



Aries

The Journal of the Derby and District Astronomical Society



The Dwarf Planet Pluto as revealed by the New Horizons Spacecraft.

Summer/Autumn 2015



Contents

Aries - Summer/Autumn 2015

Editorial	-	2
Society News	-	4
Astro News Desk	-	13
Local Astronomers: Alan Heath: A Lifetime of Observations – Arthur Tristram		22
The Man from Buzzard – Stephen Webster		27
Book Review: The Lonely Hearts of the Cosmos by Dennis Overbye - Malcolm Neal		28

Editorial

Welcome to this Edition of Aries!

And we have had a change of Management, as it were, since Aries was last published, at this year's (2015) May AGM, I stood down from the Secretary position on the DDAS Committee, as I thought it was high time to let someone else have a go, (thank you to Brian Dodson who took up the DDAS Secretary job) as this was my third stint as DDAS Secretary (not my longest one either), I felt it was time to move on, but I did not want to leave the Committee, Dave Selfe, the then Aries Editor and the current DDAS Chairman wanted to step down from the Editorship of Aries, and as I was looking for another Committee job anyway, and I really enjoyed my last 'tour of duty' as Aries Editor, both myself and Dave thought it would be a good idea if I were to return to the 'top job' at Aries, so here I am!

Before I go any further I want to say thank you to the previous Editor, Dave Selfe, the last edition of Aries was brilliant, and though Dave only managed to get one edition of Aries out, it was a good one. I know how challenging it can be to publish Aries and Dave did a damn good job. I felt sorry for Dave that he could not keep Aries in the A5 format I had used previously, it is to his credit that he sought the council of others, such as Arthur Tristram, who said why not publish Aries in Microsoft Word and print it in A4 size, which Dave did.

As for Aries itself, well, luckily, I kept the old steam-driven PC I used to produce Aries on, with the equally ancient DTP software (Pagemaker), which is no longer available, which I put Aries together with and all the old Pagemaker Aries page templates, so I was pretty much set up and ready to go, all I needed was content, enter Dave Selfe and Arthur Tristram, Dave gave me the articles he had been saving for the next Aries and Arthur submitted to me an article he had written which was based on an interview he did with Long Eaton-based astronomer Mr Alan Heath, a great friend of the Society. So, I had articles! All I had to do now is write the rest and publish! Yay! That is also when the really hard grind starts, it's not all glamour you know! But I love every second of it! I'm a geek, I know, I know!

I will expand upon what Dave has done during his Editorship and incorporate his ideas for Aries in the 'new' Aries. Aries will continue to be a creature of two worlds, it will be published both as a hardcopy booklet and it will have its usual home on the Society website. Electronic publishing is all very well, but you just can't beat reading something that is physically in your hands, it seems more real than reading it off a screen.

So Aries will be in two formats, its electronic iteration will have a wider readership as it will be accessed by anyone who accesses our Society website.

As for my plans for Aries, well, as far as the hardcopy version goes, it will return in the A5 booklet format, and also I will try and keep Aries to 25 pages, one or two of my previous Aries' went to 44 pages! Keeping it as a 25-page publication makes a lot of sense, it will be easier and quicker to publish, and this will mean that Aries will be published on a regular basis, about 4 times a year.

As soon as the hardcopy Aries is published, the electronic version will not be too far behind, it will appear on the Society website as soon as our Webmaster, Mike Lancaster, gets the Aries content from me and can post it online.

I will be keeping the usual features, such as, Editorial, Society News and Astro News Desk, I am quite keen to re-introduce the 'Letters to the Editor' page, this appeared in previous Aries' and appeared to do quite well, this feature is a way for you, the Readership, to let me know what you are thinking, whether that is about Aries itself, or the Society, or even if you have a suggestion for the DDAS Committee to consider, then the 'Letters to the Editor' page is the place for you to do that. Also, if you have read a good astronomy/space book, or have any observing/imaging tips to share, then, again, this is the page for you.

One of Dave's ideas that I would like to try out is a 'Question and Answer Page, if any of you have any kind of astronomical question, or question about the Society, then this will be the place where you can submit your question and get your answer.

Another of Dave's ideas that I would like to see within the pages of Aries is 'Meet the DDAS Member', this section will give a profile of a chosen DDAS Member, it doesn't have to be a member of the DDAS Committee or any other DDAS 'high up', it can be any DDAS member, newcomer and veteran alike. This feature is a way for the DDAS to get to know its wider membership better; the 'profile' will come in the form of an interview with that member. I have a few ideas about who the first DDAS Member will be, keep watching the pages of Aries!

I am also going to continue the Crossword Page, so if we have any budding crossword setters in the Society, then please do send me your devilishly devious clues and I will ensure that they appear in Aries. Also, I am mulling an idea around my head that it may be a good idea to include an Aries 'Member's Astronomy Picture Gallery Page,' we have a number of excellent astro-imagers in the Society, so this would be a good page for them to display their latest imagery.

So that's that, Aries is back again and healthier than ever! But as I write this Editorial I get a feeling that things have come full circle in a way, when I was Aries Editor the last time, I started in 2005 and in the Spring of 2006 I produced an Aries and wrote the first part of an article concerning the launch and mission of a spacecraft called New Horizons and its intended destination, the then planet Pluto. And, as no doubt you have all noticed the images on the front and back pages of this Edition of Aries, that New Horizons has completed its mission and has flown by Pluto and its five moons and has revealed a world of such dazzling complexity and activity that it stuns the Mind!

So Pluto and Aries are getting to know each other again, with me in the Editor's Chair, who'd have thought it? I was Aries Editor when New Horizons was sent on its historic journey and I am Aries Editor again when it reached its mission destination! Full circle or what?! Be warned though, expect a comprehensive article regarding New Horizons and its mission to Pluto in the next Edition of Aries!

So what's in this Edition then? Well apart from the usual Society News and Astro News features, you will find the next in Arthur Tristram's Local Astronomers series, this time Arthur turns his attention to Long Eaton Astronomer and former British Astronomical Association (BAA) Saturn Section Director Alan Heath. Arthur went to visit Alan at his home in March 2015 and interviewed him for this article. Thanks to Arthur for his interviewing skills and such a fascinating article.

Then we have a Book Review by Malcolm Neal, Malcolm will be reviewing "Lonely Hearts of the Cosmos" By Dennis Overbye, the book centres on the life and professional discoveries of Alan Sandage, the book covers Cosmology and Particle Physics and how these two disciplines helped us understand the very nature of the Universe around us, with Sandage playing a major role.

Finally we have a report from "The Man from Buzzard" submitted by Stephen Webster, this edition of "The Man from Buzzard" concerns itself with an exhibition of a manned rocket launch in the 1960s with a Derbyshire link (You will not believe your eyes! - Editor).

Enjoy this Edition of Aries and let the Adventure begin!

Anthony Southwell

Society News

Meetings

2014

4th April

Images of the Universe Volume 4 – Paul Money

The April 4th meeting saw the return of a very good friend of the Society, Paul Money, to present the fourth volume in his “Images of the Universe” series. Paul has been developing this series for quite some time and it is a personal selection of what Paul regards as some of the most significant images of the Cosmos available. These are collected from well-known observatories, to space-based observatories, including the Hubble Space Telescope (How could you not include Hubble? - Editor) and imagery from space probes from all over the Solar system. Paul is currently working on Volume 5, as this series has become so popular.

24th April

DDAS Second Meeting – A Guide to the Stars – Anthony Southwell

The third Friday in April saw the next in the DDAS’ series of ‘second meetings’, these meetings are more of an informal format and allows newcomers and older members of the Society alike to come along and watch a more ‘practical’ astronomical presentation, see what’s in the night sky for that month, catch up on the latest Astronomy and Space News, have a cuppa and a chat and, if anyone has any questions, then they can get them answered at that meeting, something that is not always possible at the more ‘formal’ main meeting on the 1st Friday of the month.

This meeting saw DDAS Secretary Anthony Southwell give a presentation about the Stars, how they are born, how they go through their lifecycles, how they die and how their deaths contribute to the next generation of stars, also Anthony looked at the ‘corpses’ that some of these dying stars leave behind, such as, Neutron Stars, and the monsters of the Cosmos, Black Holes.

2nd May

DDAS Annual General Meeting

The results of the election of Society Officers and Ordinary Committee Members at the DDAS AGM held at the Friend’s Meeting House on Friday 2nd May 2014 were as follows:

Chairman	- Dave Selfe
Vice-Chairman	- Robert Seymour
Secretary	- Anthony Southwell
Treasurer	- Ian Bennett
Web Master	- Mike Lancaster
Site Curator	- Mike Dumelow
Aries Editor	- Dave Selfe

Ordinary Committee Members:

Tony Barker
Brian Dodson
Bob Richardson
Peter Sturgess

16th May

DDAS Second Meeting – A Guide to Astrophotography – Adrian Brown

The 16th May second meeting saw DDAS Member, and former DDAS Treasurer, Adrian Brown give a fascinating talk on astrophotography. Adrian is an accomplished astrophotographer and examples of his work have adorned the homepage of the DDAS website and appear quite regularly in the Gallery section of the DDAS website.

In his presentation Adrian discussed what equipment you need to begin in astrophotography, what cameras would be best a dedicated CCD camera or a Digital SLR, how you take an astro-image, how many images do you take of an object, what exposure times would be best, image stacking and processing. All in all this was a very comprehensive treatment of the subject and proved to be a fascinating talk and a real help to all those budding astro-imagers who we present at that meeting.

6th June

The Formation and Transformation of Galaxies – Professor Alfonso Aragón-Salamanca

The 6th June meeting of the DDAS saw Professor Alfonso Aragón-Salamanca from the School of Physics and Astronomy at the University of Nottingham.

Professor Aragón-Salamanca's lecture was a real eye-opener on the formation and transformation of galaxies, this Author thought he knew about the formation and evolution of galaxies, but boy, was he wrong on that score! It also seems that Dark Matter plays a more significant role in this process that was previously thought, or even imagined! The research continues.

5th July

DDAS BBQ at the Flamsteed Observatory

July was, as always, that staple Society tradition of the DDAS Barbeque. Our resident 'chef' Mike Lancaster was on hand to slave over a hot BBQ to serve up the beef burgers, sausages, chicken and anything else the assembled DDAS member had brought with them, and, clouds permitting, we would do some observing with the 10-inch in the Observatory and with the telescopes that members had brought with them.

1st August

Equipment Evening and Observing Session at the Flamsteed Observatory

Our second meeting away from the Friend's Meeting House during the 'Summer Break' is the Equipment Evening/Observing session at the Society's Flamsteed Observatory. Members are encouraged to bring their own telescopes along and observe, clouds permitting of course.

5th September

Rosetta: Learning the Language of Comets – Anthony Southwell

The 5th September meeting of the DDAS saw the DDAS Secretary, Anthony Southwell present a talk titled "Rosetta: Learning the Language of Comets." With the arrival of the Rosetta spacecraft at Comet 67P/Churyumov-Gerasimenko and with the release and (hopefully successful) landing of its lander probe known as 'Philae,' it was high time that we took a look at these wispy wanderers in the sky. Anthony took his audience on a journey of discovery, we looked at the ancient observations of Comets when their real nature was not known, how comets were perceived by civilisations and peoples in historical times as portents for good or ill, Anthony took a look at some examples of 'Comet Madness,' examples of some of the hype and wacky ideas that would put modern-day 'silly-season' stories to shame, then he went on to look at how we came to understand Comets through the work of people like Newton, Halley, Whipple and Oort and so on, we looked at what Comets actually are, Comets as friend or foe, he looked at notable Comets of the past, and finally, Anthony introduced the audience to all the probes that have visited comet such as Giotto, Vegas 1 and 2, Stardust (which returned a sample of cometary dust for analysis back on Earth – Editor), Deep Space 1, Deep Impact (which released a 1 ton instrumented 'lump' of copper to impact on the surface of Comet Tempel 1 in 2005, the see the September/December 2005 issue of Aries – Editor),

and, last, but not least, Rosetta, its mission, the latest images from Comet 67/P and the much anticipated landing of Philae on 67/P.

19th September

DDAS Second Meeting – Telescope Clinic/Workshop

The September Second Meeting was a Telescope Clinic/Workshop. Members were invited to bring their own telescopes to the meeting if they needed any help or advice regarding their use, maintenance, storage and so on, this was the meeting where they could get answers to their questions, also there would be practical demonstrations to help telescope users old and new hone their 'telescopic skills.'

3rd October

A Beginner's Guide to Astrophotography – Adrian Brown

With Adrian's Astrophotography presentation being so successful at the 16th May second meeting, it was decided that we should invite him back to do a more 'expanded' talk at a main meeting, Adrian agreed and this talk was the result. The talk itself pretty much followed the format of his Second Meeting talk, but he also gave practical demonstrations of image stacking, correction and image processing techniques to produce the best astro-image you can from the equipment utilised. Again, another comprehensive and fascinating talk and with the practical demonstrations in image processing, it was an invaluable guide to astro-imagery.

17th October

DDAS Second Meeting – The Autumn Night Sky – Dave Selfe

The October Second Meeting saw DDAS Chairman, Dave Selfe, take a look at what's in the Autumn Night Sky. Dave also selected what he thought were the best objects to observe in the Autumn night Sky, all this was done using the extremely useful free software astronomy package "Stellarium."

7th November

There's Gold in Them Thar Stars – Professor Nial Tanvir

The November meeting saw former DDAS member and now Professor Nial Tanvir of the Department of Physics and Astronomy at the University of Leicester present a lecture titled "There's Gold Them Thar Stars." This lecture concerned itself with the stars as 'celestial alchemists,' how stars create the elements that make up the Universe in their cores and how those elements are released into the Universe to feed the formation of the next generation of stars who will go on to create more elements in turn. A very good introduction in to stellar physics and astrophysics in general.

21st November

DDAS Second Meeting – Preparing to Observe: How to Set up Your Telescope – Anthony Southwell

The November Second Meeting saw DDAS Secretary Anthony Southwell conduct a practical demonstration on how to set your telescope up to observe, to do this Anthony used his own 6-inch Skywatcher Newtonian to demonstrate how to set up for an observing session, the demonstration was so comprehensive and 'realistic' that Anthony even demonstrated how to drop items such as small screws, eyepiece caps and eyepieces on the ground! Much was learnt by all present (or much was learnt on how not to do things! – Editor)!

5th December

A Curious Passion – Katie Smith

The December Meeting saw DDAS Member Katie Smith present a talk titled "A Curious Passion," which was something of a personal journey though Science, with an Astronomical focus. Katie's talk looked at the nature of light, its colours, how infrared light was discovered by William Herschel and so on, she then went on to look at Gravity. It was an engaging romp through Science seen through the lens of Astronomy (no pun intended, honest! – Editor).

19th December

DDAS Second Meeting - How to Sketch Objects Seen Through the Telescope – John Brown

The December Second Meeting saw DDAS Member John Brown give a presentation on something this Author has never thought to try at the telescope, actually drawing what you see at the telescope eyepiece. John showed his audience how to sketch what you see whilst at the eyepiece, what information to record to log your observation and drawing, the 'tricks of the trade' of astronomical sketching, also how to finish off and 'tidy-up' your drawings. A very interesting talk on an aspect of astronomical; observing that this Author had not considered, astrophotography, yes, but drawing what you observe, no, the thought had not occurred. John also brought along a few examples of his drawings, and they are quite breath-taking and detailed.

2015

9th January

Society Quiz

The January 2015 meeting saw that other great Society tradition, the annual Society Quiz. As usual, we were split into four teams and, once again, the master of torment, sorry, Quizmaster, was our very own Arthur Tristram. The standard of question setting was the same as always, fiendish! I can't remember which team won, in fact, I can't I can't remember the names of the teams! I think the team this Author was on came second. But we all left the Quiz with headaches afterwards and beat a hasty retreat to the Seven Stars! Thanks again to Arthur Tristram for all his efforts with the Quiz.

23rd January

DDAS Second Meeting – Telescope Advice Clinic

The January Second Meeting saw another Telescope Advice Clinic being run, this time DDAS Chairman, Dave Selfe and DDAS Secretary, Anthony Southwell were on hand to help with advice and to answer any questions the audience had.

6th February

WIMP Hunting: The Hunt for Dark Matter – Dr Anne Green

The February main meeting saw Dr Anne Green from the School of Physics and Astronomy at the University of Nottingham to visit to present her "WIMP Hunting: The Hunt for Dark Matter" lecture. This lecture looked at the search for Dark Matter and what it could be, the WIMP part of the title stands for 'Weakly Interacting Massive Particles,' which is what Dark Matter is thought to be. WIMPs, Dark Matter, call it what you may, are particles that are so odd, that they do not interact with 'normal' matter, in fact, a billion Dark Matter particles can pass through the tip of your little finger and you would not feel it, and they would carry on and go straight through the Earth, as if it were not there, and carry on. These particles are like ghosts, Dr Green's lecture looked at the latest research in this area and discussed likely ways in which you could detect a Dark Matter particle, what these particles might be and how the Large Hadron Collider at CERN could help us in this search.

Why chase after such an elusive thing? Well it turns out, dear reader, that Dark Matter plays a more important role in the Universe than we think. All the Planets, Stars, Galaxies, clusters of Galaxies, and so on in the Universe only makes up 4% of the Universe, the other 96% of the Universe is missing, this is where Dark Matter comes in, it probably makes up that 96% (there is Dark Energy too, but that is a different story! – Editor) of the missing mass, but we have no idea what it is, but we do know it has mass and, therefore, it can have a gravitational influence, Dark Matter influences the large scale structure of the Universe and, as it turns out, that it also plays a vital role in the formation and evolution of Galaxies.

So for something that you cannot see, touch or feel and that makes up 96% per cent of the Universe, it is vitally important that we find out what this stuff and that will give us a better understanding of the true nature of the Universe we live in. It would be interesting to invite Dr Green back at a later stage so she can update us on the hunt for Dark Matter.

20th February

DDAS Second Meeting - How to Sketch Objects Seen Through the Telescope – John Brown

Because his first 'Drawing at the Telescope' talk was so successful and after hearing that those who missed the first one wanted to see it, it was decided that John Brown would present his "How to Sketch Objects Seen Through the Telescope" presentation at the February Second Meeting. And this second outing for this talk was every bit a success as the first one.

6th March

Percival Lowell and the Canals of Mars – Dr Ann Bonnell

The March meeting saw Dr Ann Bonnell of the Leicester Astronomical Society visit the DDAS to present her "Percival Lowell and the Canals of Mars" lecture. In this lecture Dr Bonnell looked at some of the early observations of Mars and the life and ideas of Percival Lowell and how his obsession with gaining evidence for 'canals' on Mars led to the establishment of one of the World's most famous observatories, the Lowell Observatory in Flagstaff, Arizona, the place where in 1930 Clyde Tombaugh discovered Pluto.

20th March

DDAS Second Meeting – The Essential Book List for Amateur Astronomers

The March Second Meeting was a little different to previous one, rather than looking at equipment and observing techniques, astrophotography and drawing at the telescope, the meeting concerned itself with what astronomical books should be on the shelf of an amateur astronomer. Members were asked to bring in their books and talk about them. This meeting saw DDAS Chairman, Dave Selfe and DDAS Secretary, Anthony Southwell bring in a number of books which they thought should be on the bookshelves of an amateur astronomer, these included such books as Norton's Star Atlas, The Backyard Astronomer's Guide and Cosmos by Carl Sagan amongst others.

10th April

A Beginner's Guide to Astrophysics – Julian Onions

The April meeting was held a little late due to the Easter Holidays and saw Julian Onions from the School of Physics and Astronomy present a talk on "A Beginner's Guide to Astrophysics." The talk was a very comprehensive overview of astrophysics and how stars produce energy via nuclear fusion processes.

24th April

DDAS Second Meeting – Piers, Planks and PODS: Building Your Own Observatory – Mike Lancaster and Brian Dodson

The April Second Meeting saw DDAS Members Dr Mike Lancaster and Brian Dodson discuss their experiences building their respective astronomical construction projects. Brian discussed the construction of a Pier in his back garden for his 5" Explore Scientific Refractor and Mike spoke about his experiences building his Skyshed POD Observatory in his backyard. Both presentations were very interesting and gave a lot of useful advice concerning what to do, and more importantly, what not to do, when building these projects.

1st May

DDAS Annual General Meeting

The results of the election of Society Officers and Ordinary Committee Members at the DDAS AGM held at the Friend's Meeting House on Friday 1st May 2015 were as follows:

Chairman	- Dave Selfe
Vice-Chairman	- Robert Seymour
Secretary	- Brian Dodson
Treasurer	- Ian Bennett
Web Master	- Mike Lancaster

Site Curator - Mike Dumelow
Public Relations Officer - Anthony Southwell
Aries Editor - Anthony Southwell

Ordinary Committee Members:

Tony Barker
Libby Ray
Mike Noble
John Brown

15th May

DDAS Second Meeting – Using Telescopes and Binoculars

The May second meeting saw DDAS Chairman, Dave Selfe and DDAS Secretary, Anthony Southwell take a look at using telescopes and binoculars, a few members brought their telescopes to the meeting and Anthony brought in his pair of Orion Optics 17X50 binoculars. Useful advice was given concerning using telescope and binoculars for observing.

Events

DDAS 40th Anniversary Day

2014 was the 40th Anniversary year of the DDAS and it was decided that we should mark this event by holding a special Anniversary Celebration and Open Day at the Friend's Meeting House on Saturday 21st June. The Anniversary Celebration Day took the form of a series of four talks given by guest speakers through out the day, and indoor DDAS display with members telescopes and other equipment, posters, books and even a 'model' of the Solar System laid out on a table, and a large amount of DDAS archival material.

The four talks presented throughout the day were:

In the Footsteps of Flamsteed – Dr Mike Lancaster Derby and District Astronomical Society

Observing Star Clusters – Martin Griffiths of the University of South Wales

After lunch:

Images of Space – Art or Science – Paul Money

Professional and Amateur Astronomy - Dr Colin Steele of the University of Manchester

If you fancied a cuppa and a biscuit or a cake, then we had a little 'café area' set up in another room in the Friend's Meeting House in which you could relax and watch a DDAS slide show as you drank your tea or coffee.



A View of the DDAS Display in Room 1 of the Friend's Meeting House.

Image Credit: Bill Miles

And for once the weather was kind to us, we had a lovely sunny day and we even had a few solar telescopes set up in the garden area at the rear of the Meeting House, in fact, one of our guest lecturers, Martin Griffiths, even brought his Coronado Solar Telescope with him and set it up in the Garden!

Even the DDAS' Founder Member, Mrs Jane Kirk, turned up and presented the Society with a present, an 8.5" mirror and a flat, these were then incorporated, by our Site Curator, Mike Dumelow, into the "Jane Kirk 40th Anniversary Telescope, or JK-40 as it has become known as in DDAS circles.



Solar Telescopes set up outside in the Garden of the Friends Meeting House.

Image Credit: Barry Ashforth

The only fly in the ointment on the day was that, despite all our efforts at promoting this event, in fact, the day before, our Secretary, Anthony Southwell, was on Radio Derby and also plugged the event, but the public seemed to stay away. It was just our bad luck that on the same day as our 40th Anniversary Celebration, there was an event going on in the Market Place. In an attempt to get more members of the public through the door, DDAS member Bill Miles took a bunch of leaflets and had a walk around the around the City Centre handing them out to people, thanks again to Bill for all his efforts. All in all, despite the lack of public attendance, the day went very well, we were treated to four fine speakers and a good time was had by all who were present (looking forward to the 50th Anniversary event – Editor).

25th October

Stargazing Session and Exhibition at Brookfield Social Club

As part of our 40th Anniversary celebrations we decided to take the DDAS 'On The Road,' we were invited to come to the Brookfield Social Club in Barrow on Trent to set up a display inside and have a few member telescopes outside so we could show the members of the public who turned up, the night sky. We thought that would be a good thing to do as part of our 40th Anniversary thanks to DDAS Member Brian Dodson for all his hard work in co-ordinating this event. In fact, the local school wanted to get involved and Brian ended up giving a short talk to the local Primary School children shortly before the event took place.

The event itself went very well we had a good turn out from the Society, we had four telescopes set up outside for public observing, including the newly-constructed JK-40, inside we had a 6-inch Skywatcher Newtonian on display, the Society display board was there, we had two meteorites, stony and nickel-iron examples, which both weight quite a bit, from the marvellous collection of DDAS Member Graham Ensor. The Society Moon Globe took a prominent position and attracted a lot of attention, a large number of books were on display and we had not one, not two, but three presentations running, one was running off the Society laptop and was showing the DDAS slideshow, the Author's laptop was on hand running a video showing the scale of the Universe from the Social Club's digital projector, which went down very well, and Peter Branson brought along his laptop and showed a presentation showcasing some of his astrophotos.

All those who were there enjoyed the event very much, the Author never stopped talking to the public and answering their questions all evening! Everyone seemed so enthusiastic and interested, one young lady, near the end of the evening came up to have a look at the Moon Globe and when she noticed the Apollo astronaut signatures on the Moon Globe, she asked how much longer we would be there, as she wanted to run back home and get her parents to have a look and they turned up a few minutes later! Amazing!

The only let down was that it was cloudy and it began to spot with rain, so there was no observing to be done, which disappointed everyone there, but we have been invited back for 2015 for a second visit!

24th January

Stargazing in Alvaston Park



DDAS Members setting up their telescopes for public observing next to the football field at Alvaston Park.

Image Credit: Friends of Alvaston Park/Peter Edges Photography

Another event that is fast becoming a Society tradition is the Stargazing in Alvaston Park. This event is run by the Friends of Alvaston Park and is planned to coincide with the BBC Stargazing Live programmes, or be held very soon after them, but this year, there was no Stargazing Live in January, the programme was going to run in March to cover the Total Solar eclipse, which would be around 92% total depending on where you were in the UK. So it was decided that the Stargazing event at Alvaston Park would still be run in January. Saturday 24th January came and it was looking good until it came to the evening and the clouds began to close in!

We had a static indoor display of Society member's astrophotos and a range of Society handouts for people to take away with them. Also we had a number of member's telescopes outside for member of the general public to observe with, in fact we had six telescopes on duty that evening.

After playing cat and mouse with the clouds most of the evening, we managed to do a little observing with Jupiter and M42 in Orion being the main targets. Despite the clouds doing their level best to ruin things, the event was a complete success and those members of the public who were lucky enough to see anything were so enthusiastic and amazed at what they saw. For many of them it was the first time that they had seen Jupiter!



DDAS Members and the General Public at the public observing session at Alvaston Park.

Image Credit: Friends of Alvaston Park/Peter Edges Photography

14th February

Stargazing in Allestree Park

We repeated our observing session at Alvaston Park with a similar observing event at Allestree Park on Saturday 14th February, we had around five member's telescopes there on the night, one of them, the Author's 6-inch Skywatcher Newtonian was the indoor display telescope. The DDAS display consisted of the Display Board, books, posters, members astrophotos and Society handouts. Unfortunately, due to the awful weather, overcast and rainy, there was very little in the way of observing going on, but the indoor display did pretty well with a good number of visitors.



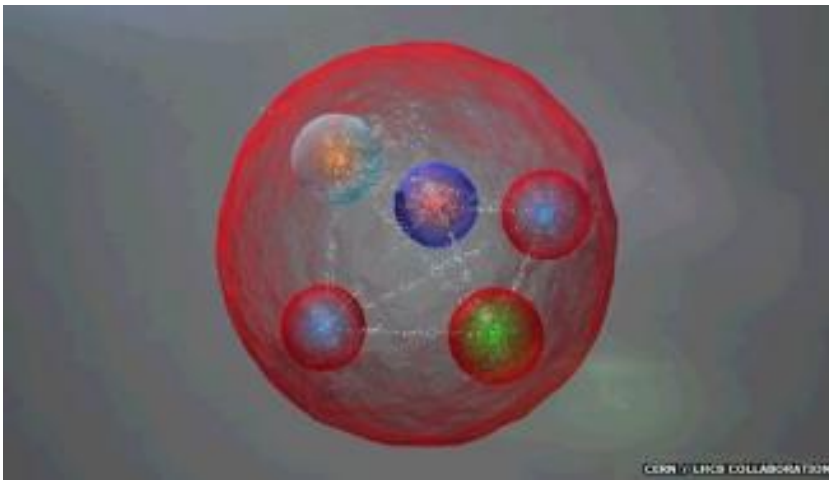
DDAS Members Anthony Southwell and Mike Dumelow at the the DDAS indoor display at Allestree Park.

Image Credit: Friends of Allestree Park

Astro News Desk

BBC News Website – 14th July

Large Hadron Collider Discovers New Pentaquark Particle



An Artist's representation of the Pentaquark.

Image Credit: BBC News/CERN

Scientists at the Large Hadron Collider have announced the discovery of a new particle called the pentaquark.

It was first predicted to exist in the 1960s but, much like the Higgs boson particle before it, the pentaquark eluded science for decades until its detection at the LHC.

The discovery, which amounts to a new form of matter, was made by the Hadron Collider's LHCb experiment. The findings have been submitted to the journal *Physical Review Letters*.

In 1964, two physicists - Murray Gell Mann and George Zweig - independently proposed the existence of the subatomic particles known as quarks.

They theorised that key properties of the particles known as baryons and mesons were best explained if they were in turn made up of other constituent particles. Zweig coined the term "aces" for the three new hypothesised building blocks, but it was Gell-Mann's name "quark" that stuck.

This model also allowed for other quark states, such as the pentaquark. This purely theoretical particle was composed of four quarks and an antiquark (the anti-matter equivalent of an ordinary quark).

New States

During the mid-2000s, several teams claimed to have detected pentaquarks, but their discoveries were subsequently undermined by other experiments.

"There is quite a history with pentaquarks, which is also why we were very careful in putting this paper forward," Patrick Koppenburg, physics co-ordinator for LHCb at Cern, told BBC News.

"It's just the word 'pentaquark' which seems to be cursed somehow because there have been many discoveries that were then superseded by new results that showed that previous ones were actually fluctuations and not real signals."

Physicists studied the way a sub-atomic particle called Lambda b decayed - or transformed - into three other particles inside LHCb. The analysis revealed that intermediate states were sometimes involved in the production of the three particles. These intermediate states have been named Pc(4450)+ and Pc(4380)+.

"We have examined all possibilities for these signals, and conclude that they can only be explained by pentaquark states," said LHCb physicist Tomasz Skwarnicki of Syracuse University, US.

Previous experiments had measured only the so-called mass distribution where a statistical peak may appear against the background "noise" - the possible signature of a novel particle.

But the collider enabled researchers to look at the data from additional perspectives, namely the four angles defined by the different directions of travel taken by particles within LHCb.

"We are transforming this problem from a one-dimensional to a five dimensional one... we are able to describe everything that happens in the decay," said Dr Koppenburg who first saw a signal begin to emerge in 2012.

"There is no way that what we see could be due to something else other than the addition of a new particle that was not observed before."

LHCb spokesperson Guy Wilkinson commented: "The pentaquark is not just any new particle... It represents a way to aggregate quarks, namely the fundamental constituents of ordinary protons and neutrons, in a pattern that has never been observed before in over fifty years of experimental searches.

"Studying its properties may allow us to understand better how ordinary matter, the protons and neutrons from which we're all made, is constituted."

The LHC powered up again in April following a two-year shutdown to complete a programme of repairs and upgrades.

Universe Today – 13th July 2015

Big Discovery from NASA's New Horizons; Pluto is Biggest Kuiper Belt Body



An image mosaic of Pluto and Charon made from New Horizons images. These images of Pluto and Charon were the last to be sent back to Earth before New Horizons' historic flyby of the Dwarf Planet its system of moons on 14th July 2015.

Image Credit: Universe Today/NASA/JPL/Johns Hopkins Applied Physics Laboratory

Plutophiles everywhere rejoice. On the eve of history's first ever up close flyby of mysterious Pluto on Tuesday morning July 14 making the first detailed scientific observations, NASA's New Horizons has made a big discovery about one of the most basic questions regarding distant Pluto. How big is it?

Measurements by New Horizons gathered just in the past few days as the spacecraft barrels towards the Pluto planetary system now confirm that Pluto is indeed the biggest object in the vast region beyond the orbit of Neptune known as the Kuiper Belt. Pluto is thus the undisputed King of the Kuiper Belt!

Pluto measures 1,473 miles (2,370 kilometers) in diameter, which is at the higher end of the range of previous estimates. Stern also confirmed that frigid Pluto also has a polar cap composed of methane and nitrogen ices based on measurements from the Alice instrument.

"We knew from the time we designed our flyby that we would only be able to study the small moons in detail for just a few days before closest approach," said Stern. "Now, deep inside Pluto's sphere of influence, that time has come."

But because they are so small, accurate measurement with LORRI could only be made in the final week prior to the July 14 flyby.

Nix is estimated to be about 20 miles (about 35 kilometers) across, while Hydra is roughly 30 miles (roughly 45 kilometers) across. These sizes lead mission scientists to conclude that their surfaces are quite bright, possibly due to the presence of ice.

Determinations about Pluto's two smallest moons, Kerberos and Styx, will be made later at some point during the 16-month long playback of data after the July 14 encounter.

It has been three decades since we last visited planetary bodies at the outer reaches of our solar system when Voyager 2 flew past Uranus and Neptune in 1986 and 1989.

New Horizons is closing in fast on its quarry at a whopping 31,000 mph (49,600 kph) after a nine year interplanetary voyage and is now less than half a million miles away, in the final hours before closest approach.

The New Frontiers spacecraft was built by a team led by Stern and included researchers from SwRI and the Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Maryland. APL also operates the New Horizons spacecraft and manages the mission.

Universe Today – 14th July 2015

New Horizons Phones Home, Flyby a Success

Whew! We're out of the woods. On schedule at 9 p.m. EDT, New Horizons phoned home telling the mission team and the rest of the on-edge world that all went well. The preprogrammed "phone call" — a 15-minute series of status messages beamed back to mission operations at the Johns Hopkins University Applied Physics Laboratory in Maryland through NASA's Deep Space Network — ended a tense 21-hour waiting period.

The team deliberately suspended communications with New Horizons until it was beyond the Pluto system, so the spacecraft could focus solely on data gathering. With a mountain of information now queued up, it's estimated it will take 16 months to get it all back home. As the precious morsels arrive bit by byte, New Horizons will sail deeper into the Kuiper Belt looking for new targets until it ultimately departs the Solar System.

Assuming NASA funds a continuing mission, the team hopes to direct the spacecraft to one or two additional Kuiper Belt objects (KBO) over the next five to seven years.

BBC News Website – 10th August 2015

Survey Puts Figure on Fading Cosmos

A team of astronomers has published a multi-coloured survey of five chunks of space - and offered the best estimate yet of how fast the Universe is fading.

They analysed the light from 200,000 galaxies in 21 wavelengths and found that the energy output of the Universe has nearly halved in two billion years.

This agrees with previous calculations, confirming that the lights are slowly going out right across this spectrum.

The drop is largely due to the falling rate at which new stars are formed.

The results, which come from the Galaxy and Mass Assembly (GAMA) survey, were unveiled at the general assembly of the International Astronomical Union in Honolulu, Hawaii.

"We used as many space and ground-based telescopes as we could get our hands on to measure the energy output of over 200,000 galaxies across as broad a wavelength range as possible," said GAMA's principal investigator Prof Simon Driver, from the International Centre for Radio Astronomy Research in Western Australia.

He and his team are now opening up this huge collection of data for other astronomers to work on.

"The data release means that a whole lot more people outside the team are going to be able to jump on the data and do science with it, which is incredibly important," said Dr Stephen Wilkins of the University of Sussex, another GAMA team member.

He told BBC News that the strength of GAMA is that it combines so many wavelengths, where previous surveys have concentrated on a few.

Because the team used a variety of the world's most powerful telescopes - both earthbound and in orbit - their analysis spans wavelengths from UV light to infrared, including the small strip of visible wavelengths in the middle.

That means they can look at light from stars that are both young and old, as well as light that has been absorbed and then re-emitted by dust. So the new assessment of the Universe's decline includes information from a huge variety of galaxies, including those hidden behind dust.

'Nodding off'

"We know that star formation peaked a few billion years ago and has been declining since. This is just a new way of measuring that decline," Dr Wilkins said. "It's a new spin, and it completely agrees with the previous results - but it's tightened the error bars as well."

Specifically, when the team totted up the total energy output of galaxies at three different ages, they saw a steady slump. In total, from 2.25 billion years ago to 0.75 billion years ago, the Universe's output apparently fell by about 40%. "The rate at which stars are forming is slowing down so much that we are now starting to see the total energy output of all the stars decreasing," Dr Wilkins explained. This happens because the stars that already exist - on average - get older, smaller and less energetic.

Prof Driver wrapped the findings into a sad but cosy analogy: "The Universe will decline from here on in, like an old age that lasts forever," he said. "The Universe has basically sat down on the sofa, pulled up a blanket and is about to nod off for an eternal doze." The eventual end of the Universe is still an awfully long way off, the team said - and it is far too early to put a date on it.

"The rate at which stars form is probably going to decline more and more," Dr Wilkins said. "So the Universe will, based on our expectations, become fainter and fainter and fainter. But there's a huge amount of uncertainty there because we don't understand so much of the underlying cosmology."

The team's analysis of the great cosmic drowsiness has been submitted to the Monthly Notices of the Royal Astronomical Society, but is not yet peer-reviewed.

Dr Aprajita Verma, an astrophysicist at the University of Oxford, said GAMA offered a unique and valuable data set because of its spread of wavelengths.

"We know that galaxies can exhibit very different properties if you look at them purely in the visible, compared to other wavelengths," she told the BBC. "This study is making a census of their emissions, right the way from the UV through to the sub-millimetre range."

Dr Verma was also pleased the wider research community would get its hands on the data. "It will spawn lots of new studies," she said.

Rosetta: Comet 67P makes closest approach to Sun



A Rosetta OSIRIS camera image of active jet escaping the surface of Comet 67/P on 29th July 2015.

Image Credit: Universe Today/European Space Agency/Rosetta/ OSIRIS

Comet 67P has passed the closest point to the Sun in its 6.5-year orbit, with the European spacecraft Rosetta still in orbit around it. This landmark, called “perihelion”, occurred at 03:03 BST on Thursday, when 67P was 186 million km from the Sun - a distance that puts it between the orbits of Earth and Mars. The Rosetta team has been studying the small, icy world as it warms up.

It has released dust and gas, including a very bright jet seen on 29 July. Scientists have also seen a “boulder” - a chunk of the comet nucleus - travelling through space above 67P’s surface. Dramatic images of the dust and gas outburst - the brightest jet seen so far by Rosetta’s cameras - were released on Tuesday by the European Space Agency, Esa.

“Usually, the jets are quite faint compared to the nucleus and we need to stretch the contrast of the images to make them visible - but this one is brighter than the nucleus,” said Carsten Guettler, a member of the Osiris camera team from the Max Planck Institute for Solar System Research in Germany. The material released by comets, as they become more active on approach to the Sun, is the reason for their characteristic tails when they appear in the night sky. This particular jet, caused by frozen ices turning to gas and pouring out into space, was bright and brief. Three photos, each separated by 18 minutes, capture it appearing and fading.

Tumultuous activity like this is not necessarily expected to coincide with perihelion, as any temperature increase is gradual - and also lags behind the comet’s actual distance from the Sun. “The solar flux increase between today, tomorrow and the day after is almost immeasurable,” said Mark McCaughrean, senior science advisor at Esa.

He likened the comet’s perihelion to the summer solstice, which is not the warmest day of summer on Earth. “On the Earth there’s a thermal lag, and that’s true on the comet too. It reaches peak sunlight tomorrow, but it probably doesn’t reach peak activity. “We don’t know exactly when that peak will be. Nobody’s ever done this before.”

In a Google Hangout, Holger Sierks, principal investigator for Rosetta’s Osiris instrument, said of the “boulder” from 67P: “We found the first resolved chunk leaving the nucleus.”

We do not know what the distance to it is. If it’s in the plane of the nucleus, it would be about 40m in size. But we have an indication it might be closer to the spacecraft, which would change the size of the chunk we see in our images to something like 1m.”

It was just over a year ago, on 6 August 2014, that Rosetta first arrived at Comet 67P/Churyumov-Gerasimenko. It has spent the intervening months in orbit, manoeuvring itself as close as 30km to the surface of the duck-shaped “icy dirtball”.

In the last few months, increasing flows of dust around the comet have forced the probe to retreat. “We’ve now moved back to 300-plus km,” Prof McCaughrean said. “Because activity is building up, we are constantly monitoring the navigation cameras, in case they lose lock. And the engineers are pre-emptively moving the spacecraft further away.

“Activity will build up further after perihelion, so we’ll probably move even further away - then wait to go back in again. Probably by the end of the year we’ll be back down at 10-30km. At that point, we get to see what’s changed.” The Philae lander, meanwhile, is still on the comet’s surface, but not communicating.

After Rosetta dropped it onto the comet in November 2014, its historic but wayward landing finished in the shade, making it difficult for Philae’s solar panels to charge its batteries. It has only briefly “phoned home” again since, and controllers are unsure if they will ever regain a stable line of communication between Rosetta and its slumbering lander.

BBC News Website – 14th August 2015

Young ‘alien Jupiter’ Planet Discovered

A planet 100 light-years away resembles an infant version of Jupiter, astronomers say. The new world, known as 51 Eridani b, is only 20 million years old - a toddler by astronomical standards.



An Artist’s impression of Exo-Planet 51 Eridani b

Image Credit: BBC News Website/SETI Institute

The alien world could yield clues to the formation of our Solar System, which has an unusual lay-out. The find was made by the Gemini Planet Imager (GPI), which looks for faint, young planets orbiting bright, relatively nearby stars.

The new world shows the strongest methane signature ever detected on an alien planet. Previous Jupiter-like exoplanets have shown only faint traces of methane, making them very different from the heavy methane atmospheres of gas giants in our Solar System. The astronomers also detected water, using GPI's spectrometer instrument.

These findings indicate that it might be similar to planets in our Solar System, yielding additional clues to the formation of giant, astronomical bodies. The vast majority of alien solar systems that have been discovered are very different from our own, with massive planets - so-called "hot Jupiters" - orbiting close to their stars. This is partly because such systems are easier to detect with the techniques currently used to search for planets orbiting distant stars.

"Previous search methods couldn't find systems like our own, with small, rocky worlds close to their star and large, gas giants at large distances like Jupiter and Saturn," said co-author James Larkin, from the University of California, Los Angeles (UCLA).

"The search for large planets at large separations from their star is exactly the goal of GPI. These solar systems are likely much more similar to our own." Studying such worlds should reveal how common our Solar System architecture truly is.

A tale of two theories

Astronomers believe the gas giants in our Solar System formed slowly - by building up a large core over a few million years and then pulling in a huge amount of hydrogen and other gases to form an atmosphere. This is known as a "cold-start". But the Jupiter-like exoplanets that have been discovered so far are much hotter than models have predicted. This hints that they could have formed quickly - as gas collapses to make a scorching planet in what is known as a "hot-start".

The core build-up process can also form rocky planets like the Earth. But the fast collapse process might only make giant gas planets. The planets in our Solar System are 4.5 billion years old, but at just 20 million years old, 51 Eridani b might be young enough to reveal clues about how it was created. "This planet really could have formed the same way Jupiter did; the whole solar system could be a lot like ours," said co-author Bruce Macintosh, from Stanford University's Kavli Institute.

The new gas giant is roughly twice the mass of Jupiter. Until now, the gas giant planets that have been directly detected have been much larger - five to 13 times Jupiter's mass.

It orbits a little further from its parent star than Saturn does from the Sun and has a temperature of 430C (800F), hot enough to melt lead, but still rather cold compared with other alien gas giants, which reach temperatures above 540C (1,000F).

The Gemini Planet Imager is installed on the 8m Gemini South Telescope in Chile. It began science operations in 2014. Other scientific instruments designed to detect exoplanets do so indirectly, by, for example, detecting the dip in starlight as a planet passes in front of its parent sun. GPI instead searches for light from the planet itself - referred to as direct imaging.

The astronomers use adaptive optics to sharpen the image of a star, and then block out the starlight. Any remaining incoming light is then analysed, with the brightest spots indicating a possible planet.

BBC News Website – 26th August

Black holes preserve information about the stuff that falls into them, according to Professor Stephen Hawking.

Physicists have long argued about what happens to information about the physical state of things that are swallowed up by black holes. This information was thought to be destroyed, but it turned out that this violated laws of quantum physics. Prof Hawking now says the information may not make it into the black hole at all, but is held on its boundary.



Professor Stephen Hawking

Image Credit: BBC News Website

In broad terms, black holes are regions in space where the gravity is so strong that nothing that gets pulled in - even light - can escape. At the same time, the laws of quantum mechanics dictate that everything in our world can be broken down into information, for example, a string of 1s and 0s. And according to those laws, this information should never disappear, not even if it gets sucked into a black hole.

But according to Einstein's theory of general relativity, the information must be destroyed. This quandary is known as the information paradox. Prof Hawking believes the information doesn't make it inside the black hole at all.

"The information is not stored in the interior of the black hole as one might expect, but in its boundary - the event horizon," he told a conference at the KTH Royal Institute of Technology in Stockholm, Sweden. The event horizon is a boundary, or point of no return, where escape from the gravitational pull of the black hole becomes impossible.

Hawking has been working with Cambridge colleague Prof Malcolm Perry and Harvard professor Andrew Strominger on the problem. They believe that information at the event horizon is transformed into a 2D hologram - a phenomenon known as a super translation.

"The idea is the super translations are a hologram of the ingoing particles," Hawking explained. "Thus, they contain all the information that would otherwise be lost."

Prof Marika Taylor, a theoretical physicist at the University of Southampton, told BBC News: "Einstein's theory says that matter gets sucked into the black hole, falling behind its event horizon.

"Holography seems to suggest that Einstein's picture of black holes isn't right. In particular, it's not clear that there is actually an 'inside' to black holes at all - matter which gets sucked in might get stuck at the event horizon and hang around as a hologram there."

But she added that there was no consensus on this.

On the question of matter getting stuck at the event horizon, she said: "Nobody really understands the details of how this happens - this is what Hawking is trying to work out and what other related ideas 'fuzzball' and 'firewall' explore too."

There's currently little additional detail on the maths behind Prof Hawking's talk, but he and his collaborators plan to publish a scientific paper in coming weeks. Light particles - or photons - can be emitted from black holes due to quantum fluctuations, a concept known as Hawking radiation. Information from the black hole might be able to escape via this route.

But, Prof Hawking says it would be in "chaotic, useless form," adding: "For all practical purposes the information is lost." If the information was not in this chaotic form, an observer might be able to reconstruct everything that had fallen into the black hole if they were able to wait for a vast amount of time.

Universe Today – 29th August

NASA and New Horizons Team Pick Post-Pluto Target

NASA and the science team behind the New Horizons mission to Pluto and beyond have settled on the popular choice for the spacecraft's next flyby: It's 2014 MU69, an icy object a billion miles beyond Pluto that's thought to be less than 30 miles (45 kilometers) wide.

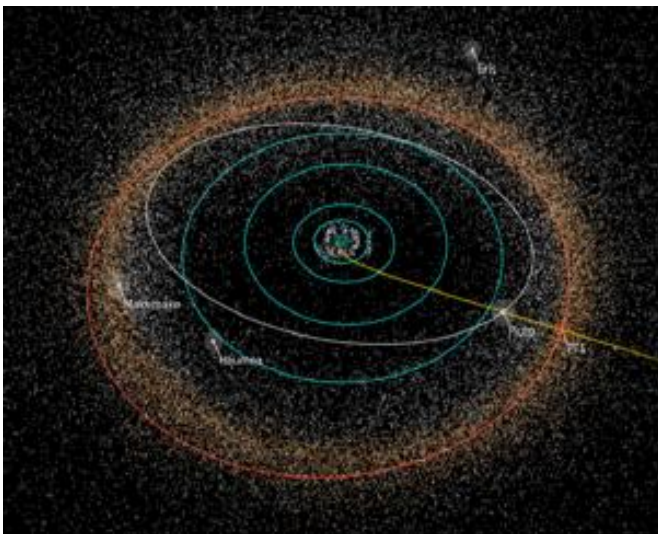
That's 10 times bigger than, say, the comet targeted by the European Space Agency's Rosetta probe – but on the order of 1 percent as wide as Pluto. The New Horizons team suspects that 2014 MU69 represents a primordial object in the Kuiper Belt, the vast ring of icy material that lies beyond the orbit of Neptune.

Studying such a Kuiper Belt object, or KBO, should satisfy the mission's post-Pluto objective of documenting the diversity of worlds at the solar system's edge. "It is just the kind of ancient KBO, formed where it orbits now, that the Decadal Survey desired us to fly by," New Horizons principal investigator Alan Stern said Friday in a NASA news release.

2014 MU69, also known as Potential Target 1 or PT1, was one of three objects identified after a months-long search that drew upon the observing power of the Hubble Space Telescope. Although an alternate target known as PT3 was somewhat brighter and probably bigger, PT1 was favored because there's a 100 percent chance of reaching it with the fuel that was left on the New Horizons spacecraft after last month's big Pluto flyby.

The New Horizons team has planned a series of four maneuvers in October and November to send the piano-sized probe toward 2014 MU69, but NASA won't be able to give the final go-ahead for the extended mission until the team makes a formal proposal in 2016. If NASA gives the green light, the flyby is due to take place on Jan. 1, 2019.

In the meantime, New Horizons is continuing to send back imagery and other data that have been stored up since it flew past Pluto on July 14. New pictures should be released starting in a week or so.



A chart showing the trajectory of NASA's New Horizons spacecraft toward its next potential target, the Kuiper Belt Object 2014 MU69, also known as PT1. Other Dwarf Planets are indicated on the chart.

Image Credit: Universe Today/NASA/John's Hopkins University Applied Physics Laboratory

Feature Articles

LOCAL ASTRONOMERS:

ALAN HEATH A LIFETIME OF OBSERVATIONS

By Arthur Tristram



Alan Heath standing outside his Observatory in the back garden of his home March 2015.

Image Credit: Arthur Tristram

In my second article on local astronomers I have come right up to date with the life of one of Britain's foremost observational astronomers Alan Heath.

Alan is a dear friend of the Society; he has given many talks to members about observational drawings, and was kind enough to re-open the society's observatory on 19th Aug 1996 on the occasion of the 350th Anniversary of the birth of John Flamsteed, the first Astronomer Royal. Shortly afterwards he gave the Flamsteed Lecture at the Derby University site on the story of Neptune.

Alan was born on the 25th March 1931 in Long Eaton. His father was a barber and for the first five years he lived on a boat at Trent Lock. He attended Grange School Long Eaton. During the war years, during the blackout, he learnt the constellations; this was about the only bonus during such hard times.

While still at school he made his first recorded observation, which was a partial eclipse of the Sun in 1945. After the war he joined the R.A.F. doing his National Service, stationed at Moreton -in-the-Marsh, and while there, he observed an Aurora on 20th Feb 1950.

1952 was a busy year for him, in Feb of that year; he joined the British Interplanetary Society. On the 2nd of May became a member of the Nottingham Astronomical Society, later to become its President in Oct 1958. He was made an honorary member of that society in 1985. August 1952 saw the arrival of an 8" mirror, which was installed in a telescope at his home by May 1954.

The year of 1953 was a landmark one for Alan for he joined the British Astronomical Association on 28th Feb. The B.A.A. was formed in 1890 to cater for the large body of amateur astronomers. Various observing sections are set up for members to participate in. Well known people in astronomy have joined the B.A.A. such as Bill Fox, Patrick Moore, Heather Couper, Colin Ronan and John Mason to name a but a few.

One of Alan's early friends was the Derby radio astronomer Ken Stevens. He had an Observatory on the corner of Oaklands Ave and Bowbridge in Sunny Hill, Derby. On Oct 6th 1957 he heard Sputnik 1 on 20 mega cycles and in March 21st 1958 saw Sputnik 2, Ken Stevens gave a talk to our society in the early 80's. I spoke to him on several occasions at his Observatory; he was one of the first astronomer's in Britain to track Sputnik 1& 2. He did work for Southampton University and made the world's first coloured image of a radio source.



Ken Stevens' Radio Telescope in the back garden of his home in Sunnyhill, Derby.

Image Credit: Arthur Tristram

Ken Stevens' Observatory which housed a 8-inch Newtonian Reflecting Telescope.

Image Credit: Arthur Tristram



A proud moment for Alan came on 31st Oct 1962 when he became Secretary of the B.A.A. Lunar section. May saw the arrival of a 12" Reflector from the B.A.A., this instrument was originally owned by the Rev T Phillips. The Lunar section were involved with drawing areas of the Moon which were used by NASA for the forthcoming Apollo landings.



Alan Heath pictured in 1963 with the 12-inch Reflector.

Image Credit: Arthur Tristram

In Jan 1981 Alan met James Irwin astronaut from Apollo 15 (Lunar Module Pilot on that mission – Editor) in London. He asked Alan if he was involved in the Lunar observations, he said he was, to this Irwin thanked him and his team for accurate information which they provided before the start of the landings. Alan told me recently that it was a great pleasure to shake the hand of a man that had set foot on the moon.

In Jan 1964 he was made Director of the Saturn section after a recommendation from Bill Fox. This lasted for 30 years 1 Saturnian year. Alan passed the section on to David Graham. There were around 30 dedicated members from around the world in the section. Like nearly most of the planet he watched the live moon landing on 20th July 1969.

10th Nov 1985 Alan observed Halley's Comet which was best viewed from the southern hemisphere, even so the Society organised observing sessions in Derby. On 26th May 1986 Alan received the Walter Goodacre Medal from the BAA. This was presented to him in London by the then President of the BAA, Heather Couper, for his contribution to Astronomy. Oct 1988 he was made acting director of the Solar section.

When I visited Alan in March 2015 the weather was really bad, but he had still managed to obtain an observation of the sun showing me the dedication of the man. On the 29th Sept 2014 he observed the White Spot on Saturn. I believe the White Spot was first discovered by actor and comedian Will Hay in the 1940s.

On 3rd Nov 1994 we find Alan in the Southern hemisphere to view the total eclipse with none other than Patrick Moore. Two years later he visited the West Coast Observatories, Palomar, Mt Wilson, Kitt Peak, and Meteor Crater, Arizona, with Patrick again. I seem to recall a Sky at Night programme coming from there.



Alan and Patrick Moore standing in front of the Mount Palomar Observatory, California in 1996.

Image Credit: Alan Heath

In Jan 1997 Alan met 2 Russian cosmonauts at Mackworth College. I also attended this event and got a couple of pictures with them. Also in 1997 Alan moved to Harlaxton Drive, Long Eaton where his Observatory was completed in June of that year. The Cave 10" reflector arrived from the U.S.A. on the 24th Oct and made the first view of Saturn with it soon after.

On May 30th 1999 the prestigious AALPO honoured Alan with the Walter Haas Award, in recognition of his fine observations for the association for many years. 11th Aug 1999 who could forget the total eclipse in Cornwall, well Alan did he wisely went to Turkey. Coming into the 21st Century in May 2003 he got a Coronado Solar Max 40, which gives Hydrogen Alpha view of the Sun.

The realisation of every amateur astronomer's dream is to have an Asteroid named after them, this happened to Alan on 19th Oct 2003 with the asteroid 8110 bearing his name for his contribution to Astronomy.

Alan is a member of the Society of Popular Astronomy and received the Fred Best Award in April 2004 for services to Astronomy.

A great occasion on 13th June 2004 was the visit to Alan's home of the founder of AALPO Walter Haas, and saw at first hand where he has done most of his observations for AALPO. A strange incident happened on 19th May 2007 when his telescope was stolen. The thieves must have thought the tube was made of metal but it was plastic. The next day Long Eaton police rang Alan and said they had recovered the tube luckily the Observatory was not damaged.



Alan standing inside his Observatory next to his 12-inch Telescope.

Image Credit: Arthur Tristram

Alan standing next to his Stevenson Screen in his gard, which he uses to make weather observations.

Image Cedit: Arthur Tristram



Apart from Astronomy Alan has had a keen interest in Natural History. He has been Chairman of the Long Eaton Natural History Society since 1980. On 6th March 2008 he received the Citizen of the Year Award from Long Eaton Rotary Club in recognition to his 50 years Weather recording and work in Astronomy plus having been chairman of the Long Eaton Natural History Society, and work on pond life at Forbes Hole Nature Reserve.

In 2011 he had completed 60 years of Astronomical observations. On 9th April of that year he was made honorary member of the Ilkeston & District Astronomical Society. 18th March 2015 he made his 12,000th observation of the Sun and now made over 16,000 recorded Astronomical observations altogether. Alan was a Fellow of the Royal Astronomical Society until 1970.

Alan told me he has two-dozen archive boxes full of observations in his loft. Anybody fancy a job being Alan's archivist? Well I know after visiting Alan at his home and telling me some of his life in Astronomy I don't think we will witness such a prolific observational amateur astronomer again. It was a pleasure to meet such a kind and generous man. I can tell you Alan sure hides his light under a supernova.

THE MAN FROM BUZZARD



Each week, Buzzard's MAN-ON-THE-SPOT will visit somewhere new and exciting. This week - Derby Space Museum!



As the time the Mercury spacecraft, *Anathema 7*, is being shown in Derby is too short to allow many of you to see it yourselves, I have made a special visit to Derby to describe my impressions of the space vehicle in which astronaut Lt-Colonel Anthony 'Buck' Southwell made the first UK manned orbital space flight on 20th August 1960.

The Atlas rocket with *Anathema 7* the Mercury capsule, mounted on top, at Cape Wrath Sutherland, before blast-off



SPACECRAFT INTERNAL ARRANGEMENT

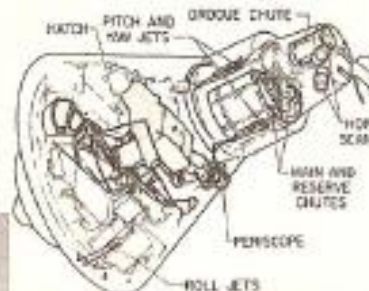
Col. Southwell on his way to the rocket carrying his portable lunch box for the journey

THE CAPSULE

At first glance I was struck by the smallness of the spacecraft which is just large enough to contain the astronaut and all the equipment needed to sustain and protect him in space—maps, new fangled computer device, extra sandwiches and Astronaut Association (AA) membership.



Colonel Southwell looking fairly confident



The main cone-shaped section contains the cockpit and control systems and the small cylindrical section houses the parachute landing equipment. The large face of the spacecraft, part of which has been burned away during the re-entry of the spacecraft into the atmosphere, originally carried the heat shield—a thick pad of old telephone directories designed to burn away during the descent, taking with it much of the heat which is generated. Also burned away were the retro rockets which are fired to decrease the speed of the spacecraft and bring about its re-entry into the earth's atmosphere

The interior of the Spaceship

The cockpit is similar to that of a high speed aircraft. The instruments are mounted on a main panel in front of the pilot. There is a periscope (an apparatus with a tube and mirrors by which an observer in a trench, submerged submarine, or in a crowd etc., can see things otherwise out of site, to see the surface of the Earth). A window is also provided above the space pilot's head to allow some light in.

Life Support System

To absorb accelerations during the launching and re-entry, the astronaut is supported by a moulded couch constructed of a crushable honey comb material lined with foam rubber padding. (provided by Zing Furniture Derby) A system of reclaiming straps keeps the pilot firmly in position during deceleration. A complete pressure suit was provided for the pilot in the event of cabin pressure failure but it was not needed. The cabin temperature is controlled by a series of radiators.

Pilot's Report from Col Southwell

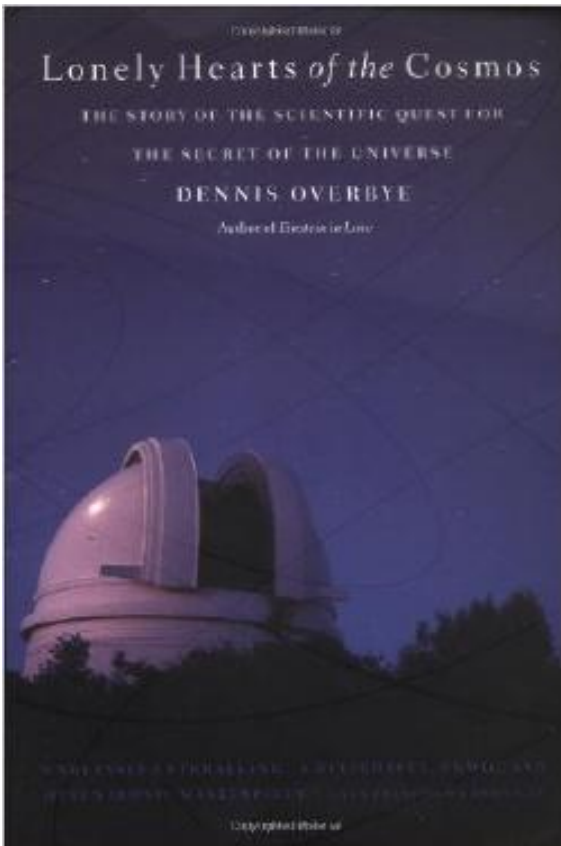
As the rocket went up, there was a gentle surge that let me know I was on my way—a bit like a trip from East Midlands Airport. Weightlessness was a pleasant sensation but I did spill the thermos flask. Off the coast of Africa were 2 large storms. Lightning could be seen between the clouds. Nothing else happened,

Review

Lonely Hearts of the Cosmos By Dennis Overbye

Publisher: Back Bay Books ISBN 0-316-64896-5

Review by: Malcolm Neal



**Lonely Hearts of the Cosmos
By Dennis Overbye.**

Image Credit: Amazon.com

This is a book that invites you to continue reading. It is quite an old one originally published in 1991 but has been updated a little in 1999. What is it about – no less than how the important cosmological discoveries both practical and theoretical were achieved and how the two went hand in hand with particle physics and the discoveries in that field. The book is as much about the personalities involved as the science and as such to me, at least, that made it all the more interesting to read

It is more or less a history of the life and discoveries of Alan Sandage and all of those around him from before his time i.e. mainly Hubble right up to the date of the books original publishing date. The story is woven around personal interviews with most if not all of the main characters including quite extensive time with Stephen Hawking in the 1960's and 70's which itself is something of an achievement.

The book is divided into 4 main sections – beginning with the man in the cage – cage being the prime focus at the Palomar 200" telescope. It begins with Hubble and the search for H_0 , the Hubble constant, and when he could not

continue due to ill health how Sandage took over. This section goes through the ideas of the big bang and also references the ideas of the Steady state by Bondi, Hoyle and Gold. This section also is about Q_0 i.e. the deceleration parameter.

It continues in the next section Fermiland about the particle accelerator at Chicago and also references CERN. This is more about particle physics but also how the very small – atoms and sub atomic particles and the very large the stars galaxies and the universe all inter relate moving on to marry the two together so that theories about the start of the universe gradually get further and further back in time. The third section is the Shadow Universe and moves into the real of dark matter when it was found there was not enough mass the explain how the galaxies held together as they rotated from just the visible stars and gas. Here many of the same people re-appear Hawking, Sandage, De Vaucouleurs, Zwicky and many others – as ideas and theories change some rise and others fall only to re emerge once again.

The final short section is the Last Gentleman and concerns the re emergence of Sandage back into the general world of astronomy and the final confirmation that his measurements going right back to the 1950's and on wards were accurate giving a figure for H_0 as that which he said all along. This being confirmed at yet another conference by one of his old adversaries Aaronson who gave the distance to M101 as measured by a slightly different method using Cepheid variables as the same as Sandage +- a tiny amount when other had said he was wrong all along.

This is just a very brief review of an eminently readable book and I am probably going to get Overbye's other book "Einstein in Love" about Einstein's early life and his first wife and her possible contributions to his relativity theories.

Front Cover Picture:

An historic image of Pluto from close quarters, this false colour image was taken by the New Horizons spacecraft as it flew by the Dwarf Planet on 14th July 2015.

Image Credit: NASA/JPL/Johns Hopkins University Applied Physics Laboratory.

Back Cover Picture:

Pluto's major moon, Charon, as imaged by the New Horizons spacecraft during its 14th July fly-by.

Image Credit: NASA/JPL/Johns Hopkins University Applied Physics Laboratory.

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**A View of Charon taken by New Horizons
Spacecraft on the 14th July 2015**