

# The Astronomical Society of Edinburgh

Journal 42 - October 2000



**M31 imaged at Earliburn by Neil Grubb and Jim Douglas in August  
with a rogue satellite crossing the field**

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## From the President

Whilst many will mourn the passing of summer, now that the nights are drawing in again, we in our Society can look forward to an interesting and constructive winter season.

Thanks to the hard work of several of the Society members our dark site at Earliburn is finally ready for use. We now have a garage for shelter and storage as well as the use of a small dome which, at present, accommodates Jim Douglas's 12" SCT. Jim is happy to allow members to look through his telescope when he is there to supervise the use of the instrument. The 8" Dobsonian telescope belonging to the Society is to be taken out to Earliburn so that members, who do not have their own telescope, can make use of this very nice instrument. An added bonus of the Dobsonian is that it is very easy to use and requires no special setting up procedures, so please take full advantage of this opportunity.

At the Calton Hill, one of the long-term projects currently being undertaken is the refurbishment of the 13" Cox telescope, which we hope will be installed in the Crawford Dome. As well as having a large aperture, the Cox has a very long focal length, which means that this telescope will be excellent for lunar and planetary observing. A further advantage is that being on the same level as the car park and main entrance, the Crawford Dome will provide easier access for disabled people.

Neil Grubb has set up a CCD/astrophotography group, which has created great interest within the Society. The group meets on the first Monday of each month and is very well attended. The dark site at Earliburn is proving to be very beneficial, with some stunning images being obtained by CCD cameras and conventional film photography. Some of these images are on our web page.

Charlie Gleed has been working on refining the technique for hyper-sensitising photographic film and he will be happy to "hyper" film for members of the society... ideal for use at our dark site. For more information on this process and its applications, see ASE Journal no. 38, Summer 1998, (available in the library.).

The observatory continues to be opened between 8pm and 10pm each Friday night to provide members with access to the telescopes and library as well as showing visitors around. It is always the same 4 or 5 people who regularly volunteer, so if you are free on Friday evenings and willing to help out, please let me know. All offers of assistance will be gratefully received!

Our lecture meetings take place in the City Dome on the first Friday of each month with talks aimed at covering a wide range of topics. If you have a suggestion for a topic or a speaker, then please contact Graham Rule, the Society's Secretary.

I am sure you will agree there are many exciting developments happening within the Society and they will best thrive with the benefit of members' support. I hope that as many members as possible will join in and find the rewards of becoming involved in these activities. The elected Council run the society on behalf of the members, but we do need your ideas and feedback. Please let us know if you have ideas that you would like to see implemented or suggestions that you think would improve the Society.

Wishing you clear skies and happy viewing.

Lorna McCalman

## Observing Report

There have been some successful meetings at the Observatory of the Observing Group on Monday evenings, devoted to CCD work and computer imaging. Two striking images of Jupiter and Saturn by Neil Grubb were published in September's Astronomy Now.

Non-electronic observations have been somewhat hampered by a very wet and cloudy summer and the present autumn seems to be continuing this trend. No sooner was our last Journal at the printers than a huge aurora occurred on April 6/7. It went on all night and was seen by many of our members. Of the many photographs Lorna McCalman's were most striking. The whole sky was covered in vivid pulsating red, green, white, yellow and pink rays, with several coronal peaks, although the sky was hazy. Neil Bone phoned to say that the aurora was overhead in Chichester. A few days later Dave Gavine went to the BAA's Winchester Weekend, to give a lecture - on the Aurora! He says that everybody down there had seen the aurora and all their photographs were much better than his! Following a large solar mass ejection another great aurora with red, green and white coronal rays occurred on July 15/16, but again in a poor sky, twilight and moonlight. This was most unusual in that as the aurora began to fade at 0100 Dave Gavine detected gradually brightening Noctilucent Cloud bands. The presence of both phenomena simultaneously is rare and of great interest. During a meteor watch on Aug 10/11 Dave saw a moderate rayed display from 0110, then he and Ron watched a small display with red rays at Glasgow Observatory on Sept 15/16. With the current high activity on the sun we can expect more aurora so watch the northern sky every clear night.

Dave, Ron, Lorna and Graham Rule saw several Noctilucent Clouds this summer but they were all faint: June 2/3, 9/10, 14/15, 25/26; July 13/14, 19/20.

Dave was the only serious observer of this year's Perseid meteors, with 10 Perseids and 6 others in 2 hours on Aug 10/11, and in 11/4 hour on 11/12 before it clouded over he saw 35 Perseids and 3 others, none of them very bright. Both nights had a bright moon, and unfortunately 2000 is a year in which most of the meteor showers are affected by moonlight.

Lorna, Ron and Dave continue an extensive Variable Star programme. Lorna has become a member of the BAA and hopes to contribute to its observing sessions.

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## Letter to the Editor

Anyone who saw Das Rheingold at the Festival Theatre in August will have noticed that the main curtain and the stage backdrops showed a night sky, but not one familiar to us. Clearly the action takes place in 'another part of the Universe'. There were also hyper-dimensional moments when the gods entered and exited through a 'door' in the sky! Fascinating. I look forward to more operatic astronomy in Die Walkure next year.

Steuart Campbell

## Re-Energising the ASE

(based on an article in 'Astronomy' July 2000)

by

**George Grant**

(ASE Treasurer)

- **What's the problem?**
- **Some suggestions**
- **What next?**

I volunteered to give a talk at this year's Member's Night as we were a bit low on speakers with one week to go! I had no idea what I was going to talk about but I was sure I'd think of something. and then I remembered an article in Astronomy magazine (July 2000 issue), entitled "Re-Energising Your Astro Club". "I know," I thought "I'll just plagiarise that article, I bet no-one has read it." (and I was right...I checked on Member's Night!). But I didn't just choose this article at random, I chose it because it struck a chord with my view at least, of the current status of the ASE. Allow me to elaborate...

Briefly, my experience of the ASE of the last 9 years or so (I joined in 1991) has comprised turning up for (excellent) talks on diverse astronomical topics on the first Friday of the month, perhaps followed by a squint at the Moon or a bright planet through the 6" Cooke refractor and very little else. Most of my observing was done outwith the ASE, usually alone, either with binoculars or with a 6" reflector I built during 1993. I no longer have that telescope (I am currently working on a portable 10" replacement 'scope), however probably the best night's observing I ever had with the 6" was during an ASE Observation Group meeting at Portmore Loch (not far from Earlyburn) on 10th November 1996. I remember the 20 km drive south through patches of freezing fog was quite atmospheric in itself and I wasn't convinced that the sky would be clear when I got to Portmore. I needn't have worried, the sky was jet black, crystal clear and saturated with stars! I don't have room here to go into details but the observing list included M1, M27, M31, M32, M33, M57, M110 - several of which were 'first time' objects for me. Sadly, Orion was just rising when we had to stop due to iced-over mirrors & lenses!

So that was a great night in 1996, enjoyed by some ten or so members. Unfortunately, for one reason or another, as far as I know there was no follow-up meeting.

## Things aren't that bad but...

- **Does the ASE Council discuss astronomy?**
- **Is Calton Hill under-used?**
- **Is Earlyburn under-used?**
- **Do ASE meetings inspire members?**
- **To do what?**
- **Are members happy with the ASE?**
- **Do members know what's available?**

Also around this time, work began on the renovation of the Cox 13" reflector. Although good progress was made over the summer, the lack of power inside the 'Cox Drum' meant shelving the project over the winter. We were also stymied by the Millennium proposals for Calton Hill, particularly the infamous 'glass box' project. This was one of many topics which occupied the ASE Council's time to the detriment of (you guessed it) astronomical matters. In fact, the burden (financial & otherwise) of running the observatory was becoming so great that in July this year that the ASE Council decided that an alternative meeting venue should be sought if the situation did not improve, particularly since the dark-sky site at Earlyburn was becoming available.

Thankfully, we do seem to have reached a new and more favourable understanding with Edinburgh City Council regarding our mutual needs on Calton Hill. We have been assured that the City Council is keen to maintain the ASE's astronomical presence at the City Observatory and provided we secure a better 'financial package', I am optimistic that we can now make some longer-term plans for astronomy on Calton Hill. Of course not everyone wants to stand outside in the cold observing at Earlyburn, however I don't see why we couldn't develop the Calton Hill site as a good (albeit light-polluted) city-centre observing site. We can potentially operate several high-quality telescopes on Calton Hill and with a little imagination we could organise interesting observing programmes...**if that's what members want!**

## Some suggestions #1

- **Exploit astro-events**  
**Public awareness (comets, meteors, eclipses, open days)**
- **Cater to new members**  
**Observatory tour / "Welcome to ASE" sheet / W3 page?**
- **Delegate & do it**  
**Journal / W3 site / social meetings / ASE "merchandise" (!)**
- **Think Internet**  
**Articles, activities, images on W3 side - bulletin board?**
- **Get out & observe**  
**Regular planned observing sessions (w/e near new moon?)**

If this article seems biased towards practical astronomy, that's because it is & there are 3 reasons for this:

- It's my own interest & as author I claim the right to be biased!
- In my opinion, our lecture programmes are already very good & very popular
- Most people join astronomical societies to look through telescopes (FACT)

I know that many members (including myself) 'do their own thing' observing-wise but my perception is that **as a Society**, the ASE's focus has moved away from 'practical astronomy' for various reasons.

In the space I have left here, I don't want to go through all the points on the slides I used for Member's Night in great detail. I think most of them are self-explanatory but a few points are worth highlighting (I'd also recommend the article in Astronomy for further reading).

I think we could do more to improve public awareness - it's a sobering thought that during the 'glass box' stoushie it emerged that some members of Edinburgh City Council were not even aware that the City Observatory was active! Public awareness and public support has to be good for the ASE in the long run.

## Some suggestions #2

- **Teach & inspire**  
Schools/scouts etc. (satellites, CCD, Internet, ATM etc.)
- **Encourage club projects**  
Earlyburn, new (old) telescopes, renovation (!)
- **Invite speakers**  
We do this quite well already!
- **Display your equipment**  
5-10 min. slot every month would help newcomers
- **Interact with other local clubs**  
We do this already (provide speakers for each other etc.)

It is important that we find out what our members want from the ASE and make sure we engage new members in our activities. Delegating means encouraging members to develop any new ideas they have and perhaps dispelling the view that "the ASE Council will/should be doing that.". The Council is keen to encourage members to talk/write about their hobby.

Teach & inspire....hmm, I read recently that 27% of adults in the USA think that the Sun orbits the Earth and 50% don't know that the Earth orbits the Sun in one year! This article (Sky & Telescope, September 2000) was all about motivating youngsters to get into astronomy and it also noted that the average age of astronomy society members in the USA was 40+ years old. While the statistics above were blamed in part on the education curriculum in the States (which, from memory, does not require any astronomical content), it seems that this is a trend which is seen globally. My generation (I'm 40 in January 2001) grew up in the midst of the 'space race' and had darker skies - mind you, telescopes were still expensive then! Computer games & the Internet were predictably blamed for the lack of interest in being outside under the stars. That said, the article also noted that children around the age of 10-11, are still fascinated by the stars & planets and any encouragement received then can lead to a lifelong love of astronomy.

Again, this subject has been discussed at ASE Council meetings (in response to applications for junior membership), however the general feeling has been that the subject matter in monthly meetings might overwhelm younger members and prove a disincentive(!).

The other points on the above slide are there as thought-provokers - again feedback is most welcome.

## And finally ... what next?

- Use Calton Hill (2x4", 6", 13")
- Observe at Earliburn (8¾" Dobsonian, etc.)
- Observing/Imaging Group
- Observing Projects (variable stars, meteors, etc.)
- Telescope making (Aluminising - soon?)
- Gas Hypering of photo films for imaging
- ASE "Socials" (BBQs, Whirlpool Star Party, Dynamic Earth, etc.)
- Generate some "PR" in the local press (e.g. by discovering a Supernova, Gamma Ray Burser, etc.)

My last slide from Member's Night lists some of the wealth of resources that the ASE is fortunate in having and offers a couple of suggestions for increased interaction within the society and with the wider public (although our press-releases don't have to be as dramatic as the examples I've used here). Given our healthy, diverse membership, I'm sure there are a lot more 'resources' (in terms of specialised astronomical know-how), that I don't even know about.

Strictly on the instrumentation front, of course there is the Cooke 6" refractor, which for a Society as large as the ASE, is definitely under-used. One comment I received immediately after the talk was that most members have never been instructed in its use and it was suggested that we hold some 'telescope training sessions'; we intend to address this problem soon. We also have a 4.25" equatorial reflector and our 'Leviathan' 13" Cox equatorial reflector which will hopefully be restored to working order before the end of the year in the Crawford Dome. Then there's the 4" refractor which currently provides a nice backdrop for the tea-room. Plans are also afoot to restore this instrument too! The Earlyburn site is already being used by the Society's Astrophotography & Imaging Group. As the nights draw in, I would encourage more members to make the trip to enjoy the dark sky views, using their own instruments and/or the Society's 8.75" Dobsonian telescope.

In conclusion, I think this is an exciting time for the ASE, with plenty of opportunity for members to engage in 'hands-on' astronomy. And remember, the ASE Council is always pleased to hear your suggestions and comments.

George Grant

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## Debbie Geddes

Debbie, having taken her BSc at Edinburgh University, has gone to Aberdeen to do a post-graduate diploma. She writes to pass on best wishes to everyone, she'll miss the Society, but hopes to come back in future. We all wish her well.

# The Scottish Astronomy Weekend 2000

15 to 17 September, at the Kelvin Conference Centre,  
University of Glasgow

In spite of the nationwide fuel crisis, difficulties with transport, ad hoc rearrangement of the programme to suit speakers, etc., an excellent weekend was experienced by all who came along, either to stay in or as day visitors. It was a great pity that neither the Astronomical Societies of Glasgow or Edinburgh were well represented. Top marks go to Dundee Astronomical Society and to new Braemar Astronomical Society (50% attending) for their turnouts. Individuals from England and north Scotland were present.

After registration and dinner on Friday evening Mrs Margaret Morris, Vice President of the host Society (Glasgow) welcomed the visitors. Dr David Clarke, Director of the University of Glasgow Observatory, gave a talk on the Pleiades cluster, describing the constituent stars in terms of the Hertzsprung-Russell Diagrams. Various research techniques were discussed, right up to papers currently in preparation. Dr Clarke then took the visitors over to the Acre Road Observatory site where a cloudless night permitted a good observing session. To begin with the northern sky was aurorally active for half an hour or so comprising green glows, green and red rays and a red veil. The 12-inch Meade reflector in the dome was used to observe Vega, the Ring Nebula, the Hercules globular cluster, the Andromeda Galaxy and Saturn with 5 moons. It was noted that Algol was in eclipse and its recovery to normal brightness was followed throughout the session.

Following Sunday breakfast Mr Charles Cavanagh, President of the Astronomical Society of Glasgow, chaired the morning session. Dr David Kerridge, Director of the Seismology and Geomagnetic Section of the British Geological Survey, delivered a talk on the monitoring and forecasting of solar activity, space weather and their effects on human technologies. He outlined work currently being undertaken in conjunction with Scottish Power to forecast magnetic events and measure consequent earth current activity in the power distribution system.

As Dr Francisco Diego's plane was delayed, Dr Dave Gavine filled in a half hour with a talk on the Scottish engineer and astronomer James Nasrnyth, builder of big telescopes of unique design with which he studied the Moon. Dr Diego (of University College London) did arrive, and gave a thoughtful talk on the importance of Astronomy in human culture. He advocated the education of the general public into the facts as indicated by observation, in contrast to theory. He demonstrated the age of the Universe by the 14.5 metre width of the auditorium against which the age of Man was but the thickness of a sheet of paper.

In the afternoon the visitors were free to pursue their own interests in Glasgow but a party under the expert guidance of Mr Michael Dukes of Glasgow University visited the Hunterian Museum, the Bute Hall and the Senate Room, followed by a walk to the storage rooms of the Kelvin Collection of scientific instruments. Mr Dukes gave a very comprehensive description of many items in the collection, with their histories and the scientists associated with them. Lord Kelvin's own depth and breadth of involvement in scientific development was amply demonstrated.

After evening dinner the audience was entertained and enlightened by a marathon 2 hour presentation by Dr Allan Chapman of Wadham College, Oxford, in which he explored the world of the Victorian amateur astronomer. He noted that in contrast to the Continent where the development of science was dependent upon the largesse of the state, British astronomy was being evolved by self-financing individuals, be they landed gentry or working tradesmen. Dr Chapman proposed that it was the difference between the political systems in the British Isles and on the Continent that determined the methods of financing

research. It was the enthusiasm of determined individuals that drove the system of amateur astronomy in Britain.

On the Sunday morning Dr Alastair Simmons, the President of the Scottish Astronomers' Group, spoke on the diffuse and discrete forms of the aurora that he had studied in Scotland, with the help of land- and satellite-based observations. He described the geophysical processes forming the two types of aurora. He demonstrated that the diffuse aurora related to the "northern dawn" effect and the discrete aurora to the "merry dancers" of Scots mythology.

After coffee the Members' Session was chaired by Dr Simmons. Ron Livesey reviewed the present state of geomagnetic and auroral activity. John Fitzgerald showed pictures of the Cornish total eclipse, and of aurora from Norway, and Dr Ken Mackay described the geometry of sundials together with the layout of a multi-headed sundial to be erected in a garden at Wormsley. This structure included a graph of the Equation of Time to convert sundial time into GMT. Dr Simmons concluded the session with some photographs he took of the Zodiacal Light, followed by a vote of thanks to all who had made the Weekend possible under difficult circumstances, not least the housekeepers and kitchen staff.

Ron Livesey

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## Popular Geology Class

Dr Dave Gavine intends to run another Popular Geology class at the Jewel and Esk Valley College (Milton Road campus). It will run for 8 weeks on Monday evenings from 6:30 to 9:00, beginning on 23 October. Cost: about £38, half price for the more "mature".

Content: minerals, rocks and how they are formed, plate tectonics, erosion, strata & use of fossils, geological history of Britain. No previous knowledge needed beyond basic science, no "hard sums", exams or tests. Field trip if weather permits. Free handouts.

Dave hopes also to run a Popular Meteorology class, beginning Monday 8th January 2001.

See Dave or phone him at 657 2338, or enrol beforehand at the College. Harry Sutherland (a member of ASE) is Senior Lecturer in charge of evening classes. His number at the College is 657 7284.

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## Dr Harry Ford

Our Honorary Member and Lorimer Medallist of 1985 has been further honoured by the University of Abertay, Dundee, with the award of the honorary degree of Doctor of Science, in recognition of a lifetime devoted to the furtherance of astronomy to the public, especially to children, through his work as Curator of the Mills Observatory, Dundee, then as creator of the Southend Planetarium, and now Lecturer at the Planetarium at the Old Royal Observatory, Greenwich. At an impressive graduation ceremony in the Caird Hall, Dundee, on 7th July, Harry was capped by the Chancellor, the Earl of Airlie. An old friend and fellow astronomer, Dr Bill Samson, gave the laureation address.

# Binoculars with 153mm Diameter Mirrors

A precis of an article written by **Laurent Souchu** of the ASE and published in the French periodical *Astronomie Magazine* no.14 June 2000.

Translation by Ron Livesey

## Introduction

Binoculars are not necessarily a lightweight instrument slung around one's neck. This is a 153mm instrument, ideal for observing comets, the moon and the Milky Way. With a mount there are some advantages : simple to aim, wide field, and comfort while observing. It is a good DIY project.

It's a question of personal choice. I avoid the technicalities of CCDs and automatically-aimed instruments controlled from the comfort of a warm room. I like the intimacy of the fresh night air, and find my way around using my "natural detectors". I prefer wide-field viewing of open spaces which excite the imagination. Having practised with one eye with its frustrating discomfort for a long time I decided in 1994 to construct binoculars with mirrors. Little information is available on binocular construction and this conservatism, which I can't explain, deprives us of an incomparable observing pleasure. The instrument presented here will, I think, give a little boost to Hervé Burillier who, in the October 1999 issue of *Astronomie Magazine* was worried about the lack of interest in observing, with more being devoted to "galloping technologies".

## Difficulties in construction

The principles of binocular construction are not fundamentally different to those of other types of instrument but there are particular difficulties :

## Mirrors

The maximum difference in focal lengths must be limited to 1%. Above this value the unequal lengths carry a constraint incompatible with binocular vision. It is not a question of using here the method of mould templates or thickness wedges sufficient for making a single telescope mirror, but a spherometer, as described in Jean Texereau's book. I obtained a micrometer screw having a 26mm travel and adapted the three-point support used by Jean-Claude Dubsay. I prefer a mirror tool using rough to fine stages, working the mirror above and below so that the values given by the spherometer are identical to within 1/200mm. The Foucault test then gave a divergence less than 1mm which is only 1/7 of the 1% limit.

## The mirror supports

Due to the conic section produced by the method of grinding, the mirrors lie in their supports with a lateral clearance of 0.5mm. Without this precaution, uncontrolled displacements of the mirrors would render the optical tuning very difficult. The necessity of obtaining a perfect fusion of the two ocular fields required me to think up and construct a specific system. With 4 knurled adjusting screws each ocular can be independently moved in the longitudinal and transverse (x, y) axes, thereby providing optimal alignment. A vernier facilitates the setting in x for the distance between the eyes.

## The prisms

It is perfectly possible to utilise four flat mirrors to bring in the 160mm separation of the optical axes to the average separation of the eye pupils, which for me personally is 64mm. I prefer two prisms with total reflection which give a useful 39mm field sufficient to adapt to variations in anatomy. They are in BK 7 and I thank Michel Dodard for making them.

## The Eyepieces

Before satisfying my taste for wide fields my choice was for the following 3 combinations:

1. 33mm focal length, magnification x23, 6.7mm pupil diameter, field 2° 12'.
2. Eudiascopic 25mm focal length, x27, 5.6mm pupil, field 1° 50'.
3. Panoptic 19mm focal length, x36, 4.3mm pupil, field 1° 54'.

Note that it is not always possible to use wide-field oculars with long focal lengths which because of their large diameters renders it difficult to adjust the separation of the eyes (x) or their installation on the mounting plate.

## Adjustment

Besides the optical adjustments familiar to owners of Newtonian telescopes the fusion of the two ocular fields presents no particular difficulty, it is carried out in two stages. Azimuth - point the instrument at any region of the sky and put a star at the edge of the field of one of the oculars by moving the tube left or right. Then verify the same position in the other ocular using the horizontal transverse (x) screw. The Altitude is corrected in the same manner using the vertical (y) screw. This operation takes less than a minute and is necessary after disconnecting and transporting the instrument.

## A stable and functional mounting

The mounting described in *Lunettes et télescopes* by Danjon & Couder answers perfectly. The weight of the tube and its small dimension gives it a remarkable insensitivity to wind. The large field and absence of movement on the altitude and azimuth axes give it a simplicity of operation. The only improvement, a spirit level, permits the horizontal setting of the assembly, making corrections in azimuth unnecessary. The instrument is easily transportable, it comes apart as feet, fork and optical tube and can be assembled in 5 minutes. It goes into a trunk which can fit into a small car.

## Observations

The 2° field makes a finder telescope unnecessary. The instrument is easily pointed at objects using the upper edges of the tube. It takes 7 minutes for a star to traverse the field, so there is no need to constantly re-centre when a group is observing. A motor drive is not needed. I am now able to spend nights of up to 5 hours continuous observing without undue fatigue or the bleary vision of monocular use. There is no appreciable chromatic aberration and it doesn't mist up. The first impression is of observing in a different dimension, not like looking through a keyhole. The instrument is particularly good for comets, close conjunctions, lunar occultations, star fields and eclipses. At x23 the crescent moon and its Earthshine offer an incomparable spectacle, a globe "floating" in a field about 4½ times its diameter. Jupiter and its 4 satellites offer the feeling of isolation as they float among pinpoints of stars. The Orion Nebula, the Pleiades, the Andromeda Galaxy, the M27 planetary, the lacework of the Cygnus loop or the Rosette Nebula are unforgettable, with a depth and relief which make one reluctant to return to monocular viewing. I have an

indelible memory of observing Comet Hale-Bopp at the Viaileix Observatory and of the solar eclipse of 11 August, where these binoculars without doubt gave me the greatest benefit.

At gatherings such as in Saint-Aubin de Courteraie, at the home of Pierre and Agnès Bourge, or the third European Amateur Astronomical Meeting organised by SAN, where these binoculars were voted the premier prize in the category of an instrument made by a craftsman, I could appreciate more objectively the value of this instrument and take a real pleasure in seeing the enthusiasm it has generated

## Optical characteristics

Primary mirrors : clear diameter 153mm, focal length 679mm, focal ratio f.4.44. surface precision  $\lambda/13$  to 15.

Secondary mirrors : minor axis 45mm, precision  $\lambda/10$ .

Prisms : total internal reflection.

Stellar limiting magnitude 13.2

## Down-to-Earth considerations

Here are details of the costs of materials. (approx 10F to the £)

|  |        |
|--|--------|
| Primary mirrors (blanks, abrasives, aluminising) | 2000 F |
| Secondary mirrors                                | 1300 F |
| Prisms   | 3000 F |
| Various materials (wood, aluminium, rubber)      | 1500 F |
| Oculars  | 1900 F |
| Total  | 9700 F |

While the cost seems high it was spread over the period of construction. The following table gives the comparative cost of other instruments :

| Diameter mm | Collecting surface cm <sup>2</sup> | Limiting mag. | Price (F) (fixed ocular) |
|-------------|------------------------------------|---------------|--------------------------|
| 153         | 183.9                              | 13.2          | 45,000                   |
| 125         | 122.7                              | 12.7          | 27,000                   |
| 100         | 78.5                               | 12.3          | 8,600                    |
| 80          | 50.2                               | 11.8          | 4,500                    |

It doesn't stop there. I am completing the construction of binoculars with 306mm diameter mirrors at f.7 on a motorised mounting, specially designed for high-resolution lunar and planetary observations and suitable for photography.

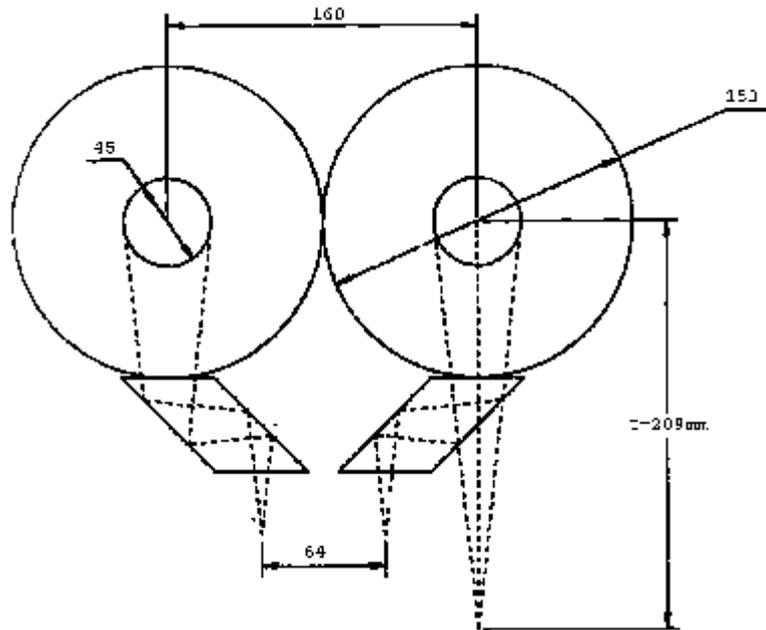
## Bibliography

André Danjon & André Couder, *Lunettes et Télescopes*.

Jean Texereau, *La construction du télescope d'amateur*.

Pierre Bourge & Jean-Marc Becker, *Mon télescope, mon observatoire pourquoi pas*.

Karine & Jean-Marc Leclaire, *Réalisez votre télescope*.



**Design of 153m binocular using prisms**

## Are you on e-mail?

Thanks to Horst Meyerdierks at the ROE the Society now has an e-mail list for use by members of the Society. This will be used to send announcements about forthcoming events of interest to members and allow us to keep in touch between meetings.

If you would like to join this list please send an e-mail to [Majordomo@roe.ac.uk](mailto:Majordomo@roe.ac.uk) containing just the lines:

```
subscribe ase-list
end
```

I will then receive a message saying that you want to join and will add you to the list.

Graham Rule

## Lonely Astronomers Ads

At a recent Council meeting it was suggested that new (or even longstanding) members don't know much about each other's astronomical interests. Often people don't want to stand up and advertise their observations, or ask publicly for help in getting started. In order to help bring people with similar interests together we are going to set aside some space on a notice board at the observatory. (Nothing too personal please - astronomical interests only!)

I will try to convince your Council to lead the way with some potted biographies by the November meeting.

Graham Rule

# Scottish Astro-Fest

**November 24th-25th in Wigtown**

The Wigtownshire Astronomical Society is only a few years old but the enthusiasm of its members has led it to organise this event in the County Buildings, Wigtown. At 8pm on the Friday evening Scotland's Astronomer Royal, Prof. John Brown, will present "Black Holes & White Rabbits". Saturday's activities will last all day and feature talks on astronomy (including one from our own Neil Grubb) and the Scottish Astronomers' Group AGM. If the evening is clear then expect a great star party at a site with dark skies!

Admission is free (except for Planetarium shows)

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Website: <http://www.wigtown-booktown.co.uk/scottishastrofest.htm>