



# ***A Collection of Curricula for the STARLAB Inuit Star Lore Cylinder***

*Including:*

*Inuit Star Lore by Ole Knudsen*



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## **Constellations and Star Groups on the Inuit Star Lore Cylinder**

### **Note**

*In the following text, the letters 'AS' followed by a page number refer to a reference in John MacDonald's book **The Arctic Sky**, 2nd printing 2000, on which this material is based. Among the Inuit, there is a huge difference in spelling and pronunciation. In the old days before a written language existed this can a.o. be credited to or blamed on the travelers who wrote the legends and stories down. Today there are several dictionaries, each covering its own area. Words and spelling in this text are mainly taken directly from "The Arctic Sky", and only occasionally supplemented with modern spellings, mainly from Greenland.*

### **Aagjuuk [AS44]**

For the Inuit of old, the new year started when the two stars called **Aagjuuk** rose above the horizon in the North East shortly before dawn. This happens in the days around mid December every year, and Aagjuuk is clearly the most important of the Inuit constellations.

The names of these two stars in the modern astronomical literature are Altair and Tarazed, or alpha Aquilae and beta Aquilae, both in the constellation Aquila, The Eagle. They belong to that part of the evening sky of late summer which can be seen in the south. Altair is one of the prominent stars of the 'Summer Triangle' together with Vega in Lyra and Deneb in Cygnus, The Swan. The same stars can be seen in other directions at other times of the day and on other dates of the year.

Throughout January, February and March, Aagjuuk is seen during the pre-dawn hours but thereafter the stars are rapidly taken over by sunlight as the days lengthen.

The meaning of the term Aagjuuk is not clear, but in a legend from Noatak, Alaska, it is said that it means something like "the two beams of light cast by the Sun when it first reappears above the horizon in late December" [AS283]. There are also stories of a grandmother or another old woman pursuing a young boy up into the sky. The boy becomes Altair and the old woman the fainter Tarazed.

In most of the Inuit area there is a connection between the first visibility of these stars at dawn and the reappearance of the Sun after the dark period, and it is quite obvious why the Inuit also saw this time as the beginning of something new and good after the long, hard winter. The Aagjuuk stars also signalled the time for the midwinter celebrations, involving good eating, masquerade, partner exchange and various shamanistic rituals. In some places this started at the first new moon after the Aagjuuk was seen. After this date, the playing of string-games (like cats cradle, e.g.) was strictly taboo in many areas, for the whole brighter part of the year.

Of course the same two stars can be seen much more easily when they stand high in the south during early autumn, but they only seem to have had the name Aagjuuk when they were low in the northeast, there filling the purpose of heralding the longer days to come.

Aagjuuk is the name used in the Igloodik area in Nunavut, Canada. Here is a short list of other names for the same constellation, used in other parts of the Arctic.

Agru-la-wik, A.gru	Point Barrow, Alaska
Aaguruk, Aagruuk	North Alaska
Agyuk	Coronation Gulf
Aagssuk, Aagssiit	North and West Greenland — old sources.
Aassuutit, Aaxxuuk	North and West Greenland — modern.
Asiit, Aavssit	East Greenland — old sources.
Aattik, Aagjik	East Greenland — modern.

### **Akuttujuuk [AS52]**

Bright and reddish Betelgeuse and the fainter Bellatrix, that make up the shoulders of the giant Orion are 'those two placed far apart' in the Inuit sky. They were used for time keeping. During all of the dark season they appeared in the Eastern sky sometimes during the night. When they were seen during the evening twilight it was a sign that the days were getting longer. One would say at this time that 'the Akuttujuuk has caught up'.

Only one interpretation can be connected with **Akuttujuuk** with some certainty. In Western Greenland, it was told that the two stars Inerfuk (Iversuk — modern) looked like 'two persons that contend with songs or verses in taunting one another'. The bright red star Aldebaran in Taurus, The Bull, is then the lamp named **Nenneroak** providing light for those who sing and dance. You can find another interpretation of Aldebaran in the section on **Nanurjuk** in the story of the great Polar Bear hunt.

### **Sivulliik and Kingulliq [AS54, AS76]**

**Sivulliik** is plural and means 'the first ones' and **Kingulliq** means 'the one behind', or the second one. The two stars Arcturus and much fainter Muphrid, both in the constellation Bootes, rise first in the north northeast, followed by the one behind, which is bright blue Vega in Lyra. Vega is actually circumpolar, so it never passes below the horizon, and thus it never rises, but it always follows bright Arcturus across the sky some 60° behind.

In the legend of **Iliarjugaarjuk**, the little orphan boy [AS230] the three stars obtain names as the story is told. Muphrid is the boy, Iliarjugaarjuk, Arcturus is the old man **Uttuqalualuk** following him and Vega is the old woman, maybe the boy's grandmother named **Ningiuraaluk**. You can find the story in the section of selected legends.

In East Greenland Vega is called Nelarsik (Nalaarsik — modern), another brother of the Sun apart from the Moon. Nelarsik is very helpful, telling us time when it is dark. He also once shot an arrow, killing one of the women causing thunder, which is why, in the Arctic, thunder is a relatively rare phenomenon.

The star Rigel is also named Kingulliq, 'the one behind' in connection with the story of the great polar bear hunt.

When Arcturus is meant in the singular it is called Sivulliq or Sivulliaaluk.

Some other spellings:

Sivlliq, sivulliik	Alaska
Siugdliit, Siulliit	modern W. Greenland
Hiulliit	N. Greenland, Thule area.
Kingullialuk	Igloolik
Kiudleq	Repulse Bay

### **Ullaktut, Kingulliq, Nanurjuk and Qimmiit. The Runners and the great polar bear hunt.**

The three belt stars of Orion, Mintaka, Alnitak and Alnilam are three hunters pursuing a polar bear. [AS] They are not individually named. The fourth man of the hunting company dropped his mitt and had to retrieve it. That is Rigel; the right foot of Orion. His name is Kingulliq, 'the one behind', or maybe what you see is just the mitt lying there because the fourth hunter got safely back to earth? [AS56]

Higher up in the sky, to the right and in front of the three hunters is the polar bear himself, **Nanurjuk**, surrounded by a pack of hunting dogs [AS57]. The dogs, called **Qimmiit** are the V-shaped cluster of stars around Aldebaran, called by the astronomers The Hyades [AS64]. Nanurjuk himself is of course bright Aldebaran, the Red Eye of Taurus, The Bull.

Below the runners you can see their children, **Qangiammaariik**, carrying warm clothes of caribou skin for their fathers who are probably by now becoming quite cold because they perpetually have to run across the sky. The children, or maybe nephews or nieces, are the stars of the sword of Orion, looking quite fuzzy because of the furry skins they carry. [AS90]

In other versions of the story Aldebaran and the Hyades are a bear hunter and his dogs. The Pleiades is then the bear surrounded by the dogs. The belt of Orion is something entirely different: Three steps cut into a steep snowbank; or, in another story from Greenland, three seal hunters that lost their way and paddled up into the sky. The last version is a parallel to a similar story from the west coast of Norway, where they are three lost fishermen, Fiskarkarene.

### **Sakiattiak, The Pleiades [AS68]**

Further to the right and above Nanurjuk and the dogs we find the small fuzzy cluster of the Pleiades. The Inuit have given this distinct group of stars many different names and many roles in their star lore.

In some areas of the Arctic, the Pleiades are connected to the great polar bear hunt. In Greenland they are **Qilugtuusat**, (Qiluttuusat—modern), the 'baying dogs', a pack of dogs letting out the special barks that signify for the hunter that they have surrounded the bear.

In many parts of Northern Canada the name is a variant of **Sakiattiak**, The Breastbone (of a Ringed Seal — nattiq). For a person with good eyesight this reflects the 5-10 stars visible. The seal breastbone consists of 9 small bones, and the root of the word Sakiattiak is 'chopped or cut into (pieces?)'. (In many parts of the world the Pleiades are called The Seven Stars, or Seven Sisters, although more stars can be seen by some people.)

In the Alaska area the Inuit name is **Kaguyagat**, the Red Fox, or sometimes Little Foxes.

There is also indication of the Pleiades having been used for time keeping and for navigation.

### **Nuuttuittuq, the one that never moves. AS59**

This is of course Polaris, the North Star, in Greenland called **Avangnata uvdloria** (Avannaata Ulloriaa — modern). Keen observers like the Inuit will easily have noticed that of all the stars this one never moves. Inuit living in more southerly latitudes have used **Nuuttuittuq** as a navigations aid, pointing North. Far north of the Arctic Circle Polaris is so high in the sky that it's usefulness for this is very limited though. In Igloodik at 70° and in Greenland north of Disko Island this is definitely the case.

### **Pituaq [AS62]**

In the constellation Cassiopeia the three southernmost stars form an equilateral triangle, and this is **Pituaq**, the 'lamp-stand'. This refers to the three stones, or posts made from wood, stone, or bone, placed upright in the floor of a dwelling in the form of a triangle upon which rests a soapstone oil lamp, the qulliq.

Alternative words with the same meaning are Ikurraattiaq or Nikurraatiit.

### **Uqsuutaattiaq [AS88]**

**Uqsuutaattiaq** is also connected to the constellation Cassiopeia. It is a container made out of a whole seal skin, used for keeping blubber or oil for the lamp in. One should imagine a filled seal skin lying on it's side and with one flipper sticking out.

No legends or stories of this constellation seems to have survived.

### **Quturjuuk [AS65]**

Four bright stars to the upper left of Orion comprise **Quturjuuk**, 'The Collarbones'. They are Castor and Pollux in Gemini, The Twins and Capella and Menkalinan in Auriga, The Charioteer. Though the spellings vary, the meaning seems to be the same all over the Arctic. In West Greenland the spelling Killab Kuttuk in a source from 1767 is recognizable (Qilaap Qutua - modern) even though the author mistranslates the words. The name comes from the distinct resemblance of a set of human collarbones, or, as some say the shoulder line if seen from the other direction.

Strangely enough in spite of the widespread use of the constellation, no legends are known in connection with it.

### **Sikuliaqsijuittuq [AS72]**

The single bright star Procyon in Canis Minor, The Lesser Dog has a rather funny name, meaning 'the one who never goes onto the newly formed sea-ice'. One understands why, because there is a story [AS213] about a grossly oversized man whose sheer weight prevented him from going onto the sea-ice. To survive he stole the catch of other hunters, but they took a strong revenge, killing him on the ice one day when finally the ice was strong enough to carry even him.

When **Sikuliaqsijuittuq** (Sikuliarsijuittuq - modern Greenland) is rising in the East in Winter you can see it twinkling in reddish colours low above the sea-ice. The colour red signifies the blood of the murdered man.

### **Singuuriq [AS73]**

Far below Procyon you find Sirius, the brightest star of the night sky. It sits so low in the sky that only Inuit living south of 73° North will ever see it, and then only in mid January. Due to the low altitude, it will twinkle and flash in different brilliant colours, and it will have a reddish or orange hue most of the time. The name **Singuuriq** from Iglolik appropriately means "like a flickering lamp".

Around Hudson Bay it is just Ulluriraaluk, the Big Star, and in West Greenland it bears a proper name, Nelleraglek, but unfortunately no legend accompanies the name anymore. It might be a misspelling of Nalikkatteeq, one of the names of The Entrail Snatcher.

Singuuriq is a weather forecaster: when reddish, it will be very cold. When it does not twinkle mild weather is on its way, and when a storm is coming the star behaves like a flickering lamp flame in a draft.

There is a story about an old woman named Singuuriq dwelling near the route taken by those travelling between the Earth and the Moon (the shamans). The old woman was known to mutter at passersby because they caused her lamp to flicker.

In the Western Arctic it was called "Red fox and white Fox", Kajuqtuq Tiriganniarlu because the flickering made one think of two foxes fighting to gain access of a single foxhole.

### **Tukturjuit [AS79]**

The best known constellation of them all, The Great Dipper is connected to caribou or reindeer in most of the Arctic, and not as one might expect to a (polar) bear. The Dipper is part of the constellation Ursa Major, The Great Bear and this bear, always seen in a northerly direction from ancient Greece actually gave name to the area that we are concerned with in this text: Bear is Arktos in Greek; hence Arctic.

To some Inuit the star group is one single caribou; to others it is a flock of 7, one for each star.

Which part of the animal that belongs to what star is source of considerable disagreement, so here we have chosen to illustrate one caribou looking left, mostly for aesthetic reasons.

In some parts of Canada the caribou are followed by a pack of wolves, but there is no sure identification with specific stars, so you can use your own imagination there.

In Greenland in more recent times the stars of the Great Dipper are mostly called Asaluusat because they look like a kayak line rack used for winding up the harpoon line.

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### **Aviguti [AS91]**

Not a constellation, though definitely comprised of stars, the Milky Way is identified by the Inuit in various ways. Some call it a divider; **Aviguti**, either just dividing the sky or acting as a separation between the winds, so that if e.g. an easterly wind prevails, the Milky Way is actually blown a bit towards the west. Do not expect to see this in the real sky though! The idea may have come from the fact that in most parts of the Arctic the Milky Way is rather difficult to see at all because of aurorae, Moonlight or the usual haze of ice crystals in the air. At various times of the night the Milky Way band of light spans the sky in different directions and thus one can easily imagine that this has to do with changing wind directions.

In Greenland the divider is interpreted in a slightly different, very pragmatic way as Qilaup sivdlia (Qilaap Sillia - modern), 'the middle line on the belly of an animal where it is cut up'.

Some North American Inuit use the terms "the river" or "the snowshoe tracks of the Raven", and this may be influenced by the sky lore of Native American Indians further South.

### **Ulloriaqjuat, The Planets [AS92]**

The planets are generally just called **Ulloriaqjuat**, 'great stars', though Venus may be called Ulluriaqjuaq — 'The Great Star' occasionally. They do not seem to have influenced Inuit sky lore much, even though the ecliptic with the planets during the dark part of the year rise to almost halfway up in the sky.

The slower moving planets stay invisible for many years in a row. In the summer it is always very light for most of the day and night, plus the summer Ecliptic is very low during the nighttime. Parts of the Ecliptic never rise above the horizon in the Arctic for the same reason that the Sun stays below horizon for some time every winter.

Some of the planets do seem to have had some significance in Greenland though. When two planets meet (a conjunction) they are said to be "two females that visit or tear each other's hair out". In Amassalik in East Greenland Jupiter is said "to be the

mother of the Sun; it is very dangerous for the angakut (the shamans) to pass near it on their journeys to the Moon", and in Thule a seal hunter, the great Naalagssartog (Naalassartog - modern) once rose up into the air and, according to legend [AS281], was transformed into Venus, giving it his own name, meaning 'the one who stands and listens'.

## ***On Inuit Sky Lore***

Of the arctic cultures and beliefs much has been written down by various travellers, anthropologists and other friends of the Arctic peoples, the Inuit. It is also obvious that much has been lost forever, in part because many of the Europeans, the missionaries and the administrators took Inuit culture to be very primitive and not worth dealing with, or by all means writing down. This has now changed, but alas, mostly too late.

In the few written accounts surviving only a few constellations are mentioned; (AS 14) between ten and twenty. There is some reason to believe that in the old days many more existed, but the cultural chain has been broken and knowledge of Inuit stars and star lore is not a living thing among the young anymore. These notes are mainly an attempt to give the stars back to the children of the Arctic.

The author is very much aware that by attempting this, there is a risk of turning many things totally the wrong way around. By its nature this has to be a short written account, and by picking one version of a story instead of another, and by letting an artist draw some of the figures in the sky under the planetarium dome, the mind of the listener is shaped into a very limited and maybe even misleading understanding of what the elders meant by a story. We do find, though that any knowledge is better than not knowing anything of the old traditions at all.

There seems to have been a twofold use of the stars and constellations. One use is very practical and pragmatic: for timekeeping and for navigation mostly. Certain stars have special roles at certain times of the year. Being able to find and remember some stars could save your life if you were far out on the sea ice or inland and had lost your orientation.

The other use, mainly for the same stars and constellations was for storytelling. This could be just a pastime or a way of teaching the proper way to behave in a world of gods and spirits. For most of these stories only the entertaining aspect has been recorded. The deeper mythological meanings may have been forgotten by the storyteller, or there may have been a taboo towards telling such profound things to a stranger.

Sometimes a certain story was told in almost the same version all over the Arctic, concerning the same stars. At other times the person telling a good story just picked some stars visible at the time and used them as characters in the story. This is rather irritating to a rational mind wanting to put order and system in the old tales, but such a systematic approach is quite un-Inuit. A good story becomes even better if the storyteller gives it a personal touch, elaborating on aspects of the story of common interest and giving the narration a local angle.

The myths, legends and stories cited here are as they were recorded. They reflect the values and thoughts of a people that has survived the harsh arctic conditions for millennia. The wording used may not be considered suitable for children due to differences in age and cultural background, so feel free to adapt your presentation as a storyteller accordingly. The drawings on the cylinder are pure conjecture on behalf of this writer and the artist, and will hopefully at the least be an enjoyable experience.

## ***The World of the Inuit***

Knud Rasmussen, during an interview in the early 1920s in Igloodik persistently asked the angakok Ava: "What do you believe?". His answer, when it came, was, "We do not believe, we fear," meaning that so many things can go fatally wrong in the Arctic due to weather, bad luck in hunting, illness or suffering. What one can rightly do is to perform the proper rituals at the right time and uphold the different taboos. Then if you are of a positive inclination, hope for the best.

Inuit have explanations for most of the phenomena of their world; and just like the star lore some explanations are mythological and others are built on keen observations of the phenomena.

The world is, of course, flat, as anyone can see. It is a large disk, probably round, and thicker in the middle. It is far too big to be moving, so when stars move it must be because the sky is moving overhead. The sky is fixed to a very tall mountain far, far to the North. Up there the stars are much closer to the Earth, so you may have to be quick with your whip to keep them away when travelling on your dog sled.

In the sod cabin where you spend Winters (in Greenland at least) you remove the roof when Spring comes to let in some fresh air. Just the same with the sky: The world is dark during winter and in Spring the roof of the world is removed, letting the sunshine in all of the time. Four wooden posts are said to hold up the sky, but they rot, and occasionally the angakut have to replace them with fresh ones to keep the sky from falling.

The world is made up of layers. You can (if you are an angakok, a shaman) travel to the next level down, entering via a crack or a cave in the coastal cliffs and there visit the Great Fire People, living in a world almost like ours with sky and sea and ground. You can also travel up into the sky, Qilak, if you can find a hole to climb or if you can repeat the trick of The Man in the Moon; to throw your dogs, your sled and yourself up into the air and then glide along, up in the Sky. Some also say that there are more layers above and beneath those mentioned here, but things look more or less the same no matter where you are.

When visiting the Moonman you may even be offered a chance of looking down through a hole in his floor. There under you is our whole world with villages and your own family milling around, looking upwards in surprise if you spit, because they will think that it is a shooting star.

### **The Stars**

The stars are just holes in the sky, Qilak, the size of a seal skin, and they light up because you see the house lamps of people in the upper worlds shining through.

Thinking of stars mythologically they can be the eyes of spirits, looking down upon us. This goes to explain the twinkling or scintillation of stars, as that is caused by the winking of the eyelids in front of the stars. One should be careful to not get too close though, because it is also said that the red stars eat liver and the white ones kidney. Having your entrails eaten is always a clear and present danger if you travel the sky. When visiting the Moonman you will inevitably meet The Entrail Snatcher, who will try to make you laugh. If she succeeds, she will gut you.

The stars may also be just sparks. In the East Greenland version of the Sun-Moon legend, the brother's moss or lighted stick is about to go out, so he blows on it and

sparks fly out in all directions ending up as stars.

Finally you yourself could also transform into a star. In many of the legends people eventually become stars according to the common idea, that by running very fast in a circle the same way that the Sun moves over the sky you can spin your way up into the sky more or less voluntarily.

Being transformed into stars requires severe transgressions like murder, incest, unreasonable violence, bad treatment of others (especially orphans), or breaking of the strict taboos surrounding death and childbirth. The transformation has some cleansing effect, though, so afterwards you might become a decent person or rather spirit again.

### **Shooting Stars**

Adults will call these inik, (inneq - singularis, in W. Greenland and E. Canada) fire or sparks. Some times in Greenland they will say that the soul of one of the forefathers wants to go for a visit and that is what causes the shooting stars. Children, rather indifferently will say ulluriat anangit, or literally star droppings. It is said that occasionally you can find these sparks on the ground as meteorites or lumps of pyrite that you can use for making fire. From fire to fire one could say, though pyrite and minerals containing it have definitely not fallen from the sky.

We know that the large iron meteorites found in Cape York have been used by the Inuit to hack off bits of iron to be made into points for harpoon and arrows. The word for iron in Northern Greenland is the same as the word for meteor. Maybe someone once saw an iron meteorite fall and made the right connection.

### **The Turning of the Year**

Loosing the Sun for lengthy periods of time each year, especially in a culture that is entirely dependent on hunting for survival, has understandably influenced Inuit culture deeply. The new year begins when the Sun is beginning to rise again. To assure that this important thing will happen, there are strict taboos around this time. You must stop playing with the popular and elaborate string figures ajaraaq (like Cats Cradle etc.) or else the Sun will get caught in the strings and stop rising. In the myths where people have met the Sun personified as a beautiful girl we hear the results of breaking the taboo: her back and hindquarters are severely lacerated by the sharp strings, and she is suffering much.

In most Inuit societies time was kept by the Moon, with names for the lunar months that reflected what happened in nature during that month. That is with the exception of the two long and dark winter months when nothing happened in frozen nature, but when the grand festivities took place. The months had the same name: The Darkness, Tavvikjuaq.

The movement of the Sun and the Moon across the sky was explained in one of the most prevalent myths of the Inuit world (told in the section of mythological stories). The Brother-Moon always struggled to catch up with his Sister-Sun while they traversed the same path in the sky. At times he was starving and almost disappeared, but she fed him, though with a rather ghastly diet, and he grew again. Occasionally his pursuit succeeded, and he caught up with her. The Inuit word for eclipse, pulamajuaq means "obscured" or "covered with a blanket".

There was also something benevolent and fertile to the Man in the Moon. When things were really tough, when a wife was beaten too much or was unable to bear children, an orphan was mistreated by his housemates or when the hunters utterly failed to catch anything, one could call on the Moon. He might come visiting with assistance, or you might be invited to follow him back home to the sky for a shorter or longer while. Here you would inevitably be shown how he could survey all that

happened down on Earth, especially when someone broke a taboo.

### **Sila**

Sila is nature, the environment, the weather, the atmosphere, the keeper of life, and also a great, dangerous and divine spirit that lives somewhere up in the air. To the Inuit it is the single most important aspect of nature, to be treated with deep respect, and not to be provoked. Children born in bad weather would be carrying a bad-weather influence with them, so that when say a snow storm was needed or the freezing of the sea was overdue, one of these people would undress and go outside to call for his or her weather to come.

The opposite would also work, with good-weather persons. This is only one aspect of being integrated with Sila in the daily life.

Today Sila is still equivalent to weather, to be watched carefully at all times.

Among the weather phenomena observed were rainbows and halos around the Sun and Moon, and not least the Aurorae. These were explained as spirits playing the favourite game of the Inuit, football (soccer !) but with a walrus cranium. A goal was achieved if they could kick the "ball" and make the tusks stick into the ground. If you wanted and dared you could call the spirits of the Aurorae closer by whistling to them.



## ***The Skies of the Far North***

Around and above the Arctic Circle, latitude  $66^{\circ} 33' 38''$  North the movements of the sky, Sun, Moon, and planets have some characteristics that determine much of the Inuit star lore.

To an Inuk living above the Arctic circle it is very strange to discover how different the sky is when you come South:

The Sun is in the sky even in midwinter days,

Midsummer nights are dark,

Twilight lasts only very shortly,

The stars are in strange positions and move in strange ways,

There are lots of unknown stars in the southern direction,

There are many more stars in the sky and they shine much more brightly than at home,

The Sun, Moon, and planets rise much higher in the sky, and

The Aurorae, the Northern Lights, are not out every night but only rarely.

### **Up to the Pole**

To better understand why there is such a great difference, let us first look at the situation in the most extreme case. Let us stand for a moment at the North Pole, at  $90^{\circ}$  North, although very few Inuit actually live further north than some  $76^{\circ}$ , represented by Qaanaaq or Thule in Greenland.

At the Pole the stars do not rise or set. During the polar nights Polaris is exactly overhead, and all the other stars move to the right, all the way around you in flat circles with the Pole Star as the centre. In summer you do not see the stars at all.

At lower latitudes, Polaris is some degrees away from the Zenith, the top of your local sky. The altitude of Polaris above the horizon is the same in degrees as your latitude.

At  $70^{\circ}$  N the stars still move in circles only slightly inclined to the horizon, and in a sliver towards the South only  $20^{\circ}$  high you will see different stars appearing with the changing of the seasons.

At the very North Pole the Sun is in the sky half of the year and gone for the other half - in principle. In the real world the Sun is visible 186 days; i.e. for more than half of the year, because it has a diameter of  $\frac{1}{2}^{\circ}$  and thus some of the upper part of the Sun is visible above the horizon even though the centre has set. In addition atmospheric refraction rises the image of the Sun more than  $\frac{1}{2}^{\circ}$ , causing the Sun to seemingly "hesitate" before setting and after rising.

On the Arctic Circle you would have one night with midnight Sun and one full midwinter day when the Sun does not rise, a Polar Night, but the same two effects come into play here, changing things just slightly.

### **Midnight Sun and Polar Nights**

Anywhere between, in the Arctic proper you will experience some days of Midnight Sun, with the sun never passing below the horizon, and some days when you do not

see the disk of the Sun at all. But contrary to common belief it does only rarely get fully dark in the daytime even on Midwinter midday. Only above 84°33' North the sun declines more than 18° below the horizon in due South at Midwinter noon, making it totally dark, and this is far North of any habitation or landmass of Earth.

Everywhere else there will be at least some twilight for a period of time around noon. At 70° N this twilight on the day of Winter Solstice lasts some 10 hours and 15 minutes, making it light enough to travel or do work out of doors easily. Nevertheless many of the winter days are very gloomy and if there is a cloud cover it will of course be much darker.

### **Not Much Fun for the Star Gazers!**

A polar explorer, Edward Parry once in Igloolik just below 70° N attempted to evaluate just how dark it becomes. He found out that on Winter Solstice, around December 21st the bright star Arcturus was visible in a clear sky until 12 minutes before Noon, and it could be seen again 30 minutes after.

Adding to the illumination during the winter nights is starlight reflected in the ice and snow, and in many parts of the Arctic the Aurorae, the Northern Lights that may dance above you for hours on end illuminating the surroundings with a mostly green light that occasionally will wash out the light from the stars. On top of this the air is almost constantly filled with a haze of tiny ice crystals, that will give a foggy impression, showing an almost clear starry sky right above you and increasingly hazy visibility the closer you get to the horizon.

For the Summer half of the year the twilight lasts the whole night, or the sun is above the horizon even at midnight, giving you the beautiful, but in this case annoying Midnight Sun.

All in all stargazing in the Arctic is not an easy thing.

### **Missing Planets**

Another effect of being this far North is that for long periods of time some of the planets may not be visible. Depending on how far North you are, some part of the Ecliptic never rises above even a flat sea horizon, and if a planet happens to be there you will not see it. Let us take an example. At 70° North, a bit North of Igloolik in Nunavut, Canada or Ilulissat in Greenland, 62° of the Ecliptic or a bit more than 1/6 of the full Ecliptic circle is never seen. Saturn is the planet which moves most slowly among the stars, traversing the 62° over several years. So starting in November 1985 and lasting 5 years and 4 months until February 1991 Saturn was not seen. The next such period will begin in July 2016.

The other planets move faster, making the time of invisibility shorter. Observing from further North makes the situation even worse.

This may be the reason why the planets have only little significance in Inuit sky lore. Only Venus is mentioned to some extent.

### **The Moon**

By and large the Moon follows the path of the Sun across the sky, giving rise to one of the aspects of the Brother-Moon and Sister-Sky legend. This means that there are times and latitudes where the Moon is in the sky continuously for longer periods, and other times when it is hidden below the horizon. The full Moon will naturally always be opposite the Sun, so generally in Winter when the Sun is low, the full Moon will rise high during night hours giving much needed light for outdoors activities. At the same time of year the crescent new or old Moons are not easily observed, because the Moon during these phases is always close in the sky to the low Sun.

During the Summer months the full Moon is invisible most of the time as it is deep below the horizon in the North at noon, but at midnight it will occasionally peek above the horizon in the South. In the full blaze of the Midnight Sun it will not be much noticed or needed though.

### **Phases**

The Inuit had names for the phases of the Moon [AS135] and also a practical (though erroneous!) explanation for them: The waxing and waning is seen because "the Moon is a thin round disk of ice which follows the Sun and turns about of itself, so that it sometimes looks big and sometimes thin", according to Inuit in the Eastern Arctic [AS133].

The myth of the origin of the Sun and Moon explains the phases from another point of view.

Lunar phases as known in Igloolik, Canada:

Waxing = piruqalliajuq

Waning = nungupalliajuq

Full = naaqquruktuaq

Gibbous = qullikkuminaqsijuaq

Half = nappalluaruqtuaq

Intermediate = alungajuq

Crescent = taqqiniktuaq

New = taqqiila

To the Inuit the Moon is also connected to the tides, the weather, the menstrual cycle of women, the movement of game animals, and it is used as a time marker. Eclipses of the Moon and the Sun were known [AS136] and feared as an omen that the world might end. To test the omen, you could pinch the ear of a dog. If it whined, the end was not yet due.

### **The Circumpolar Moon**

The Midnight Sun of Summer has a parallel during winter. The path of the Moon is not exactly the same as the one that the Sun follows. The orbit of the Moon is inclined a bit more than  $5^\circ$  to the Ecliptic, and this causes the Moon at times to stand higher than usual in the sky, giving rise to a phenomenon specific to the Arctic; the Circumpolar Moon. At certain times of its cycle the Moon will not set at all for a period of several days if you observe it from above a certain latitude. The southern limit of the Circumpolar Moon is  $61^\circ 28''$ . At  $70^\circ$  you will experience a period of up to 7 days around a Winter Full Moon with the Moon continuously circling; never setting. In the 5-6 years before and after there is also a circumpolar Moon period in winter, but for a shorter stretch of days.

The phenomenon will repeat every 18.6 years, concurrent with the so-called Major Lunar Standstills, and the next period is centered around 2023.

In StarLab it is a bit difficult to simulate the Circumpolar Moon, but Activity 6 gives you some hints.

### **Some Mythological Stories**

Knud Rasmussen pointed out once that Inuit tales were never intended to be read.

In print they are completely out of context, like reading a musical score as compared

to hearing a symphony performed by an orchestra. In writing, the stories lack the essential vitality bestowed by a narrator, who makes each telling a creation, a unique event.

The legends are not for fun, so when retelling do it with some respect! Apart from being mythological explanations and reminders of your place in the world, they are tools of survival in a non-literate culture. When traveling your life could depend on your ability to recognize the navigation stars. There are several Inuit stories about hunters who misinterpreted the sky and were lost on the sea ice because they took the wrong way. Remembering what you learned about the stars is so much easier if you have a legend to help your memory, especially in a critical situation.

### **The Creation [AS260]**

From: *The People of the Polar North*, Knud Rasmussen, 1908

*That time, very long ago, when the earth was made, it dropped down from above — the soil, the hills and the stones — down from the heavens; and that is how the world came into existence. When the world was made people came. They say that they came out of the earth. Babies came out of the earth. They came out among the willow bushes, covered with willow leaves. And they lay there among the dwarf willows with closed eyes and sprawled. They could not even crawl about. They got their food from the earth.*

*Then there is a story of a man and a woman; but how came it to be? It is a riddle - when did they find each other, when did they grow up? I do not know. But the woman made babies' clothes and wandered about. She found the babies, dressed them, and brought them home.*

*That is how there came to be so many people.*

*When there were so many of them they wanted dogs. And a man went out with dogs' harness in his hand, and began to stamp on the ground, calling "Hoc, hoc, hoc!" Then the dogs sprang out of little tiny mounds. And they shook themselves well, for they were covered with sand. That is how men got dogs.*

*But men increased; they grew more and more numerous. They did not know death, at that time so very long ago, and they grew very old; at length they could not walk; they grew blind and had to lie down.*

*Nor did they know the Sun; they lived in the dark; the daylight never dawned. It was only inside the houses that there was light; they burnt water in the lamps; at that time water would burn.*

*But the people who did not know how to die grew too many; they overfilled the earth - and then there came a mighty flood. Many men were drowned, and men grew fewer. The traces of this flood are to be found on the tops of the high hills, where you often find shells.*

*Then when men had grown fewer, two old women began one day to talk to each other. "Let us be without the daylight, if at the same time we can be without death!" said the one, doubtless she was afraid of death.*

*"Nay!" said the other, "we will have both light and death."*

*And as the old woman said those words, it was so - light came and with it death.*

*It is said that when the first man died, they covered up the corpse with stones. But the body came back; it did not properly understand how to die. It stuck its head up from the stone sleeping-place and tried to get up. But an old woman pushed it back.*

*"We have enough to drag about with us and the sledges are small!"*

*They were, you must know, just about to start on a seal-catching expedition. An so the corpse had to return to its stone grave.*

*As men by this time had light, they could go on long seal-hunting expeditions, and no longer needed to eat the soil. And with death came the Sun, the Moon, and the stars.*

*For when people die, they go up to Heaven and grow luminous.*

—Told by Arnaaluk, (Greenland)

### **Brother-Moon and Sister-Sun**

From: *The Ammassalik Eskimo*, Gustav Holm, 1914.

*The Moon dwelt in a house in this country, where his sister the Sun also dwelt. When the lamps were put out in the evening, the Moon went and lay with his sister. As she wished to find out who it was that lay with her night after night, she smeared her hands one evening with lamp-soot. When the lamps had been put out, and he lay with her as usual, she rubbed her hands over his shoulders. Next morning when the lamps were lit, his sister said that there was someone who had soot on them. When she found out that it was her brother, she took her knife, sharpened it, cut off one of her breasts and tossed it to her brother, saying, "As you seem to be so fond of me, eat me then!" She now took a small stick, stuck some moss on one end of it, dipped it in train-oil, and set fire to it. Then she ran out, and as she ran, she rose up in the air. When the Moon came out and saw that she was up in the air, he ran in and stuck some lamp-moss on his sermiaut, set fire to it, and ran out with it in pursuit of his sister. But when he came up in the air, the lamp-moss went out, leaving only some glowing embers.*

*When the Moon's lighted stick is about to go out, he blows on it, so that sparks fly out in all directions, and it is these that turn into stars. The Moon does not shine so brightly, because he has only a glow, and sometimes he must go down to earth to hunt seals; but the Sun shines brightly and gives forth warmth, for the lamp-moss was still burning, when she came up into the air.*

—Told by Sanimuinak (East Greenland)

A **sermiaut** (sermiiat - modern) is an ice scraper for the kayak.

*This story is known all over the Inuit world, but in many variants. Sometimes the persons are named Aningaak and Naiya, meaning older brother and younger sister; or Taqqiq and Seqiniq, meaning Moon and Sun. In most versions, though not in this one, the two when outside start running in circles clockwise, the way the Sun and Moon still move across the sky from East to West. The reddening of the Sun when low in the sky is explained as blood and gore from the wounds in her breast. On the Moon you still see the dark markings of the soot from her hands.*

*The phases of the Moon occur because the brother is starving in his eternal chase, so he shrinks and wanes away. He then accepts his sisters offering and eats from the severed breast, waxing again.*

*On rare occasions the Moon succeeds in catching his sister, causing a Solar eclipse where he modestly covers her from our eyes. Lunar eclipses on the other hand occur when the brother has to return to Earth to help someone, to hunt or to defecate, so it is told.*

### **The Man in the Moon and the Entrail Snatcher [AS265]**

The Man in the Moon, in spite of his incestuous behavior can also be benevolent to man. He is in charge of some of the game animals, and can send them to the hunter. He rules weather and thunder, and you can call on him for help. When things turn bad the angakut can visit him to atone for breaches of the taboos, that the Moon-man supervises, but it is a dangerous undertaking. (In the original version of this story the Entrail Snatcher is a man, but this seems to be an error caused by Holtved's translator.)

From: *The Polar Eskimos*, Erik Holtved, 1951 (here abbreviated some).

*(After a violent fight with her husband a wife leaves home to be a mountainwalker, a qivittoq, and in her need she calls on the Moon). At last she began to say: "Moon, come down to me!"*

*And then she again remained sitting for some time. To be sure, it now began to darken. The Moon was darkened, it began to grow quite dark. At last she could begin to hear a tremendous rumbling, something that rumbled tremendously. It was the Moon coming down to her, the great man in the Moon. He began to open his great sledge-skins, beautiful, large bear-skins. Only the lower one he left where it was. Then he said to the poor beaten woman: "Please, now only sit down there." Then they drove off.*

*After some time the sledge ceased making a noise. Then again they drove for a little while, and it did not take long, before they could again be felt not to have firm ground under them, because the sledge now made no noise.*

*At last they seemed to have stopped, and the Moon began to open the many sledge-skins. On the large meat platform she could see the animals moving; they were alive, both bears and other great animals. When she now came up beside him, he, the Moon, invited his (new) wife to enter, saying: "Please enter, but take care not to look into the side-house, for my little sister is apt to singe all that is strange to her!"*

*She now went in, and she was on the point of glancing towards the sidehouse, but alas one side of the border of her hood was singed. Then she sat down on the sleeping platform and for the time being remained sitting there. At the front wall of the house she caught sight of some poor human beings; their faces were one broad grin - they had no entrails. Whenever they swallowed something, they had chewed a little, it fell right through them.*

*The Moon now said to her, "Look here! My poor cousin, the entrail snatcher, will surely come in to take away thy entrails, but now listen how to act. Thou must begin to blow and at the same time to thrust thy hands in under the front flap of thy fur coat, holding them so that they resemble a bear. Then she must take herself off. Do thus, whenever thou art on the point of smiling."*

*..the entrail snatcher entered, carrying a dish and a large knife. And look! At the window a woman stood and kept on saying: "She smiles!"*

*The entrail snatcher began to dance a drum dance, with ridiculous movements, and*

*they only looked at her, while she sang.*

*At last she could hardly keep from smiling when looking at her, but she placed her hands under the front part of her fur coat and blew violently, as the Moon had told her to do. And indeed she took herself off, the entrail-snatcher, over there, saying: "One with blubber (i.e. a bear) is heard!" Then she disappeared.*

*One day when cleaning the house, she (the poor woman) caught sight of the shoulder-blade of a reindeer behind the lamp. She removed it, and what did she see? A large hole, deep, deep down.*

*Sometimes, it is told, when the Moon was out hunting and stayed away long, the Sun used to come and peep in. It wore men's kamiks, and its hams were bleeding violently. One day it said to her: "I have wounds on the hind parts of my thighs, because thy children make string figures, while the Sun shines, at the time of the year when it rises higher in the sky!"*

*One day the Moon opened the reindeer shoulder-blade over there at the wall and said to the woman: "Peep down there!" It was dark. "They are down there, thy relatives!" The Moon began to whittle a walrus tusk, and at last he let his whittling fall down through the hole and closed it again. After a while she peeped down again, and now she saw her family.*

*(The woman becomes pregnant and wishes to return to her family, and ...) The Moon took her home on his sledge.*

— Told by Amaunalik (North Greenland)

### **The Great Polar Bear Hunt (retold)**

*Once a group of four hunters went off on a polar bear hunt with their dogs. During the hunt one of the men dropped his mitten from the sledge, and after some consideration he leaves the others to retrieve it. He never manages to find it though, so he returns to the village. The other three passed by a house where an unclean woman, one who has recently had a child and whose period of taboo was not over, came out and saw them. This is such a bad thing to happen that both the hunters, that we call "The Runners", their dogs, and the bear turn into stars in the sky, to warn us all against forgetting such things.*

*In the Winter sky you can still see them running in a row. Up in front of them the dogs, Qimmit, have surrounded the bear, Nanurjuk, on two sides, making up a "V" formation of small stars. Nanurjuk himself has been wounded. If you look closely you can see that his bright star is reddened by the blood.*

*Below the Runners, Ullaktut, you can see Qangiammaariik, their children, coming in a row with warm fur clothes, that almost cover them and make them fuzzy. Further down to the right a bright star (Rigel) shows you where the lost mitten still lies for anyone to come by and pick it up. Remember to do so if you pass by, maybe on your way to visit the Man in the Moon!*

### **The Great Bear [AS278]**

From: *The People of the Polar North*, Knud Rasmussen, 1908.

*A woman who had had a miscarriage had run away from her family. As she ran she came to a house. In the house-passage lay the skins of bears. She went in.*

*The inhabitants turned out to be bears in human shape.*

*But she stayed with them. One big bear caught seals for them. He pulled on his skin, went out, and remained away for some time, but always brought something home. One day the woman who had run away took a fancy to see her relations and wanted to go home. Then the bear spoke to her. "Do not talk about us when you get back to men," he said to her. He was afraid that his two young ones might be killed by men.*

*So the woman went home, and a great desire to tell came over her. One day as she sat lousing her husband, she whispered in his ear, "I have seen bears!"*

*Many sledges drove out. When the bear saw them coming towards his house he had great compassion for his young ones and bit them to death. He did not wish them to fall into the power of men. Then he rushed out to look for the woman who had deceived him, broke into the house where she was, and bit her to death. When he came out again the dogs closed up in a circle round him and rushed upon him. The bear defended himself, and suddenly they all became luminous and rose up into the sky as stars. And those are what they call Qilugtuussat; they who are like a flock of barking dogs after a bear.*

*Since then men have been cautious about bears, for they hear what men say.*

— Told by Aisivak (North Greenland)

### **The Orphan Boy, the Old Man and the Grandmother [AS230]**

Iliarjugaarjuk, Uttuqalualuk and Ningiuraaluk.

*Uttuqalualuk, when he was a young man, murdered his brother-in-law and kept it a secret. He grew old with this secret. Iliarjugaarjuk, who had lost both parents, was now living with his grandmother. Whenever Iliarjugaarjuk visited Uttuqalualuk the old man would taunt him, chanting: "Iliarjugaarjuup katuma arnavit pamiallua ailugu kikkaruk, pamaa!" - "Orphan, go and get your mother's tailbone and eat the meat from it, pamaa!"*

*For some time Iliarjugaarjuk did not tell his grandmother about the old man's insults. When he eventually did, his grandmother told him to reply to Uttuqalualuk thus: "Uttuqalualuup piksuma sakialli angialli qungnikut sallikut kivitipiuk, pamaa!" - "Uttuqalualuk, your brother-in-law is your secret. On the crack at the further pressure ridge you did sink him, pamaa!"*

*Iliarjugaarjuk's grandmother taught him these lines.*

*For some time the orphan was anxious and uncertain and would not risk to say these words to the old man even though Uttuqalualuk continued to taunt him as before. His grandmother, however, kept asking if he had yet responded to Uttuqalualuk in the manner she had taught him, adding that if the old man became aggressive on hearing these words she would come to Iliarjugaarjuk's rescue.*

*So once again the orphan boy visited the old man and, as usual, Uttuqalualuk sang: "Iliarjugaarjuup katuma arnavit pamiallua ailugu kikkaruk, pamaa!" - "Orphan, go and get your mother's tailbone and eat the meat from it, pamaa!"*

*This time, when Uttuqalualuk had finished, the orphan boy summoned all his courage and responded in the manner he had been taught by his grandmother: "Uttuqalualuup piksuma sakialli angialli qungnikut sallikut kivitipiuk, pamaa!" - "Uttuqalualuk, your brother-in-law is your secret. On the crack at the further pressure ridge you did sink him, pamaa!"*

*Having said this, Iliarjugaarjuk, following his grandmother's instructions fled the igloo. All at once the old man took his knife and started to chase the boy. They ran round and round the igloo, the boy fleeing and the old man following. The grandmother did not immediately notice that Uttugalualuk was chasing Iliarjugaarjuk, so she was late in coming to the rescue. As she joined the chase, the two in front of her, the boy and the old man, suddenly rose upwards into the sky. The grandmother followed and they all turned into stars. The first two are therefore called Sivulliik and the late one, that is the one behind, is called Kingullialuk.*

— Told by Hervé Paniaq (Igloodik, Canada)

### **Naalagssartog [AS281]**

From: The Polar Eskimos, Erik Holtved, 1951

*The great Naalagssartog (Naalassartog - modern, Greenland), it is told, used to catch seals at breathing-holes at a short distance from the shore. There he always stood waiting at the breathing-hole. At one time at last a number of children began to play at the huge crack in the mountain at Agpalersoq (Appalersog - modern), while Naalagssartog stood waiting at the breathing-hole below. While playing they shouted and made a terrible noise, so that Naalagssartog said to them, "You make my seal keep down, you make my seal keep down!"*

*Then at last he exclaimed: "Let them be locked in, those up there, let the crack close above them!" - because they all along frightened off the seal, which he was lying in wait for. In this manner he locked them in.*

*As the crack closed above them, there was one who just managed to get out. She who carried a child in her amaut did not get out. He now ran up to Agpalersoq saying: "Naalagssartog has locked my comrades into the large mountain crack. He has caused them terrible harm!"*

*When the people heard it, they immediately set off towards him, but first they went to see, how it was with the children who had been locked in. Armed with lances they then approached Naalagssartog in order to kill him. There he stood and could see them approach. When there was only a short distance between him and them, he suddenly rose up into the air.*

*When he had now risen right up into the air and was transformed into the star Naalagssartog ("Venus") they had to give up getting hold of him. They therefore returned home in order to see how the children fared. They were woefully locked into the crack. They could hear the little child crying incessantly. For some time they tried to get down to set them free, but this turned out to be impossible. The little one down there with the child in the amaut could be heard to say, "Mother up there - the kamik soles, in order to finish them she had taken off the kamik sole."*

*For some time they kept on providing for the children, as well as they could, by sending something down through the little aperture. At last they buried them by putting large stones over them. Since then nothing has been heard of them.*

— Told by Amaunalik (Northwest Greenland)

### **The Woman Who Married a Dog**

From: The People of the Polar North, Knud Rasmussen, 1908

*There was once a woman who had a daughter. When the daughter grew up, the mother in vain encouraged her to find a man to marry, but the daughter rejected all*

*men. At last the mother became angry and told her dog to marry the daughter. The dog did so, and it lived with the girl. Thus having punished her daughter, the mother after some time had the daughter sent to a small island, and here the daughter had a litter of puppies as her children.*

*The dog was not brought to the island with the girl, and when the dog tried to swim over to her, the mother suddenly took pity on her daughter and strapped some stones around the neck of the dog so it drowned when it tried to swim to the island.*

*The girl's father used to row over to the island with meat to feed his daughters offspring. One day the daughter told the puppies, "When your grandfather arrives to feed you, you shall tear him apart and eat him!"*

*And they did so.*

*Afterwards the daughter placed all the puppies in the sole of a kamik boot and set them to sea. When they drifted away from shore she said, "You will live from now on without ever needing anything!"*

*They tell that the puppies floated away to some far-off country where they turned into white men, and from them all white men come.*

— Told by Jonasine Nielsen of Saattoq, Greenland

This last story actually has nothing at all to do with the sky, but it may tell a bit of the thought patterns of the Inuit towards others. In other versions of this legend half of the litter become Indians and the other half white men. Dogs are a necessity - your life depends on them but they do not have a very high status. The word Inuit itself means "human beings"!

**Some words explained (spellings vary widely around the Arctic area)**

amaut - the hood of a woman's anorak used for carrying small children. W. Greenland: amaat

annoraq - a fur parka

angakkok - shaman, spirit traveller. Plural angakkut

ajaraaq - string games

Nunavut - area of northern Canada with some home rule and special protection plans for the Arctic nature and culture.

Inuit - human beings. Singular: Inuk

Eskimo - esquimaux, by some regarded as a negative word, allegedly from an Indian language, meaning "those eating raw meat" or "those speaking a foreign language".

Arctic - from Greek meaning bear, that is the area under the Bear (Ursa Major, or the Great Dipper) or in the direction of the bear, North.

ulu - a semi-circular womens' knife

kamik - seal skin boots

## ***Credits and Author Notes***

This is NOT a work of science! It is intended to be an introduction to the rich world of Inuit culture and star lore. Most references and a lot of background information has been left out deliberately, for the sake of the stories themselves. I hope that this will whet the appetite more for the teachers and pupils that encounter this text. There **is** much, more, and it is quite easy to find.

While researching for this work, I quickly discovered that someone had been there before and had done all the tedious work before me. That someone is John MacDonald of the Nunavut Research Institute in Igloolik, Canada. In his wonderful book ***The Arctic Sky*** (ISBN 0-88854-427-8 pbk, 0-88854-432-4 bound, published in 1998 and 2000, and may it never go out of print!) John MacDonald has gathered a lot of material on Inuit star lore, cosmogony and other sky-related material, mainly from the Igloolik area, but his research covers the whole of the Arctic and the list of references is impressive to say the least. Do not hesitate to buy the book!

For the benefit of the good cause of spreading the knowledge of Inuit star lore, John MacDonald has graciously permitted me to base this work on his book. He has also read the material before publication, but of course all responsibilities for errors and misinterpretations are still mine alone. For any failure to treat the Inuit languages properly I also ask for forgiveness, as I do not know more than a handful of words.

***The Arctic Sky*** is richly and beautifully illustrated, but the artwork in this text and on the Inuit cylinder is original, partly because of copyright reasons, partly because of the special requirements of the STARLAB cylinder technology, and partly because I have wished to give this material a slightly stronger Greenlandic emphasis than the book has.

This work is one part of the Ulloriarsiooq project. Ulloriarsiooq (meaning StarGazer in Greenlandic) is a STARLAB now owned by the Nuuk, Greenland-based centre for educational material, Inerisaavik. A string of generous donators enabled Inutek, the technological society of Greenland to purchase and donate this planetarium to the children of Greenland, Kalaalit Nunat during 2005. I happily accepted the task of producing the text material and to develop new illustrations for this Inuit STARLAB cylinder.

One may find, correctly, that legends from the Siberian Inuit are missing. The reason is that the published material is very thin, and not much anthropological work has been done in the Soviet days.

Thanks are due for the assistance with this work to more people than I can mention here, but any of you reading this will know whom I mean.

Finally I'd like to paraphrase the last words of Danish astronomer Tycho Brahe: *May this work not have been in vain!*

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## ***Suggested STARLAB Activities in STARLAB Using the Inuit Cylinder***

1. The movement of the stars at the North Pole, at  $70^\circ$  and "at your home latitude".

Use Activity 5-6 "Position of the North Pole" in Astronomy and More, Vol. 1. Shift to your "home latitude" and then to  $70^\circ$  N to compare.

You can change between the standard Starfield cylinder, the Inuit cylinder or for the older children, the Lewis and Clark or the Celestial Coordinates cylinder which includes the ecliptic and the celestial equator.

2. The Midnight Sun and the Polar Night [AS293]

The same cylinders as those used in Activity 1 can be used to demonstrate the midnight Sun.

The position on the Ecliptic of the Sun at the equinoxes and the solstices are marked. At a latitude above the Polar Circle note how the Sun does not set for some days or weeks during the summer half of the year, and how the number of days increase as you approach the North Pole. With the 12 solar positions of the standard Starfield you can do this month by month.

You can combine this with Activity 6-2 Sunrise and Sunset positions.

If you cover the Sun at the Equinoxes and at the Summer Solstice (use a bit of yellow note block paper, do not use tape or gaffa) you can also demonstrate that during winter the Sun never rises — the Polar Night. In some positions at least the Winter Solstice Sun is visible on the dome, or you can observe the position of the Summer Solstice Sun and mirror the position.

For full darkness to reign the Sun has to be more than  $18^\circ$  below the Horizon. Astronomical Twilight (faint Twilight visible) is seen when the Sun is between  $18^\circ$  and  $12^\circ$  below; Nautical Twilight (Navigational stars visible) occurs with the Sun between  $12^\circ$  and  $6^\circ$  below; Civil Twilight (You can read a paper under a clear sky) is from Sunset until the Sun is  $6^\circ$  below Horizon.

- 3) Return of the Sun. Set the latitude to  $70^\circ$  N. Find the two stars Aagjuuk and place them low over the horizon in North East. Read off (some of) the date and times of day that correspond to this position. Try to estimate the position of the Sun and the amount of Twilight at the various dates (see activity 2), and find out at what time of year the Inuit celebrate the new year as the emergence of Aagjuuk a few days before they disappear in the Twilight.

Do the same for  $80^\circ$ N. Is there any difference ?

- 4 Time of Night. Can you use the stars as a clock? Set the latitude to  $70^\circ$  or some other Arctic latitude, and set the sky for early winter. Put on the cardinal points and let the sky turn slowly. Note some corresponding positions of bright stars, compass directions and times of day.

Try to remember some positions — make a rhyme or a short story to help you remember.

Set the sky to late winter and do the same. Note how most of the same stars are visible, but they have changed positions.

Now return to early winter and see how much you can remember of the correspond-

ing positions and times. — And maybe do the same for this season.

- 5) How bright is the midwinter twilight? Try to reconstruct Parry's measurements. Place Arcturus in the south and slowly fade the white house lights of the projector up. When can you not see it anymore? Note the position of the faders. Then fade up to full, look away turn the projector  $\frac{1}{2}$  hour forwards and dim the lights slowly. Note the position of the faders again. Are they the same as before? Why do you think that it requires less light to find the star again?
- 6) The circumpolar Moon [AS296]. NOT EASY! With the Transparent Cylinder you could draw the ecliptic and put a Moon symbol  $5^\circ$  higher than the summer solstice position of the Sun to show the full moon at Major Standstill. Then choose a proper Arctic or near Arctic latitude and let the sky roll! The Moon will act as a "Midnight Sun" and never set. As the Moon moves some  $12^\circ$  Eastwards per full day, one day later it will also have moved closer to the Ecliptic, and after a week it will cross the Ecliptic. Sometimes during this interval the Moon will stop being circumpolar and set. For the days up to the full Moon the situation is reversed. Remember that after a week the Moon is no longer full but half, and not as useful for illumination in the darkness.

Try do the same demonstration with a summer full Moon, and see how it fails. This can also be used to demonstrate why some of the planets are absent from the Arctic sky for years on end in periods.

If you want to go deeper into the matter with older children, try to draw the full orbit of the Moon during Major Standstill and, in another colour Minor Standstill, but be warned: it becomes very complicated very fast!

If you don't own the Transparent Cylinder, hurry up and buy it! While you wait for delivery you can use the standard Starfield Cylinder and place one of the planet projectors (Mars is good because of the distinct colour) as a marker for the position of the winter full moon at Major Standstill.

Moving this Moon-marker the proper  $12^\circ$  steps during a presentation calls for considerable skills. You can always let the children try it if you fail!!!

Other activities with relations to this text include: 5-7 The Ecliptic, Celestial Coordinates cylinder text, pg. 3. Native American Mythology cylinder, Lapp/Sami Sky Mythology Cylinder — mostly to note that there is no overlap. The Inuit language is not related to any other language nor is the mythology — both are totally unique.