

### BOARD OF TRUSTEES' RESEARCH AND ECONOMIC DEVELOPMENT COMMITTEE AGENDA AND MATERIALS

September 20, 2023 1:00 – 3:00 p.m.

#### <u>AGENDA</u> RESEARCH AND ECONOMIC DEVELOPMENT COMMITTEE September 20, 2023 1:00 – 3:00 pm Salon C

#### **Discussion:**

AI Initiative

Parag Chitnis Alex Kean

#### **Research Presentations**

New Faculty with Computing expertise

- 1. Dr. Shivanand Sheshappanavar Assistant Professor, EECS *"Geometric Intelligence Research Lab"*
- 2. Dr. Ellen Aikens Assistant Professor, School of Computing *"Environmental data science to advance ecological research and conservation."*
- 3. Dr. Sean Field Assistant Professor, School of Computing *"Applied Computing in Archaeology & Beyond."*
- 4. Dr. Stefan Rahimi Assistant Professor, Atmospheric Science *"Setting a new standard for physics-based climate projections."*

### **Regular Meeting:**

1. RED Division updates.

Parag Chitnis Shawna McBride Bryant Smalley

#### RESEARCH AND ECONOMIC DEVELOPMENT COMMITTEE COMMITTEE MEETING MATERIALS

#### AGENDA ITEM TITLE: AI Initiatives – Parag Chitnis, Alex Kean

☑ PUBLIC SESSION

 $\Box$  EXECUTIVE SESSION

#### PREVIOUSLY DISCUSSED BY COMMITTEE:

🛛 Yes

□ No

FOR FULL BOARD CONSIDERATION:

□ Yes [Note: If yes, materials will also be included in the full UW Board of Trustee report.]
 ☑ No

Attachments/materials are provided in advance of the meeting.

#### EXECUTIVE SUMMARY:

Vice President Chitnis and Vice President Kean will lead a discussion on the proposed University of Wyoming AI Initiative. Building AI Expertise for Enhancing Student Success and Statewide Economic Growth.

PRIOR RELATED BOARD DISCUSSIONS/ACTIONS:

WHY THIS ITEM IS BEFORE THE COMMITTEE: Informational update

ACTION REQUIRED AT THIS COMMITTEE MEETING: N/A

PROPOSED MOTION: N/A

#### RESEARCH AND ECONOMIC DEVELOPMENT COMMITTEE COMMITTEE MEETING MATERIALS

#### AGENDA ITEM TITLE: Presentation – Faculty in School of Computing – Parag Chitnis

☑ PUBLIC SESSION

 $\Box$  EXECUTIVE SESSION

#### PREVIOUSLY DISCUSSED BY COMMITTEE:

□ Yes

🛛 No

FOR FULL BOARD CONSIDERATION:

□ Yes [Note: If yes, materials will also be included in the full UW Board of Trustee report.]
 ☑ No

Attachments/materials are provided in advance of the meeting.

#### EXECUTIVE SUMMARY:

In every in-person meeting of the Research and Economic Development Committee of the UW Board of Trustees, research presentations in certain areas of UW's research enterprise are included. For September's meeting a variety of New Faculty with Computing expertise have been invited to present their current and planned research.

PRIOR RELATED BOARD DISCUSSIONS/ACTIONS: N/A

WHY THIS ITEM IS BEFORE THE COMMITTEE: Informational

ACTION REQUIRED AT THIS COMMITTEE MEETING:

N/A

**PROPOSED MOTION:** 

N/A

#### RESEARCH AND ECONOMIC DEVELOPMENT COMMITTEE COMMITTEE MEETING MATERIALS

#### AGENDA ITEM TITLE: RED Division Updates – Parag Chitnis

☑ PUBLIC SESSION

 $\Box$  EXECUTIVE SESSION

#### PREVIOUSLY DISCUSSED BY COMMITTEE:

🛛 Yes

🗆 No

FOR FULL BOARD CONSIDERATION:

□ Yes [Note: If yes, materials will also be included in the full UW Board of Trustee report.]
 ☑ No

Attachments/materials are provided in advance of the meeting.

EXECUTIVE SUMMARY:

Opening remarks and REDD update to include, New Industry and Strategic Partnership Office, New EPSCoR/IDEA Office, Streamlining research administration processes.

PRIOR RELATED BOARD DISCUSSIONS/ACTIONS:

WHY THIS ITEM IS BEFORE THE COMMITTEE: Informational update

ACTION REQUIRED AT THIS COMMITTEE MEETING: N/A

PROPOSED MOTION: N/A

#### University of Wyoming AI Initiative: Building AI Expertise for Enhancing Student Success and Statewide Economic Growth

Artificial Intelligence (AI) is transforming industries, education, and society. AI holds the promise of substantial advancements across Wyoming's core economic sectors, including oil and gas, mining, agriculture, tourism, wildlife conservation, and manufacturing. AI provides unprecedented predictive capability in decision support, automates routine tasks, and helps open new frontiers in research and development. Federal agencies are developing new funding programs in AI to nurture industries of the future. Similarly, large corporations, like <u>Walmart</u>, are rapidly employing AI tools and skills to help their workforce.

To capitalize on these opportunities, many states such as FL, ID, UT, TX, MA, and CA are making major investments in their universities to advance research and workforce development that will leverage the emerging Al-driven economy. To be competitive in the new Al-enabled advances, Wyoming must also invest in Al education, research, and innovation. *Currently, the University of Wyoming (UW) has insufficient expertise in Al.* Increasing the faculty and staff with Al expertise will position UW in providing a significant ROI (return on investment) through increased student enrollment, additional extramural funding, and enhanced industry collaborations. Research agencies such as NSF, DOE, NIH, NIFA, and others are requesting new funds for, and diverting existing funds towards, applications of Al in all disciplines. Companies are looking to partnerships with universities to be able to understand how to respond to pending transformations of their markets. *Facing a dearth of faculty with requisite backgrounds, a significant increase in Al-savvy faculty across UW is needed to be competitive for research funds and corporate partnerships, and to serve the needs of our students in all majors, who will be expected to have Al-related skills in the future.* 

UW aims to establish an AI Initiative across the entire University, and across Wyoming, to trigger economic growth, enhance research capabilities, drive job creation, and prepare our workforce for AI's disruptive transition across market sectors. This initiative requires investments in faculty and technical positions with AI expertise. These investments will:

- Strengthen broadly UW's faculty expertise in AI
  - The core investments will create faculty positions with foundational AI research programs in key units.
  - Additional cluster hires will be developed in key programs linked directly to the state's economy, including energy and mining, agriculture, business, education, engineering, health, and the arts, building upon their established expertise.
  - These faculty will increase UW revenues. They will help UW increase enrollment in computing disciplines and applications across the university. Some community colleges in WY are starting two-year programs in AI; these students can transition to UW and continue their education. Also, the AI faculty will take advantage of new opportunities for additional grants and contracts with research agencies and companies alike.

- Foster WY economic growth through seeding of AI-driven industries
  - Staff will be hired to better support industry partnerships and resources such as the NCAR-Wyoming Supercomputing Center, to enhance entrepreneurial activity, and to connect better to statewide communities, schools, and community colleges.

UW requests the following investments in the UW AI initiative over the next three years. In the FY25-26 biennium budget, \$10 million is requested over two years (of which \$7.5M is for one-time costs).

Year	FY2025	FY2026	FY2027		
Recurring annually	\$0.9 million and recurring annually hereafter	+\$1.6 million (\$2.5 million total recurring annually)	+\$2.0 million (\$4.5 million total recurring annually)		
One time	\$3.2 million	\$4.3 million (\$7.5 million total)	+\$0.2 million		
Biennium budget request					

### Strengthen UW's faculty expertise in AI

#### Year 1 (FY2025)

- Up to 6 new faculty positions (\$0.9 million recurring) in core AI disciplines to be hired in the College of Engineering and Physical Sciences (with focus on EECS) and School of Computing (jointly with departments across UW). These hires will focus specifically on AI and its applications and will augment the expertise that is already in the School of Computing and among those hired through Tier 1 Engineering Initiative in related areas. Examples of such positions include:
  - Explainable AI,
  - Automated Decision Making and Control,
  - Machine Learning and Data Mining,
  - Computer Vision,
  - Natural Language Processing,
  - Generative AI, and
  - Al education
- One-time funds (\$2.8 million) towards faculty start up.
- One-time funds (\$0.4 million) for hiring two scientists for AI-based computing applications working with faculty across campus to enhance external funding from research agencies in AI application areas.

Year 2 (FY2026)

- Up to 8 faculty positions for two cluster hires (\$1.2 million recurring) for AI-driven discoveries in other colleges, allowing interdisciplinary research and AI applications in diverse fields, including energy sciences, social sciences, health sciences, environmental sciences, law, arts, humanities, and others. Some of these faculty may not even have computer science expertise but will have research expertise in social, policy, law, ethics, and other aspects of AI. These cluster hires will focus on one of the industry sectors and challenges relevant to Wyoming (energy, outdoor recreation, agriculture, etc.). Examples of topics for cluster hires include:
  - **Al applications for the Ranch of the Future** Al for predicting invasive species, Al applications in animal migration studies, Robotics for cattle management, Business analytics applications in ranch management, precision prediction of local weather patterns, etc.
  - Al for Energy and Mining- AI-enabled analytics for carbon storage predictions, AI for market analytics (energy, carbon, etc.), AI for geological predictions of mineable critical minerals, AIdriven management of regional hydrogen systems, digital twins for oil fields or geological pore spaces, etc.
  - AI to improve Rural Quality of Life- AI-enabled analytics for health applications, AI for market analytics outdoor recreation and tourism, ethics of AI applications in social programs, AI and IP laws, etc.
- Provide introductory AI classes with hybrid delivery in which community college students or interested faculty will also be able to enroll. Develop a statewide asynchronous online AI course for workforce development and implement alternative credentials (e.g., badges) that would confirm competencies to state agencies or industry employers. Address shortage of Advanced Placement Computer Science offerings in Wyoming (especially for rural schools without a CS teacher) by working with Dept of Education to provide online, asynchronous, offering of AP Computer Science Principles (\$0.3 million one-time funds for development).
- UW will use internal funds to support start-up costs for faculty. It is anticipated that the current faculty and new hires from the previous years will increase the extramural funding to generate additional revenues for the university, thus allowing UW to cover start-up costs.
- One-time funds (\$0.4 million) for hiring two scientists for AI-based computing applications working with faculty across campus.

### Year 3 (FY2027)

- Up to 8 faculty positions for two cluster hires (\$1.2 million recurring) for AI-driven discoveries in other colleges, allowing interdisciplinary research and AI applications in diverse fields, including social sciences, health sciences, environmental sciences, law, arts, humanities, and others. The cluster themes will focus on industry sectors and challenges relevant to Wyoming (energy, outdoor recreation, agriculture, etc.)
- UW will use internal funds to support start-up costs for faculty.
- One-time funds (\$0.2 million) for hiring one scientist for working with faculty across campus in AI-based computing applications.

### Foster economic growth in AI-driven industry

#### Year 2 (FY2026)

• One-time funds (\$3.6 million) for AI-capable computing environment deployed at NWSC.

 Grow the planned UW Industry and Strategic Partnership office in the Research and Economic Development Division to support strengthened relationships with UW across all colleges of the university, providing more opportunities for student internships, sponsored research, and investments from companies (2 staff, \$0.4 million).

#### Year 3 (FY2027)

- Create a focused "UW-NWSC Industry Program" building on UW's ARCC (Advanced Research Computing Center) and the NCAR-Wyoming Supercomputing Center (NWSC), to assist existing Wyoming-based businesses to adopt AI and to attract new industry to the region, catalyzing growth in the southeast Wyoming tech sector, enhancing collaboration with statewide industry. This is based on successful programs in other states (e.g., <u>STAR Industry</u> in Texas) and would include 2 research scientists, (\$0.25 million plus 0.25 million for operational costs of the computer). This was an original aim for NWSC, not yet been realized, but needed more than ever as AI has matured.
- Enhance community partnerships with support staff (three distributed across the state) (\$0.3 million) to work with local communities and their economic development offices, facilitating the development and dissemination of AI literacy.

#### Partnerships, Outcomes and Timelines

This initiative will catalyze partnerships with industry, federal agencies like NSF and DOE, other universities, national laboratories, and regional businesses and communities, fostering a vibrant AI ecosystem to advance both the state's workforce and economy.

Further, the Wyoming Innovation Partnership (WIP) established digital and entrepreneurial activities as central to its efforts and is already establishing numerous transfer programs with community colleges, with software, AI, and cybersecurity training among the digital pathways.

The phased approach with broad searches with thematic cluster hires to implement the AI program across the university will allow us to build strength over time and attract the best faculty available each year, adopting best practices at many universities. The timeline includes setting up infrastructure and resources in the first year, hiring faculty in the second year and beyond, and likewise expanding partnerships and community engagement as staff are hired to support the initiative throughout the timeline.

The UW AI initiative will be managed by an AI coordinator who will monitor the progress and seek opportunities for leveraging external funding opportunities. This will not be a new position but will be additional responsibility for an existing position. An AI Steering Committee with representatives from the Colleges and Schools as well as Research and Economic Development Division will be responsible for decisions and oversight and will report to the President and Provost. Annual reports on progress will be provided.



### Geometric Intelligence Research Lab

Department of Electrical Engineering and Computer Science College of Engineering and Physical Sciences University of Wyoming

### Shivanand Venkanna Sheshappanavar

Tenure-Track Assistant Professor, EECS (Computer Vision and Deep Learning) Ph.D. in Computer Science (University of Delaware) MS in Computer Science (Syracuse University)







Geospatial world



Tango Project

Virtual Reality



Heritage





Infra design

3D face/Medical



DeptIQ



### Grocery Domain

Assist Visually Impaired Robotic Store Management





avocado 11 (2)	banana 12 (3)	bartlett-pear 13 (4)	donjau-pear 14 (4)	red-pear 15 (4)	pear-bosc 16 (4)	coconut 17 (5)	coconut2 18 (5)	dragonfruit 19 (6)	grapefruit 20 (7)	navel-orange 21 (7)	cantaloupe 22 (8)	watermelon 23 (8)	honeydew-melo	on lemon 25 (9)
Lime 26 (9)	nectarine 27 (10)	peach 28 (10)	plum 29 (10)	kiwi 30 (11)	papaya 31 (12)	pineapple 32 (13)	pomegranate 33 (14)	mango 34 (15)	artichoke 35 (16)	broccoli 36 (17)	cucumber 37 (18)	eggplant 38 (19)	garlic 39 (20)	ginger 40 (21)
green-bp 41 (22)	orange-bp 42 (22)	red-bp 43 (22)	yellow-bp	green-cabbage 45 (23)	red-cabbag 46 (23)	ge jalapeno 47 (24)	potato 48 (25)	red-potato 49 (25)	rutabagas 50 (26)	red-onion 51 (27)	whiteonion 52 (27)	yellowonion s	squash-acorn so 54 (28)	Juash-butternut 55 (29)
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ham 86 (53)	ice-tea-gallon 87 (54)	milk 88 (54)	milk-in-cooler 89 (54)	water-gallon	mayonnaise 91 (55)	oreos 92 (56)	peanut-butte 93 (57)	er ranch 94 (58)	tomato-ketch 95 (58)	nup sugar 96 (59)	tropicana-orang 97 (60)	e-juicevitamin 98 (61)	-water vinegar	whip-cream



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Environmental data science to advance ecological research and conservation

### Dr. Ellen O. Aikens

University of Wyoming School of Computing 20 September 2023





### Bridging this gap is fundamentally a big data challenge



Our world is rapidly changing with unknown consequences for wildlife Technology is providing data at scales and volumes previously unimaginable



Computational biology

### Movement ecology

Wildlife biology



## Computational biology

Develop tools and methods to translate data into useful information

Movement ecology

Wildlife biology

NASA

## Computational biology

Develop tools and methods to translate data into useful information

### Movement ecology

Merge tracking technology with remote sensing to provide a lens into resource and habitat requirements Wildlife biology

NASA

## Computational biology

Develop tools and methods to translate data into useful information

### Movement ecology

Wildlife biology

Merge tracking technology with remote sensing to provide a lens into resource and habitat requirements

Applied research that aids in wildlife management and decision making

Global environmental change  Understand how animals make a living in dynamic environments (Ecology)
 Identify threats and anticipate future impacts of global change (Prediction)
 Target conservation and management efforts (Application)

Big data

### Trends in Ecology & Evolution

Learning to migrate

### Aikens et al. 2022

Memory

Social animal migration

Abrahms, Hazen, **Aikens,** et al. 2019, PNAS ww.nature.com/natecolevol / November 2022 Vol. 6 No. 11

### nature ecology & evolution

Aikens et al. 2022

**Aikens** et al. In Revision, PNAS

New sanctions squeeze Iran's science

Scier

books Solar greening in the Sahara p. 2019

Animal culture

ocial information guide

migrations on 972 & 1023

Jesmer, Merkle, Goheen, Aikens, et al. 2018

### Future Directions at the School of Computing

1. Building better environmental datasets



### **Future Directions at the School of Computing**

1. Building better environmental datasets



### 2. Inspiring and training the next generation



## Applied Computing in Archaeology & Beyond



Sean Field SoC & Dept. of Anthropology



Morefield Canyon Great House Village











Morefield Canyon Great House Village









### **Computer Assisted Recognition of Archaeological Sites** (CARAS)



## Computer Assisted Recognition of Archaeological Sites (CARAS)





### **Computer Assisted Sustainable Irrigation** (CASI)



### **Computer Assisted Sustainable Irrigation** (CASI)



Locate Irrigated Areas with LiDAR/High-res satellite Data

Use Image Detection/Machine Learning to Identify Existing Ditches Apply Hydrological Modeling to Determine Optimal Ditch Placement

## **Thank You!**



Sean Field SoC & Dept. of Anthropology

# Setting a new standard for physics-based climate projections

Stefan Rahimi University of Wyoming





## About me

### Stefan Rahimi

B.S./M.S. U. Oklahoma (2012, 2014; meteorology) Ph.D. U. Wyoming (2019; atmospheric science)

Arriving from the UCLA Center for Climate Science (regional modeling lead)

### @ Wyoming

Tenure-Track Assistant Professor, Dept. Atmospheric Science

**Derecho Professor** 

My research focuses on creating trustworthy high-resolution climate change information & delivering it to those who need it most

## GCMs & climate change: what we really want



Global Climate models are not good for informing adaptation planning and mitigation at decision-relevant scales

Terrain height [m] considered in Walton et al. (2020)

## Climate change and big data

- Climate change is continuing to create huge financial losses, especially for insurance companies
- Companies now required to disclose financial risk  $\rightarrow$  huge demand for climate data.
- PBs of high-resolution climate change data have flooded the market, are being used to quantify and constrain climate risk.
- Many of these data products are built on statistics due to compute limitations.
- We have been prioritizing AR6 emissions scenarios across the western U.S., using dynamical downscaling to create better, physics-based climate projections. (Also now moving on to CONUS)

 $\sim$ 

# Thu UCLA dynamically downscaled ensemble

•For the past 4 years, we have been principally been working to improve the physical quality of climate change projections across the western U.S.

•<u>Downscaling</u> utilized the Weather Research & Forecasting (<u>WRF</u>) model

•Expanding from Western US to Conterminous US (CONUS) through new NCAR award



## Downscaling across the western U.S.: The GCMs

Individual GCM responses by end-century

16-GCM mean changes by end-century



## A little more on the future of snow



### At SNOTEL sites:

- Similar trends in SWE changes between the two ensembles, although not true sub-regionally
- Experiments drop below historical 0.1 percentile around 2050.
- In last decade of 21<sup>st</sup> century, maximum SWE-producing GCMs struggle to get above historical 10<sup>th</sup> percentile.

## Improving Processes and Procedures to Enhance Research Productivity

University of Wyoming Board of Trustees Research and Economic Development Committee

September 20-22, 2023





- The Research and Economic Development Division (REDD) is committed to supporting the growth and expansion of the research enterprise at the University of Wyoming.
- To ensure our processes and procedures maximally advance that goal, we have formed four new committees that are examining specific topic areas to create faculty-driven recommendations to improve efficiencies, reduce administrative burden, and maximize impact.



## New Committees

- Faculty Startup Process Advisory Committee
  - Financial support provided to new faculty to help them establish their research upon joining UW faculty
- Contracted Services Advisory Committee
  - Skill- and deliverable-based contracts that are often time-sensitive and limited in scope



## New Committees

- Research Core Facilities Task Force
  - High-tech resources centralized at the University level to make them available to researchers across campus
- Undergraduate Research Advisory Committee
  - Opportunities for undergraduate students to become involved in research experiences (demonstrated benefit to student success)



## Faculty Startup

### • Charge

 Responsible for reviewing current processes and procedures for requesting and expending faculty startup packages and making recommendations for ways to streamline that process

### Intent

- Simplify the process by which units request startup for incoming faculty members (important for offers)
- Improve procedures for expending startup funds



## Faculty Startup

### Final Recommendations

- Increase categories of allowable costs from startup funding
- Increase flexibility in expenditure of funds within approved startup packages
- Expand the threshold for REDD support to include assistance with smaller startup packages

continued



## Faculty Startup

- Final Recommendations (cont.)
  - Establish a threshold below which REDD will support an entire startup package
  - Increase the speed of approvals of startup packages
  - Streamline the Request for Faculty Start-Up Support form



## **Contracted Services**

### • Charge

 Responsible for reviewing current processes and procedures for submitting and approving contracted services and making recommendations for ways to streamline that process

### • Intent

- More efficiently engage in contracted services with industry and other agencies
- Better support faculty who conduct contracted services work



## **Contracted Services**

### Preliminary Recommendations

- Improve communication with contracted services Principal Investigators
- Create expedited approval process for contracted services
- Increase the timeliness of billing and invoicing for contracted services
- Increase the number of central staff focused on contracted services and contract negotiation



## **Core Facilities**

- Recently formed
- Charge
  - Responsible for creating a strategic and operations plan that will define the successful growth and administration of REDD's core facilities to maximize the impact of and access to advanced research instrumentation
- Intent
  - Maximizing impact and sustainability of core facilities
  - Developing a strategy for expansion of core facilities



## **Core Facilities**

### Anticipated Focal Areas

- Improving the administrative structure and policies governing REDD's core facilities
- Developing a strategy to guide the creation, financial support, and sustainability of REDD's core facilities (e.g., revenue generation)
- Creating an approach for collective and efficient operation and management of REDD's core facilities



## Undergraduate Research

- Recently formed
- Charge
  - Responsible for assessing current undergraduate research opportunities at UW and making recommendations for ways to advance undergraduate research
- Intent
  - Grow opportunities for undergraduate students to become involved in research
  - Guide the creation of an Office of Undergraduate Research



## Undergraduate Research

### Anticipated Focal Areas

- Cataloging existing UW initiatives supporting undergraduate research
- Reviewing the implementation and reach of the 2023
  Undergraduate Research and Inquiry Day (URID) and making related recommendations for improvement/enhancement
- Identifying undergraduate research programs/initiatives at other institutions that could be implemented at UW
- Proposing a potential model for establishing an Office of Undergraduate Research at UW



#### Intent and Charge for New REDD Committees

#### • Faculty Startup Process Advisory Committee

- Intent: REDD financially supports faculty startup packages in collaboration with academic Colleges and Schools. As UW continues to progress toward R1 status, creating systems that streamline and simplify the awarding and management of startup funds will be essential in scaling research at the University and in attracting top research talent to the University.
- Charge: The committee will be responsible for reviewing current processes and procedures for requesting and expending faculty startup packages and making recommendations for ways to streamline that process.

#### • Contracted Services Advisory Committee

- Intent: In addition to traditional investigator-initiated research, REDD encourages and supports engagement in industry-sponsored contract work (e.g., execution of contracted tasks/services that typically follow a standard rate sheet or formula-driven budget). Such work presents opportunities to support industry and other agencies with tasks the University possesses expertise in, while also generating new revenue streams to the University. Such work often requires fast turnaround times and it is important to have streamlined procedures for reviewing and approving such work.
- Charge: The committee will be responsible for reviewing current processes and procedures for submitting and approving contracted services, and making recommendations for ways to streamline that process.

#### • Research Core Facilities Task Force

- Intent: Numerous benefits derive from managing research instrumentation in shared core facilities, e.g., in-house spending of external research funding, improved efficiency of sample analysis (lower costs and increased turnaround time), and opportunities for new method development enhancing the research capabilities of UW. The REDD oversees several instrument core facilities operated as research service centers. These facilities currently operate independently but share a common mission and have similar demands for operation, financial accounting, marketing, and compliance.
- Charge: The task force will be responsible for creating a strategic and operations plan that will define the successful growth and administration of REDD's core facilities to maximize the impact of and access to advanced research instrumentation.

#### • Undergraduate Research Advisory Committee

- Intent: Student success literature has repeatedly demonstrated the positive impact of involvement in research during undergraduate studies, ranging from increased persistence to increased attainment of future advanced degrees. UW has historically engaged in several initiatives to increase and/or support undergraduate research, such as the Undergraduate Research and Inquiry Day (URID), but there remain many opportunities to further grow undergraduate research within the University – including the potential establishment of an Office of Undergraduate Research.
- Charge: The committee will be responsible for cataloging existing UW undergraduate research initiatives, making recommendations for ways to improve/enhance URID, identifying undergraduate research programs and initiatives at other institutions that could be implemented at UW, and proposing a potential model for establishing an Office of Undergraduate Research at UW.

## **FACULTY STARTUP PROCESS ADVISORY COMMITTEE** Final Report



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Appendix B Current Startup Request Form

## **Executive Summary**

In order to improve the availability and impact of research startup funds for faculty members across the University of Wyoming campus, the Research and Economic Development Division (REDD) Faculty Startup Process Advisory Committee was formed in Spring 2023, charged with the task of 1) reviewing current processes and procedures for requesting and expending faculty startup packages; and 2) making recommendations for ways to streamline that process. Chaired by the Associate Vice President for Research, the Committee was composed of representatives from the College of Agriculture, Life Sciences, and Natural Resources, the College of Arts and Sciences, the College of Education, the College of Engineering and Physical Sciences, the College of Health Sciences, and the Haub School of Environment and Natural Resources. The Committee met during the Spring semester to review current forms and procedures, solicit feedback from additional stakeholders, and create a set of six key recommendations:

- 1. Increase categories of allowable costs from startup funding
- 2. Increase flexibility in expenditure of funds within approved startup packages
- 3. Expand the threshold for REDD support to include assistance with smaller startup packages
- 4. Establish a threshold below which REDD will support an entire startup package
- 5. Increase the speed of approvals of startup packages
- 6. Streamline the Request for Faculty Start-Up Support form

By focusing on modifiable issues, challenges, and opportunities and crafting specific strategies for improving faculty startup processes and procedures, the Committee's recommendations have the ability to accelerate startup package approval, maximize the impact of startup funding, expand the availability of startup funding in units that have not previously benefited from central startup support, and reduce overall administrative burden for academic units and REDD with relation to approval and expenditure of faculty startup packages.

## Context

### **Background**

The Research and Economic Development Division (REDD) is committed to supporting the growth and expansion of the research enterprise at the University of Wyoming (UW). A critical component of this goal is supporting new UW faculty in establishing productive research programs during their initial years at UW. As such, REDD collaborates with academic Colleges and Schools to jointly financially support startup packages that provide initial seed funding to faculty members. Startup packages are an essential component of faculty recruitment and retention, as well as faculty success. The ability of UW to continue to offer competitive startup packages is essential for the growth of the research enterprise.

REDD and academic Colleges and Schools share the responsibility for supporting startup packages. Certain UW policies and procedures related to that shared responsibility have created unintentional constraints on the impact of startup, the timeliness of startup package approvals, and the units that are able to benefit from startup packages. Three specific policies/procedures in particular have been repeatedly identified as challenges, namely the minimum threshold of College support before central funding will contribute to startup packages, limitations on what types of expenses can be supported by central startup funds, and the logistics of requesting startup (e.g., timeliness of approval and redundancy in procedures).

1.Current REDD policy states that central support is not available until a startup package exceeds \$50,000, at which point REDD will then contribute on a 1:1 match for expenses above \$50,000. This threshold has inadvertently disincentivized units without large discretionary research accounts from offering startup packages (i.e., units that currently generate smaller amounts of indirects from extramural funding do not have the capacity to fully fund startup themselves, and thus are not able to proportionally support expansion of research).

- 2.Current REDD policy also excludes central support for research staff salaries and for faculty summer salary, focusing instead on research supplies, equipment, travel, and renovations. This policy aligns closely with the support of bench science, but has inadvertently limited the ability of researchers in the arts, humanities, social sciences, population health, clinical sciences, and education to receive the critical support of human resources frequently needed to establish and advance their research programs.
- 3. The current Request for Faculty Start-Up Support form includes redundant requests for information and a highly granular level of detail that some have found to be cumbersome.

### Committee Charge

As UW continues to progress toward Carnegie R1 – Very High Research Activity status and the size and scope of research increases at UW, it is important to ensure that startup investments have maximum impact and that administrative burden associated with startup packages is minimized for faculty members, academic units, and REDD. To that end, REDD identified the startup process as an area for quality improvement, with the goal of increasing the campus-wide impact of startup packages and reducing any undue administrative burden associated with the process.

To support that goal, REDD constituted the Faculty Startup Process Advisory Committee in Spring of 2023 (the full Committee Formation Document can be found in Appendix A). The charge of the Committee was to:

Be responsible for reviewing current processes and procedures for requesting and expending faculty startup packages and making recommendations for ways to streamline that process

### **Committee Membership and Activities**

The membership of the Committee was selected to represent various academic units impacted by startup, and included:

- 1. Dr. David Bagley, Associate Dean for Graduate Education and Research, College of Engineering and Physical Sciences
- 2.Dr. Sean McCrea, Chair, Department of Psychology, College of Arts and Sciences
- 3. Dr. Sreejayan Nair, Chair, Department of Pharmaceutical Sciences, College of Health Sciences
- 4. Dr. Jenna Shim, Associate Dean, College of Education
- 5. Dr. Steve Smutko, Associate Dean, Haub School of Environment and Natural Resources
- 6. Dr. Eric Webster, Associate Dean, College of Agriculture, Life Sciences, and Natural Resources
- 7. Dr. Bryant Smalley, Associate Vice President for Research, Research and Economic Development Division (Chair)

The Committee met during the Spring semester. First, the group reviewed current forms and procedures associated with the start-up process and identified initial areas for improvement. The group then solicited feedback from additional stakeholders and discussed each area of improvement at subsequent meetings. Finally, the Committee created a set of six key recommendations presented within this report.

By focusing on modifiable issues, challenges, and opportunities, the Committee's recommendations have the ability to accelerate startup package approval, maximize the impact of startup funding, increase the availability of startup funding in units that have not previously benefited from central startup support, and reduce overall administrative burden for faculty, academic unit staff, and REDD with relation to approval and expenditure of faculty startup packages.

### <u>Connection to the 2023+ Strategic Plan for the University of</u> <u>Wyoming</u>

These recommendations will further support the 2023+ Strategic Plan for the University of Wyoming by supporting the following Key Execution Strategies:

Objective 2: Pursue Institutional Excellence

- Key Execution Strategy A: Raise UW's Scholarly Capacity and Profile Nationally and Internationally
- Key Execution Strategy B: Value and Reward all Teaching, Research, Extension, Engagement, Innovation, Inclusion, and Service Contributions to UW's Mission

Objective 5: Cultivate Financial Stability/Diversification

• Key Execution Strategy C: Grow External Funding for Research and Scholarship across All Disciplines

The Committee would like to thank Vice President Chitnis for his support of faculty startup packages and his willingness to receive recommendations for ways to improve the process.



### Increase Categories of Allowable Costs from Startup Funding

### Recommendation

 Change current policy preventing expenditure of central startup funds on personnel expenses to allow for use of funds for research staff, graduate assistants, and summer salary support for faculty

### **Driving Factors**

- Supporting a broader range of disciplines that heavily depend upon personnel in their research
- Simplifying expenditures by removing differentiation of allowable costs between central funds and unit funds

### <u>Impact</u>

- Increased impact of startup funding for faculty in the arts, humanities, social sciences, population health, clinical sciences, and education.
- Enhanced attractiveness of UW for research-intensive faculty who increasingly expect availability of bridge funding to support summer research during their initial research program establishment
- Expanded research workforce and increased support of graduate students

- Change standard practice to allow for use of funds for research staff, graduate assistants, and summer salary support for faculty
- Update Request for Faculty Start-Up Support form to reflect this change and house form on a REDD-managed website
- Communicate change to Deans, Associate Deans, and Department Heads

## Increase Flexibility in Expenditure of Funds within Approved Startup Packages

### Recommendation

 Change current policy to allow for increased flexibility in use of approved startup funds within budget lines (for example, the ability to change the specific piece of equipment originally proposed or to purchase more reagents and fewer animals than originally proposed)

### Driving Factors

- Accommodating evolving needs of researchers over the course of a multi-year startup plan
- Removing overly granular monitoring of minor and unavoidable fluctuations in specific line-item costs

### <u>Impact</u>

- Increased responsiveness of researchers to emerging opportunities and needs
- Decreased administrative burden on faculty, staff, and REDD

- Change standard practice to remove the need to account for startup funds at the line-item level
- Change standard practice to allow for rebudgeting between approved budget lines up to 25%, with notification to REDD needed above the 25% level
- Implement requirement for faculty receiving startup packages to submit a research plan within 60 days of their start date
- Implement requirement for faculty receiving startup packages to submit an annual report on startup-funded activities
- Create formal guidance document detailing each of the items above to be housed on a REDD-managed website

Expand the Threshold for REDD Support to Include Assistance with Smaller Startup Packages

### **Recommendation**

 Eliminate the current \$50,000 minimum contribution from academic units before central funding from REDD can be received for startup packages

### **Driving Factors**

- Removing the financial burden placed upon units with smaller discretionary research budgets
- Increasing financial support for research in the arts, humanities, social sciences, and education

### <u>Impact</u>

- Improved participation from diverse academic units in securing startup funding for their new faculty
- Increased research productivity in the arts, humanities, social sciences, and education

- Change standard practice to where REDD will contribute 50% to startup packages below the \$50,000 threshold
- Update Request for Faculty Start-Up Support form to reflect this change and house form on a REDD-managed website
- Communicate change to Deans, Associate Deans, and Department Heads

Establish a Threshold Below Which REDD Will Support an Entire Startup Package

### Recommendation

 Implement a policy that REDD will cover the full cost of any startup package that is \$25,000 or below

### **Driving Factors**

 Accommodating small startup packages from units who may not otherwise be able to afford them

### <u>Impact</u>

- Increased research productivity in the arts, humanities, social sciences, and education
- Retained capacity within academic units to support other strategic research priorities
- Accelerated timeline for faculty startup negotiations
- Reduced administrative burden on faculty, staff, and REDD

- Change standard practice to where REDD will cover 100% of startup packages that are \$25,000 or below (subject to allowable costs)
- Establish internal REDD process by which packages meeting this criterion can be approved without VPRED or AVP signoff (e.g., administrative approval by the REDD Business Manager)
- Update Request for Faculty Start-Up Support form to reflect this change and house form on a REDD-managed website
- Communicate change to Deans, Associate Deans, and Department Heads

### Increase the Speed of Approvals of Startup Packages

### Recommendations

- Establish a standard procedure and timeline that expedites approval of startup packages, incorporating conditional preapproval range prior to faculty search followed by final approval at faculty offer stage
- Establish a threshold below which approval of startup packages can be expedited

### Driving Factors

- Establishing parameters in advance to guide faculty startup negotiations
- Ensuring faculty startup negotiations can be responsive and timely
- Streamlining startup approval processes by having an expedited review category

### <u>Impact</u>

- Accelerated timeline for faculty startup negotiations
- Reduced administrative burden on faculty, staff, and REDD

- Collaborate with Academic Affairs and with Deans to create an annual list of faculty searches with anticipated total startup package amounts prior to search season beginning, and to develop standard procedures for updating the list based upon search outcomes (e.g., failed searches)
- Review the annual list and provide conditional approval for startup package amounts for each search (subject to final approval at time of submission of Request for Faculty Start-Up Support form)

### Increase the Speed of Approvals of Startup Packages (continued)

### Implementation Strategies (cont.)

- Establish an expedited approval process by which Request for Faculty Start-Up Support forms below a certain threshold can be administratively approved by the REDD Business Manager. The recommended threshold is \$200,000 or lower contribution from REDD, with REDD's contribution representing no more than 50% of the total startup package. Forms containing requests above the threshold will still require approval by the VPRED or AVP.
- Update Request for Faculty Start-Up Support form to reflect this process and house form on a REDD-managed website
- Create formal guidance document detailing this procedure to be housed on a REDD-managed website
- Communicate change to Deans, Associate Deans, and Department Heads
- Determine the historical startup package approval throughput time (prior to changes) and monitor new approval throughput time following changes to examine impact of new procedure.

### Streamline the Request for Faculty Start-Up Support Form

### **Recommendation**

 Revise the Request for Faculty Start-Up Support form (see Appendix B) to remove unnecessarily granular information in favor of decision-driving information

### **Driving Factors**

• Accelerating the approval of startup requests

### <u>Impact</u>

- Increased ability of negotiators to finalize faculty offers in a timely manner
- Reduced administrative burden on faculty, staff, and REDD

- Revise Request for Faculty Start-Up Support form to remove the need for a line-item budget and house form on a REDDmanaged website
- Communicate change to Deans, Associate Deans, and Department Heads

## Appendix A Original Committee Charge



February 13, 2023

RE: Faculty Startup Process Advisory Committee

#### Membership:

Dr. David Bagley, Associate Dean for Graduate Education and Research, CEPS Dr. Sean McCrea, Chair, Department of Psychology, CAS Dr. Sreejayan Nair, Chair, Department of Pharmaceutical Sciences, CHS Dr. Jenna Shim, Associate Dean, COE Dr. Steve Smutko, Associate Dean, HSENR Dr. Eric Webster, Associate Dean, CALSNR

**Chair**: The committee will be chaired by Dr. Bryant Smalley, Associate Vice President for Research (AVPR)

Duration: The committee will complete its function at the end of April 2023

**Intent**: The Research and Economic Development Division (REDD) is committed to supporting the growth and expansion of the research enterprise at the University of Wyoming. To that end, REDD financially supports faculty startup packages in collaboration with academic Colleges and Schools. As UW continues to progress toward R1 status, creating systems that streamline and simplify the awarding and management of startup funds will be essential in scaling research at the University and in attracting top research talent to the University. The Faculty Startup Process Advisory Committee (FSPAC) will provide advice to the Associate Vice President for Research in planning new processes and procedures regarding faculty startup.

**Charge**: The committee will be responsible for reviewing current processes and procedures for requesting and expending faculty startup packages and making recommendations for ways to streamline that process.

**Operation**: The committee will meet virtually each week. The Committee will sequentially engage in the following: 1) review current REDD processes and procedures for requesting, reviewing, and approving startup packages; 2) solicit feedback from appropriate stakeholders regarding startup procedures; and 3) create a set of recommendations for changes to the startup processes and procedures.

The Committee will file a report to the AVPR by March 30, 2023, allowing time for additional meetings to discuss recommendations prior to disbanding of the committee.

## Appendix B

### Current Request for Faculty Start-Up Form

### Request for Faculty Start-Up Support

### UNIVERSITY OF WYOMING

Date: Name of Potential Faculty Member: School/Department/Unit Position #

Expected Start Date: College:

#### Startup Commitment Detail

ltem	Year 1 Amount	Year 2 Amount	Total
Faculty Salary + Fringe			\$ -
Travel			\$-
Equipment/Lab Equipment (attach detail)			\$-
Computing (attach detail)			\$-
Undergraduate Support (include fringe)			\$-
Grad Student Support (include fringe)			\$ -
Grad Student - Tuition and Fees			\$ -
PostDoc Support (include fringe)			\$ -
Other Reagents, consumables, supplies &			¢
Moving Expenses			<b>Ъ</b>
Total	\$ -	\$	\$

Attach additional explanation as appropriate

Division/College/School/Department/Unit Commitments

College, School, Department, Division, Unit	Year 1 Amount	Year 2 Amount	Total	Authorized Signature	Date
Department					
College					
Program					
Central Adminstration					
Total UW Commitment	\$ -	\$ -	\$ -		

·    Research Supplies    ·    Salaries (except in rare pre-negotiated cases)      ·    Scientific equipment    ·    Graduate students and Post-Docs      ·    Research related travel    ·    Furniture, Moving costs      ·    Minor laboratory renovations    ·    Computers and printers (unless as an integral part of research equipment or specifically required for intensive computational work)	The	Central Administration funding will support:	<u>The</u>	Central Administration funding will NOT support:
Scientific equipment  Graduate students and Post-Docs  Research related travel  Graduate students and Post-Docs  Graduate students  Graduate students and Post-Docs  Graduate students  Graduate students and Post-Docs  Graduate students  Graduate stu	•	Research Supplies	•	Salaries (except in rare pre-negotiated cases)
Research related travel  Furniture, Moving costs  Minor laboratory renovations  Computers and printers (unless as an integral part of research equipment or specifically required for intensive computational work)	· .	Scientific equipment	÷	Graduate students and Post-Docs
Minor laboratory renovations Computers and printers (unless as an integral part of research equipment or specifically required for intensive computational work)	· .	Research related travel	÷	Furniture, Moving costs
	•	Minor laboratory renovations	•	Computers and printers (unless as an integral part of research equipment or specifically required for intensive computational work)



#### **Request for Faculty Start-Up Support**

Potential Faculty Member:	Title:	
College:	Dept:	
College Contact:	Dept Contact:	
Salary (9 mo):	Position #:	

\*The original signed copy of this form must be submitted to the Office of Academic Affairs before any offer will be approved in HRMS\*

						Central						
	<b>Unit Price</b>	Quantity	Dept	College	Program	Administration	TOTAL	Year 1	Year 2	Year 3	Total	Comments/Details
Faculty Salary												
							\$ -				\$ -	
Fringe							\$ -				\$ -	
							\$ -				\$ -	
Travel	1						\$ -				\$ -	
							Ś -				\$ -	
							· Ś -				\$ -	
							Ś -				\$ -	
Equipment/Lab Equipment							· Ś -				\$ -	
							Ś -				\$ -	
							Ś -				\$ -	
							· Ś -				\$ -	
Computing							Ś -				\$ -	
							\$ -				\$ -	
							Ś -				\$ -	
							\$ -				\$ -	
Undergrad Support (including fringe)							Ś -				\$ -	
							\$ -				\$ -	
							Ś -				\$ -	
							\$ -		1		\$ -	
Graduate Support (including fringe)							\$ -				\$ -	
							\$ -				\$ -	
							\$ -				\$ -	
							\$ -		1		\$ -	
Graduate Tuition & Fees							\$ -				\$ -	
							\$ -		1		\$ -	
							\$ -				\$ -	
							\$ -		1		\$ -	
Post Doc Support (including fringe)							\$ -				\$ -	
							\$ -		1		\$ -	
							\$ -		1		\$ -	
							\$ -				\$ -	
Other							\$ -				\$ -	
							\$ -				\$ -	
							\$ -				\$ -	
					l		\$ -				\$ -	
		TOTALS	0.00	0.00	0.00	0.00	<b>\$</b> -	\$ -	\$ -	\$ -	\$ -	

\* First \$50k to be paid by department or college, Central Administration will cover 50% of the remaining balance \*Startup funds expire 2-3 years from start date

The	Central Administration funding will support:	The	Central Administration funding will NOT support:
•	Research Supplies	÷	Salaries (except in rare pre-negotiated cases)
•	Scientific equipment	÷	Graduate students and Post-Docs
•	Research related travel	÷	Furniture, Moving costs
•	Minor laboratory renovations	÷	Computers and printers (unless as an integral part of research equipment or specifically required for intensive computational work)

Type of Equipment	Detail/Justification	Amount

#### DETAILS ON FILLING OUT THE SPREADSHEET CORRECTLY

- 1. Please fill out all 3 tabs as completely as possible.
- 2. Please make sure each Year total matches (example Year 1 has the same total throughout the spreadsheet).
- 3. Please gather all other sources of startup funding before requesting startup funds from Central Administration.
- 4. Central Administration = Academic Affairs + ORED funding source is the same. Do not request one amount from ORED and another amount from Academic Affairs you will request one amount from Central Administration.
- 5. Central Administration Funding model: First \$50k covered by Dept/College, remaining balance will potentially be split 50/50 between Central Administration and College/Dept.
- (example Total startup package is \$200k. \$200k \$50k (paid by College/Dept) = \$150k/2 = \$75k (Central) + \$75k (College/Dept).
- 6. If a Program (example INBRE or COBRE) is contributing to the startup package, please provide details of their contribution.
- 7. Please be sure to list the position number.
- 8. All signatures and approvals are needed before an offer letter can be sent. Aneesa in Academic Affairs must approve the offer letter and she will check whether or not the startup package has been approved by Central Administration.
- 9. Incorrect spreadsheets will delay approval please send your questions to Amanda Larson in ORED amanda.larson@uwyo.edu, 766.2074.

#### \*10. Please pay attention to what Central Administration will fund and what it will not (see below).

11. Possible shared use of new instrumentation, that is aligned with the strategic interest of UW, will be an important consideration in determining approval.

#### STARTUP APPROVAL PROCESS

- 1. The Department Head or Dean should fill out the spreadsheet (whoever is working on the faculty hire).
- 2. Once your spreadsheet and all tabs are filled out completely send spreadsheet to Amanda Larson in ORED amanda.larson@uwyo.edu, 766.2074.
- 3. Please allow 1-2 business days for a response.
- 4. If the spreadsheet is filled out correctly you will either be notified by email that it has been approved, or a meeting will be scheduled to discuss the startup further.
- 5. Once all signatures have been obtained the startup request is approved and you can move ahead with your offer.

#### The Central Administration funding will support:

Research Supplies Scientific equipment Research related travel Minor laboratory renovations

#### The Central Administration funding will NOT support:

Salaries (except in rare pre-negotiated cases)

Graduate students and Post-Docs

Furniture, Moving costs

Computers and printers (unless as an integral part of research equipment or specifically required for intensive computational work)