



## NEXUS NSF EPSCoR RESEARCH SUSTAINABILITY

*Taking solar energy to a new level and making Nevada one of the leading states in terms of environmentally friendly solar development*



The NEXUS project, funded by NSF EPSCoR focuses on innovative research to achieve water efficient and environmentally friendly solar power. The project, in its final year of the five-year award, has developed state-of-the-art facilities that is catalyzing research. Project researchers are now seeking industry and institutional collaborators that are interested in solar energy generation, associated water use, and the potential environmental impacts of large-scale solar energy generation to perform research in these facilities. Five areas of expertise are:

- ✓ **Microgrid**  
Test new smart devices
- ✓ **Advanced Dry Cooling Test Facility**  
Improve dry cooling performance
- ✓ **Environmental Towers Network**  
Impact of solar plants on microclimates
- ✓ **Nevada Solar-Water Express**  
Water reuse and reclamation technologies in rural areas
- ✓ **Solar-Driven Supercritical CO<sup>2</sup> Cycle Engine**  
Minimize water use for renewable/solar energy

**5 NEW FACULTY HIRED IN SOLAR, WATER, ENVIRONMENT & ECONOMICS**

## GRADUATE STUDENT RESEARCH

NEXUS graduate student Kaipo Kekaula's motivation to be part of the international exchange program was both to further international collaboration but also to get first hand experience of the similarities and differences in cultural and research practices abroad.



**Kaipo Kekaula**  
University of Nevada, Las Vegas  
(Advisor Dr. Yitung Chen)

Kekaula's research focuses on the development of dry cooling systems that use air instead of water to condense steam for water reuse in solar thermal plants.

While he was on an international research study in China, Kekaula collaborated with his Chinese supervisor, Dr. Quiwang Wang and was a coauthor on a paper published in November, 2017 in the journal Applied Thermal Engineering. "The exchange was a great learning experience all around," Kekaula says. "I would definitely recommend this to another student, it was an amazing experience."

**47 GRADUATE STUDENTS TRAINED**

## WORKFORCE DEVELOPMENT



**NEVADA STEM MENTOR NETWORK**

Online resource to connect students with faculty mentors and research projects.



**PATHWAYS TO STEM NEVADA**

Online resource outlines the potential pathways, via state programs and institutes, to a STEM Career.



## EPSCoR **IMPACT** in Nevada

Effecting lasting improvements and increasing research competitiveness

**74**  
NEW HIRES  
Since 1985

**84%**  
RETENTION IN NEVADA  
Since 1985

**420**  
PROPOSALS AWARDED  
Since 1985

NSF EPSCoR PROJECT (NEXUS)  
**196**  
Faculty, post docs, graduate students, undergraduate and administrators

NASA EPSCoR RID (2012-2018)  
**130**  
Participants and 103 students involved



SOLAR NEXUS IN NEVADA UNDERGRADUATE RESEARCH OPPORTUNITY PROGRAM (UROP) FEATURED IMPACT IN 2016 NATIONAL SCIENCE FOUNDATION BROCHURE



INNOVATION WORKING GROUP ACROSS JURISDICTIONS



NSHE CUR INSTITUTE FOR BROADENING PARTICIPATION IN UNDERGRAD RESEARCH ASSISTED IN THE DEVELOPMENT OF THE UNLV OFFICE OF UNDERGRADUATE RESEARCH

**\$778K**  
AWARDED FOR 173 SCHOLARSHIPS  
From 2015-2017

## CAN NASA EPSCoR NEW AWARD

A multi-disciplinary multi-institution Cooperative Agreement Notice (CAN) has been awarded to Nevada NASA EPSCoR for \$750k federal + \$375k state match. Co-PI's Dr. Henry Sun, DRI, Dr. Brian Hedlund, UNLV, and Dr. Simon Poulson, UNR: team will address high-priority NASA research and technology needs through "Life in Salts: a Multidisciplinary Investigation of Microorganisms and Biosignatures in the Death Valley Salt Pan" (2018-2021).



**3 CAN & 1 RID AWARDS**

## NEVADA'S EPSCoR PROJECT FUNDING



National Science Foundation  
Current Projects  
2013 - 2018 \$22,749,700  
Past Projects  
1993 - 2013 \$51,154,083



National Aeronautics and Space Administration  
Current Projects  
2013 - 2018 \$2,625,000  
Past Projects  
1993 - 2013 \$8,700,000



Department of Energy  
Past Projects  
2000-2010 \$4,150,000



Department of Defense  
Past Projects  
2002-2011 \$4,177,659

**RETURN ON INVESTMENT: \$185.4 MILLION 2:1**

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