

Native Voices in STEM

AN EXHIBITION OF PHOTOGRAPHS AND INTERVIEWS



EXECUTIVE SUMMARY

Introduction

Native Voices in STEM: An Exhibition of Photographs and Interviews is a collection of photographs and texts created by Native scientists and funded by the National Science Foundation (NSF). The artworks speak to the photographers' experiences of Two-Eyed Seeing, or the tensions and advantages from braiding together traditional Native and Western knowledges.¹ The exhibition was shown at the American Indian Science and Engineering Society (AISES) 2022 Conference, where it received exceedingly positive responses. One viewer stated,

"Seeing the pain that I've experienced directly, the determination, and the humor – were all very impactful. [There is] nothing like art to bring us to connect with our emotional experience."

About the exhibition

The 16 photos for the exhibition were curated to represent as many genders, tribal affiliations, career levels, and science, technology, engineering, and mathematics (STEM) disciplines as possible while covering many topics including:

- Native identity as a source of pride
- The importance of giving back
- The importance of Nation building
- Professionals' persistence in STEM
- A lack of sense of belonging in institutions of higher education
- Financial barriers in continuing studies
- The impact of the erasure of Native people
- The challenges and opportunities of Two-Eyed Seeing

¹ Bartlett, C., Marshall, M., & Marshall, A. (2012). Two-eyed seeing and other lessons learned within a colearning journey of bringing together Native and mainstream knowledges and ways of knowing. *Journal of Environmental Studies and Sciences*, 2(4), 331–340. <https://doi.org/10.1007/s13412-012-0086-8>.

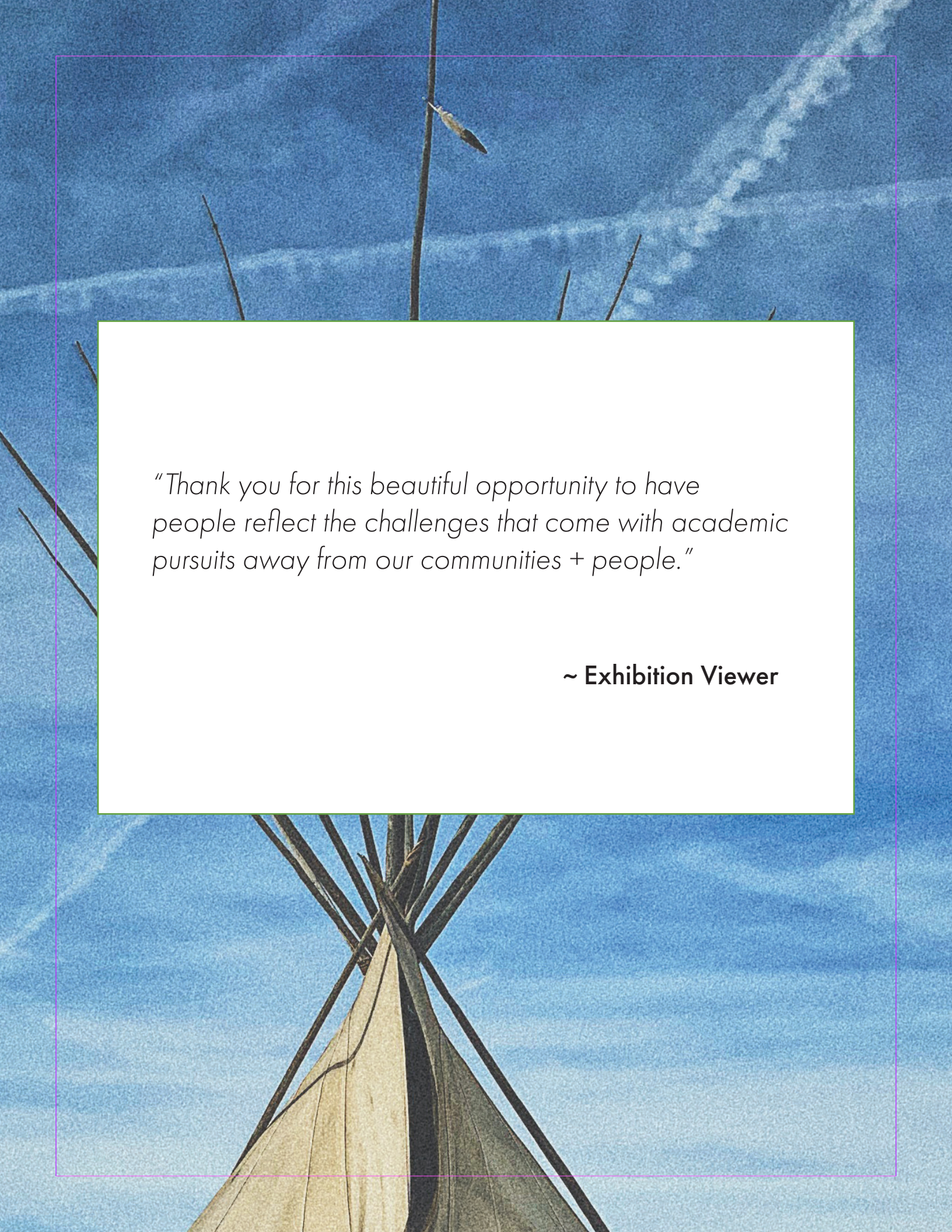
The photographs are each framed with excerpts from written captions or an interview with the photographer. These texts illustrate what the participants were thinking about or feeling as they created the images. [Read more about the process.](#)

About the photographers

The photographers are Native undergraduate students, graduate students, and professionals in STEM. They are participants in [a study conducted by researchers from TERC, AISES, and the University of Georgia](#). To protect the identities of the participants, pseudonyms are used. [Read more about the photographers.](#)

To discuss exhibiting this work at your location, email Mia Ong at maria_ong@terc.edu.





"Thank you for this beautiful opportunity to have people reflect the challenges that come with academic pursuits away from our communities + people."

~ Exhibition Viewer

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About the Researchers



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"Seeing an image related to my field at the AISES national conference was a welcome reminder that there are others like me out there. Philamayaye [Lakota for 'Thank you for coming']."

~ Exhibition Viewer



About the Photographers

The photographers highlighted in this exhibition represent a wide range of genders, tribal affiliations, career levels, and STEM disciplines. They are Native undergraduate students, graduate students, and professionals in STEM. None are professional photographers. The photographers in this exhibition are affiliated with the following tribes: Blackfoot, Cherokee, Citizen Potawatomi Nation, Diné (Navajo), Native Hawaiian, Oglala Lakota Nation, Pyramid Lake Paiute Tribe, Red Pheasant Cree Nation, Unalaska Aleut Nation, and United Houma Nation. The photographers were located across the United States, including Alaska, Arizona, Florida, Hawaii, and Washington, among others.

To protect the identities of the participants, we have used pseudonyms and have only shown the photographer's faces with permission.



THE RESEARCH PROCESS

Photo Elicitation Process

The *Native Voices in STEM* team uses Photo Elicitation (PE) as part of our exploration of the lived experiences of Native scientists. PE is a research method that focuses on collecting the stories of participants through pictures and words. This method accesses participants' memories and emotions in ways that other methods rarely do, often resulting in vivid images and powerful stories.

We asked Native students and professionals in STEM to take photographs and write captions that reflected their answers to three questions. These questions asked about their experiences in STEM regarding the supports and hurdles that they have encountered and how they identified as Native STEM students and professionals (i.e., what does it mean to be Native person doing science?). Research team members then met with participants one-on-one to talk about how

the photographs responded to the three questions. The recorded interviews were then transcribed and matched with the photographs.

To select the photographs and captions for this exhibition, we worked with Sarah Berkeley, professional photographer, designer, and artist, to select 16 images and their captions based on the technical quality of the photographs, their artistry, and their narrative power. We chose six images per group (undergraduate students, graduate students, and professionals) that form the current exhibition.



Impact of the Exhibition

Native Voices in STEM aims to contribute to a better understanding of Native people in STEM by providing insights about supports and hurdles they encounter during their journeys to complete degrees and to build their careers in STEM. It also aims to better understand how they conceptualize the intersection of their identities as Native scientists.

In our work with Native individuals in STEM, we seek to sustain reciprocal and caring relationships with the Native communities that we are working with. One of our main priorities is to engage in reciprocity by bringing back what we learn from our research to the Native communities that have welcomed us and have shared their stories with us. We value relationships and refuse to continue building on the legacy of extraction and colonization that is so common in research done with Native participants.

Our hope with the work in this project and with this exhibition is to contribute to the dismantling of the barriers and hurdles that Native students and professionals encounter while persisting in STEM. We hope that young Native students who aspire to enter STEM and those who are already there see themselves represented in the images in the exhibition. They should understand that they are not alone and that others like them have been able to succeed in STEM. We also want to provide recommendations for institutions of higher education and employers to support Native students and professionals. For example, we are learning that giving back to their communities is very important to Native students and professionals in STEM. Thus, institutions should consider integrating giving back activities to what they already do so that their Native students and professionals feel supported in their desire to contribute to their communities by using their STEM knowledge to help others.

Viewer Responses

This exhibition has been viewed at the AISES conference and at a Midwestern liberal arts university. Responses from the viewers at these locations can be categorized into two broad groups:

- Native people and other viewers of color were able to see themselves in the work. They felt a sense of affirmation by seeing their experiences reflected in the work even if they were non-Native.
- White students, faculty and staff expressed surprise at Native people's experiences in contemporary life. They were interested in the differences and similarities across Native experiences.

Viewer Testimonials

"Thank you for this beautiful opportunity to have people reflect the challenges that come with academic pursuits away from our communities + people. Seeing the pain that I've experienced directly, the determination, and the humor – were all very impactful. Nothing like art to bring us to connect with our emotional experience."

"As a neuroscientist that also works with perinatal mouse pups, seeing an image related to my field at the AISES national conference was a welcome reminder that there are others like me out there. Philamayaye [Lakota for 'Thank you for coming']."

"Normalizing regalia as formal presentation wear has massive impact. It's beautiful to feel seen, to belong, to be empowered by what we wear."

EXHIBITION DETAILS

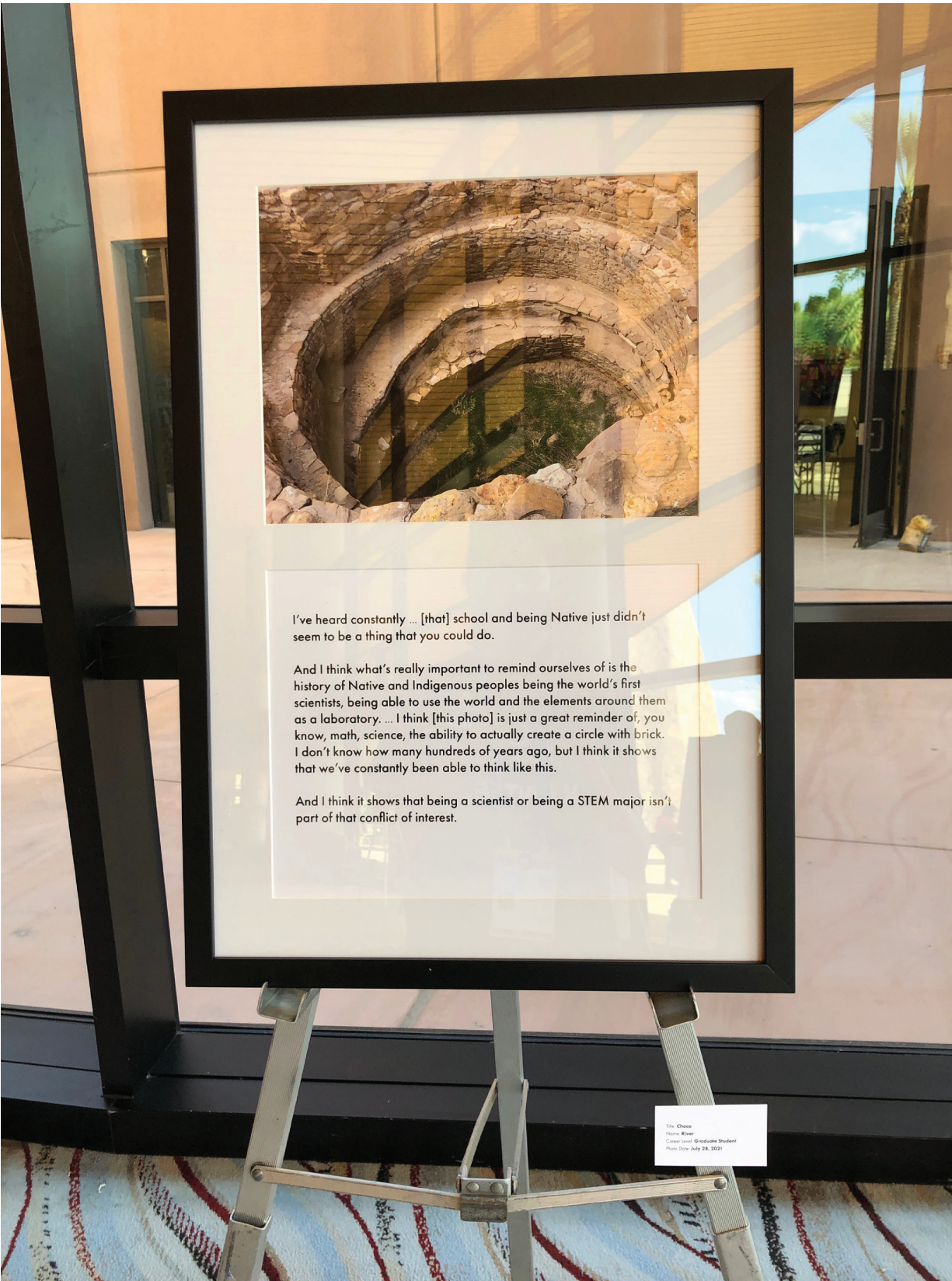
Exhibition Preview

Each photo and interview excerpt is printed on archival paper and professionally framed. Eight images are oriented vertically and eight are oriented horizontally.



Exhibition view from the AISES 2022 Conference

EXHIBITION DETAILS



I've heard constantly ... [that] school and being Native just didn't seem to be a thing that you could do.

And I think what's really important to remind ourselves of is the history of Native and Indigenous peoples being the world's first scientists, being able to use the world and the elements around them as a laboratory. ... I think [this photo] is just a great reminder of, you know, math, science, the ability to actually create a circle with brick. I don't know how many hundreds of years ago, but I think it shows that we've constantly been able to think like this.

And I think it shows that being a scientist or being a STEM major isn't part of that conflict of interest.

Title: Chase
Name: Chase
Center: Level 4 Graduate Student
Photo Date: July 28, 2021

Exhibition view from the AISES 2022 Conference

EXHIBITION DETAILS



With neurons, they're primary cultures. ...
Because they don't keep dividing, you
have to harvest them. ... It's sad, though,
because then the rest of the animal's
discarded. ...

For neonatal rodents ... isoflurane ... it's
just not an effective anesthetic. But the
bottom line is that it's not required. In the
U.S. ... decapitation is actually the most
humane, quickest way to euthanize a
rodent, a baby rat.

And so that's kind of what's being depicted
here. And for me, it's just [ethically]
difficult.

Example of a framed vertical image and text

Title: Sacrifice

Name: Daphnia

Career Level: Professional

Photo Date: November 4, 2021

Dimensions: 28.5" x 18"

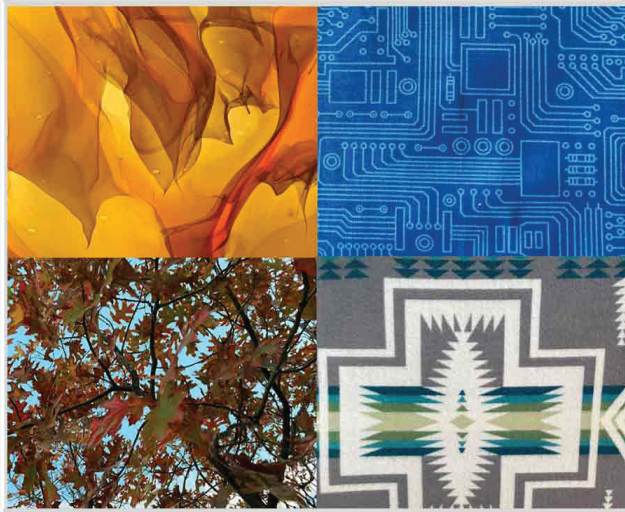
Text reads:

With neurons, they're primary cultures ... Because they don't keep dividing, you have to harvest them. ... It's sad, though, because then the rest of the animal's discarded. ...

For neonatal rodents ... isoflurane ... it's just not an effective anesthetic. But the bottom line is that it's not required. In the U.S. ... decapitation is actually the most humane, quickest way to euthanize a rodent, a baby rat.

And so that's kind of what's being depicted here. And for me, it's just [ethically] difficult.

EXHIBITION DETAILS



Four different patterns are reflected in this photo. They represent four mindful areas that intersect in my current stage of life – imaginative, natural, logical and Diné (cultural/traditional).

The creative and logical [parts] are more present in my Engineering frame of mind. The natural and traditional [parts] are more aligned with my Indigenous mindset.

Of course, they often get blurred and are not so distinctive as the photo may show. If I had more time, I probably would've adjusted the photos so that they overlap at the boundaries.

Example of a framed horizontal image and text

Text reads:

Four different patterns are reflected in this photo. They represent four mindful areas that intersect in my current stage of life – imaginative, natural, logical and Diné (cultural/traditional).

The creative and logical [parts] are more present in my Engineering frame of mind. The natural and traditional [parts] are more aligned with my Indigenous mindset.

Of course, they often get blurred and are not so distinctive as the photo may show. If I had more time, I probably would've adjusted the photos so that they overlap at the boundaries.

Title: Patterns of Life

Name: Willow

Career Level: Professional

Photo Date: July 22, 2021

Dimensions: 28.5" x 18"

EXHIBITION DETAILS

Exhibition Requirements

To facilitate the exhibition, we provide the following:

- 16 framed artworks
- Guestbooks: the guestbooks will be shipped with the photographs and is meant to document viewer comments, reactions, and reflections
- Title card text
- Introductory text to be printed as vinyl lettering for gallery wall or mounted on a foam board
- Press release draft

Your venue will provide:

- An exhibition space that has at least 48' of wall space OR 17 easels (16 for artworks, 1 for intro text)
- Printed title cards
- Printing of introductory text
- Table: a table will need to be placed near the photographs to hold the guestbook and pens
- Pens for writing in the guestbook
- Return shipping with insurance
- Adequate lighting, ideally track lighting with at least two lights per artwork
- A secure location with a gallery monitor or other method of protecting the artwork from vandalism or theft
- Storage for packing materials during exhibition

Specifications:

- 16 framed artworks
- Dimensions: 26.5" x 18"
- Orientation: Eight are vertical, eight are horizontal
- Hanging hardware: each artwork is fitted with a hanging wire on the back



“Normalizing regalia as formal presentation wear has massive impact. It’s beautiful to feel seen, to belong, to be empowered by what we wear.”

~ Exhibition Viewer



Let's continue the conversation!

**Please contact us for more information about hosting
Native Voices in STEM at your venue.**

Email Mia Ong at maria_ong@terc.edu to discuss details.

Acknowledgments

We would like to acknowledge the following people and organizations who made this project possible.

We thank *Native Voices in STEM* team members Anya Carbonell and Angela D’Souza for their assistance in data analysis. Angela also contributed to data collection and dissemination.

We are indebted to our institutional partners and representatives for their ongoing and enthusiastic support of our project: Montana State University (Dr. Brittany Fasy); New Mexico State University (Dr. Jonathan Cook); Oklahoma State University (Dr. Jovette Dew and Dr. Christopher Bingham); University of Oklahoma (Lisa Morales); and Salish Kootenai College (Dr. Judy Hudgins).

We are grateful to our project advisors—Dr. Rebecca Davis, Frieda McAlear, Dr. Stephanie Masta, and Dr. Marigold Linton—for their cultural insights, disciplinary expertise, and guidance at key decision-making points of the project.

Sarah Berkeley provided photography expertise and steadfast guidance throughout the process of creating a collection for exhibition.

Finally, we thank our evaluators, Dr. Maria Jimenez and Dr. Janet Smith, for ensuring that our activities were culturally responsive and in alignment with project goals.

Material for this project is based upon work supported by the National Science Foundation under Grant No. 2000619, *Native STEM Portraits: A Longitudinal, Mixed-Methods Study of the Intersectional Experiences of Native Learners and Professionals in STEM*. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

