

# SPACEWATCH

the newsletter of the Abingdon Astronomical Society

**May 2003**

**“Changing Views of Mars” – an SPA  
Presentation**

**followed by the Annual General Meeting**

Before our Annual General Meeting tonight, we have a presentation to mark the 50<sup>th</sup> Anniversary of the Society for Popular Astronomy (formerly known as the Junior Astronomical Society).

## The Night Sky this Month

By Bob Dryden

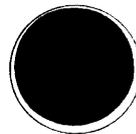
Last session was dominated by one rare event, the transit of Mercury. This time it is dominated by two rare events (OK, one is not as rare as the other, but neither are everyday occurrences). The first is a total eclipse of the Moon on the morning of the 16th May. This is going to be a difficult eclipse to see because the Moon will be low throughout the event. The eclipse actually begins at 01:05 UT (02:05 BST) when the lunar disc first touches the penumbral shadow. However, you will probably not notice any changes until the disc reaches the darker umbral shadow at 02:02 UT. Totality begins at 03:13 UT (04:13 BST) when the Moon will be completely within the umbra. At 04:06 UT the main eclipse starts to end as the Moon begins to leave the dark shadow and by 05:17 UT the eclipse is over. However, from the UK, the Moon sets at 04:14 UT. Oh dear! So, unless you have a perfectly clear south western horizon, you will miss the start of the end of the eclipse. As it is unlikely you will have a clear enough horizon, perhaps you should just try to see mid eclipse at 03:40 UT and be happy with that. As the eclipsed Moon is going to so low, this could be a good chance to get some dramatic photographs that include horizon objects as well as the eclipse. If it is cloudy, or your horizons are not clear enough, you can console yourself with the thought that there is another total lunar eclipse in November which is much more favourable. (However, it is often cloudy in November so maybe you should try and see this one after all.)

The other rare event is an annular eclipse of the Sun on the morning of 31st May. This is so rare that this is the only one you can see from the UK in your lifetime. [Ed. There is another visible from Spain in October 2005 if you miss this one though.] Unfortunately the eclipse will

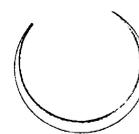
only be annular from north-western Scotland and all points north of there. From Abingdon the eclipse will be partial (and these are not as rare. Clear skies and God-willing, you should see several more of these from here before you pop your clogs). Again, to see this eclipse you will need a clear horizon, only this time it will be the eastern one. From Scotland the Sun will be only a

degree or two above the horizon when the eclipse occurs. Here in Abingdon, greatest eclipse is as the Sun rises at about 03.50 UT (04.50 BST) when 70% of the disc will be covered. The partial eclipse is over by 04.32 UT so you are going to have to be up early to see anything. That morning, you will have the very strange sight of a crescent Sun rising so it will be well worth your effort to try and see it.

The appearance of greatest eclipse at various



*Lerwick*



*Edinburgh*



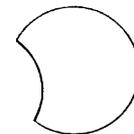
*York*



*London*



*Cardiff*



*Penzance*

UK locations

**REMEMBER: NEVER LOOK AT THE SUN THROUGH A TELESCOPE OR BINOCULARS. DOING SO WILL BLIND YOU! YOU CAN VIEW THE SUN'S DISC BY PROJECTING IT ONTO A PIECE OF WHITE CARD. ALSO, USE APPROPRIATE FILTERS EVEN WHEN VIEWING THE SUN WITH YOUR NAKED EYE.**

Apart from these two events, there is not much out of the ordinary to see in the night sky this session. Keep your eye on Mars though as it is brightening rapidly now. In fact it reaches a negative magnitude for the first time in over 18 months. Its size is increasing as well and it is big enough now to see detail on the disc, but let the planet get fairly high before you give it a go.

## Moon Phases:

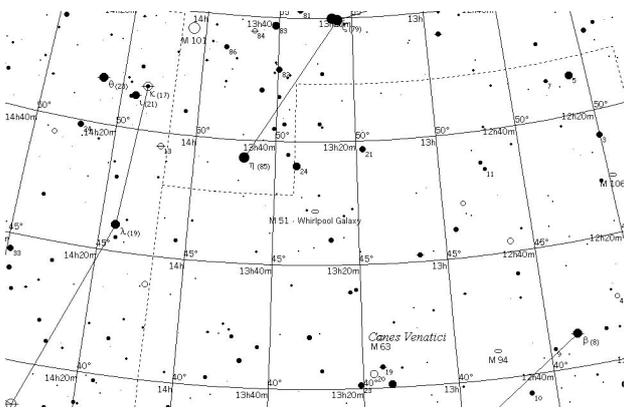
New: 1<sup>st</sup> May.; First Qtr: 9<sup>th</sup> May.; Full: 15<sup>th</sup> Apr.; Last Qtr: 22<sup>nd</sup> Apr.; New (eclipse): 31<sup>st</sup> May; 1<sup>st</sup> Qtr: 7<sup>th</sup> June; Full: 14<sup>th</sup> June.

## This month's Deep Sky Object

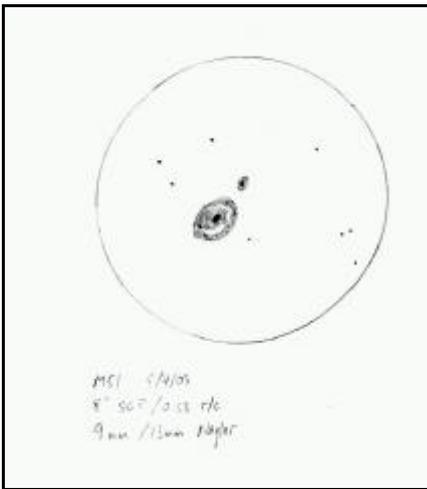
By Paul Warren & Paul M<sup>c</sup>Gale

This month's DSO is M51, more commonly known as the Whirlpool Galaxy, a bright galaxy situated in the constellation of Canes Venatici, very close to the border with Ursa Major.

For some reason or other, it is supposed to be a party piece to be able to find M51 without the use of star charts. What absolute rubbish! If you know any region well enough, you can get to your destination without the use of star charts or maps or whatever.



I happen to think that this is one of the easier Messier objects to find. Start off from the end star in the tail of the Big Dipper. Over to the right of it is a brightish star (as seen through a finderscope) labelled 24 on the diagram. Beneath this you should see a sort of keystone asterism. M51 lies in the upper half of this asterism. I can usually spot M51 using my 9x50 finderscope, and the keystone asterism is very obvious in it.



I have been trying to see the spiral arms in this galaxy for quite a long time. I succeeded only fairly recently, and I think that one of the ingredients for success in this is experience. On the night in question, I had been

observing a lot of very faint galaxies, and I think that my eye was well trained to spot subtle detail by the time I came round to observing M51.

What can you realistically expect to see visually with this galaxy? You should be able to see two blobs, with the southern blob being the larger of the two. I could make this out using a 5 inch SCT scope several years ago. You will need reasonably dark skies, and the darker the better for M51.

When I made this sketch, I couldn't see the spiral arms outright, but I could discern some dust lanes, which I've attempted to show in my sketch. My feel is that a 10 inch scope should show up the spiral arms as a matter of course from my back garden, and a 12 inch scope should blow the socks off me!

I used an 8 inch SCT for this observation, and this is one of those galaxies where I think it pays to use magnification of 140X – 150X rather than 100X. Note that I could see a “supernova” in M51! No, it's just a foreground star from our own Milky Way Galaxy, but seeing this sort of thing makes the observation much more rewarding and interesting.



This image of M51 was taken during the early hours of 13<sup>th</sup> Apr 2002 from Oxford using a SX MX916 CCD and LX200 8” SCT working at about f/7. Exposures through clear, red, green, and blue filters were combined to produce a colour image.

As is obvious from the image, M51 is actually two galaxies interacting with each other. The main galaxy (NGC 5194) is a classic spiral galaxy, of type Sc, whereas its companion (NGC 5195) is actually a barred spiral. Being such a beautiful site, M51 is often imaged and as above these images normally show the gas streamers that connect the two galaxies and the whirlpool structure from which M51 gets its popular name of the Whirlpool Galaxy.

The influence of NGC 5194 is causing active bursts of star-formation in M51. This has probably caused some of the difficulty in establishing the correct distance to M51. It was previously estimated to be 15 million light years, but this has recently been revised to 31Mly. Combined with its apparent size, this gives the diameter of M51 to be about 100,000 light years.

## Double Stars (Part 3)

By Guy Yeates

With summer arrive high pressure weather systems characterized by hazy warm days and murky skies at night. Such nights may not look up to much astronomically speaking but often the air is more stable than at any other time of the year. If the air is unstable then stars appear to merge in a boiling pool of light making clear separation nigh on impossible. But a murky summer night when galaxies are lost in the haze the air can be so stable that even the tightest pairs of stars will appear 'tack' sharp. It's on these nights that you can really push your optics and your observing skills to their respective limits.

Since such ultra stable evenings are relatively uncommon even in summer (& like gold dust in winter) you'll spend more time wanting to look at doubles that are bit wider apart and perhaps more interesting than just a pair of white points of light in the darkness. To make life interesting, stars - when seen close together - may appear more intensely coloured than if they were further apart. There therefore exists a whole cadre of doubles that are not especially close together but are particularly beautiful because of their colour contrasts. In fact there's nothing quite so nice as finding a pair of stars of contrasting colours set against an inky black sky. So below I've listed a sample set of colour rich stars you might want to find. It would be interesting to know what colours you see.

### Binocular targets

**Beta Cygnus: (Albeiro)** 19h31m +27d58m, Golden-yellow and blue. Best seen against a good dark sky background.

**Theta Serpens: (Alaya),** 18h56m +4d13 min,

**Iota Bootes: (Asellus secundus)** 14h16m 51d21m, beautiful field of view.

### Telescopes targets

**Beta Capricorn** 20h21m -14d46m, yellow and pale blue.

**Epsilon Bootes** 14h45m +27d04m, Yellow and blue.

**Xi Bootes** 14h51m +19d06m, Yellow and red.

**24 Coma Berenices:** 12h35m +18d22m, Orange and emerald.

**Zeta Corona Borealis:** 15h39m +36d3m Blue-white and blue.

**95 Hercules:** 18h02m 21d35m, Good double at low power Green and red-yellow.

**Alpha Hercules (Rasalgethi)** 17h15m 14d23m, wonderful pair of golden suns.

**Gamma Delphinus:** 20h47m +16d07m Yellow and green.

**Zeta Lyra** 18h45m +37d36m, Red and blue-green.

**70 Ophiucus** 18h06m +02d30m Yellow and red-orange.

## MUTUAL EVENTS OF JUPITER'S SATELLITES

1 = IO 2 = EUROPA 3 = GANYMEDE 4 = CALLISTO  
o = occults e = eclipses A = annular T = total

	Start UT	End UT	Type	Mag %
14 Apr	19.16	19.19	1o2	58
17 Apr	03.28	03.32	2e1	A43 48 secs
21 Apr	21.27	21.31	1o2	64
28 Apr	23.40	23.44	1o2	71
4 May	21.06	21.10	2e1	A41 69 secs
6 May	01.55	01.59	1o2	82
7 May	02.26	02.51	2o4	A65 287 secs
11 May	23.21	23.24	2e1	38



**In Search of Alien Oceans**  
by Patrick L. Barry and Dr. Tony Phillips

A robotic submarine plunges into the dark ocean of a distant world, beaming back humanity's first views from an alien ocean. The craft's floodlights pierce the silty water, searching for the first, historic sign of extraterrestrial life.

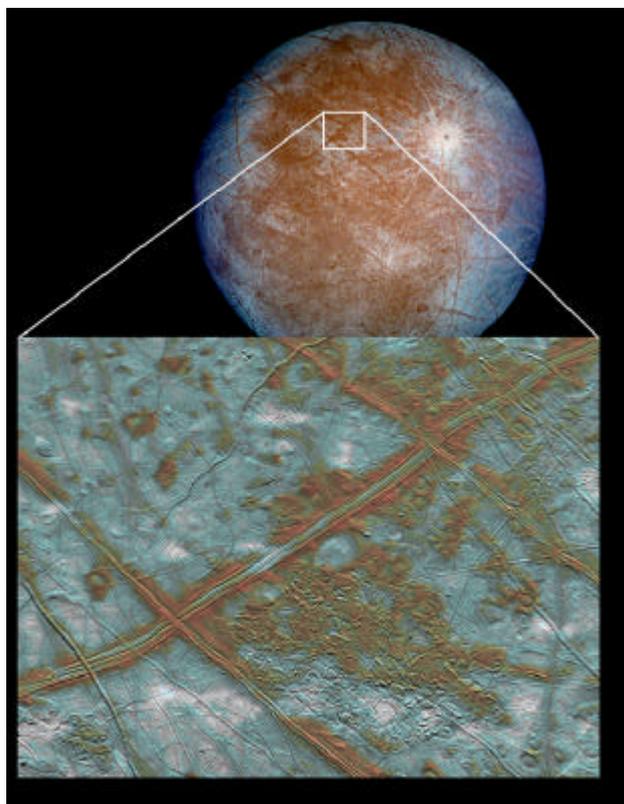
Such a scenario may not be as fantastic as it sounds. Many scientists believe that Jupiter's moon Europa conceals a vast ocean under its icy crust. If so, heat from the moon's interior-which would keep the ocean from freezing solid-may also drive subaquatic volcanoes and hydrothermal vents. On Earth, such deep-sea vents provide chemical energy for ecosystems that thrive without sunlight, and some scientists even suggest that Earthly life first got started around these vents.

So a warm European ocean spotted with thermal vents could be a natural incubator for life. That's why some scientists hope that someday we will send a probe to Europa that could bore through the ice and explore the ocean below like a submarine.

To plan for such a mission, scientists would first need to put a camera in orbit around Europa. By looking for places where water has welled up to fill the spindly cracks that riddle Europa's surface, scientists can estimate where the ice is thinnest-and thus easiest to bore through.

That mission scenario presents a problem, though. Europa orbits Jupiter inside the giant planet's punishing radiation belts. Continuous exposure to such high radiation would damage today's scientific cameras, making the information they gather less reliable and perhaps ruining them completely.

That's why NASA is designing a more radiation-tolerant CCD that could be used on a mapping mission to Europa. A CCD (short for "charge-coupled device") is a digital camera's chip-like core, which converts light into electric signals.



"We've seen the effects of this radiation during the Galileo mission to Jupiter," says JPL's Andy Collins, principal investigator for the Planetary Imager Project. "Galileo has orbited Jupiter for many years, dipping inside the radiation belts only for brief intervals. Even so," he says, "we've seen clear signs of damage to its instruments."

By using the hardier CCD's developed by the Planetary Imager Project, a future probe could remain in Jupiter's radiation belts for many months, gathering the maps scientists will need to finally get a peek behind Europa's icy veil. And who knows, maybe there will be something peeking back!

To learn more about the Galileo mission to the Jupiter system, visit <http://www.jpl.nasa.gov/galileo/> . For children, a fun, interactive "Pixel This!" game at [http://spaceplace.nasa.gov/p\\_imager/pixel\\_this.htm](http://spaceplace.nasa.gov/p_imager/pixel_this.htm) introduces CCDs and how a really tough one will be needed for a future mission to Europa.

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a*

*contract with the National Aeronautics and Space Administration.*

## NOTICES

### NOTICE OF ANNUAL GENERAL MEETING

The Annual General Meeting for 2002/03 will take place on **Monday 12 May 2003** at All Saints' Methodist Church Hall, Dorchester Crescent, Abingdon at approximately **9.30 p.m.**, following the joint Golden Jubilee meeting with the Society for Popular Astronomy, which will start at **8 p.m.** and will feature an SPA presentation on Mars.

Chris Holt, Secretary, Abingdon Astronomical Society

### NOMINATIONS FOR ELECTIONS TO COMMITTEE

Nominations are sought for the posts of Chairman, Secretary, Treasurer, Publicity Officer and between 1 and 6 other committee members.

Under the Constitution of the Society, the "candidates for election shall be proposed and seconded by ordinary members of the Society and the nomination, including the candidate's signature, submitted in writing to the Chairman at least four weeks prior to the Annual General Meeting" (para. 10.3.3). Ordinary members are all those who are not honorary members or affiliated members.

The Constitution goes on to say that, "in the event of there being no candidate for the election of an officer of the Society, or fewer than ten candidates for the election to the Committee, the Chairman may accept nominations given at the meeting" (para. 10.3.4).

Chris Holt, Secretary, Abingdon AS

## 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 subscribe: send an email to [abiastro-subscribe@topica.com](mailto:abiastro-subscribe@topica.com) . You will then receive all e-mails sent to the list. To post e-mails on the list: send an email to [abiastro@topica.com](mailto:abiastro@topica.com) . To unsubscribe: send an email to [abiastro-unsubscribe@topica.com](mailto:abiastro-unsubscribe@topica.com)

## DATES FOR YOUR DIARY

**2<sup>nd</sup> June:** 8pm. Beginners' Meeting in the Perry Room.

**9<sup>th</sup> June:** 8pm. Talk by Paul Warren (Abingdon Astronomical Society). "1+1=1: Stretching the Truth, Relatively?"

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

Mail: A.T.Ramsey, 35 Cope Close, OXFORD, OX2 9AJ.

E-mail: [AbiAstro@ATRamsey.com](mailto:AbiAstro@ATRamsey.com) Phone: 01865 245339