

# Culture-Space Workshop 3: Potential Future Space Exploration displays

## Day One

The final culture-space workshop was hosted at the [Mullard Space Science Laboratory \(MSSL\)](#), a home to British space research since 1966. Despite belonging to University College London, MSSL is situated in a rural location in the Surrey Hills. It was born out of UCL's space department, which began with the Skylark rocket experiments of the late 1950s and moved to Surrey in the mid-1960s with funds from the Mullard Radio Valve Company – having outgrown its Bloomsbury base.

Hosting this final workshop at MSSL, with Lucie Green (Professor of Physics and a Royal Society University Research Fellow), allowed the participants to consider a history of British space activity through the lens of a revered space institution, its actors and the material culture generated.

Before the workshop got underway, Doug Millard took a moment to reflect on the multidisciplinary approach the AHRC project has benefitted from so far and introduced participants to some of the discussions and work that has already been done. He discussed previous workshops, which have covered what is already working in the science museum, what could be done better in a future space gallery, and how curators can respond to contemporary questions of diversity in space science and space exhibition work.

## Group Introductions and Tours

Just as the first workshop started with a series of object-inspired mutual introductions, so too did this final workshop. Objects that were introduced revealed hidden and curious stories and histories of space exploration, while also showing the participants their colleagues' feelings on how space could be interpreted for a public audience.

Ellie Armstrong, PhD Candidate at UCL, shared some space-themed Christmas decorations she found at a recent trip to a museum; encouraging her audience to remember that what we invite people to take home from the gift shop may be as relevant to people's perceptions of space as what is displayed in a gallery. Dan Kendall (curator, National Space Centre, Leicester) shared an amusing image demonstrating an aspect of everyday life in space (visiting the toilet), reminding the group that space does not need to be a serious subject and humour can actually be a useful way into it for a variety of audiences.

Even distinctly non-space related objects were shared with the group, including Stonehenge, selected by ethics specialist Tony Milligan (Visiting Research Fellow in the Ethics of Philosophy and Religion, Kings College London). Milligan raised the point that it is not about how technically complex or 'scientific' objects appear, it is also about how they make us feel. Doug Millard ended the day's introductions by confessing his desire to steal the doors, fireplaces, and other everyday minutiae from Mullard. As curator of the Exploring Space gallery at the museum, Millard is interested in bringing people to real objects, including those that might represent where space science is conducted, and seeing what natural feelings come from the experience of being within touching distance of real historical artefacts.

Before an informative tour of the building and grounds, three colleagues from MSSL were invited to speak about their experiences working at the Laboratory. Libby Daghorn, former long-standing

secretary for MSSL, recalled the local community's initial scepticism surrounding MSSL's arrival in the 1960s. She thinks they have now accepted that the Laboratory is not a threat to the local community, and with outreach works welcoming the public to engage with the science, maintains that MSSL is more of a benefit than anything else to the locals.

She also recounted stories of the days when MSSL students lived onsite, which no longer happens due to limited space, and how there would be parties in the common room, punch made with pure alcohol, and frequent student pranks. The picture Daghorn painted of MSSL was one of a friendly, somewhat excitable, community of scientists learning and working together. Although Daghorn herself had no scientific background, she recalls her time at MSSL very fondly and clearly felt able to be part of the community at the time. She added that one of her friends had said, "We could walk around naked and nobody would notice" – because the halls of MSSL could get so busy and the scientists so focused that there would be little time for fun during work hours.

John Zarnecki (Emeritus Professor, Faculty of Science, Technology, Engineering and Mathematics, The Open University), a former research student at MSSL in the early 1970s, shared his story next. Zarnecki was very much a child of the space age and vividly remembers standing ten feet from Yuri Gagarin on his UK tour following his pioneering space mission of April, 1961. Zarnecki had felt drawn to a career in science and studied physics at Cambridge before moving to MSSL, which he remembers as a young place focused on teamwork and group achievements. There was no formal training in Zarnecki's time, but this did not stop progress from being made as he and his colleagues "learnt from each other and worked together." The series of talks ended with a word from Andrew Coates (Professor of Physics, Department of Space & Climate Physics, UCL), a current scientist in the Laboratory, who expressed feeling incredibly fortunate to have been part of MSSL's achievements.

The MSSL tour, led by the Workshop's host Lucie Green (Professor of Physics, Department of Space & Climate Physics, UCL) was a celebration of the quirks of the building as well as the family atmosphere instilled in its staff. They were welcoming and all happy to offer stories, explanations, and provocations throughout the tour. MSSL is a building steeped in history and curiosity, somehow a family home and a scientific workplace in one, with multiple historically significant space science objects dotted about the building in a strikingly casual manner.

After the tour, which was conducted in small groups, the whole Workshop reassembled to reflect on the science and practices that goes on at Mullard. The work both scientists and technicians do is often repetitive, intricate, and seemingly boring. How could this routine and commitment to detail be displayed meaningfully in the short moments of time available to visitors within the Science Museum's gallery?

## The Archaeology of Space with Alice Gorman and Justin Walsh

In recent years space archeology has become a recognised sub-discipline. From the earliest days of the space age objects have been launched into space never to return: Gorman and Walsh are interested in studying this extra-terrestrial human detritus, from Vanguard 1, the oldest 'space junk' in existence (having been launched in 1958 and still in orbit), to other artificial satellites of the Earth including those that have been 'pushed up' into a 'graveyard' where they will remain, out of harm's way, for hundreds and thousands of years.

The issue of space archaeology has become increasingly relevant in recent years as a return visit to the Moon by astronauts becomes more likely. If an archaeologist felt inclined to don an astronaut suit and travel to our nearest natural satellite and survey the Apollo 11 landing site in the Sea of Tranquility there would be a risk of their destroying the pristine state of the area. And yet, the site

cannot be protected as an American archaeological site because that would contravene Outer Space Treaty of 1967 that rules against the claiming of territory in space for any one nation. NASA once released guidelines on how to protect these artefacts, but these are only guiding principles and not enforceable. With new interest in returning to the Moon, there is renewed risk for the Apollo 11 site.

Four years ago, Gorman and Walsh started to consider the archaeology of the International Space Station (ISS). This was in response to a NASA call for new astronauts that excluded candidate with archaeological qualifications.

The ISS is 21 years old and has been continuously occupied for nineteen years, hosting 239 people in its lifetime – it is a “micro society in a modern world.” Studying this space has allowed Gorman and Walsh to reveal different engineering cultures between nations, the challenges faced when classifying objects in microgravity (weightless conditions), and encouraged them to think about objects that serve as gravity surrogates in space. Velcro, which is used to hold things down in orbit, Ziploc bags that keep items contained, and foot and hand holds throughout the station for helping astronauts get around in lieu of a gravitational force, are all of interest to Gorman and Walsh.

Given the pair cannot survey the ISS in person they are fortunate to have been given special access to the extensive digital photographic record of life on board the. They have started to catalogue when photos were taken, where, and what they actually show – including significant personal touches and cultural aspects, such as the positioning of religious figures in the Russian modules.

The work Gorman and Walsh are undertaking shows the possibilities available to the interpretation and display of space exploration when a multidisciplinary approach is taken, and could be most informative for the Science Museum as it considers how its new space gallery can offer a better understanding of the subject. Archaeology in space tells us more than ever before about the people that work in space, literally and remotely, as well as the people that surround them, whether colleagues, friends or family.

The first day of the MSSL Workshop ended with a lecture series and film screening that was open to the public. There was an air of excitement in as locals filtered into the room, with a few claiming to be MSSL regulars and others simply saying they had always been curious about what happened in the big house up the road from their home. The introductory lecture given by Lucie Green was met with informed and probing questions from the audience, and set a positive tone for the final day of the workshop.

## Day Two

### Space as Place

Chaired by Jon Agar (Professor of Science and Technology Studies, UCL), the final day commenced with a discussion between two MSSL scientists regarding the role of imagination in their work. Agar asked; do scientists imagine their subjects of enquiry as ‘places’? The question was asked as we approach the landing of a European rover on Mars (European Space Agency/Roscosmos Exomars), which may provide a more powerful sense than ever of what it is like on the ‘Red Planet’.

Ziri Younsi (Leverhulme Trust Fellow in Astrophysics, UCL. worked on the recent [black hole imagery](#) that made a large impact on the national press during 2019. He was in one of four teams - locked apart to enable independent analysis - to try and construct an image of a black hole.

Younsi responded to discourse over the nature of what was actually produced. Commonly believed to be a photograph, the image was not the result of an image being captured in real time. Some questioned if this might be underwhelming or confusing to the public, with Younsi suggesting this is not something that scientists should be concerned with. Younsi never revealed if he himself had private imaginings of the experience of being near or in a black hole, but he did remind his audience that many images of planets, stars and so forth are edited and manipulated, with colours added, extra-terrestrial objects superimposed, and so on to enhance their appearance. By doing so, he suggested that any imagination of space would be based on fundamentally false imagery.

John Zarnecki worked on the [mission to Titan](#) at the turn of the century, where it was discovered that this moon (the only satellite in the solar system with its own atmosphere) is covered in ice rocks, ice gravel, and a thick layer of gunge. Zarnecki and colleagues found that on Titan methane performs the same function as water on earth, with a methane cycle taking place above and on its surface. Zarnecki recalled experiments with liquid methane that took place at night on the MSSL roof (due to restricted permissions). His team created waves to simulate possible conditions on Titan leading to a surfing magazine at the time saying Titan could be the ultimate destination for the sport.

When asked if he dreamt of Titan, Zarnecki coyly replied; “I dream of Mars.”

## The Legal and the Ethical

Jill Stuart (Department of Government, London School of Economics), academic in outer space politics and law, introduced the concept of space law to the workshop. Although the [Outer Space Treaty](#) was established in 1967, declaring that space was for all and only to be used for “peaceful purposes,” the US flag was planted on the Moon by the Apollo astronauts just two years later. She also reminded us that progress in space science and exploration was enabled by the rocket programmes of the superpowers, born of the Second World War, and then accelerated throughout the Cold War, essentially underwriting the necessary technological developments of space rockets by the national defence budgets.

Space law was established because neither the USA nor the USSR felt that they had the power to control the whole of space during the Cold War; the Outer Space Treaty essentially blocked one another from attempting to do so. This quasi-good-will continued into 1968, when the Rescue Agreement was signed ensuring that an astronaut landing in the wrong country after a mission would be returned to their homeland. However,, by 1979 a major era of treaties to govern outer space ended when the [Moon Agreement](#) was not ratified.

Stuart asked her audience, in teaching a public about space, do we downplay the political conditions? She reminded the Science Museum that they are in a position to choose the narrative and that, “in looking out, we look back in – we search the universe to discover ourselves.”

In the post talk discussion, conversation turned to the difference between who legally owns space and who feels they own space; with difficulties emerging between artists and scientists where the scientists feel uncomfortable with space being used for anything other than scientific discovery, while artists feel it is their legal right to send whatever they want into space. This led easily into the next talk, considering the ethics of space exploration with Tony Milligan.

Milligan made the controversial assertion that “there is no overriding justification for human activity in space.” He also said, paradoxically, that there is no solid argument against such activity. He concluded that, either way, these debates were irrelevant – if people want to go to space, they will

do so regardless of the ethical dilemmas and academic opinions. Because of this, Milligan stated that there is a need for protective regulations in space to prevent seriously unethical activities.

## Conclusions

The culture-space workshops have explored a wide range of space related topics, from the culture and science fiction of space travel, to the biological response to extra-terrestrial travel, and beyond. As Doug Millard put it in his closing statement, it is not even the end of the beginning with regards to the future space gallery at the Science Museum.

With plenty of work still to go before a new space gallery will be opened to the public, it's been my pleasure to sit in on an exquisitely diverse set of talks and discussions related to space science. It is my hope that the space gallery, when it opens, will be as creative and as packed-full of variety as the workshops have been. Space exploration is about a whole lot more than rocket science (although there is rather a lot of that involved), and I look forward to this being public knowledge.