

NATIVE SKYWATCHERS presents:



**TWO-EYED SEEING:
ART,
INDIGENOUS ASTRONOMY
& NASA SCIENCE
MAKING SPIRIT, MAKING ART**

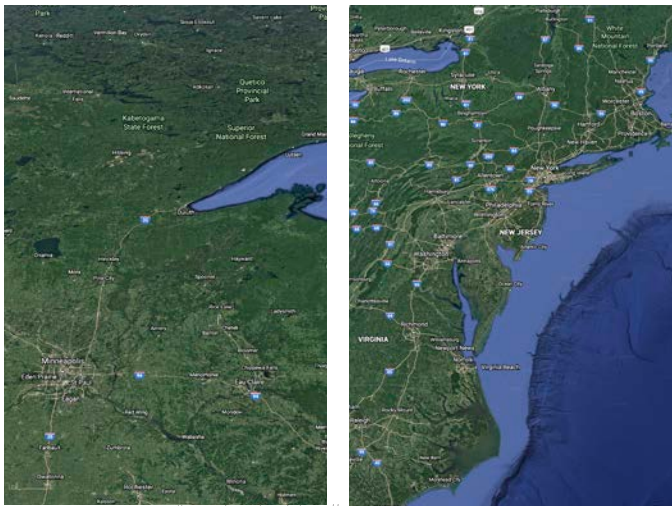
FRIDAY, APRIL 30, 2021

Two-Eyed Seeing

Etuptmunk or Two-Eyed Seeing "is learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing and from the other eye with the strengths of Western knowledges and ways of knowing and to use both these eyes for the benefit of all." (Bartlett, Marshall and Marshall, 2021)

Land Acknowledgment

The *Native Skywatchers* program would like to acknowledge that the land under our feet is the original homelands of the Dakota people and later the Ojibwe. *Mni Sota Makoce*, "Land where the waters reflect the skies" is the Dakota name for Minnesota. We acknowledge both the Dakota and Anishinaabe's painful history of genocide and forced removal from this territory, and we honor and respect the many diverse Indigenous peoples still connected to this land on which we gather.



Credit: Google Earth Web, <https://earth.google.com/web/>

Every community owes its existence and strength to the generations before them, around the world, who contributed their hopes, dreams, and energy into making the history that led to this moment. Some were brought here against their will, some were drawn to migrate from their homes in hope of a better life, and some have lived on this land for more generations than can be counted. Truth and acknowledgment are critical in building mutual respect and connections across all barriers of heritage and difference.

At the Dr. Bernard Harris Elementary and at Native Skywatchers, we believe it is important to create dialogue to honor those that have been historically and systemically disenfranchised. So, we acknowledge the truth that is often buried: We are on the ancestral lands of the Piscataway People, who were among the first in the Western Hemisphere. We are on indigenous land that was stolen from the Piscataway People by European colonists. We pay respects to Piscataway elders and ancestors. Please take a moment to consider the many legacies of violence, displacement, migration, and settlement that bring us together here today.

Moon Phases

As viewed from space, half of the Moon is always lit up by the Sun, just like Earth. As viewed from your backyard, the amount of the half-lit Moon that we can see changes, depending on the relative position of Sun-Earth-Moon. We call this 'the phases of the Moon'.

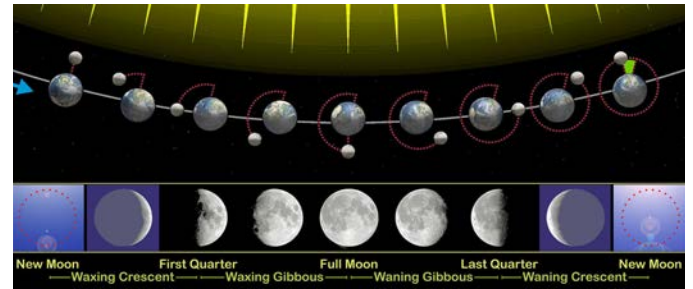


Diagram created by Orion 8, 2018 (not to scale)

Indigenous Moons

Ojibwe Spring Moons:

April - Iskigamizige-giizis - Maple Sap Boiling Moon

May - Zaagibagaa-giizis - Budding Moon (Moment of Birth)



Dakota Spring Moons:

April - Watopapi Wi/ Mağa Okada Wi/ Wokada Wi/ Wihakakta Wi - Moon when streams are open/Goose egg-laying Moon/Egg laying Moon/ Moon of Fattening

May - Wożupi Wi - Planting Moon

Spring Moons 2021:

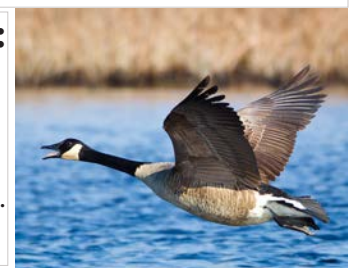
Full... April 26...

3rd Q...May 3...

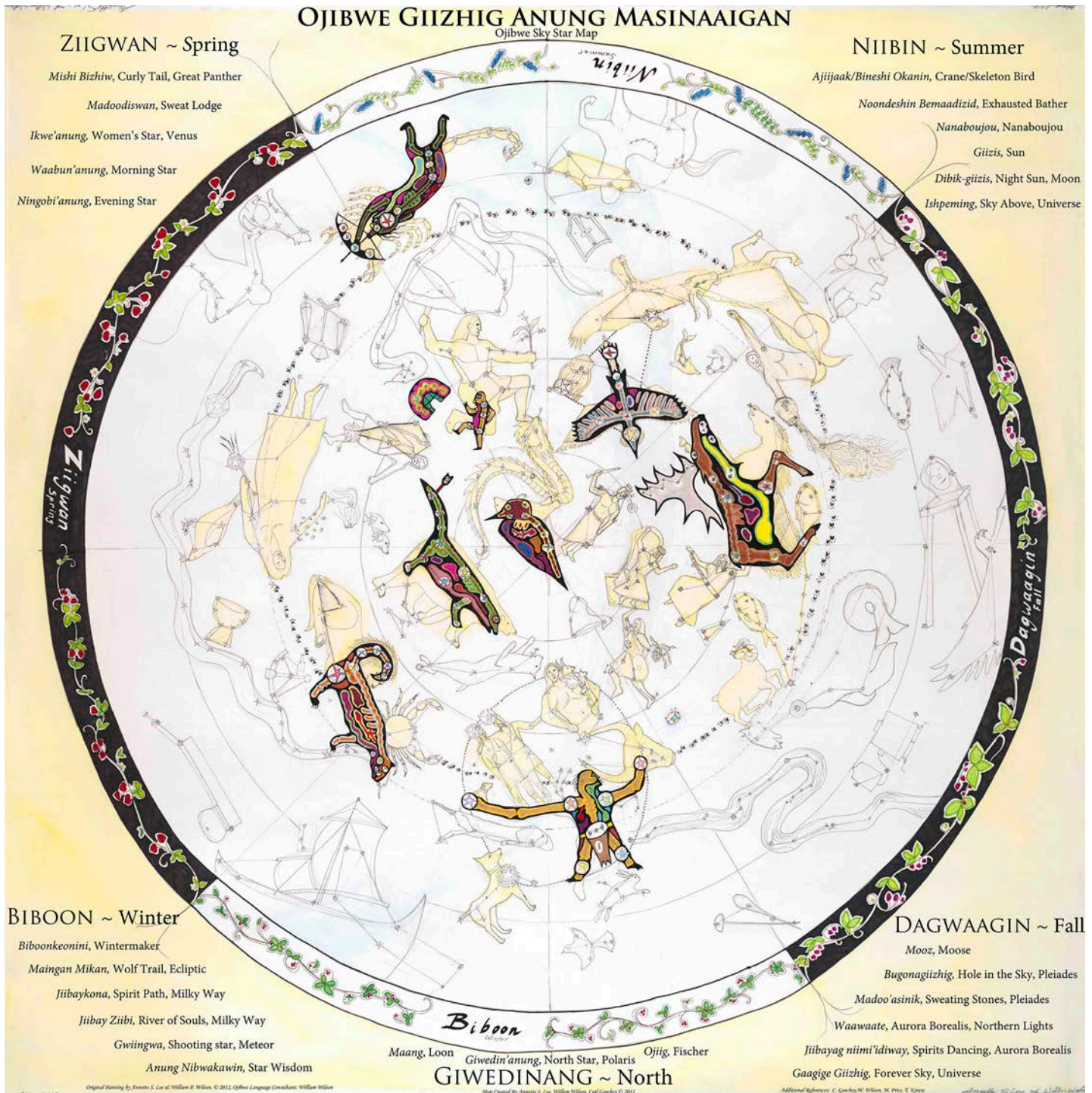
... New...May 11 ...

...1st Q...May 19....

Full... May 26 ...



Kulu, Waning Gibbous, Photo by Anthony Thelion Hilo -First Crescent Moon, Photo by Birrell Walsh



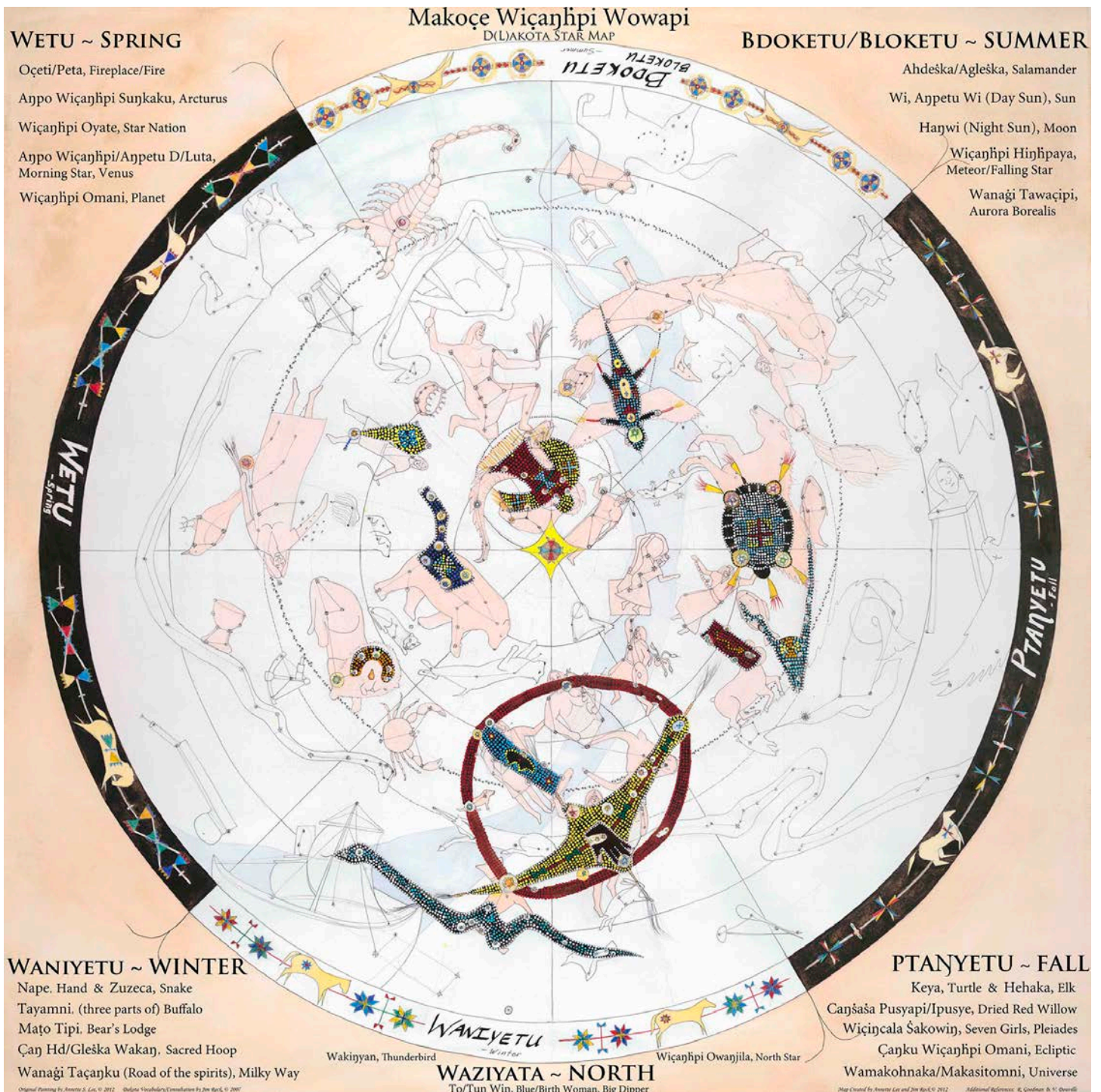
“OJIBWE GIIZHIG ANUNG MASINAAIGAN - OJIBWE SKY STAR MAP”, A NATIVE SKYWATCHERS STAR MAP CREATED BY ANNETTE S. LEE, WILLIAM WILSON, CARL GAWBOY, ©2012

URL: <https://web.stcloudstate.edu/aslee/>

URL: <https://nativeskywatchers.com/>

URL: <https://nativeskywatchers.com/resources.html>

URL: <http://aspbooks.org/custom/publications/paper/473-0029>



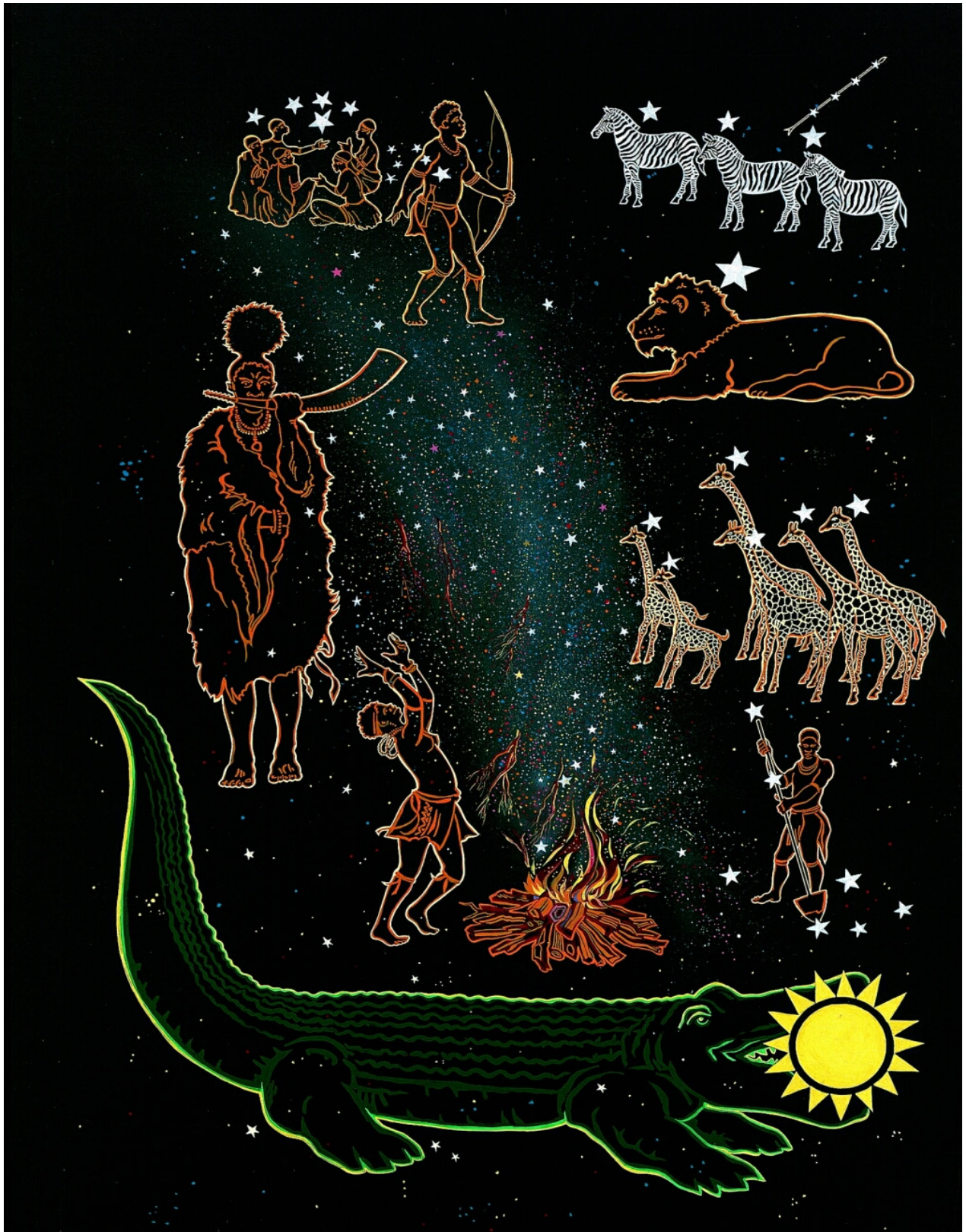
“MAKOČE WIČANŁPI WOWAPI - D(L)AKOTA STAR MAP”, A NATIVE SKYWATCHERS STAR MAP CREATED BY ANNETTE S. LEE, J. ROCK, ©2012,

URL: <https://web.stcloudstate.edu/aslee/>

URL: <https://nativeskywatchers.com/resources.html>

URL: <https://nativeskywatchers.com/>

URL: <https://www.epi-conferences.org/articles/>



“STAR LORE OF SOUTHERN AFRICA ”, ARTWORK BY BRAAM BOTHA, SOUTH AFRICAN ASTRONOMICAL OBSERVATORY (SAAO) ©1998

URL: <https://www.sao.ac.za>

URL: <http://www.lelliott.co.za/African%20Starlore.pdf>
URL: <http://sirius-b.ncat.edu/esass/mythology/Africa-Star/index.html>
URL: https://journals.co.za/doi/pdf/10.10520/AJA1729830X_871

Students' Voices - 3rd graders

Led by Mrs. Venzen-Hall and Ms. Richardson third grade students at Dr. Bernard Harris Sr. Elementary School in Baltimore, Maryland were introduced to African Cosmos by a visit with Ms. Tavia. Following Ms. Tavia's visit the teachers gave the students an opportunity to select three stories they were interested in based on the titles and illustrations. Then the students were separated into four groups based on their interests: The Hopeless Hunter, The Healing Star, The Crocodile who Swallowed the Sun & The Giraffe Stars. The books were then read to the students, they discussed the stories, created their illustrations, and then recorded their versions of the stories.

Giraffe Stars

The bright stars of the pointers and the southern cross were often seen as giraffes, though different tribes had different ideas about which were male and which were female. Among the Venda the giraffes were known as Thutlwa, 'rising above the trees', and in October the giraffes would indeed skim above the trees on the evening horizon, reminding people to finish planting. -<http://sirius-b.ncat.edu/esass/mythology/Africa-Star/index.html>



The Giraffe Stars, Credit: Diontae in 3rd Grade Champs



The Giraffe Stars, Credit: Lameia in 3rd Grade Champs

The Hopeless Hunter & Zebra Stars

According to the Namaquas, the Pleiades were the daughters of the sky god. When their husband (Aldeberan) shot his arrow (Orion's sword) at three zebras (Orion's belt), it fell short. He dared not return home because he had killed no game, and he dared not retrieve his arrow because of the fierce lion (Betelgueuse) which sat watching the zebras. There he sits still, shivering in the cold night and suffering thirst and hunger. -<http://sirius-b.ncat.edu/esass/mythology/Africa-Star/index.html>



The Hopeless Hunter, Credit: Kuron in 3rd Grade Champs



The Hopeless Hunter, Credit: Denaysia in 3rd Grade Champs

Dr. Bernard Harris Sr. Elementary School

Dr. Bernard Harris Sr. Elementary school is a Title One neighborhood school located in Baltimore, Md. DBH is a gifted and advanced and intensive social-emotional learning site that serves students from Pre-kindergarten to 5th grade. The mission of Dr. Bernard Harris Sr. Elementary School is to: Involve all stakeholders in providing a positive and safe community that maximizes student achievement and prepares all students to be college and career-ready. At DBH, we are committed to providing a high-quality education in a safe and orderly learning environment that will prepare students to be caring and responsible citizens who are able to be: Problem Solvers, Proficient Readers, and Critical Thinkers.

The Crocodile Who Swallowed the Sun

Some believed that after sunset the sun traveled back to the east over the top of the sky, and that the stars are small holes which let the light through. Others said that the sun is eaten each night by a crocodile, and that it emerges from the crocodile each morning. -<http://sirius-b.ncat.edu/esass/mythology/Africa-Star/index.html>



The Crocodile & Sun, Credit: Dennaira in 3rd Grade Champs



The Crocodile & Sun, Credit: Malachi in 3rd Grade



The Crocodile & Sun, Credit: Grace in 3rd Grade Champs



The Crocodile & Sun, Credit: Devon in 3rd Grade Champs

Healing Star

A young couple was blessed with a son, but unfortunately their son had an unhealthy heart. The mother remembered her grandmother's story of a Healing Star. She took her son under the stars one night and sang a pleading song. Amazingly a star healed her son. They were forever thankful to the 'Warm-Hearted Star'. -"The Crocodile Who Swallows the Sun and Other Stories of the Southern Sky", Danisile Ntuli, 2006



The Healing Star, Credit: Jai'khye in 3rd Grade Champs



The Healing Star, Credit: Leeah in 3rd Grade Champs

NASA Moon to Mars



Photo credit: NASA.gov, <https://www.nasa.gov/artemisprogram>

Our Educators recommend:

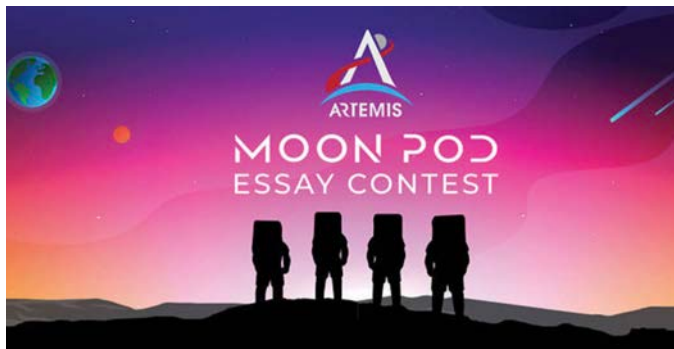


Photo credit: NASA.gov, https://www.nasa.gov/solve/Moon_Pod_Essay_Contest/

Mrs. Venzen-Hall and Ms. Richardson recommend the NASA Artemis Activity: IMAGINE LEADING A ONE-WEEK EXPEDITION ON THE MOON AND WRITE AN ESSAY THAT TELLS NASA ALL ABOUT IT.

NASA is taking remote learning to the Moon! 2020 has been a year of working and living at a distance. Now consider what it might be like if you were living with a pod of astronauts 250,000 miles from Earth. Your challenge is to imagine leading a one-week expedition at the Moon's South Pole – with the whole world cheering you on. Tell us about the types of skills, attributes, and/or personality traits that you would want your Moon Pod crew to have and why. How many would be in your pod?



And of course you'll need high tech gear and gadgets! In your essay, also describe one machine, robot, or technology that you would leave on the lunar surface to help future astronauts explore the Moon.

Photo credit: European Space Agency, Samantha, https://www.youtube.com/watch?v=C-65mBQ7s_Q



Credit: Perseverance's Mastcam-Z's 1st panoramic image of Mars, <https://mars.nasa.gov/>

NASA STEM on Station

SpaceX Crew-2 Astronauts Join Station Crew



The four new SpaceX Crew-2 astronauts joined the Expedition 65 crew today bringing the station population to 11. Credit: NASA TV

NASA astronauts Shane Kimbrough and Megan McArthur, along with JAXA (Japan Aerospace Exploration Agency) astronaut Akihiko Hoshide, and ESA (European Space Agency) astronaut Thomas Pesquet aboard the SpaceX Crew Dragon have arrived at the International Space Station. Crew-2 joins Expedition 65 crew of crew of Shannon Walker, Michael Hopkins, Victor Glover, and Mark Vande Hei of NASA, as well as Soichi Noguchi of JAXA and Roscosmos cosmonauts Oleg Novitskiy and Pyotr Dubrov.

<https://blogs.nasa.gov/crew-2/2021/04/24/spacex-crew-2-astronauts-join-station-crew/>

NASA's Perseverance Mars Rover Extracts First Oxygen from Red Planet

The growing list of "firsts" for Perseverance, NASA's newest six-wheeled robot on the Martian surface, includes converting some of the Red Planet's thin, carbon dioxide-rich atmosphere into oxygen. A toaster-size, experimental instrument aboard Perseverance called the Mars Oxygen In-Situ Resource Utilization Experiment (MOXIE) accomplished the task. The test took place April 20, the 60th Martian day, or sol, since the mission landed Feb. 18.

While the technology demonstration is just getting started, it could pave the way for science fiction to become science fact – isolating and storing oxygen on Mars to help power rockets that could lift astronauts off the planet's surface. Such devices also might one day provide breathable air for astronauts themselves. MOXIE is an exploration technology investigation – as is the Mars Environmental Dynamics Analyzer (MEDA) weather station – and is sponsored by NASA's Space Technology Mission Directorate (STMD) and Human Exploration and Operations Mission Directorate.

"This is a critical first step at converting carbon dioxide to oxygen on Mars," said Jim Reuter, associate administrator for STMD. -<https://www.nasa.gov/press-release/nasa-s-perseverance-mars-rover-extracts-first-oxygen-from-red-planet>



Technicians at NASA's Jet Propulsion Laboratory lower the Mars Oxygen In-Situ Resource Utilization Experiment (MOXIE) instrument into the belly of the Perseverance rover. Credits: NASA/JPL-Caltech

Miigwech! Wopida!

Thank you.



Funded by:

NASA-Next Gen STEM & MN State Arts Board

Credit for this work:

Lee, Annette S., Carl, Carl Gawboy, William Wilson, Jeffrey Tibbetts, Jim Knutson-Kolodzne, Janice Bad Moccasin, Ida Downwind, Ramona Kitto Stately, Tavia La Follette, Mrs. Venzen-Hall, and Ms. Richardson. Our lead school is the Dr. Bernard Harris Sr. Elementary School in Baltimore, Maryland, "Two-Eyed Seeing: Art, Indigenous Astronomy & NASA Science-Making Spirit, Making Art", Apr. 2021, <https://nativeskywatchers.com/two-eyed-nasa-art.html>