



GNOMON

Newsletter of the Association for Astronomy Education

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SPRING 1997

A grant from The Royal Astronomical Society enables "The Universe in the Classroom", the Newsletter of The Astronomical Society of the Pacific, to be sent to members with issues of "GNOMON".

The 1997 Association for Astronomy Education Annual Business Meeting

This year we are delighted to announce that the Annual Business Meeting will take place in the suitably astronomical surroundings of Cambridge. Full details of times and costs are on the flyer which you should find in this issue of GNOMON. If it is missing, please call the editor urgently and one will be sent to you.

The AAE now owns a large selection of equipment and other resources which is used in our various workshops and events. There will be ample opportunity for you to work through examples of practical work that can be done during daylight and with cloudy skies, and many ideas and suggestions for you to come away with. We are also planning a guest speaker. If you are looking to stock up your astronomy teaching ideas cupboard, then this is going to be the ideal place for inspiration and advice.

AGENDA

- 1) Minutes of the last Annual Business Meeting (May 11th 1996)
- 2) Reports from officers of Council -
 - President
 - Treasurer
 - Secretary
- 3) Election of Council for 1997/98
- 4) Any other business.

Nominations for posts on Council:

All posts are elected annually at the AGM. Here is your chance to become involved - new faces are always welcome! Many of the officers are happy to stand again but note that due to a rule on length of term, some posts have become vacant this year.

The posts are:

Officers

President, Vice-President (3)
Treasurer, Secretary, Assistant Secretaries (2)

Members

Resource Centre Representatives (3), Members (3) Editor (co-opted by council).

Nominations can be made from the floor at the ABM, or in advance by post. Each nomination should be accompanied by the names of a proposer and seconder.

This year we would be particularly pleased to receive nominations for the post of Minutes Secretary. This is an important post in council, and a good one for anyone who wants to observe what goes on in the AAE Council meetings before deciding whether they want to be further involved! There are 4 meetings of council a year.

One of the Vice-President posts is also vacant and as Editor is co-opted by council, any willing persons can also apply for that position.

Subscription Rates:

Individual Members	£10.00
Retired Members	£7.00
Corporate Members (e.g. schools, colleges, etc.)	£20.00

Corporate Members will receive three copies of GNOMON.

Extra Copies:

0-10	£1.00 per copy
11-50	£0.75 per copy
51-	£0.50 per copy

Back numbers, not less than one year old, half these prices.

There will generally be a 10% discount to AAE members on all publications and advertising rates.

Practising teachers may claim their subscriptions as an allowance against income tax, thereby effectively reducing their contributions.

All communications (except those to the Editor) should be addressed to:

The Association for Astronomy Education,
The Royal Astronomical Society,
Burlington House, Piccadilly,
LONDON. W1V 0NL.

Editor: Alex Lovell, Vaughan, Wistow Hall,
Kibworth Road, Wistow, Leicester LE8
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Email: alexlovell@dial.pipex.com

Advertising Charges:

Whole page	£120
Half page	£60
Quarter page	£30
Inserts	£75*

* These may be of any size which may conveniently be inserted into the newsletter. There may also be an additional charge for posting if the inserts are heavy.

The prices are for *one* issue.
A 25% reduction is made for advertising in all four issues.

Publication Dates:

These are the equinoxes and the solstices, that is four times a year. Copy deadlines are two months *before* these dates.

SPECIAL REVIEWS ISSUE !!!

MEMBERSHIP of the AAE costs £10.00 a year for individual members, £20 for corporate membership and £7 for retired persons. For more information address letters to: AAE, Royal Astronomical Society, Burlington House, Piccadilly, London W1V 0NL. Members receive 4 issues of GNOMON a year.

GNOMON - definition from the Concise Oxford Dictionary:

Pillar, rod, pin or plate of sundial, showing time by its shadow on marked surface; column, etc. used in observing sun's meridian altitude

FOR YOUR INFORMATION . . .

We kick off this Spring issue with several interesting happenings. Firstly, at the **Old Royal Observatory in Greenwich** during Science, Engineering and Technology week 1997 (SET97) the Planetarium is hosting what is believed to be a UK first - a planetarium show for the hearing impaired. It is not uncommon for schools with hearing impaired children to attend a show as in many cases, a hearing aid and the help of their teacher enables them to appreciate the programme. With the profoundly deaf though it is more of a problem and a sign language interpreter needs to be present, and of course, visible in an otherwise darkened environment. They think they've worked out how to do it and if they succeed, then we'll report on it next issue incase you know of any schools that would appreciate knowing about this trial.

Also in the spring, the final long list of new projects for the millennium was announced. These are projects which put in an application for money from the Millennium Commission and have gotten through the initial application and the more detailed, 20 page application stage. There is still a long way to go, but schools in the west country should keep their fingers crossed for a planetarium project in West Cornwall and schools in **West Yorks** may be interested to know that there is a planetarium project in the planning stages in their area.



The Royal Astronomical Society has produced another **very useful** leaflet to accompany the already popular 'Galaxies' leaflet. This new leaflet is about the 'Moon' and it neatly sums up all you need to know with the same clear text and diagram format that the 'Galaxies' leaflet exhibits.

They are photocopyable, although the odd size (2 A4's with 2 A5's on the side) makes working out the best way to put it on a photocopier a rather interesting exercise. Send an A4 SAE to the RAS, Burlington House, Piccadilly, London W1V 0NL and ask to be sent a copy.

With all the comet mania going on, you may want to take the opportunity of making contact with your local astronomical society. Send an SAE to the Federation of Astronomical Societies, Whitehaven, Lower Moor, Pershore, Worcs. WR10 2NY to ask for the addresses of those nearest to you.



The **British Association** is holding a two day workshop called "Building Bridges to Science 1997 - Shaping the PUS agenda for the New Millennium" at the Edinburgh Science Festival on the 4th and 5th April. This meeting will focus on the opportunities for the public understanding of science that will be arising due to lottery funding and others in the coming years. The cost, not including accommodation and travel is £75, but this includes coffee, lunch, tea and a reception on the Friday evening. For more details contact Jane Mole at the BA on 0171 973 3069.



The British Association Youth Section is teaming up with **The London Planetarium** to repeat their successful '**Rising Stars**'

Astronomy and Space Science Challenge for Secondary Schools. Rising Stars 1997/8 is being generously sponsored by British Telecom. The competition will be in two parts:

Autumn 1997 - a school based project involving satellites and technology

Spring 1998 - A challenge quiz to be held at the London Planetarium

Exciting prizes include a trip to Goonhilly Earth Station and the Challenge Trophy as well as numerous astronomy related goodies.

UNFORTUNATELY . . . this is only open to schools in London and South East England for logistical reasons. Details will be sent to schools in those areas in June 1997. If there is a demand, then Rising Stars will consider going national, but you have to write or call the British Association or London Planetarium to register your vote. Enquiries to: Teresa Grafton, London Planetarium 0171 487 0243; Sarah Webley, The British Association 0171 973 3060

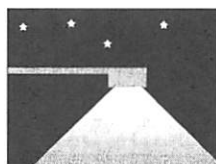
May we draw your attention to the PPARC small awards scheme advert in this issue. This very useful scheme has already funded many useful projects like the **Stars for Schools** scheme. This has been set up to provide local schools with access to a high quality telescope and imaging system with which to make their own observations. This, apart from reinforcing astronomy in the National Curriculum, provides hands-on experience with some hi-tech equipment.

The Stars for Schools scheme is being administered by the University of Hertfordshire to whom all enquiries should be addressed. They will provide an application form on which you have to submit and outline of what you would do with the equipment for 2 months loan if you were lucky enough to have it. Time is then allocated. Successful applicants do have to make a contribution to insuring the equipment while it is in their care, but the telescope does come with lots of help and support and has its own project co-ordinator who can come and explain what the telescope is, what it does etc etc.



Hertford, Herts SG13 8LD

The project is now looking for applications for the year beginning September 1997. Write to: Stars for Schools, University of Hertfordshire, The Observatory, Bayfordbury, Lower Hatfield Road,



If you are looking for an **observational project** to do that doesn't require anything, not even a dark or clear sky, then look no further than the current initiative by the British Astronomical Association's **Campaign for Dark Skies (CfDS)**. Here is a chance to do something very useful. The campaign is collecting letters and information regarding the flood-lighting of churches and public buildings. As you may be

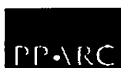
aware, the Millennium Commission have earmarked some money for yet more floodlighting of public buildings. This is not only an incredible waste of energy, but it will also contribute massively to light pollution and the loss of the ability to be able to see the stars and planets from our backyards or streets. The CfDS has already collected a large number of letters from vicars, priests, local councils, residents, monument owners which state that far from being a great thing to do, floodlighting is expensive, doesn't stop burglaries and is a constant worry, especially for churches who state that they are often replacing the floodlight bulbs when vandals smash them. This is not cheap.

What CfDS wants everyone to do is to contact your local vicar / council or owner of a floodlit building in your area and get some views. Do they consider it a waste of money, how much does it cost, do they think they really need it....? Whatever the opinions that you get, send them, with a note of how many floodlit buildings you have found in your area to: Campaign for Dark Skies,

British Astronomical Association, Burlington House, Piccadilly, London W1V 9AG.

And finally, apart from encouraging you to reread the article about our **Comet Contest**, if you have any money to spare are planning a **busman's holiday**, or know a rich student, pass them this information.

Mount Wilson summer program for undergraduates - August 13 - 26, 1997 The Consortium for Undergraduate Research and Education in Astronomy (CUREA) will offer for the eighth time its summer program in astronomy and astrophysics, August 13 through 26, 1997. Undergraduate physics and astronomy majors, with junior or senior standing, who are considering a career in science or science teaching are encouraged to apply. Staff members and students will live and work on Mount Wilson, in the San Gabriel Mountains above Los Angeles. This site, renowned for its superb atmospheric conditions, is home to the historic 100-inch Hooker Telescope as well as many smaller telescopes now being used in frontier astronomical research.



Particle Physics and Astronomy Research Council

SMALL AWARDS SCHEME

IN PUBLIC UNDERSTANDING OF SCIENCE & TECHNOLOGY (PUST)

The Particle Physics & Astronomy Research Council (PPARC) announces the fourth round of its small awards scheme, to fund projects publicising our science areas in the UK and to encourage creativity in PUST.

Highlights of the scheme

- ◆ anyone can apply
- ◆ awards range from £100 to £10K per project (Maximum)
- ◆ encouragement for projects involving schools and young people
- ◆ applications for jointly funded projects are welcomed
- ◆ must be relevant to publicising or teaching PPARC science areas, namely: particle physics; space, planetary and solar science; astronomy, astrophysics and cosmology.

Closing date for receipt of applications is Thursday 10 April 1997. For application forms contact:

PUST Office, Room 2232,
PPARC, Polaris House, North Star Avenue,
Swindon, Wiltshire SN2 1SZ.

Tel: 01793 - 442123
Fax: 01793 - 442002
Email: PR_PUS@PPARC.AC.UK

A further round will be held in Autumn 1997

The program will centre around a short course in astronomy and astrophysics with a major hands-on component. The course will emphasise how our present understanding of the Sun has been achieved and how it relates to the astrophysics of all stars. Students will make intensive daytime use of the Snow Horizontal Solar Telescope (24-inch aperture and 60-foot focal length), with its associated powerful grating spectrograph; make both daytime and night-time observations of a wide variety of celestial objects using a 7-inch diffraction limited refractor; observe with a 24-inch reflector equipped with a CCD system; and for the first time use the historic 60-inch telescope. Each student will complete a short project of his or her own choice.

Additional activities will include: short presentations on important contemporary and historical astronomical topics; special lectures by distinguished astronomers; tours of research facilities on the mountain; field trips to nearby sites.

The application deadline is April 18, 1997. The tuition fee is \$1375. This covers all expenses during the two-week program. Students are responsible for the cost of their transportation to Burbank, California. For further information and application materials, contact: Prof. Joseph L. Snider, CUREA Director, Dept. of Physics, Oberlin College, 110 North Professor Street, Oberlin OH 44074. Tel 00 1 (216) 775-8335, joseph.l.snider@oberlin.edu

EDITORIAL COMMENT

Over Christmas, many of us got astronomical goodies, and not only from the publishers who were after reviews. Hence this issue contains more than the usual number of summaries of books, videos and computer stuff that could be useful (or not) for teaching astronomy and space. If you had anything good for Christmas that you'd like to share then I would welcome your contributions to this newsletter.

The Annual Business Meeting flyer should be within this GNOMON. If it isn't, give me a call on the number listed on the front page and I will send you one. There are one or two vacancies, and council would enjoy meeting some new faces so if we aren't doing what you think the AAE should be doing, then come and tell us (and volunteer for council!).

Our sixth form workshop at ASE in January went very well indeed and we are going to continue running workshops whenever and wherever possible. At the ABM you can get a chance to explore the equipment and resources that we use at the

workshop plus some other ideas for resources not only for sixth form, but also for the other key stages. It will be well worth coming along.

Make sure you get out and observe THAT comet. As we go to press it is around magnitude 1.0 with a nice long tail and visible in the early morning sky standing above the NE horizon. Very pretty. By the time you get this, it will be a major object in the evening sky so there will be no excuse not to look to the NW to spot it unless it is the cloudiest March on record.

And finally, can I alert you to the fact that the address for correspondence to the editor will be changing for the next issue, as indeed will my surname as I'm moving house and getting married, all before the summer solstice. Mind you, since taking over this job I can count on one hand the number of letters that I have received about GNOMON, so come on, let me know that you are out there and tell me what you want to read!!!

TURKEY TEASER SOLUTIONS

OK, we kept you guessing long enough. Here are the solutions to Eva Hans astronomical puzzles.

- | | |
|------------------------------------|-----------------|
| 1. avon purse (not a whisper) | SUPERNOVA |
| 2. untidy list | MESSIER |
| | CATALOGUE |
| 3. Einstein greeting Newton | GRAVITATIONAL |
| | WAVE |
| 4. You should get this in a flash! | PULSAR |
| 5. A Ptolemaic mode of Transport | EPICYCLE |
| 6. Part of the Celestial Circus | TRAPEZIUM |
| 7. Encounter with a donkey | METEOR |
| 8. Fast getaway | ESCAPE VELOCITY |
| 9. Engaging spectacle | DIAMOND RING |
| | EFFECT |
| 10. Admiral's Plot | BUTTERFLY |
| | DIAGRAM |
| 11. Optical Chant | GREGORIAN |
| | TELESCOPE |
| 12. World-wide marriage bureau | INTERNATIONAL |
| | DATE LINE |
| 13. Love Letters? | PASHEN LINES |
| 14. space booze | EARTH SHINE |
| 15. Diana's leg | LUNAR LIMB |

If you did well on these, then here are a couple more. All are famous persons connected with astronomy:

- 1) Woman astronomer, one of the big guns.
- 2) Ignored the third monkey
- 3) astronomer mentioned in Macbeth
- 4) space prima donna
- 5) A powerful limb

AAE ANSWER LINE!

Ever had a question about astronomy that you just can't answer? Need to settle the argument over how many moons Saturn has? Want to know when the next major eclipse is?

All of your astronomy education and factual questions can now be put to the AAE via our email answer line. To ask anything, just send us an email to the address below and we'll do our best to get back to you as soon as possible. Thanks to UCL/ ULO for hosting us.

The AAEs answer line is at:
query@ulo.ucl.ac.uk

AAE COMET CONTEST REMINDER - *Still time to enter!!!*

Entry in the Comet Contest requires the composition of a poem about the comet in a specific form. During the spectacular fly-by of Comet Hyakutake, several contributors to the Internet newsgroup sci.astro felt inspired to compose short poems in the Japanese form known as haiku, to celebrate the wonder and awe they felt at seeing this exquisite visitor from the depths of space. Basically, a haiku must describe something or express a thought, feeling or emotion in 17 syllables. It does not have to rhyme. It can often be humorous. See the last GNOMON for examples.

- The categories are
- (1) primary school pupils;
 - (2) secondary school students;
 - (3) teachers of any of the above.

The winners in categories (1) and (2) will each receive a prize of a £20 book token, with second prizes of £10 book tokens. The winning teacher in category (3) will receive a copy of the 1998 Astrocalendar of the Federation of Astronomical Societies, and second prize will be a copy of Comet by Carl

Sagan and Ann Druyan. The first and second place comet haiku in each category will be published in GNOMON. We may also publish other entries in the category "Honourable mention".

The final deadline for receipt of entries will be April 15, 1997. Winners will be notified during May, and the results will be announced at the Annual Business Meeting of the AAE in June. Winning entries will be published in the Autumn Equinox issue of GNOMON; the AAE reserves the right to publish the results and the winning entries before this date in other media, including news media and the Internet. Teachers should state their profession on their entries.

Contestants should submit their entries (one haiku per individual, please) together with their name, address, school, and status (primary, secondary, or teacher) to:

AAE Comet Contest
c/o Royal Astronomical Society
Burlington House
Piccadilly
LONDON W1V 0NL

REVIEWS



GRAYSTEL STAR ATLAS version 2 - Desktop Planetarium Programme. £75 including p&p

Normally a review is conducted once a review copy is received, but sometimes, reviews are done by people that purchased their copy and found it so good that they had to tell everyone else about it. Such is this product.

It doesn't have the glitzy pictures of Redshift 2 another popular desktop planetarium program, but if you want a fully featured package that can do anything you can think of, simply and with a minimum of razzmatazz then this is THE program.

Installation was simple and easy, and you can watch a demo to get you started. The help is all on-line so no fumbling through manuals trying to find the answer. It produces excellent quality star maps and I appreciated the level of customisation, from the size and style of font, to, if printing in colour, the colours of lines, symbols etc. Bad star maps are often a frustrating feature of other less well thought out programs.

Well thought out should be the slogan for this product. You can put it in night vision mode where it adjusts the screen colours to red on black, and you can program it to run little sequences like a lunar eclipse or a conjunction. I think that schools would probably find their pupils more entertained and informed by a program like Redshift 2 (Maris Multimedia) but for those that have one or two serious students, or anyone taking GCSE Astronomy, then I think this would be very hard to beat.

Alex Lovell

Requires: 4 Mb RAM, VGA/SVGA graphics, 10Mb hard disk space, 386 or above, windows 3.1/3.11/95/NT

Available from Graystel Software Ltd, 175 Pershore Road, Evesham, Worcs, WR11 6NB (01386) 47352.

THE CAMBRIDGE STAR ATLAS - 2nd Edition. Wil Tirion. CUP ISBN 0 521 56098 5 hb. 90pp. £13.95 (\$19.95)

There are a great many star atlases available on the market today and the most famous is undoubtedly Norton's Star Atlas. However, in recent years we have seen a number of star atlases appear that have sought to try and capture the same sort of market. This effort from Cambridge University Press is among the best I have ever used and, while this is purely personal, I prefer the star map format of this Atlas to the veritable Nortons.

So, what does this book have going for it? I liked the clear and simple introduction to observing the moon with a good map that surprisingly had been printed to allow for the fact that the book is bound and so a portion of the map would be inaccessible. Laying the book flat produced a perfect map, a nice touch.

There follows monthly allsky maps which are usable from a wide range of latitudes. These are similar to the ones found in the more portable Collins Guide to Stars and Planets, but nevertheless useful for a quick check on what's up.

A quick zip through what you need to know about the celestial sphere and a potted guide to things in the Universe that you might come across (ie what is a globular cluster or even a galaxy) and then you are into the main book.

I love using these charts. They sit neatly on a photocopier so I can copy them and scrawl comet paths over them. They show stars up to magnitude 6 so you don't get confused with lots of faint stars. Above each chart is a page of suggested objects for viewing, much along the same lines

as Nortons, although I would say that there are more objects listed here and some more unusual ones. The book finishes with a useful resource - six all sky maps showing the distribution of different objects like globular clusters and galaxies. These are a great talking point with a class and serve to illustrate neatly for example that nebulae are found in the galaxy, and globular clusters are outside.

Norton's has a good reference section which will always be useful, but, as these maps are a more portable and less detailed version of the excellent Sky Atlas 2000.0 which accompanies my telescope everywhere, they have fast become my standard desk reference and I think many casual and keen observers will also discover them.

Alex Lovell

STARBASE ONE Astronomy and Space Collection on CD-ROM - Volume 2 - 1997.

Building on the success of their first collection, Starbase One has released a second CD-ROM volume. It is another very comprehensive collection of images, data and computer programs relating to astronomy.

On the images front, it has the latest from the Hubble Space Telescope as well as images from the Galileo mission to Jupiter. There are recent images from the Shuttle as well as many archive images from NASA missions to the planets.

There are over 20 animation files. Of particular interest is the sequence showing the Moon librating during its orbit round the Earth. It is surprising how much the Moon rocks to-and-fro.

In the shareware directories there are many useful programs; there are graphics viewing utilities and planetarium shows. There is even a FITS viewer for professional images.

There is a mass of textual material; electronic journals, teaching notes from JPL, notes about the Space Telescope and much more.

The Starbase CD-ROM is not intended as a teaching aid but as a resource package. It will save you hours of Internet downloading time.

The CD-ROM can be purchased for about £15 at astronomy fairs or by making contact with Nick Stevens via the Starbase One BBS 0171-703 3593 or 0171-701 6914 or at <http://www.ukindex.co.uk/ukastro/sb1main.html> on the World Wide Web.

THE PHOTOGRAPHIC ATLAS OF THE STARS by HJP Arnold, P Doherty and P Moore. IOP Publishing. ISBN 0 7503 0378 6. About £35.

This atlas shows the whole night sky in 45 full-page colour photographs.

At the side of each plate is a detailed finding chart and on the two adjacent pages there is a written description of the interesting objects along with appropriate data tables.

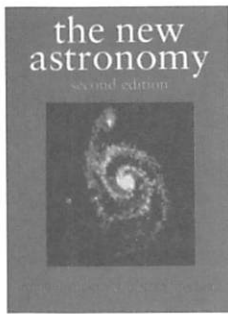
Each photograph approximates to the view that could be seen with the naked-eye or through inexpensive binoculars. The faintest images are 8th magnitude.

Taking one plate in particular, the constellation of Orion is very well displayed. The red giant, Betelgeuse, is suitably yellow (yes, yellow) and Rigel is very blue. The nebula is a good red colour. It is distressing to see the myriad of stars in this field that observers in urban sites will never see!

The appendix contains a Messier catalogue and a Glossary. Also included is the Caldwell catalogue recently constructed by Patrick Moore comprising over 100 worthwhile objects. It is nice to see a challenge for amateur astronomers.

The book is beautifully presented and would be a nice gift. However I would not recommend it as a first purchase. A real beginner should buy a simple guide to the night sky and a more advanced observer should not be without Norton's Star Atlas.

Alan C Pickwick



THE NEW ASTRONOMY - Henbest and Marten. 248pp 300 colour plates

CUP ISBN 0 521 40871 7 pb £19.95

For centuries, astronomers have learnt about the universe by studying the visible light which reaches us from space. It is only recently that technological advances have allowed us to detect radiation over the full electromagnetic spectrum, from radio waves to gamma rays. Modern astronomy

combines these new observations to develop a fuller understanding of the universe. "The New Astronomy" by Henbest and Marten illustrates the effectiveness of this integration by bringing together hundreds of quality images of planets, stars and galaxies taken at various wavelengths, and discussing the contributions each have made to the overall picture. This second edition includes new pictures from the Hubble Space Telescope, COBE, and ROSAT, all clearly described in non-technical text, without oversimplifying the subject.

The book is arranged so that readers can quickly find the relevant section to turn to, whether they are interested in the images themselves or the methods used to obtain them. Summary chapters discuss the different types of telescope and other instrumentation, their technical limitations, and the areas of research where they are particularly useful. The main body of the book, however, is concerned with the images themselves, and what they reveal.

As befits the integrated approach of modern astronomy, images from different parts of the spectrum are directly compared and contrasted in chapters on the birth and death of stars, the solar system, the Milky Way, and normal and active galaxies. A general introduction to each topic is followed by detailed studies of numerous examples, including old favourites like the Orion Nebula and Cygnus A. The result of this combined approach is the revelation of many fascinating features not even hinted at in purely visual observations.

Spectacular views of the universe are often used in education to capture the interest and imagination of students. This book is highly recommended both as a plentiful source of such images and as a neat summary of the methods used to obtain and interpret them. Whilst the sections on instrumentation and general astronomy are not overly detailed, the concise outlines give the reader some insight into the principles behind image acquisition and interpretation. As a visually stunning collection of images illustrating how combined new astronomy techniques can reveal the secrets of the universe, it works beautifully. A fascinating insight into modern astronomy.

C. V Miles

FIND AND ENJOY COMET HALE-BOPP, THE GREAT COMET. Robert Burnham. CUP ISBN 0521 586364 Price £8.95 60pp pb

As astronomers have known about Hale-Bopp since 1995, and have been aware of the fact that it may well be a remarkable object, there are now quite a few Hale-Bopp books on the market devoted to finding this comet. Even though it may well not be the comet of the century, it is already one of the brightest for some considerable time and is well worth making an effort to observe. The challenge for most people is knowing when and where to look.

This book takes you through the challenge with ease. It starts with an explanation of why there has been so much fuss over this comet, and goes on to explain about the anatomy of comets and why they are important. It also explains what to look for in the comet and how to keep a record. There is a useful chapter explaining how to take a simple photograph which I hope many people are encouraged to try. This all gets you fired-up for attempting to see this phenomena for yourself.

The bulk of the book is the comet watchers log book, a guide to where to look and when. It starts in January 1997 and goes through until September 1997. It is divided into

reasonable stages (ie week long periods around the best time, two weeks at other times). The text explains what you can expect to see and what other interesting phenomena are around, like a nice grouping with the crescent moon or a planet. This text is accompanied by skyviews that have been generated by a desktop planetarium programme. While these are fairly realistic, I felt they were a bit dark in my copy, probably just a printing variation, but it made it hard on occasions to see the detail in the charts. Otherwise, they are a nice way of showing what you will actually see, trees and all!

The book ends with some tips for discovering your own comet, a list of resources and books and a good glossary. In all, a splendid, full colour resource with some nice photos and no nonsense. It tells you what you need to know and you could do worse than trust it as your observing companion during this exciting time.

Alex Lovell



NASA VIDEO PACKS from the Easy Learning Company. £25.00 per video pack (inc. VAT)

The Easy Learning Company have launched a series of Space Science videos which are aimed at the Key Stage (KS) 3,4, and 5 criteria of the National Curriculum. I have used two of the series with KS2 students and found them stimulating and visually attractive to years 4 & 5. The videos were Space Basics, which looks at the energy needed to launch a space shuttle, and All Systems Go! which looks at the human body and what happens to our six main body systems in a gravity-free environment.

The students viewing Space Basics with me were at an inner city multicultural school. There were 36 in the class and English is the second language for most of the.. The video is well produced and although the narration is American and the talk fast, the students listened with interest and when I held a plenary session later in the day they were able to remember what they had seen and even the language of the script - they knew what an orbit is, and discussed atmosphere and weightlessness with understanding.

The All Systems Go! video was viewed by special needs students in years 4 & 5 of another city school. This group were all boys with behavioural and remedial problems. The content of the video uses animation to explain the workings of the body systems and there were many talking points during the 35 minute tape. One of the students is asthmatic and was particularly interested in the research being done to understand medical conditions on Earth.

The teacher notes are interesting and informative for both secondary and primary education. The content is easily converted into classroom worksheets and can be tailor-made for the teacher's own student population - I am writing my own to support this excellent material. The student worksheets are too wordy and although they say KS4 and KS5 at the top of the different coloured paper, the content is the same, printed in different sized fonts with words missing for KS4 and the research results added for KS5. I would prefer a book of photocopiable masters to support the tapes rather than a rehash of the teacher's notes.

The areas covered by the tapes include:

- Systematic Enquiry
- Science in Everyday Life
- Nature of Scientific Ideas
- Communication
- Health and Safety

All of these subjects are part or the school curriculum from year 1. By using material such as this, students learn the correct vocabulary and terminology from the beginning and, as with a good painting, every time you look at it you see some different - the content never changes but becomes more familiar and understood.

Jean Collins.



CURRICULUM CORNER

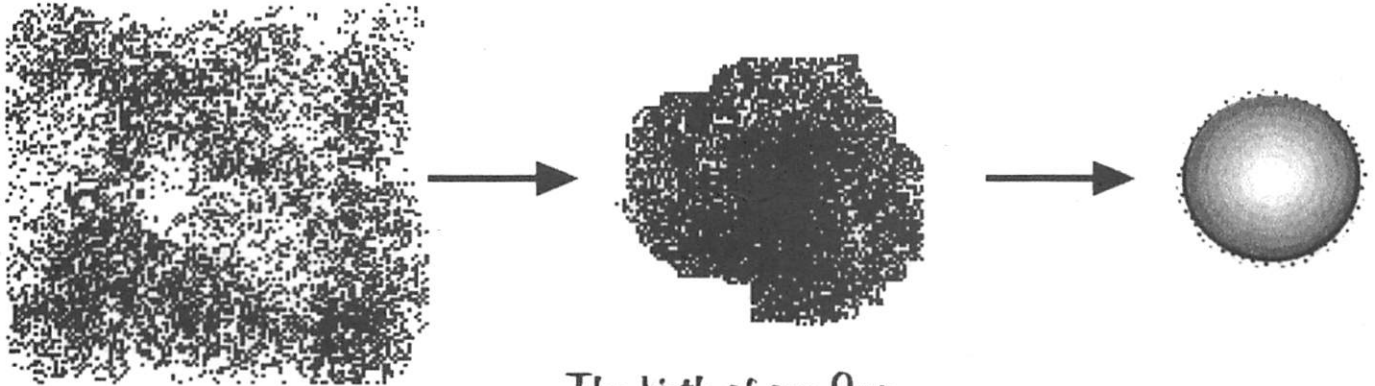
Our Sun - this is your life

by Bob Kibble

How long has your life been? Probably less than twenty years if you are still a student or at school. Hopefully you will have most of your life ahead of you. Your teacher may be approaching or passing middle age. They are about half way through their life. The Sun is

centre became so hot that, at about 15 million degrees Celsius, a nuclear reaction started in the core of the Sun. The hydrogen particles were forced together with such speed that they fused together to form heavier elements like helium. This reaction, called nuclear fusion, released energy to warm up the Sun. Eventually this energy emerged as light - the Sun started to shine.

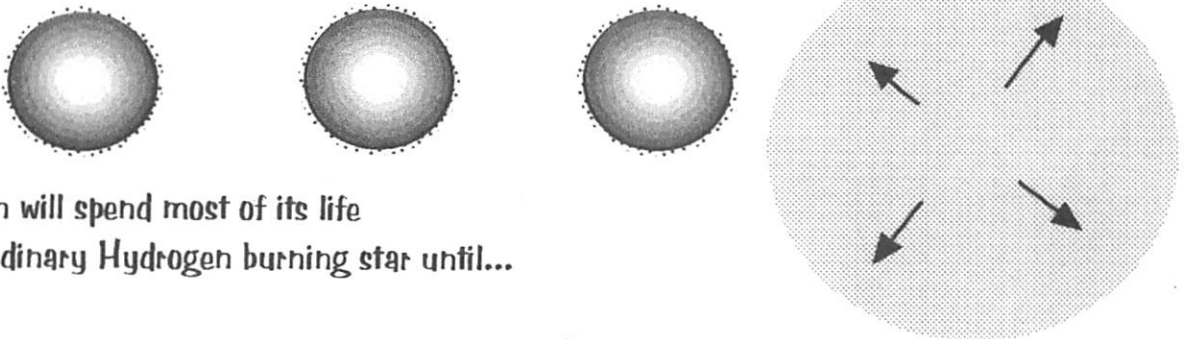
Since then the same reaction has continued in the Sun's core. There is still so much hydrogen to use up that it will be another 5,000 million years before the Sun approaches the end of its life. When all the hydrogen has been fused to helium the Sun will start to collapse. But its temperature will rise again and the helium itself will start to fuse to heavier elements like carbon. When this



The birth of our Sun

also about half way through its life. A birthday cake for the Sun this year would require about 5,000 million candles. The Sun started its life soon after the universe began, about 5,000 million years ago.

happens the energy produced from helium fusion will cause the Sun to explode. It will become an enormous giant ball of gas, much cooler now and appearing red from a distance. The Sun will become a Red Giant.

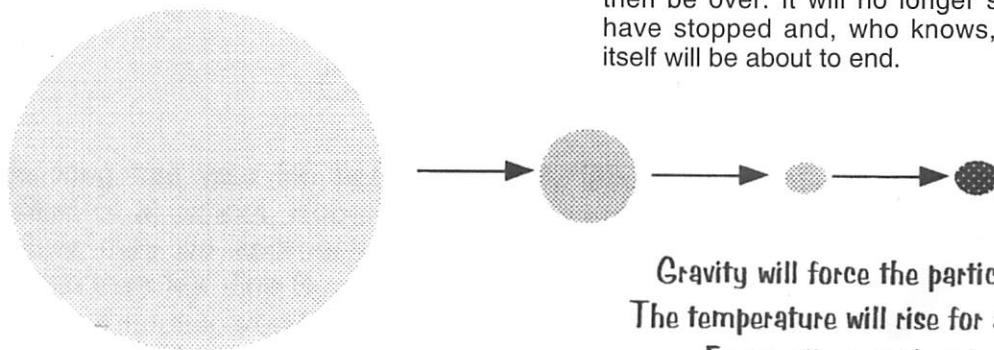


The Sun will spend most of its life as an ordinary Hydrogen burning star until...

...the Red Giant phase..

The Sun started out as a huge cloud of hydrogen gas. The forces of gravity from the millions of tonnes of gas forced all the particles closer together and the gas cloud collapsed into a hot ball of gas. The temperature at the

There is likely to be the final gasp of a dying Sun. The Red Giant Sun will then collapse into a small dense hot dying star known as a white dwarf. There it will stay as it gradually cools into a cold rocky mass. The Sun's life will then be over. It will no longer shine, life on Earth will have stopped and, who knows, perhaps the universe itself will be about to end.



Red Giant

Gravity will force the particles together. The temperature will rise for a short time. Eventually a cold rocky fate awaits.

Sky Diary Spring 1997

Comet Hale-Bopp will be capturing the limelight during March and early April but after it fades from view, what else is there to see? The stars are not so sparkly at this time of year. The sky is dominated by the Plough overhead and the backwards question-mark of Leo the Lion in the south. There are many other constellations visible, but very few have bright stars which makes it quite tricky to trace them in the sky.

MARS dominates the evening sky, glowing a dull red and reaches opposition on March 17th. It is very bright at magnitude -1.2 so should be noticeable. It remains in the Virgo/Leo region of the sky throughout the spring.

MERCURY is putting on a favourable appearance this spring. It will be in the northwestern sky after sunset from mid March and at its highest above the horizon at sunset around the beginning of April. It will be shining at magnitude -0.4

VENUS is too close to the Sun to be seen the early part of spring, but by May it will reappear as an evening star.

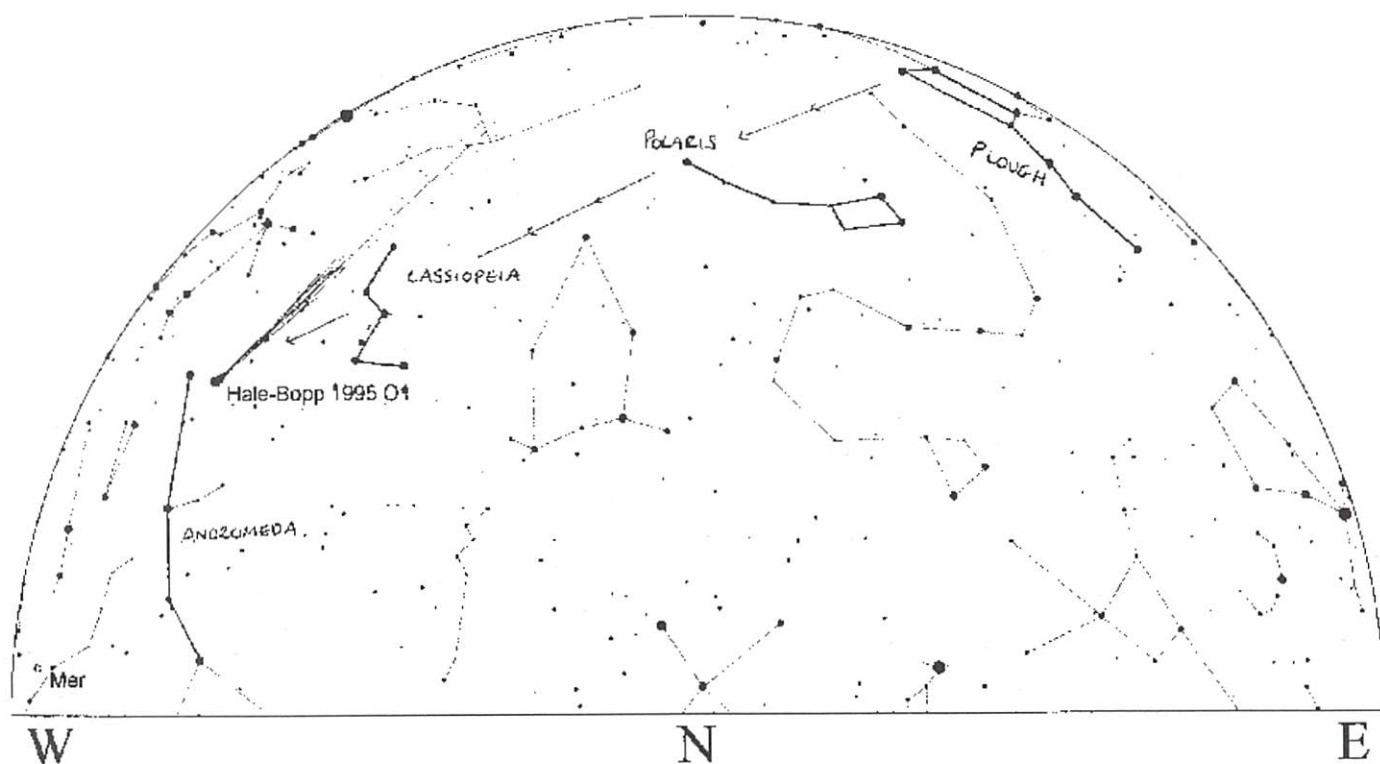
JUPITER is an object low in the morning sky in Capricornus for those who get up early. By the time the next GNOMON comes out, it will be rising not long after midnight. It is at magnitude -2.5 so very bright indeed.

SATURN is really too close to the Sun for observation throughout most of the spring. It appears as an early morning object by June.

THE MOON

	First Quarter	Full Moon	Last Quarter
	New Moon		
		Mar 23 ^d 14 ^h	Mar 31 ^d 20 ^h
Apr 7 ^d 11 ^h			
Apr 14 ^d 17 ^h	Apr 22 ^d 21 ^h		Apr 30 ^d 03 ^h
May 6 ^d 21 ^h			
May 14 ^d 11 ^h	May 22 ^d 09 ^h		May 29 ^d 08 ^h
June 5 ^d 07 ^h			
June 13 ^d 05 ^h	June 20 ^d 19 ^h		

The Equinox is on March 20th at 14^h and the Solstice is on June 21st at 08^h.



This map shows the whereabouts of Comet Hale-Bopp at the end of March, the best time to view it. Before the clocks go back, the sky will be dark enough to see the comet around 7.45pm. It is in the northwest, but easy to locate from facing north as the map shows. The Plough is actually just about overhead although it appears squashed on the map due to distortion. Basically, find the Plough, locate the pole star using the pointers and continue through the pole star to find the 'w' of Cassiopeia. The comet should be bright enough to be very obvious. It will be roughly 25° above the horizon. Good Luck!

(created using GrayStel Star Atlas 2)