

SCORPIO

Journal of the Astronomical Society of Frankston Inc

Vol 3, No.3

P.O.Box 596, Frankston Victoria 3199

May/June 1994

25 YEARS

25 YEARS

FUTURE EVENT

GENERAL MEETING

Remember there is no general meeting in June instead there will be a set of six lectures to be held each week at The Briars starting 15th June.

Details of the lectures are on page 2.

Lectures are free to members

20th July 1994

The normal General Meeting will be held together with the 6th Lecture in our Astronomy Series.

VIEWING NIGHTS

See at Right

COMMITTEE MEETING

The committee will be held at the Brown's residence on:-

23rd June 1994

28th July 1994

The Astronomical Society of Frankston was founded in 1969 with the aim of fostering the study of astronomy by amateurs and promoting the hobby of amateur astronomy to the general public. The society holds a General Meeting each month for the exchange of ideas and information. Regular observing nights, both private and public are arranged to observe currently available celestial objects. In addition the Society provides the services of its members for educational presentations or observing nights for schools and local community groups.

Up Coming Activities

May 18th - General Meeting

May 20th - School Viewing Night
Mornington: see Tony Hales for details

May 21st - Public Viewing Night
Ballam Park 7pm

June 9th - Members Viewing Night
The Briars 7pm

June 15th Astronomy Lecture No.1
The Briars 8pm

June 16th - Public Viewing Night
Ballam Park 7pm

June 19th - School Viewing Night
The Peninsula School from 5pm

June 22nd - Astronomy Lecture No.2
The Briars 8pm

June 29th - Astronomy Lecture No.3
followed by Members Viewing at The Briars

July 6th - Astronomy Lecture No.4
The Briars 8pm

July 9th - Members Viewing Night
The Briars 7pm

July 13th - Astronomy Lecture No.5
The Briars 8pm

July 16th - Public Viewing Night
Ballam Park 7pm

July 20th - General Meeting &
Astronomy Lecture No.6

The Peninsula School 8pm

FOR SALE

AT GENERAL MEETING

Society Badges \$5

Planospheres \$8

ASF "T" Shirts \$30

Telescope Making Equipment

Mirror Blanks, Grinding & Polishing
Compounds, Spherometers, Eye-
pieces, Secondary Mirrors, Spiders

Meeting Venue:

The Peninsula School

Wooralla Drive, Mt Eliza
(Melways Map 105, F5)

Room F6 at 8.00pm on the third
Wednesday of each Month

Visitors are always welcome

Annual Membership Fees

Full Members \$20

Concession Members \$15

Family Members \$30

Family Pensioners \$25

Membership Fees due 1st January
each year

President

Peter Lowe (03)775 9347 (AH)

Vice President

Peter Skilton (03) 776 5898

Treasurer

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Committee

Ros Skilton (03) 776 5898

Tony Hales (03) 781 3251

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Don't forget if you have any
comments or contributions - please
contact the Editor

WINTER ASTRONOMY LECTURES.

During the winter months we will be holding a set of astronomy lectures at The Briars. The lectures are intended to be non-technical and give a general overview of current astronomical topics. The lectures will be held each Wednesday during June and July. Please note the last lecture on 20 July will be at our normal General Meeting at The Peninsula School. All lectures start at 8pm.

The lecture topics will be:-

1. Our Earth - Its place in space (15th June)
2. The formation and life cycle of stars (22nd June)
3. The Planets: Their formation and structures (29th June)
4. Formation of Life and the Search for Extraterrestrial Life (6th July)
5. Cosmology (13th July)
6. Comets, Meteors and Planetary Impacts (20th July)

Attendance is free for members however a charge of \$25 will be made for non-members. {Included in this charge is a 1994 membership fee and a Society badge}

25 Year Celebrations

This year is the 25th anniversary of the Society formation. The committee has been planning to celebrate this achievement in some way and two events are planned.

Firstly on the 6th August a dinner will be held in the function room of the Baxter Tavern. This is still being organised and details will be available in the future.

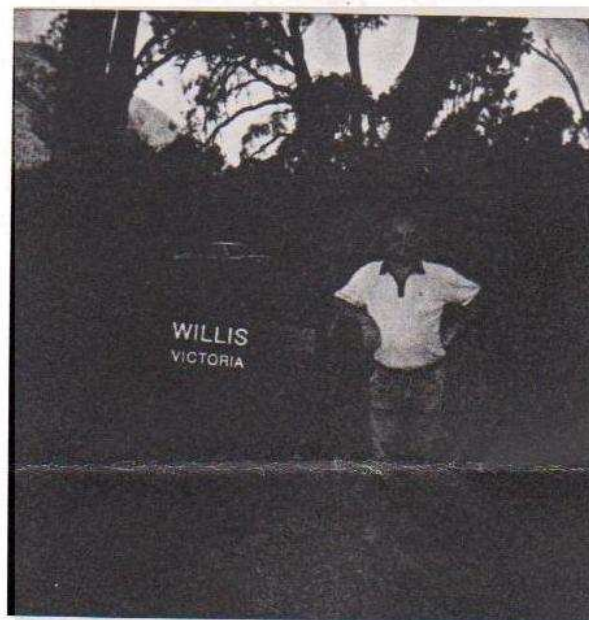
Secondly it is proposed to offer a souvenir ASF T-shirt to members at \$12 each. (If enough can be ordered the price could be lower). It is important that these are ordered and paid for before the shirts can be made. If you would like to order a T-Shirt please see Peter Brown or one of the committee members. (alternatively you could use the order form included with your Scorpio).

CAR TREK - The Voyage Home by Vivienne Lowe.

This is a brief account of our journey home after NACCA which was as memorable as the convention.

After departing University House, Canberra around midday, the long trip back to Langwarrin began. Firstly to find Melbourne Ave. Half an hour later after mainly driving in circles, we were heading down the Monaro Highway. After about an hour we stopped at a roadside cafe at Bredbo for a well earned lunch. Now fully re-freshed, it was Viv's turn to drive with Peter promising accurate navigation. All went well until Cooma when Peter said "I know a short cut" {Need I say more !!}

So from Cooma we drove via Berridale, Jindabyne and suddenly the Ford Fairmont was attempting Barry Way, a 4WD track including dry river bed crossings through the Mt Kosciusko National Park. Only twice did Peter reach frantically for the steering wheel in a state of hysteria after looking at the sheer vertical drop from the passenger side of the vehicle. For the remainder of the Barry Way trip Peter was either in a semi-comatose state or inert with fear despite the wonderful views of the Kosciusko National Park. A brief halt was made at Willis on the NSW/VIC border for a photo session, refreshment and toilet stop. Peter drove from Willis to Buchan, stopping at Morwell for a late meal. From there it was a simple drive back to the house, arriving close to midnight. And what did Peter say when we finally got home? "I'll just go out the back for a bit to take a few variable star readings"



WHAT'S NEWS IN ASTRONOMY

Satellite Meteor Observatories.

Surrounding the Earth are dozens of military satellites designed to constantly watch the Earth for the telltale signs of enemy rocket launches. The US Pentagon recently decided to release the results of several years of monitoring. Since their installation these satellite have been detecting the fiery entry of meteors into our atmosphere. The data shows large mass meteors (1000+ tonnes) are much more frequent than previously estimated. For instance on Feb 1st this year a 1000+ ton meteor entered the atmosphere north of New Guinea at an estimated speed of 72,000 k/hr and travelled south east several thousand kilometres before exploding some 20 km above the sea. The fireball was seen by local fishermen who reported the object took several seconds to cross the sky leaving a smoke trail that persisted for hours. The Pentagon's decision to release this data adds an additional set of sophisticated eye in the study of large mass meteors.

Meteorite Video.

Football fans videotaping a match in the US got more than they planned for in October 1992 when they also recorded the first meteorite to be filmed breaking up from which samples were recovered. The analysis of some 14 video recordings show the object streaking across West Virginia and slowing from some 75,000 km/hr down to a few hundred. The object broke up into many fragments during its 40 second flight. While its original mass is estimated at 20 tonnes only a 12.4 kg sample has been found. The videos show how the meteorite broke up and melted during its fiery flight. The meteors light flickered several times as molten material fell off. Orbital calculations suggest the parent asteroid had a high elliptical orbit which crossed the orbits of Mars and the Earth.

{ed notes: At the recent NACCA some tektites were on display. The exact origin of tektites has been a bit of a

mystery and their possible origins was discussed in Scorpio last year. It seems to me the breakup of largish meteors not so large that they explode as fireballs but large enough to breakup while still retaining a significant fraction of their original speed would be an ideal tektite manufacturing situation. It's worth exploring}

Asteroid Moon Discovered.

It was always considered asteroids have insufficient mass to hold onto asteroid moons. The radar discovery of binary asteroids showed it was possible to bind large asteroids together and provided some hope for the possibility of small asteroid moons. With the further recovery of photographs from the Galileo space-probe, astronomers have found the asteroid Ida has a small moon. The as yet unnamed moon is about 1.5 kilometres across compared with Ida's 56 kilometres. The moon is orbiting about 100 km from the asteroid. Given the speed with which the very first asteroid moon has been discovered scientists now believe such moons may be common.

Solar Wind Damages Satellites.

High energy electrons originating from a Solar corona hole is suspected of damaging two Canadian communications satellites.

The two satellites ANIK E1 & E2 were damaged in geosynchronous orbit on January 20th. Levels of high energy Solar electrons rose over a period of about week to a peak on Jan. 20 when the satellites failed. It is believed the satellites suffered from a charge buildup called "deep-dielectric charging". In effect the satellites suffered damage to internal electric circuits because the rate of charge buildup from Solar electrons was faster than the satellite could bleed the excess charge away into space.

The nearby GOES-7 geosynchronous environmental and meteorological satellite recorded a buildup up of high energy (2 MeV+) electrons from Jan

12. The buildup is thought to be associated with a solar coronal hole. Coronal holes are regions where the Sun's atmospheric density is exceptionally low and high speed solar winds emanate out into space. Most coronal holes have no effect upon the Earth however if the direction and solar magnetic field are right profound effects can be felt in the geomagnetic field. Radio blackout and aurora are a normal consequence.

Desperately Seeking SETI.

NASA's highly publicised SETI program was killed off last year when the US congress cut the funding for the program. It appears the on again/off again program may just be on again. The SETI Institute of Mountain View which ran the program for NASA has started raising private monies to resurrect the effort. They have over \$4.4 million pledged from major industry sponsors in less than three months. This gets them started with equipment and the stage one search from the Parkes Telescope. They need a further \$3 million to complete the original NASA program

Ulysses in Unexplored Territory.

The Ulysses spacecraft has move into the unexplored polar regions of the Sun and become the first probe to reach further south than the most southerly dip of the Sun's magnetic equator. The probe has detected the changing in direction of the solar magnetic field as it moves across the solar magnetic equatorial plane.

One interesting discovery comes from measurements of the solar winds. The solar wind plasma experiment shows wind speed of about 800 k/sec which is about twice the speed of those found at lower latitudes.

Magnetometers on the craft continue to measure the strength and direction of the magnetic field. In the southern hemisphere the magnetic field lines point in toward the southern pole and Ulysses is monitoring the variations in the field as shock waves move up and down the magnetic field.

The probe was launched in Oct 1990 and will pass over the solar south pole in June this year.

ODDSPOT

I final found out why the BAS can't spell Ballarat. If you look at their newsletter they are "The Ballaarat Astronomical Society".

Peter Caldwell from the BAS told me the double "A" is the official spelling used by the Ballaarat Council for heritage purposes and is a registered spelling.

The single "A" version is a colloquial spelling from more recent times. Since the BAS's observatory site is heritage listed they use the double "A" version.

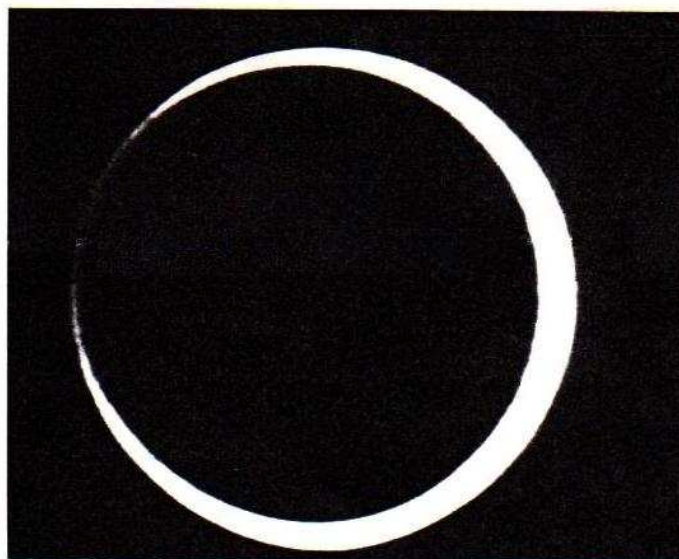
And I thought they just couldn't spell?? Sorry Guys

ANNULAR ECLIPSE

A annular solar eclipse occurred over central Northern America on 11th May.

At the time of the eclipse, the Earth was close to aphelion being 1.02AU from the Sun and the Moon was close to apogee at over 406,000km away from the Earth. The Moon is thus only some 0.49 degrees across.

A photograph of the eclipse (off the TV) is shown at right.



DISCUSSIONS - N.A.C.C.A.

Well, we're back after some 1500km of driving to and from the 16th NACAA. Was it worth it? - you bet ya!

The biannual NACAA's have always been special events for southern amateurs because it is one of the few times that amateurs working in similar fields can get together. The 16th NACAA followed the traditional lines for this event. Held over the Easter weekend, the Friday is reserved for a getting to know you cocktail party. Saturday and Sunday contain the formal NACAA convention and Monday is a social event. For this NACAA the social event was a series of visits to the various astronomical sights around Canberra. In our case Vivienne and I visited the Molongo Synthesis Radio Telescope, a fascinating instrument worthy of a story in a future issue.

The convention itself was held at Mt. Stromlo Observatory just West of Canberra, a lovely site containing the revitalised Old Melbourne Telescope, a 50 inch reflector currently dedicated to the MACHO project plus a 74 inch reflector being used for high resolution spectroscopy. Both instruments are a bit awesome when you stand underneath them. It has been traditional to have a convention theme and the 16th NACAA's theme was "Toward greater co-operation between amateur and professional astronomers". This theme was acted upon throughout the convention with several professional astronomers presenting their views.

The keynote address was by Professor Don Mathewson who highlighted the links already forged between amateurs and professionals. The rapid development of new instrumentation within the budgets of amateur societies and the proliferation of electronic communication means amateurs and professionals alike can access the same databases from the world's astronomical observations.

There is thus a blurring of the distinction between amateurs and professionals in some areas. Professor Mathewson went on the point out that the amateur has a distinct advantage over the professional in that the amateur can set his own timetable and dedicate resources to one project. The professional on the other hand competes for observing time on the larger instruments and by its very nature this is limited. He went on to point out that many of the fundamental discoveries in astronomy have, in general come from projects where the research has been done by teams working exclusively on a project with equipment dedicated to the purpose. While larger, overseas telescopes may be more capable in technical ability, they are hamstrung by the need to share observing time amongst many researchers. Professor Mathewson suggests we would be better off in Australia to concentrate our efforts with a large number of smaller instruments where research teams could run longer dedicated programmes. He described the recent success of the MACHO program at Mt Stromlo. Using a century old telescope {rebuilt for the project} coupled with the latest CCD camera and dedicated to a single observational programme, this research team seems to have answered one of the fundamental questions in cosmology. Where is all this missing matter and what form of matter is it? Other telescopes around the world could have made the same discovery but didn't because you would never have gotten the telescope time. Can you imagine asking for 18 months observing time on the Anglo-Australian Telescope so you can photograph the same area of sky thousands of time to see if anything changes? No way!!

It was Professor Mathewson's view that the distance between amateur and professional was much closer these days for two reasons. Firstly technological change is putting

instruments and computing power into the hands of amateurs that were strictly professional instruments in the past. This means amateurs can take over to some extent from the ongoing work. An example of this is the use of photometric measurements and in recent times the development of automated measurements. Secondly, instrumentation is becoming increasingly complex and expensive and the amateur is becoming a major means of bring astronomical research to the public and thereby supporting the ongoing research. Astronomical Societies are one of the astronomical information outlets to the public. The formal NACAA consisted of several lecture like sessions during which speakers could talk to their papers and field questions.

The presentations were:-

Meteor Studies

Status of Southern Mira stars

Making Star Charts

Development of a telescope auto drive

Cosmologies of an expanding universe
Evidence for the extreme youth of Venus

The Photometric Section of the RASNZ

Astro-Videography

Changes during lunar eclipses

Eclipse of Galilean satellites

A Solar eclipse in the South Atlantic

The International Union of Amateur Astronomers

Missing mass in the universe and its function

Practical variable star astronomy

Recruiting/Supervising amateur variable star observers

Hydrogen line observations of the galaxy and Magellanic Clouds

While all the presentations were interesting, from my viewpoint the more interesting ones were the meteor studies, astro-videography, variable star observations and Peter Norman's presentation on Cosmologies of expanding universes.

Dr. Duncan Steele gave a brief summary of the organisations associated with meteor studies and how amateurs could undertake meteor observations using simple radio equipment.

The astro-videography showed what could be done with relatively simple camera equipment. Modern miniature CCD camera are sufficiently sensitive to make videography a reality.

Peter Norman's presentation on cosmologies of an expanding universe was particularly interesting because for the first time I started to get an understanding of the interdependence of the look-back time and distance between galaxies as time progresses.

And finally there was a great deal of variable star discussion. Stan Walker showed some of the excellent work being done in New Zealand and explained what Australian amateurs were doing to support this. A very impressive contribution.

All in all, the 16th NACAA was a great get-together for a lot of fun and talk about topics of interest and re-firing of interest into new observations.

The Canberra Astronomical Society is to be congratulated on an excellent convention.

The 1994 South Pacific Star Party

During the past week (5-11 May), Viv and I have been camping at The 1994 South Pacific Star Party.

The star party is a camp-out held by the Astronomical Society of NSW at their Ilford dark sky site. The Society bought the 110 hectare property a few years ago and is slowly developing the site which contains a small bungalow and an observing shed where observers can work out of the weather. Individual members have set up small personal observing sites with concrete pads and plinths. An impressive site with plenty of potential.

The Star Party is a week of camping, observing and interacting with other amateurs from around Australia. About 120 campers attended the party with a number of day visitors and on the observing field I counted 56 telescopes. A wide range of telescopes was present and included a few 20" Dobsonians, various 16", 14" and 12" Dobsonians, two Questars, a Russian Maksutov, several Celestrons from 14" down. I didn't bother to set up my C8 preferring instead to move around the field trying out the various telescopes. Great fun.

Each day technical and general entertainment talks were presented at the observing shed. Most of these were only lightly attended because the night seeing was so good people were a bit too tired during the day.

The night we got there the sky was jet-black and seeing was superb. Unfortunately clouds moved in and we canned it an early night. The next two nights were a little brighter and heavily dewed but still provided great viewing. I found the 20" instruments a bit of a disappointment. They were seriously affected by dew and did not have the contrast necessary to really show detail in faint nebulosity. Some of the smaller Dobsonians gave better performance. One memorable instrument was a 14" Dobsonian made by Alan Giles of ASNSW. Alan had gone to particular lengths to enhance the contrast from his telescope. The front of the telescope was triple baffled and the inside of the scope lined with black velvet to reduce internal reflections. The secondary mirror was undersized and supported by a single vane. A good quality main mirror was temperature stabilised quickly using a built in fan. The view through the instrument was

magnificent. I have never seen so much detail in nebulosity. The Tarantula Nebula showed millions of fine filaments and the Carina region was just full of nebulosity. You had to move the telescope about just to see the extent of the nebulosity available. As far as I'm concerned, the minor additional effort required to reduce light scatter effectively adds a few inches extra aperture to the instrument and you are just not getting the best from your instrument until you address the image contrast.

I guess at these types of events there is always one mind blowing attraction and for me the 200mm Newtonian Binocular was it. A matched pair of 200mm Newtonians were mounted as a binocular on a Dobsonian type mount. The inter-ocular distance is adjusted to match your eye spacing by rotating the telescopes to vary the distance between the eyepieces. To bring the images from the two telescope into coincidence the main mirror on one of the telescopes can be electronically adjusted by DC motors. Once aligned the view through the instrument was unbelievable. Apart from the reduced eye strain, you really did see a 3D effect. Globular

clusters actually looked like balls. Another advantage was the enhanced contrast from the instrument. I'm convinced this is an instrument worth building.

The real value in these events is the opportunity to meet and talk to like minded amateurs and this is where the 1994 Star Party was a real success. People were more than happy to talk about their activities (success and failures). It's amazing how much I learnt in a few days of just talking and I heard the same comments from many participants.

While the weather was quite good for the first few nights, poor conditions were anticipated and to help keep the rain away a telescope was burnt to appease the rain gods. Unfortunately the rain gods were not suitably impressed with the quality of telescope offered and turned the rain on anyway. Some people suggested we should have burnt a Questar instead of a look-alike.

The Star Party was a resounding success and the ASNSW is to be congratulated upon the organising and running of the event.

Peter Lowe

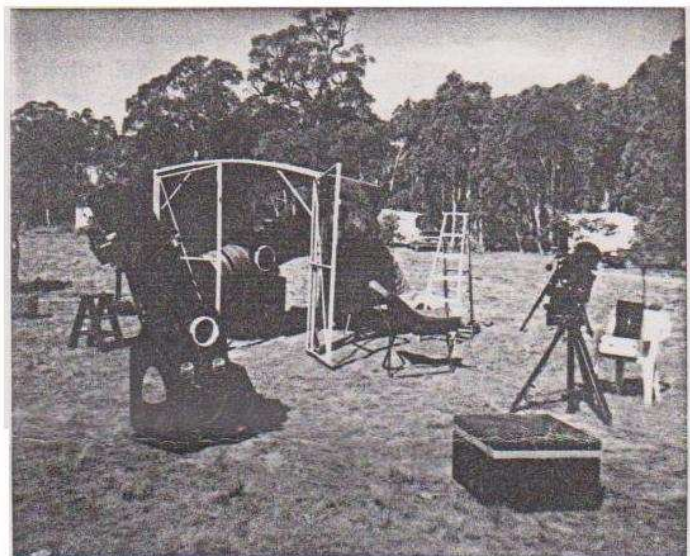
NSW ODDSPOT

On the way back my wife found the driving in NSW a bit daunting.

At one point she stopped on a set of railway lines. When I asked why she had stopped she said the boom gates were dropping.

You guessed it she had stopped between the booms gates.

We quickly drove on.



Jupiter-Comet Collision in July

The time of impact between comet Shoemaker-Levy 9 with the planet Jupiter is rapidly approaching. During the period 16 - 22 July, at least a dozen cometary fragments will slam into the planet's upper atmosphere and provide observers with a unique opportunity to study the inner workings of the gaseous planet.

Comet Shoemaker-Levy 9 {designated S-L9 } is thought to have been captured by the planet Jupiter some time ago, possible even thousands of years ago. In its cosmic orbital dance around the planet it apparent past sufficiently close to the planet that gravitational forces started to break the comet apart. Until it was torn apart in 1992 the comet was too small and dark to be discovered from Earth however after the break up, the comet's surface area started to increase thereby reflecting more sunlight and thus enhancing its detection. The new repaired Hubble telescope has started taking high magnification photographs and suggests the chain of cometary bits is slowly extending. Some smaller fragments seem to have disappeared from view but Hubble still shows at least 21 separate fragments.

The breakup of comets into a fragmentary chain is though to be a common occurrence on planetary time scales. Mysterious chains of craters on the moons Ganymede and Callisto were discovered by the Voyage 1 spacecraft in 1979. Detailed analysis of these photographs show a possible 15 cometary impact events. From this it is possible to estimate the rate of impacting. The data suggests some tens of million impacts during the last few billion years or about one per century. We are thus lucky to be seeing this event in our lifetime.

The exact time or number of impacts is still unknown. The impact times for the larger fragments are only known to within a few hours and give Jupiter

12 hour rotational period, this gives plenty of margin for error. The error will reduce as more observations closer to the event are made. Unknown of course is how many smaller 1km objects are present but not visible. The big question is what will happen when fragments upto 5km across plunge deep into the Jovian atmosphere. It is anticipated each fragment will plough deep into the atmosphere before exploding into a gigantic fireball. The hope is these fire balls will be seen from Earth. The impacts calculations at present suggest the major impacts will not be visible for Earth but will occur about 20 minutes before Earth-rise on the planet. We may see the flashes reflected off the moons Io or Europa but who can tell. There may of course be impacts visible from Earth of some of the smaller trailing fragments. Like many astronomical observations the secret is keep watching and you might see something.

The impact of such large objects has the professional astronomers around the world in a bit of a frenzy. Every instrument you can imagine will be

pointed at Jupiter during this period. The approaching spacecraft Galileo will be in a position to see the collisions directly but its failed antenna will limit its ability to transmit those pictures back to Earth. The principal observations will centre around the effect of the collision of the planets atmosphere. An impacting object several kilometres across will undoubtedly stir-up the atmosphere. This is a perfect opportunity to gain a direct glimpse into the structure and composition of the Jovian atmosphere. It may be possible to observe the seismic waves generated from the fireball explosion. The opportunity for Jovian seismology is a golden opportunity to probe the planets inner structure.

From an amateurs viewpoint these collisions are no less fascinating. It may be possible to view the fireball flash directly and would be a unique opportunity to observe. By connecting a CCD video to a telescope, it may be possible to record the collisions and effects upon the atmosphere. It is certainly worth planning an observing program

