

INDIGENOUS EDUCATION INSTITUTE

COLLABORATION WITH INTEGRITY

The Indigenous Education Institute was created for the preservation and contemporary application of traditional Indigenous knowledge. IEI leadership is wholly composed of Indigenous people, with an International Advisory Council from many backgrounds and professions.



The Indigenous Education Institute (IEI) is a 25 year-old non-profit organization with an all Indigenous board and an advisory council made up of renowned knowledge holders and scientists from around the world. Our board includes members of the Navajo Nation, Swinomish Indian Tribal Community, Native Hawaiians, Maoris, Cherokees, and Ojibwes.

IEI focuses on the preservation and contemporary application of traditional Indigenous knowledge, including Tribal Ecological Knowledge (TEK). The goals of the Institute were developed to provide awareness of the importance of cultural and linguistic diversity in the world today. We support efforts to revitalize and utilize the traditional Indigenous languages across the globe, since we believe that is where all deep traditional Indigenous knowledge is held.

The role of IEI is to bring awareness of traditional knowledge, including traditional ecological knowledge (TEK) to the general public, academic and government agencies. We have years of experience working with the National Science Foundation, NASA, and NIH, all federal agencies. We have a focus on grass roots, local issues, as well as a global network which provides oversight and communication among global tribes, communities, scientists, universities and planetariums.

We provide professional development to science centers. We teach strategic planning based on traditional Navajo knowledge (the Dine Cosmic Model) which is readily transferable to other entities such as Multiverse, Space Sciences Laboratories, UC Berkeley, cross cultural evaluation, Indigenous astronomy research (particularly Navajo and Cherokee), Native astronomy educational materials such as Navajo star maps, posters, CSs, and planetarium shows. We give presentations around the world as we continue to build and strengthen our worldwide networks. We develop curriculums for K-12 schools, both Indigenous and non-Indigenous and we have written books on Navajo Astronomy juxtaposed with western astronomy – Sharing the Skies: Navajo Astronomy, and on the process of professional development using the Dine Cosmic Model in 5 weeklong workshops to over 135 science center personnel across the nation, Cosmic Serpent: Collaboration With Integrity. We partner with National Museum of American Indian (NMAI). Also we partner with Association of Science and Technology Centers (ASTC).

Today, as never before, IEI's mission is of vital importance as it speaks strongly to the significance of balance to create a healthy environment. Utilizing a lens of contemporary scientific perspective along with a traditional Indigenous perspective illuminates the complementary aspects of both ways of knowing and a greater sense of understanding the earth and sky that would not be possible with one perspective alone.

Traditional knowledge can provide greater global sustainability through avocation of reciprocal stewardship of the earth and cosmos, leading to harmonious, balanced outcomes, while enhancing recognition of Indigenous science, through processes that respect the honor and integrity of both ways of knowing.

This poster will highlight several examples of our successful cross-cultural collaborations.

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I-WISE - Indigenous Worldviews in Informal Science Education (I-WISE): Integration, Synthesis, and Opportunity

'Imiloa Astronomy Center of the University of Hawai'i at Hilo and the Indigenous Education Institute (IEI) were awarded support for I-WISE from the National Science Foundation. I-WISE consists of two national conferences, one in Albuquerque, NM and a second one in Washington DC.

The first two-day event in September 2015 convened 125 principal investigators, educators, scientists, policymakers, researchers, tribal community members including native youth, to advance research aimed at the convergent margins of Native and Western science in the field of informal STEM learning, science research and community collaboration, across the US. The goals of the conference included:

1. Integrate and synthesize theoretical approaches, methods, and findings of work to date
2. Formulate a research agenda from the findings
3. Share results with the broader STEM education field and beyond through a second conference with Federal funders and policymakers in Washington DC

The first conference took place in September 2015 in Albuquerque, NM. It was preceded by a four-week online webinar discussion of issues that were addressed in the conference. A follow-up Policy Meeting in Washington, DC in June 2016 will include 30 agency representatives and other stakeholders. Discussions will center around the resulting implications concerning the importance of Indigenous worldviews to enhance public science literacy, community engagement, health improvement, and promote STEM education, career opportunities, and lifelong learning for Native youth. Much of the DC conference will take place at the National Museum of American Indian (NMAI), to provide cultural context.

The I-WISE Conferences provide a key opportunity for a broad spectrum of stakeholders both within and beyond the field of informal STEM learning to share experiential knowledge and evidence-based findings, and to chart a course for how an examination of Indigenous worldviews of the natural world and informal learning as well as research, can be stimulated through collaboration. Outcomes will provide a focused starting point for informal STEM educators investigating the cultural roots of science and examine challenges in creating these new types of public learning experiences. Results will also inform how NSF, NASA and NIH sponsored projects might effectively introduce Indigenous worldviews into informal learning experiences and to maintain the currency and vitality of projects initiated with federal funding. Most importantly, the conferences will be interdisciplinary, building on collaborations NSF, NASA and NIH have already invested in, bringing together diverse perspectives, and facilitating the development of lasting collaborations. The greater impact on society will be new directions for policy that will stem from the meeting in Washington, DC.
http://iwiseconference.org



partner organizations, The Indigenous Education Institute (IEI), The National Museum of the American Indian (NMAI), the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), Tulalip Tribes, Pacific American Foundation and Waikalu Loko Fishpond Preservation Society (Native Hawaiians) and Eastern Band of Cherokee Indians, worked collaboratively to develop all aspects of the project, which includes the following deliverables: (a) a 2,000 square foot traveling exhibition, (b) a small traveling graphic panel exhibition, (c) a website, (d) an activity kit for Native youth in informal and formal settings, and (e) opportunities and resources for reciprocal collaboration between ISE and Native American partners. The traveling exhibit invites guests to understand the important issues facing Indigenous communities, discover innovative ways native peoples are overcoming obstacles, and take part in the growing movement towards sustainability and the reclamation of age-old practices.

The traveling exhibit has been shown at OMSI, in Portland, OR, Tamastlikt Cultural Institute in Pendleton, OR, and Hibulb Cultural Center, Tulalip Tribes, Tulalip, WA. It is scheduled to be exhibited at the Wild Center, at Tupper Lake, NY.

The four tribal partners featured in the exhibit showcased the following activities that helped to restore ecosystems and rediscover traditional foods and crafts:

- *Native Hawaiian restoration of traditional fishponds
- *Tulalip Tribes restoration of medicinal plants
- *Confederated tribes of the Umatilla Reservation restoration of Lamprey Eel and Salmon
- *Eastern Band Cherokee Indians restoration of River Cane

Outcomes included development of awareness that:

Traditional ecological knowledge (TEK) is a way to understand the natural world that is still used today
TEK and western science offer complementary ways of understanding the natural world
TEK and western science are both relevant and valuable for understanding the natural world

Navajo Sky – Education Modules for Digital Planetariums

IEI was funded by NASA to create a planetarium show based on Navajo astronomy and western comparative astronomy. The project was funded for 4 years and has culminated with a planetarium show for digital planetariums, both fixed dome and portable. The 17 Navajo astronomy modules were the result of 23 years of research on the Navajo Reservation by PI Dr. David Begay and CoPI Dr. Nancy C. Maryboy. They highlight place-based science, and were built on observation-based, authentic traditional knowledge of local communities, using the Navajo language. Comparative modules were created by Multiverse, Space Sciences Labs, UC Berkeley. Images were provided by the Hubble Telescope.

Portions of the planetarium show, Navajo Sky, were shown in many venues including New Zealand, Australia, Alaska, Oregon, Washington, California, North Carolina, and more. These shows reached over 25,000 visitors at planetariums, universities, tribal colleges, schools, science centers, natural history museums, tribal museums, local native communities, national and international conferences. The IEI portable planetarium was showcased at the National Museum of American Indian, in the Atrium, for a week. Navajo Sky was presented at the National Indian Education Association Annual Meeting, American Indian Science and Engineering Society, Cherokee schools in Cherokee, NC for a week, and the World Indigenous Peoples Conference on Education in Melbourne, Australia.

MAVEN – Imagine Mars Through Native Eyes

The NASA MAVEN mission (Mars Atmosphere and Volatile Evolution) provided another opportunity for IEI to work with space scientists. IEI in conjunction with Multiverse, Space Sciences Labs, UC Berkeley, developed a cyclical activity curriculum for educators of Navajo, Native American and Native Hawaiian students for grades 5 through 8. IEI and Multiverse worked with STAR (Service to All My Relations) school, a charter elementary school, near Flagstaff, AZ, an off the grid, bi-lingual school, which has been cited as being in the top 41 most innovative K-12 schools in the US. IEI and Multiverse provided a live feed to several schools during the successful MAVEN launch from Cape Canaveral. Students and scientists had interacted over several months prior to the launch in a series of interviews, and the students were keenly interested in the launch process. IEI and Multiverse have been teaching the curriculum during fall 2015.

Diversity in Academia

IEI works with various universities to enrich programs and departments in areas of diversity and underserved minorities. We also work with Tribal Colleges, including Dine College, Northwest Indian College and the Institute of American Indian Arts.

Collaborative Partnership with the University of Washington, Tacoma – Symposium on Contemporary Native American Issues in Higher Education: Intersectionality of Native Language and Culture in Modern Society. IEI presented planetarium shows to Native high school students in the Seattle/Tacoma area – Sharing Our Skies – Looking at the Stars Through Indigenous Eyes and Western Astronomy lenses.

AST 201 – Introduction to Indigenous Astronomy – online course in the Department of Physics and Astronomy at Northern Arizona University, fulfills a diversity requirement for graduation. IEI professors Begay and Maryboy developed the 16 week course and have taught it for 17 semesters.



Navajo Birth Cohort Study and Center for Native Environmental Health Equity Research

are projects that are funded by CDC and NIH, administered by University of New Mexico. The Navajo Birth Cohort Study works to assess pregnancy outcomes and child development in relation to uranium mine and tailings waste exposures among Navajo mother-infant pairs, and does home environmental assessments to identify and quantify exposures to contaminants in and around Navajo homes. The Center for Native Environmental Health Equity Research studies disparities in health status among Native Americans, focusing on regulatory arenas, including air and water contamination, environmental metals, and uranium waste. The role of IEI is to provide a bridge between multi-agency scientists and local Navajo communities, building authentic collaborations, providing meaningful translations, and assisting in community reports. This includes reporting back to Navajo chapters on air, soil and water testing and measuring mine site radiation levels. In addition IEI provides professional development training and tribal government liaisons with Navajo Nation and Laguna Pueblo.



Native Universe (NU) was designed to build institutional capacity in leadership and practice among scientific museums, in order to increase public understanding of environmental change and the human relationship to nature from Indigenous perspectives, while also providing access to science as practiced in the established scientific community. The 3 case study museums were Oregon Museum of Science and Industry (OMSI), Arizona Sonora Desert Museum, and Powerhouse Museum in Durango, CO.

The project involved 9 month residencies at each museum with intense multi-cultural professional development through week long workshops and continuous mentoring throughout the 5 year project. Small seed grants offered by the NU team provided much needed funds to develop many deep and lasting working relationships with Indigenous peoples and tribes in their local communities. The NU team deepened its collaborative methodology and became a model of best practices for collaboration. The evaluation was conducted by the Life Long Learning group out of Center for Science and Industry (COSI), in Columbus, Ohio, a multi-cultural evaluation and research partnership.

The project began with a week-long intensive initiation on the island of Hawaii, showcasing how the 'Imiloa Astronomy Center grew out of a partnership with the local Native Hawaiian community. This laid down a strong foundation for the residencies to follow. Each residency has been unique to the museum and its community. Our evaluation and research has shown evidence of transformational change among leadership and staff, and the growth of strong partnerships with local Indigenous communities.

