center for Teaching & Learning
  - Amy Chen – Associate Director of the Center for Teaching Excellence
- UNM Library Research Data Support & Services
  - Karl Benedict & Jon Wheeler – Director & Subject Librarians

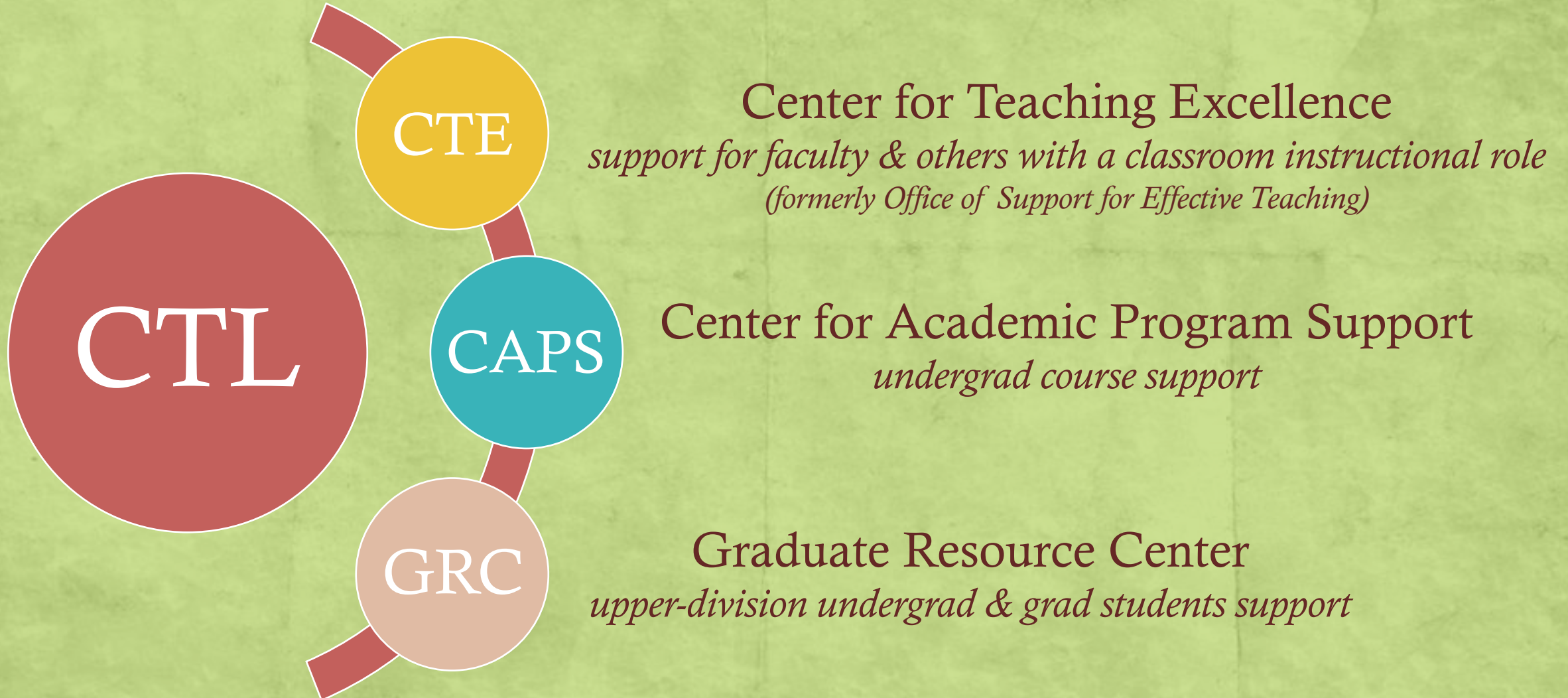


# NSF Proposal Support from CTE

**Amy P. Chen, Ph.D**  
Associate Director  
Center for Teaching Excellence

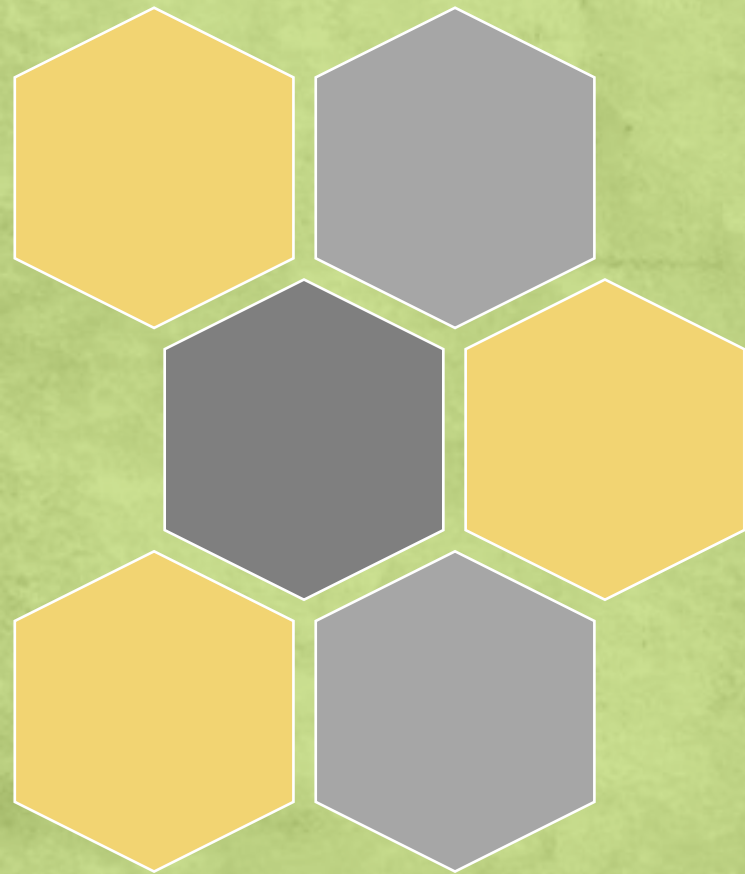
**NSF CAREER Proposal Workshop**  
FRDO & ADVANCE at UNM  
March 21, 2017

# UNM Center for Teaching & Learning (CTL)



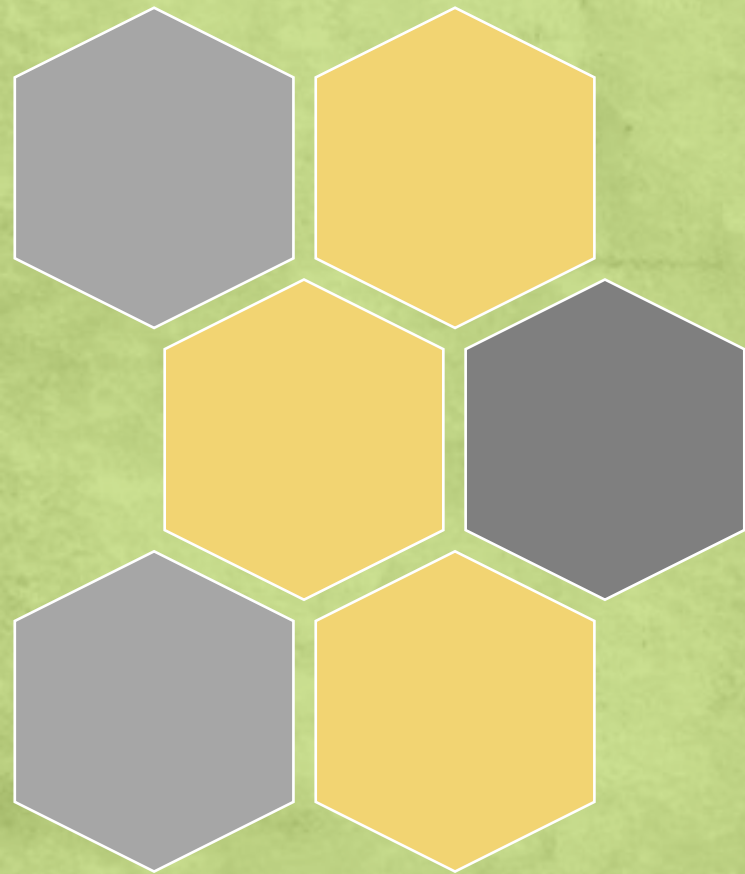


# CTE Core Initiatives



- Get set/Reset: *teaching tools, research support, faculty life*
- Success in the Classroom Conference
- Course Design Institute: *backward design, active learning, formative & summative assessment, equity-minded teaching*
- Workshops: *metacognition, engagement/motivation, iClickers, ed policies, multiple choice tests, rubrics, discussion, scientific teaching, active learning, undergrad research in curriculum, inclusive classroom*
- Teaching Awards; w/ *Faculty Senate Teaching Enhancement Committee (TEC)*
- Teaching Allocation Grant (TAG; w/ TEC)
- Teaching Fellows Program
- Teaching Consultation: *individual/departmental, peer observation*
- Graduate Teaching Academy

# CTE – Others



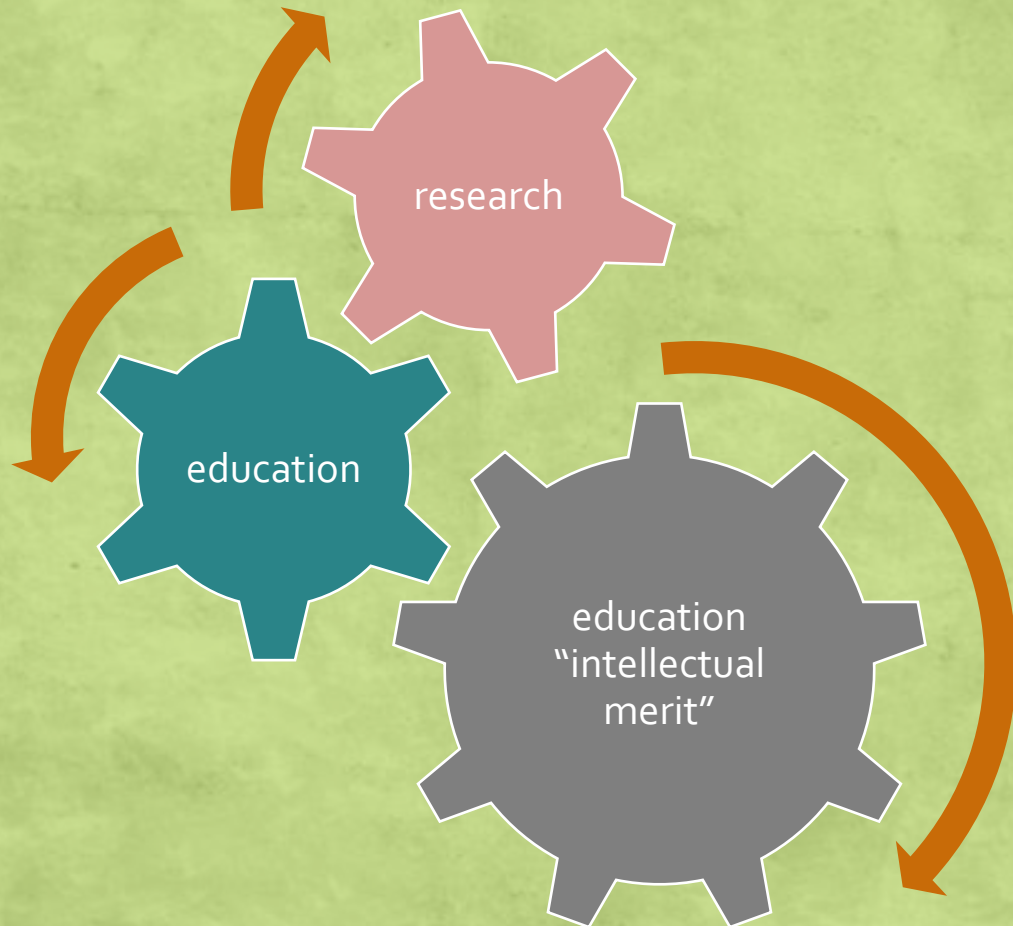
- Grant proposals: *we go after them ourselves and provide consultations to others on campus*
- Course redesign/realignment efforts on campus
- High impact teaching practices
- Online/hybrid best practices

*Do you have teaching-related needs? Get in touch with us!*



# CTE Support for NSF Proposals

## Successful NSF CAREER Education Component:



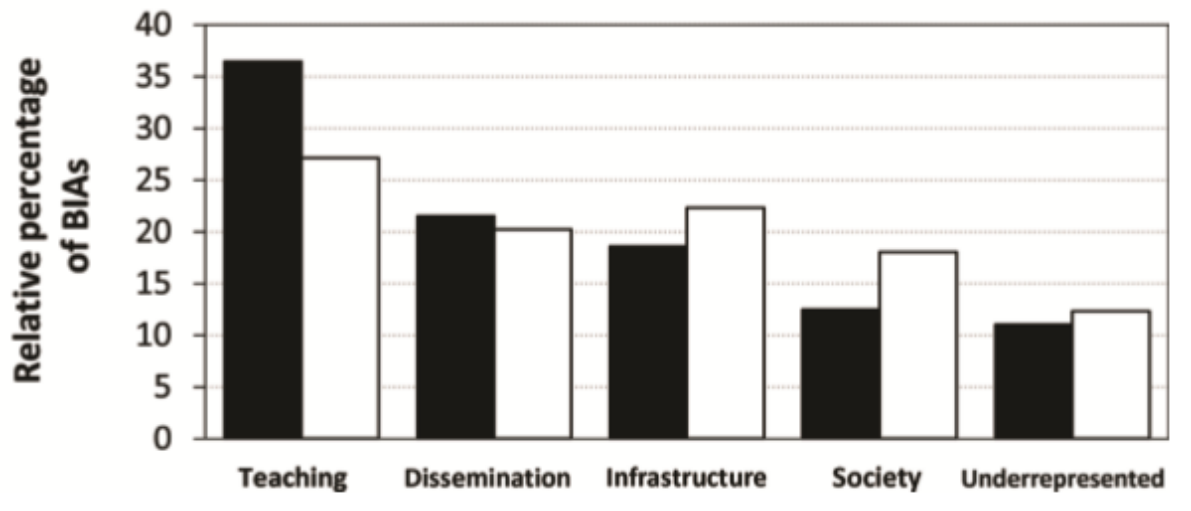
- built upon solid education “intellectual merit”
- demonstrate integration of research and education
- “outside of typical box” expected in your field

Excerpt from 2015, 2016 NSF CAREER Program Webinar

*CTE can help!*

# Teaching in BI

NSF BIO/DEB proposals



Watts *et al.*, BioScience (2015)

Iowa State University proposals

|               | Number of activities |     | Proposals with at least one activity |     |
|---------------|----------------------|-----|--------------------------------------|-----|
| Disseminating | 167                  | 36% | 70                                   | 80% |
| Teaching      | 96                   | 21% | 64                                   | 74% |
| Training      | 94                   | 21% | 76                                   | 89% |
| Facilitating  | 51                   | 11% | 40                                   | 46% |
| Researching   | 50                   | 11% | 47                                   | 54% |
| Total         | 458                  |     | 87                                   |     |

Wiley, S. MS Thesis (2014)



# Teaching in BI

NSF – wide

Table 1. Strategically selected key words representative of each BI criterion for use in the internal Research.gov search engine.

| BI criteria  | Search terms   |
|--|--|
| Advance discovery and understanding while promoting teaching, training, and learning | "curriculum" OR "doctoral student*" OR "educational material*" OR "elementary school*" OR "GK-12" OR "GK12" OR "graduate student*" OR "high school*" OR "IGERT" OR "K-12" OR "K12" OR "K-16" OR "K16" OR "masters student*" OR "mentoring" OR "middle school*" OR "MS student*" OR "PhD student*" OR "post doc*" OR postdoc* OR "RET" OR "REU" OR "student assessment*" OR "student evaluation*" OR teacher* OR "undergraduate student"    |
| Broaden participation of underrepresented groups                                     | "african american*" OR "AGEP" OR "alaska* native*" OR "blacks" OR "community college*" OR disabilit* OR female* OR "HBCU" OR hispanic* OR "HSI" OR latin* OR "LSAMP" OR minorit* OR "MSI" OR "native alaska*" OR "native american*" OR "native hawaiian*" OR "OEDG" OR "pacific islander*" OR "TCU" OR "two-year college*" OR "underrepresented group*" OR "women"   |
| Enhance infrastructure for research and education                                    | "collaboration" OR "education platform*" OR "equipment" OR "industry" OR "information tool*" OR "infrastructure" OR "instrumentation" OR "interdisciplinary" OR "international" OR "multidisciplinary" OR "multi-user facilit*" OR partnership* OR "partner institution*" OR "research center*" OR "research platform*" OR "technology" OR "technologies" OR "technology center*" OR "transdisciplinary"                                   |
| Broad dissemination to enhance scientific and technological understanding            | "blog" OR "blogs" OR "broader community" OR "broad audience*" OR "citizen science" OR database* OR "dissemination" OR "diverse media" OR "DLESE" OR "exhibits" OR "informal science education" OR "knowledge transfer" OR "libraries" OR "library" OR museum* OR "nature center*" OR "public accessibility" OR "public engagement" OR "public outreach" OR "radio show*" OR "science center"   |
| Benefits to society  | "decision maker*" OR econom* OR "environmental management" OR "environmental policy" OR "federal agencies"~5 OR hazard* OR "local agencies"~5 OR "national interest" OR "policy analysis" OR "policy maker*" OR "policy tool*" OR "public health" OR "public participation" OR "public policy" OR "public safety" OR "public service" OR "public welfare" OR "risk assessment" OR "societal impact*" OR stakeholder* OR "state agencies"~5 |



# Teaching in BI

Table 2. Projects among Divisions within the Geosciences Directorate (GEO), and among Directorates, that mention in the project description at least one of the search-terms that describe each BI criterion. Numbers reported for each criterion are all percentages, reflecting the annual average (2007-2012) with standard deviation in parentheses. The top number is the % of awarded projects that mention the BI criteria, the middle number is the % of declined projects that mention the BI criteria, and the bottom number is the success rate (%) of projects that mention the BI criteria (i.e., the % that result in awards). \* The EHR Directorate is unique in that the IM criteria use very similar terms to the BI criteria because its mission is directly concerned with education.

| BI criteria  | Division                   |                            |                            |                            | Directorate                |                            |                            |                            |                            |                            |                            |
|--|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
|  | EAR                        | AGS                        | OCE                        | PLR                        | BIO                        | CSE                        | ENG                        | GEO                        | MPS                        | SBE                        | EHR*                       |
| Advance discovery and understanding while promoting teaching, training, and learning | 76 (2)<br>92 (1)<br>31 (4) | 62 (3)<br>82 (3)<br>42 (5) | 60 (3)<br>92 (2)<br>33 (5) | 63 (6)<br>88 (6)<br>39 (6) | 58 (4)<br>91 (1)<br>22 (3) | 87 (4)<br>91 (1)<br>24 (3) | 50 (3)<br>81 (2)<br>19 (2) | 69 (2)<br>90 (2)<br>34 (4) | 77 (5)<br>89 (2)<br>30 (3) | 59 (3)<br>67 (1)<br>23 (3) | 78 (1)<br>97 (1)<br>21 (4) |
| Broaden participation of underrepresented groups                                     | 41 (2)<br>55 (6)<br>29 (5) | 27 (4)<br>40 (5)<br>40 (9) | 31 (3)<br>51 (6)<br>32 (6) | 39 (4)<br>52 (6)<br>40 (7) | 50 (3)<br>77 (2)<br>22 (2) | 66 (5)<br>71 (4)<br>24 (3) | 41 (3)<br>68 (3)<br>19 (2) | 37 (1)<br>51 (5)<br>33 (5) | 52 (4)<br>61 (3)<br>30 (3) | 59 (1)<br>69 (1)<br>23 (4) | 71 (2)<br>86 (1)<br>22 (4) |
| Enhance infrastructure for research and education                                    | 77 (3)<br>93 (6)<br>31 (4) | 65 (5)<br>82 (3)<br>43 (4) | 64 (2)<br>89 (1)<br>36 (5) | 70 (4)<br>93 (3)<br>40 (6) | 56 (4)<br>88 (2)<br>22 (2) | 95 (2)<br>96 (1)<br>25 (3) | 62 (4)<br>96 (0)<br>20 (2) | 72 (2)<br>89 (1)<br>35 (4) | 73 (2)<br>86 (1)<br>30 (3) | 75 (1)<br>85 (1)<br>23 (3) | 78 (1)<br>97 (1)<br>21 (4) |
| Broad dissemination to enhance scientific and technological understanding            | 56 (4)<br>71 (7)<br>30 (4) | 42 (3)<br>61 (5)<br>40 (6) | 46 (3)<br>69 (4)<br>34 (5) | 56 (4)<br>78 (3)<br>38 (8) | 49 (2)<br>77 (3)<br>22 (2) | 76 (2)<br>82 (2)<br>24 (3) | 39 (2)<br>62 (2)<br>19 (2) | 52 (3)<br>70 (4)<br>34 (4) | 46 (3)<br>57 (3)<br>29 (3) | 60 (3)<br>69 (2)<br>23 (3) | 74 (2)<br>91 (2)<br>21 (4) |
| Benefits to society  | 39 (2)<br>51 (5)<br>30 (4) | 25 (2)<br>36 (6)<br>39 (6) | 25 (2)<br>37 (3)<br>35 (5) | 32 (5)<br>38 (2)<br>43 (8) | 22 (2)<br>35 (3)<br>21 (3) | 47 (5)<br>50 (4)<br>24 (3) | 40 (3)<br>59 (4)<br>20 (2) | 33 (2)<br>44 (4)<br>34 (4) | 22 (2)<br>29 (2)<br>28 (3) | 66 (2)<br>75 (1)<br>23 (3) | 59 (3)<br>73 (2)<br>21 (4) |
| Average number of projects:<br>(Standard deviation)                                  | 1444<br>(236)              | 705<br>(95)                | 1113<br>(93)               | 512<br>(58)                | 6552<br>(891)              | 5086<br>(418)              | 11233<br>(1496)            | 3860<br>(330)              | 7906<br>(781)              | 4424<br>(490)              | 4458<br>(724)              |
| Average success rate:<br>(Standard deviation):                                       | 35<br>(4)                  | 49<br>(5)                  | 43<br>(5)                  | 47<br>(7)                  | 30<br>(4)                  | 25<br>(3)                  | 27<br>(2)                  | 40<br>(4)                  | 34<br>(4)                  | 26<br>(4)                  | 25<br>(4)                  |



- CTE has (or can help you find) pedagogical resources that you need
- CTE offers “seed grants” (competitive) for BI related to undergraduate teaching (TAG, Teaching Fellows Program)
- CTE can connect you with those working on, or interested in, similar things on/off campus

*Watch for our announcements through **ALLFAC-L**, or, subscribe to **OSET-L** in [list.unm.edu](mailto:cte@unm.edu); e-mail us suggestions, questions, & inquiries: [cte@unm.edu](mailto:cte@unm.edu); [AmyPChen@unm.edu](mailto:AmyPChen@unm.edu)*



# Data Management Planning & Broader Impacts

Jon Wheeler [jwheel01@unm.edu](mailto:jwheel01@unm.edu) | Karl Benedict [kbene@unm.edu](mailto:kbene@unm.edu) | [rds@unm.edu](mailto:rds@unm.edu)



# Data Management Plan

- From the GPG:
  - *...increased public scientific literacy and public engagement with science and technology... (II.C.2.d.i)*
  - *The Data Management Plan will be reviewed as an integral part of the proposal, considered under Intellectual Merit or Broader Impacts or both, as appropriate for the scientific community of relevance (II.C.2.j).*
- Public Engagement
  - Make data available in a timely manner, in diverse media and formats.
  - Present research in formats useful to the public, policy makers, non-scientists.

# Broader Impact Statement

- Societal Benefits of Research
  - Development of an informed and scientifically literate public
  - Data driven policy decisions
  - Documentation and characterization of research
- Educational & Outreach Activities that Benefit Society
  - Curriculum development and resources (learning objects)
  - Integrate research with education activities
  - Workforce development



# NSF EPSCoR as an Example of Planning for Maximum Broader Impacts

- **Data Management Training** for project participants
- **Robust Documentation** through submission, review and support for researchers
- **Discovery and Access** through value-added data management platform/portal (with integration with DataONE & Data.gov)
  - [https://www.nmepscor.org/data\\_portal/browse-data](https://www.nmepscor.org/data_portal/browse-data)
- Long-term discovery and access through **UNM's Institutional Repository**
  - <http://digitalrepository.unm.edu/energizenm/>

# We're Here to Support You

- Data Management Plan Development
  - IRB Protocol Data Security Plan Support
  - Data management training & instruction
  - Infrastructure support
  - Data management, analysis, visualization, and preservation consultation
- <http://libguides.unm.edu/data>
  - Contact Us:
    - Jon - [jwheel01@unm.edu](mailto:jwheel01@unm.edu)
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  - [RDS@unm.edu](mailto:RDS@unm.edu)

# Faculty Research Development Office Proposal Support

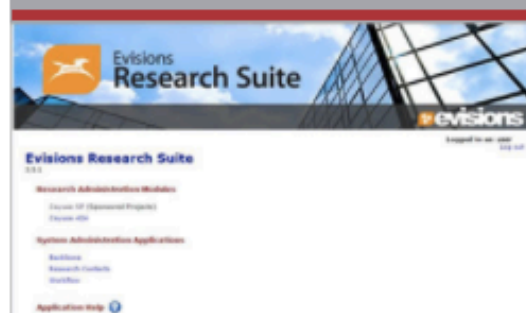
## PROPOSAL PLANNING & EDITING SUPPORT

The FRDO and the FRSO network provide a number of services highlighted below relative to proposal planning, editing, and preparation. If you would like to request this kind of support, please click the button below. The [Office of the Vice President for Research](#) also provides faculty on campus access to external review services provided by Hanover. More details concerning that resource are below.

Submit a  
Request for Proposal Support

## Proposal Preparation and Editing Support

### CAYUSE SUPPORT



### COORDINATE INTERDISCIPLINARY PROPOSALS



### EDITING & FORMATTING



### COMMUNICATING WITH COLLABORATORS



### BUDGET PREPARATION



### SOLICITATION ANALYSIS



# FACULTY RESEARCH DEVELOPMENT NETWORK DIRECTORY

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**Director**

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Office of the VP for Research

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Office of the VP for Research

## COLLEGE EMBEDDED FACULTY SUPPORT TEAM

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School of Architecture+Planning  
Research

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**Phone:** (505) 277-2111

College of Fine Arts Research

# What to do now...

- Contact your NSF Program Manager
- Find a mentor with CAREER experience
- Plan your time line
- Use UNM resources
  - <http://frdo.unm.edu>
  - [@UNMFRDO](#)





# Try “Shut Up and Write”



- Quiet time scheduled at the ADVANCE work space in the Communications and Journalism Building
- Every other Friday starting 3/31 from 1:30-3:30
- Every other Tuesday starting 4/4 from 2-4