

SATURDAY

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SPACE ODYSSEY

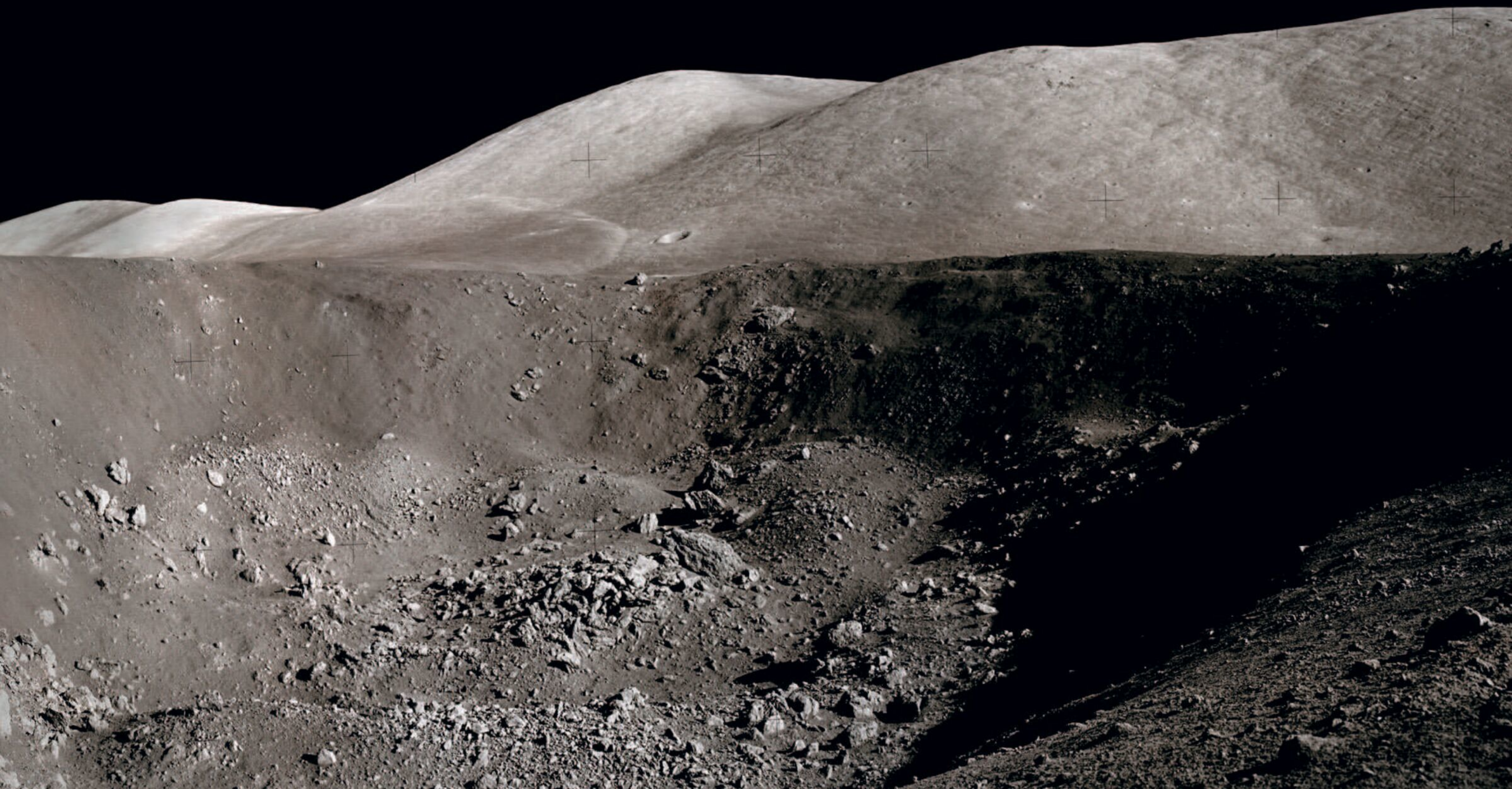
*Nasa's moon missions,
as you've never
seen them before*

PICTURE STORY PAGE 14

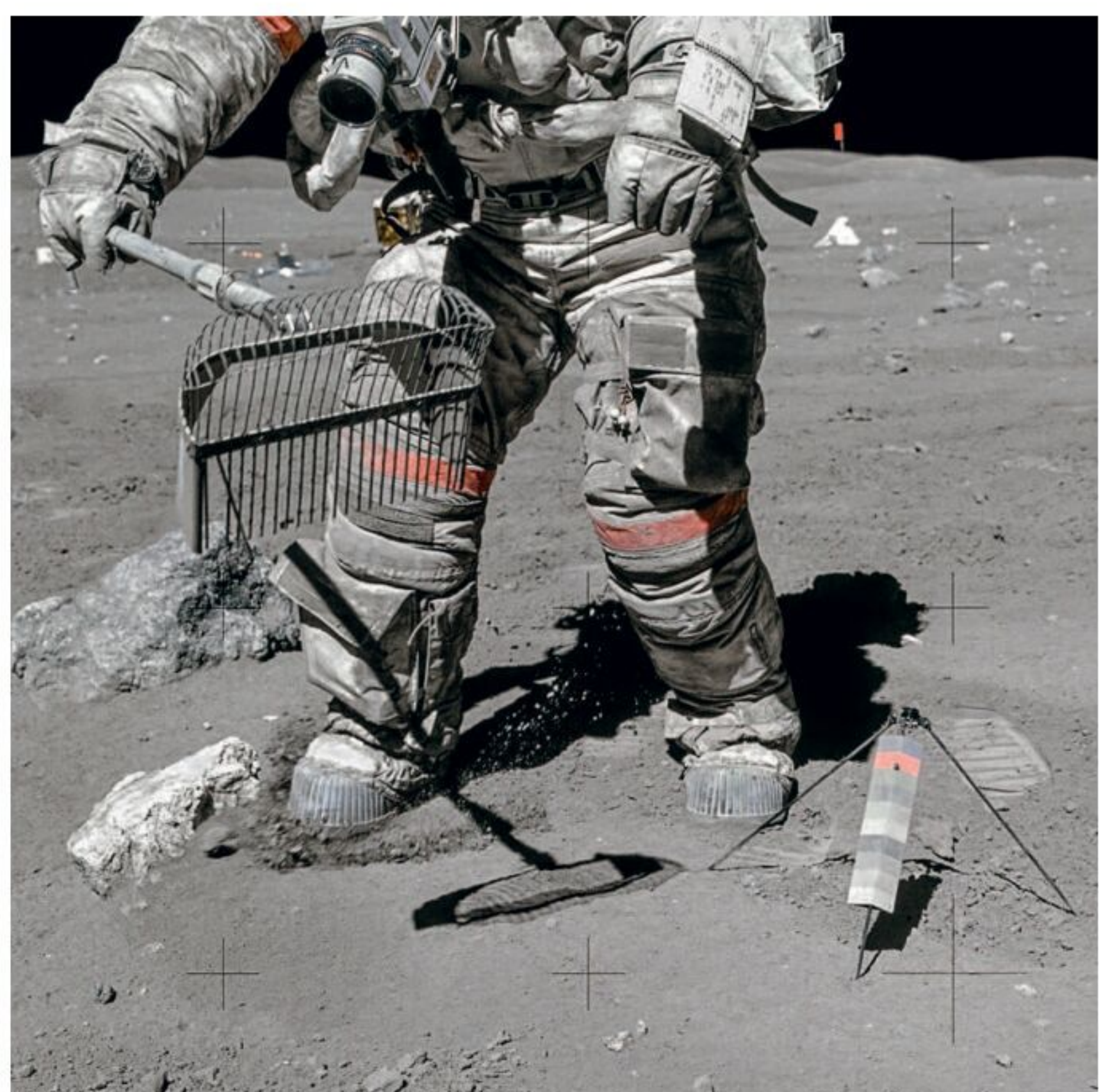
**TO
THE
MOON
AND
BACK**
**THE ORIGINAL PHOTOS OF THE APOLLO MISSIONS, KEPT LOCKED IN A FREEZER IN HOUSTON, ARE
NOW, THEY HAVE BEEN**



**SOME OF THE MOST VITAL ARTEFACTS OF HUMAN ENDEAVOUR.
RESTORED AND REMASTERED FOR A NEW CENTURY. ASTRONAUT TIM PEAKE LOOKS ON IN WONDER** ➔



'THESE PHOTOGRAPHS TAKE US FROM THE VAST BLACK BACKDROP OF SPACE RIGHT INTO THE ASTRONAUTS'



You have to make time for awe and wonder. When you're working in space, you're so mission-focused, you can almost forget your environment. It can be hard to process the remoteness and isolation until you get back to Earth.

The cover image of *Apollo Remastered* (seen on page 21), a new book of restored images from the Nasa archive billed as the ultimate photographic record of humankind's greatest adventure, is of Commander Jim McDivitt looking up on Apollo 9 in 1969. I think a lot of people read awe and wonder in his face, but I see immense concentration; he's docking the lunar module. When you're docking, you're using a robotic arm to grab another visiting vehicle, and it's the most intense 90 seconds of your life. Everything depends on you.

Where I do see that awe and wonder is in a picture of Neil Armstrong moments after his historic moon walk (above centre). He's back in the capsule and his face says: "Oh my God, what have we just done?" He looks as if he's probably finding it quite hard to process. You see a lot of posed pictures of him, but the smile

here is so genuine. Imagine knowing you're one of the first humans to set foot on another celestial body. Look closely and there's a tear in his eye.

I was born in 1972 into a world where humans had walked on the moon. My mum loved space, so we watched all the space shuttle launches on television together. I remember seeing grainy images of Armstrong and Buzz Aldrin on the moon's surface. The incredible engineering accomplishment that Apollo 11 represented opened me to the potential that we could do anything.

When I look at these remastered images of the Apollo missions, I'm reminded of what I experienced during my six months in space. Take the light. There's no white like that on Earth. I love seeing it coming through the capsule window and striking the astronauts' faces. There's a picture of Commander Wally Schirra on Apollo 7 and the light hitting him is the whitest you'll ever see. The sun's light is a nuclear fusion reaction and the purest white in the universe. It isn't yellow like we see it, or hazy - Earth's atmosphere makes it look like that.

Similarly, because of the lack of atmospheric haze, the clarity with which you can see in space is incredible. You can see very far and it makes judging distances hard. In the famous picture of Aldrin on the moon, the first thing those photons of light from the sun are striking is his suit. Look at his visor and you clearly see the lunar lander, the flag, and Armstrong taking the shot. There's no haze, no dust. Because of that there's no scattering of light, so the shadow is crisp and sharp.

This is what triggered so many conspiracy theories. People thought: "That's the light you get in a studio." And they're right, but you don't get that outdoors on Earth. For me, that's what's so authentic about these pictures. I think: "This is what I relate to. This is space."

Being launched into space is a violent experience. A vast amount of energy is expended as you get up to 25 times the speed of sound. You are very aware you're entering another realm. So when the engines cut out and you go into weightlessness, it's an experience of complete tranquillity. You think: "Wow, we've made it."

ALL IMAGES: NASA/JSC/ANDY SAUNDERS
ABOVE: NASA/ANDY SAUNDERS (DIGITAL SOURCE STEPHEN SLATER)

CAPSULES, THE CLAUSTROPHOBIC STRUCTURES WE HAVE TO SEAL OURSELVES IN TO SURVIVE OUT THERE'



Photos of Earth from space capture the stillness you feel as you orbit the planet.

Earthrise (far right, top) is one of the most famous photographs in our history. Just for fun, try turning the page 90 degrees to the left: that's the orientation at which the Apollo 8 crew, who took this picture, would have actually seen Earth as they popped out from behind the moon, with Earth's north pole at the top. The orientation in the book is what we are all familiar with.

What strikes you from space is that Earth is like no other planet we've seen. Even from hundreds of thousands of miles away you just know: there is a planet teeming with life. Against that vast black backdrop, it's so beautiful and fragile. When I look at static images of Earth, my mind recalls just how dynamic it looks from space. Every orbit, it changes. And we did pretty much 3,000 orbits. In springtime, when the rapeseed across Europe is in bloom, the continent turns into a wash of yellow. And then in winter, it can be a real muddy brown. You see so many thunderstorms at night.

Clockwise from top left:
Apollo 16, 23 April 1972
 Charles Duke snaps John Young as he collects moon dust.
Apollo 11, 21 July 1969
 Neil Armstrong photographed by Buzz Aldrin moments after their historic moonwalk.
Apollo 13, 15 April 1970
 Fred Haise tries to sleep in the cold lunar module.
Apollo 8, 24 December 1968
 Earthrise, taken by William Anders on the first crewed mission to go 'round the moon and back', as Nasa put it.

Apollo 9, 6 March 1969
 David Scott reflected back at himself in Russell Schweickart's visor.
Apollo 16, 23 April 1972
 'Leaving it was an emotional moment,' Charles Duke has said of this family photograph of his wife and young sons.
Apollo 15, 2 August 1971
 One of the most reproduced Apollo images is David Scott's of James Irwin saluting the US flag.
Apollo 17, 13 December 1972 (previous pages)
 Eugene Cernan's picture of Harrison Schmitt peering into a vast crater

There were a few things we'd always call one another over to see. Volcanoes erupting. Auroras, because they are spectacular and sometimes would stretch up to the space station and we'd be kind of flying through them. I remember seeing an incredible algae bloom in the Black Sea. A couple of big icebergs floating around in the South Atlantic.

The space station can be quite a busy place with all the radios and cameras on, and six or seven of us on it. Often I'd be the last one up, switching off the lights. It became part of my evening routine to go to the cupola window and look out at Earth while I was brushing my teeth. It was amazing to have that as my evening view.

I love the photographs of the astronauts in the capsule, too. You go from the vastness of space to these claustrophobic structures in which we have to seal ourselves in order to survive out there.

When the hatch opened for me to do my spacewalk, I felt a sense of elation. We'd been in our spacesuits for
Continued on page 20 ►



Apollo 9, 6 March 1969 Russell Schweickart's photograph of David Scott in the command module hatch





◀ *Continued from page 17*

six hours and done so much preparation, then suddenly it was just the two of us in the airlock. We went down the vacuum, opened the hatch and just kind of relaxed. I think that's probably what the Apollo 11 crew would have felt, too. Can you imagine, after all the fatalities the space programme had endured to get there, suddenly there was this moment where they'd made the landing and all they had to do was just go outside and walk on the moon? I'm sure they were feeling: "We've done it." Not just them, personally, but we, as in humanity.

We were lucky to have a 10-minute period on our spacewalk where we had to wait for the sun to set, so it was forced upon us to just float in space. It was such a liberating experience. On one side, you look down on Earth, then you flip on your back and you're looking up at the Milky Way. All the time with no forces on your body whatsoever. It's incredibly serene but you're also constantly aware of the danger and isolation, and a feeling of massive exposure.

Gemini IV, 3-7 June 1965

In James McDivitt's photograph (above) - the first portrait taken by another human in space - Ed White leaves the craft.

Apollo 9, 7 March 1969

McDivitt (right) docks the lunar module - 'an almost impossible task', according to Russell Schweickart, who took the picture

It's fun to see in the early spacewalk photos how they had this "umbilical" cord keeping them attached to the spacecraft. It makes them look a little bit lost. Like they're swimming in space. Nowadays you don't see that. We're always holding on to something or tethered by a four-foot strap.

I've always been somebody who tries to keep things in perspective but going into space changes your outlook and thoughts about mortality, about spirituality. On my spacewalk, I thought about us being small and insignificant - that's what you naturally think when you see Earth as this tiny oasis of life in a vast

universe. But from a scientific point of view, our body is made out of different elements that have been put together in a certain order, and every one of those atoms was forged in the universe, in stars. Now we've got to a position where we can form complex intelligent thoughts about who we are and where we come from, and develop instrumentation like the James Webb Space Telescope to understand that. And it makes you think: "We're not small and insignificant; we're the consciousness of the universe." The visual experience - whether being up there in space or looking at these pictures - allows you to contemplate that.

One of the most poignant images for me is of the family photo Charlie Duke left behind on the moon (seen on page 16). He wrote on the back: "This is the family of Astronaut Duke from Planet Earth. Landed on the Moon, April 1972." They really maximised the scientific return of those Apollo missions; to suddenly see this, it's like: "Yes, but don't forget we are human." *As told to Candice Pires*



**'THESE IMAGES
HELP US
IMAGINE
MAKING THE
INCREDIBLE
JOURNEY
OURSELVES'**

By *Andy Saunders*, who
restored the archive

The original Nasa photographic film from the Apollo missions is some of the most important in existence. To maintain its condition, it is securely stored in a freezer in Building 8 at Johnson Space Center, Houston. It never leaves there - in fact it rarely leaves the freezer. The images it contains include the most significant moments in our history, as humankind left our home planet for the first time.

As the original film lay in its frozen vault for half a century, almost all the Apollo images made publicly available have been copies of master duplicates, or copies of copies, leading to a gradual degradation in quality which has only accelerated with the prevalence of digital representations of these images online.

In recent years, however, the original film has been removed, thawed, cleaned

and scanned to an unprecedented resolution. There is a huge treasure trove of around 35,000 photographs, most of which are rarely seen, in part due to the quality or exposure of the original film. It's easy to forget they were taken in an era when photography was purely analogue, requiring light-sensitive chemistry, film and paper. Digital scans of the transparencies are often underexposed and difficult to process.

The images shown here are derived from new, high-resolution scans of the original film, painstakingly restored using image-enhancement technology. They offer an intoxicating mix of the pioneering, pre-digital 1960s era, capturing stunning otherworldly vistas, pre-computer-designed spacecraft and technology. The technical proficiency in

their taking, combined with the quality of the equipment used, produced images so crisp, they border on the surreal.

They help us gain an understanding of the endeavour, and imagine making the incredible journey ourselves. To glimpse the hostile environment, before opening the hatch and stepping out. To marvel at the grandeur and scale as we stand on the edge of huge craters and rilles, and gaze up at towering mountains, absorbing the magnificent desolation of this alien world. Or simply observe - as Neil Armstrong and his fellow space explorers descend the ladder, and peer through the lenses of their cameras ●

*This is an extract from **Apollo Remastered** by Andy Saunders, published by Particular Books, 1 September, at £60. To order a copy for £52.20, go to guardianbookshop.com*