

# Stars' ascent signals arrival of makahiki

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As Nahiku (the Big Dipper) sinks below the western horizon, Iwakeli'i (Cassiopeia) and Kalupeakawelo (the Great Square of Pegasus) climb high into the northeastern sky, signaling the arrival of Makali'i (Pleiades) in the star house 'Aina Ko'olau on the star compass. The arrival of the constellation Makali'i after sunset on the eastern horizon heralds the beginning of the makahiki season.

An open star cluster, the Pleiades, also known as the Seven Sisters and Messier 45, comprises hot blue, very luminous stars that are obvious to the naked eye. Makali'i, or Matariki as it is called in the South Pacific Polynesian islands, follows a similar celestial cycle.

Each island had different names for the lunar months of the year. The Hawaii island calendar designates the names 'Ikuwa for October, Welehu for November, Makali'i for December and Ka'elo for January. The makahiki season lasted for four lunar months. Counting months following a lunar calendar is problematic as a lunar month is about 29.5 days. Over time the calendar drifts, and the names no longer align with celestial season.

In David Malo's book, "Hawaiian Antiquities," editor W.D. Alexander commented that following the lunar calendar meant that the yearly Hawaiian calendar drifted about 10.75 days a year set against the backdrop of a yearly 365-day sidereal calendar.

To rectify this the Kahuna Kilo Hoku, a person who observes the heavens, would need to intercalate the calendar, that is, insert a third month every three years. Although we do not know the name of that additional month, this protocol follows South Pacific Polynesian traditions.

During the makahiki season, Lono, the god of agriculture, succeeded the pantheon of Hawaiian gods. Warfare was suspended, taxes or tribute was collected, and athletic competitions became part of the makahiki season activities. Competitions such as boxing, wrestling, spear throwing and bowling were held.

Local communities often entered trained athletes as their representatives. In a clockwise circuitous procession, the king's retinue moved from community to community to collect taxes, which were in the form of food and utilitarian products such as cloth, rope and feathers.

At the end of the lunar month of Ka'elo, Lono was replaced by Ku as the paramount god, and the leisurely life of the makahiki season was concluded.

## Evening observations

As we move further into our fall season, the sun will set earlier in the evening. Through November the sun sets at around 5:51 p.m., meaning that it will be dark enough for stargazing by 7 p.m. In these early evening hours, observers will be able to see Saturn and Mars.

In the early evening Saturn will be closer to the horizon and preparing to set in Manu Kona. While Saturn and its dynamic rings are beautiful through a telescope, the planet appears to be relatively faint in the sky. Higher up in the southern sky, observers will also be able to see Mars with its distinctive reddish color.

As we march fully into our fall months, the central region (the most visibly prominent selection) of the Milky Way galaxy will be leaving our sky. As the bulge of the Milky Way sets, higher up in the sky we will be able to view the only other galaxy that can be seen with human eyes.

While looking toward the body of Kalupeakawelo, about 10 degrees north and west of the star Manokalanipo, you can see a small, faint smudge in the sky. This faint object is the Andromeda Galaxy, the closest full-size galaxy to the Milky Way, and the only object you can see with your naked eye that is outside of our own galaxy. The Andromeda Galaxy is approximately 2 million light-years away from us, meaning that when we look at it we are looking at light that is over 2 million years old.

Through mid- to late November, the spectacular Leonid meteor shower will scatter our sky with shooting stars. These meteors come from the tail of the comet Tempel-Tuttle, a periodic comet which last swept through Earth's orbit in 1998. The peak of the shower will occur on Nov. 17, when observers can expect to see at least 10 to 15 meteors each hour.

## Morning observations

In November the sun will rise between 6:30 and 6:50 a.m. As the days get shorter, there will be more opportunities to do observing during the early morning hours. Around 5 a.m. the bright, recognizable shape of Kaheiheionakeiki, famously known as Orion, will be visible toward the western sky. Beneath Orion will be the incredibly bright star of A'a, also known as Sirius. Rising in the east at this time will be the incredibly bright planet Venus appearing as our "morning star."

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