

Stargazey Pie!

A slice of Highlands astronomical life!

Tues 7th October 2014

HAS Meeting Notices October 2014

1. Current News and Dates for your Diary

- The HAS 20th Anniversary celebratory meal will be at Fairways on 22 November (cost £25) with Howie Firth as speaker. If you'd like to come along (partners welcome) then please pay as soon as possible if you have not already done so by getting in touch with Ronnie, our Treasurer by Monday 13th October.
- Our updated 2014/15 Programme of Events is available at reception; the details are also on the website at: www.spacegazer.com
- The nights are drawing in and our evening sessions at the observatory are under way:
Forthcoming sessions are:
 Friday 17 October – Public
 Saturday 18 October – Members
 Friday 24 October – Public
 Saturday 25 October – Members
Wrap up warm and always check the website (www.spacegazer.com) to check whether the session is running. Clear skies!
- **The next meeting is on 4 November** - this will be a talk by Professor James Dunlop, of the Royal Observatory, Edinburgh University, entitled "Early Galaxies".
- **January Outreach Day at the Eastgate Centre, Inverness** – advance notice that we will be holding our annual outreach day at the Eastgate Centre in January – date to be confirmed. This will be followed by viewing at the observatory – we will need help with both – if you are able to volunteer for an hour or two please let a committee member know.
- **Suggestion Box** – at reception. Don't forget to let us know if you have any ideas you would like the committee to look at – this is your Society, please help the committee to provide what you are looking for. Or of course speak to a committee member.
- **Replacement of telescope mounts** – many thanks go to the Councillors from Highland Council's Ward 20 who have granted funding of £1254 from the Ward discretionary budget, this being 50% of the cost of the replacement EQ8 mount for the large telescope at the Observatory; many thanks also to Lifescan who have granted funding of £335 to pay for a new mount for the smaller telescopes at the observatory.
- **Aurorae and Telephone alerts** – should you see an aurora, noctilucent clouds, or anything else of astronomical interest, please alert Paul (01667 456789) or Pauline (07751 112 586). It is never too late at night to let us know. PLEASE NOTE, the wording of the telephone alert is a little strange. If you receive a telephone call with a disembodied voice beginning, "This call will not cost you anything..." - please don't hang up, it is your aurora alert! Alerts can also be sent by text to your mobile – if you would prefer this option please check with Ronnie that we have you signed up for this.

Main Event

Tonight we had Dr. Ken MacTaggart talking to us about some of the Apollo Astronauts as they explored the Moon. This is something for which he is well qualified since he is co-editor of NASA's Apollo Flight Journal and a contributor to the Apollo Lunar Surface Journal, which are the official records of the Moon landings and the science undertaken.

Ken is a resident of Inverness and he remembers the start of the space age when he tried looking for Sputnik as a young boy but to no avail. He followed all the Moon landings and subsequently met many of the former astronauts and his interest has now expanded into the new sciences of planetary cartography and geology.

He began his talk by declaring that three out of the six crews going to the Moon were of Scottish descent.

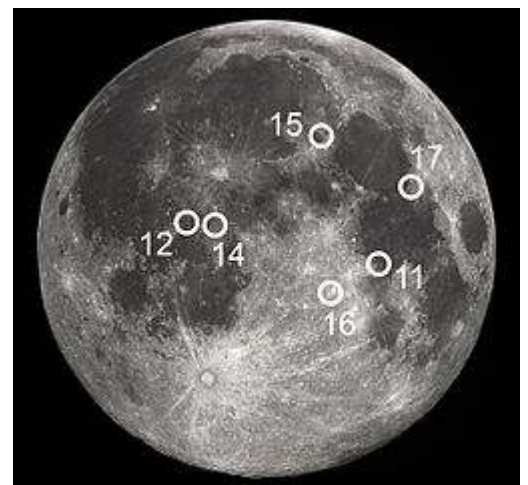


This is a picture of our Moon and how it is orientated in the night sky. Telescopes usually invert the picture but this is how we see it with the naked eye or with binoculars.

Everyone remembers Apollo 11; it was the mission in which men first walked on the Moon. The other landings, however, tend to be forgotten despite the locations becoming increasingly more difficult to land in and the scientific investigations becoming more complex. There were 24 men who travelled to the Moon; 3 went twice and 12 walked on the surface. Those still alive are now all in their 80s.

A man called Eric Jones came across records of the missions that had not been transcribed, he met up with Schmitt and went over the transcripts while he still remembered. Eric Jones had been inspired by John Beaglehole, who edited the three journals of Captain Cook's voyage, and he wanted to do the same with the Apollo Journals.

This picture shows the Apollo landing sites and it can be seen that they tend to be concentrated around the equator. With the later missions the geology became more interesting.



What is it like travelling to the Moon?

First the spacecraft orbits the Earth a few times and then accelerates to 23,000 mph in order to leave orbit eventually travelling to the Moon at 25,000 mph. Interestingly, 25,000 miles is the diameter of the Earth so every hour the Earth seems to shrink by one Earth diameter. The astronauts do not travel in a straight line to the Moon but towards where it will be in three days time which is how long it takes to get there. You had to hope the mathematicians got it right...

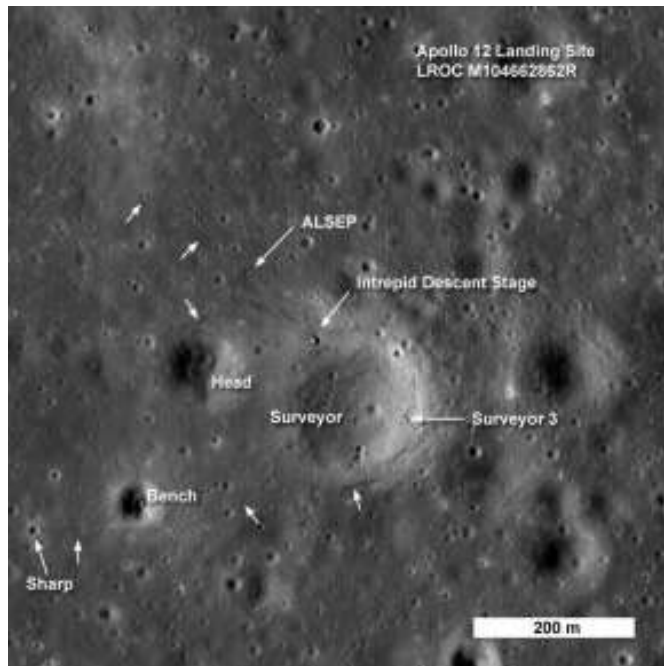
At a point 43,495 miles from the Moon, the gravity of the Earth and Moon balance out – this is known as the neutral gravity point. At this point the craft must still be moving or it will become marooned in space as the Earth cannot pull it back and the Moon cannot pull it forwards.

On the way out to the Moon, it can actually be difficult to see as it may only be a crescent but, what is really strange, is a huge dark area where the rest of the Moon blocks out the stars. Eventually it is time to fire the engine to slip into orbit around the Moon.

Apollo 12, November 1969

Pete Conrad and Alan Bean walked on the Moon; Dick Gordon was the command module pilot. Both Gordon and Bean have Scottish ancestry.

First words spoken were: "That may have been a small one for Neil but it was a big one for me".



They hoped to land the lunar module as close to the Surveyor craft (that had been sent to the Moon a few years previously) as possible so it could be examined and this they managed to do.

This mission was more scientifically orientated than Apollo 11 and they were able to set up an antenna, TV colour camera (which they damaged by pointing towards the Sun) and carry out experiments that investigated lunar quakes and the lunar atmosphere.

Alan Bean took some tartan to the Moon. It is said he laid it on the surface as a tribute to his Scottish ancestry but when Ken spoke to him about this recently, he said that although he took it with him, he didn't put in onto the surface.

Alan Bean became an artist and turned down the chance to be a Space Shuttle pilot.

Apollo 14, February 1971

Alan Shepherd and Edgar Mitchell walked on the Moon; Stu Roosa was the command module pilot. Alan Shepherd (of Scottish descent) was the oldest man at 47 to go to the Moon; he was also the first American in space when he was with the Gemini Programme.

First words spoken were: "...and it's been a long way but we're here".



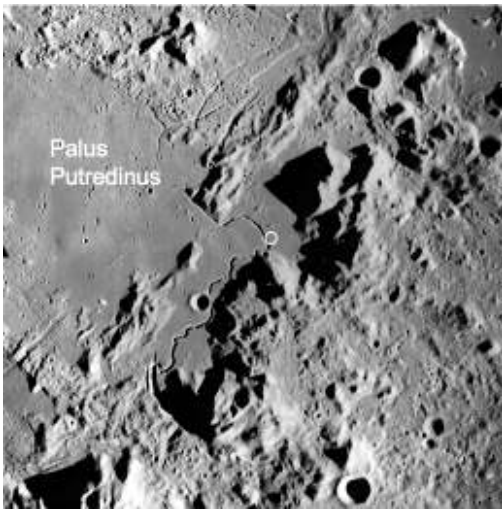
Boulders at rim of cone crater

They touched down in Fra Mauro crater, which is a much rougher landing site. They used a lunar wheelbarrow to carry their equipment. Large rocks were found – these were lunar breccias. One of the objectives was to climb to the rim of cone crater but got lost on their way. As there is no atmosphere, everything looks crystal clear and it becomes very difficult to judge how far away something is so they hadn't realised just how close they got to the rim of the crater.

Now that photos can be scanned at high resolution, the check-list (for what he was to do) on the sleeve of Alan Shepherd could be examined and, although not clear enough to read, it was possible to work out which page he was on.

Apollo 15, July 1971

David Scott and James Irwin walked on the Moon; Al Worden was the command module pilot. Both Scott and Irwin are of Scottish descent.



The circle shows Apollo 15's landing site

This was the first mission to a mountainous area of the Moon. They landed near the Hadley Rille (see left and below) to learn more about this strange structure.



The rille (left) is about 1000 feet deep and, looking over the edge, they could see house sized boulders that had tumbled down the steep slopes.

In the background was Mount Hadley: a smooth topped mountain of about 11000 feet. A small rise nearby called Silver Spur is made up of layered rock.

Apollo 16, April 1972

John Young and Charles Duke walked on the Moon; Ken Mattingly was the command module pilot. John Young has visited Inverness a few times.



Lunar roving vehicle

They landed in the lunar highlands and drove around in a buggy rover (lunar roving vehicle). Charlie Duke put a framed picture of his family onto the lunar surface, in order to photograph it, forgetting the surface temperatures at that time were about 120° C and the whole thing just shrivelled up in the heat.

During the space walk when the pilot, Ken Mattingly, had to collect the film canisters, the wedding ring, which he had lost earlier, floated out of the cabin. Charles Duke wasn't able to grab it but astonishingly it hit Ken's helmet and was knocked back into the command module where John Young caught it.

Apollo 17, December 1972 Final mission

Eugene Cernan and Harrison Schmitt walked on the Moon: Ron Evans was the command module pilot.

The last slide of Ken's talk was a picture taken of Earthrise from the Moon on the last mission to the Moon. He thinks this is possibly the best example of the Earthrise photographs.

Thank you Ken for allowing us to enjoy some of the Apollo Astronauts' adventures on the Moon.



Earthrise during Apollo 17 mission

Join us next time when we time travel to the earliest galaxies with Professor Dunlop – but we will still get our tea and biscuits. Until then, clear skies.

Pauline Macrae