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Pipe Ceremony in the Stars: Connecting Astronomy to the Arts

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The first day of spring or the Vernal Equinox has held a place of high honor in the yearly calendar for many cultures and throughout human history. It is a day of balance, with twelve hours of day and twelve hours of night. It is one of two days where the Sun rises exactly in the east and sets exactly in the west[1] As seen from space the Spring Equinox is one of the four guideposts or gateways in the circling[2] of Earth around Sun (Fig. 2), and the day-night line (the 'terminator') slices the Earth in half along the north and south poles (Fig. 3).

On March 20, 2015, D(L)akota peoples will celebrate the first day of spring with a Pipe Ceremony in the Stars (Fig. 1). On this day, around sunrise, this sacred ceremony will unfold along the eastern horizon. The rising Sun, *Wi*, represents the fire or the hot coals. Looking northward along the east horizon is the constellation Ursa Major, whose seven brightest stars are known by their popular nickname, the Big Dipper. In D(L)akota these same seven bright stars are known by several names and relevant here is the name: *Wicakiyuhapi* (the Dipper) and Can Cinkska (Wooden Spoon) (Fig. 4). The Big Dipper represents the Sacred Pipe (Fig. 5) or *Çaŋnunpa*. Between the pipe, *Çaŋnunpa* (the Big Dipper) and the fire (the Sun) is the plant medicine that is used in the smoking mixture, *Çaŋśaśa Pusyapi/Ipusye* (Dried Red Willow). The *Çaŋśaśa Pusyapi* (Red Willow) constellation is made up of two Greek constellations: the three brightest stars in Aries and Triangulum (Fig. 6).

Praying with the pipe is a sacred tradition that

Figure 1: "Pipe Ceremony in the Stars", mixed media painting by A. Lee, 2011.

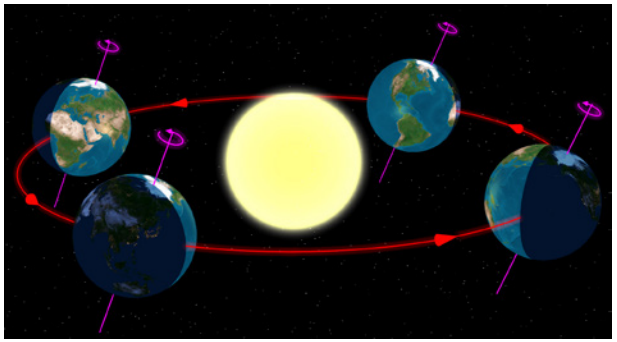

Figure 2: Four "guideposts" in Earth's orbit around the Sun, created by Tau'olunga.

1 Varies by a few days depending on location

2 Technically the orbit of Earth around the Sun is an ellipse with eccentricity ~ 0.02

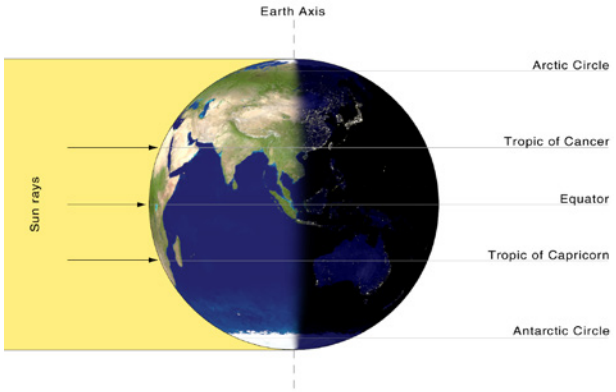

Figure 3: Illumination of Earth by Sun on the Equinoxes, Image by Przemyslaw "Blueshade" Idzkiewicz.

began many generations ago when *Pte Ska Wiŋ* (White Buffalo Calf Pipe Woman) brought the first pipe to the D(L)akota people. It was a time when people were living out of balance and she gifted them with the pipe to help them. The mixture of medicinal plants that goes into making the 'tobacco' varies. One traditional plant medicine used is the inner bark of the red willow plant (technically called Red Osier Dogwood) (Fig. 7).

In D(L)akota star knowledge one of the most important teachings is *kapemni/kapemniyaŋ.* Wrapped up in this one word are layers of meaning that can be thought of as 'As it is above; it is below.' In the Dakota dictionary[3] it is described as a 'dangling, swinging, as scissors tied by a string….' Imagine two tipis stacked vertically. The top triangle is inverted so that the pair meets at the apex. It is understood that the top realm represents the sky above, the stars or the spirit world. The bottom tipi represents the Earth, the material or physical world. (Fig. 9) It is understood that when a person prays

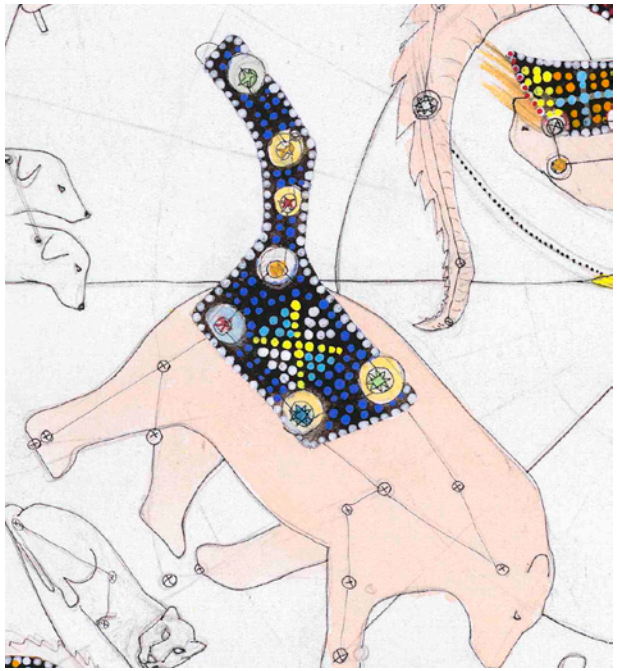

Figure 4: Close up from *D(L)akota Makoçe Wiçaŋȟipi Owapi* — D(L)akota Star Map, A. Lee, J. Rock, 2012.

in ceremony or in everyday life, that they stand at the doorway between the worlds. The intentions of the prayers open the door between the above and below and the healing flows, "a sacred power can be drawn down"[4]. (Fig. 10)

The Pipe Ceremony in the Stars is a very special example of this sacred mirroring or pairing. As the celestial pipe ceremony is unfolding along the eastern horizon at sunrise (Fig. 8), traditional people have a pipe ceremony in their homes at the same time (Fig. 1). This is just one example of the living, participatory relationship of D(L)akota people with the stars that has been practiced for thousands of years.

Native Skywatchers is a research and program-

Figure 5: Wood and Stone Pipe, circa 1800, Minnesota Historical Society.

ming initiative led by astronomer and artist Annette S. Lee (mixed race Dakota-Sioux). The aim is to prevent the loss of the Ojibwe and D(L)akota star knowledge and to build community around the native star knowledge. This is a grassroots revitalization effort. The *Native Skywatchers* core team is composted of six native educators, scientists, artists, language and culture experts. In 2012 two native star maps were created: *Ojibwe Giizhig Anung*

Figure 6: Close up from *D(L)akota Makoçe Wiçaŋȟipi Owapi* — D(L)akota Star Map, A. Lee, J. Rock, 2012.

3 S. Riggs, A Dakota-English Dictionary, (1890), 1992

4 R. Goodman, Lakota Star Knowledge, 1992

Figure 7: Red Willow plant, Red Osier Dogwood, photo by A. Lee.

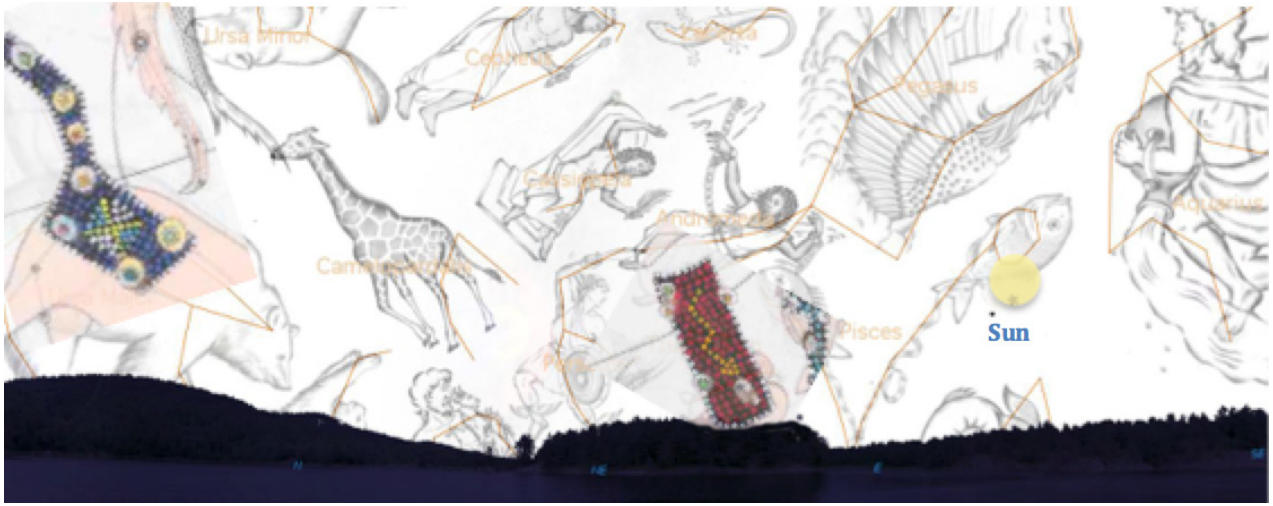

Figure 8: The celestial Pipe Ceremony as seen on March 20, 2015, shortly after sunrise, created by A. Lee.

Masinaaaigan-Ojibwe Sky Star Map and *D(L)akota Makoce Wiçaŋȟipi Wowapi* — D(L)akota Star Map (Fig. 11). To accompany the two maps, constellation guidebooks, planispheres, curricula and artwork are being created on an ongoing basis.

Native Skywatchers formally began in 2009, filling a critical need as prior to that time only two books had been published on this subject. In 2010 the Minnesota State Science Standards required K–12 teachers to *"teach how all cultures have contributed to science"* and more specifically to *"teach Ojibwe & Dakota use of the stars to plan and predict"*[5].

5 MN State Science Standards

Various programming has been offered including: a two-day *Native Skywatchers* Summer Educator Workshop (funded by NASA-MN Space Grant) (Fig. 12); *Native Skywatchers* Art programming that blends art-culture-science (funded by the MN State Arts Board); *Native Skywatchers & Community* art shows; *Native Skywatchers* planetarium programming; and world-wide *Native Skywatchers* presentations such as at the World's Indigenous Peoples' Conference on Education. (Fig. 13, 14, 15).

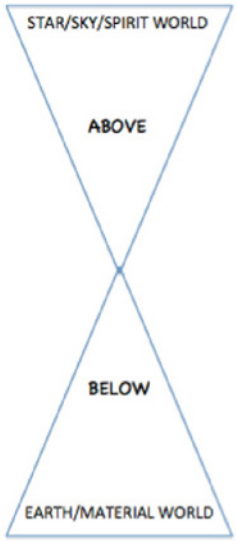

Figure 9: *Kapemni* Diagram, created by A. Lee.

In native culture there is a natural tendency to focus on the inter-relatedness of ideas making learning participatory and making it real. The Pipe Ceremony in the Stars is one example of how people from different cultures and different histories have valuable relationships to the cosmos. Although the focus of this article and *Native Skywatchers* is on native Ojibwe and D(L)akota communities, it is a human connection that we share with the cosmos. We come from the stars. It is our hope that in sharing some of the Ojibwe and D(L)akota star knowledge with both

Figure 10: *Kapemni* Photo Diagram, created by A. Lee.

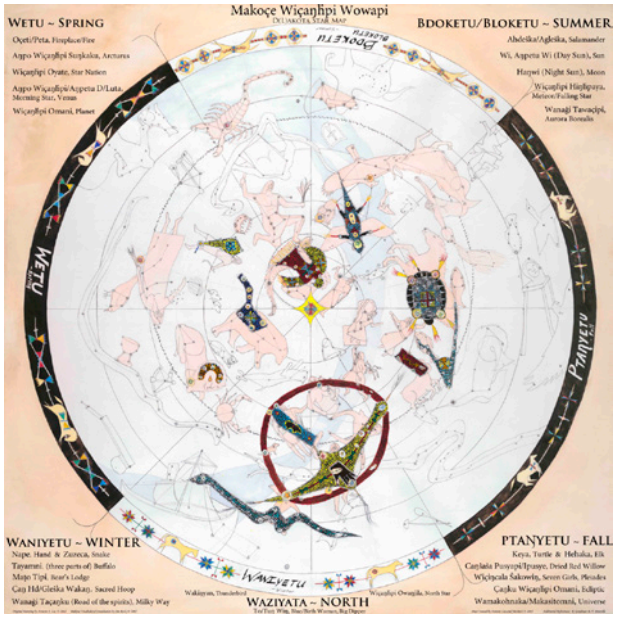

Figure 11: *D(L)akota Makoçe Wiçaŋȟpi Wowapi* — D(L)akota Star Map, A. Lee, J. Rock, 2012.

native and non-native peoples that this can serve as a springboard for acknowledging different indigenous knowledge systems and nurture each person's connection to the stars.

The following activity is one example of how astronomy can be connected to art in a meaningful way. Astronomy is rooted in a tradition of data collection, measurement and the powerful laws of math and physics. Art is equally powerful, rooted in human perception, the human experience and truthful expression. The place where the two disciplines meet is a bridge rich with layers of meaning and mystery communicating our human connection to the cosmos.

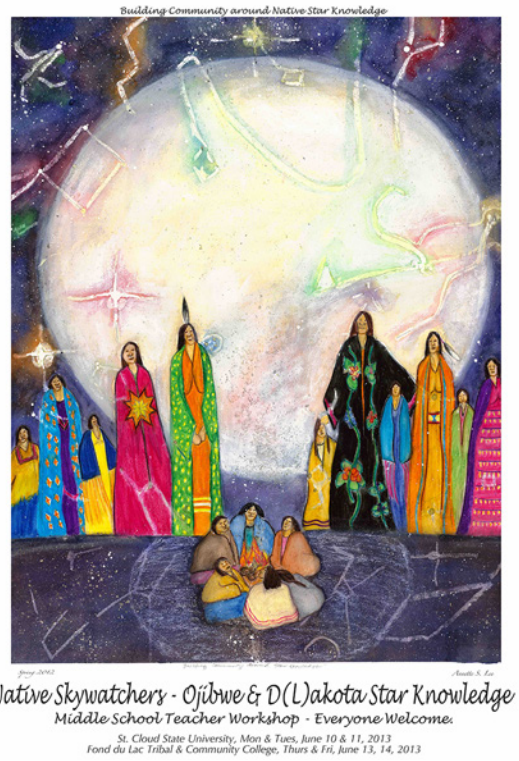

Figure 12: "Building Community Around the Native Star Knowledge", mixed media painting, A. Lee, 2012.

Classroom Activity

Native Skywatchers: Kapemni, As it is Above, It is Below

Click on this link to download a pdf of the activity

Resources for Further Exploration

D(L)akota Makoce Wicanhpi Wowapi — D(L)akota Star Map, A. Lee, J. Rock, 2012

Ojibwe Giizhig Anung Masinaaaigan-Ojibwe Sky Star Map, A. Lee, W. Willson, C. Gawboy, 2012

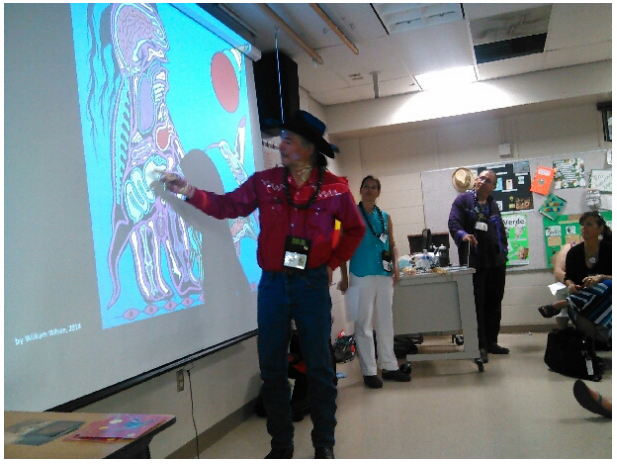

Figure 13: W. Wilson and Native Skywatchers team presenting at the World Indigenous People's conference on Education, 2014.

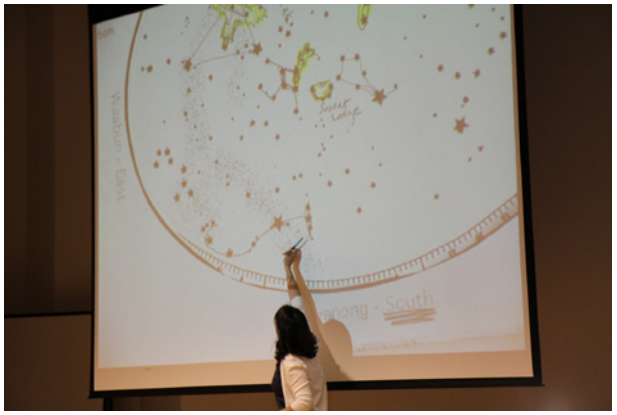

Figure 14: A. Lee presenting at Fond du Lac Tribal & Community College, 2013, photo by T. Urbanski, FDLTCC.

Ojibwe Sky Star Map Constellation Guide, A. Lee, W. Willson, J. Tibbetts, C. Gawboy, 2014

D(L)akota Star Map Constellation Guide, A. Lee, J. Rock, C. O'Rourke, 2014

Lakota Star Knowledge, R. Goodman, 1992

Multicultural Astronomy Resource Guide, by Andrew Fraknoi and Miriam Fuchs, Astronomical Society of the Pacific: http://astrosociety.org/wp-content/uploads/2012/09/ASP-Multicultural-Astronomy-Resource-Guide.pdf

Talking Rocks, R. Morton & C. Gawboy, *Talking Sky,* C. Gawboy & R. Morton

Websites

http://web.stcloudstate.edu/planetarium/native_skywatchers.html

http://web.stcloudstate.edu/aslee/

http://web.stcloudstate.edu/aslee/OJIBWEMAP/home.html

http://web.stcloudstate.edu/aslee/DAKOTAMAP/home.html

www.nativeskywatchers.com

Figure 15: Participant at the Native Skywatchers Workshop, Fond du Lac Tribal & Community College, 2013, photo by T. Urbanski, FDLTCC.

Figure 16: Sample student work, "*Kapemni* Classroom Activity".

Figure 17: Sample student work, "*Kapemni* Classroom Activity".

Figure 18: Sample student work, "*Kapemni* Classroom Activity".

Figure 19: Preparing the materials for "*Kapemni* Classroom Activity".

Figure 20: Sample student work in progress, "*Kapemni* Classroom Activity".