

SCOTTISH AFFAIRS COMMITTEE VISIT TO SAN FRANCISCO, NEW YORK AND WASHINGTON D.C.

The Scottish Affairs Committee visited San Francisco, New York and Washington D.C. on Tuesday 2 – Tuesday 9 April 2024 principally in connection with its ongoing inquiry into *Scotland's space sector* and *Science and Scotland*. The Committee also held meetings related to its inquiries into *intergovernmental relations: 25 years since the Scotland Act 1998*, and *Intergovernmental relations: The Civil Service*.

Members in attendance:

- Alan Brown MP
- Christine Jardine MP
- Mark Menzies MP
- Ms Anum Qaisar MP
- Douglas Ross MP
- Pete Wishart MP

This note summarises some of the meetings held as part of the official programme for the visit. The Committee is grateful to all those who took the time to meet with us, and to the FCDO for facilitating the visit.

San Francisco

Generation Space

The Committee met with the following representatives of Generation Space, the US subsidiary of Seraphim Space, at the British Consulate, San Francisco:

- Beth Vaccarezza, Partnerships Manager, Accelerator
- Lewis Jones, Investment Vice-President

Generation Space focusses on “series A” funding, as this tends to be part of the “valley of death” for space companies. The Committee heard how Generation Space has over 100 early-stage and growth-stage space companies within its portfolio. Generation Space has secured grant funding from the UK Space Agency and European Space Agency; the contract with ESA is the first time the Agency has partnered with an accelerator programme. The Committee also discussed Scotland’s “brand recognition” across the space value chain, beyond the recognised strength in cubesats, and the sector’s move away from a focus on cubesats as launch becomes more affordable.

The Committee also discussed the funding environment for start-ups in the UK and US. San Francisco and Los Angeles are both “hotspots” for the space industry, with many start-ups in Los Angeles being founded by ex-SpaceX employees who can access venture capital quickly. It has historically been easier to access early-stage capital in the US, because of a tendency in the UK for companies to be spun out from more traditional businesses that need more confidence in design.

Discussing recruitment, the Committee noted that salaries in the Bay Area are high, so there is more value for employees in company equity. There had also been experience of a company effectively attracting people from non-space businesses by building buy-in to the company’s “mission”.

Capella

The Committee visited the offices of Capella, which builds and operates synthetic aperture radar (SAR) satellites to image the Earth. The Committee met the following Capella representatives of Capella:

- Corey Snyder, Director of Productions and Missions
- Katina Mattingly, Director of Systems and Programs—Space Systems



Committee Members at the offices of Capella, San Francisco.

The Committee heard how specialist SAR satellites house sensors that can penetrate cloud cover and darkness, unlike traditional optical cameras on many satellites. Applications include monitoring illegal fishing and deforestation. Rideshare missions, which allow launch providers to aggregate a number of different satellite sizes, have been key to Capella’s launch access.

The Committee heard that, while the US Government remains Capella Space’s biggest customer, CEO Frank Backes recently announced that foreign governments (including the UK, UAE, and Japan) are emerging as a significant driver of future growth. Capella’s Analytics Partner Program also allows other companies to get access to Capella’s SAR data archive.

The Committee discussed Capella’s experience of recruitment in the Bay Area ecosystem, raising venture capital, and navigating licensing processes. The Committee noted that the US Government’s Office of Space Commerce had been helpful in navigating a number of different agencies.

NASA Ames

The Committee met with the following representatives of NASA Ames, at the British Consulate, San Francisco:

- Sidney Sun, Lead, University Collaborations, NASA Ames
- Mejghan Haider, Director, NASA Research Park, NASA Ames
- Terry Pagan, Senior Engagement and Strategy Manager, NASA Ames

The Committee heard how the Berkeley Space Centre is a proposed, 36-acre innovation centre at NASA Ames, in which academia, private industry and government can come together to identify, incubate and launch technological breakthroughs. The NASA Ames representatives explained the history of the site, and how the Centre's proposed layout will follow a 'clusters' model, with each cluster reflecting a domain in technology or science which is relevant to aerospace. The Committee noted that two particular priorities of the Centre will be autonomous air travel/urban air mobility and climate change/earth sciences technologies.

The Committee discussed the ways in which the soon-to-be built Centre could leverage – and further expand – the space ecosystem surrounding the campus and help attract companies; this includes by connecting and leveraging the combined capabilities of governmental and academic research with private industry's innovation, entrepreneurialism and capital in a central location designed to foster collaboration across multiple disciplines. The Committee heard how the project hopes to realise Berkeley's vision to accelerate the translation of research discoveries into goods and services that benefit the public while creating opportunity.

The Committee heard how partnerships and research collaborations have already been established in advance of the physical development, and that Google and the University of California are two prominent partners of the project. The NASA Ames representatives also outlined the Centre's funding model.

The Committee also discussed opportunities for transatlantic collaboration between the US and Scottish space ecosystems.

Spire Global

The Committee met with the following representatives of Spire Global, at their offices in San Francisco:

- Johnny Truong, Spire Chief Technology Officer
- Parvinder Thapar, Spire Vice President of Software Systems
- Austin Ellis, Spire Global Launch Manager
- Gregg Webber, Spire Global Facilities Manager



Committee Members at the Spire Global headquarters in San Francisco.

Spire's Chief Operating Officer and Director, Theresa Condor, had previously given oral evidence to the Committee in November 2023.

The Committee discussed how Spire initially came to the UK in 2015, and to Glasgow specifically, to set up their satellite manufacturing facilities and space R&D centre of excellence. The discussion covered Spire's manufacturing operations in Scotland, as well as its launch plans in the United States.

The Committee discussed how changes in Spire's business and the wider sector impact launch needs. The Committee noted that launch availability is lower today than five years ago, with several providers struggling or now unavailable (such as the Russian Soyuz, due to the conflict in Ukraine). Spire is now also focussed more on developing a "planned" constellation of satellites, which is difficult under the rideshare model.

The Committee also discussed recruitment to Spire's Glasgow operation. As multiple space companies often compete for the same talent, Spire needs to both identify and relocate talent from other countries, and work with universities to ensure a "pipeline" of skilled workers. The latter could include offering internships through universities to bring people on board, who could then be offered a job at the company.

The Committee also explored challenges in diversifying the space workforce, with a huge gender gap observed among applicants in Glasgow. The Bay Area has sufficient "pull" to attract a broader pool of applicants from other regions, which Glasgow may not currently have.

Stanford Photonics Research Centre Faculty

The Committee met with the following representatives of Stanford University at the Stanford campus:

- Dr Armand Niederberger, Stanford Photonics Research Center, Executive Director
- Prof David Miller, W.M. Keck Foundation Professor of Electrical Engineering and Professor, by courtesy, of Applied Physics
- Dr Thomas Baer, SPRC Faculty Co-director, Adjunct Professor in Applied Physics, Stanford University



Committee Members at Stanford University campus, California.

The Committee discussed transatlantic initiatives intended to revive collaboration between researchers in Scotland and California in the field of photonics, and how academia and industry could benefit from Scotland's scientific enterprise and economic development. The Committee also discussed the UK Government's role in supporting such initiatives.

Discussion focused, in particular, on the EPSRC-supported Scottish and Stanford Universities Photonics collaboration (SU2P) programme, which ran from 2009 to 2018. The Committee heard how the programme brought together leading universities in the UK (Strathclyde, Glasgow, Heriot Watt, St. Andrews and Edinburgh) with Stanford and Caltech and linked strongly with industrial partners in both countries.

The Committee heard about the work the UK Government's Science & Innovation Network is supporting the renewal of this initiative through discussions with Principal Investigators at the Universities of Strathclyde and Stanford.

Planet Labs

The Committee met with the following representatives of Planet Labs:

- Will Marshall, CEO & Co-Founder
- Charlie Candy, Chief Revenue Officer

The Committee heard how Planet Labs designs, builds, and operates the largest Earth observation fleet of imaging satellites, known as 'Doves', as well as providing mission-critical data, advanced insights, and software solutions to over 880 customers.



Committee Members at the offices of Planet Labs, San Francisco.

The Committee noted that the biggest value in the space sector comes from downstream services, with datasets presenting a huge

opportunity to create more products using local information; the question is how to encourage an ecosystem of services to develop from these datasets. While Planet Labs has the data, it is other organisations that have the local knowledge to build on this data.

The Committee explored the potential of companies like Planet Labs to improve the delivery of public services and environmental protection, and their existing work with the Rural Payments Agency (RPA) and the Welsh Government. Driving government procurement of space services are the sustainability transition, digital transformation, and peace and security. Applications can include warning of saturated land liable to flooding, and monitoring water environments, peatland, fly-tipping and urban development. Planet Labs data enables the RPA to undertake broad monitoring of fields for compliance with new agri-environment schemes, allowing them to be more targeted with inspections.

A particular focus of discussion was the potential for governments to undertake centralised procurement of space services, which can provide better value for money than departments procuring separately. This could also be applied to academia; in the US, NASA had also paid for all federally-funded researchers to have access to Planet Labs data, and it was suggested that this could be replicated for UK universities.

Scottish Development International

The Committee met with the following representatives of Scottish Development International (SDI), at the British Consulate, San Francisco:

- Adeep Chooramun, Vice-President, Lead Generation and Business Development, Space and Digital Technology
- Ali Taslimi, Vice-President, Business Development Technology, Americas.
- Fazel Taslimi, Vice-President, Lead Generation

The Committee discussed SDI's range of focus, which spans multiple sectors from space and software/IT to clean energy, as well as SDI's ways of working, including attending conferences, and hosting venture capital roundtables between Scottish Government Ministers and potential venture capitalists.

The Committee also discussed SDI's efforts to promote Scotland internationally, attract inwards foreign direct investment to Scotland, and assist Scotland-based companies to trade overseas. The discussion focused, in particular, on SDI's efforts in respect of Scotland's space sector.

Professor Reg Kelly

The Committee met with Professor Reg Kelly PhD OBE, Byers Family Distinguished Professor Emeritus, Biochemistry & Biophysics, UC San Francisco, at the British Consulate, San Francisco.

The Committee discussed access to funding for SMEs, and barriers to scaling-up and commercialisation for start-ups and spin-outs. Access to lab space was raised as a particular challenge for SMEs. Professor Kelly argued that simplifying bureaucracy for innovators, and providing lab space and manufacturing capacity is key to supporting innovative SMEs.

Professor Kelly drew from his experience at QB3 (California Institute for Quantitative Biosciences) helping to launch two companies, a life sciences start-up incubator and a venture fund, to strategically position the Bakar Labs – a life science-focused incubator for start-ups developing innovative technologies to benefit society – to be a world-class comprehensive incubator for life science and bioconvergence start-ups. Professor Kelly drew on his experience to demonstrate how incubating start-ups from within campuses and attracting venture capital was, when he was at QB3, a new idea, but is now common.

The Committee discussed the changing cultures of US universities, from purely fostering collaboration with businesses and innovators, to also recognising and valuing a public service mission of solving social problems. Professor Kelly also offered a comparative perspective on US and UK cultures – noting that innovators in the US feel they can “do anything”, which fosters a significant entrepreneur culture. Professor Kelly argued that that mindset is less evident in the UK and Scotland, where a more conservative and less confident culture prevails.

Professor Kelly also noted the importance of networking and socialising events for collaboration between innovators; he explained that such events have a disproportionately large impact relative to the minimal cost – particularly in terms of connecting innovators with venture capitalists.

New York

NYU Entrepreneurial Institute

The Committee met with the following representatives of the NYU Entrepreneurial Institute, at NYU’s New York campus:

- Marc Sedam, Vice-President of Technology Opportunities and Ventures, NYU Langone Health
- Frank Rimalovski, Executive Director, NYU Entrepreneurial Institute
- Annette Gray, Assistant Vice Provost for Research, NYU

The Committee heard about the NYU Entrepreneurial Institute's role as a catalyst for entrepreneurship education and innovation across the University. The Committee heard about the range of resources, programs, and initiatives the Institute uses to support aspiring entrepreneurs from diverse backgrounds and academic disciplines; including training, mentorship, seed-funding, community support, and experiential learning opportunities. The NYU Summer Launchpad was highlighted as such an example, in which provides students with funding, mentorship, and access to workspace to develop their start-ups. The Committee noted that the institute also hosts numerous events, workshops, and competitions, including a \$300K Entrepreneurs Challenge, which awards substantial funding to promising ventures. The NYU representatives explained that the Institute's approach is underpinned by a core philosophy of being experiential, multi-disciplinary and diverse.

The Committee heard that the Institute's focus is equipping innovators with the core business and commercial skills they will need to scale-up on their own – rather than supporting the innovators' research itself. The NYU representatives highlighted the Institute's tech venture program as an example of this – explaining the role of 'founders-in-residence' (i.e. alumni entrepreneurs) and 'rock star mentors' in supporting new innovators.

The Committee noted that, since its inception, the Institute has supported the launch of over 1,000 student-led ventures, which have collectively raised more than \$1bn in funding. Notable companies that have emerged from the institute's programs include Kinetic, a wearable technology company acquired by a subsidiary of Alphabet Inc., and Trigger Finance, a fintech start-up that raised \$27m in funding. The institute's efforts have led to the creation of over 100 start-ups founded by NYU faculty and researchers, further exemplifying its impact on fostering innovation and entrepreneurship within the university community. The NYU representatives explained that, for the Institute, returns from royalties or IP are not significant, and that the Institute is not driven by return on investment.

The Committee discussed different models of technology transfer, and how these vary according to the size and scale of institutions. NYU representatives explained that NYU's approach is about more than just licensing – it is about fostering a start-up culture, and creating and sustaining an ecosystem of entrepreneurial innovators within the institution. The NYU representatives explained the inherent tension in technology transfer and incubating start-ups – namely, a friction between 'blue sky research' and more applied research which leads to solutions the world needs, and which can be commercialised.

The Committee heard that one in 10 innovative technologies at NYU will get licensed; one in 100 will make more than \$1m. The Committee noted the NYU representatives' view that the University of Edinburgh's technology transfer office is one of the best in the world.

The Committee also discussed cultural differences between the US and UK, and the extent to which this impacts entrepreneurialism within universities. For example, the NYU representatives explained that US-based innovators are often not 'scared of failure', and that this mentality is supported by a tax structure and bankruptcy rules which does not punish failed business ventures as severely as in the UK or Europe. It was also explained that US universities receive significant income from philanthropy – which exceeds any income through return on investment, and that this enables innovator/start-up failure to be part of the university's business model. The NYU representatives also highlighted that US universities have a significant 'pull-back' or ongoing connection between alumni and their universities, which is usually absent in a European context; this means it is easier for US universities to draw on the resource and expertise within the alumni community, compared to European counterparts. The NYU representatives explained that this connection also helps ensure start-ups stay within the locality of the university, and that the universities continues to benefit from them – for example, 73% of all start-ups stay within 13 miles of the university within which it started.

NYU Endless Frontier Labs

The Committee met with Deepak Hedge, Founding Director, NYU Endless Frontier Labs, at NYU's campus.

The Committee heard about NYU Endless Frontier Labs' role as a selective start-up accelerator, within the Stern School of Business, and its work to create a start-up ecosystem. The Committee heard about the range of support Endless Frontier Labs can provide to start-ups to help them grow and scale, such as providing seed funding, access to state-of-the-art lab facilities, mentorship from successful entrepreneurs and industry experts, and connections to potential investors and corporate partners. The Committee heard how program runs for an intensive 8-month period, during which start-ups receive guidance on refining their products, developing go-to-market strategies, and securing follow-on financing.

The Committee also noted that, relatively unique to the NYU Endless Frontier Labs programme, Founders (i.e. participants in the accelerator programme) are not required to have a New York University affiliation and do not have to relocate to New York. There are multiple UK start-ups currently affiliated, including ARC Marine, an eco-engineering company using nature based, and nontoxic building solutions that rehabilitate damaged marine habitats, and AUAR, which uses AI-based design tools to enable builders to manufacture sustainable timber homes using robots.

Columbia Technology Ventures

The Committee met with Orin Herskowitz, Executive Director, Columbia Technology Ventures (CTV), at Columbia's New York campus.

The Committee discussed CTV's role as the technology transfer office of Columbia University, and its responsibility for facilitating the commercialisation of innovative technologies and intellectual property developed by the university's researchers.

The Committee heard how CTV manages the entire lifecycle of technology commercialisation, from identifying and evaluating promising inventions to securing patent protection, marketing technologies to potential licensees, and negotiating licensing agreements. The Committee noted that the office has a portfolio of over 4,000 issued patents and hundreds of active licenses across various industries. In addition to licensing technologies, CTV also supports the formation of new startup companies based on Columbia's intellectual property. The Committee also heard how, since its inception, CTV has facilitated the launch of over 200 startup companies, many of which have gone on to secure significant funding and achieve commercial success.

The Committee heard about how CTV supports entrepreneurial endeavours, including the range of resources and programs, such as the Columbia Startup Lab, which provides co-working space, mentorship, and access to funding opportunities for early-stage startups. The Committee also heard how CTV administers several funding initiatives, such as the Columbia Ignition Fund, which provides non-dilutive funding to help Columbia researchers advance their technologies toward commercialisation.

City University of New York Advanced Science Research Centre and Tech Transfer Office

The Committee met with the following representatives of City University of New York (CUNY):

- Joshua Brumberg, Interim Director, CUNY Graduate Center
- Mark Hauber, Executive Director, ASRC CUNY Graduate Centre
- Andrea Alu, Director of Photonics Initiative, ASRC CUNY Graduate Centre.
- Rein Ulijn, Director of Nanoscience Initiative, ASRC CUNY Graduate Centre
- Vinod Menon, Director, CUNY Advanced Technology City College of New York
- Tavis Ezell, Director of Business Development, ASRC CUNY Graduate Centre
- Douglas Adams, Director of Technology Commercialisation Office, CUNY.



Committee Members touring the CUNY ASRC facilities.

The Committee heard how the ASRC's 200,000 square-foot facility features specialised labs and equipment designed to support interdisciplinary science initiatives. These research initiatives include Nanoscience, Photonics, Structural Biology, Environmental Sciences, and Neuroscience. It also houses several cooperative institutes and centres, such as the CUNY Energy Institute, the Soft Matter Research Center, and the ASRC Neuroscience Initiative.



Committee Members with CUNY representatives at CUNY ASRC.

The Committee also heard how, with over 200 researcher faculty, postdoctoral fellows, and graduate students, the ASRC provides training opportunities through PhD programs, postdoctoral fellowships, and undergraduate research experiences. The centre actively pursues research funding, often securing over \$60m in external grants and contracts per year from sources like the National Science Foundation, National Institutes of Health, Department of Energy, and industry partners. The Committee also noted the role ASRC has played in attracting and retaining top scientific talent to CUNY.

The Committee also received a tour of CUNY's state of the art ASCRC facilities.

Tartan Week celebrations

A number of Members attended a Tartan Week celebration hosted by the Scottish Government at the British Consul General's residence in New York.

All Members attended the Kirkin' o' the Tartan at the Brick Presbyterian Church, and then participated in the Tartan Week Parade in Manhattan.



Committee Members at the Tartan Day parade, New York.

Washington, DC (and Arlington)

NASA

The Committee visited NASA Headquarters in Washington, DC and met with the following NASA representatives:

- Katelyn Kuhl, International Program Specialist, NASA
- Peyton Blackstock, International Program Specialist, NASA
- Nate Kumar, International Program Specialist, NASA



Committee Members at NASA Headquarters in Washington, DC.

The Committee heard about the work of NASA's Office of International and Interagency Relations, and how it works to assemble international partnerships to deliver its missions. NASA representatives explained that international science co-operation is "bottom-up", with the international community informing priorities through decadal surveys. The Committee discussed specific examples of co-operation between NASA and UK stakeholders.

Members heard about the Artemis programme to return to the Moon, how it differs from the earlier Apollo programme, and the role of international co-operation through the Artemis Accords.

The Committee also discussed the range of federal agencies involved in space (such as the Federal Aviation Administration and the Office of Space Commerce), as well as the role of the National Space Council, chaired by the US Vice President, in synchronising civil, commercial, and national security space activities across the US.

Lockheed Martin

The Committee met the following representatives of Lockheed Martin at its offices in Arlington, Virginia:

- Mark Phillips, Head of Government Affairs, Lockheed Martin UK
- Stephanie Driscoll, International Business Development Senior, Lockheed Martin

Nik Smith, Lockheed Martin Space UK's Regional Director for UK and Europe, previously gave oral evidence to the Committee in January 2024.

The Committee heard about Lockheed Martin's operations in the UK, and Scotland specifically, as well as various space-related projects with partners around the world. There was discussion of Lockheed Martin's involvement in both the Sutherland and SaxaVord Spaceports, including the planned pathfinder launch from SaxaVord (with a

launch vehicle provided by ABL Space Systems). Lockheed Martin representatives explained the company's reasons for participating in the pathfinder, including its need to access launch services, the flexibility of the launch vehicle in being able to access different orbits, the desirability of developing the UK space ecosystem's "end-to-end" capability, and the geographic factors that make Scotland a desirable location to develop launch operations.

The Committee discussed the importance of enabling infrastructure for testing activities, with government support in this area meaning that upfront costs can be reduced. The need to ensure a pipeline of customers beyond first launch was also discussed, with the Department for Business and Trade having a role to play as well as the UK Space Agency. On attracting people into space careers, there is a challenge for the UK Government in making people aware that space is intrinsic to all aspects of life.

British Embassy Washington

The Committee met the following representatives of the UK and Scottish Governments at the British Embassy Washington:

- James Roscoe, Deputy Head of Mission, British Embassy Washington, UK Government
- Chris Thomson, Scottish Government

The Committee discussed how officials of the UK and Scottish Governments work together to promote Scotland internationally.