



UK Engagement with Space Committee

Corrected oral evidence: The UK's engagement with space

Monday 9 June 2025

3.35 pm

Watch the meeting

Members present: Baroness Ashton of Upholland (The Chair); Baroness Bonham-Carter of Yarnbury; Lord Clement-Jones; Lord Lansley; Baroness Mobarik; Lord Shamash; Lord St John of Bletso; Viscount Stansgate; Baroness Stowell of Beeston; Lord Tarassenko.

Joined by Special Adviser Michelle Howard.

Evidence Session No. 15

Heard in Public

Questions 135 – 141

Witnesses

I: Laurent Jaffart, Director of Connectivity and Secure Communications, European Space Agency; Hermann Ludwig Moeller, Director, European Space Policy Institute.

Examination of witnesses

Laurent Jaffart and Hermann Ludwig Moeller.

Q135 **The Chair:** I welcome everybody to the next session of the UK Engagement with Space Committee. I am delighted that we are joined today by two distinguished colleagues. Online is Laurent Jaffart, who is the director of connectivity and secure communications at the European Space Agency. Laurent, it is lovely to see you. We had the great pleasure of spending some time with you—though not enough—when we visited you in Harwell. Thank you so much for coming and joining us on the committee. We also have with us today Hermann Ludwig Moeller, the director of the European Space Policy Institute. Hermann, thank you so much for being with us today.

Lord Shamash will ask the first question. As I said, if you have any additional comments to make at that point, please do.

Q136 **Lord Shamash:** Thank you both again for coming and sparing your time. Could you provide a brief overview of the degree of collaboration between the United Kingdom and Europe in space? How would you characterise the UK's engagement with both ESA—the European Space Agency—and the EU on this front? There is then a supplementary.

The Chair: No, that is going to go to someone else.

Lord Shamash: I was getting very enthusiastic there.

The Chair: We are all very enthusiastic. Laurent, do you want to start?

Laurent Jaffart: Thank you very much for the question. It is important to note that ESA is a separate organisation from the European Union. The UK is joined by Norway and Switzerland, which are also member states of ESA but not of the EU. The UK is a founding member of the European Space Agency, which is marking its 50th anniversary this year—50 years of successful collaboration.

In this time, the UK has played an active role in ESA's many successes with missions such as PLATO and Ariel, which are science missions and Biomass – an earth observation mission. Four UK astronauts have been selected under ESA: Tim Peake, Rosemary Coogan, John McFall, and Meganne Christian. There is ExoMars for exploration, but also on telecommunications—which is in my area—with Eutelsat Quantum and the Moonlight project offering connectivity to the moon. These are important successes that we have been able to achieve jointly.

In terms of our presence in the UK, the UK hosts ECSAT—the ESA telecommunication centre—where I am based, in Harwell, and thank you for the visit you made to us a few weeks ago. In that respect, we are leading commercialisation and downstream activities. We also have a climate office and some activities for exploration, technologies and engineering. The UK is the fourth-largest contributor to ESA, behind France, Germany and Italy. The footprint we have in the UK includes four

business incubation centres, four ESA labs and one technology transfer broker.

So, overall, the UK is a major contributor to ESA. We are very glad that despite Brexit, the UK remained a member of ESA and as agreed by the convention, each member has one vote that governs and sets the boundaries for co-operation among the member states.

Hermann Ludwig Moeller: First, I would like to explain ESPI and where we sit. We are not ESA or the European Union or the Commission, but we have the UK Space Agency, CNES and Germany, and most European space agencies as members. We are an independent think tank, and I would add advocacy for space. We promote European space policy globally, from the White House across the Atlantic to Japan—from the National Space Council in the White House to the National Space Policy Secretariat in Tokyo. We work on the intersection between policy and government agencies, if you like, but also business, academia and the media.

It is an honour and a pleasure to be here. I will say a few words up front. I understand I can have a moment for a bit of an opening statement; I saw this in your procedure, so I would like to make use of it. As you understand, this is a European perspective; it is not specific, as it is for Laurent, and we know each other well. Bonjour, Laurent. It is really a broader perspective. Maybe it also has the luxury not to be in the daily business, which we are often all kept by.

If I may, I would say it is not only a question towards ESA and the Commission but towards Europe and maybe also internationally at large: how to position the UK strategically. It happens at a unique point in time—I would almost say moment in time—if you watch the news, I do not have to repeat the geopolitical shifts.

What I like to do—as I did this morning—is check the news. I checked the *Guardian* and the UK is losing the technology on the Stock Exchange. There is another example of a successful business that is acquired across the ocean; that is not the only case. The whole notion of innovation and space is a key element of innovation. Sitting close to the City of London, finance is a particular emphasis.

At the same time as we speak here, the Secretary-General of NATO is talking to your Prime Minister about closer co-operation and security and missile defence shields, which is also a big topic across the oceans. It is an example where space and defence will be significant and come together. So when you ask me, “How should it work and why would you do this at all?”, I do not say anything new, really. It is certainly the economy, but unfortunately, it is increasingly security and defence. The bad news—or the good news—is they cannot be separated. You have duality in this. The innovation and industry segments depend on each other. A big mystery to resolve is really how to get those two forces together to best effect.

It can build on the incredible strength of the UK as a financial hub, and certainly also in terms of your history of working on security and defence across the board. Regarding the international dimension, the UK is a global actor, so it is not only Europe and questions such as Japan or South Korea, Australia, India and other regions. The big question is about how Europe and the UK—maybe as a facilitator—can enable what we sometimes call space diplomacy.

I conclude just by saying it takes a village—this is what we call it: everybody—to bring the key interests, national priorities, but also leverage on the European level. We are deeply convinced, and this is why I also took the plane this morning to be here in person, to embrace the UK in this.

The Chair: Lady Bonham-Carter, do you want to ask your supplementary?

Baroness Bonham-Carter: I say to Laurent: thank you also for a fascinating day. It is a pity that you took the plane here; we might have liked to meet you in Vienna.

Hermann Ludwig Moeller: Next time.

Baroness Bonham-Carter: Next time, exactly. You said that civil and defence cannot really be separated. Is it the case that the UK's space relationship with the US tends to be defence and with the EU tends to be civil? I think you are going to say they cannot be separated.

Hermann Ludwig Moeller: If life were simple, this is the way you would operate. You would say on the security and defence, it is one direction; under the civil, it is in the other. It has not really been possible in the past—if you look at the core of it—but also increasingly so.

If you go to the US these days, the biggest concern it has is that China will overtake it in innovation, and innovation is not coming just from the defence sector. There are entrepreneurs, finance and dynamics that belong to what makes something a commercial enterprise, which the US also wants to tap into. We have an extreme example—I will not mention names—but you can create enormous dependencies, so it is also complex if you are successful. It always has the two sides of the coin, but the example we just witnessed on the other side of the Atlantic is the example of where defence and commercial are hand in hand. When it is true over there within a single country, it is a universal truth.

Laurent Jaffart: Of course, it would not be appropriate for me to comment on the national strategic orientation as we are working for individual member states giving us directions and we do not comment on the strategic directions taken by a country. Having said that, in the global context—echoing what Ludwig was saying—we see a shift with dual-use technologies. The line between civil and defence applications is becoming even more blurred than ever before, and the role of space in society has evolved and is evolving rapidly.

Space is uniquely positioned to tackle many of our urgent societal needs, such as climate, security, competitiveness, energy and digital transformation, just to name a few. When you look at technology, I do not know whether you are familiar with the tree of technology readiness level, which is TRL 1, the most immature, to TRL 9, proven in orbit. Basically, from TRL 1 to TRL 6, you cannot allocate a technology for a single use. The technology specialises from TRL 6 onwards, and in fact, the technology is the same; it is just that you specialise it for the mission and the application.

In today's world, we are more and more reliant on space every day, more than ever before. It is crucial not to necessarily segment the backbone of the application between civilian and defence at the expense of one against the other. In fact, the two are working hand in hand, and the investment made by the UK or other member states of ESA can be specialised at a later stage for a given mission.

Baroness Bonham-Carter: That must lead to some ethical questions, I would think, but maybe that is something to debate later.

Q137 **The Chair:** I will move into the world of ESA, because the UK has to decide where it puts its money, what it is going to prioritise and so on. For the last period, something like €1.85 billion has been put in, making us the fourth-largest contributor, as Laurent rightly pointed to.

So there are questions really about whether the UK has the level about right, whether it should invest more in what would be the benefit of so doing, or whether we would be better off thinking about diversifying more and developing partnerships with countries that have been mentioned already, such as Japan, India, Canada and so on. It is fine to think of a thousand flowers blooming but there is going to be a limit on resources.

I might start with Hermann because I know you used to be ESA but Laurent still is and I suspect I can predict what his answer might be. I would be quite interested if you advise us slightly more independently and say, "Well, this is what we think". How do we position ourselves best so that we contribute to the future in terms of science, defence, security, exploration and all the potential of space, but also that we use our limited resources to best effect?

Hermann Ludwig Moeller: I emphasise it is more than slightly more independent. We praise ourselves that we are independent, with 21 members, and we do justice not only to the members but I would really believe to the wider good.

You asked about the level of investment. It is understood that the biggest concern these days is finance, in many ways, for many reasons. Allow me to zoom out; this is not the UK, not even Europe. If I take China and the US, and I could take India, we are about a factor of five out of scope. When it comes to security and defence, it is a factor of 15, always space-specific. Space, security and defence, Europe, and you take the same for the US, it is a factor of 15.

It is evident that this gap cannot be just closed like this; that is understood. The fair question is: what is a reasonable invest and what is maybe affordable? If you look into another figure, it is the GDP percentage for R&D, and there are numbers like 3% advocated. In fact, the UK is not far from this; it is strong in R&D. Compared with the 2.77%—I think; you may know better—your investment in space is underinvested, if I may say that. If I compared it with France, Italy or Germany, there is a factor of two to three, really, if you compare it with the economic power of the nations.

So there is a true question of absolute scale, but also relative scale. What we advocate is a GDP share of 0.15%, which across Europe would be a doubling; for the UK, it would be a tripling. I know this is not very fashionable to say here, but we say this at a time when security and defence are on the rise, for the wrong reasons. Where there is discussion now—maybe right now—for 3.5% to 5% GDP for security in defence, it is probably the true game-changer in terms of needs, where space has a need that is completely, in scale, different from the past. We should look at it from the two sides; from scaling up from where we are—which is underinvested—compared with other boundaries are around. I left out the digital economy, which I would put at par with security and defence, but maybe that is for another question.

Laurent Jaffart: Each member state's financial contribution is reflecting an ambition of the member state itself. It is true that we have a growing interest, both from the public and private side for the space sector. We have well-known actors—such as SpaceX—but also China or India, where basically there is a variety of entrepreneurial approaches coming into the market.

On the economic return, £1 invested at ESA has generated 14x in return.¹ This is quite an inspirational value that should demonstrate the capacity to multiply because you are basically pooling into multinational missions that the UK would not necessarily do alone. When we look at the Council at Ministerial Level of 2022, we estimate—the reports will be published later this year—that the economy in the UK has benefited from roughly £2.7 billion of GDP value added and supported 33,000 jobs over the three years, so 11,000 jobs per year. These are not necessarily investment return figures, but just to give you an order of magnitude. Through the commercial activities that we are doing—the commercialisation—we have supported 132 companies over the last few years and distributed £200 million in funding for these companies.

So one could argue that the contribution of ESA is not just a question of declaration of ambition in comparison with 23 others, but how to support the national industries thanks to the geo-return in the participation in much larger missions that would be done nationally.

Lord St John of Bletso: I have three short questions. First, to what

¹ Mr Jaffart clarified in writing that this figure is for the more commercially-focussed ESA programmes.

degree has Brexit destabilised our influence in ESA? Secondly, as you mentioned, we are the fourth-largest contributor. If we contributed more, do you think that this would give us greater influence? Thirdly, Laurent, you mentioned this figure of £1 generating 14x. Can you substantiate how that is made up?

Hermann Ludwig Moeller: I was in fact on the ESA side at the time. I had breakfast with your delegates from the communications programme board the morning Brexit happened, and it was quite a moment. As far as my experience at the time goes, it was quite evident that there was continued commitment to leverage ESA, and in particular anything that was close to competitiveness, industry or market. This is also reflected by the high percentage; the UK invests 60% in the optional programmes, where you really can play à la carte. You are not just part of everybody; you can actually shape direction and programmes and lead programmes. This is a big beauty of the intergovernmental setup of ESA.

To answer your question: if you put more money in, you can shape more. There is no question; it is the design of the system. If you said it is quantum communications, as an example, or remote sensing earth observation intelligence for dual use, those can be things you can be a shaper of. There is no question.

Before Laurent answers the factor 14 question, we did an analysis of that kind as an institute and there are two figures. One is that you invest money and there is a return for industry of jobs and tax; that is a factor of three in most cases. There is, in effect, into the wider economy—I always say nobody would measure the size—the value of the semiconductor industry thanks to the size of the semiconductor industry. In fact, the company I mentioned just now that was acquired by the US is a semiconductor industry for connectivity and data centres—not a good example.

If you look into the transversal nature of semiconductors, batteries, pharmaceuticals, space and R&D-intensive endeavours that need public guidance, support and funding, you typically find a factor of six to seven on top of the first number. So there are two distinct effects. The second one is a bit more complicated. We have a report on it, but the numbers are right.

The Chair: Is the report in English?

Hermann Ludwig Moeller: Absolutely. All our reports are in English.

The Chair: Please send it to us because that would be really fascinating for some of us. Laurent?

Laurent Jaffart: On your first question about whether the industry has been destabilised by Brexit, the answer is probably yes. Exclusion from participation in EU contracts—such as Galileo—was a big loss. I remind you that the Galileo payload for the first generation was done in the UK.

The UK is rejoining Copernicus and reopening opportunities for its member states. We are now working on IRIS². The UK is not yet—maybe never will be—part of the programme. A lot of opportunities that the EU is fostering are just not accessible and it has not necessarily been compensated by national programmes; that is the difficulty that the UK industry is facing.

Nevertheless, I see and note very positive openings with the Government and the European Commission, which should give opportunities for a rise in Europe and potentially additional programmes that the UK would subscribe to. When it comes to the question of contribution, it is not just a blanket statement that more will lead to more return. It is the selection of particular missions of interest that would lead to a particular return, and the selection of areas where the UK has strength and could definitely bring something, potentially ranging from science all the way to the commercial missions of telecom. We are proposing a direct-to-device initiative, for example, where I would imagine that the contribution by the UK would have a significant return in this very commercial but very promising market.

For the substantiation on the up to 14x, I suggest that we send you the report—in English—that we are publishing, which is tracking this. The question of the time horizon is important. Some can be measured from one budget cycle to another; others take much longer to actually establish the return. Space is usually a business with a long timeframe for measuring returns on investment, and therefore you potentially need to look at a 10-year horizon to be able to have concrete numbers.

The Chair: We will take Baroness Stowell next because she has the other supplementary, and I have not forgotten that Lord Shamash is next.

Baroness Stowell of Beeston: My question is quite straightforward. What is your view or advice as to what the UK's strategic priorities should be going into the ESA ministerial? I will direct that at Mr Jaffart, but if there is anything that Mr Moeller wants to add then he can come in after.

Laurent Jaffart: When we look at this ministerial, every member state will have its own opinion and a different strategy. The next ministerial focuses on five areas. The first is around the protection of our planet and climate. These are missions such as Vigil, to monitor space weather and position Europe as a global leader in space safety, or TRUTHS, to help inform our climate models to monitor climate change in ways that can be done only from space.

The second area is around explore and discover, unravelling the mysteries of our planet and the universe with science. Given the geopolitical context, Europe has an opportunity to lead science in the world. By expanding our role in the new space exploration era—in low earth orbit, around the moon and towards Mars—the UK certainly has an opportunity.

The third axis is around resilience, autonomy and security. This is encompassing autonomous access to space and the development of the next generation of technologies for connectivity, positioning, navigation, timing, earth observation and civil security. We are looking at the development of solutions to predict and manage natural disasters and emergencies, not only in space but downstream, with applications.

The fourth element is around boosting European growth and competitiveness: innovation, acceleration of innovation, strengthening industrial capacity and driving economic growth. This is also how to position Europe as a commercial hub attracting further private investment but also talent. In some areas, we have seen a brain drain and we would like to attract that talent.

Finally, it is to inspire Europe and future generations, to inspire people from different backgrounds to look at the power of space, and use space to influence international diplomacy and global affairs. The UK is particularly strong on the commercial and economic areas of the space sector—such as telecommunication with Viasat and OneWeb, for example—the downstream applications, sustainability and the science sector.

In my mind, the UK is a technology leader in different domains. One area that could be of particular interest at this ministerial would be around artificial intelligence or new types of propulsion technologies around nuclear to be able to explore further and sustain the lunar nights, for example.

Hermann Ludwig Moeller: I just want to emphasise a point that was made and is often forgotten: the space diplomacy part. I talked about the international. This is something where Europe has to step up as a whole, and the UK by nature has something to bring to the table, no question. Talent and workforce are important. Those are the soft things that are sometimes forgotten and should have their place.

When it comes to the big programmes—capital-intensive programmes—the big question will be: is it the moon or the Golden Dome? Because that is the question in the US and it will affect us. Right now, it looks more like the Golden Dome than the moon. This is something that has to be looked at very carefully. Artificial intelligence, propulsion and all these things will be required in either case, but you need to know why you do it. That has to be a top-level decision that really gives the rationale why you would scale up the investment, which you need to, not only at the ESA ministerial but nationally.

Lord Shamash: Forgive me: I want to go back to the finance, if you would not mind. I was looking through the material that we have been supplied. If you work on the basis that he who pays the piper plays the tune, I was really surprised to see that the Germans gave just short of £1 billion last year, whereas we are at £320 million and have had a drop of £121 million. It was said in our briefing note that we have lost a lot—to a certain extent—sitting around the table. You touched on it earlier: do we

have the same say if we are not paying the cash? I just wonder how important that is.

I am not quite certain where the extra money is going to come from for us to catch up with the Germans. It is not the Germans; it is the French. I am sorry, forgive me. It is the French who paid £1 billion. They are way ahead of us: three times the amount. It just strikes me that they must be getting pretty fed up with us in the sense that we are not putting the money in. I just wondered what your take was. I am sorry, Lord St John of Bletso asked that question but I just want to follow up with this. I feel unsettled by this and I do not know whether it is actually working its way through. You touched upon the programmes, Hermann, but I just wonder whether I have gone off on the wrong tack here.

Hermann Ludwig Moeller: First, I can confirm that the factor of three between France and the UK investment is correct. It is roughly a factor of two when you compare it with Italy and Germany. This is not just ESA; it is also the national programmes. It is really what you put on the table.

Laurent can explain much better than I can, but it is clear that—as I said before—in investing in programmes, you become a shaper of the programmes. If you are a leader in the programme—which you can be—then you are a leader on the programme. It is evident that the amount of influence on the shaping of the overall picture is also affected, which is only fair, in a way, because it would be like this in any business.

What you describe is not a UK-specific point; it is pretty much true for most nations of Europe when you compare internationally. We are all challenged and need a good reason why we would do it. Without the why—if you come just from the how—there is a difference between efficiency and effectiveness. You need to do the right thing. We always come from the supply side and we have lots of good stuff already. We do stuff. All Europe does excellent work, but we have not penetrated collectively as a space community—I would count myself as part of this—into the policymakers' minds to understand that this is a strategic tool for the economy and for peace.

Laurent Jaffart: The ministerial cycle—where budget is allocated—is a key area where you need to have foresight and a crystal ball, probably even beyond the three-year horizon that the budget will be voted for. For a lot of member states, picking certain missions is highlighting certain strengths of the country in which the money will be going. It is important for the UK to decide at what level of subscription it wants to go and not to have any regrets afterwards, because once the money is locked in, the money is locked in. It is very difficult to add to contributions given the fact that the missions need predictability.

For the comparison with France, it is not necessarily a competition between nations. For example, the French would have a lot of their contribution going towards the launchers, maybe less in other areas of optional programmes. It is more a matter of the UK defining for itself

where it wants to maintain or regain strength and therefore allocating money to be able to substantiate this strategy with its industry.

- Q138 **Lord Lansley:** Perhaps I might take us into the question of the relationship between the European Space Agency, the European Union, and of course the European Union Agency for the Space Programme. Could you tell us a bit more about the operational divide between those two agencies and how they relate to one another, perhaps by reference to an interesting programme or two, such as Galileo or Copernicus? Laurent, you used the phrase, "what was accessible to the United Kingdom", and I wondered whether you might just guide us through the extent to which programmes being run operationally by the EU agency makes them inaccessible to the United Kingdom.

Laurent Jaffart: Today, when we look at the programmes that are run together with the EU, the EU is putting different missions that it would like to start or conduct through what it calls the MFF—multiannual financial framework—for its budget. Money is then allocated to EUSPA or through ESA to run those programmes. In fact, in the case of Galileo, it is a delegation of funds through EUSPA, which is then contracting with ESA. So there is not one way; every programme has its own fashion of operating and there is no template yet defined that actually works.

If you look at IRIS², it is even a different model of a public-private partnership, where industry is co-funding with ESA as the source of funds, the Commission directly with the industry, and then between the Commission and ESA. What we see for the ESA programmes is that each member state has one vote and can decide and instruct ESA to participate in a programme. The issue comes later if this programme is then working together with the Commission, and here there is a need for a government-Commission agreement to be able to onboard industry, which has been done in the Copernicus programme. So the rules are not clearly defined on how it works.

In terms of perimeter, EUSPA is largely involved in the operations and the downstream outputs of the programmes. ESA is more involved in the upstream, the definition of the system, the technical realisation of the programmes, and the programme management of those very complex systems. You then have some other agencies—such as SatCen—which may actually pool and share data for the benefit of the European Union member states.

So we have different agencies acting in different areas. We can always improve but the share of responsibility is rather clear: programme, technical excellence, system done by ESA, operations by EUSPA, and for the downstream, pooling and sharing by SatCen.

Lord Lansley: Can I—

The Chair: Can we just ask our second witness to respond?

Lord Lansley: Yes. I beg your pardon. I was just trying to finish with Laurent and then ask if Mr Moeller would comment on it.

The Chair: Okay. If you want to, go for it.

Lord Lansley: Let us just take two programmes, for example: Galileo and EGNOS. To what extent are they accessible to the United Kingdom as programmes should we wish to join them? Clearly, you and your ESA colleagues would like the United Kingdom to subscribe to IRIS², but to what extent would IRIS²—in its downstream applications—be controlled by the European Union Space Agency insofar as it relates to security aspects as opposed to, as it were, the upstream definition of the programme?

The Chair: As you know, we have a question on IRIS², which Lord Tarassenko was about to ask.

Lord Lansley: I was using it as an example of the relationship between the two.

The Chair: I completely get that, but I do not want to end up having to go late.

Lord Lansley: It is an interesting and already discussed question.

Laurent Jaffart: In fact, for all your questions, these are EU programmes, not ESA programmes, and therefore a separate negotiation would be needed between the EU and the UK. This negotiation would give the framework under which industry would be able to participate. As long as this negotiation has not taken place, I do not think there is an answer to your question.

Lord Lansley: If I may, we need to ask Hermann to maybe look at this from the outside as an independent voice. If you want to create unity in space, this sounds like a very complicated way of trying to achieve it.

Hermann Ludwig Moeller: I would not use the word unity in space, in fact. We are talking about a de facto federation in space because in the future we will increasingly have components that will have their different *raison d'être*, if you like, their reasons to exist, and priorities may be national or European. There is a parenthesis. But maybe the bigger answer is, if you look at the money side of things, it is below 20% that is invested through the EU space programme. It is more than 80% that is in national hands, including in the UK, and about 60% of that is channelled through ESA. So ESA is the biggest procurement agent for Europe in space by far.

What does it do? Laurent said it. It is the procurement side: the big, complicated programmes and system architecture implementation, but I would underline that it is also the innovation. Without innovation, we can talk about many, many things. In five or 10 years from now, we will not be on the table. You need to make sure that you bring the innovation in, something that is accelerating only in China, maybe even more than in the US. We need to bring this innovation.

I would argue that the innovation engines are national agencies and ESA. The Commission—Laurent underlined it—is maybe the political side. It is about requirements and the agreement with member states. I would clearly distinguish this but also look at the scale of it. It is a different task and scale, and that is true for all programmes to come, I am pretty sure.

The Chair: I am going to bring in Lord Tarassenko so that we can keep on this theme.

Q139 **Lord Tarassenko:** I am going to pursue both Galileo and IRIS² further. Laurent, you have addressed a little how it might happen, I want to look at the why. We have heard a lot of evidence in our committee so far that the UK should seek access to both these programmes for both strategic and economic reasons. In fact, in Galileo's case, it would be coming back into Galileo.

Very early on, one of our witnesses—Major Tim Peake, the second British astronaut—almost made it his first priority. He said that we should really be in there because we contributed so much to the money and scientific expertise of Galileo before Brexit. One of our top priorities should be to get back in there as quickly as possible.

If you were writing the bid to the Government to say we should get back into Galileo and into IRIS²—it does not really matter at this point what the mechanism might be for that—what would be the top three or four reasons you think the UK should do that?

Laurent Jaffart: You will have to look at it from different angles for the two programmes. On one side, Galileo, the second-generation contract was done some years ago. The industrial set-up is done, and therefore the question of opportunities for the UK industry at this stage of the programme would have to be looked at in a very particular way on where potential gaps are and where the UK industry can provide these gap fillers.

On IRIS², the programme started in December 2024 and has not passed the system requirement review or the preliminary design review. Now is the time for the concessionaire—which is responsible for the concession agreement towards the Commission—to form its technical answer with the selection of industry, and therefore the ability to select technologies that are mature or need maturation in Europe before deciding to potentially go elsewhere. Participating in a programme from the beginning gives a lot more opportunity for the industry to have a chance to participate.

IRIS² is a concession agreement, meaning the Commission is buying a service from a concessioner and the ability to participate now is to have the capacity of the system allocated to the UK. It would be additional capacity to the capacity defined in the system baseline. This means interoperability and the ability to use a multi-orbit system that is defined with security in mind and the notion of sovereignty.

To make it short, depending on the maturation and status of the programme, there are different opportunities for the UK industry, upstream and downstream.

Hermann Ludwig Moeller: If I had to write something and it needed to be short, I would talk about the why and give the example of—again, I just read it this morning—the Baltic states, Poland and Ukraine having 6,000 spoofing of Galileo GPS in the month of January alone. This is now regional because the conflict is regional: if the conflict grew bigger tomorrow, I am not sure I would get my flight from Heathrow tonight. You will be affected systemically, not only where it is traditional security and defence, if you like; it will touch you at the heart of the economy. We depend on timing and positioning. That is true for Galileo and whatever the name will be in the future; it is a universal answer that will be true for many years to come.

The same is true for connectivity; again, the example is Ukraine. The first thing Russia did at 4 am was to hack Viasat, which happens to be—as Laurent mentioned—a commercial satellite. It has a business in the UK, which became a target. Maybe you also want to protect the target because otherwise it would disappear from the Stock Exchange even more.

The same is true for reconnaissance and information on what is happening on the ground, be it civilian or military. So there is an enormous dependency building up and a vulnerability that is affecting civil society as much as people on the battlefield. That is the reason we need all these space capabilities, without any doubt. If we do not do it, we will regret it.

The Chair: Lady Mobarik, do you have a supplementary?

Baroness Mobarik: I was just going to go off on a slight tangent. Following on from what you were saying, I know collaboration is the key, but as the UK is no longer involved in the EU's Galileo programme—as mentioned by Laurent—do you think that the UK should perhaps be ambitious and engage in the development of an autonomous PNT system, similar to Japan, which has developed a system that is complementary to the EU's Galileo, and so ensuring alignment? After all, we have the technical skills and knowledge to build a dedicated system. Would you say that that is financially challenged or unachievable? I will ask Hermann first, if I may, and then maybe a comment from Laurent.

Hermann Ludwig Moeller: The answer is that you will see more autonomous development in nations. That is going to happen; you can see it already. World regions have autonomous systems, and that is also true for weather satellites in regions where they have autonomous systems and still co-operate and share data. So it is not a bad thing; it is what I call the federation in space instead of a unified space.

It depends on the case and whether everybody in Europe should have an all-navigation system. I am not so sure about this one because ultimately

the service it provides is a unique service, if you want. It is maybe not the same as in some communication systems or remote sensing and other domains. Specifically for that case, it is more where we should go united, but as a principle to also have developments under national priorities, which in fact can also be done through ESA, if somebody wishes, and we have these cases. This is a reality of the planet and is probably going to increase rather than decrease.

Laurent Jaffart: I agree with what was said. PNT is a signal that you cannot monetise and is beamed for free with Galileo via GPS, but you do not control when this signal is proofed or jammed intentionally or unintentionally. To have an autonomous PNT system is a major investment, and I believe that this investment could be shared among other nations. It was the intention behind the Government's investment in OneWeb—after the bankruptcy—to have a PNT signal on the second generation. It is a question you should ask Eutelsat OneWeb.

The Chair: We have two questions left, just to give you a sense. I hope you are not too exhausted from all this. Lord Stansgate, you have been very patient, thank you.

Q140 **Viscount Stansgate:** I would like to ask a question about the upcoming EU space law. First, could you tell us a bit about what it involves and what it is due to say? Secondly, could you say a bit about its impact on the European space economy? I then have one follow-up question about the UK. Who would like to go first?

Hermann Ludwig Moeller: First, the short answer is no, I cannot say what is inside because I do not know, and most people probably do not know. There is a question whether it is a regulation or a directive, so that will make a difference as to what extent it will actually become something applicable. There has been a lot of discussion that it could also be an obstacle for some industrial developments if you put too much burden on European industries versus global competitors. This is all known in the press.

My main answer to your question on the law is: let us not confuse the law with policy and strategy. The law is a means to get somewhere, and there are places where you need it. If done right, I am sure the law can have its value and maybe help to create a European market, some standards and the like. This is the most dangerous thing I see right now in the debate: it almost seems like we have the law, and then everything is solved. You need the policy and the strategy to implement; the policy and the law will be part of the strategy. It is not the other way around; otherwise, maybe life would be easier. But on the substance—what is in the law and how it will affect us—I am afraid, at least from our institute and myself, we do not have the information.

Viscount Stansgate: That is helpful to know. Laurent, can you shed any light on what you understand by the phrase “upcoming space law”?

Laurent Jaffart: Similar to my friend, we are outside the debate on the space law; it is driven at the EU level. We are following the developments from what we hear and we see that this could be a proposal that could also be an opportunity for the European space industry, particularly if the topic of sustainability is inserted; for example, Zero Debris action. For the benefit of the member states, we can be the expert body on this EU space law once we have the technical definition of this. We can also play on the question of standardisation and implementation of the space law. We will hear from the EU pretty soon, but we do not currently have the details.

Viscount Stansgate: My second question may be rather difficult to answer in the light of the limited knowledge we all have and you have about what may be in it. I was going to ask in what way an EU space law would affect the UK's collaboration both with ESA and with the EU. Is there anything you can think of to add in the absence of a lot of knowledge about what this law might involve?

Laurent Jaffart: No. The question is related to a potential extraterritoriality of that law—or not—and it is too early to say.

Hermann Ludwig Moeller: At this particular moment in time, I cannot imagine that something like this would really be proposed and accepted.

Lord Shamash: Can I ask a question? It is about enforceability. If you have a law—whatever it is—unless you have teeth behind it so that you can enforce a breach, at the end of the day, it is probably not worth the paper it is written on. Are we anywhere near there yet? Probably not.

The Chair: I think the answer is we do not know.

Lord Shamash: I do not think we do. Are we still in the dark?

The Chair: Yes.

Viscount Stansgate: Thank you for saying it is too early to say. We will have to live with that for the time being.

Hermann Ludwig Moeller: You will have to come to Vienna for that.

The Chair: That is always an excuse. The final question is from Lord Clement-Jones.

Q141 **Lord Clement-Jones:** It has been a fascinating session so far. Thank you very much. I am using my words rather carefully here. To what extent does the US changing strategic posture alter the calculus when it comes to the relationship between the UK and European partners in space? For instance, will we see European states—both individually and collectively—increase their footprint when it comes to defence space? Laurent, would you like to kick off on that?

Laurent Jaffart: Yes, thank you. Indeed, it is difficult to predict what the contribution of the member states would be, but we note that space is becoming an ever more contested environment. With the changing

geopolitical structures, technology is used even more intrinsically in the display of power. The need for resilience and security is at the forefront of the minds of many Governments across the globe to protect their citizens.

The UK recently released a paper with the European Commission hinting at space being an important economic driver. The global space economy is growing rapidly, and it is important for Europe and the UK to invest in their future and ensure that they do not get left behind.

Lord Clement-Jones: That is a very diplomatic formulation, if I may say so. Hermann, can you be slightly less diplomatic?

Hermann Ludwig Moeller: In fact, we consider ourselves as a 1.5 diplomacy sometimes, so yes, I can try. First, the short answer to your question—whether European investments in space and defence will go up in the nations—is yes. There is no doubt in my mind, and probably significantly.

Lord Clement-Jones: So this change of US posture will have quite a significant effect both in ESA and in individual member states?

Hermann Ludwig Moeller: I guess it starts with the member states, and ESA at the end will be tasked, or not, to take care of certain aspects of it, but it is rooted in the member states and is a very political decision. You take Germany and the change of government; it has a situation now that was unimaginable not so long ago. I will give you an example: you have companies such as Rheinmetall, which is a defence company that just opened a satellite manufacturing plant—together with ICEYE—in a small place in Germany. You will see mass production of satellites in the defence context, and that goes for remote sensing. So this will have a major impact.

At the same time, you have talks on a political level—as I said, today it is NATO with your Prime Minister, and last month it was von der Leyen with your Prime Minister—which are not talks that would involve ESA and in which they try to see how forces can be joined. The first answer to the question is there is not a question on the national side. The sub answer to that is I would expect—but this is my reading—that some of this may also be entrusted to ESA under the dual-use innovation aspect. The third part of the question is beyond the parameter that is really political agreements, but I would also think the times are such that these discussions between the UK and NATO and the UK and the Commission will probably open up new opportunities.

Lord Clement-Jones: So the impact will be very broad. Laurent talked about the space economy; you talked about defence and the politics, if you like. This is fundamental.

The Chair: Thank you both very much for joining us. You have been extremely generous with your time and your answers. You get awards for diplomacy as well along the way. It has been a delight, and thank you for

the two invitations to Vienna; we will think about that. It is one of my favourite cities for sure. But for now, I close the public session and thank you again very much.