# NSF EPSCoR*
# Research Infrastructure (RII)
# Track-1 Pre-Proposal Orientation

*September 4, 2018*

*__E__stablished __P__rogram to __S__timulate __Co__mpetitive __R__esearch

# AGENDA

1. Introductions (Gayle Dana)
2. NSF EPSCoR Track-1 Program (Gayle Dana)
3. Letter of Intent to submit pre-proposal (Gayle Dana)
4. Pre-proposal format and content (Gayle Dana)
5. Pre-proposal required forms (Marcie Jackson)
6. Budget/budget justification requirements (Marcie Jackson)
7. Pre-proposal submission (Marcie Jackson)
8. Review Process (Gayle Dana)
9. Timeline (Gayle Dana)
10. Preparing a competitive pre-proposal (Kelvin Chu, TIG)

# Introductions

- Name
- Institution, Department
- Research Interests
- Part of a Pre-proposal Team?
- Pre-proposal topic

# NSF EPSCoR
# RII Track-1 Program

Gayle Dana, Nevada NSF EPSCoR Project Director

# RII Track-1 Awards

- NSF's only state-based program
- Primary goal is to improve research competitiveness of the jurisdiction
- A jurisdiction can submit only one proposal to the Track-1 program
- This internal NSHE competition will determine the pre-proposal most likely to result in an award under NSF's 2019 competition

# NSF EPSCoR Track-1 Goals

- ***Catalyze*** new research capabilities and knowledge
- ***Establish*** sustainable STEM education, training, and professional development pathways
- ***Broaden*** diversity in the project's STEM
- ***Engage*** partners
- ***Impact*** research, education, and economic development in academia, government, private sector

# Foremost

- Intellectual merit, broader impacts, and research hypotheses/questions provide the rationale for the infrastructure investments requested in pre-proposal

# Activity Examples - *relevant to topic area*

- Hypothesis/question-driven research
- Startup funding for new faculty
- Attract/retain established faculty
- Integration of multi-institutional and multidisciplinary research
- Connections with private sector, industry, national laboratories
- Acquisition of equipment for research
- Involvement of 2-year, 4-year, and minority servicing institutions
- High potential for transformative outcomes, revolutionizing disciplines, creating new fields, disrupting accepted theories

# NSF and NSHE Topic Requirements

- Alignment with priorities in the 2015 NSHE Science and Technology Plan;
- Alignment with current scientific and engineering grand challenges, either NSF's Big Research Ideas or NSF-relevant grand challenges put forth by other agencies or entities;
- Topics funded by NSF's regular programmatic and cross-cutting areas; and
- Leverage the strengths of all three NSHE research institutions.

# NSF's Big Research Ideas

1. Harnessing the Data Revolution
2. The Future of Work at the Human-Technology Frontier
3. Navigating the New Arctic
4. Windows on the Universe: The Era of Multi-Messenger Astrophysics
5. The Quantum Leap: Leading the Next Quantum Revolution
6. Understanding the Rules of Life: Predicting Phenotype

# Desirable but not required:

- Alignment with NSF's Big Process Ideas
  1. Mid-scale Research Infrastructure
  2. NSF 2026
  3. Growing Convergence Research
  4. NSF INCLUDES

# Letter of Intent (LOI)

Gayle Dana, Nevada NSF EPSCoR Project Director

# LOI's are required

- A LOI is required for submitting a pre-proposal
- LOI does not bind you to:
  - Submitting a pre-proposal
  - Specifics stated in LOI abstract

# LOI required format

- Draft title of the project;
- Name, department, and institution of PI/Co-PIs;
- Names, departments, and institutions of additional collaborating faculty; and
- Abstract of the project (one-page maximum) that describes the work in sufficient detail to
  - Determine relevance to the NSF EPSCoR RII Track-1 program
  - Aid in selection of qualified reviewers.

# LOI Submission

- Use online form:
  - https://epscorspo.nevada.edu/nevada-nsf-rii-track-1-letter-of-intent/
- Submission deadline:
  - Monday, October 1, 2018 by 5pm PDT

# Pre-proposal Format and Content

Gayle Dana, Nevada NSF EPSCoR Project Director

# Font and Page Guidelines

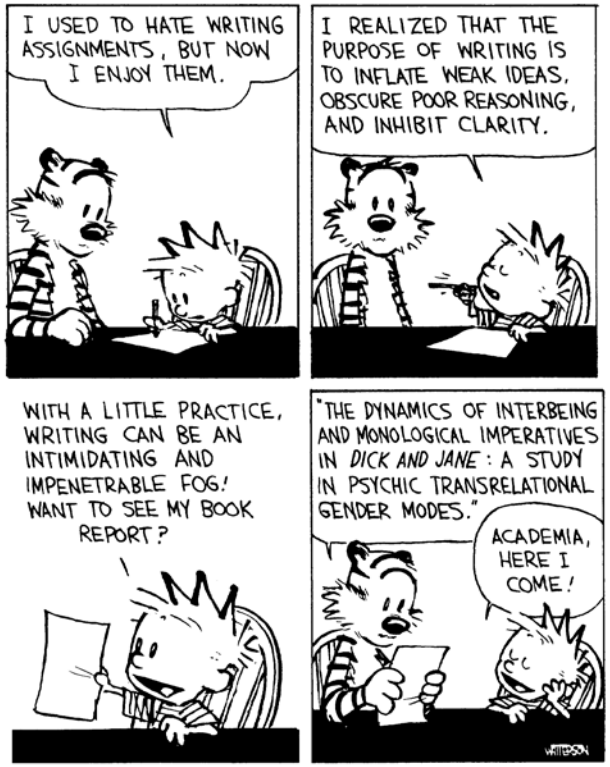
- Font: Times New Roman
- Font Size: 11pt
- No more than 6 lines per inch
- Margins: 1 inch on all sides
- Page Limits:
  - Project Summary 1 page
  - Project Description 16 pages maximum
    - Status and Overview 2 pages max
    - Research Program 12 pages max
    - Partnerships and Collaborations 2 pages max

# Project Summary

*(1 page max)*

NOT!

- Clear vision and goals
- Potential impact
- Scope and research
- Research integration
- Separate statements of:
  - Intellectual merit
  - Broader impacts
- Alignment with Nevada S&T Plan



# Projection Description

## 1. Status and Overview

*(2 pages max)*


- Current status of Nevada R&D in proposed topic
- Strengths, barriers, opportunities
- Rationale for scientific vision
- How proposed implementation mechanisms and infrastructure support will
  - Mitigate identified barriers
  - Improve academic research competitiveness
- Alignment of proposed research with Nevada S&T Plan research priorities

# Projection Description

## 2. Research Program

*(12 pages max)*

- Research goals, intellectual focus, activities
- Evidence for intellectual merit and broader impacts of research activities
- Present proposed research in context of:
  - Other efforts in the field (with references)
  - Major scientific challenges
  - Current knowledge gaps
  - Novelty/originality

# Projection Description

## 2. Research Program, cont.

- Describe research with sufficient detail for review by experts in the field:
  - Scientific hypotheses
  - Goals
  - Research and training methods
    - Lab, field, theoretical, computational, or other
- Innovative use of cyberinfrastructure is encouraged:
  - Proposed developments, improvements, and/or deployment of cyberinfrastructure must be integrated with project goals

# Projection Description

## 2. Research Program, cont.

- Research Program section should detail:
  - Senior leader leadership
  - Estimates of postdoctoral, graduate, undergraduate research participants
  - Available and planned resources to attain goals
  - Infrastructure improvements proposed
  - Plans for coordination and collaboration among investigators and organizations within NSHE, nationally and internationally
  - Description of what a “Center of Excellence” in proposed research area would look like at end of 5 year award period and how funded

# Projection Description

## 2. Research Program, cont.

- Research Program section should also detail how the proposed research:
  - Builds on strengths of UNLV, UNR, and DRI and how each will contribute meaningfully to the proposed research
  - Aligns with Nevada S&T Plan priorities
  - Aligns with NSF relevant scientific and engineering grand challenges or NSF's Big Research Ideas
  - Advances frontiers of knowledge
  - Advances Nevada's future competitiveness in the proposed research area

# Projection Description

## 2. Research Program: *Seed Funding and Emerging Areas*

- Flexible mechanism for
  - Responding quickly to new opportunities
  - Pursuing high-risk, high impact, potentially transformative research
- Identify
  - Investment areas with relevance/synergy of, and integration with the research program
  - Mechanisms to be employed to catalyze research in emerging areas
    - Funding amounts
    - Duration of seed projects
  - Criteria and mechanisms for selecting and evaluating seed project
- Funding may not exceed 10% of the annual NSF RII Track-1 project budget

# Projection Description

## 3. Partnerships and Collaborations

*(2 pages max)*

- Describe plan for creating partnerships and collaborations that promote:
  - Innovation and STEM-pipeline development within Nevada, regional, national, or international
  - Partnerships with nationally recognized R&D centers are encouraged:
    - Federal and industrial R&D laboratories
    - NSF-sponsored research centers
    - Academic institutions with nationally recognized research capabilities

# Projection Description
## 3. Partnerships and Collaborations, cont.

- Proposed activities should:
  - Demonstrate how anticipated partnerships and collaborations
    - Directly contribute to attaining project goals
    - Integrate with the proposed Research Program
  - Increase competitiveness
  - Build and strengthen the STEM Pipeline
  - Provide opportunities for commercialization of research products
  - Pave the way for economic development

# Projection Description
## 3. Partnerships and Collaborations, cont.

- Proposed activities should also:
  - Clearly articulate goals, milestones, and timelines
  - Specifically articulate partnerships with large NSF or federally funded projects, including cyberinfrastructure resources, if applicable
- Proposed partnerships may involve unfunded partners or stakeholders

# When in doubt

- Recheck pre-proposal solicitation guidelines
  - https://epscorspo.nevada.edu/opportunity/nevada-nsf-rii-track-1-program-pre-proposal/
- Ask Project Director, Gayle Dana
  - Gayle.dana@dri.edu
  - 530-414-3170

# Pre-proposal Required Forms

Marcie Jackson, NSF EPSCoR Project Administrator

# Pre-proposal Required Forms
## Cover Page

- **Fill out online Cover Page form**
  - Click the “NEXT” button at the bottom of the main Pre-proposal Solicitation Web site to access the online Cover Page form:
  - https://epscorspo.nevada.edu/opportunity/nevada-nsf-rii-track-1-program-pre-proposal/

# Pre-proposal Required Forms
## Biographical Sketches

- Each faculty and equivalent level participant
- 2-page limit per person
- Use NSF instructions:
  - https://www.nsf.gov/pubs/policydocs/pappg18_1/pappg_2.jsp - IIC2f

# Pre-proposal Required Forms
# Facilities, Equipment & Other Resources

**Use Template Attached to Solicitation**

- Laboratories, Clinical/Animal, Computer Equipment, Office Equipment, Other, Major Equipment
- Used to assess adequacy for organizational resources
- Describe only those resources that are directly applicable
- Description should be narrative in nature and not include quantifiable financial information

Significant modifications to building, acquire a new building or land, or make arrangements to use other facilities for the focal area – must be explained in a letter of commitment

# Pre-proposal Required Forms
## Participants and Partners

**Use Template Attached to Solicitation**

- List all NSHE participants
  - Faculty level or equivalent or other key personnel; include named subcontractors
  - Include key personnel, even if not receiving funding
- All organization partners
  - Other research institutions
  - Industry
  - Government agencies
  - Non-profit organizations

# Pre-proposal Required Forms
## Letters of Commitment

- Specific commitments from participating institutions are required for:
  - New faculty hires or other key personnel
  - Significant modifications to a building
  - Acquisition of a new building or land
  - Sharing of data or facilities

# Budget and Budget Justification

Marcie Jackson, NSF EPSCoR Project Administrator

# Budgets
## Awards and Subawards

- NSF EPSCoR is a state-based program
- Nevada System of Higher Education (NSHE) will be the prime recipient of the NSF EPSCoR RII Track-1 award
- The NSHE institutions – UNR, UNLV, DRI, CSN, GBC, NSC, TMCC, WNC – are considered sub-recipients and will receive subawards from NSHE

Nevada System of Higher Education Sponsored Programs
EPSCoR NEVADA

# Budgets
# Budget Requirements: Routing

- PIs are responsible for routing pre-proposals through the appropriate channels at their institutions
- Proposals that do not have AOR approval or are not submitted by their sponsored programs office will not be accepted
- Allow sufficient time for your institutions to approve your proposals -- contact them now
- Your Sponsored Programs Offices and Business Managers are there to assist you!
  - Please reach out to them early in the pre-proposal process
  - They will be especially helpful with your budgets/budget justifications

Budgets included in the winning pre-proposal will be subject to revision by the Project Director and Project Administrator, including incorporating costs split between federal and state special project matching funds.

# Budgets
# Budget Preparation

**Use Template Attached to Solicitation**

- Budgets (direct plus indirect costs) must not exceed $15M total
- Pre-proposals must contain a budget for each year of support requested (Years 1-5) and a cumulative budget
- Each institution is required to provide a budget
- Include appropriate annual increases for salary, fringe and tuition costs
- Include travel for annual statewide meetings each year
- Use the NSF budget line items
- Your institutions will “translate” the NSF budget lines into the institutional budget lines after you receive your subaward

Budgets must be no less than 20% and no more than 50% of the total budget from any research institution

# Budgets
# Budget Justification

- Amounts requested for each budget line item must be documented and justified in the budget justification (3 pages per institution max)
- As a general policy, NSF limits salary compensation for senior project personnel to no more than two months of their regular salary in any one year. This limit includes salary compensation received from all NSF-funded grants
- Please refer to the NSF Grant Proposal Guide (GPG) Chapter II.C.2.g for detailed information on budgets

Budgets included in the winning pre-proposal will be subject to revision by the Project Director and Project Administrator, including incorporating costs split between federal and state special project matching funds.

# Pre-proposal Submission

- Convert entire pre-proposal (sections 1-9, in Section VII of solicitation) to one PDF file and upload at:
- https://epscorspo.nevada.edu/opportunity/nevada-nsf-rii-track-1-program-pre-proposal/
- Deadline: Monday, November 19, 2018 by 5pm

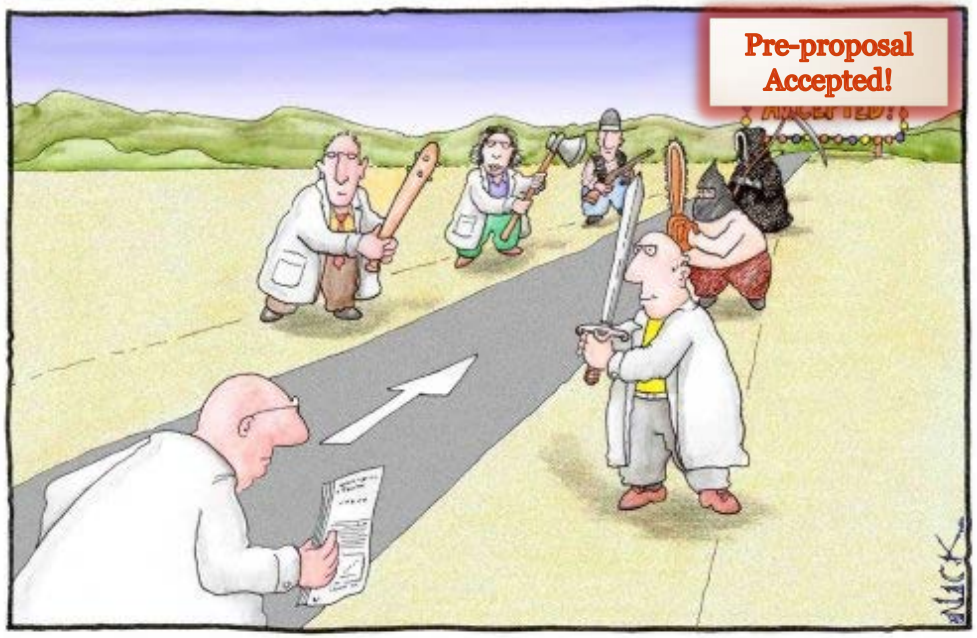
Pre-proposals will only be accepted if signed by and submitted by the PI's authorized organization representative.

# Pre-proposal Review Process

Gayle Dana, NSF EPSCoR Project Director

# Review Process

- External peer review panel
- Review Criteria
  - Intellectual merit
  - Broader impacts
  - Solicitation specific
- NSHE RAC selects winning pre-proposal
- NVEAC approves selection




Most scientists regarded the new streamlined peer-review process as 'quite an improvement.'

Make sure your pre-proposal addresses all review criteria as outlined in the solicitation

# Anticipated Timeline

| Event | Date |
|---|---|
| Pre-proposal workshop | September 4, 2018 |
| LOIs due | October 1, 2018 |
| Pre-proposals due | November 19, 2018 |
| External review completed | early January 2019 |
| Pre-proposal team selected | early January 2019 |
| Full proposal development begins | mid-January 2019 |
| Solicitation released by NSF | early May 2019* |
| Proposal due to NSF | early August 2019* |
| Notification of Awards | Spring 2020 |
| Awards made | Summer 2020 |

# Preparing a competitive pre-proposal

Dr. Kelvin Chu
Vice President
The Implementation Group
kchu@tigdc.com

# RII Track-1 Overview

- Hypothesis-driven, not discovery-based, research is key. The infrastructure and increased research capacity are consequences of the cutting-edge research that happens as part of the project
  - Review includes non-EPSCoR NSF program staff, Director's Review Board
- The goal should not be the RII Track-1 award. The award helps you achieve is the means to achieve a goal.
  - Sustainability, strategy, execution

# RII Track-1 Overview +

- "These proposals are unique in their jurisdiction-wide scope and complexity; in their integration of individual researchers, institutions, and organizations; and in their role in developing the diverse, well-prepared, STEM-enabled workforce necessary to sustain research competitiveness and catalyze economic development." (NSF 17-562)

- Project alignment is critical:
  - Topic
  - Teams

# What has been funded recently

- 5 new RII Track-1 projects in FY 2017
  - Alabama, OIA-1655280
  - Kansas, OIA-1656006
  - Rhode Island, OIA-1655221
  - South Carolina, OIA-1655740
  - Wyoming, OIA-1655726

T.I.G.
The Implementation Group

# CPU2AL: Connecting the Plasma Universe to Plasma Technology in Alabama

- Experimental, theoretical, and computational approaches to understand, predict, and control low temperature plasma (LTP) processes and properties. Improve understanding of plasma kinetics, collective processes such as turbulence and self-organization, and plasma interactions with solid, liquid, biomaterials, as well as plant seeds and food.
- Knowledge will be used to develop new technologies for aerospace, manufacturing, medicine, agriculture, and food safety.
- Share resources, leverage partnerships among AL institutions and industries as well as establish national and international collaborations to strengthen research capacity and to build and train an inclusive workforce in plasma science and technology.
- CPU2AL will facilitate plasma science and technology related programs that reach all levels of education: faculty, postdoc, and student exchanges among all participating institutions, industry internships, summer undergraduate research programs with international opportunities, cross-institutional courses, workshops and training sessions for industry workers, and open houses with student poster and K-12 teacher training.

T.I.G.
The Implementation Group

# Microbiomes of Aquatic, Plant, and Soil Systems across Kansas

- Large survey of plant, soil and aquatic microbiomes and their environmental characteristics to develop a mechanistic understanding of microbiome-mediated ecosystem functions; predict ecosystem responses to changes in precipitation and land-use patterns; and identify ways to select for and utilize microbiomes to produce desired characteristics such as increased agricultural productivity or drought tolerance, efficient nutrient utilization, and enhanced soil quality.
- Synergistic with the 2016 White House Initiative to improve understanding of microbiomes
- Kansas is an ideal natural laboratory due to the large gradients in precipitation and land use across the state.
- Integrate research and educational activities to improve STEM education capacity in both urban and rural areas, among mainstream, economically disadvantaged, and first-generation college students, enhance the participation of Native Americans and other under-represented groups, and expand the workforce in microbial, plant, and soil science, genomics, bioinformatics and ecology.

T.I.G.
The Implementation Group

# Rhode Island Consortium for Coastal Ecology Assessment, Innovation, and Modeling (C-AIM)

- Observations, modeling, and technology development in Narraganset Bay (NB) to assess interactions between organisms and ecosystem function and investigate ecological responses to environmental events (hypoxia and algae blooms). Network of observational platforms will be networked to trigger enhanced water sampling and sensing during specific environmental events, such as hypoxic conditions or phytoplankton blooms. Biogeochemical, ecological, and coastal circulation models will be integrated and coupled to focus on eutrophication and pollutant loading. New sensing technologies for nutrients and pollutants will be developed, including affordable, micro-fluidic (Lab-on-a-Chip) devices with antifouling capabilities.
- Establish RI STEAM Imaging Consortium to foster collaboration between artists, designers, engineers, and scientists. Research internships for undergraduates; seed funding for research projects for PUIs.

T.I.G.
The Implementation Group

# Materials Assembly and Design Excellence in South Carolina: MADE in SC

- Combine computation and experiment to design materials with specific desirable properties using a Materials Genome Initiative (MGI) framework. Research thrusts: 1) hierarchical structures with controlled optical and magnetic properties; 2) stimuli-responsive polymeric materials; and 3) rational design of interactive biomaterials.
- The project will advance fundamental knowledge of complex materials while simultaneously working toward the development of products with valuable commercial applications, such as improved lasers, water treatment, and regenerative medicine.
- The project will hire seventeen new faculty researchers at institutions across the state.
- MADE in SC will work to improve STEM capacity in South Carolina through college curriculum improvements and professional development activities for high school teachers.
- Advance fundamental understanding of the chemical and physical drivers of material properties while realizing new materials with desirable properties for commercial applications.

T.I.G.
The Implementation Group

# Linking Microbial Life to Ecosystem Services Across Wyoming's Dynamic Landscape

- Collect samples of microbes from thousands of sites across Wyoming that differ in their local climate, land use, and plant life to understand the environmental roles of the microbes and their responses to changes in precipitation, soil properties, land use. Predict how different regions will respond to environmental disturbances and provide policy makers tools to better manage natural resources.
- Train workers how to handle the huge volumes of data generated by such research; data science training will serve the technology workforce needs of WY and benefit state economy.
- Outreach efforts to Native American, Latino, and hearing-impaired students will promote diversification of the workforce trained in STEM fields.
- Position the University of Wyoming as a national leader in microbial ecology and data science.

# Topic: Alignment with NSF

- Topic area:
  - Have a “Grand Challenge” question;
  - Consider alignment with an NSF priority area (Big 10 ideas, agency-wide initiatives)

- Questions to consider:
  - Is the topic area an area funded by NSF?
  - Do you know what NSF program areas you would apply to for this topic area?
  - Do you have success in being funded by these programs?
  - Do you know NSF staff in the program area?

# Topic: Alignment with Nevada

- Why is **your project** right for Nevada?
- Need to be aligned with state Science and Technology plan;
- Need to have buy-in across the jurisdiction (HEIs including MSIs, State, private sector);
- Need to convince panel that Nevada is the BEST place to do this project;

# Strategies

- EPSCoR dollars are catalytic, not foundational.
- The award is not the goal.  The award is the means to achieve the goal.
- Collaboration and teamwork are critical.

# Recommendations for pre-proposals

- Problem has national, state importance
- Hypothesis-driven
- Broadening participation
- Representation from across Nevada institutions
- Has an NSF focus
- Is able to result in a sustainable center that will live beyond the award period
- Has an economic impact
- Is the right project for Nevada