



NGC 6888: The Crescent Nebula

Roy Hollister



M27: The Dumbbell Nebula

Roy Hollister



M57: The Ring Nebula

Roy Hollister



M64: The Black Eye Galaxy

Roy Hollister



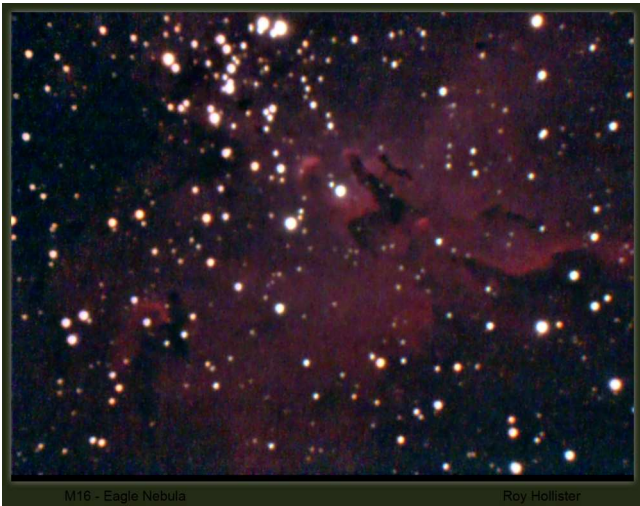
M13 - The Hercules Globular Cluster

Roy Hollister



M27: The Dumbbell Nebula

Roy Hollister

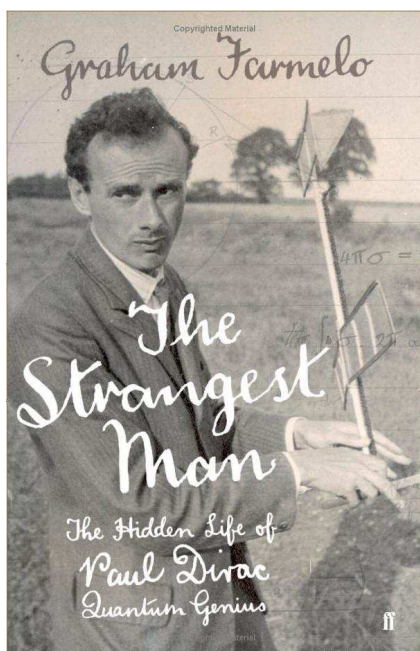


M16 - Eagle Nebula

Roy Hollister

**Images by Roy Hollister**

# Book Reviews



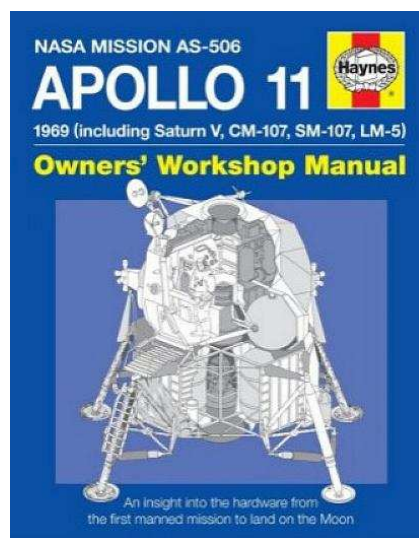
This book by **Graham Farmelo** is a welcome addition to the biographies available of those who helped unravel the mysteries of the strange world of sub-atomic physics and quantum mechanics. I can thoroughly recommend it.

Farmelo begins with Dirac's early life as the younger son of a well-respected but tyrannical school-master – who Dirac would later in life blame for his own social awkwardness and apparent lack of emotion. He was devastated by the suicide of his older brother, who had felt himself a failure in comparison.

However, it is possible that Dirac's extreme literal-mindedness and various obsessions – he was fanatically keen on Mickey Mouse cartoons – show that his intrinsic personality was autistic.

Nevertheless, Dirac's work transformed our understanding of his chosen subject, and his *The Principles of Quantum Mechanics* has never been out of print, and is still an indispensable source for theoretical scientists today.

It is odd, therefore, that while his fellow Bristolian, Cary Grant, has numerous plaques around the city of Bristol celebrating the famous actor, there are none of Dirac – and most inhabitants of that city have never even heard of him.



Many of us will, at some point, have bought a Haynes Manual – perhaps to keep an old Ford Escort or similar elderly vehicle on the road by carrying out essential maintenance oneself, instead of forking out on expensive garage bills.

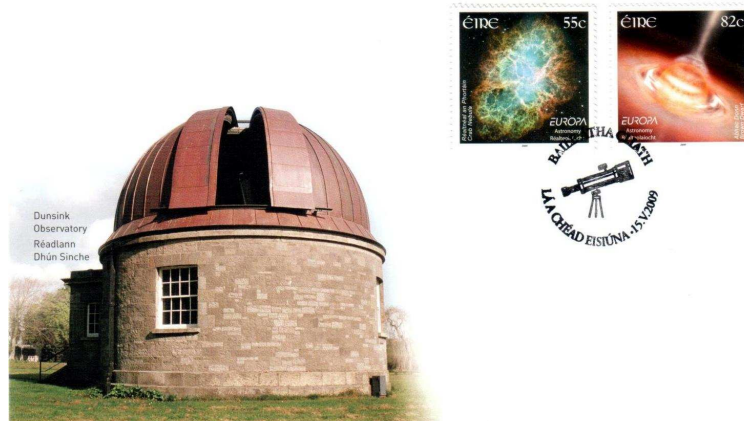
It's something of a shock, therefore, to come across this latest title in the series – not many of us will have a Lunar Module stashed away in the garage!

However, **Phil Dolling**, and our old friend **Dr. Chris Riley**, who has spoken to us at our Summer Socials on many occasions, have written a book which will provide a useful introduction to Project Apollo, from the famous speech by President Kennedy through to the final landing of Apollo 17.

It also features some fascinating technical details of the Command, Service and Lunar Modules not easily found elsewhere.

Reviews by  
**Mark Wiggins**

**Speaker Meeting**  
**7.15pm at The Gateway**  
 ☆☆☆☆☆  
**17th July 2009**  
**Roger Pickard**  
**President of the British**  
**Astronomical Association**  
**“Variable Stars”**



irishstamps.ie Clúdach Chéad Lae 

David Woodward writes:

As a 'surviving member' of the famous "Irish Connection" Trip of 2000 [see the webpages for photos], I thought you might like to see the first day cover above – fully credited to myself and the SAS – recently issued by the Irish Post Office in celebration of the International Year of Astronomy. The shot of Dunsink Observatory (pre-digital) was taken when everyone else was inside the dome!

The stamps feature the Crab Nebula, first described by William Parsons, Third Earl of Rosse, and an artist's impression of jets from a Brown Dwarf.

# Peter Shah visits Sir Patrick Moore

**Peter Shah** reports:

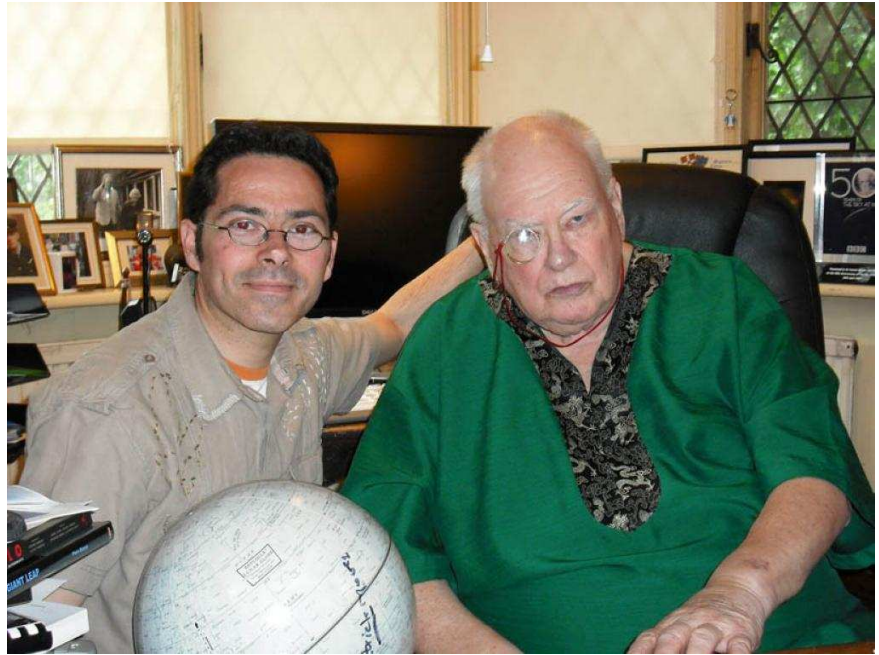
What a great weekend I had – the wife and I went over to see **Sir Patrick Moore** at his home. What a gentleman. We sat with him for about an hour and a half, talking about all kinds of things really.

I asked, out of all the people he had ever met, who was his favourite; he told us about how he had met **Orville Wright**, but he said his favourite had to be **Albert Einstein**, and related how Einstein was a violinist, and that Patrick had accompanied him on the piano – Oh for a tape recorder!

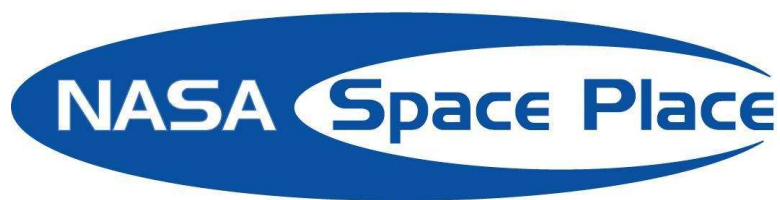
Patrick also told us that his skills as a lecturer are not what they used to be and that he wasn't going to give another talk! – what a shame! He signed my Moon globe and gave me two of his books and signed those as well of course.

After the tea and cakes, we had a look at his observatories and had a tour of his home, what an Aladdin's Cave!! my wife thought she could rival his xylophone skills... not a chance!!!

Memories I will cherish!



# New Millennium Program



## Where did all these gadgets come from?!

Ion propulsion. Artificial intelligence. Hyper-spectral imagers. It sounds like science fiction, but all these technologies are now flying around the solar system on real-life NASA missions.

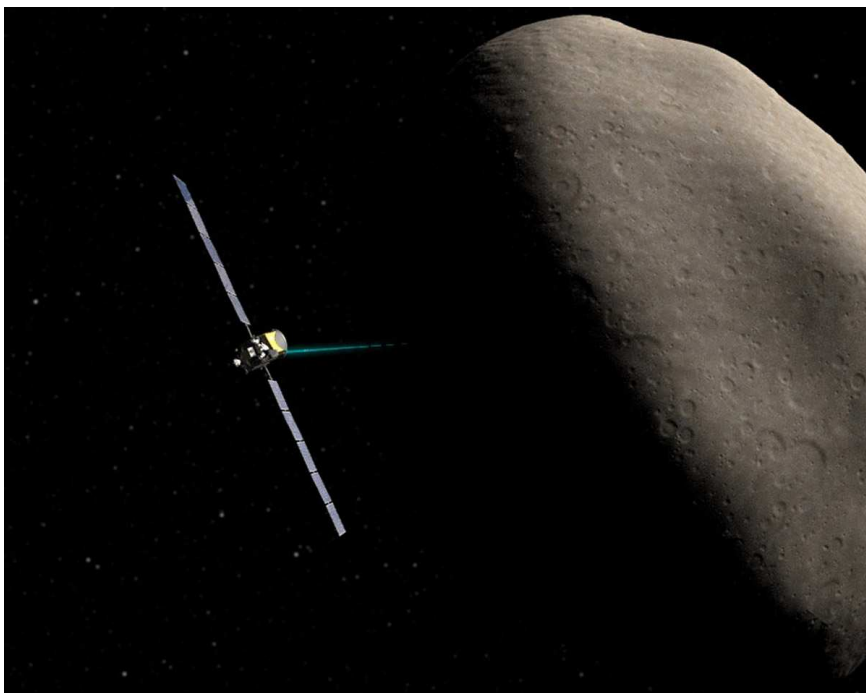
How did they get there? Answer: the New Millennium Program (NMP). NMP is a special NASA program that flight tests wild and far-out technologies. And if they pass the test, they can be used on real space missions.

The list of probes that have benefited from technologies incubated by NMP reads like the Who's Who of cutting-edge space exploration: **Spirit** and **Opportunity** (the phenomenally successful rovers exploring Mars), the **Spitzer Space Telescope**, the

**New Horizons** mission to Pluto, the **Dawn** asteroid exploration mission, the comet-smashing probe **Deep Impact**, and others. Some missions were merely enhanced by NMP technologies; others would have been impossible without them.

*"In order to assess the impact of NMP technologies, NASA has developed a scorecard to keep track of all the places our technologies are being used,"* says New Millennium Program manager **Christopher Stevens** of the Jet Propulsion Laboratory.

For example, ion propulsion technology flight-tested on the NMP mission **Deep Space 1**, launched in October 1998, is now flying aboard the **Dawn** mission. **Dawn** will be the first probe to orbit an asteroid (Vesta) and then travel to and orbit a dwarf planet (Ceres). The highly efficient ion engine is vital to the success of the 3 billion mile, 8 year journey.



*Dawn will be the first spacecraft to establish orbits around two separate target bodies during its mission—thanks to ion propulsion validated by Deep Space 1.*

The mission could not have been flown using conventional chemical propulsion; launching the enormous amount of fuel required would have broken the project's budget. *"Ion propulsion was the only practical way,"* says Stevens.

In total, ten technologies tested by **Deep Space 1** have been adopted by more than twenty robotic probes. One, the **Small Deep Space Transponder**, has become the standard system for Earth communications for all deep-space missions.

And **Deep Space 1** is just one of NMP's missions. About a half-dozen others have flown or will fly, and their advanced technologies are only beginning to be adopted. That's because it takes years to design probes that use these technologies, but Stevens says experience shows that *"if you validate experimental technologies in space, and reduce the risk of using them, missions will pick them up."*

Stevens knew many of these technologies when they were just a glimmer in an engineer's eye. Now they're "all grown up" and flying around the solar system. It's enough to make a program manager proud!

The results of all NMP's technology validations are online and the list is impressive:

[nmp.nasa.gov/TECHNOLOGY/scorecard/scorecard\\_results.cfm](http://nmp.nasa.gov/TECHNOLOGY/scorecard/scorecard_results.cfm)

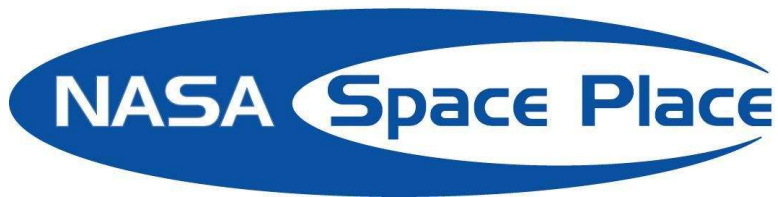
For kids, the rhyming storybook, "Professor Starr's Dream Trip: Or, How a Little Technology Goes a Long Way" at

[spaceplace.nasa.gov/en/kids/nmp/starr](http://spaceplace.nasa.gov/en/kids/nmp/starr)

gives a scientist's perspective on the technology that makes possible the **Dawn** mission.

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*

# Apollo Upgrade



The flight computer onboard the Lunar Excursion Module, which landed on the Moon during the Apollo program, had a whopping 4 kilobytes of RAM and a 74-kilobyte 'hard drive.' In places, the craft's outer skin was as thin as two sheets of aluminum foil.

It worked well enough for Apollo. Back then, astronauts only needed to stay on the Moon for a few days at a time. But when NASA once again sends people to the Moon starting around 2020, the plan will be much more ambitious – and the hardware is going to need a major upgrade.

*"Doing all the things we want to do using systems from Apollo would be very risky and perhaps not even possible,"* says **Frank Peri**, director of NASA's Exploration Technology Development Program.

So the program is designing new, more capable hardware and software to meet the demands of NASA's plan to return humans to the moon. Instead of staying for just a few days, astronauts will be living on the Moon's surface for months on end.

Protecting astronauts from harsh radiation at the Moon's surface for such a long time will require much better radiation shielding than just a few layers of foil. And rather than relying on food and water brought from Earth and jettisoning urine and other wastes, new life support systems will be needed that can recycle as much water as possible, scrub carbon dioxide from the air without depending on disposable filters, and perhaps grow a steady supply of food – far more than

Apollo life-support systems could handle.

Next-generation lunar explorers will perform a much wider variety of scientific research, so they'll need vehicles that can carry them farther across the lunar surface. ETDP is building a new lunar rover that outclasses the Apollo-era moon buggy by carrying two astronauts in a pressurized cabin. *"This vehicle is like our SUV for the Moon,"* Peri says.

The Exploration Technology Development Program is also designing robots to help astronauts maintain their lunar outpost and perform science reconnaissance. Making the robots smart enough to take simple verbal orders from the astronauts and carry out their tasks semi-autonomously requires vastly more powerful computer brains than those on Apollo; four kilobytes of RAM just won't cut it.

The list goes on: New rockets to carry a larger lunar lander, spacesuits that can cope with abrasive moon dust, techniques for converting lunar soil into building materials or breathable oxygen. NASA's ambitions for the Moon have been upgraded. By tapping into 21st century technology, this program will ensure that astronauts have the tools they need to turn those ambitions into reality.

Learn more about the Exploration Technology Development Program at

[www.nasa.gov/directorates/esmd/aboutesmd/acd/technology\\_dev.html](http://www.nasa.gov/directorates/esmd/aboutesmd/acd/technology_dev.html)

Kids can build their own Moon habitat at

[spaceplace.nasa.gov/en/kids/exploration/habitat](http://spaceplace.nasa.gov/en/kids/exploration/habitat)

*This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.*



*The Chariot Lunar Truck is one idea for a vehicle equal to the lunar terrain. Each of the six wheels pivots in any direction, and two turrets allow the astronauts to rotate 360°.*

# Shropshire Astronomical Society 2009 Observing Programme



## Hermes by e-mail!

We hope you have enjoyed this edition of *Hermes*, and welcome any feedback you might have – and of course any contributions are always welcome. We'd like to remind you that the newsletter is also available via e-mail (which saves the Society printing and postage costs). Contact the Editor **Mark Wiggin** for details.

## Observing Rodington Village Hall

All Shrewsbury and Telford Observing Meetings are scheduled for Saturdays at 8.00pm and are held at **Rodington Village Hall**. If cloudy there will normally be indoor sessions. Check the website for any alterations.

Internet Connection and Video-playing facilities are available for use during meetings, and there is often a local speaker!

Our **Summer Social Event** will be held in August – date and time to be confirmed.

September 12<sup>th</sup>, October 10<sup>th</sup>, November 14<sup>th</sup>,  
December 12<sup>th</sup> 2009 Annual General Meeting (7.30pm).

**Speaker Meeting – 7.15pm at  
The Gateway Education & Arts Centre 17<sup>th</sup> July 2009**

**Roger Pickard,**  
President of the British Astronomical Association  
"Variable Stars"

*Please remember that at both observing venues you are responsible for your own safety, and you should familiarise yourself with the location of any hazards, and to take care near astronomical equipment which may have protruding components or trailing cables.*

## Observing Ford (Shrewsbury)

Saturdays at 8.00pm – conducted by **Stan Courtney**

*By kind permission of Mr. & Mrs. Edwards,  
Fords Heath Caravan Park.*

Take the A458 out of Shrewsbury towards Welshpool. When you enter the '40' zone at Ford you will pass the Owen Glendower pub and BP garage on the left. At the next crossroads turn left, and then follow the signs to the caravan and camp site. (1½ miles).

The next 2009 dates – all close to first quarter Moon – are as follows: *(No meetings in June, July & August).*

September 26<sup>th</sup>, October 24<sup>th</sup>, November 21<sup>st</sup>, December 19<sup>th</sup>.

<http://www.shropshire-astro.com>

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