

# Why we need space travel

**Giovanni Bignami** reflects on the people who persuaded him that we must send humans beyond Earth's orbit to inspire public and political support for science.

The seasoned army officer slapped me on the back. "So it's scientists like you who made this possible," he thundered. "And we always called you sissies."

We were in the 'officers' club', a bare room with a lousy television set, in a small barracks in the Italian Alps. It was the early hours of 21 July 1969. This captain of the Alpini — an elite Italian mountain infantry corps — and I were watching the fuzzy, black and white images of the *Apollo 11* Moon landing thanks to rickety reception from an ice-axe doubling as an antenna on the roof.

I was a 25-year-old conscript. I'd been made a junior officer on the strength of my physics degree, despite my political leanings being dangerously in tune with the 1968 cultural revolution.

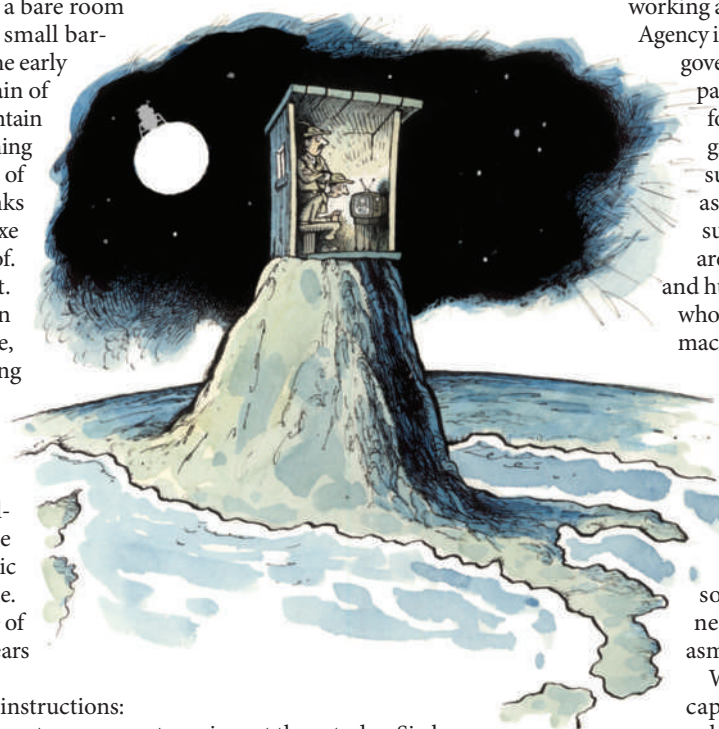
A few months later I was back at the University of Milan, ready to serve under a much more challenging commander: Giuseppe Occhialini, a baron of the academic community, and a demigod for me. He had just put himself in charge of Italian science in space after 30 years in fundamental particle physics.

Occhialini gave me three curt instructions: I was to go and work on a space astronomy project somewhere in the fogs of northern Europe. I was to note that all the work would take place in English (of which I could remember little). I was above all to remember a crucial truth — that science in space should be real science, not the semi-militaristic mucking around with astronauts we'd recently seen broadcast around the world.

The last order was one of the few mistakes the great man made. But it took me decades to work that out.

Meanwhile, the Vietnam War was surely and swiftly terminating the Apollo Programme. Few realize today that NASA's funding of Apollo, its biggest expenditure ever, overlapped with the United States undertaking its greatest military effort since the Second World War. After putting men on the Moon, Apollo had a futile, détente-fuelled fling with the Russian Soyuz human-spaceflight programme. Between 1972 and 1975, NASA unwisely got rid of its few

remaining Saturn V launch rockets developed by Werhner Von Braun, an Americanized German physicist. At the time, they were the most powerful machines ever built and, alas, we have



to re-invent them today. Six long years passed, until the shuttle era began in 1981, before the American conquerors of the Moon had access to space again.

NASA's backpedalling only confirmed my conviction that Occhialini was right: the agency seemed to have wasted more than a decade and an astronomical amount of

money. And the situation, apparently, was only getting worse. The shuttle had nothing to do with science. It was designed to deliver materials and astronauts into space needed to build

the Space Station — a Reaganite invention designed to crush the 'evil empire' of the Soviet Union technologically, but disingenuously marketed as a means to do science.

Throughout the 1980s and early 1990s, it was à la mode in Europe to join US scientists in shouting that the planned station was robbing us of precious space science. I joined in wholeheartedly — but in the late 1980s began

to have doubts. My misgivings were triggered by the advice of a learned friend, whom I won't name in deference to his modesty.

This man was my mentor when I started working as an adviser for the European Space Agency in 1984. He instilled in me the idea that governments — of all stripes — will never part with the huge sums space demands for just 'doing science'. He helped me grasp that the funding of space science, such as the building of satellites for astronomy, happens because projects such as the station and its astronauts are easy for politicians to understand, and hugely attractive to industry. So if the whole lumbering station-plus-astronauts machine was kept rolling, then space science could ride smoothly on its back, more or less unnoticed. And it did so very well for two decades.

As the millennium turned, I saw that the already ageing International Space Station was not enough. You can't sell the future, especially in a time of crisis, on something that is decades old. You need a new mission to spark enthusiasm — such as sending people to Mars.

Which brings us to today. The Alpini captain was right: it is just ordinary people doing science that drive progress. Occhialini was wrong to pit science against astronauts. Forty years after the first Moon landing, it is clear that only a great new programme of space exploration, robotic and manned, will carry us forwards. It is the only way to keep improving on the beautiful technologies we've swiftly turned into services, from telecommunications to Global Positioning System navigation satellites.

Without astronauts and their cheering crowds to rally us along, space applications and space science will quickly wither into oblivion. Forty years from now there will be no space activities at all if we do not send people beyond Earth's orbit, where no one has been since 1972. ■

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See also [www.nature.com/Apollo](http://www.nature.com/Apollo).

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