



Southampton
Astronomical Society

Founded 1924

Newsletter

September 2009

www.southampton-astronomical-society.org.uk

NEXT MEETING Thursday 8th October
Jerry Workman The Apollo Missions

Programme of Events

October 8th	Jerry Workman	The Apollo Missions
October 22nd	Tim Stretton	
November 12th	Edd Edmondson	"Future large scale surveys"
November 26th	Lilian Hobbs	Winter Star Party
December 10th	n/a	Film evening + American supper
December	No Club Evening	
January 14th	To be announced	
January 28th	Stephen Cole	

Venues for Monthly Meetings

All Meetings start promptly at 7.30 pm.

Club Evenings and Observing Meets:

Maps to venues are available at the Monthly Meetings. Alternatively, please E-mail:

Stephen Cole

news@southampton-astronomical-society.org.uk

for a map.

Meetings on the 2nd Thursday of each month are held at:

Edmund Kell
Unitarian Church Hall,
Bellevue Road,
Southampton,
SO15 2AY.

Parking Arrangements: On-street parking is usually available in Bellevue Road. There is a car park in King's Park Road nearby. From the car park there is pedestrian access to Asylum Road. Please ensure that your car is securely locked.

Please note that our venue is accessible by Disabled Visitors

Contact Details:

President:
Ian Gore
president@southampton-astronomical-society.org.uk

Treasurer/Membership Sec:
Michael Hobbs
secretary@southampton-astronomical-society.org.uk

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A.G.M. September 10th 2009

Presented by Mr. Michael Hobbs

1. Apologies for absence

Dr. Lilian Hobbs
Dr. Veronica Radford
Mr. John Epstein

2. MINUTES OF THE A.G.M. FOR 2008

Proposer: Mr. Ian Gore
Seconder: Mr. Michael Hobbs

3. ACCOUNTS FOR THE YEAR 2008/9

Proposer: Mr. Tim Stretton
Seconder: Mr. Ian Gore
Auditor: Dr. Veronica Radford

4. SUBSCRIPTIONS

As for the Year 2008/09.
Annual membership: £12.00
Tri-annual membership: £33.00
Life membership: £150.00

5. COMMITTEE REPORT

See Page 12

6. COMMITTEE MEMBERS

The Current Committee members agreed to continue in their posts with the election of two new members. The current Committee as follows:-

President:	Mr. Ian Gore	Event Organiser:	Mr. Gerard O'Mara
Vice President:	Mr. Stephen Cole	Members Representatives:-	
Secretary:	Mr. Tim Stretton		Dr. Lilian Hobbs
Treasurer :	Mr. Michael Hobbs		Mr. Mat Brady
			Mr. R. McAthey

7. AUDITOR

Dr. Veronica Radford to be asked to Audit the accounts for the coming year.

8. THE SATURN AWARD

There were no nominations.

9. A.O.B. None. **10. A.G.M.** closed

Minutes for Meeting - Thurs 11th June

End in Fire: ultimate fate of the Earth

By Dr. Robert Smith

Dr. Robert Smith said that some say that the world will end in fire and some say that the world will end in ice.

EVOLUTION OF THE SUN

There will be a mass loss which will be a vital ingredient. The future of the Earth.....and life.....

THE SUN

Mass: 1.9891×10^{30} kg
Radius (equatorial): 6.955×10^8 m
Luminosity: 3.846×10^{26} W
Surface temperature: 5,778 K

PRESENT:

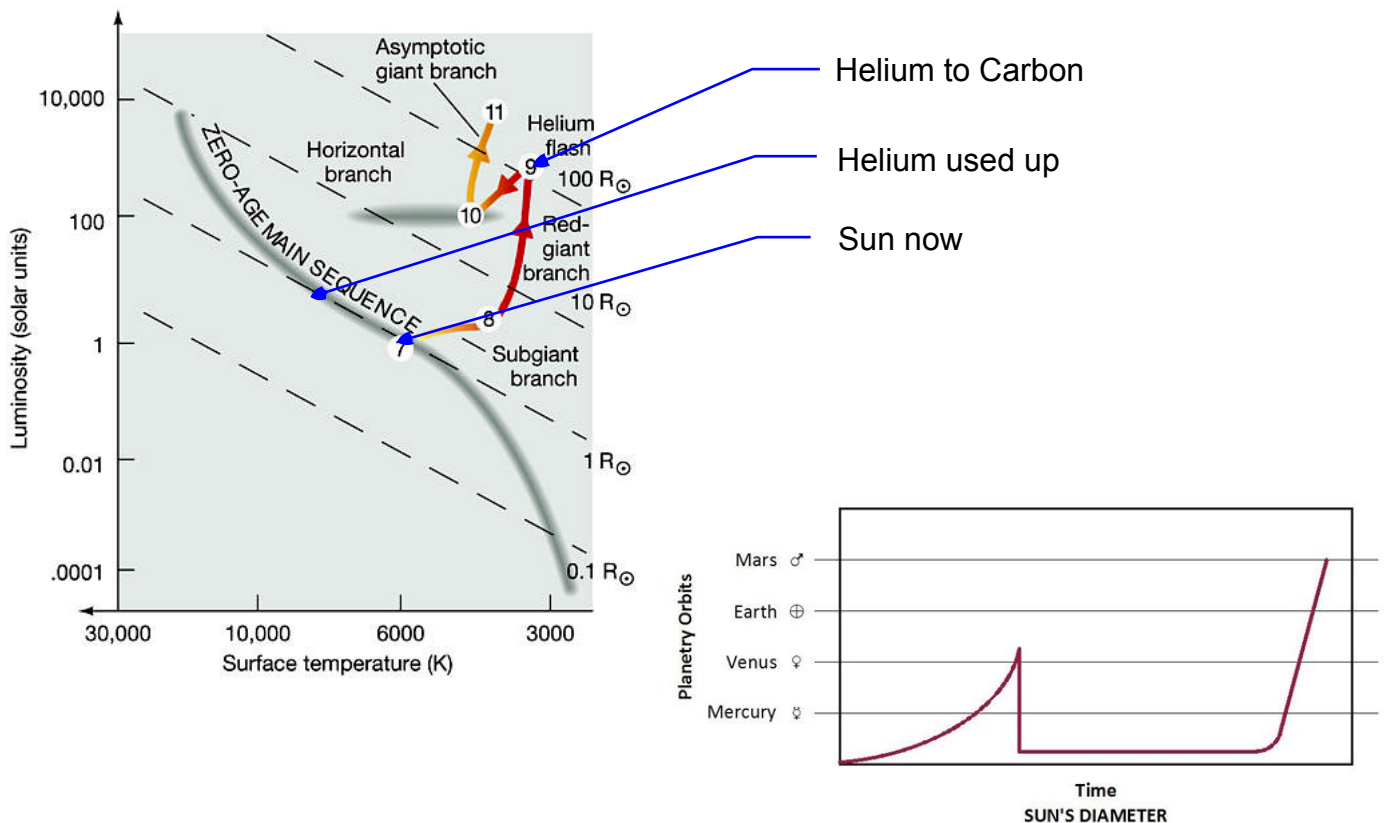
The Earth's geology doesn't suggest any major change.
The Sun is about 4.5 billion years old.

FUTURE

Dr. Robert Smith said that in the next 7 billion years, the Sun will not suggest any major change. The Sun will then get hotter and will release gravitational energy. The core of the Sun will collapse and the outside will begin to expand.

The Sun's core is at a temperature of 100 million K and it fuses helium (He) to carbon (C). After approximately 100 million years hence, the helium will be used up.

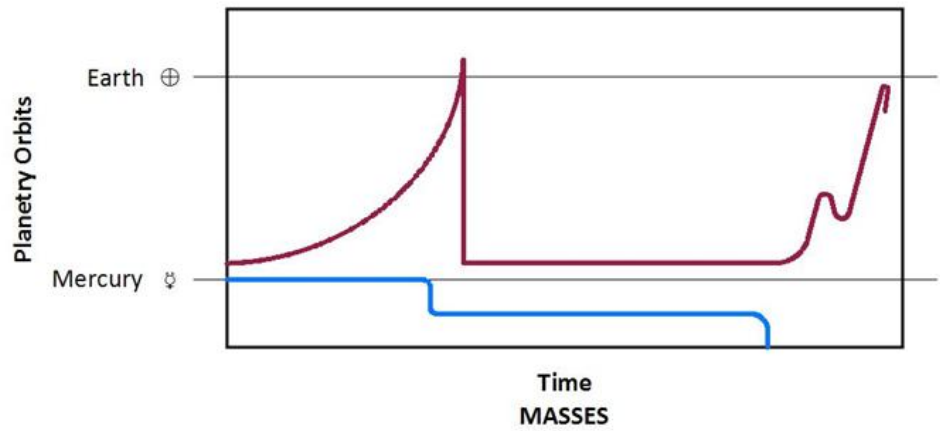
The Sun will then become a supergiant star and the hot core will become cooler.



The question is, why does the Sun lose mass? The Sun's corona will be approximately 2 million K, the solar wind speed will be approximately 450 km/s, and the density will be low.

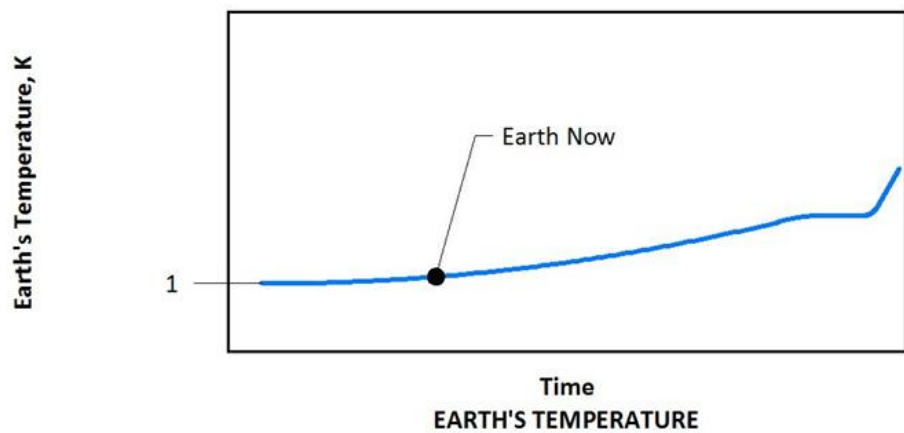
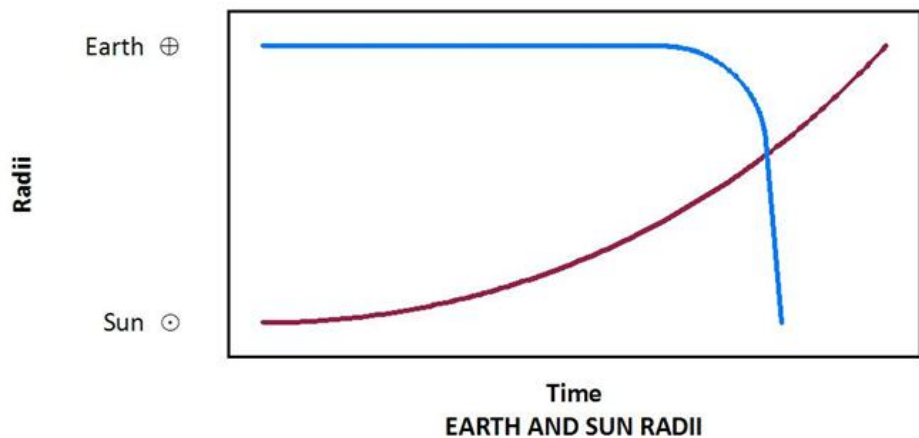
Typically, the Sun will lose 10^{-14} solar masses per year, and the supergiants will lose 10^{-7} solar masses per year. Over 20 million years, the Sun can lose 20% of its mass. The mass loss causes planetary orbits to expand.

MASS



TIDES

Dr. Robert Smith said that the Sun will occupy most of the daytime sky and it will be very close to Earth. The Earth will create a tidal bulge which will slow the Earth down, drifting inwards towards the Sun.



The geological records show that the Earth has had a constant temperature (warm) because of the greenhouse effect. The greenhouse gases being; carbon dioxide (CO_2), methane (NH_4), and water vapour. The oceans will evaporate and the result will be that the Earth will be a hot and dry lifeless ball in about 1 billion years.

Minutes for Meeting - Thurs 9th July

Lecture 1 for the evening:

The “WorldWide Telescope (WWT)” by Microsoft on-line

By Mr. Stephen Cole

INTRODUCTION

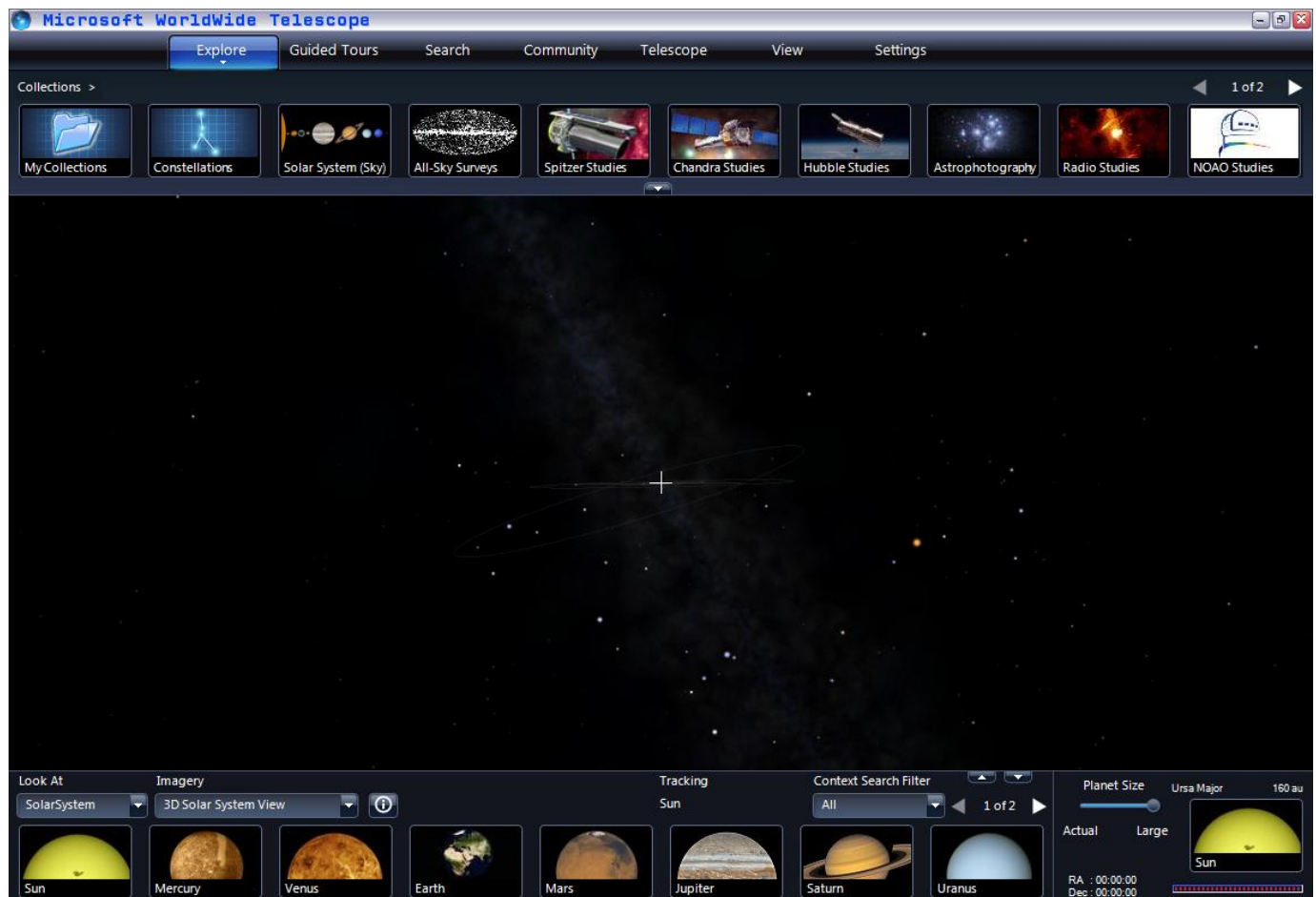
Stephen Cole introduced us to the WorldWide Telescope by Microsoft on-line. Once downloaded, the facility pulls night sky images taken by many large telescopes such as the Hubble Space Telescope (H.S.T.), Chandra X-ray Observatory, and the Sloan Digital Sky Survey.

JIM GRAY

The WorldWide Telescope is dedicated to James Nicholas “Jim” Gray who studied at the University of California where he earned his B.S. in Engineering Mathematics in 1966 and his Ph.D. in 1969. He subsequently worked as a researcher and software designer for many including I.B.M., Tandem Computers and D.E.C. (Digital Equipment Corporation). Unfortunately, when Jim Gray went out in his boat to the Farallon Islands near San Francisco to scatter his mother’s ashes on Sunday 28th January 2007 (21st anniversary of the Shuttle Challenger disaster), he was reported missing at sea.

IMAGES

This is the front page of the WorldWide Telescope:



Stephen Cole showed us many images including:

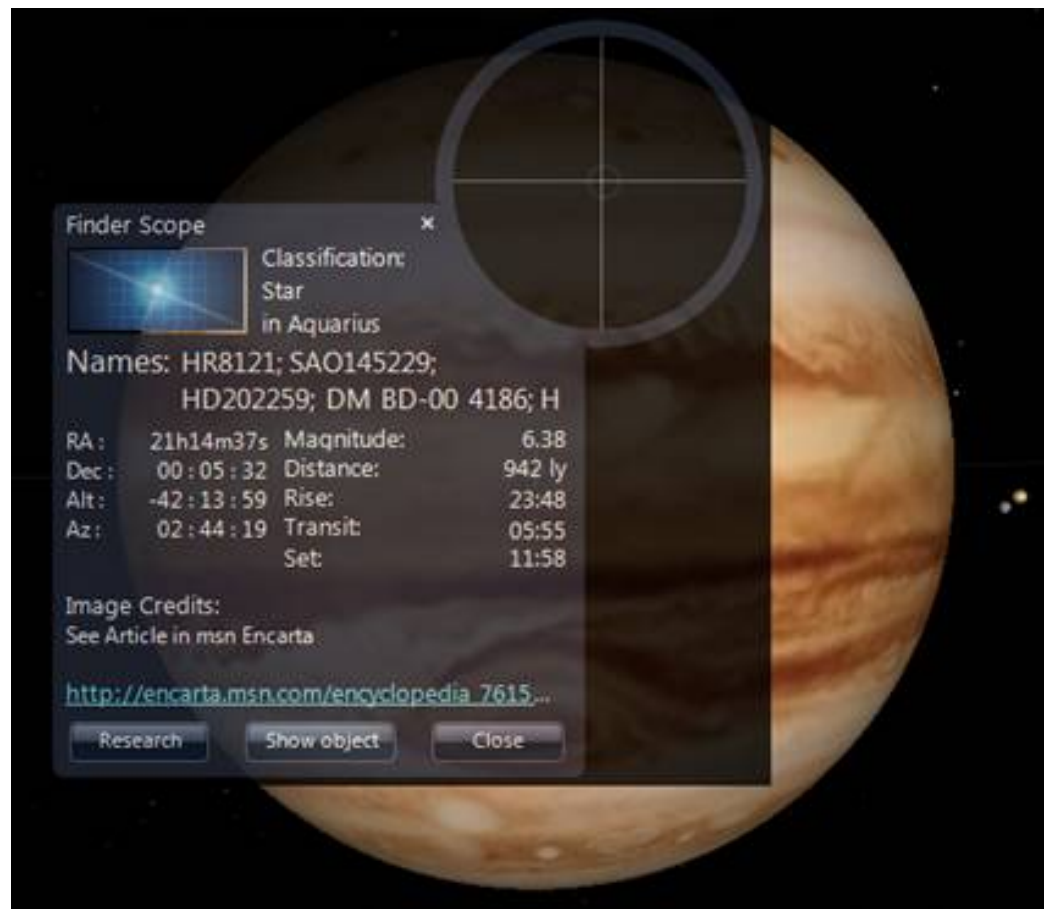
Pleiades — an H.S.T. image and a deep H.S.T. Image

Orion — flame nebular, horsehead nebular, and the orion nebula

Ursa Major — M81 and The Cigar Galaxy M82

The planets; Venus, Mars, and Jupiter including it's great red spot and two of its satellites, Io and Europa.

Stephen told us that this programme showed a good way too look at the universe as it had many informative tools in the programme. For example, if you selected and then right clicked on Jupiter, then you had this:



By typing in the required Messier's number, such as M31, or Herschel's New General Catalogue number, such as NGC 891, then the WorldWide Telescope would simply find the object in the night sky. Or, if you know where they are, you can pan and zoom with the mouse to locate the required object.

Stephen Cole demonstrated the programme at his home for the July Club Evening.

Lecture 2 for the evening:

Summer Constellations

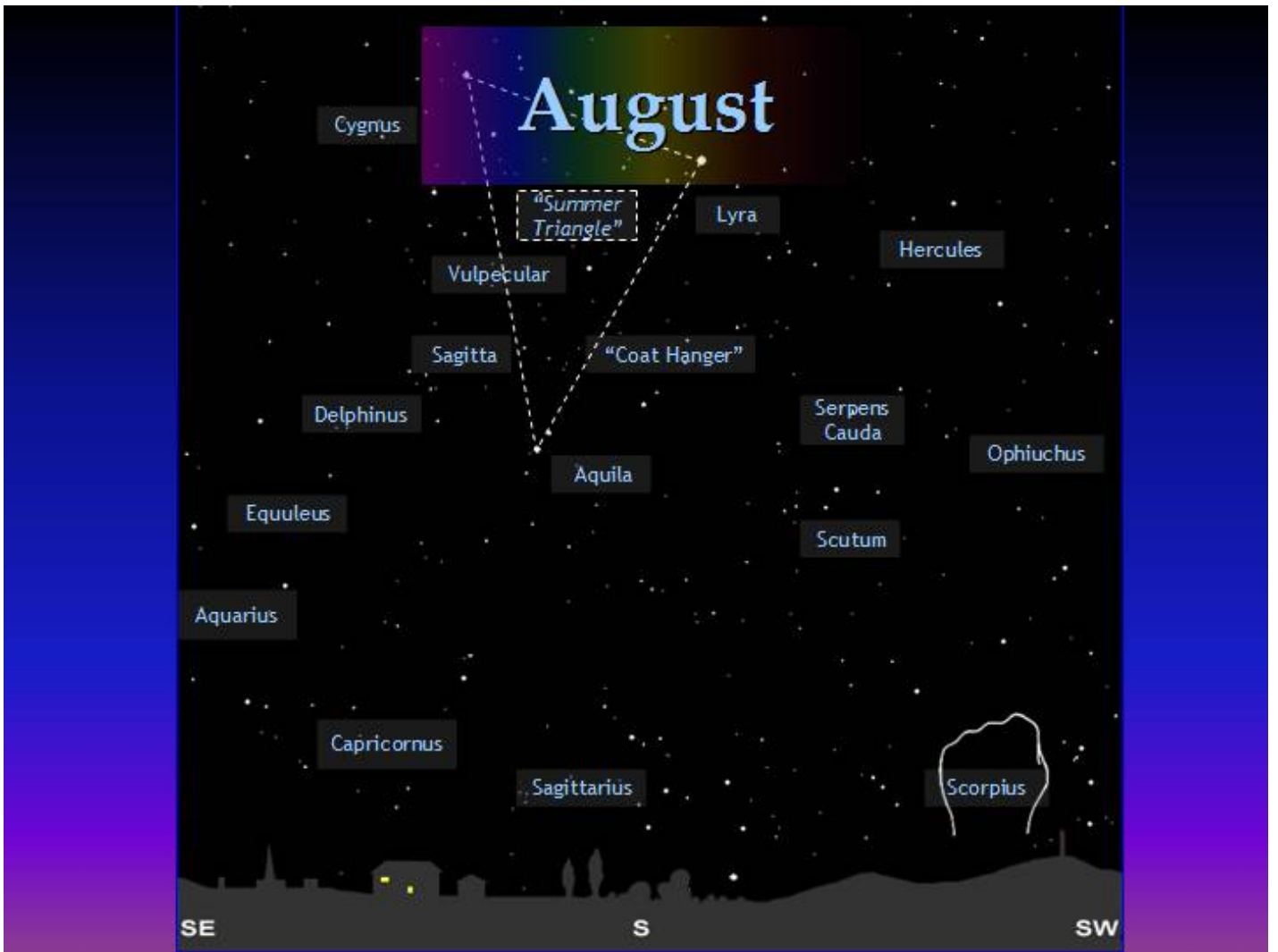
By Mr. Timothy Stretton

Tim Stretton first showed the constellations of June. Here, he located the constellation of Scorpius, the Scorpion and showed that it is one of the few constellations that really do look like the namesake. He showed the constellation Hercules, the Warrior and two of its objects M92 and M13, two globular clusters.

Next came July with the constellation Lyra, the Lyre, with two photographs of M57, the Ring Nebula. Here he demonstrated a typical photograph from an Earth based large telescope, and a typical photograph showing what most amateur astronomers, like you and me, would see of it; very little!



Following that, Tim showed us the constellations of August. He located the “Summer Triangle”, as coined by Sir Patrick Moore. Tim showed us one of the more famous constellations called the “Coat Hanger”, which for him indicated a helicopter in flight.



Lastly, Tim showed us the circumpolar constellations. Here, he indicated that “the Plough” was indeed part of a much bigger constellation called Ursa Major, the Great Bear. Using the Plough, Tim showed how “pointers” can be used to locate other stars, such as Polaris (the pole star). Tim also said that during his time at boarding school, he had discovered that Polaris wasn’t always located neatly between two branches and this told him that Polaris wasn’t exactly on the celestial pole but just off centre.

Minutes for Meeting - Thurs 10th September

The John Thompson Memorial Lecture: The President's Address "What's the Matter?"

by Mr. Ian Gore

JAN OORT

Ian introduced us to Jan Oort, who showed that the Milky Way galaxy rotates. Jan Oort found that the stars were moving too quickly and thought that there might be latent matter causing the stars to move in that manner.

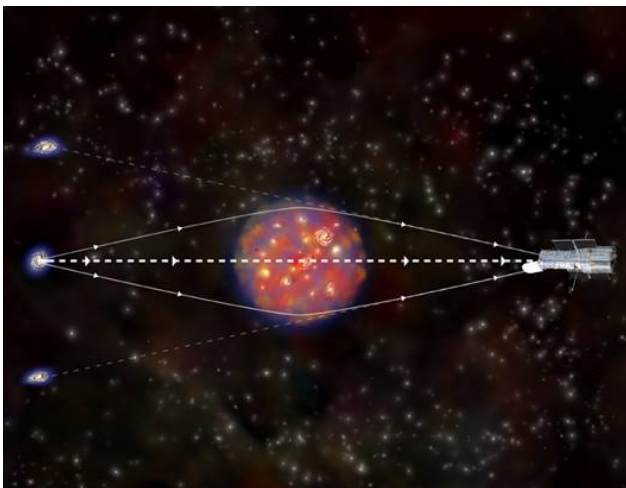
FRITZ ZWICKY

Next came a man by the name of Fritz Zwicky who was not popular in the scientific circle because of his unpopular character, and the way he treated his students. He was the man, Ian said, who coined the phrase, "Comets are dirty snowballs." Fritz Zwicky recognised supernovae and neutron stars. On 'weighing' a galaxy cluster, such as the Virgo cluster, Zwicky found that it was 160 times too much than he would have expected it to be, although he could only 'see' 1/50 of the galaxy cluster. One question that was asked about the galaxy clusters was, "Were all the galaxies in the cluster or were many, or all of them, just a line of sight effect.

Fritz Zwicky's theories were largely ignored as they seemed to be very different from the current scientific thinking at that time.

GRAVITATIONAL LENSING

Ian showed us a drawing showing the effects of gravitational lensing.



With this, Ian showed that the light from a distant object, way beyond the galaxy cluster, is bent around the galaxy cluster. This had the effect of seeing two or more of the same distant object.

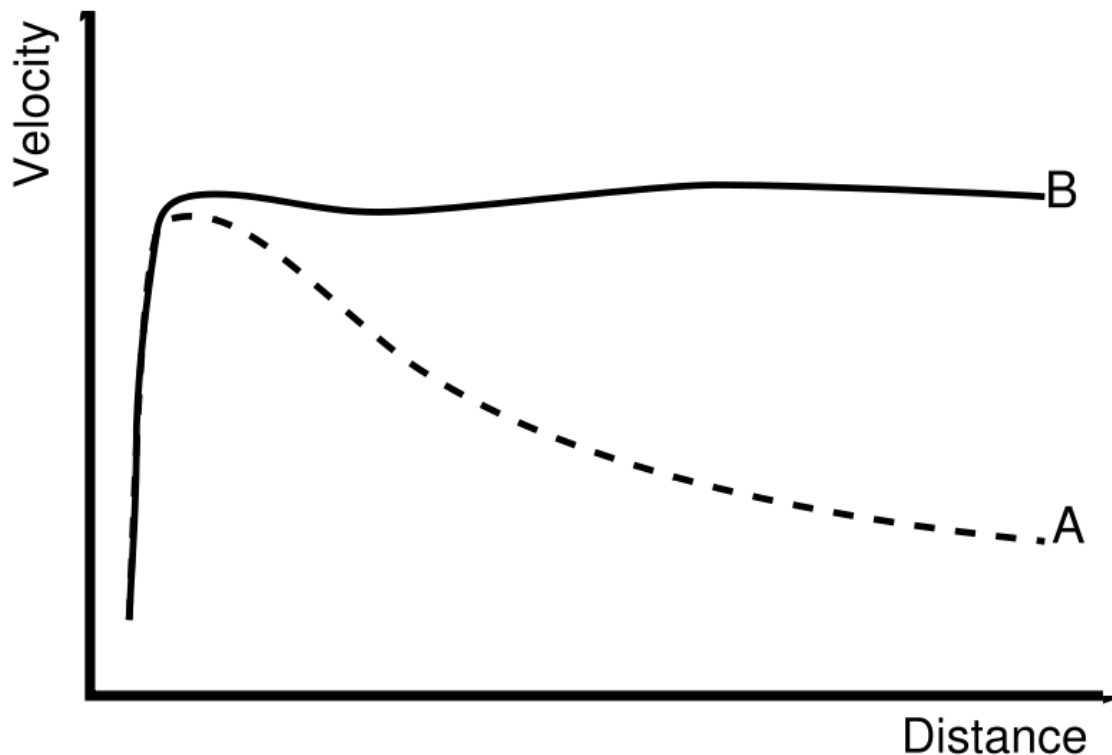
Ian showed us an image of what the effect of gravitational lensing has on the objects.

Horace Babcock and looked at the Andromeda Galaxy, M31, and looked at its core.



VERA RUBIN

Vera Rubin, (née, Cooper), was born in Philadelphia and she looked at galaxy rotation rates. Her opus magnum was the uncovering of the discrepancy between the predicted angular motion of galaxies and the observed motion, by studying galactic rotation curves. This phenomenon became known as the galaxy rotation problem.



For planets, Ian said that we find that the orbital speeds around the sun tend to follow the path indicated by line A. When Vera Rubin observed the galaxy rotation rates, she found that the stars would follow the path of line B. This suggested the existence of some other 'matter' within the galaxy that was creating the effect as observed. This 'dark matter' was one that was proposed by Franz Zwicky before.

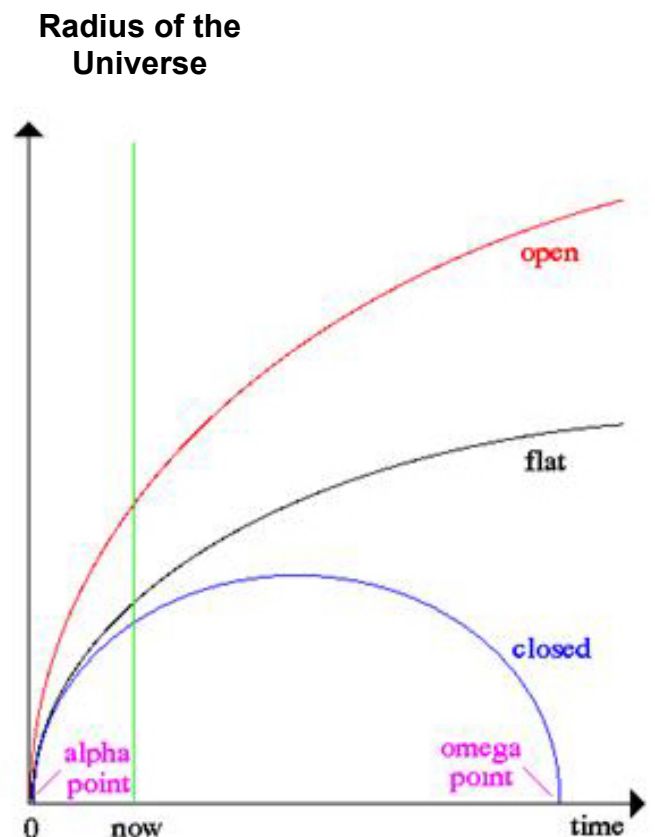
JEREMIAH OSTRIKER AND JIM PEEBLES

Ostriker and Peebles looked at the formation of barred spiral galaxies. This became known as the Ostriker-Peebles Criterion. They carried out observations and calculations to find out the reason for the formation of barred spiral galaxies, or by observing the barred spiral galaxies, finding out why unbarred spiral galaxies were formed.

VIDEOS

Ian played a video showing us two galaxy clusters colliding which showed the colliding galaxies sifting out the dark matter.

There were three possible suggestions for the shape of the universe:



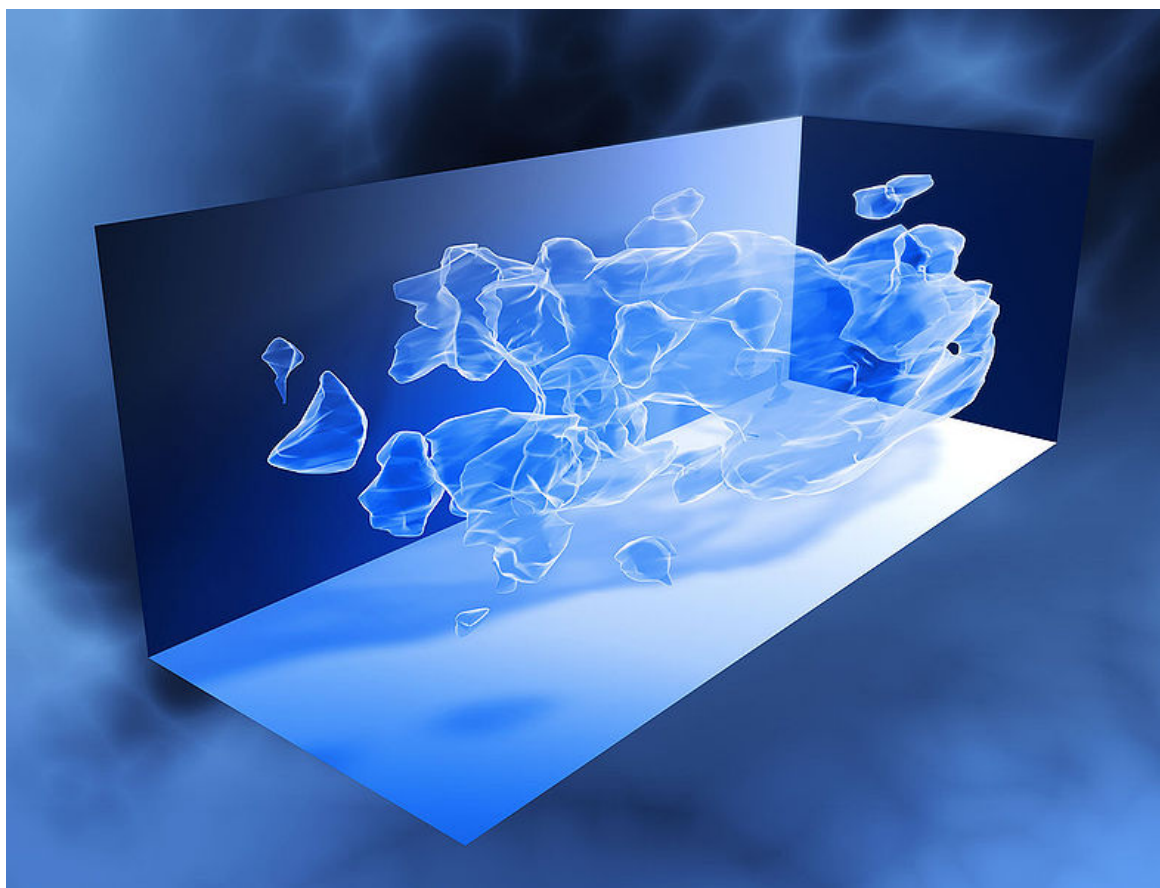
It was shown that there was not enough mass for a 'flat' universe, and that to have one, it required dark matter. Temperature differences were showing up in the order of millionths of a degree.

Ian showed the second video showing the collapsing universe matter which indicated the homogenous matter being collapsed into a foam-like structure, as Ian put it, which looked like a block of plastics material foam.

The third video showed the universe in its foamed structure as a fly-through.

DARK MATTER

The fourth video was a video about dark matter. In the video, it showed the distribution of the dark matter in the universe:



Ian said that there are two types of dark matter:

Hot Dark Matter (H.D.M.), and

Cold Dark Matter (C.D.M.).

Hot dark matter is nonbaryonic particles that move ultrarelativistically, meaning that their velocities are very close to the speed of light, C .

Cold dark matter is nonbaryonic particles that move non-relativistically, i.e. the slow stuff.

DETECTION

There are two candidates for the make-up of dark matter:

WIMPs: Weakly Interacting Massive Particles, and

MACHOs: Massive Astrophysical Compact Halo Objects.

COMMITTEE REPORT by Ian Gore

September - Lilian Hobbs delivered the John Thompson Memorial Lecture on "How Astronomy Has Changed". Lilian spoke about the changes she has seen while she's been involved in amateur astronomy

October - Jerry Workman gave us an update on the Pioneer Missions and Saturn and its rings.

November - Neil Bone spoke to the society about "Astronomy With a Small Telescope". Sadly, this was one of Neil's last talks, but one he'd very much wanted to give.

December - This was the annual film show and American Supper,

January - Robin Gorman spoke to us about the International Year of Astronomy and how societies can get involved.

February - Karen Masters from Portsmouth University spoke about "Searching for Spirals: How to Look at a Million Galaxies" . It seems that while we know there are a lot of galaxies out there, we don't know how to describe them.

March - Prof. Malcolm Coe from Southampton University told us about "The Antikytheran Mechanism - the first astronomical computer". Believed to have been built in about 150-100 BC, this was not just the first astronomical computer but the first mechanical computer.

April - Alan Drummond spoke about "The Andromeda Galaxy" , how to find it, how to observe it and the role it has played in modern cosmology.

In the early hours of 23rd April, Neil Bone died of the cancer he'd been suffering from for several months. The society lost a good friend.

May - Tom Maccarone from Southampton University spoke about "Stellar collisions and near misses" . It turns out that globular clusters are much more complicated than we'd realised!

June - Dr Robert Smith from Sussex University spoke about "End in fire: the ultimate fate of the Earth?" We're all doomed!

July - Short Talks By Members saw two new speakers take to the floor (at last!). Tim Stretton talked about "Summer Constellations" and Stephen Cole gave us an overview of the World Wide Telescope.

Advertisement

University of Southampton School of Physics and Astronomy

Inaugural Lecture

'Tides in the Universe'

By Professor Malcolm Coe School of Physics and Astronomy

In the chair: Dame Jocelyn Bell Burnell FRS CBE.

5:00pm Wednesday 28th October 2009.

Lecture Theatre A, Building 46.

Tea and coffee served at 4:30pm.

All are welcome. No tickets required.