R.A.S.C. - BELLEVILLE CENTRE

NEWSLETTER - JUNE, 2007
VOLUME 02 - NUMBER 06

Welcome to another newsletter of R.A.S.C. - Belleville Centre. Your most humble newsletter editor (Magister Mundi sum!) hopes that various members took advantage of any good weather to make important, interesting, exciting and valuable observations to enhance their knowledge of the abstruse, arcane, cryptic, esoteric, mysterious and obscure science of astronomy.

Here is a list of useful information of meteor showers:

Radiant	Duration	Maximum	
June			
tau (τ) Herculids*	R.A.: 15h 12m Dec: +39.0°	03 June	Z.H.R.: 15
chi (χ) Scorpiids*	R.A.: 16h 28m Dec: -13.0°	05 June	Z.H.R.: 10
Arietids***	R.A.: 02h 56m Dec: +23.0°	07 June	Z.H.R.: 50
zeta (ζ) Perseids***	R.A.: 04h 08m Dec: +23.0°	07 June	Z.H.R.: 40
Librids	R.A.: 15h 09m Dec: -28.3°	08 June	Z.H.R.: 10
Sagittariids	R.A.: 20h 16m Dec: -35.0°	11 June	Z.H.R.: 30
theta (θ) Ophiuchids	R.A.: 17h 48m Dec: -28.0°	13 June	Z.H.R.: 02
June Lyrids* -only appeared from 1966 onward	R.A.: 16h 32m Dec: +35.0°	16 June	Z.H.R.: 09
Corvids* -appeared only in 1937	R.A.: 12h 48m Dec: -19.1°	26 June	Z.H.R.: 13
Draconids	R.A.: 16h 55m Dec: +56.0°	28 June	Z.H.R.: 05
June Boötids.	R.A.: 14h 36m Dec: +49.0°	28 June	Z.H.R.: 06
beta (β) Taurids***	R.A.: 05h 44m Dec: +19.0°	29 June	Z.H.R.: 25
June Aquilids*	02 June - 02 July	16/17 June	

Ophiuchids	19 May - 02 July	20/21 June
omega (ϖ) Scorpiids	19 May - 11 July	03-06 June
June Scutids	02 June - 29 July	27/28 June

July

Moderate Activity:

Southern delta (δ) Aquarids   14 July - 18 August   28/29 July   Z.H.R.: 30
R.A.: 22h 12m Dec: -16.5°
-not visually resolvable from alpha (α) Capricornids

Minor Activity:

alpha (α) Lyrids	09 July - 20 July	14/15 July	
July Phoenicids	09 July - 17 July R.A.: 02h 05m Dec: -49.9°	14/15 July	Z.H.R.: 30
alpha (α) Pisces Australids	16 July - 13 August	30/31 July	
sigma (σ) Capricornids	18 June - 30 July	10 July - 20 July	
tau (τ) Capricornids	02? June - 29 July	12/13 July	
omicron (ο) Draconids	06 July - 28 July R.A.: 18h 04m Dec: +59.0°	17/18 July	Z.H.R.: 03
epsilon (ε) Pegasids	R.A.: 22h 40m Dec: +15.0°	09 July	Z.H.R.: 08
Capricornids	R.A.: 20h 52m Dec: -23.0°	22 July	Z.H.R.: 04
alpha (α) Capricornids	R.A.: 20h 28m Dec: -10.0°	30 July	Z.H.R.: 30

-not visually resolvable from Southern delta (δ) Aquarids

Guide:

- * -Major Activity
  -Beginner Level
- ** -Minor Activity
  -Expert Level (i.e. - Quite Experienced Observer)
- *** -Daylight Activity
  -Expert Level (i.e. - Quite Experienced Observer)

Planetary Observations (courtesy of R.A.S.C. - 2007 Observer's Handbook)

Mercury - Mercury continues to be visible on early June evenings and reaches greatest eastern elongation of 23° on 02 June. Mercury's magnitude drops dramatically to the point that Mercury becomes difficult to find and observe as the waning crescent planet visually moves closer to the Sun. Mercury reaches inferior conjunction on 28 June.

Venus - Venus continues to be very well placed in the evening sky. Venus reaches greatest eastern elongation of 45° on 09 June. Venus skims by the northern edge of the Beehive Cluster (M 044) on 12 June and 13 June.

Mars - Mars is in the constellation of Pisces for most of the month of June and enters the constellation of Aries on 26 June. During the morning astronomical twilight at midmonth, Mars can be observed at 3° above the eastern horizon for observers at ~45°N.

Jupiter - Jupiter is in the constellation of Ophiuchus for the month of June. Jupiter is a opposition on 05 June when it rises near sunset, transits at midnight and sets near sunrise.

Saturn - Saturn, at midmonth (15 June), lies in the western sky at the end of civil twilight at an altitude of ~27° at a latitude of ~45°N. Jupiter sets in the west-north-west quite late in the evening.

Full Moon:	Friday, 01 June, 2007 01h 04m
Last Quarter:	Friday, 08 June, 2007 18h 04m
New Moon:	Friday, 15 June, 2007 03h 13m
First Quarter:	Friday, 22 June, 2007 13h 15m
Apogee:	Sunday, 24 June, 2007 14h 404,540 kilometres
Perigee:	Tuesday, 12 June, 2007 17h 363,779 kilometres

Stellar Populations

A way of classifying stars on the basis of several properties, including location in the host galaxy, type of orbit, and heavy element content or metallicity; it was introduced by Walter Baade in 1943. In Baade's scheme there are two main population types: Population I and Population II. A more refined system, based on modern knowledge, sees our Galaxy and others made of four stellar populations: thin disk, thick disk, stellar halo, and bulge.

The thin disk population is confined to within about 1,000 light-years of the galactic plane and includes the Sun and 96 percent of its neighbours. Thin disk stars are metal rich, vary in age from newborn to 10 billion years, and revolve around the Galaxy fast in fairly circular orbits.

The thick disk population, which probably includes Arcturus and about 4% of the Sun's neighbours, is generally older than the thin disk and extends several thousand light-years above the galactic plane. Its members move in elliptical orbits and have metallicities around one-quarter that of the Sun.

The halo population is a roughly spherical system of very metal-poor stars (1 to 10 percent of solar metallicity), mostly subdwarfs, that move in highly elliptical orbits that may reach up to 100,000 light-years from the galactic centre at apogalacticon and as little as a few thousand light-years at perigalacticon. The nearest example of a halo star to the Sun is Kapteyn's Star.

The bulge population occupies the central few thousand light-years of the Galaxy and consists of old, metal-rich stars. No such objects are in the solar neighbourhood; it is the least explored stellar population in the Milky Way.

Population I Stars

A term used to describe stars and other objects, such as star clusters, that tend to be found in, or near to, the plane of a spiral galaxy and follow roughly circular orbits around the centre. They are younger than Population II objects, have a relatively high heavy element content, and have probably been formed continuously throughout the lifetime of the disk.

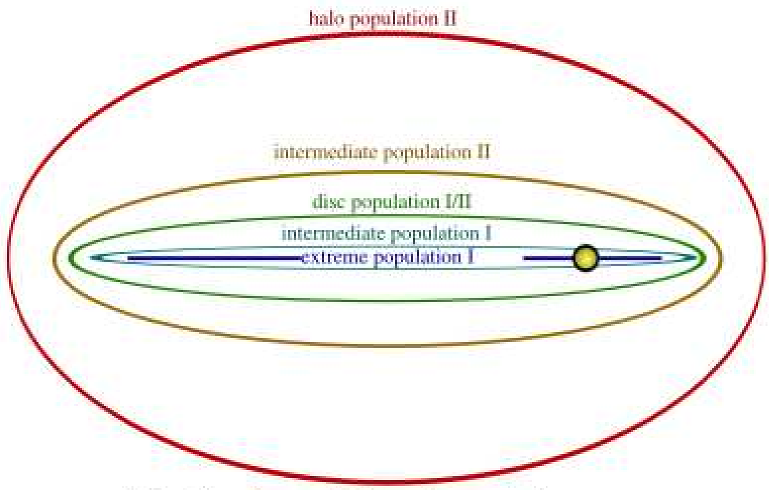
Extreme Population I objects are found in spiral arms and consist of young objects, such as T Tauri stars, O stars, B stars, and stars newly arrived on the zero-age main sequence. It is the brilliant light – in particular, the intense ultraviolet radiation – from extreme Pop I stars that causes the spiral arms to glow to brightly. Older Population I objects include stars like the Sun.

All Population I stars are relatively rich in elements heavier than hydrogen and helium since they formed from clouds of gas and dust which contained the products of nucleosynthesis from previous generations of stars. The presence of heavy elements in protoplanetary disks is believed to be a key factor in the formation of planets, so that only Population I objects are expected to harbour planetary systems, and possibly life, similar to our own.

Population II Stars

A term used to describe old, red stars and other objects found in the galactic halo and galactic bulge of a spiral galaxy, such as our own, near the galactic centre, and in parts of the disk of the galaxy which are well away from the galactic plane. The halo contains individual old stars and large groupings known as globular clusters. Population II stars make up the overwhelming bulk of the stellar population in elliptical galaxies.

Pop II stars follow highly elliptical orbits around the galactic centre and are relatively deficient in heavy elements (i.e. those heavier than hydrogen or helium) because they formed when their parent galaxy was young, before much stellar nucleosynthesis had taken place. The importance of heavy elements in planet formation suggests that few, if any, Population II stars have worlds in orbit around them.



Distribution of Star Populations in Milky Way

A third category is Population III stars

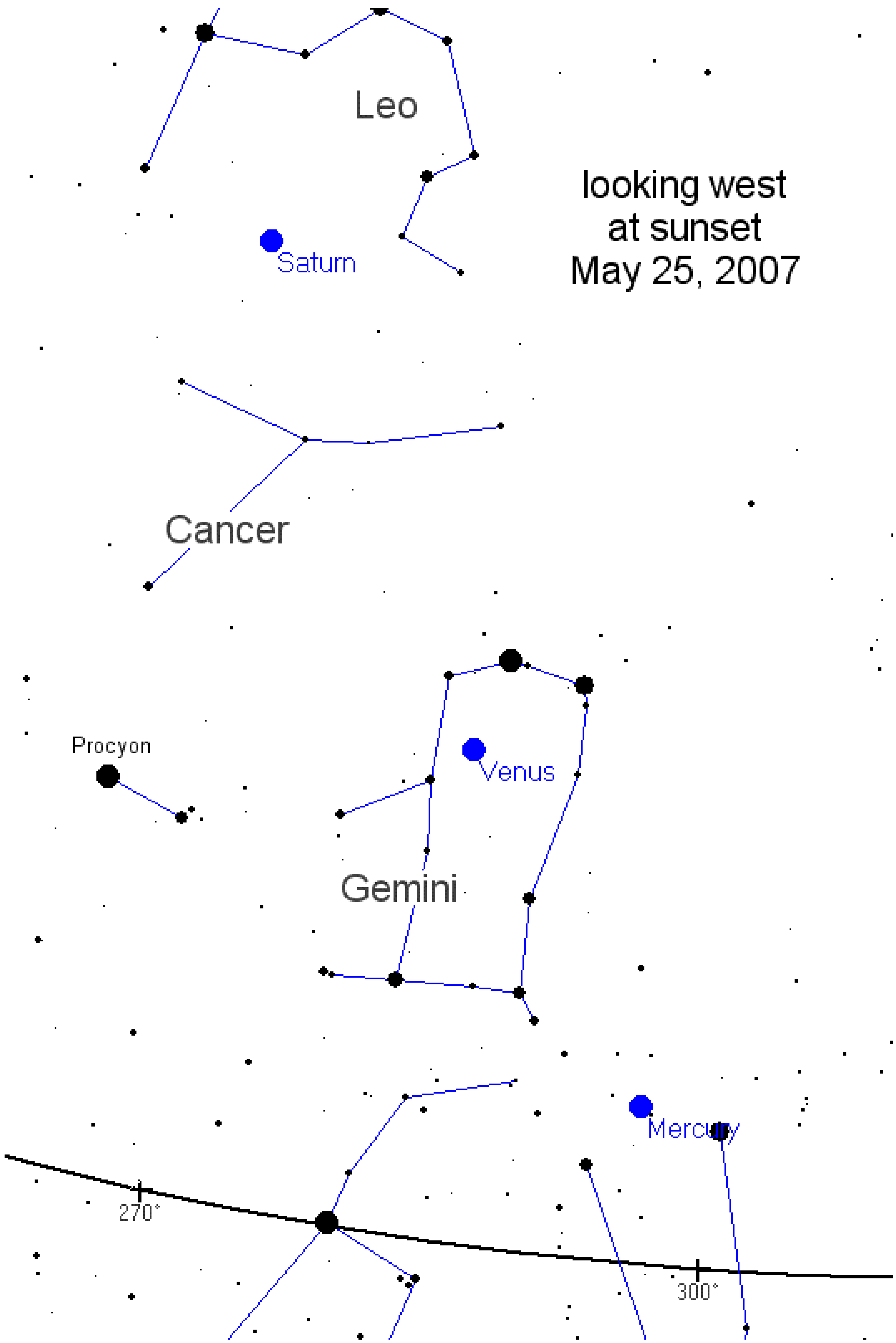
Population III or metal-less stars are a hypothetical population of extremely massive and hot stars with virtually no metal content which are believed to have been formed in the early universe. They have not yet been observed directly, but indirect evidence for their existence has been found in a gravitationally lensed galaxy in the very distant universe. They are also thought to be components of faint blue galaxies. Their existence is necessary to account for the fact that heavy elements, which could not have been created in the Big Bang, are observed in quasar emission spectra, as well as the existence of faint blue galaxies. It is believed that these stars triggered a period of reionisation.

Current theory is divided on whether the first stars were very massive or not. One theory, which seems to be borne out by computer models of star formation, is that with no heavy elements from the Big Bang, it was easy to form stars with much more total mass than the ones visible today. Typical masses for Population III stars would be expected to be about several hundred solar masses, which is much larger than the current stars. Analysis of data on low-metallicity Population II stars, which are thought to contain the metals produced by Population III stars, suggest that these metal-free stars had masses of 10 to 100 solar masses instead. This also explains why there have been no low-mass stars with zero metallicity observed. Confirmation of these theories awaits the launch of NASA's James Webb Space Telescope. New spectroscopic surveys, such as SEGUE or SDSS-II, may also locate Population III stars.

The most massive star that can form today is about 110 solar masses; a more massive protostar would blow itself apart during the initial ignition of nuclear reactions. Without enough carbon, oxygen, and nitrogen in the core, however, the CNO cycle could not begin and the star would not go nuclear with such enthusiasm. Direct fusion through the proton-proton chain does not proceed quickly enough to produce the copious amounts of energy such a star would need to support its immense bulk. The end result would be the star collapsing into a black hole without ever actually shining properly. This is why astronomers consider Population III to be something of a mystery - by all rights they should not exist, yet they are necessary for an explanation of the quasar observations.

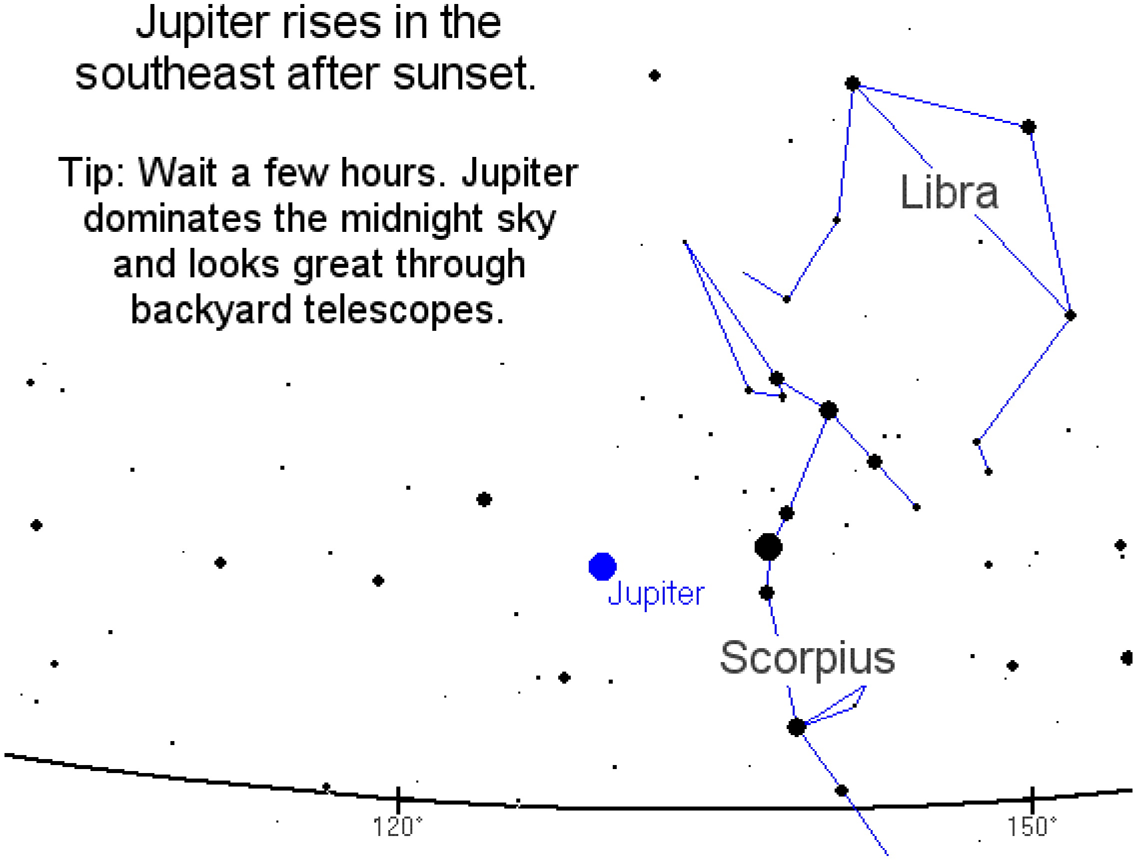
If these stars were able to form properly, their lifespan would be extremely short, certainly less than one million years. As they can no longer form today, viewing one would require us to look to the very edges of the observable universe, since the time it takes light to reach Earth from great distances is extremely great, it is possible to see "back in time" by looking farther away. Seeing to this distance while still being able to resolve a star could prove difficult, even for the James Webb Space Telescope.

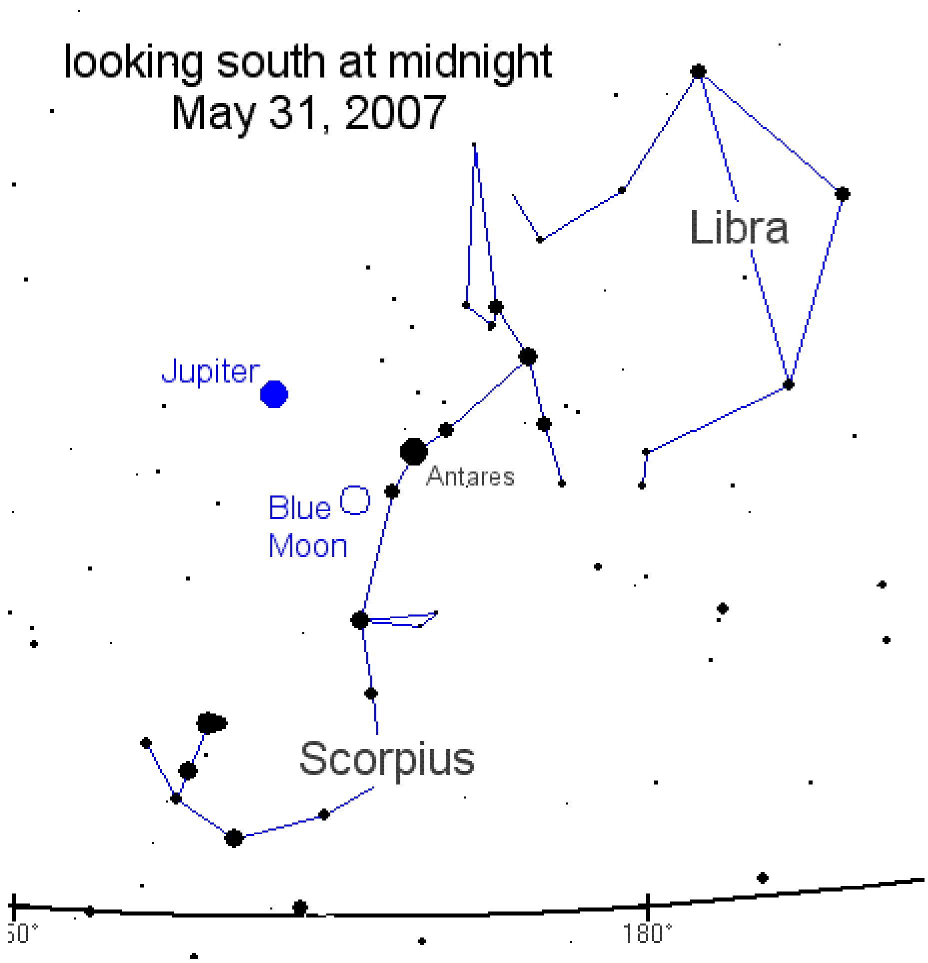
This lesson was gleaned from various Internet sources.


Leo
looking west
at sunset
May 25, 2007
Saturn
Cancer
Procyon
Venus
Gemini
Mercury
270°
300°

Jupiter rises in the southeast after sunset.

Tip: Wait a few hours. Jupiter dominates the midnight sky and looks great through backyard telescopes.





looking south at midnight
May 31, 2007
Libra
Jupiter
Antares
Blue
Moon
Scorpius
180°