

SPACEWATCH

the newsletter of the Abingdon Astronomical Society

14th March 2005

Dr Sarah Dunkin –
Rutherford Appleton Laboratory

“ESA Mars Project, Aurora”

This month sees the spring or vernal equinox. On Sunday 20th March, the Earth's axis will be perpendicular to its orbit, giving equal lengths of day and night all over the planet.

This orientation allows the centrifugal force due to axial rotation to work together with the gravity of the Sun and New or Full Moon to produce the largest spring tides of the year. In the Severn Estuary this weekend this led to one of the largest Severn Bores of the year, which I was lucky enough to see on Saturday morning.

THE NIGHT SKY THIS MONTH

by Bob Dryden

The Planets:

Mercury is coming to the end of its best northern apparition this year. You have less than a week left to look for it low in the south west straight after sunset. It passes between the Earth and the Sun (inferior conjunction) on 29th March and by the end of the first week of April it will have reappeared in the morning sky. Unfortunately, this morning apparition is not a good one and you will have to be very determined if you want to see Mercury at all.

Venus is now too close to the Sun to be seen. Superior conjunction (when the planet passes behind the Sun) is 31st March but the planet will not reappear in the evening sky for some time yet.

Mars has been hanging around very low in the south east just before dawn for several months now. This session it continues more of the same. It is slowly brightening (increasing from mag +1.0 in mid March to +0.8 by mid April) and slowly increasing in apparent size (from 5.3" to 6.1") but it remains a very difficult object to find. Mars actually passes just 45' north of the globular cluster M75 on 20th March so if you fancy a challenge, try and see this.

Saturn is obviously the main telescopic target of planet hunters at the moment as it is conveniently on view high in Gemini, towards the south as it goes dark. Some of you may have noticed that the planet has been moving westward for awhile now, but after 21st March this

retrograde motion stops and Saturn then starts to move eastward again, moving back towards Pollux once more.

Jupiter is in Virgo and now starts to rise at a more friendly time. The bright 'star' near the eastern horizon mid evening is Jupiter and it rises earlier and earlier as the month passes. Any small telescope will show you the four main moons of Jupiter, as will a good pair of binoculars if you can hold them steady enough.

Asteroids: For the last couple of months the asteroid 2 Pallas has been on view. It now reaches its brightest around 20th March (mag 7.1) and then starts to fade (to mag 7.6 by mid April). However, it will be easily visible in binoculars throughout this session and to give it extra interest the asteroid passes through the Virgo galaxy cluster as it heads towards Coma Berenices. Besides Pallas, another bright asteroid appears by the end of March. 1 Ceres, the first asteroid ever discovered, crosses Libra and will be about 7.5 mag. It will be at its brightest in early May when it will reach magnitude 7 so this is an early opportunity to see it.

Occultation: There is an easy to see lunar occultation on 17th March. At 22.28 UT the Moon will pass in front of a mag 4.5 star, 136 Taurus. Any small telescope should enable you to see this event.

Comets: This session there are only 2 brighter comets on view. The easier of the two is C/2004 Q2 Machholz. It is now fading, but should still be visible in binoculars as it dims to magnitude 8 by mid April. Although it is fading, it is visible all night as it crosses Camelopardus and Draco, heading towards the bowl of the Plough. The second comet you can see is brightening, but is much more inconveniently placed as it is in the morning sky. C/2003 T4 Linear reaches mag 5.6 (which will be its brightest) by mid April but it is heading south, crossing Delphinus, Equuleus, and Aquarius as it does so.

Eclipse: There is an interesting solar eclipse on 8th April, a hybrid total/annular eclipse, which is rather unusual. However, you will have to be in the southern hemisphere to see it. Just north of Pitcairn Island is a good spot! A partial eclipse is visible from New Zealand starting at sunrise, 06:48am on Sat. 9th April (local time) lasting one hour exactly.

Summer Time: Do not forget that we change the clocks at the end of March when we advance them one hour and we change to British Summer Time (BST). Do not forget, also, that astronomical times are always given in Universal Time (UT) which, very conveniently for us, is the same as Greenwich Mean Time (GMT). So make sure you add one hour to any time given in UT to reach BST and so match the time on your watch.

MOON PHASES:

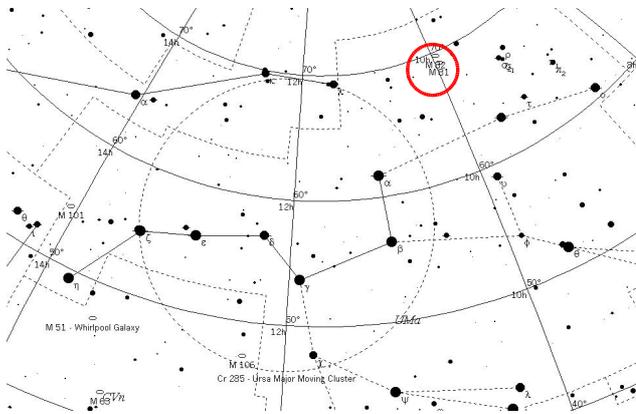
Last Qtr: 3rd Mar.; New: 10th Mar.; First Qtr: 17th Mar.; Full: 25th Mar.; Last Qtr: 2nd Apr., New: 8th Apr.

THIS MONTH'S DEEP SKY OBJECTS

M81 and M82

by Paul Warren

It's getting on to that time of year when the galaxies appear in their thousands. I always find that the spring observing season is disproportionately short, because the lengthening days squeeze the time for observing. So, make the most of those (increasingly) rare clear dark nights.



Now how to find M81 and M82? Some people like to extend a line running from γ (gamma) Ursa Maj to α (alpha) Ursa Maj and run it for the same distance again. M81 should be visible in a good finderscope (I've even seen it once naked eye, but that was from a very dark sky site and at an elevation of 5000 feet). I've never found this particularly easy, and my way to locate these two galaxies is to locate the star to the right of the midpoint between alpha and beta Ursa Maj in my finderscope. Move up North in declination by about 5 degrees and I hit a triangle, which is lying horizontal. Nudge the finderscope up a little, then lock it in declination and move across right to the end point of the triangle, and move that same distance again. With a low powered eyepiece in the scope, at least one of the two galaxies should be in view.

M81 is a spiral galaxy, and the brighter of the two. I can see a nebulous misty patch surrounding the core of the galaxy, which are its arms, but I haven't yet been able to make out the actual spiral structure in them.

M82 is an irregular galaxy. It is irregular because it had a close encounter with the larger M81 some 60 million years ago and suffered gravitational disruption. M82 has a definite cigar shape to it, and is fairly uniformly illuminated for the entire width of the galaxy. This is because we are seeing a major starburst in progress (a lot of new stars being formed all at the same time).

Most people (and I'm no exception) just like looking at these two galaxies side by side. The two galaxies belong to the M81 group of galaxies, and are around 12 million light years away from us. They are about 150,000 light years apart from one another.

I find that M82 yields more detail through the scope than M81, and I attribute this to the fact that it is uniformly illuminated across its entire width. It doesn't take much effort to make out dust lanes and tracts running down through it. Also, on those once-in-a-year fine nights, it can take astonishing magnification well. Several years ago I was observing it with an 8-inch scope at magnification 280. No one has any right to use that sort of magnification on a galaxy, but I got away with it simply because the seeing was so exceptionally good that night, and the view was simply stunning.

I showed these two galaxies to my son Patrick a couple of years ago when he was 5 or 6. His observation was that whilst M81 is the brighter of the pair, M82 was easier to see. I don't think that I could have put it better myself!



THE SOUTHERN SKIES

by Deborah Hambly in New Zealand

Thank you to everyone at the society for the farewell and the card. I spent the first week moving my body clock forward and focusing on the school so I only got a short glimpse of the stars. In the second week I moved into my own place by the beach and finally had the chance to see what I had come here for.

On the first two nights I observed with a nearly full Moon and was beginning to wonder what all the fuss was about. However, the next three nights I started observing before moonrise and was completely amazed. It is as good as people said it would be! It is so fabulous to be finding things in the sky and having to hunt for them on my atlas, rather than seeing things in the atlas and forever searching for them in the sky! There are so many star clusters and galaxies that it is taking me a considerable time to work out which is which, and I'm finding new ones every night! It has been cloudy one night in six, and on that night I could see the Milky Way as a band of light in the clouds.

The Large Magellanic Cloud (LMC) and the Small Magellanic Cloud (SMC) are accurately described as clouds because that is how big they are. They won't even fit in binoculars – that's pretty awesome if you think about it. I'm very much looking forward to seeing everything more closely with a telescope. For now, there is more than enough to keep me busy with my binoculars for a long time.

[Ed: For anyone interested in buying Deborah's 8" Schmidt-Cassegrain Meade (with GoTo) see Ian Smith.]



UTTERLY ALIEN

by Dr. Tony Phillips

There's a planet in our solar system so cold that in winter its nitrogen atmosphere freezes and falls to the ground. The empty sky becomes perfectly clear, jet-black even at noon. You can see thousands of stars. Not one twinkles.

The brightest star in the sky is the Sun, so distant and tiny you could eclipse it with the head of a pin. There's a moon, too, so *big* you couldn't blot it out with your entire hand. Together, moonlight and sunshine cast a twilight glow across the icy landscape revealing . . . what? twisted spires, craggy mountains, frozen volcanoes?

No one knows, because no one has ever been to Pluto.

"Pluto is an alien world," says Alan Stern of the Southwest Research Institute in Colorado. "It's the only planet never visited or photographed by NASA space probes."

That's about to change. A robot-ship called New Horizons is scheduled to blast off for Pluto in January 2006. It's a long journey: More than 6 billion kilometres (about 3.7 billion miles). New Horizons won't arrive until 2015.

"I hope we get there before the atmosphere collapses," says Stern, the mission's principal investigator. Winter is coming, and while it's warm enough now for Pluto's air to float, it won't be for long. Imagine seeing a planet's atmosphere collapse. New Horizons might!

"This is a flyby mission," notes Stern. "Slowing the spacecraft down to *orbit* Pluto would burn more fuel than we can carry." New Horizons will glide past the planet furiously snapping pictures. "Our best images will resolve features the size of a house," Stern says.

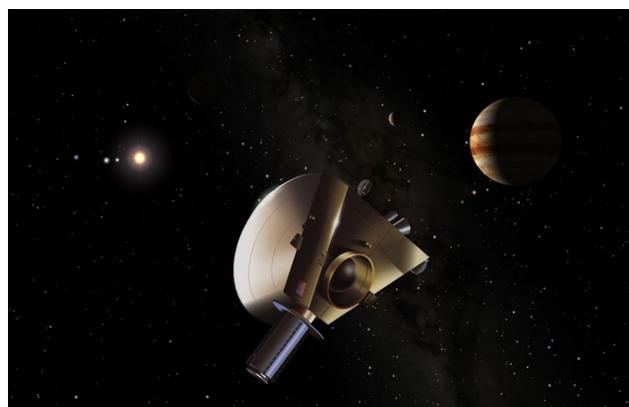
The cameras will also target Pluto's moon, Charon. Charon is more than half the size of Pluto, and the two circle one another only 19,200 kilometres (12,000 miles) apart. (For comparison, the Moon is 382,400 kilometres [239,000 miles] from Earth.) No wonder some astronomers call the pair a "double planet."

Researchers believe that Pluto and Charon were created billions of years ago by some terrific impact, which split a bigger planet into two smaller ones. This idea is supported by the fact that Pluto and Charon spin on their sides like sibling worlds knocked askew.

Yet there are some curious differences: Pluto is bright; Charon is darker. Pluto is covered with frozen nitrogen; Charon by frozen water. Pluto has an atmosphere; Charon might not. "These are things we plan to investigate," says Stern.

Two worlds. So alike, yet so different. So utterly alien. Stay tuned for New Horizons.

Find out more about the New Horizons mission at www.pluto.jhuapl.edu/. Kids can learn amazing facts about Pluto at spaceplace.nasa.gov/en/kids/pluto.



New Horizons spacecraft will get a gravity assist from Jupiter on its long journey to Pluto-Charon. Credit: Southwest Research Institute (Dan Durda) / Johns Hopkins University Applied Physics Laboratory (Ken Moscati).

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

NOTICES

Observing Evenings Organiser

We *still* urgently need a volunteer to take over the organising of the Observing Evenings. The new organiser will take over from this coming September as the present programme has already been arranged. Whoever takes over does not have to keep to the present arrangements of 'the first clear night' etc, or just one observing week a month. He/she can do as they like in this regard, and even organise the events at the actual evening if they want to. We really need a volunteer because without one there will be no observing sessions next season at all as Bob definitely cannot continue in this role. So, if you want to have a chat with Bob about this, even if you are only considering the position, feel free to phone or email, or see him at one of the meetings. You do not need to be an expert for this job at all! Anyone with a phone can do it.

FURTHER DISCUSSION

The society's e-mailing list is used by members to comment on all things astronomical, as well as other related and not-so-related subjects. The list is also used to publicise "first-clear-night" observing evenings and for alerting members to hot observing news.

To view the messages on the web go to:
<http://www.smartgroups.com/groups/abastro> .

To subscribe to the list either go to this web page and click on "Join the Group" or send an email to abastro-subscribe@smartgroups.com . You will then receive all e-mails sent to the list. To post e-mails on the list: send an email to abastro@smartgroups.com . To unsubscribe: send an email to abastro-unsubscribe@smartgroups.com

Don't forget the Society's web site:
www.abingdonastro.org.uk

Our new webmaster, Andrew Ramsey [Ed – that's me!] is always on the look-out for members' photographs to put on there. Don't forget you can read back copies of SpaceWatch on the web site too.

DATES FOR YOUR DIARY

21st Mar: 8pm. Beginners' Meeting in the Perry Room.

4th – 6th April (FCN*): 8pm Observing Evening at Britwell Salome. See Bob tonight for a map. [FCN = 'first clear night' – ring Bob on 01491 201620 to confirm before setting out.]

11th Apr.: 8pm. Speaker Meeting: Dr Andrew Benson (Oxford University), "The Long and the Short of it: What Determines the Size of Galaxies?".

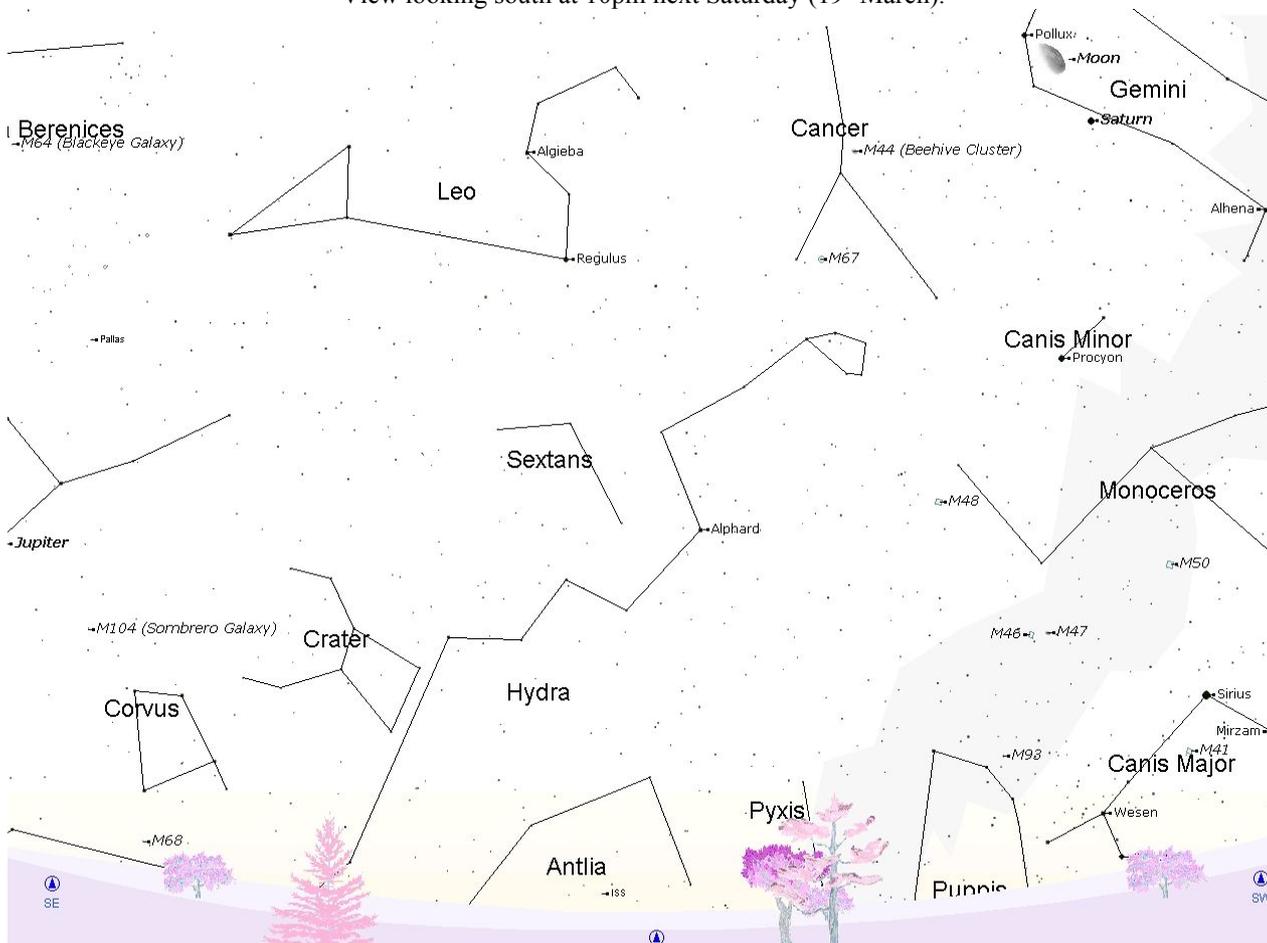
The editor of "SpaceWatch" is Andrew Ramsey, who would very much appreciate your help and contributions. Please send any news, observations, photos, etc. to:

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STAR CHART

View looking south at 10pm next Saturday (19th March).



Jupiter shines in the south-east in Virgo. Saturn is near Castor and Pollux in Gemini. If you have binoculars or a small telescope, search for minor planet Pallas above and to the right of Jupiter.