



The PRETORIA CENTRE

of the
Astronomical Society of Southern Africa

www.pretoria-astronomy.co.za

NEWSLETTER AUGUST 2012

Next meeting

Venue: The auditorium behind the main building at Christian Brothers College (CBC), Mount Edmund, Pretoria Road, Silverton, Pretoria.

Date and time: Wednesday 22 August at 19h15.

Programme:

- **Beginner's Corner:** "Essentials of astronomical sketching" by Pat Kühn
- **What's Up:** by Danie Barnardo
- 10 minute break — library will be open
- **Main talk: The topic will be communicated by e-mail to members in time.**
- Socializing over tea/coffee and biscuits.

The chairperson at the meeting will be Bosman Olivier.

Next observing evening

Friday 17 August at the Pretoria Centre Observatory, which is also situated at CBC. Turn left immediately after entering the main gate and follow the road. Arrive from sunset onwards.

CONTENTS OF THIS NEWSLETTER

Report of observing evening on July 20 th 2012	2
Telescope for sale	3
Feature of the month: Uniting the planet for a manned journey to another star	3
Meet some members of the Pretoria Centre of the ASSA	4
Basics: The signs and constellations of the zodiac	4
Noteworthy items	6
Venus and Jupiter conjunction in the evening twilight	7
Now offered for sale on the bookshelves of bookstores	7
Pretoria Centre committee	7

Report of observing evening on July 20th 2012 - by Michael Poll

Not many people came on this evening – about 15 of us and four telescopes. However, in spite of the light pollution, the sky was quite clear (the Milky Way in Sagittarius was visible later in the evening), and we were able to look at some objects other than the usual favourites.

On arrival we were greeted with the thin sliver of the 36 hour old moon in the north west, the crescent was almost horizontal. However the moon was low down and disappeared behind the trees before we had a chance to look at it.

First up, Percy found NGC 4103 which we revisited later in the evening. Michael Fidos brought some friends who were originally from Europe, so we had a discussion about the visibility of the seven star asterism in Ursa Major. These seven stars are generally known as the Big Dipper in North America, the Plough in Britain, and the Wain or Wagon in Europe. The Plough is visible in the evenings here around April, low on the northern horizon, but the latitude of Pretoria (26° S) is the last latitude at which all seven stars are visible. At this time of year the bowl of the Dipper has set in the evening, only the last couple of stars of the handle can be seen, and on this evening we could still see the last star in the handle, Eta (η). Incidentally, the curve of the handle points to Arcturus, which was standing above Eta.

We did a bit of a tour for the visitors, including Saturn (and Titan), and Mars. The latter showed a reddish disc which was a lot smaller than the globe of Saturn at the same magnification. Saturn and Spica still comprise a distinctive pair, and we noted that Mars will pass between Saturn and Spica in mid-August. We also visited Messier 6 and Messier 7 in Scorpius, and IC2602 – the latter is known as the Southern Pleiades, and the brightest of them is 3rd magnitude Theta Carinae. Also we looked at the Jewel Box (NGC 4755), and the double star Alpha Centauri.

With the clear sky, we got on to some of the less visited objects, including some which lie near Alpha Crucis. In this area of the sky are NGC 4103, NGC 4052, NGC 3766, and IC 2944.

NGC 4103 is a small open cluster, which was not difficult to find - it is nearer Epsilon Crucis rather than Alpha. NGC 4052 is a fainter open cluster that was not seen in Michael's 6 inch, but was found in Percy's 10 inch. This cluster lies near a pair of stars in Crux which are labelled as Theta¹ and Theta² on some charts, and Upsilon¹ and Upsilon² on others. It would appear that the Theta designation is correct. (The lowercase Greek letter Theta is θ and Upsilon is υ). In this area of sky, we must record that Percy found the *cutest* little asterism that resembled the Southern Cross, but with the axes at right angles.

NGC 3766 and IC 2944, although nearby, are actually in Centaurus. We found a nice raft of bright stars, but not being totally familiar with the area, we were not sure which of these two we were looking at. Eventually we realised that we were looking at NGC3766, which is also known as the Pearl Cluster. IC 2944 is a separate, smaller cluster around Lambda Centauri (see below).

A bit of post-observing-evening-homework established that NGC 3766 was discovered by Abbe Lacaille on March 5, 1752 from South Africa. The cluster is said to "shimmer like a pearl". IC 2944 is a smaller [open cluster](#) with an associated [emission nebula](#), the Lambda Centauri Nebula, which is also known as the "Running Chicken Nebula". Neither the stars of IC2944 or the nebula were seen on this evening, but will be searched for at the next dark sky opportunity. In deep images, the nebula features dark globules and so is most likely a site of active star formation. The globules in IC 2944 were discovered by [South African astronomer A. David Thackeray](#) in 1950, and are now known as [Thackeray's Globules](#).

In addition to these clusters, we looked at NGC 6025, which is an open cluster in Triangulum Australe, and is quite easy to find by extending the line formed by the stars Gamma, Epsilon and Beta Trianguli Australis. Beta is the star nearest to the cluster. NGC 6025 shows a distinctive zig-zag line of stars.

Telescope for sale

8" Dobsonian telescope (Sky-watcher)
 1200mm focal length
 10 & 26mm eyepieces
 Barlow Lens (x2 magnification)
 Including Ring adapter & T-piece nose for Nikon camera (astrophotography)
 Very good condition.
 Price: R6 400.00
 Contact Antonio de Franca
 072 297 2252
 See photograph of the telescope at right .



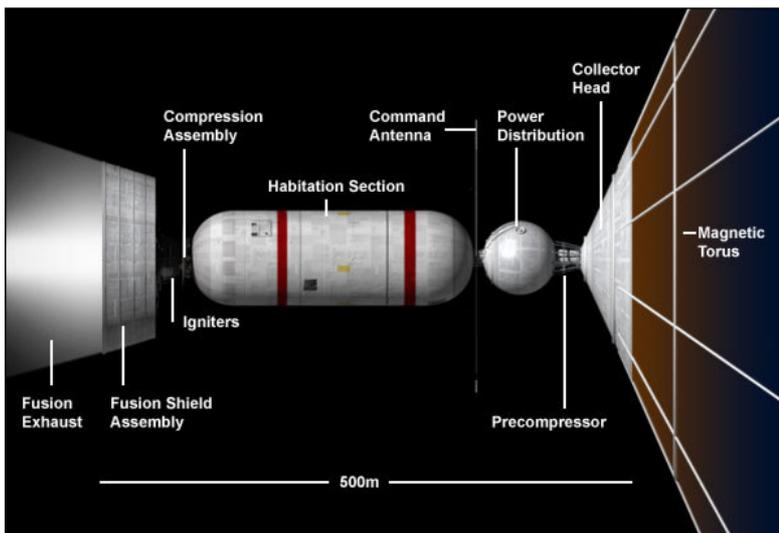
**Feature of the month: Uniting the planet for a manned journey to another star
 by Pierre Lourens**

Ex-NASA astronaut Mae Jemison will spearhead the audacious 100 Year Starship plan to send humans on an interstellar adventure by the year 2112.. At the present time, a manned journey to another star is science fiction. The basic problem of travelling to another star is just the enormous distance. But for the group of interstellar enthusiasts headed by Jemison, the distance between the stars isn't insurmountable; it's merely a problem we need to embrace and work toward finding a solution. What's more, they have the backing of the Defense Advanced Research Projects Agency (DARPA) to begin work.

The technology to do it doesn't exist at present, but the pace of development of science and technology should not be underestimated. Jemison's organization will also establish **The Way**, a scientific research institute that will embrace speculative, long-term science and technology initiatives. The **Dorothy Jemison Foundation for Excellence**, led by Mae Jemison, will head this multi-partner project, including **Icarus Interstellar Inc.**, a non-profit organization with the aim of developing technologies for interstellar travel. Other partners include the **Foundation for Enterprise Development** and the **SETI Institute**. The effort will go by the acronym **100YSS** (**100 Year Starship**). The project will host a public symposium in Houston, Texas, on Sept. 13 - 16, 2012. The 100YSS project provides a means to unite the world toward a common goal. "The public never left space exploration, they were just left out. It's our job to make sure they are included", says Jemison.

I can't say: "We shall see if it realizes in the year 2112", because none of us will still be around then. So I will rather say: "Our descendants shall see if it realizes in the year 2112".

At left is shown an artist's depiction of the Bussard interstellar ramjet, one of the concepts proposed for manned interstellar travel. Ω

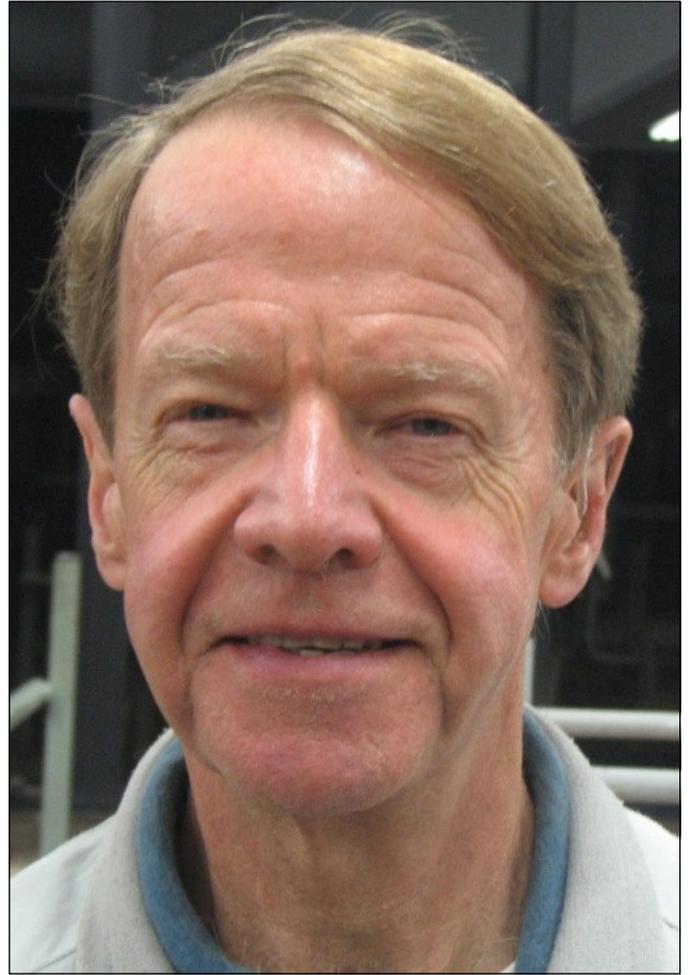


<http://news.discovery.com/space/mae-jemison-darpa-100yss-interstellar-120529.html#mkcpgn=emnws1>

http://en.wikipedia.org/wiki/Interstellar_travel

Meet some members of the Pretoria Centre of the ASSA

Left to right: Johan Hartmann, Dr Hubrecht Ribbens (both former committee members).



Basics: The signs and constellations of the zodiac - by Pierre Lourens

The zodiac is the band of the celestial sphere, 16° in width, through which the ecliptic runs centrally. It contains at all times the Sun and moon and seven of the eight planets, except Venus. The dwarf planet Pluto and many asteroids also stray outside the zodiac. It is the coloured band in the figure below.

The signs of the zodiac are the 12 equal divisions, each 30° of celestial longitude in width, into which the zodiac is divided. ($12 \times 30^\circ = 360^\circ$.) They are marked off eastward, starting with the vernal equinox. The signs are named from the 12 constellations of the zodiac situated in the respective divisions over 2000 years ago. They are Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpius, Sagittarius, Capricornus, Aquarius, Pisces. But because of the precession of Earth's axis, the position of the vernal equinox shifts westward along the ecliptic. It shifts through 360° in 25 725 years. Since 2000 years ago the vernal equinox has shifted about 30° westward, and the signs along with it, so that the signs no longer coincide with the constellations after which they were named. **The difference between signs and constellations is that signs move westward along the ecliptic with the vernal equinox, but constellations stay fixed.**

While signs neatly extend eight degrees north and south of the ecliptic, and 30° along the ecliptic, the constellations of the zodiac do no such thing. The 16° wide belt of the zodiac actually passes through 24 constellations. An additional 12 constellations, apart from those mentioned above, reside in part within the zodiac's belt of stars, namely Auriga, Canis Minor, Cetus, Corvus, Crater, Hydra, Ophiuchus, Orion, Pegasus, Scutum, Serpens and Sextans.

The borders of the constellations were drawn up and finalized by the International Astronomical Union in 1930. The Sun, which travels the straight and narrow road of the ecliptic, even

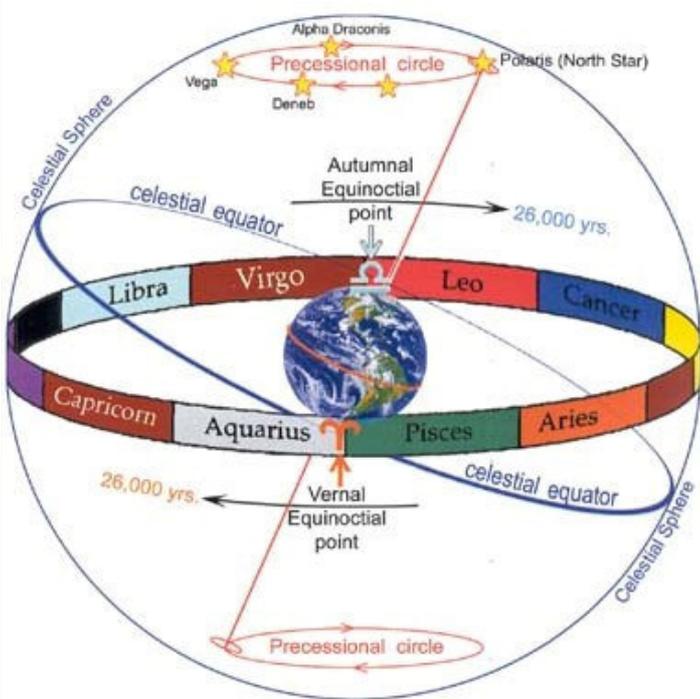
passes through a thirteenth constellation - Ophiuchus - from about November 30 to December 17. What's more, the Sun touches upon the constellation Cetus at the end of the first week in March.

The Sun moves eastward along the ecliptic against the background of stars during the course of the year. When it arrives at the vernal equinox (of the northern hemisphere) near 21 March, and therefore enters the **sign** of Aries, it is in the southwest of **constellation** Pisces. The Sun only enters the **constellation** Aries in late April. (See the table.)

The vernal equinox itself is moving slowly westwards towards **constellation** Aquarius, and will eventually (c. 2600 C.E.) enter it. This is the origin of the idea of the "**Age of Aquarius**" celebrated in the musical **Hair** from the 1970's: a period when according to astrological mysticism and related stuff, there will be unusual harmony and understanding, sympathy and trust in the world. It is also the origin of the song "**Aquarius**" sung by Engelbert Humperdinck. But astrologers differ widely about when the dawning of this so-called "**Age of Aquarius**" is supposed to arrive.

Some lyrics of the song "Aquarius"
 When the moon is in the Seventh House
 And Jupiter aligns with Mars
 Then peace will guide the planets
 And love will steer the stars
 This is the dawning of the Age of Aquarius
 The Age of Aquarius
 Aquarius! Aquarius!
 Harmony and understanding
 Sympathy and trust abounding
 No more falsehood or derisions
 Golden living dreams of visions
 Mystic crystal revelation
 And the mind's true liberation
 Aquarius! Aquarius!.....

We could certainly do with a heavy dose of all these wonderful things in this old world. Unfortunately, it is unlikely to come about because of something as irrelevant as the position of the vernal equinox in the constellations of the zodiac. Ω



The coloured band shows the zodiac with the names of constellations in it. Note that the constellations as defined today have more complicated boundaries than shown here, and that the band passes through 24 constellations as defined today, not just 12 as in ancient times and as shown here. The vernal equinox is not yet in the constellation of Aquarius as shown here.

Dates during which the Sun is found in different constellations today (c. 2000 C.E.)

Constellation	Date span	Days
Aries	19 Apr - 13 May	25
Taurus	14 May - 19 Jun	37
Gemini	20 Jun - 20 Jul	31
Cancer	21 Jul - 9 Aug	20
Leo	10 Aug - 15 Sep	37
Virgo	16 Sep - 30 Oct	45
Libra	31 Oct - 22 Nov	23
Scorpius	23 Nov - 29 Nov	7
Ophiuchus	30 Nov - 17 Dec	18
Sagittarius	18 Dec - 18 Jan	32
Capricornus	19 Jan - 15 Feb	28
Aquarius	16 Feb - 11 Mar	24-25
Pisces	12 Mar - 18 Apr	38

NOTEWORTHY ITEMS

- **Aurora Australis over Concordia station 18 July.**
http://www.esa.int/esaCP/SEM943VTP4H_index_1.html
- **A magnetic monster's dual personality.** Is it a magnetar or is it a pulsar?
http://www.esa.int/esaSC/SEMUZHMXL4H_index_0.html
- **Discovery Channel's telescope.** The 4.3 meter telescope in Happy Jack, 64 km southeast of Flagstaff, Arizona, USA, is a joint \$53 million project between Lowell Observatory and Discovery Communications. <http://news.discovery.com/space/photos-discovery-channel-telescope-lowell-observatory-120419.html#mkcpgn=emnws1>
- **First light for Discovery Channel's telescope.** <http://news.discovery.com/space/discovery-channel-telescope-first-light-3-120721.html#mkcpgn=emnws1>
- **Flying along the Vela ridge.** See an image.
http://www.esa.int/esaCP/SEM0XIJXB4H_index_1.html
- **NASA'S Spitzer finds evidence for an exoplanet smaller than Earth.** Strong evidence for a very small, very hot planet around a star only 33 light-years away.
http://www.nasa.gov/home/hqnews/2012/jul/HQ_12-238_Spitzer_Small_Exoplanet.html
- **Eruption from the Sun.** SOHO captured a coronal mass ejection (CME) erupting from the Sun. http://www.esa.int/esaSC/SEMZ2HPXV4H_index_0.html
- **Another, more recent eruption from the Sun.** Northern Lights spilled into the USA as far south as California, Colorado, Kansas, and Arkansas. In the southern hemisphere, skies turned red over Tasmania and New Zealand.
http://science.nasa.gov/science-news/science-at-nasa/2012/20jul_tasteofsolarmax/
- **New NASA supercomputer facility set to advance Earth research.** NASA will soon open a new chapter of discovery using enhanced Landsat Earth-observing data in a supercomputer facility called NASA Earth Exchange (NEX).
http://www.nasa.gov/home/hqnews/2012/jul/HQ_12-248_NEX_Landsat_Available.html
- **The Higgs boson and Higgs field.**
<http://physics.about.com/b/2012/07/21/higgsfield.htm?nl=1>
- **A decade of future visions from ESA's Advanced Concepts Team.**
http://www.esa.int/SPECIALS/Technology/SEMAOMJXB4H_0.html
- **NASA Innovative Advanced Concepts (NIAC).** NASA's Space Technology Program is turning science fiction into science fact. The program has selected 28 proposals for study under the NIAC program. http://www.nasa.gov/offices/oct/early_stage_innovation/niac/index.html
- **Scale of the Universe - awesome!** <http://htwins.net/scale2/>
- **NASA survey counts potentially hazardous asteroids.** Observations from NASA's Wide-field Infrared Survey Explorer (WISE) have led to the best assessment yet of our solar system's population of potentially hazardous asteroids.
http://www.nasa.gov/home/hqnews/2012/may/HQ_12-157_NEOWISE_PHAs.html
- **A ten billion-year stellar dance.** The HST offers this view of M68, a globular cluster. The image is a nice screen saver. http://www.esa.int/esaSC/SEM7RFSX55H_index_0.html
- **NASA's Mars Reconnaissance Orbiter detects large changes in Martian sand dunes.**
http://www.nasa.gov/home/hqnews/2012/may/HQ_12-152_Mars_Sand_Dunes.html
- **Curiosity has landed!** http://www.nasa.gov/multimedia/podcasting/curiosity_lands.html
http://www.nasa.gov/home/hqnews/2012/aug/HQ_12-271_Mars_Orbiter_Images_and_Curiosity.html

Venus and Jupiter conjunction in the evening twilight

Photograph taken from Dries van Zyl's website at

<http://www.icon.co.za/~dvanzyl/FramesetWeather.html>



Now offered for sale on the bookshelves of bookstores

A special edition of the magazine **Astronomy** about the world's great telescopes.

Pretoria Centre committee

Chairman	Bosman Olivier	082 883 1869 [C]
Vice Chairman	Danie Barnardo	084 588 6668 [C]
Secretary	Tony Viljoen	072 247 6648 [C]
Newsletter Editor	Pierre Lourens	072 207 1403 [C]
Treasurer and		
Membership Secretary	Rynhardt van Rooyen	082 325 8745 [C]
Assistant Treasurer	Michelle Ferreira	073 173 0168 [C]
Librarian	Danie Barnardo	084 588 6668 [C]
Assistant Librarian	Pat Kuhn	082 895 5686 [C]
Curator of Instruments	Johan Smit	072 806 2939 [C]
Public Relations Officer	Fred Oosthuizen	072 373 2865 [C]
Observing Co-ordinator	Percy Jacobs	082 498 4680 [C]
Member	Michael Poll	074 473 4785 [C]

