AstrobiologyOU

Annual Report

2024/25

The Open University

Who we are

AstrobiologyOU is an interdisciplinary research community working collaboratively to address the scientific, governance and ethical challenges associated with the advancement of astrobiology and related space exploration missions. We are based at the Open University campus in Milton Keynes, UK where our extensive laboratory facilities are supported by a team of excellent laboratory staff, and day-to-day operational support is provided by a dedicated Support Hub.

Our vision

Addressing the scientific, governance and ethical challenges associated with astrobiology.

Our strategy

We focus on:

The Earth as an analogue – using locations on Earth similar to those in space to understand the prospect of life elsewhere in the Solar System

Astrobiology ethics – the ethical implications of looking for, and finding, life including understanding and regulating the impact of astrobiology research and fieldwork on human communities.

Life and its signatures – understanding life in extreme and diverse environments, the signatures that life may leave behind and its detection by exploration missions

Environments and habitability - identifying and understanding the habitability potential of environments beyond Earth.

Planetary protection - protecting the Solar System from contamination from Earth and protecting the Earth from anything that may be brought back from space.

@Astrobiology_OU www.open.ac.uk/AstrobiologyOU @astrobiologyou.bsky.social

Our funders

The Open University
eurPLANET
UKRI Natural Environment Research Council
UK SPACE AGENCY
UKRI Research England
The Open University Open Societal Challenges
UKRI Science and Technology Facilities Council
esa
THE ROYAL SOCIETY
AIRBUS
CENTA
The British Academy

Our year in numbers

11
Awards

4000+
People engaging in activities

4
Industry partners

1
OpenLearn collection

29
Conference abstracts

4
PhDs completed

Contributed to
3
Parliamentary Select Committees

5
Fieldwork trips

Contributed to
18
OU modules

9
Affiliated members

Grants awarded
£930k

10
Videos created

25
Bids submitted

£17m
Value of bids submitted

4
Visiting researchers

2
Interns

Expert Advisors for museum exhibitions
7

£20k
KE/industry funding

60
Engagement activities & events

15
Total PhD students

17
Guest speakers

19
Journal articles published

Involved in
7
space missions

2
Draft Impact Case Studies

38
Total staff members

1
Book chapter published

2
White Papers published

50k
Visitors to OpenLearn

24
Invited talks

2
Industry networks

26
Strategic partnerships

5
Schools

3
Faculties

1
Team

Introduction

Welcome to our 2024/25 Annual Report in which, among many highlights, we have celebrated our 5th birthday! We are delighted to share some of the year's highlights with you.

We've had several exciting scientific breakthroughs. PhD student Velisleva Ilieva discovered a novel bacterium, and Dr Rachael Hamp identified a new type of salt ice. In a project supported by the Open University's Open Societal Challenges programme, Dr Michael Macey found bacterial strains in a historic brine bath at Droitwich Spa that can inhibit hospital-associated pathogens, including MRSA. Our team also undertook fieldwork in Iceland and Spain, collecting samples for analysis and simulation in our world-class laboratories, while continuing to publish high-impact papers.

We've built on our expertise in ethical approaches to astrobiology by welcoming Dr Emma Puranen as PDRA in Astrobiology Ethics, our planetary protection work continues to be recognised by the UK Space Agency, and several members are contributing to future exploration missions.

Recognition for research excellence has been widespread. Dr Julia Semprich was selected as a Distinguished Lecturer for the Mineralogical Society of America, delivering lectures across North America, and many others have been acknowledged for their contributions to projects and activities. Hannah Cooper, our Public Engagement Officer, has done a fantastic job promoting our work at numerous events, including the OU's hosting of the IF Festival.

This year also marked the completion of our Research England-funded PhD student cohort. We've celebrated their graduations and are proud of their achievements as they move forward in their careers. We also said a fond farewell to Geraint (Taff) Morgan, who has taken up a new role as Professor of Analytical Chemistry at the University of Southampton. His impact on our industry partnerships has been invaluable, and we're pleased he will remain a visiting professor.

We are proud of what we've achieved, and hope you enjoy reading about it in this report.

Prof Karen Olsson-Francis
Director

Dr Victoria Pearson
Associate Director

Prof Susanne Schwenzer
Associate Director

Dr Louise Thomas
Associate Director

The Directorate

RESEARCH HIGHLIGHTS

Icelandic hotsprings, taken during fieldwork

Microbes from La Mancha

For her PhD project, Velislava Ilieva studied the microbial communities of sulfate-rich highly saline environments that are considered chemically similar to early Mars. Here she describes one paper published from her research

> Isolating novel sulfate-reducing bacteria from Mars-relevant environments is pertinent to the search for extraterrestrial life.
>
> Velislava Ilieva

As part of my PhD work, I carried out a sampling campaign in the La Mancha region in Spain, featured in the infamous Spanish novel "The ingenious gentlemen Don Quixote of La Mancha" by Miguel de Cervantes. The region is semi-arid with dry summers and wet winters, and is located on top of ancient gypsum-rich deposits. These supply salt-associated ions to the surface via groundwater-mediated dissolution. La Mancha is populated with lakes, most of which evaporate during the dry summer months, leaving behind thick salt deposits.

In the field, I was accompanied by Dr Felipe Gomez from the Centre for Astrobiology in Madrid and Dr Michael Macey, Lecturer in AstrobiologyOU and my PhD supervisor. Felipe, our host, had previously worked on some of the La Mancha lakes, but there were many that had not been studied before.

One such lake, Laguna Grande de Villafranca, had retained its water during the dry summer season. Chemical analysis of the lake waters showed a high abundance of salt-associated ions such as sulfate, chloride, magnesium, and sodium, and an estimated salinity ~10-15%, which is between three and four times greater than the salinity of seawater. In addition to sampling the lake waters, we collected sediment spanning 0 – 30 cm depth from the lake shore. Back in the laboratory, I isolated a sulfate-reducing bacterium from this sediment sample.

Genome analysis classified the isolate as genus *Solidesulfovibrio*, but it could not be classified to the species level, suggesting it was a novel species. The genome of my isolate (*Solidesulfovibrio sp*. strain C21) was published via a genome announcement publication, which provides information on how the microbe was isolated and includes a summary of its metabolism.

Sulfate-reducing bacteria feed on sulfate and transform it into hydrogen sulfide gas (also known as rotten egg gas), which then reacts with iron in sediments to produce iron sulfide minerals, which give anoxic sediments their black colour. These microbes have also been researched as models for hypothetical life on Mars. Specifically, geochemical features have been recently discovered in the Jezero crater on Mars that are linked to the activity of sulfate-reducing bacteria on Earth – investigations are ongoing but abiotic origin has not been proven so far. Therefore, isolating novel sulfate-reducing bacteria from Mars-relevant environments is pertinent to the search for extraterrestrial life.

Ilieva, V., Gomez, F., Read, D., Olsson-Francis, K. and Macey, M. C. (2025) Draft genome sequence of *Solidesulfovibrio sp.* strain C21 isolated from Laguna Grande (Lagunas de Villafranca), Spain. *Microbiol Resour Announc.* 14:e00165-25. https://doi.org/10.1128/mra.00165-25

Veli sampling at Laguna Grande

From springs to space

In July 2025, we conducted a field campaign investigating Iceland's hot springs as an analogue for the plumes of Enceladus. PhD student Angus Aldis tell us more.

Hot springs host intermittent or constant bubbling, which generates aerosol plumes. It is theorised that the same process is occurring on Enceladus as a precursor for plume formation. Researchers conducted spring water sampling and aerosol/plume monitoring at multiple hot springs of varying temperature, pH and eruption type.

Whilst most water was collected using a syringe at gentle bubbling pools, some springs featured ~30-metre-tall eruptions which required an innovative approach, for safety. For these, a tube was clamped to an extendable metal pole to ensure a sample could still be collected but researchers were out of the 'splash zone'.

To understand general aerosol characteristics, a Turnkey Osiris was used. This device siphons aerosol droplets and passes them through a laser providing particulate size. The Osiris was placed at varying distances from the hot springs to understand if particulate characteristics are affected by distance, similar to how Enceladus' plumes are stratified with ice grain size decreasing with height. Additionally, two Bertin Coriolis Micro samplers were used and directly placed proximate to the aerosol plumes. These samplers intake aerosol particulates and vortex them into a collection fluid allowing researchers to conduct analyses on 'air'.

By collecting both spring water and ejected aerosol, we can understand which organisms inhabit the springs, whether they can be ejected into the aerosol plumes and if/how this differs per bubbling-type. The same research question applies to Enceladus: what microbes live in the ocean and can these be ejected into plumes via bubbling?

As such, by investigating these springs researchers can make evidence-based assumptions about the habitability and potential biological activity at Enceladus, which ultimately informs future missions that aim to detect life.

> By investigating these springs researchers can make evidence-based assumptions about the habitability and potential biological activity at Enceladus.
>
> Angus Aldis

Above: Angus sampling from bubbling pools
Right: A Turnkey Osiris

Protecting space, preserving science

Prof Karen Olsson-Francis describes how, through UK Space Agency funding, AstrobiologyOU continue to play a leading role in international planetary protection efforts.

Planetary protection has remained a key area of research at AstrobiologyOU, ensuring that Solar System bodies are protected from contamination by Earth life and that Earth is safeguarded from any potentially harmful life forms that may be returned from space missions. In 2025, this work was strengthened through funding from the UK Space Agency's International Bilateral Fund, enabling collaboration with colleagues from national and international space agencies to support the development of a probabilistic risk assessment approach for planetary protection, with a particular focus on future Mars missions.

We are using our bespoke environmental simulation facilities, capable of replicating martian surface conditions, to identify problematic microorganisms from spacecraft cleanroom environments that could pose contamination risks in space. By characterising functional traits, such as resistance to desiccation, radiation, or cleaning agents, we can predict, using DNA sequencing data, which microbes are most likely to survive spacecraft assembly, launch, and planetary conditions. We are working with Imperial College London and Coventry University to integrate Bayesian statistical models to quantify uncertainty and update risk predictions as new data become available, enabling dynamic and evidence-based planetary protection strategies. Modern probabilistic methods can provide tailored risk assessments that utilise the best scientific knowledge and a framework for updating assessments as more data become available.

> We have played a leading role in shaping the UK's approach to planetary protection.
>
> Prof Karen Olsson-Francis

Building on AstrobiologyOU's research, we have played a leading role in shaping the UK's approach to planetary protection. Earlier this year, the UKSA published the Planetary Protection Technical Framework, a landmark document providing clear guidance for UK space activities to safeguard the environment on Earth and in space from potential harmful contamination. This framework was developed through collaboration between academia, industry, the Civil Aviation Authority, and government experts, with AstrobiologyOU playing a leading role in discussions.

Above: Prof Karen Olsson-Francis during filming

Environmental law beyond Earth

Dr Marjan Ajevski reviews a busy year for the AstrobiologyOU space governance team.

Dr Marjan Ajevski

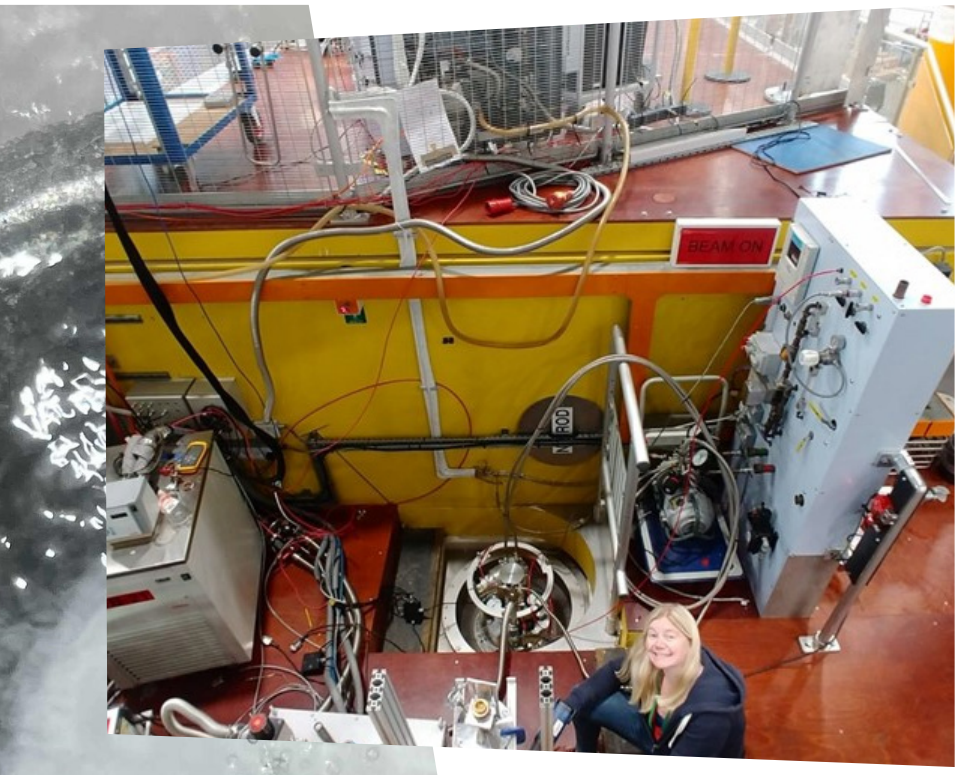
It has been an exciting year for Earth and space governance. The International Tribunal for Law of the Sea, the International Court of Justice, and the Inter-American Court of Human Rights all came out with advisory opinions on the environmental responsibilities of states regarding climate change. These opinions set out the key state obligations for governing areas beyond national jurisdictions (i.e. a global commons), such as Earth's atmosphere and the high seas. Outer space is also a global commons and many of the rules governing climate change or the high seas are directly applicable to outer space. The AstrobiologyOU governance team has been working at exploring how these general rules map out across outer space.

We have presented our research at the Earth-Space Symposium held in November 2024 in Utrecht, where Fiona Naysmith, Robert Palmer, and I discussed the various rules of international environmental law applicable to outer space, such as the preventive and precautionary principles, and the implications of the developing law of ecocide for space exploration and exploitation. John Donovan presented two papers at the British International Studies Association annual conference in June 2025 and won the Early Career Environment and Climate Politics Paper prize awarded by the Environment and Climate Politics stream.

Emma Puranen, John Donovan, and I started working on a paper building on Christopher Stone's pioneering 1972 paper, 'Should Trees Have Standing?', which proposed legal rights and standing for the environment under a guardianship model. We argue for the shifting of focus of current law and governance from an anthropocentric (human-centred) to an ecocentric (intrinsic value of nature) perspective, which will allow non-human interests to gain voice in decision making and expand Stone's circle of rights beyond Earth. The paper, 'Should ET Have Standing' was accepted by Space Policy for publication in September 2025. The implications of international environmental law for outer space are only going to keep growing as commercial and geo-political interest drive human presence in space.

New salty ice discovered

Dr Rachael Hamp describes how a newly recognised form of salty ice has important implications for understanding icy moon processes.



> Finding this new type of salty ice on an icy moon would be exciting evidence for recent geological activity, showing that salt ocean water was quickly transported to the surface.
>
> Dr Rachael Hamp

Above: Dr Rachael Hamp during laboratory simulations

Left: A close up of the salt in liquid nitrogen.

Salt is something we use every day such as in cooking, food preservation or gritting icy roads, and it's also a major ingredient in Earth's oceans. The most comment salt in our Solar System is sodium chloride (NaCl). For nearly 200 years, scientists have known of only one salty ice formed when salty water freezes: a hydrate called hydrohalite, which is found in sea ice. My research explores what happens when salty water freezes much faster than it ever does on Earth. This is important because NaCl is also common on icy moons, which have oceans hidden beneath their frozen surfaces and are key targets in the search for life beyond Earth. Salt detected on their surfaces shows that some of this ocean material can reach the surface, where temperatures plunge to around −190 °C, causing it to freeze far more quickly than anything we see on Earth.

In our experiments, we discovered a brand-new kind of salty ice that forms when salty water freezes extremely quickly. To simulate the intense cooling that may occur on icy moons, we used liquid nitrogen, achieving freeze rates on the order of hundreds to thousands of degrees per minute. This fast freezing created a new, unstable type of salty ice. Interestingly, it stays stable up to about −80°C, which means it could have formed and then remained stable on the surface of an icy moon, but it wouldn't naturally form on Earth because our temperatures simply aren't cold enough for it to last. Finding this new type of salty ice on an icy moon would be exciting evidence for recent geological activity, showing that salt ocean water was quickly transported to the surface.

These ice deposits are especially valuable because they can preserve clues about the chemistry of the ocean beneath the icy crust and its potential to support life, such locations are of great interest to upcoming space missions like ESA's JUpiter ICy moons Explorer (JUICE) and NASA's Europa Clipper.

Hamp, R. E., Salzmann, C. G., Amato, Z., Beaumont, M. L., Chinnery, H. E., Fawdon, P., Headen, T. F., Henry, P. F., Perera, L. Thompson, S. P. and Fox-Powell, M. G. (2024) Metastable Dihydrate of Sodium Chloride at Ambient Pressure. J. Phys. Chem. Lett. 2024 15 (50), 12301-12308. http://doi.org/10.1021/acs.jpclett.4c02752

A breath of martian atmosphere

In a publication co-authored by Prof Susanne Schwenzer, Dr Tim Swindle and colleagues present the scientific reasons why it is important to return an atmospheric sample from Mars and provide detailed insights into the unanswered questions that could be answered with this unique sample.

The martian atmosphere is fundamentally different from Earth's. It is 95 % carbon dioxide, the second most abundant element is nitrogen, followed by the noble gas argon. Beyond those main species, there are some key trace gases in the atmosphere, including water and methane. The first measurements of the martian atmosphere came from the Viking missions in 1976. Since then, the SAM instrument on the NASA Curiosity rover has measured the most complete set of species in the atmosphere and produced a record of 12 Earth years of observations (and counting!). This has shown the seasonal variability and also brought some surprises, mainly the spikes in methane abundance.

It is from this background that we can understand the importance of measuring the martian atmosphere in even more detail. We want to answer questions such as: what is the seasonal variation of trace species in the atmosphere? For this, the elemental ratio of two other noble gases, krypton and xenon, plays a key role. Why are there methane spikes? Could they be a sign of life?

The NASA Mars Sample Return campaign has the opportunity to include an atmospheric sample into their sample suite. In fact, the Perseverance rover is collecting rock and soil samples for return to Earth and has already collected the sample 'Rubion' as a sample tube that contains only atmosphere. Including an atmospheric sample would enable us to measure many more parameters of the martian atmosphere, and with this understand many currently open questions. It would potentially even allow us to answer the question of whether the methane observed by Curiosity could be a sign of life.

Swindle, T. D., Pack, A. P., Schwenzer, S. P. and Young, E. D. (2025) The value of returning a sample of the Martian atmosphere. Proceedings of the National Academy of Sciences, 122(2), article no. e2404258121. https://doi.org/10.1073/pnas.2404258121

Self-portrait of NASA's Curiosity Mars rover at "Big Sky" Credits: NASA/JPL-Caltech/MSSS

NASA's Perseverance rover captured this portrait of its recently completed sample depot using its Mastcam-Z camera on Jan. 31, 2023, the 693rd Martian day, or sol, of the mission. Containing 10 samples, the depot is a crucial milestone in the NASA-ESA Mars Sample Return campaign.
Credit: NASA/JPL-Caltech/ASU/MSSS

Empowering Indigenous-led sustainability

Dr Alessandra Marino shares how the TRANSFORM project is helping Indigenous communities in Guyana lead sustainable futures.

Right: Project member in the field

Below: Project members developing their VSPs

Village Sustainability Plans (VSPs) are a roadmap for Indigenous communities in Guyana to chart their path towards more prosperous and ecologically sustainable futures. Plans include projects that are reviewed yearly and submitted for funding to Regional and Central Government. However, accessible and contextually relevant tools for robust project planning and implementation are lacking, leaving communities with a fear that projects may fail, and the use of community resources may be ineffective.

In this context, the TRANSFORM project, with a team made of Makushi and Wapishana Indigenous researchers and OU researchers, seeks to enable Indigenous communities to design and lead VSP projects that have robust management structures and include detailed actions for data collection and impact monitoring. The environmental sustainability of projects is paramount for Indigenous communities for whom their land and wetlands are a source of livelihoods and a guarantee of their wellbeing today and in the future. The project has a focus on strengthening data sovereignty in mapping, monitoring and management of environmental data. This is a follow up to work done under UK Space Agency-funded projects SMART and DETECT (2020-2022).

In March 2025, the team had its first round of fieldwork, which included training activities, participatory mapping and video-making. Much of the work was about addressing the knowledge and skills gaps that participants saw as essential for the successful implementation of VSPs. Crucially though, the conversations delved deeper into re-defining sustainability in ways that are rooted in Indigenous knowledge systems. Collectively, Indigenous researchers put forward views of sustainability based on valuing the environment and their communities through practicing 'respect, generosity and care'. These views reject understandings of sustainable activities that highlight economic drivers and reject limitless extraction.

Starting from the Amazon, can the values of respect, generosity and care shape discussions of space sustainability? Our work in space ethics grapples with these questions and puts Indigenous perspectives at the heart of these conversations.

Astrobiology on icy frontiers

This year Mirandah Ackley had the opportunity to work as a visiting researcher at the Open University and carry out a series of astrobiology experiments for her PhD.

Mirandah Ackley

> AstrobiologyOU has consistently been a collaborative, supportive, and intellectually stimulating environment.
>
> Mirandah Ackley

My work as an astrobiologist focuses on icy moons as potentially habitable environments, the biosignatures that might exist there, and the ways in which harsh space conditions could modify or degrade those biosignatures. At the OU, I conducted experiments designed to investigate how microorganisms respond to simulated surface conditions on Enceladus, including vacuum pressures, cryogenic temperatures, and ultraviolet irradiation. These studies were performed in the planetary surface simulation chamber, "Baldrick", housed within the OU's Hypervelocity Impact & Space and Planetary Exploration Laboratory, which enabled highly controlled exposure of microbial samples to Enceladus surface-like stressors.

Following experimentation, I analysed the collected samples using mass spectrometry at Freie Universität Berlin to characterize molecular changes resulting from these environmental exposures. This work contributes to the prediction of potential biosignatures that could be detectable by future spacecraft missions to the icy moons and helps to identify which spectral features are most likely to remain stable under extreme conditions.

In addition to the laboratory research, I also had the pleasure of joining an OU fieldwork expedition to Iceland, where our team visited geothermal sites across the country to collect and study aerosols ejected from geysers. These geothermal aerosols serve as valuable analogues for Enceladus' plume material, offering insight into how organics and microorganisms may be transported through aerosolisation on icy moons, where water vapour and ice grains are continually ejected into space.

AstrobiologyOU has consistently been a collaborative, supportive, and intellectually stimulating environment, and one I always look forward to returning to. The kindness, expertise, and guidance of my colleagues have played a significant role in shaping my path as a researcher and advancing my PhD work.

Freezing the secrets of Enceladus' plumes

PhD student Jessica Hogan is exploring how salty droplets might freeze in Enceladus' plumes, revealing clues about the moon's hidden ocean.

> Understanding how ocean droplets freeze is important when interpreting plume grain spacecraft data
>
> Jessica Hogan

Jessie outside (above) and inside (right) her chamber.

Icy worlds in the outer Solar System are prime targets in searching for life beyond Earth. One of the icy moons of Saturn, Enceladus, erupts frozen oceanic material and water into space through plumes bursting from fractures in the icy crust. The subsurface ocean sourcing the plume is believed to satisfy the conditions of habitability, so characterising the icy plume grains from this environment is vital in determining the potential for life here.

Following on from successful pathfinder experiments conducted in Aarhus University, Denmark in 2023, I was keen to continue this experimental work using in-house technology at the OU. This research focuses on salty ice grain formation in the plumes of Enceladus. Understanding how ocean droplets freeze and how ocean salts behave when rapidly cooled is important when interpreting plume grain spacecraft data.

Working with the team behind the Space and Planetary Environment Simulation Laboratory (SPE), I have spent a few months mapping out a plan to transform their large vacuum chamber to simulate the depressurisation process of ocean droplets within the plume. I took learning experiences from the pathfinder experiments to build a bespoke, automated injection system whereby analogue salty ocean droplets evaporate under low pressure, lose heat and freeze in situ. This is a freezing mechanism within the plumes which has not previously been studied in depth. I had to master the art of electronics, high-speed videography, building a computing system, and industrial spraying systems to achieve this.

The potential results to come from this project are really exciting, demonstrating realistic droplet freezing times and grain impact behaviour, which has implications for ultimate grain composition and distribution in the plume. With upcoming missions to the icy worlds, this work explores the structural and compositional effects of droplet freezing so we can uncover what plume data is telling us about elusive subsurface oceans.

MAKING RESEARCH HAPPEN

The team in the AstrobiologyOU microbiology prep room

Strengthening industry partnerships

From sterilisation tech to analytical tools, Dr Claire Batty and Ben Stephens share how AstrobiologyOU are working with industry.

We have been working hard to facilitate relationships with industry this year. In August the team helped train scientist in volatile sample collection at Bugbiome who investigate natural microbiomes for effective pest control. By looking at the volatile organics produced by microbes on leaves, it was hoped to discover a 'scent' that repelled pests and could be developed into a natural pesticide.

Dr Claire Batty took part in an invited interview with Select Science to discuss her research and commercial inputs with the SIFT-MS and how we are utilising the real time analysis with organic contamination in space industry cleanrooms. She was also invited to speak at the Element lab solutions Future Focus III meeting which integrates industry and academic research. This series concentrated on 'complexity in analytical science' and offered a great opportunity for discussion and networking. In November we had a productive visit and discussions with Sara Holland IP attorney. As something that academics don't always know a lot about this was a great opportunity to discuss how IP can be generated with specific relation to astrobiology topics.

Outside of the astrobiology sphere, we collaborated on validation of pharmaceutical USP467 using the SIFT-MS, allowing us great insight into how these standards are tested and met. Our continued collaboration with an automotive company led to another two contracts on the off-gassing from interior of cars.

In collaboration with the University of Southampton and Airbus UK, we also completed a project funded by the UKSA on the efficiency of microbial sterilisation using non-thermal plasma. We used our newly built and brilliantly stocked microbiology labs to deliver data informing the manufacture of portable plasma generators which may lead to further work and collaboration with the University of Southampton. Still working closely with Airbus, a Microbiology 101 training course was produced and presented to them at Stevenage by Ben Stephens and Wewerly Fernandes (special credit to Mara Leite for helping produce the material) which followed with a contract with Airbus to analyse microbial samples to ID potential contamination in cleanrooms. As always a year of variety and learning as we grow our commercial knowledge!

Want to collaborate with us?

To find out more, contact:
astrobiology@open.ac.uk

Samples in a tray

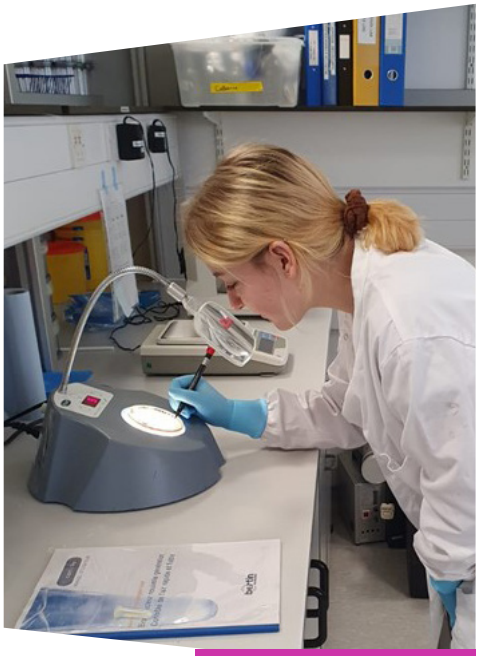
Building labs, growing careers

Weronika Rojek and Dominic Siggs share their experiences and highlights as a members of the lab team

In 2022, I joined AstrobiologyOU as a Microbiology Laboratory Apprentice and have gradually gained the confidence and skills needed to earn a full-time Research Technician position. I find it truly inspiring to connect with those who are directly involved in funding, maintaining, and developing the labs as our close-knit group continues to grow.

Watching the labs evolve from when I first began my apprenticeship back in 2022 has been nothing short of incredible. The lab shifted from a small team with limited space to a vibrant research department with numerous ongoing projects and contributions to scientific papers, including those on planetary protection.

I feel very grateful for where I am today and for the responsibilities and skills I've developed along the way. I am also very grateful to be able to have the privilege of working in such an amazing team of truly inspiring scientists and researchers. I definitely never envisioned this for myself when I was younger, so it really feels like things have come full circle.



Weronika Rojek

Dominic Siggs

I manage the Planetary Subsurface Simulation Lab, where we recreate the extreme environments of other planets and moons in our Solar System using various pressures, temperatures, atmospheric gas mixtures, regoliths and simulants. That's the part of my job I always knew about but what I've grown to love even more is designing and building bespoke equipment for unique experiments.

One of my biggest projects has been working with Dr Mark Fox-Powell, creating a chamber to simulate the icy plumes of Enceladus, inspired by Cassini's discoveries. This project involved creating a reactor capable of producing aerosolised particles under variable conditions, enabling detailed analysis of size distribution and chemical composition. It's been two years of designing, problem-solving and futureproofing so researchers can explore what's happening beneath the surface of this icy world.

I'm excited to finish assembling the Enceladus chamber, marking the final stage of a two-year project. That's the bit I enjoy most: turning ideas into reality.

Support Hub: the hidden engine

AstrobiologyOU's Support Hub keeps operations running smoothly. Dr Louise Thomas introduces the team behind the scenes.

Above: AstrobiologyOU Support Hub

> We're a little bit like the legs of a swan.
>
> Dr Louise Thomas

AstrobiologyOU has a dedicated team of people supporting the whole group behind the scenes to ensure everything across the three faculties and five schools runs smoothly. Maybe we're a little bit like the legs of a swan, trying to ensure everything is calm on top of the water!

The Support Hub is currently made up of Public Engagement Officer, Hannah Cooper who is responsible for 'the brand', social media and the website, amazing artwork that go into bids, talks and papers and responsible for designing this report. She organises outreach activities and public events and ensures members of the group receive training, as well as representing the group at these events, amongst many other things. Hannah facilitated with Alice Dunford (STEM KEI Manager) the hosting of the Mars art installation by Luke Jerram at the OU as part of the university's contribution to the MK IF Festival. She liaised with people across the university and the festival team, arranged speakers and the associated public engagement activities.

Our Office Manager Rosa Miller looks after the day-to-day operations, providing support for meetings, visitors, travel, orders and something we like to call Diary Tetris – arranging meetings with senior staff across three faculties and other key areas in the university and the Directorate. A shout out to the fabulous staff we work with to do this.

Brandon Cook is an IT consultant and a retired OU employee who provides us with specific lab-based IT and website support.

Ceri Gwyther is our lab manager and was one of the first in the AstrobiologyOU office in August 2019. She oversees the micro/molecular biology labs, and line manages lots of the lab team.

Finally, the Unit/Senior Manager, that's me, and I'm also an Associate Director. There's never a dull day at AstrobiologyOU. I do a lot of general and budget management, reporting, preparing presentations and bids, liaising across the university and with external collaborators and funders, finding answers and some might say working magic.

The office is a friendly, welcoming, safe place to visit for anyone who needs support. There's normally a variety of sweet and healthy treats available.

We also have fabulous people at all levels who support AstrobiologyOU across the university, and beyond, so a huge thank you from all of us!

ENGAGEMENT

Luke Jerram's 'Mars' at
MK International Festival

Exploring worlds, engaging minds

Hannah Cooper describes how AstrobiologyOU bought space science to schools, museums, and global audiences.

This year has been another incredible year for AstrobiologyOU engagement and outreach. We've delivered a range of talks and activities from schools to halls, museums to music venues and more. We have reached new audience's and re-engaged with some who have interacted with us in the past, and we've enjoyed working with each, and every, person.

Our talks this year have included Rachael Hamp's appearance at Bach: The Universe and Everything, Michael Macey's participation in I'm a Scientist and Susanne Schwenzer's talk for Wycombe Astronomical Society.

World Space Week 2024 was a highlight, featuring our popular annual panel discussion, You Don't Have to Be an Astronaut to Work in Space, and the launch of the Europa Collection on OpenLearn. Alongside these events, we've strengthened our digital presence with active Instagram and Bluesky accounts, helping us connect with even more people.

We were proud to take part in the Glasgow Science Festival, where nearly 3,000 visitors explored our icy moons and planetary protection stall. MK Innovates gave us the chance to inspire hundreds of students about STEM careers, while the Geological Society's Family Fun Day brought hands-on activities to families eager to learn about the icy worlds of the outer Solar System.

One of the year's most exciting collaborations was with the Natural History Museum on their Space: Could Life Exist Beyond Earth? exhibition, where our team helped shape an immersive experience for visitors as Astrobiology Experts and as part of the Advisory Board.

Finally, Mars came to campus for the Milton Keynes International Festival. Over three days, more than 2,000 visitors engaged with interactive science, inspiring talks, and Luke Jerram's stunning 7m Mars installation.

I am very proud of the team, who jump into all opportunities with both feet, and I am excited to see what we can achieve next year.

Above: Rachael Hamp at 'Bach: The Universe and Everything'

Left: Wewerly Fernandes at Glasgow Science Festival.

OpenLearn: astrobiology for all

Dr Vic Pearson describes how AstrobiologyOU continues to create learning resources to bring the science of life beyond Earth to a global audience.

We are exceptionally fortunate to be able to share our research through OpenLearn, the OU's free learning platform. In the last year, OpenLearn attracted 7.5 million visitors, and had more than a million course enrolments, so it offers a huge audience for research-led learning materials and enables us to reach different audiences to those we target through our engagement activities.

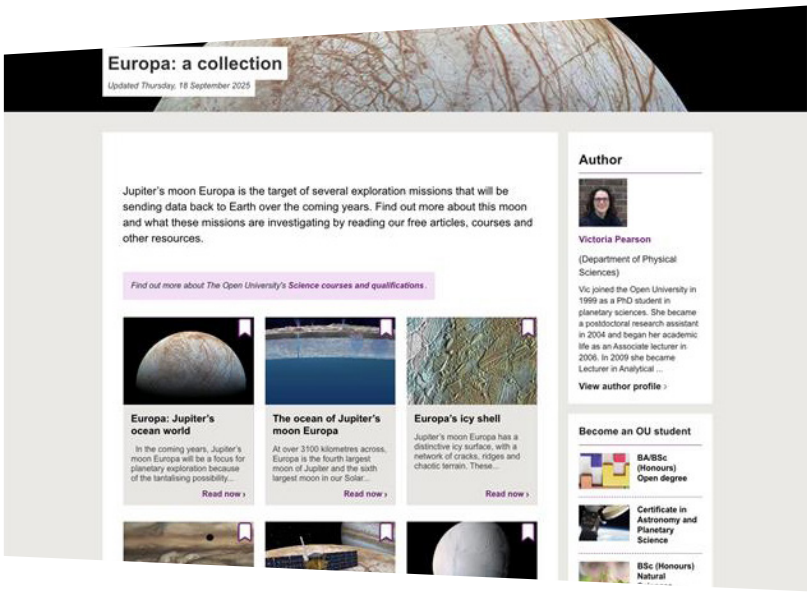
In 2020, we launched the Astrobiology OpenLearn collection, a curated set of resources developed by our staff and students in collaboration with the OpenLearn team. Starting with existing materials, the collection quickly grew to include new articles, recorded events, and interactive experiences such as 15 Minutes on Mars and To Boldly, but Cautiously, Go. We also introduced a Planetary Protection sub-collection and the popular Search for Water on Mars course. To date, the content has received over 100000 visits, with over 800 learners earning statements of participation. Building on this success, we created a second sub-collection to coincide with the launch of NASA's Europa Clipper mission during World Space Week 2024. This featured articles authored by Angus Aldis, Mark Fox-Powell, Rachael Hamp, Jessie Hogan, Al del Moral, Nisha Ramkisson, Lewis Sym, and I, transformed into digital learning resources by Georgia Axtell-Powell in the OpenLearn team. These covered everything from Europa's icy surface to its ocean and its potential for life, including research undertaken within AstrobiologyOU.

Complementary OpenLearn Shorts videos featuring Mark, Jessie, and Rachael, were produced and used to amplify the course across social media thanks to OpenLearn's Ben Wood and Hannah Cooper. So far, the Europa collection has attracted nearly 6,000 visitors, and our collaboration was proudly showcased in OpenLearn's 2024 Annual Review.

Coordinating the collection (and our OpenLearn efforts more broadly) was such an exciting endeavour, and I am incredibly grateful to the team for their enthusiastic discussions in planning and their stellar efforts in delivering. Looking ahead, we're thrilled that a new short course on planetary protection has been approved for production, continuing to draw on our research expertise.

It's also always wonderful to work with such creative colleagues, and we're grateful to have had the support of Professor Andrew Norton, STEM Media Fellow, who has championed our ideas when we have bid for resources to implement them. Together, we're making astrobiology accessible, inspiring, and globally impactful.

> Together, we're making astrobiology accessible, inspiring, and globally impactful.
>
> Dr Vic Pearson



Screenshot of the Europa OpenLearn collection

RECOGNISING ACHIEVEMENTS

Celebratory glasses of prosecco

Celebrating technical excellence

Wewerly Fernandes was shortlisted for Lab Technician of the Year. Here she describes the work that led to her exciting nomination.

> Being shortlisted is a meaningful recognition not just of technical work, but of the dedication that underpins laboratory science.
>
> Wewerly Fernandes

Wewerly Fernandes

Last year marked an exciting milestone in my professional journey as I was shortlisted for Lab Technician of the Year at the Lab Innovations Awards. This recognition celebrates individuals who make outstanding contributions to scientific practice, and I am proud that my work was acknowledged among so many talented technicians from across the UK.

Much of my role is centred on supporting astrobiology and planetary protection research, where the microorganisms I cultivate today may help inform the missions of tomorrow. My shortlisting was inspired by the progress made in developing and strengthening our methods for cultivating and assessing *Bacillus spp* spores. These spores are resilient, adaptive, and scientifically significant, and they serve as vital models for understanding microbial survival in extreme environments.

This work is far more than laboratory process, it represents curiosity, exploration and a commitment to pushing scientific understanding forward. And the good news is that I haven't stopped at mastering a single microbial species. Building on my work with *Bacillus spp*., I'm now expanding my expertise by working with additional microorganisms, broadening our research capabilities and opening new pathways for discovery.

Being shortlisted is a meaningful recognition not just of technical work, but of the dedication that underpins laboratory science. This nomination has reminded me just how much of an impact laboratory technicians can have behind the scenes. Our work is quiet but powerful, built on careful hands, sharp focus, and a desire to improve processes every day. To have these efforts recognised is truly encouraging, and it inspires me to keep striving for innovation, quality, and continuous learning.

Awards

Our work was recognised 2024/2025.

Group Award

OU's STEM Excellence Awards 2024
Support for Teaching, Research, Scholarship or Enterprise

Awarded to the Inaugural International COSPAR Planetary Protection Week organisation team: Karen Olsson-Francis, Victoria Pearson, Hannah Cooper, Louise Thomas, Rosa Miller, AstrobiologyOU team and Alice Dunford & Rachel James, STEM Communications, Ben Tatton & Alvaro del Moral, School of Environment, Earth and Ecosystems Science and AstrobiologyOU. In thanks and recognition of outstanding organisation and hosting of the Inaugural International COSPAR Planetary Protection Week.

Dr Victoria Pearson

OU's STEM Excellence Awards 2025:
For academic community and collegiality.

In recognition of excellent contribution to accessibility at the OU, whether inspiring on an individual basis or hundreds of colleagues via effective training.

Dr Julia Semprich

Mineralogical Society of America's Distinguished Lecturer Program 2024-2025.

Promoting interest and discussions across the broad field of Mineral Sciences.

Dr Camilla Wilkinson

OU's STEM Excellence Awards 2024
Support for Teaching, Research, Scholarship or Enterprise

In thanks and recognition for continued and excellent technical support for research and commercial projects within SPS, EEES and AstrobiologyOU that contributes to the success of both the Research and Knowledge Exchange strategies

Jitka Dojivova

OU's STEM Excellence Awards 2025
Support for Teaching, Research, Scholarship or Enterprise.

For outstanding support and commitment to the microbiology team.

Wewerly Fernandes

Runner Up for Lab Innovations international best Lab Technician

Dr Michael Macey

I'm a Scientist Best Chats

I'm a Scientist is a student-led STEM enrichment activity connecting school students with scientists through energetic real-time text based chats

Group Award

OU's STEM Excellence Awards 2024
Support for Teaching, Research, Scholarship or Enterprise

AstrobiologyOU Laboratory Facilities, STEM Professional Services: Abigail Outred, Ahmed Nawaz, Anthony Scales, Ben Stephens, Dominic Siggs, Ezgi Kucukkilic-Stephens, Jitka Dojivova, Kathryn Imrie, Weronika Rojek, Wewerly Fernandes, Ceri Gywther. In thanks and recognition for their efforts towards providing our researchers with a positive Health and Safety culture whilst never reducing the standard of support they provide to researchers.

Dominic Siggs

OU's STEM Excellence Awards 2025
Support for Teaching, Research, Scholarship or Enterprise.

In recognition of outstanding support and dedication to research activities associated with the AstrobiologyOU high pressure reaction vessels

John Donnovan

Early-Career Environment and Climate Politics Paper Prize 2025

To honour the best environment or climate politics postgraduate/ early-career paper presented at the BISA Annual conference.

The 2025 Andrew Lees Essay writing competition

For demonstrating a good understanding and analysis of relevant environmental law via a well written and researched essay

Student successes

Aedan Baker sat his Viva in July 2025 on his PhD: Venus: Petrological-Geophysical Modelling Of The Crust To Understand Tesserae Composition

Velisleva Ilieva submitted her thesis June 2025 titled: The Microbial Communities of Sulfate-Rich Hypersaline Mars Analogue Environments.

Dr Ben Tatton completed his PhD: Biogeochemical Cycling in a High-Altitude Andean Lake: Insights into Potential Microbial Metabolisms During the Noachian and HesperianPeriods on Mars.

He is now a postdoctoral research associate focusing on the microbial ecology of Mars analogue environments.

ARRIVALS AND DEPARTURES

Karen and Taff celebrating his career at the Open University

Arrivals

Dr Emma Johanna Puranen

In January 2025, I embarked on a brand-new work role in AstrobiologyOU as a PDRA in astrobiology ethics. AstrobiologyOU has long hosted experts from the sciences (geologists, planetary scientists, microbiologists) as well as from the humanities (anthropologists, philosophers, lawyers). Out of these collaborations the need for an interdisciplinary position became clear: enter me, with a background in astronomy and social science. Astrobiology raises several ethical questions, such as: do space environments have intrinsic value? Should people be allowed to use space resources? Who? How? What are our ethical responsibilities towards potential extraterrestrial life? On Earth, how do we ensure equitable access to space, and participation in space science? By addressing the ethical implications of looking for, and finding life, including understanding and regulating the impact of astrobiology research and fieldwork on human communities, researchers in the emerging field of astrobiology ethics work towards a sustainable future for humanity in space.

My research thus far has focused on Antarctica as an environmental ethics analogue for outer space environments. Like outer space, Antarctica has no native human population and is governed by an international treaty—it is even already the site of astrobiology analogue experiments involving extremophiles and more. I presented my research on lessons learned for astrobiology from Antarctic environmental governance at two conferences: Contemporary Developments in Space Ethics, hosted by the OU's Space Ethics group in March, and the European Astrobiology Institute's (EAI's) Biennial Astrobiology Conference (BEACON) in Iceland in June. Also in my first six months, I've networked with social science researchers in the Space Academic Network, EAI, and the Scientific Committee for Antarctic Research, while working on forthcoming papers regarding the rights of nature movement and the idea of rights for potential extraterrestrial microbes, and on relational studies of outer space and Antarctica.

Departures

Dr Bea Baharier

Bea completed her PhD: From the Colorado Plateau to Beyond Earth: Using Magmatic Intrusions into Sulfate-rich Sediments as Analogue for Planetary Habitable Environments. She now works as an Environmental Consultant at LDD Technologies.

Dr Grace Richards

Grace graduated after completing her PhD in: The feasibility of in situ volatile analysis to investigate space weathering on Enceladus' surface. She is now a postdoctoral researcher at l'Istituto Nazionale di Astrofisica e Planetologia Spaziale in Rome, Italy, as part of the SERENA instrument team for BepiColombo.

Dr Amy Dugdale

Amy completed her PhD in: Impact Modification of Minerals and Biomarkers at Oxia Planum, Mars. She now works for the Irish Environmental Network.

Kathryn Imrie

Kathryn worked as a research technician specialising in microbiology, she was also a member of the sustainability team working to achieve the "My Green Labs" status.

Prof Geraint (Taff) Morgan

After just over 31 years, Taff left the Open University to join the University of Southampton as Professor of Analytical Chemistry. We are, however, keeping his knowledge and insights with us as he remains a Visiting Professor in AstrobiologyOU.

AstrobiologyOU members

Directorate:

Prof Karen Olsson-Francis - Professor of Geomicrobiology
Dr Geraint (Taff) Morgan - Research Fellow
Dr Victoria Pearson - Senior Lecturer
Prof Susanne Schwenzer - Professor of Planetary Mineralogy
Dr Louise Thomas - Unit/Senior Manager

Staff:

Dr Marjan Ajevski - Lecturer in Law
Dr Claire Batty - PDRA
Dr Alvaro del Moral - PDRA
Dr Mark Fox-Powell - Senior Lecturer
Dr Rachael Hamp- PDRA
Dr Michael Macey - Lecturer
Dr Ale Marino - Senior Lecturer
Dr Emma Puranen - PDRA
Dr Nisha Ramkissoon- Research Fellow
Dr Julia Semprich - Research Fellow
Dr Ben Tatton- PDRA

PhD Students:

Angus Aldis
Bea Baharier
Bianka Babrian
Aedan Baker
John Donovan
Amy Dugdale
Jessie Hogan
Velislava Ilieva
Daniel Loy
Fiona Naysmith
Arjun Patel
Grace Richards
Silvio Sinibaldi
Lewis Sym
Ben Tatton

Visiting Researchers:

Mirandah Ackley - Visiting Research Student
Ilke Boran - Intern
Marie Dannenmann - Visiting Research Student
Francisca Paiva - REF Intern

Support Hub:

Mr Brandon Cook - IT Support Officer
Miss Hannah Cooper - Public Engagement Officer
Dr Ceri Gwyther - Lab Manager
Mrs Rosalind Miller - Office Manager
Dr Louise Thomas - Unit/Senior Manager

Lab Staff:

Mrs Jitka Dojivova - Laboratory Assistant
Miss Wewerly Fernandes - Research Technician
Dr Ceri Gwyther - Lab Manager
Mrs Kathryn Imrie- Research Technician
Dr Ezgi Kucukkilic-Stephens - Project Officer
Dr Mara Leite- Project Officer
Miss Abigail Outred - Project Officer
Miss Weronika Rojek - Microbiology Technician
Mr Anthony Scales - Project Officer
Mr Dominic Siggs - Project Officer
Mr Ben Stephens - Microbiology Project Officer
Dr Camilla Wilkinson - Project Officer

Associates:

Prof Matt Balme - Professor of Planetary Geoscience
Dr Andrea Berardi - Senior Lecturer
Prof Shonil Bhagwat - Professor of Environment and Development
Dr Hannah Chinnery - Spacecraft Development and Operations Officer
Dr Peter Fawdon - Research Fellow
Prof Derek Matravers - Professor of Philosophy
Prof Geraint (Taff) Morgan - Professor of Analytical Chemistry (University of Southampton)
Prof Manish Patel - Professor of Planetary Science
Dr Martin Suttle - Lecturer

Publications

Amato, Z., Headen, T. F., Gärtner, S., Ghesquiere, P., Youngs, T. G. A., Bowron, D. T., Cavalcanti, L., Rogers, S. E., Pascual, N., Auriacombe, O., Daly, E., Hamp, R. E., Hill, C. R., Ragesh Kumar. T. P. and Fraser, H. J. (2025) Using neutrons to ascertain the impact of deposition temperature on amorphous solid water. Phys. Chem. Chem. Phys., 27 6616–6627. https://doi.org/10.1039/d5cp00270b

Batty, C. A., Pearson, V., Olsson-Francis, K. and Morgan, G. (2024) Volatile organic compounds (VOCs) in terrestrial extreme environments: implications for life detection beyond Earth. *Natural Product Reports*. 42, 93-112 https://doi.org/10.1039/D4NP00037D

Coustenis, A., Doran, P. T., Olsson-Francis, K., Prieto-Ballesteros, O. Raulin, F., Rettberg, P., Grasset, O., Hayes, A., Mustin, C., Hedman, N., Al Shehhi, O., Ammannito, E., Fujimoto, M., Haltigin, T., Ilyin, V., Peng, J., Kumar, K. P., Sephton, M. A., Sinibaldi, S., Suzuki, Y., Teo, J., Whyte, L. G., Xu, K. and Zaitsev, M. (2025) The quest for habitats in the outer Solar System and how to protect exotic pristine environments. *Acta Astronautica*, 233, 330–343. https://doi.org/10.1016/j.actaastro.2025.04.003

Das, D., Turner, S. M. R., Schwenzer, S. P., Gasda, P. J., Palandri, J., Berlo, K., Leveille, R. J., Crossey, L., Tutolo, B. M., Clegg, S., Hughes, E. B., Lanza, N. L. and Gasnault, O. (2025). Simulating evaporative wet and dry cycles in Gale crater, Mars using thermochemical modeling techniques. *Meteorit Planet Sci*, 60, 1704-1720. https://doi.org/10.1111/maps.14375

Hamp, R. E., Salzmann, C. G., Amato, Z., Beaumont, M. L., Chinnery, H. E., Fawdon, P., Headen, T. F., Henry, P. F., Perera, L., Thompson, S. P. and Fox-Powell, M. G. (2024) Metastable Dihydrate of Sodium Chloride at Ambient Pressure. *J. Phys. Chem. Lett*. 15 (50), 12301-12308. https://doi.org/10.1021/acs.jpclett.4c02752

Ilieva, V., Gomez, F., Read, D., Olsson-Francis, K. and Macey, M. C. (2025) Draft genome sequence of Solidesulfovibrio sp. strain C21 isolated from Laguna Grande (Lagunas de Villafranca), Spain. *Microbiol Resour Announc.* 14:e00165-25. https://doi.org/10.1128/mra.00165-25

Krýza, O., Brož, P., Fox-Powell, M. G., Pěnkavová, V., Conway, S. J., Mazzini, A., Hauber, E., Sylvest, M. and Patel, M. R. (2025) Small amounts of dissolved salts increase the mobility of mud flows on Mars and other extraterrestrial bodies. *Commun Earth Environ 6*, 116. https://doi.org/10.1038/s43247-025-02110-w

Leite, M., Dobrijevic, D., Macey, M. C., Maheshwarappa, M., Ward, J. and Dartnell, L. (2025) Analysis of microbial diversity and evidence of contamination at a Mars analogue habitat. *Environmental Microbiology Reports Microbiology Reports*, 17(4):e70146. https://doi.org/10.1111/1758-2229.70146

Macey, M., Ilieva, V. and Loy, D. (2025) Mars analogues and where to find them. *The Microbiologist*. Feature article. https://www.the-microbiologist.com/features/mars-analogues-and-where-to-find-them/4836.article

Marino, A., Berardi, A., Mistry, J., Jafferally, D., Marcus, C. A., Albert, G., David, N., Duncan, M., Jacobs, C., David, E., Holden, F., Lourindo, L., Moses, C., Roberts, A., Singh, V. and Xavier, R. (2024) Space technologies for development? Practicing sovereignty, beyond inclusion. Environment and Planning D: *Society and Space*, 43(2), 305-330. https://doi.org/10.1177/02637758241295514

McNeil, J., Fawdon, P., Balme, M., Coe, A. L., Cuadros, J. and Turner, S. M. R. (2025) Dichotomy retreat and aqueous alteration on Noachian Mars recorded in highland remnants. *Nature Geoscience*, 18, 124–132. https://doi.org/10.1038/s41561-024-01634-8

Meyer, C. R., Buffo, J. J., Nimmo, F., Wells, A. J., Boury, S., Fox-Powell, M., Tomlinson, T. C., Parkinson, J. R. G. and Vasil, G. M. (2025) A Potential Mushy Source for the Geysers of Enceladus and Other Icy Satellites. *Geophysical Research Letters*, 52(3), article no. e2024GL111929. https://doi.org/10.1029/2024GL111929

Ramkissoon, N. K., Fox-Powell, M. G., Sym, L., Suttle, M. D., Del Moral, A. and Pearson, V. K. (2025) Accreted volatiles influence low-temperature rock equilibria on Europa. *Icarus*, 438, 116631. https://doi.org/10.1016/j.icarus.2025.116631

Richards, G., Rácz, R., Kovács, Sándor T. S., Pearson, V. K., Morgan, G., Patel, M. R., Sheridan, S., Mifsud, D. V., Sulik, B., Biri, S., Mason, N. J., McCullough, R. W. and Juhász, Z. (2025) Water-Group Ion Irradiation Studies of Enceladus Ice Analogues: Can Radiolysis Account for Material in and around the South Polar Plume? *Planetary and Space Science*, 266, 106179. https://doi.org/10.1016/j.pss.2025.106179

Semprich, J., Filiberto, J., Weller, M., Gorce, J. and Clark, N. (2025) Metamorphism of Venus as driver of crustal thickness and recycling. *Nat Commun* 16, 2905. https://doi.org/10.1038/s41467-025-58324-1

Swindle, T. D., Pack, A. P., Schwenzer, S. P. and Young, E. D. (2025) The value of returning a sample of the Martian atmosphere. *Proc. Natl. Acad. Sci. U.S.A.* 122 (2) e2404258121. https://doi.org/10.1073/pnas.2404258121

Troll, V., Deegan, F. M., Heinonen, J. S., Svanholm, C., Harris, C., Lacasse, C. M., Geiger, H., Poganj, A., Thomas, L., Andersson, M., Meyer, R., and Thordarson, T. (2025) Origin of Silicic Magmatism at the Katla Volcanic Complex South Iceland. *Geochemistry, Geophysics, Geosystems*. https://doi.org/10.1029/2025GC012319

AstrobiologyOU

AstrobiologyOU
Schools of Environment, Earth and Ecosystem Sciences;
Physical Sciences; Law, and Social Sciences & Global Studies
The Open University

open.ac.uk/AstrobiologyOU
astrobiology@open.ac.uk

@Astrobiology_OU

@astrobiologyou.bsky.social

The fieldwork team in Iceland