



Kanayama Megaliths: Iwaya-Iwakage site, ©Tokuda Shiho

Jomon Astronomy

Solar calendar of the Kanayama Megaliths

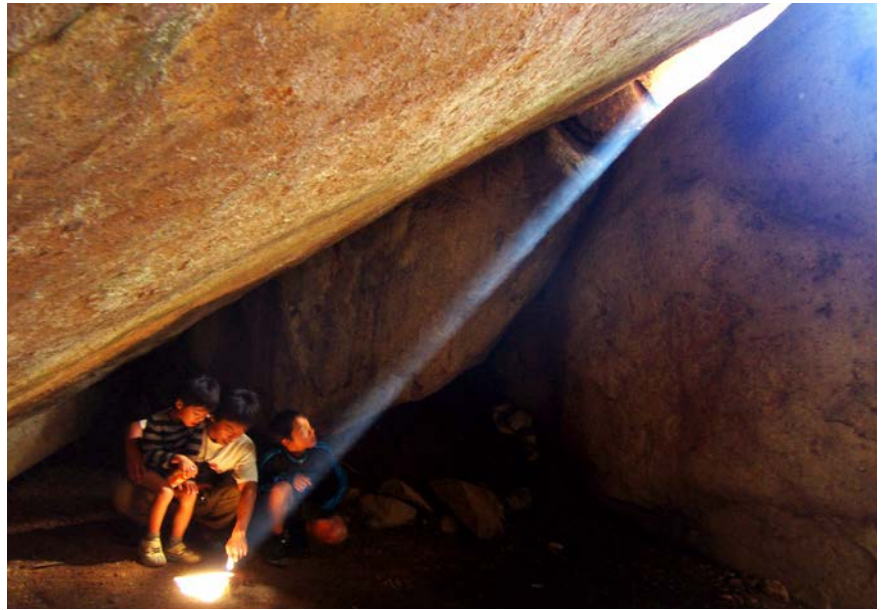
Harriet H. Natsuyama, USA

Jomon Astronomy

Solar calendar of the Kanayama Megaliths



Approach to Iwaya-Iwakage,
©Tokuda Shiho



Iwaya spotlight, ©Tokuda Shiho

Motivation

In the spring of 2010, I visited the Kanayama Megaliths in the green mountains of Hida Kanayama for the first time. Jomon people had constructed three megalithic sites as a living observatory for the sun's passage, creating a solar calendar. The enormous megaliths were shaped and ingeniously assembled, creating small apertures through which the sun would shine on certain days of the year at certain times of the day. The work of the Jomon is so delicate that it allowed them to determine the length of the solar/tropical year, even factoring in the extra leap-year day. Even more astoundingly, the Jomon knew that a further adjustment is required every 128 years! This calendar is fifteen times more accurate than the current, globally employed Gregorian calendar. It will take 51,000 years before making an error of one day!

I learned the workings of the Kanayama Megaliths from Kobayashi Yoshiki and Tokuda Shiho who have dedicated nearly twenty years to their investigation.

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Researcher Kobayashi Yoshiki
 ©Harriet Natsuyama



Researcher Tokuda Shiho
 ©Harriet Natsuyama

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Objective We are a team of researchers and advisors, including Dr. Stefan Maeder, German archaeologist of Lucerne, Switzerland. Our joint program at the Kanayama Megaliths is to preserve, document, and inform the people of Japan and the world about this great treasure. On a regular basis we make and document observations, organize guided tours, hold on-site classes and produce publications for visitors, researchers, and the general public, both domestic and international. The knowledge gained at the Kanayama Megaliths is already being disseminated in textbooks throughout Japan. Being at the site however is the best way to experience a unique synthesis of nature, astronomy, environment, and culture. Many enthusiasts visit from all over Japan and abroad. For those who cannot make the journey in person, we are developing more accessible forms of information in addition to our current website.

Context The Kanayama Megaliths form an ensemble of three megalithic sites in Hida Kanayama, Gifu prefecture. Two of them are close to each other, near the stream that flows into the Iwaya Dam. One of these is called Iwaya-Iwakage, *the cavern of stone*, providing sunlight viewing for winter and leap-year measurements. The other one is Senkoku-Ishi, *the marked stone*, where summer-time observations are done. When one site is ready to take a hiatus, the other one takes over. The third site is located to the east, 200m higher, near the peak of Higashinoyama, the Eastern Mountain. It is where the winter solstice sunrise is observed. Set-up around 5,000 years ago, the Kanayama Megaliths are still working today – in a mountain forest, a most unusual environment for sun-watching.

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Light falling into Iwaya-Iwakage, ©Tokuda Shiho



Big Dipper cup marks, ©IIDj

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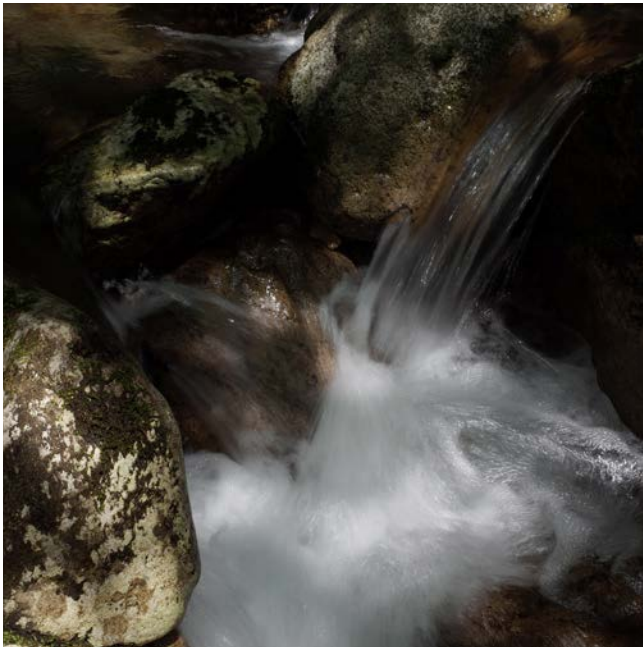
The Kanayama Megaliths have significant relevance for us today. They provide opportunities for experiencing and appreciating cycles of nature and the universe; learning how humans can live harmoniously with the natural environment; realization that there are modes of communication beyond the verbal, modes that are common to all people; embracing and building upon our indigenous heritage; sharing the essentials of life and environment with each other, leading to unity of all people and a world of non-violence.

The achievements of the Jomon belong to all people, for are we not one people, one humanity?

In the hectic world of today, a trip to Hida Kanayama is a journey into the past, to times when life was simpler and perhaps more authentic. In the Iwaya Valley of Kanayama – with its rushing rivers, gushing waterfalls, forests and meadows, full of insects, birds, and other wildlife – we can connect to our selves. We find that it is not the size of our bank account or the prestige of our job title that counts. We understand what is essence, what is of important and lasting value in life.

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Solar calendar of the Kanayama Megaliths



Stream near the site of the Kanayama Megaliths, ©IIDj



Megaliths in summer, ©Harriet Natsuyama

Our ancestors left in stone a message for us. They showed us how to keep track of time during the year. A society that has a dependable calendar is cohesive, can plan its shared seasonal activities – whether they be for the growing of crops, for fishing, or for sailing the seas. Of equal value to a society is to observe its sacred ceremonies at certain times of the year when the energy is most powerful.

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Solar calendar of the Kanayama Megaliths



Visitors observing the distinctive pattern of the spotlight, ©Tokuda Shiho



Dashed spotlight, created by the light spotted on deliberately carved stone surface, ©Tokuda Shiho



Sunlight on lower grotto ©Nagasaka Chika

The Jomon left us no written text. Instead, they cut, shaped, and arranged megaliths weighing over 100 tons with great thought and refinement. Technologies we no longer possess made sure that the structure would remain fixed for millenia despite regional seismic activity. They executed the designs of the caverns so sensitively that only small beams of sunlight would penetrate. These beams of sunlight cast spots of light on the floor or on specially constructed stone boards. The shapes and movements of these spotlights are tracked and measured, creating a calendar so accurate that current models don't compare. This spotlight technology is unique to the Kanayama Megaliths.

The extreme precision of the Kanayama calendar is based on four features: spotlight technology, division of the sun's sky into four equal zones, stone tools for making various measurements, and the coordinated arrangement of three sites. This last feature alone is probably the most specific to the Kanayama Megaliths, making the site such an accurate solar calendar. As a solar tracking station and living museum where visitors and researchers alike can be megalithic astronomers, the Kanayama Megaliths are of great significance to the world.

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Solar calendar of the Kanayama Megaliths

Changing seasons at Kanayama
©Harriet Natsuyama, Tokuda Shiho



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Natural Cycles

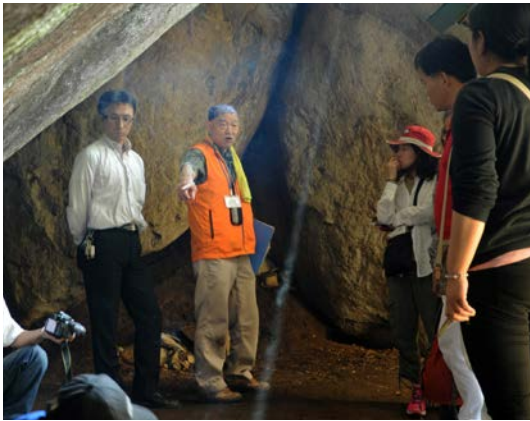
Living and working in large cities, people today have become removed from nature. We have forgotten that we are part of Nature and subject to its Laws. Experiencing the Kanayama Megaliths we recognize Nature's cycles, the cycles of the seasons, the cycles of the solar calendar. We learn to see ourselves as a beloved part of Nature's cycles of life, death, and rebirth. We develop a worldview and philosophy, imbued with wisdom.

Satoyama Initiative

The government of Japan has promoted the Satoyama Initiative internationally as a concept where mountains and villages can inspire modern society, recognizing principles of sustainability and harmony with nature that were practiced in earlier times. The Satoyama Initiative aims at fostering a vital and productive environment for all life on earth.

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Guided tour given by Kobayashi Yoshiki to visitors, ©Tokuda Shiho



Sunlight entering into the stone chamber ©Tokuda Shiho

Multi-modal Communication

There are many modes of communicating beyond the oral and written. One is field experience. The Kanayama Megaliths offer an excellent opportunity for children and adults to experience and explore the movement of the sun. Instead of teaching astronomy through books, we encourage and promote learning by direct observation in the field as our ancestors did.

Global Development

Our work at the Kanayama Megaliths sets a standard of taking pride of indigenous heritage. Our ancestors developed skills to transport and arrange the enormous megaliths as they designed and built these sophisticated structures for scientific investigation. Their ventures were always planned and executed cooperatively.

World Peace

The Kanayama Megaliths contribute to world peace by welcoming visitors to the serenity of Iwaya Valley's mountains. Nature fills people's hearts with presence. At the Kanayama Megaliths people experience our One Sun, our One Sky.

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Solar calendar of the Kanayama Megaliths



Sun setting into the mountains and megaliths, winter time

©Tokuda Shiho

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Closing We will persevere in our teamwork, expanding as possible. We will continue to observe, document, analyze, and educate through guided tours, web-based communications, seminars, and written materials. Our materials will be made accessible to people at all levels from grade school, through to university and beyond. Currently two books are underway to publication and our website and blogs are updated regularly.

Longer term activities include finding other megalithic sites, domestic and international, with astronomical features; building a visitor's center for scholars; further investigating the caverns and environs around the megalith groupings; seeking to understand how the site may effect changes in consciousness; training the next generation of researchers of megalithic astronomy.

We will always welcome specialists as well as the general public to experience and appreciate this magnificent accomplishment of our ancestors.

The Kanayama Megaliths lead the way to greater understanding of megalithic astronomy and of life itself.

Jomon Astronomy

Solar calendar of the Kanayama Megaliths



Harriet Natsuyama received a Doctor of Science degree in Astrophysics from Kyoto University. She is an alumna of the University of Hawaii in physics. She has authored six scholarly books and 200 papers. Dr. Natsuyama has had a career in both industry and academia. She serves on the Board of Advisors and is Visiting Scholar at Kanayama Research Center. She is pursuing her interests in researching megalithic astronomy, Woshite language, and other esoteric subjects. These interests have brought the knowledge and wisdom of indigenous Japan to her attention, and she proactively promotes this view of Japan to the West.

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iwakage.wordpress.com

okunomichi.wordpress.com

woshiteworld.wordpress.com

Jomon Astronomy

Solar calendar of the Kanayama Megaliths

Places **Hakusan Shrine**

One of the many Shinto shrines to Shirayamahime, the namesake of the sacred Mt Hakusan on the border of Gifu and Ishikawa prefectures, this historical shrine is located on the route from Kanayama town to the Megaliths at the entrance to the Yokotani Valley.

509-1622 Gifu, Gero shi, Kanayama cho, Kanayama 308

Hida Kanayama Station

Opened in early Showa (1928) , this rural railway station has hardly changed over time. Access from Nagoya with the Hida Express takes a mere 80 minutes.

509-1614 Gifu, Gero shi, Kanayama cho, Ofunato 679

[web-site](#)

Hida Kanayama Tourism Association

Conveniently located in the Hida Kanayama station, this place provides all the information needed to plan for an exciting trip. A guided tour is available to explore the Megaliths and the old Kanayama town. An advance reservation via email is required.

509-1614 Gifu, Gero shi, Kanayama cho, Ofunato 679-1

[web-site](#)

Restaurant Hizan

Delicious meals served daily – on Tuesdays and Wednesdays Japanese style breakfast called *morning service* including egg, toast, and more, for the price of a cup of coffee.

509-1622 Gifu, Gero shi, Kanayama cho, Kanayama 1885-3

Tel: 0576-32-4040

Iwaya Dam

The construction of this dam from 1966-1976, opened new access to the Iwaya area. Excavations during that time produced evidence of human settlements going back to the Jomon period, reigniting interest in the Kanayama Megaliths.

[web-site](#)

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Places **Kanayama Megaliths Research Center**

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Providing in-depth information on the Kanayama Megaliths, it also has a small photo gallery showing the megaliths through-out the seasons.
c/o Gallery Oofuku, 509-1622 Gifu, Gero shi, Kanayama cho, Kanayama 2142-4

[web-site](#)

Michi-No-Onsen-Eki Karen

This street-side complex offers accommodation, traditional meals prepared with locally sourced food, as well as both indoor and outdoor hot spring facilities.

509-1622 Gifu, Gero shi, Kanayama cho, Kanayama 911-1

[web-site \(Japanese\)](#)

Mitsukiya Ryokan

Located 5km south of the Kanayama Megaliths along the Maze river, Mitsukiya Ryokan is popular among sweetfish enthusiasts during summer. Sightseeing spots such as the Soshino Hachimangu shrine are nearby.

509-1606 Gifu, Gero shi, Kanayama cho, Soshino 222-11

Tel: 0576-35-2013

Okuhida Sake Brewery

In a 200-year-old building located in the center of Kanayama town, Okuhida Brewery has been making fine sake for going on 300 years using pure well water.

509-1622 Gifu, Gero shi, Kanayama cho, Kanayama 1984

Tel: 0576-32-2033

[web-site \(Japanese\)](#)

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Places **Oofuku-Ya**

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Operated by Kobayashi Yoshiki, the man who discovered the archaeological value of the Kanayama Megaliths, this traditional soba restaurant offers homemade buckwheat noodles from the Hida region. For the best experience, it is recommended to visit during harvest time in late autumn.

509-1622 Gifu, Gero shi, Kanayama cho, Kanayama 2973

Tel: 0576-32-2362

Shimizuya Ryokan

A small Japanese style inn, located in the historic neighborhood of Kanayama.

509-1622 Gifu, Gero shi, Kanayama cho, Kanayama 2219-3

Tel: 0576-32-2324

Soshino Hachimangu Shrine

Soshino Hachimangu shrine is a branch of Tsurugaoka Hachimangu in Kamakura founded in 1181. The shrine houses the *Soshino-maru* sword produced by Yasutsuna, one of the prominent swordsmiths of the Heian period. According to local lore, this sword was used to defeat a violent baboon at the Iwaya-Iwakage site. The Myoken shrine there belongs to the Soshino Hachimangu shrine.

509-1606 Gifu, Gero shi, Kanayama cho, Soshino, Azakayano 223

Yokotani Kyo

The scenic valley is filled with beautiful combinations of jagged rocks and deciduous trees that change appearance through the season, as well as four gallant waterfalls: Shira taki, Futami taki, Momiji taki, Keimei taki. This area is also registered as part of Hida Kisogawa National Park.

509-1622 Gifu, Gero shi, Kanayama cho, Kanayama

[web-site](#)

Yuttari Kan

The Gero area, with its beautiful natural surroundings, is known as one of the three best onsen localities in Japan. Yuttari kan is a traditional hot spring spa offering convenient access for exploring the Kanayama Megaliths or enjoying outdoor activities such as kayaking on the Hida river. After a long day, one can enjoy a refreshing hot bath and great variations of local food.

509-1622 Gifu, Gero shi, Kanayama cho, Kanayama 973-2

[web-site](#) (Japanese)

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Resources **Iwaya-Iwakage of Kanayama Megaliths**

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Blog on seasonal observations, nature, and people of the area.

[web-site](#)

Hida Kaido Kinkotsu Meguri

Exploring the back alleys of Hida Kanayama's old towns, visiting historic buildings and sites, and shopping for local specialties. Destinations include an old bath house, a silk cocoon factory, and a traditional sake brewery.

[web-site](#) (Japanese)

Kanayama Megaliths Tour

Experience the Light tours organized on one weekend per month. Private arrangements for groups of two or more people are possible. Advance reservation is required at Hida Kanayama Tourism Association via email.

[web-site](#) (Japanese)

The Kanayama Megaliths and Archaeoastronomy in Japan

Website, providing comprehensive information of the Kanayama Megaliths, including a schedule for guided tours and suggestions on best times to visit.

[web-site](#)

Megaliths of Kanayama

This online article by William Slifko and Funabashi Kikuko provides a comprehensive introduction to the Kanayama Megaliths.

[web-site](#)

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Glossary

Archaeoastronomy

The study of sky phenomena and their roles in ancient cultures

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Equinox

►Gregorian calendar

Gregorian calendar

Introduced in the late 16th century by Pope Gregorius XIII as improvement of the Julian Calendar, adding a 0.002% correction to the length of the year

►Julian Calendar

Hida Kanayama

In the northern part of today's Gifu Prefecture, the area of the historic Hida Province covers the localities of Kanayama, Gero, Hida, and Takayama. Some of the places are prefixed, such as Hida Kanayama or Hida Takayama, to distinguish them from other places with the same name.

Higashi-No-Yama

Literally *the Eastern Mountain*, a term used by the Kanayama Megaliths researchers to identify one of the three major megalith sites east of the Iwaya-Iwakage location, discovered in 1998 by Kobayashi Yoshiki. A 9m long stone serves as winter season sun-calendar.

►Iwaya-Iwakage

►Senkoku-Ishi

Iwaya

Literally *the Rock Shelter*, the name for the area around the Kanayama Megaliths

Iwaya Dam

The construction of this dam (1966-1976), opened new access to the Iwaya area. Excavations during that time produced evidence of human settlements going back to the Jomon period, reigniting interest in the Kanayama Megaliths.

►Jomon

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Glossary **Iwaya-Iwakage**

Literally *the Rock-Shelter-Rock-Shadow*. One of the three Kanayama Megaliths, it is a designated Cultural Property of Gifu prefecture. This very precise sun-calendar features both the four-year and 128-year leap-year cycles. Before the discovery of its archaeoastronomical value in 1998, this site was merely acknowledged as an archaeological site of the Jomon period, also known by locals as the place where a violent baboon had been defeated. It houses a small Myoken shrine.

- ▶ Higashi-No-Yama
- ▶ Myoken Shrine
- ▶ Senkoku-Ishi

Iwaya-Iwakage (Model)

The researchers, seeking proof of their assumption that the slope of the mountain plays an important role for monitoring sunlight, discovered a scaled down version of Iwa-Iwakage northeast from Iwaya-Iwakage and Senkoku-Ishi. Located at higher altitude, this prototype provides a better view of the sun.

Iwaya Shrine

- ▶ Myoken Shrine

Jomon

The Jomon period covers a time in Japanese prehistory that started as early as 14,000 years ago and lasted until 300 BCE. Evolving from a hunter-gatherer culture, the Jomon developed into an agrarian society where people lived in settlements and created a civilization marked by its rich advancements in the arts, sciences, and technologies.

Julian Calendar

Introduced in 45BCE by Julius Caesar as improvement of the Roman Calendar, setting the year to 365 days divided into 12 months with a leap day added every four years

- ▶ Gregorian calendar

Kamakura Period (1185-1333)

Commenced with the establishment of the Kamakura Shogunate by the first shogun, Minamoto no Yoritomo, later ending with the forceful re-establishment of imperial rule from Kyoto by the later Emperor Daigo

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Glossary

Kyosekigun

The Japanese term for a megalithic grouping

►Megalith

Megalith

Megaliths are giant stones that can be found in various parts of the world. Erected thousands of years ago, they reveal a lot about earlier societies. The term is a compound of the Greek words *mega* – great, and *lithos* – stone.

►Kyosekigun

Megalithic

Referring to ensembles of megaliths that represent certain prehistoric periods

Michi-No-Eki

Originally describing a simple set-up of stands where farmers sell their local produce to passing travellers, Michi-no-eki has become a synonym for a business-model that promotes locally sourced goods without intermediate dealers, nowadays often an established section within the shopping malls of highway rest-areas.

Myoken Shrine

Shrines worshipping the god Amenominakanushi, better known by its nickname of Myoken, the God of Origin. These shrines are visited by pregnant women wishing for an easy and auspicious birth. According to local lore the shrine was built in the Kamakura period by villagers after the defeat of a violent baboon. Although this shrine had been renamed as Iwaya shrine in 1868, locals still refer to it by its original name.

►Iwaya Shrine

Satoyama

A compound of the Japanese words sato, arable/livable land, and yama, mountain, it has become an umbrella term for vernacular social practices of holistic and sustainable management of agrarian resources, dating back to small scale farmers' communities in the Edo period.

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Glossary **Senkoku-Ishi**

Literally *the Line-carved stone*, a stone marked with two long lines and three ellipsoidal shapes that is one of the three major megalithic sites. Senkoku-Ishi was the first location discovered by Kobayashi Yoshiki in 1997 for its archaeoastronomical value. Upon realizing that direct observation was obstructed by a mountain during the winter season, he discovered the Higashi-no-yama site purely based on his own conceptual reasoning.

- ▶Higashi-No-Yama
- ▶Iwaya-Iwakage

Solar Calendar

A calendar that keeps track of the days in a tropical year

- ▶Tropical Year

Solar Year

- ▶Tropical Year

Solstice

Summer Solstice and Winter Solstice, around June 21st and December 22nd respectively, are the seasonal events when the sun reaches its northerly/southerly extremes. On Summer Solstice the day is longest, on Winter Solstice shortest. The latin origin of the term signifies the standstill of the sun as on these days, the sun reverses its path, seen from places other than the equator.

- ▶Gregorian calendar

Sun's sky

The part of the sky through which the sun travels during the course of a year

Tropical Year

Also called Solar Year covers the time between fixed seasonal events such as vernal equinox or summer solstice, averaging to 365 days, 5 hours, 48 minutes, and 45 seconds. The original meaning of the greek word *tropikos* is *the turn*; observed from earth, the sequence of tropical years is marked by the sun's turning its path.

- ▶Equinox
- ▶Gregorian calendar
- ▶Solar Year
- ▶Solstice

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Imprint

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Japan-Insights promotes a deeper understanding of the country – its people, places, and culture.

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Looking towards the 2020 Olympics and Paralympics and beyond, we hope to contribute to a Japan that offers people from around the world many opportunities for discoveries and memorable encounters.

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