



The Newsletter

of the



Orwell Astronomical Society (Ipswich)

Registered no. 271313

www.oasi.org.uk

2010 July

No 454

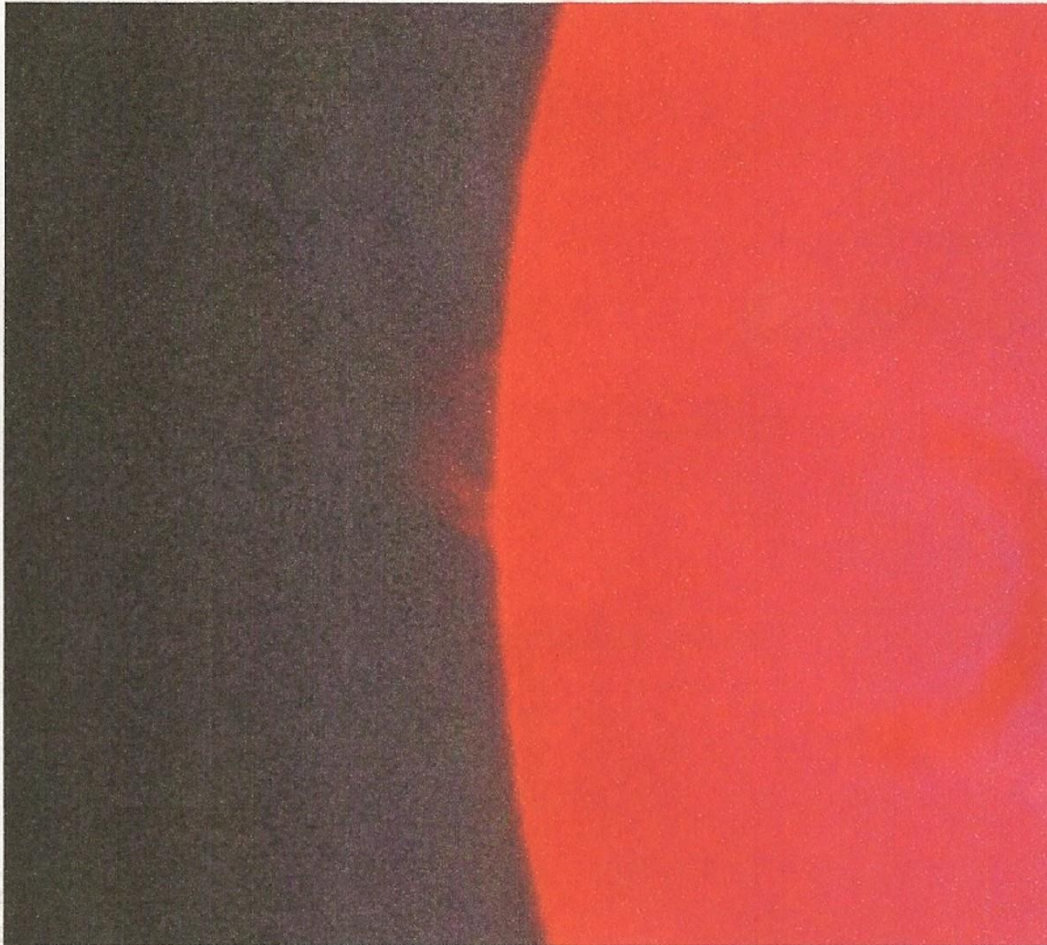


Photo of solar flare taken with OASI's Coronado PST (personal Solar Telescope) on 24th May at 18:07 UT. The brightness and contrast have been boosted significantly to reveal the arch of material ejected and then recaptured by the Sun. Taken using an Olympus c765 with 1/15sec exposure and eyepiece projection.

By Martin Cook.

Society News (Roy Gooding)

1 Committee Meeting Saturday 3rd July

All members are invited to attend the next Committee meeting, on Saturday 3rd July. Start time 20:00. Venue Methodist Church Hall

2 Access into the School Grounds and Observatory Tower

Please use the third gate into the school grounds, this is the gate behind the Gym. If the Black door entrance at the base of the observatory tower is locked, you will have to phone someone in the observatory to let you in. My mobile number is 07719 621162. (Roy Gooding) alternatively the Observatory mobile is 07967 519249 during meeting hours. The gate code is on the back of your membership card

3 Welcome to New Members

Paul Kendall John Abbess Jenny Morecom

4 Events Programme for 2010

This is a provisional event list, which will be updated through out the year

Meeting	Venue	Date
Perseid Meteor watch	The "Dip" Felixstowe	Saturday 14 th August
Autumn Equinox Sky Camp 2010 Organised by Loughton Astronomical Society with the support of the SPA	Kelling Heath, Norfolk	Monday 6 September until Friday 17 September
Summer Barbecue	Newbourne Village Hall	Saturday 11 th September 14:30
RAS Library visit	Burlington House Piccadilly Organiser: Tina Hammond	Saturday 2 nd October
FAS Convention	Institute of Astronomy, Cambridge	Saturday 9 th October
Open Weekend		16 th / 17 th October 19:30 to 22:00
Lecture by Tom Boles: Discovering Supernovae - Motivation & Rewards	Methodist Church Halls, in Blackhorse Lane	Friday 22 October 20:00
Geminid Meteor watch	The "Dip" Felixstowe	Saturday 11 th December
Christmas Meal	Arlingtons Museum street	Wednesday 15 th December 20:00

5 Open Weekend

This event has now been confirmed with the School and will be held on Saturday 16th and Sunday 17th October

Doors open for the public at 19:30 2

As usual as much help as possible is required to make this a successful Open Weekend.

If you are only available to help for a short time your presence will still be appreciated.

Christmas Meal!

Wednesday 15th December 20:00

Roll-up, roll-up its only some 34 weeks or so until 15th December. At the last committee meeting it was decided to go to Arlingtons in Museum Street this year. Recently, Eric Sims happened to be passing the restaurant, and made a casual inquiry about Christmas meals. Surprisingly they were now accepting bookings!

Starters:

Chestnut, parsnip & apple soup

Chicken, ham terrine

Prawn Cocktail

Beetroot, walnut salad with goats cheese toast

Smoked salmon, new potatoes with dill creme fraiche

Roquefort & red onion with hazelnut dressing

Main course:

Turkey with all the trimmings

Cod, with pea puree, smoked bacon & shallot sauce

Beef with Madeira fondant potatoes and mixed vegetables

Vegetable stew with fresh mango & coconut relish

Honey-roast pork, with mustard potatoes, apple compote & mixed vegetables

Roast lamb, onion mash, & mixed vegetables

Dessert:

Christmas pudding with brandy sauce

Ice coffee & honeycomb parfait

French Christmas roll

Chocolate Marquise pot

Winter berries Pavlova & toffee sauce

Cheeses & biscuits

Tea or Coffee with minced pie

Cost: £25 per head

Deposit: non returnable £10 by September

I will be instigating the usual booking method soon: Roy Gooding

Night Sky (July)

All times GMT

Moon

3rd Quarter	New Moon	1st Quarter	Full Moon
4 th	11 th	18 th	26 th

Object	Date	T		Mag	Notes
		Rise	Set		
Sun	1	03:39	20:19		
	31	04:15	19:48		
Mercury	1	03:47	20:44		Mercury is too close to the sun this month to be observable
	31	06:51	20:37		
Venus	1	07:14	22:22	-4.1	Venus is still a prominence evening sky object but as the month progresses it starts to enter the twilight sky
	31	08:35	21:12		
Mars	1	09:35	22:58	1.4	Mars is visible in the western sky
	31	09:20	21:26		
Jupiter	1	23:25	11:32	-2.6	Jupiter is well placed to observe in the morning sky
	31	21:29	09:38		
Saturn	1	10:59	23:32	1.1	Saturn is still observable for a short time in semi darkness before midnight
	31	09:14	21:37		
Uranus	1	23:18	11:22	5.8	Uranus is in Pisces
	31	21:20	09:23		
Neptune	1	22:21	08:19	7.8	Neptune is in Aquarius
	31	20:22	06:18		

Shower	Limits	Maximum	ZHR
α Cygnids	July to August	July 21 st & August 21 st	5
Capricornids	July to August	July 8 th July 15 th July 26 th	5
δ Aquarids	July 15 th to August 20 th	July 29 th & August 6 th	20 10

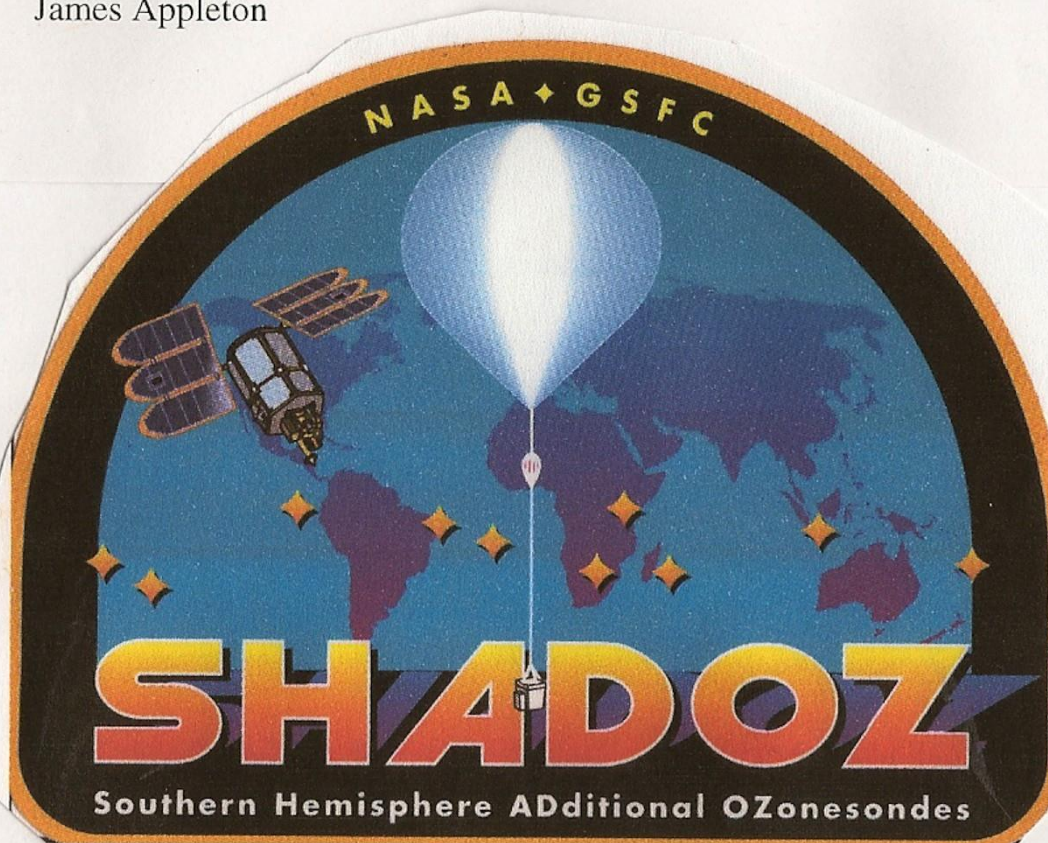
Meteor source is the BAA Handbook

OCCULTATIONS DURING JULY

Only one lunar occultation occurs during the month under favourable circumstances. The table provides details. The data relates to Orwell Park Observatory, but will be similar at nearby locations.

Date	Time (UT)	D R	Lunar Phase	Sun Alt (d)	Star Alt (d)	Mag	Star
25 Jul	00:28:55	D	0.99+	-18	14	5.6	50 Sgr

James Appleton



SHADOZ.

Southern Hemisphere Additional OZonesondes is a project to collect weekly data from ozone sensors on balloons for a two-year period. The goal is validation of tropical ozone detected by Earth probe TOMS (at left) and other satellites.

NASA/Goddard, working with NASA/WFF, NOAA/CMDL and international sponsors at ten sites (stars) will archive the data for public distribution.

The sites are at Ascension Island; American Samoa; San Cristobal, Galapagos; Fiji; Java, Indonesia; Nairobi, Kenya; Irene, South Africa; Natal, Brazil; Reunion Island and Tahiti.

by Tina Hammond

5

Julian Days (part 2 of 2)

Julian Days, discussed in part 1, offer a convenient alternative to the date when periods of time span anything from a few weeks to centuries. The unit of time is the day, and the start point, or 'epoch', is 1200 Universal Time (formerly GMT) on 1st January 4713 BC, when the JD is 0.0. So, JD 0.75 is 0600 UT on 2nd Jan that year, and JD 4.25 is 1800 UT on the 5th, and so on. Dates can be replaced by an integer, the Julian Day Number, where the JDN is 0 for 1st Jan 4713 BC.

Given any particular date, how would you work out the Julian Day Number for it? There are many calculators available on the internet, of course, like the one at <http://www.nr.com/julian.html>, but suppose you wanted to program it for yourself. If you are not careful you will end up with a dog's dinner. Here are some ways to think about it.

Complication 1. There is no year 0. So 1 BC (or BCE, 'Before Common/Christian/Current Era') was followed by AD (or CE) 1.

It is obviously easier to handle the years BC and AD in such a way that the year number can be treated arithmetically across the join. The convention in astronomy is to leave the years from AD 1 onwards numbered as they are, to call 1 BC the year zero, to call 2 BC the year -1, etc. So Julius Caesar's invasion of Britain, 55 BC, was in the year -54. This is so simple that users of a Julian Day calculator could be asked to enter years BC directly as a negative integer.

Complication 2. Leap years. Julius Caesar set the 'Julian months' exactly as they are now, and introduced the 'Julian year'. This has 365 days, except for a leap day at the end of February every 4 years. The first of these leap years was 45 BC, but they did not stabilise until AD 4. For years AD, we have the familiar rule that it is a (Julian) leap year if you can divide it exactly by 4. But how should dates before 45 BC (or AD 4) be handled?

The answer can be found in part 1 and is the 'proleptic' Julian Calendar, as used by Joseph Scaliger. This simply extends the Julian Calendar backwards in time from AD 4.

Complication 3. Leap years again. Having an extra day in February from time to time is very awkward.

A good approach is to adjust the year so that it starts as day one on 1st March, and not as day zero on 1st January. Then identify January and February as months 13 and 14 of the preceding year. Any leap day will come at the end of an adjusted year, and will be picked up automatically from the 29 entered as the day of the month.

Complication 4. Leap years again. The leap day only appears every four years.

Think in cycles four adjusted years, where the last year in the cycle is the leap year.

Complication 5. The epoch, where the numbering starts, is out of step with this cycle.

Shift the start point so it is earlier than the epoch, but convenient for you. Then apply a correction for the days which have been added. Day one for the Julian Day Number is 2nd Jan in the adjusted year -4713. Shift the count so that day one is the day after the nearest preceding leap day. Day one then becomes 1st March in adjusted (and actual) year -4716. The correction up to and including 1st January in adjusted year -4713 requires a subtraction of 1402 days.

It is not difficult now to count up the days in all the adjusted years prior to the one where the date falls.

Complication 6. How about the days in the adjusted year where the date falls? The lengths of the months are not the same.

Working with the adjusted year, you need to count the number of days in the full months previous to the date in question. For dates in March, month 3, this will be 0; for dates in April, month 4, it will be 31, etc. What is required is an algorithm based on the month identifier, M, so that 3 translates to 0, 4 translates to 31, etc.

One that works is $(M + 1) * 30.6 - 122$. To check it:

Month	Identifier (M)	Days in earlier full months (adjusted year)	$(M + 1) * 30.6 - 122$
March	3	0	0
April	4	31	31.0
May	5	61	61.6
June	6	92	92.2
July	7	122	122.8
August	8	153	153.4
September	9	184	184.0
October	10	214	214.6
November	11	245	245.2
December	12	275	275.8
January	13	306	306.4
February	14	337	337.2

So, to get the number of days required, do the sum $(M + 1) * 30.6 - 122$, and round down the answer. To avoid possible problems arising for April and September, when the machine representation of 30.6 could make the result undershoot, use a number like 30.6001 instead.

Finally, you add a number equal to the day of the month.

Complication 7. The Gregorian Calendar.

Ensure at the outset that the missing days in the Gregorian calendar are not accepted. Then, only dates on or after 15th October 1582 require any correction. 'Adjusted years' are useful again. From the date of the reform up to the end of adjusted year 1699 (the last day of which is actually 29th February 1700), the correction is to subtract 10 days. The correction required jumps to 11 days on 1st March of adjusted (and actual) year 1700. There are jumps to 12 and 13 at the beginnings of the adjusted years 1800 and 1900. Because 2000 can be divided exactly by 400, there is no jump at the beginning of the adjusted year 2000, but the correction jumps to 14 at the beginning of adjusted year 2100, and so on. The pattern is one less day every century, with an exception every fourth century.

This is easy to program if you use integer arithmetic. First, work out (adjusted year/100), to get an integer for the 'adjusted century', C. The correction required is then $2 - C + (C/4)$.

Bonus 1. Once you know the Julian Day Number it is dead easy to work out the day of the week. Divide the JDN by seven, and look at the remainder. This will be 0 through to 6 for the successive weekdays. It turns out a remainder of 0 corresponds to a Monday.

These are the techniques I used in a program you can find on the PC at the Observatory. It uses the ancient Command Line Interface. Bring up the Command Prompt window, navigate directories, and enter a command as below:

```
C:\javaProgs\julianDays> java julianDays
```

Joe Startin © 2010

A Truly Historic Weekend!

Friday April 23rd and Saturday 24th were two historic days for OASI. On Friday, two events took place at the school. During the afternoon a joint OASI & Orwell Park School (OPS) meeting took place and during the evening, the 2010 Presidential Lecture. Present at the afternoon meeting were: Dr Allan Chapman, MA, D.Phil, FRAS, and Orwell Astronomical Society President; Peter Hingley, Librarian, Royal Astronomical Society, who had introduced OPS to a colleague, Peregrine Bryant, Conservation Architect who was also present. Peregrine had previously surveyed the observatory on 26th March. Others who attended the meeting were: Rowland Constantine, Headmaster OPS; Simon Dodsworth, Business Manager OPS; David Payne, OASI Trustee, and Neil Morley, OASI Chairman. The purpose of the meeting was to review the findings in Peregrine's survey report. Also, agree on the activities needed to help establish the exceptional nature of the observatory with future funding applications in mind.

Allan summarised the position of Orwell Park Observatory as "a uniquely preserved 19th Century architectural structure, equipped with instrument in fully working order, totally unique", with the building on a par with the Radcliffe observatory in Oxford. There are only a handful of remaining Victorian observatories with their original instruments, and in full working order. This puts Orwell Park Observatory in a fairly unique position.

Peregrine confirmed the observatory fabric remains structurally sound. The point of no return had yet to be reached but time was running out. It was definitely the right time to be putting measures in place to arrest the decline. Areas requiring urgent attention include the failed guttering and stonework outside the dome and Belvedere windows.

A rough estimate for observatory building repairs was £500k, a significant element involving the erection of scaffolding. This is not helped by the challenging access to the observatory. Unlike others, it is not a separate ground-located structure. Peregrine had also approached Trevor Broom of Press & Starkey Quantity Surveyors who agreed this was the sort of figure involved based on his findings. Simon also reported a quotation for repairs to the balcony windows of £10k.

In his report and during the meeting, Peregrine recommended applying to English Heritage for re-listing the observatory to Grade 2* (Grade 2 Star) status to open up additional funding opportunities through English Heritage. With this in mind, he had already contacted Alex Baldwin, Victorian Society, to enquire whether the observatory could be upgraded to Grade 2* without impacting upon the rest of the school which would remain Grade 2. Alex in turn had contacted David Garrard, Heritage Protection Department within English Heritage. In principle re-listing is possible, but relevant policies need checking to ensure that the full implications are fully understood by all concerned. Victorian Society volunteers are happy to assist OPS with the application.

Allan and Peter kindly agreed to jointly draft a letter highlighting the uniqueness and exceptional nature of Orwell Park Observatory in order to support a potential application for re-listing the observatory to Grade 2* status. This will only be submitted to English Heritage once the implications are fully understood. Funding critically depends on generating the right evidence, and it was agreed to concentrate on the following strategies:

1. The uniqueness of the observatory and conservation by the society

Peter agreed to develop the list of observatories included towards the end of Peregrine's report into a geographic survey of historical astronomical observatories across the UK. The uniqueness of Orwell Park Observatory is not in question and this would add weight to the case to preserve it. Roy Gooding has produced a report of OASI maintenance activities over the past 30 years. OASI's commitment towards maintaining the observatory in working condition over a period of many years should not be overlooked.

2. Researching significant scientific observations connected with Orwell Park Observatory and its observers

A portfolio of significant scientific observations conducted at Orwell Park Observatory would add significant weight to any funding applications. James Appleton's recent publication on the life and times of George Tomline's professional astronomer, John Isaac Plummer, entitled "Stars and Storms" is a suitable starting point for this activity.

Opposition Loop of Mars, 2010

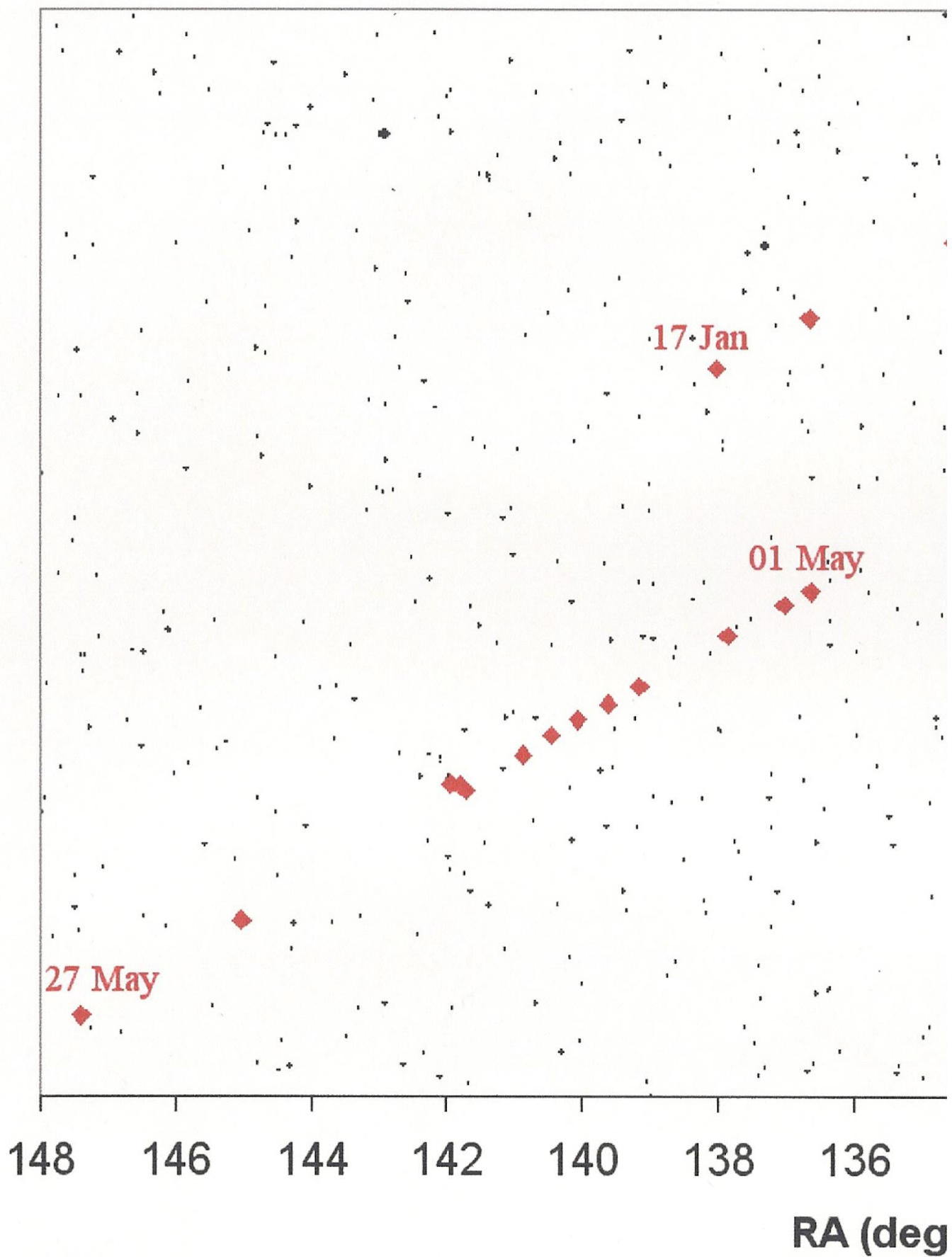
Here's an easy astronomy project that requires only a simple, inexpensive digital camera and a star atlas, yet produces very pleasing results!

It's well known that the term *planet* comes from the Greek *πλανήτης* meaning *wanderer*. A superior planet generally moves through the heavens prograde (in the direction of increasing RA). However, around the time of opposition, as the Earth in its orbit catches up with and overtakes the planet, the latter appears to become momentarily stationary, then move retrograde (in the direction of decreasing RA) for a period before again becoming momentarily stationary and then resuming prograde motion. As the orbits of the Earth and the superior planet are not coplanar, this results in the planet appearing to describe a loop in the sky. Mars, being the closest of the superior planets to the Earth, displays the most pronounced opposition loop.

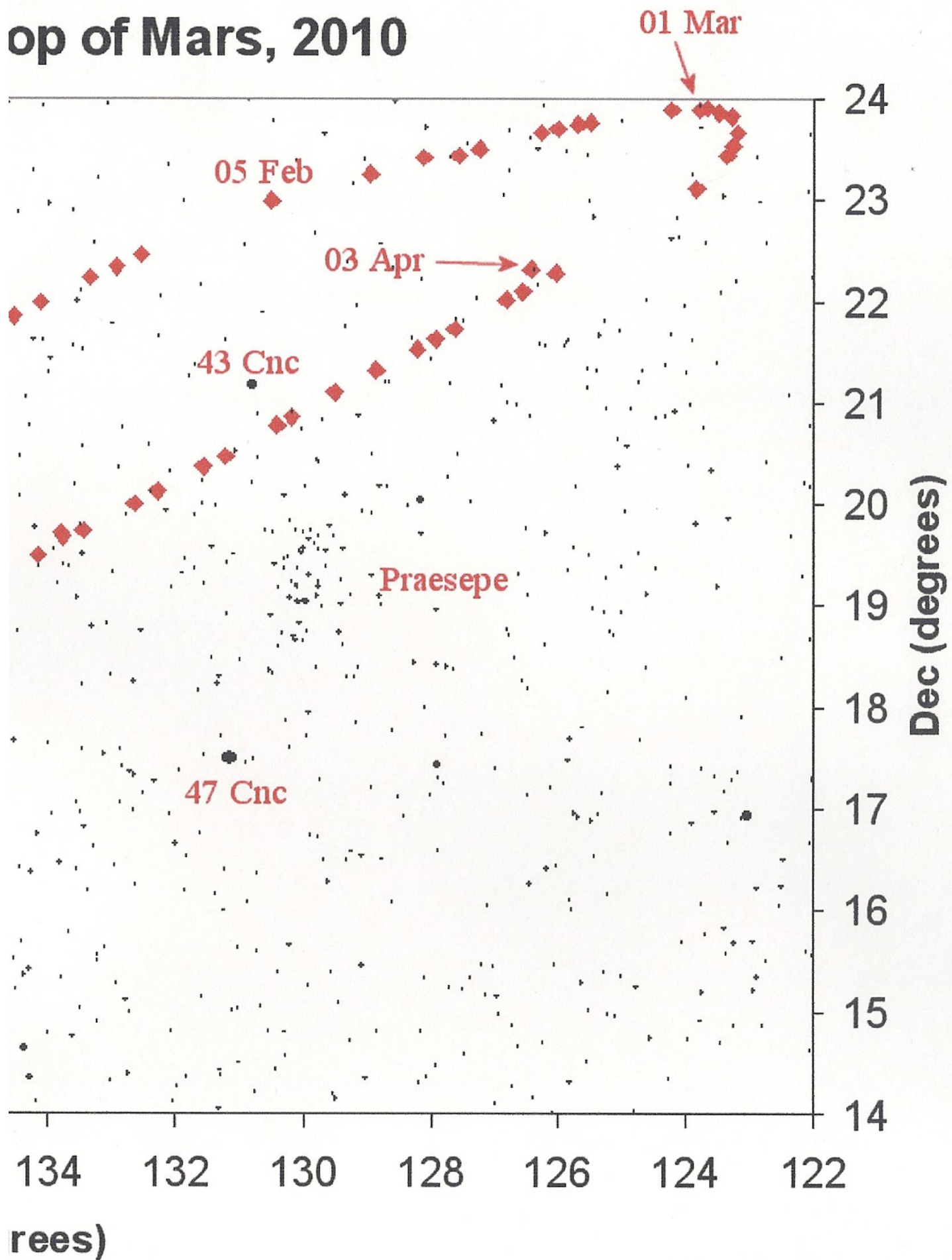
Mars began the opposition loop of its present apparition on 22 December 2009 and resumed prograde motion on 11 March 2010. In January 2010, once the planet became conveniently placed for evening observation, I began a project to photograph the remaining portion of its opposition loop. I used an inexpensive digital camera to photograph Mars against the background sky on every clear evening, starting on 17 January, and then analysed the images to estimate the coordinates of Mars and plot the motion of the planet against the background stars. After a little experimentation, I adopted the following regime.

Initially, Mars was bright enough to be seen in the camera viewfinder and I was therefore easily able to aim the camera at the planet. On each evening, I took four or five images with exposures in the range 2s – 16s, with the camera set to maximum aperture and x5 optical zoom. The camera was mounted on a tripod, and the longer exposures resulted in appreciable trailing of the stars and planet. Generally, depending on the amount of haze in the sky, an exposure of 4s – 8s, proved optimal: exposures of this length generally recorded stars to magnitude nine or so (considerably fainter on clear nights), yielded a good density of comparison stars close to the planet, resulted in a sky background of acceptable darkness and limited the length of trailing to an acceptable extent. In the later weeks of the project, once Mars was far from opposition and had grown much dimmer, the planet was not visible in the camera viewfinder, and in order to locate it I had to take several images of circa 4s exposure, starting with a wide angle view and progressively increasing the magnification in two or three stages,

Opposition lo



op of Mars, 2010



after each adjusting the aim of the camera as necessary, before capturing the final images with x5 optical zoom.

I used the Paint Shop Pro graphics package to read the pixel coordinates of Mars and two nearby stars from each image. I used ESA's Hipparcos and Tycho electronic star catalogues to provide the coordinates of the stars, and it was then a matter of developing spreadsheet formulae to calculate the coordinates of Mars from those of the stars. (Performing the analysis on a computer enabled me to partially automate the calculations; a paper-based approach would in principle be feasible, but would involve a daunting amount of arithmetic!)

The chart above shows the results. Each red diamond represents one estimate of the position of Mars. The background stars are plotted from the Hipparcos and Tycho star catalogues. At the time of the first positional estimate, 17 January, Mars was in Cancer, already approximately one month into its opposition loop. Thereafter, Mars continued its retrograde motion, making its closest approach to the Earth at a distance of 99,330,000 km on 27 January and coming to opposition on 29 January. (At opposition, the planet shone prominently at magnitude -1.3, by far the brightest object in its region of the sky.) On 07 February, Mars passed 4° N of M44 (Praesepe). In early March, Mars' apparent motion slowed, and on 11 March it became momentarily stationary and then resumed prograde motion. Its speed then increased; on 15 April it passed just 2° N of M44 and on 12 May it passed from Cancer back into Leo, thereafter continuing its prograde motion.

There are a few aberrant estimates in the chart that deviate from the otherwise smooth motion of the planet. The worst offender is the estimate on 03 April. On that evening, the sky was very hazy and only the brighter stars were visible. This forced me to use stars distant from the planet to estimate the position of the latter, and I believe that distortion in the edge field of the camera introduced inaccuracies in the positional estimate.

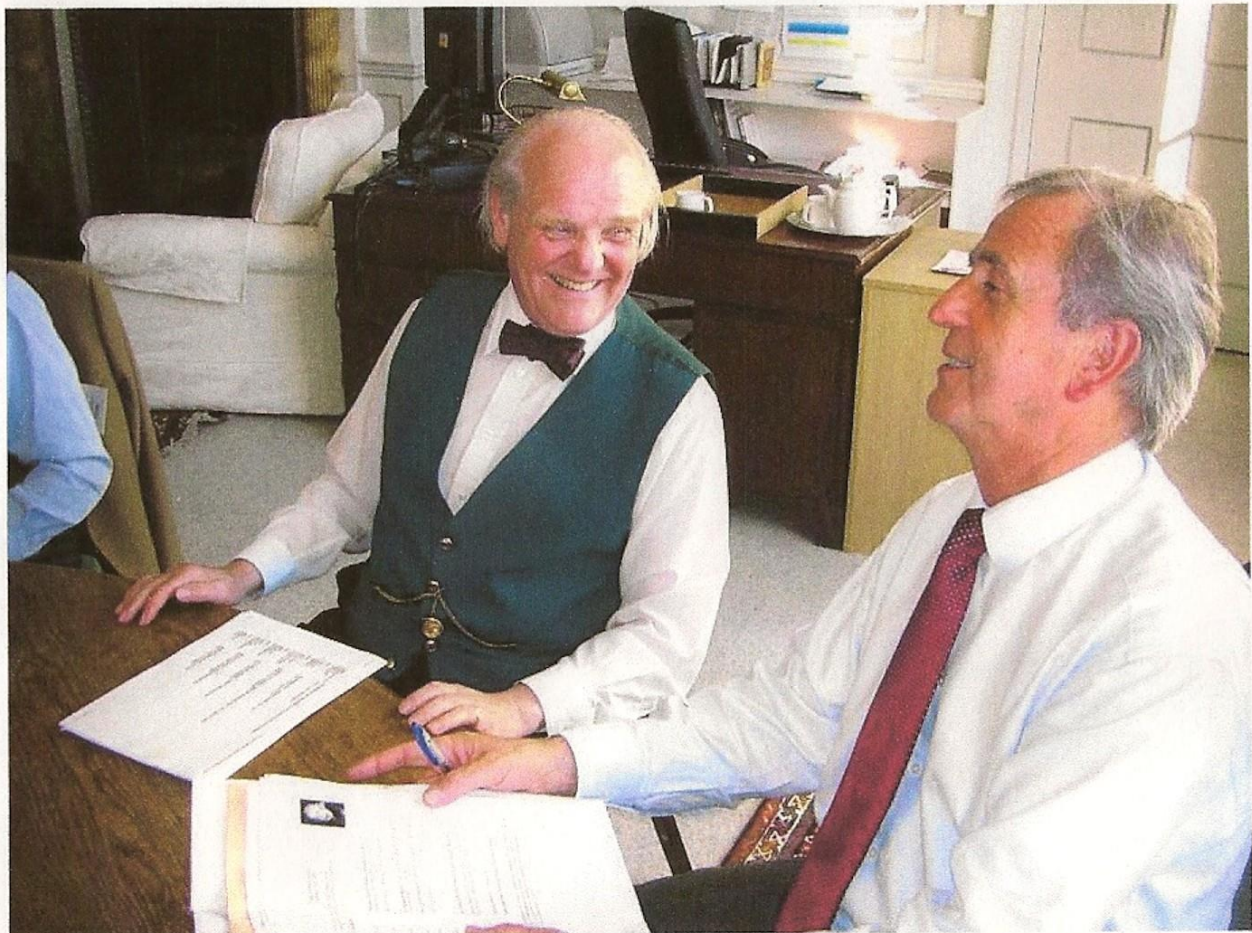
Darkness now occurs so late in the evening that Mars is hidden by a neighbour's house before I can take photographs revealing faint comparison stars close to the planet. I hope to obtain a few more positional estimates, relying on the brighter, more distant stars of Leo to estimate the position of Mars, although as noted above, this may result in inaccurate estimates.

The next opposition of Mars is on 03 March 2012. I hope to repeat the project around that date, but next time to capture the opposition loop in its entirety!

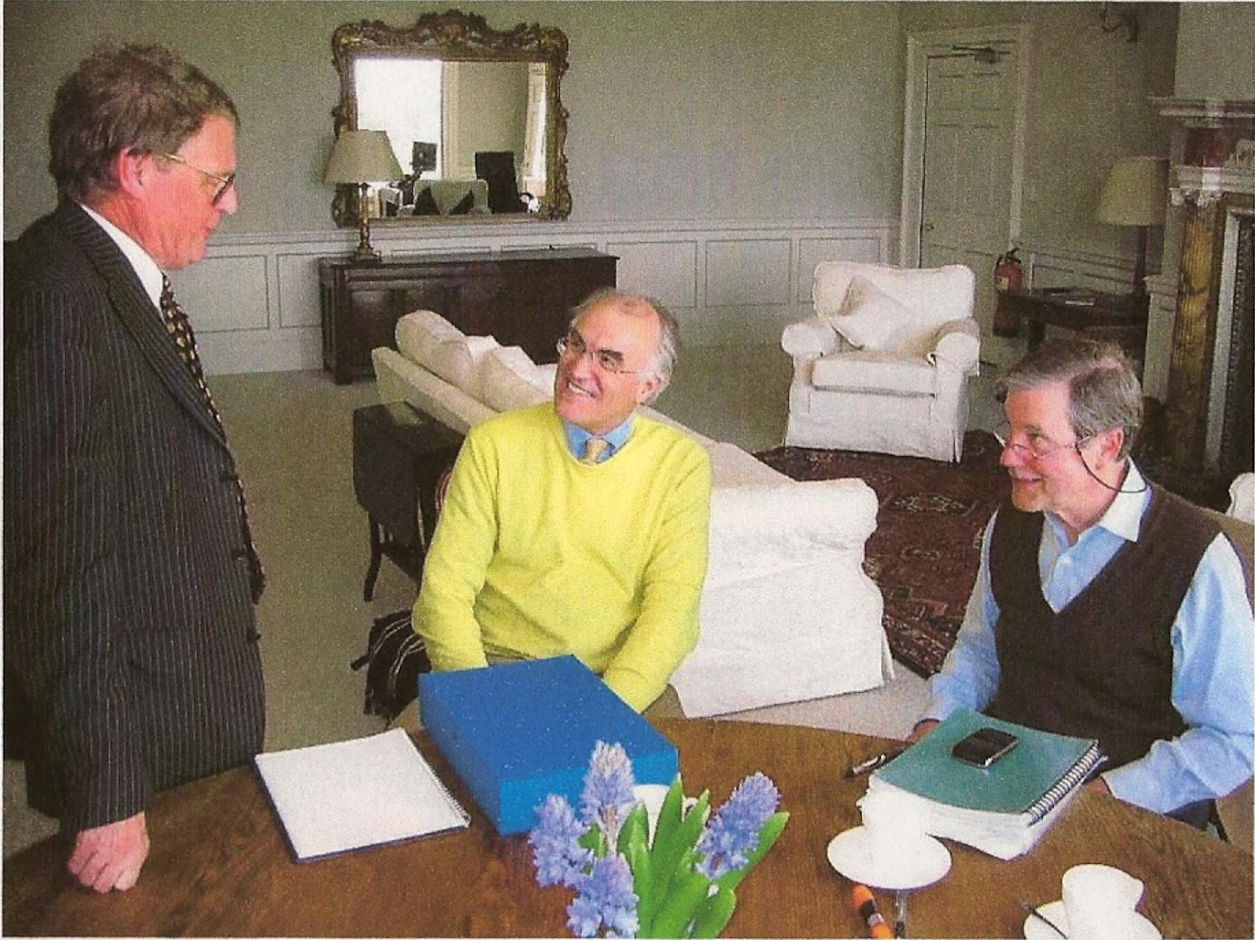
James Appleton
31 May 2010

3. The educational benefit provided by the society to the wider community

A crucial element towards funding application is evidence of educational activities aimed towards the wider community. This helps both OASI and OPS with funding applications. Peter recommended considering extending the present OASI lecture programme with additional public events at the school involving high profile speakers within the scientific/astronomical community. *After the meeting, he buttonholed a few notable people at a Royal Astronomical Society meeting who all were very supportive towards helping the school raise funds. A list has already been forwarded to OPS for further consideration. No doubt some additional meetings will take place with the school to further shape these events. Here are some photos taken just after the meeting.*



L->R Dr Allan Chapman and Rowland Constantine



L->R Peter Hingley, Simon Dodsworth, Peregrine Bryant

Before the evening lecture, Allan joined a contingent of OASI committee members at the Holiday Inn for what became a fairly major fish and chip supper theme for most of us. Anyone who chose an alternative menu option was definitely in the minority! The meal attendance was swelled by a few who attended the afternoon meeting at the school. Allan was so obviously thirsty after the meeting that he insisted on a bottle of cider before the customary tea arrived!

Any concerns I had about the meal delaying the start of the lecture were fully allayed by the attentive staff who ensured we ran to the scheduled time. The meal was fully concluded by 7:30pm allowing sufficient time to return to the school in time for the evening reception and lecture in the Orangery, a wonderful and highly appropriate setting.



Evening meal!

After a short drive from the Holiday Inn back to the school, we were treated to an evening reception with refreshments (tea/coffee) within the Alston room located in the corridor leading up to the Orangery,, OASI members had clearly taken a lot of trouble to erect display boards and telescopes. This suitably augmented the already excellent atmosphere during the reception part of the evening and made the occasion really special. OASI members freely mingled with the staff at OPS and enjoyed each others' company and the refreshments. This clearly demonstrated the society's long and strong association with the school over many years.

Here is a selection of photos I took during the evening reception in the Alston Room just before the start of the lecture. The smiles say it all!





After the reception, we were treated to another of Allan's memorable evening lectures. His 2010 lecture entitled "Thomas Hariot, Galileo, and the First Telescopic Astronomers" provided a suitable end to last year's International Year of Astronomy (IYA) activities commemorating the 400th Anniversary of the first recorded telescopic observations.

Allan presented the political and social climate of the time as a suitably themed backdrop to set the scientific discoveries within their right context. The Tudor period was a time of unparalleled scientific discovery and change which raised fundamental questions about man's place in the universe. The globe had recently been circumnavigated and was no longer flat, long sea voyages to far flung places like the Americas were taking place, new routes and continents were being discovered and mapped, the Moon and Jupiter were observed for the first time through a telescope. Man's understanding of his place in the world and universe was truly opening up.

Before the lecture, I had not appreciated that the little known and mild-mannered English astronomer and mathematician, Thomas Hariot, produced such highly detailed drawings of the moon. They were clearly far superior to Galileo's recorded six months later and demonstrated his obvious cartographic skills. It was such a pity that alleged connections to the Gunpowder Plot led to him being interned in the Tower of London. Until recently, his recorded observations had all but been forgotten and Galileo took the credit. However it wasn't all about being interned in a dark damp cell as we might typically imagine! Allan mentioned with a wink in his eye that one "resident" held at the tower was even afforded the luxury of setting up a chemical laboratory whilst under arrest!

The majority of Galileo's portraits do not always reveal the true character of the man and do him justice. He was clearly an ambitious social climber, eager for publicity, who thought nothing of telling his critics they were "intellectual pygmies"! Some other paintings displayed during the lecture clearly displayed a much darker side to his character.

Following his lecture, Allan unveiled a portrait of Ken Goward, our former Chairman, in the spiral staircase. I was particularly delighted to welcome Lorraine and Peter Goward to be very much the centre of this. It has become something of an OASI tradition for previous Chairmen to suddenly appear on the wall so without further delay, here we go!



Lorraine Goward, clearly delighted with Ken's portrait



Paying respects at Tuddenham Church

The following morning, Allan, Lorraine, Peter, and a small group of OASI members met at Tuddenham Church to lay a wreath at Ken's grave and pay respects. Lorraine invited everyone back to her house afterwards for a pot of tea. Allan's notable abilities in this department were displayed on the cover of the May newsletter!

During the evening of the 24th, OASI members set up some telescopes in the car park at Orwell Country Park and hosted a public event which was extremely well received. It had been a truly historic two days!

I conclude by making special mention of the following people:

Dr Allan Chapman for a memorable evening lecture and obvious enthusiasm for history and astronomy.

Rowland Constantine, Simon Dodsworth, Nicola McEvoy and the events and catering staff at Orwell Park School for their kind hospitality and support during the afternoon and evening of the 23rd April including the afternoon meeting; arranging and setting up the Orangery and Alston Room for the evening lecture, and supplying everyone with refreshments.

Dr Allan Chapman, Peter Hingley, Peregrine Bryant and David Payne for supporting the afternoon meeting on the 23rd April

All OASI members who assisted with setting up a selection of display boards and telescopes in the Alston Room as well as projection equipment in the Orangery, and ensuring the evening ran smoothly.

Lorraine and Peter Goward for their kind hospitality on Saturday 24th April.

Finally I would like to make special mention of Simon Dodsworth who retired from his position as business manager at OPS in early June. On behalf of the society, I would like to thank Simon for his friendship and support toward OASI over many years. I would also like to wish him all the very best for his future, and will aim to keep in touch about progress on the observatory restoration project.

Words by Neil Morley.

OASI Committee Contacts & Responsibilities

Neil Morley	Chairman	☎ 01473 743587	Chair committee meetings. Represent OASI to external bodies.
Roy Gooding	Secretary	☎ 01473 462977 07719 621162	Respond to enquiries. Press & publicity. Observatory decoration. Open days.
Paul Whiting FRAS	Treasurer	☎ 01394 273507	Finance. Visits by outside groups.
James Appleton	Committee	☎ 01473 720263	Minutes of committee meetings. Web site.
Bill Barton FRAS	Committee	☎ 01473 430865	Safety & security.
Martin Cook	Committee	☎ 01473 711511 07743 577214	Membership. Tomline Refractor maintenance.
Tina Hammond	Committee	☎ 01473 692683	Librarian.
Peter Richards	Committee	☎ 01473 659806	Lecture meetings. Email distribution lists.
Eric Sims	Committee	☎ 01473 742654	Newsletter.
John Wainwright	Committee	☎ 01473 272390	Equipment curator.
Mike Whybray	Committee	☎ 01473 659679	Workshops.

Trustees

Mr Roy Adams
Mr David Brown
Mr David Payne

Honorary President

Dr Allan Chapman D.Phil MA FRAS

DIARY for JULY

Monday STONs	SMALL TELESCOPES OBSERVING NIGHTS AT THE OBSERVATORY Will resume in October. Main observing targets: ☎ Paddy O'Sullivan 01473 621462 ☎ Gerry Pilling 01473 625597
Wednesdays From 8.00pm	OBSERVATORY CLUB NIGHTS Observing with the Tomline Refractor and other telescopes if skies are clear. ☎ Martin Cook 01473 711511, mobile 07743 577214 ☎ Roy Gooding 01473 462977, mobile 07719 621162
Wednesday Doors open 7.30pm, workshop starts 7.45pm	OASI WORKSHOP Nacton village Hall. If you are interested in presenting a Workshop, please contact Mike Whybray. ☎ Mike Whybray 01473 659679
Thursday	OBSERVATORY VISITS BY LOCAL COMMUNITY GROUP Will resume in September. ☎ Paul Whiting FRAS 01394 273507
Saturday 3rd July @ 8.00pm	COMMITTEE MEETING Methodist Church Hall, Blackhorse Lane, Ipswich

Society Contact Details

Observatory tel. no. (meeting nights only): 07967 519249

Secretary: Roy Gooding 01473 609309 (day) 01473 462977 (evening)

E-mail queries: ipswich@ast.cam.ac.uk

Chairman: Neil Morley 01473 743587