3. Institutional development of satellite navigation in Europe

An interview of Heike Wieland to ESPI Resident Fellow Spyros Pagkratis

Q: I would like to begin with my first question: what is in your opinion the importance of Galileo for the EU?

A: For the EU, I would say that the main importance lies in the fact that it is the first European space programme that is financed and managed by the European Union together with ESA. It is very important that we have for the first time a real and concrete space programme on an EU level, which is also an effort of the member states of the European Union to do something together in the space area that until now was pretty much dominated either by national efforts, or through ESA that is an international organisation set up for specifically supporting national programmes.

Q: Your answer takes me to the second question, which is what are the principal stakeholders and what are the roles in implementing it?

A: This is a very interesting question, because it depends on where you look to. Maybe I will start with the inner circle: in a strict sense the stakeholders for the moment are the European Union, represented by the European Commission and ESA. However, if you look at it on a broader scale, a lot of people or other stakeholders are involved, like the member states of the European Union, the members of ESA, the European Council, the European Parliament, small and medium enterprises (SMEs), and of course all EU citizens. Returning to your sub-question, it also brings in mind the industry involved Galileo contracts with ESA, which also have a vested interest in contracts coming out of Galileo, both independently and collectively as the space industry sector.

Q: How is this coordination between all parties working and what is their role in the implementation of the programme?

A: Let's just say that if we examine the coordination of the stakeholders in a broader sense, we might find that there is no coordination at all. Admittedly, what we are talking about here is a huge deal of political interests and political tensions. Concrete management at the moment is done by the European Commission, based on its mandate given to it by the EU member states, by the European Council and the European Parliament. The programme also involves coordinating

K.-U. Schrogl et al. (eds.), *Yearbook on Space Policy 2009/2010*

the various interests involved, including the role of third countries such as the US. I have to say that among the different stakeholders here is no real political coordination at the moment.

Q: This takes us to my third question, which is how would you qualify the role of the member states. Member states are represented in different levels, through the Council, through ESA, through heir own involvement in the programme. Would you say that they assume multiple roles in the programme, and how does this work in practice?

A: It is a very interesting question to qualify the role of member states. It is hard for me to answer right now, but I might describe even more the role of the member states, because if you look into member states now from the EU side, it is very important for them to have this Galileo programme, the first real operational space programme in the European Union. This is the realisation of a very important and quite long deal, which was born in the EU Council many-many years ago and has produced already many political documents and decisions. The member states we are talking about were pushing towards the European vision, the European Union vision. From The EU side, member states are known to keep the budget limited, not to spend more money or extend the EU budget and so on, in order to keep control on the programme's budget. On the other hand, we have a quite divergent situation within ESA member States, because ESA member states are also interested in the EU vision, making Galileo a joint effort now. However, it is clear that both sides and the ESA member states have slightly diverging interests. This is because ESA is supporting the national industry through ESA contracts, through the system of ESA that is also called geo-return, according to which the incentive for ESA member states to make Galileo happen is even greater, because it may constitute the means to support their space industry. This situation brings us to a quite vicious circle, because on one hand we have an ESA logic, which is not a vicious logic, but it's just how it is made. On the other hand, we have the EU member states, partly the same as ESA member states, which are know for looking for a system of open competition.

Q: This takes our discussion to my next question, on what is the current status of the European Commission-ESA cooperation, and how could respective competitive and geographical return models be compromised?

A: You know, if you talk about compromise between the competitive market logic and the geographic return logic, I don't think there is a lot of space for it. Nevertheless, you can still try to get the best to do the job.

Q: So how would they work together? I am not asking about qualifying or comparing them, but I am interested in how would this working arrangement

between the EC and ESA could develop in the future, based on the fact that they operate in a different logic, as you described.

A: For the moment there is no formal cooperation, there is no official co-existence between the two procurement models. We have a delegation from the European Union, represented by the European Commission, to ESA and this delegation has foreseen that geo-return is not applied. This is also something which underpins a bit the EU-ESA cooperation -I don't know if we can call this cooperation, or rather an EU-ESA agreement. This agreement is much older than the delegation agreement. According to the agreement's provisions and I think we have a quite interesting formulation there -I believe under its article 5- as far as EU is concerned EU's rules apply and as far as ESA is concerned ESA's rules apply. That means that as far as procurement is done by ESA, the geo-return principle applies. However, this is not the case with the delegation agreement. But I'm not so sure if this is going to be the case in the future, because what we have already now is a situation in which there is on one hand a free competition system according to EU rules, but behind the scenes, and now we are talking about political interests and stakeholders who are interested and involved, behind the scenes we have a situation in which member states are pushing to avoid the competition process and implement the principle of geo-return to which they are used to from ESA. I am not saying that the system of geo-return is bad, because through this system you create a kind of protected area for European industries as well. The system has its drawbacks, but it is successful in giving the right responses to the right people on the job. This is not always the case if you have a free competitive system as in the EU, because in the EU system is not really made for such a protected market as it is in space area, which would also be if we are talking about defence for example.

Q: I believe you have also answered now my next question, regarding the programme's governance structure. So, how would you see it evolving in the future?

A: I would say that none of the different governance structures that have been tried in the past has ever really worked well, certainly because of political tensions, but also because of confusing programme management with political management. Furthermore, it seems that no one ever cared about a very simple principle of life, which is selecting the best man for the job. So I think what we should do in the governance, we should have a structure in which we have somebody who is dealing with the project, fully responsible, fully accountable, with a certain political oversight. At the same time we need to limit political oversight to very basic decisions, relating for example to the programme's budget and review, in order to frame it. All other responsibility should be placed in the hands of someone required

to deliver. Unfortunately, according to the provisions of the delegation agreement, the European Commission has reserved for itself a lot of rights, controls and so on and so on, putting itself in the shoes of leading the project in every aspect, which is something that was not intended from the beginning. Therefore, my view on this issue is quite clear: for this programme we need someone who is able to do, to deliver, who is accountable for the delivery and who will be mainly supervised on the execution of the major decisions, milestones, cornerstones and basic elements of the programme.

Q: Thank you, this brings me to my next question. We are now entering Galileo's operational deployment phase and this will create some additional budgetary requirements. Do you think that this new phase in the European GNSS development will in fact complicate the relations between the stakeholders, or rather will simplify things?

A: No, that will certainly make things more complicated. My knowledge of recent developments is a little bit limited. However, as far as I know the operational model is not yet fixed. A lot of discussions are still ongoing, creating again a lot of political tensions on who is doing which part of the operation, and who might be looking for what return, if any. In other terms, who will be able to pass to his industry a little bit of the "cake". On top of that, the legal and project structure of the operational phase are also not very clear.

Q: Do you think that these procurement necessities that we will have in the immediate future related to the Galileo deployment phase and the increased budget, especially from the part of the EU, would create some kind of exit from this maze, would that simplify things in any way? The fact we will be handling the final deployment and the EU would have bigger responsibilities in running the programme?

A: That won't simplify anything because at the moment I don't see a trace of any definition how that should look like, who is responsible and who should get what part of the cake.

Q: In your opinion, what would be a suitable working arrangement?

A: For the deployment, or for the operation?

Q: For the deployment.

A: For the deployment, as I told you, for me there is one body in the European environment who is able to do the job, as long as the structure is appropriately empowered to do so, and also take a certain accountability for that and I think it's really that we should not mix again political and project management issues, we should not do it and not even with the technical issues. I don't know if we can really

do it with the existing structures, they may be suitable for the initial operation phase, but on the long run they are not very suited for the operation, because they are not made for it, it's just not their mission.

Q: I would move now directly to a question about the commercialisation of the GNSS services. First of all, should the PRS be treated as a commercial, or a strategic asset, which means should its security aspects outweigh commercialisation objectives in any way?

A: I think it is difficult to answer. I believe that PRS is anyway a strategic asset, because it is the same kind of core system as GPS is for the US. There are PRS aspects that could be also commercialised and useful, potentially creating at least some revenues, or at least some kind of limited investment return, but still in the sense of PRS, not in the sense of something broader. PRS should, according to my opinion, really remain what it is, and it is certainly one of the core elements of the system itself, because if you look at GPS, what you get from the GPS on your navigation equipment, or mobile phone etc is in deed the open signal, but what is behind this system is in fact made for the American "PRS".

Q: So, in your opinion, the existence of PRS creates commercial possibilities, but these possibilities should not be the "raison d'être" of this system at all. It would be just a kind of side advantage.

A: Yes I agree on that, I am just saying that you can use PRS on a very small extend of the commercial market, but it should definitely not be the "raison d' être" of the system.

Q: Do you think then that it could be an instrument of foreign policy for the EU, and how would it affect EU's international relations? And I'm talking specifically about the new US national space policy and some advantages on cooperation in the GNSS area it could produce, and again it would be a question of with whom to cooperate in distributing PRS?

A: Yes, to be honest I have never treated that aspect, at least not in relation to the US, so my answer would be quite indicative. The only thing I can tell you on that, is that there is an agreement between the US and the EU, a cooperation agreement in the GNSS and their full interoperability. I don't know how a commercialisation effort of PRS in the future would influence this agreement, given that there is only a very restricted market for PRS, as I already told you. Consequently, I think that there could be some affect on EU-US relations, and I would be contradicting what I said before id I thought otherwise, but I did not really study or discuss this issue in detail before, so I can just give you my personal gut feeling on the subject.

Q: Then we can continue about GMES: for our readers' information, how would you compare the two flagship programmes, Galileo and GMES, in terms of their development and realisation?

A: Again, this is a topic on which I haven't really worked so far. Let's say that the only topic on which I can compare them already is that GMES is also a joint effort in space between ESA and the EU, and that although the two programmes have different structures, they do share similar problems. Both Galileo and GMES are suffering a lot, on the EU side, from a huge amount of political influence, and both are suffering from the fact that when they were originally set up people hoped to have a kind of very interesting business commercial model for the EU, which was nevertheless not thoroughly studied in advance. Therefore, at least until now their commercial aspects have not been overly successful; in fact Galileo's haven't even started yet.

Q: What you are saying, is that in the case of GMES we somehow repeated some of the mistakes, or let's just say some of the complications that we had with GNSS?

A: Absolutely!

Q: So we are not learning from our mistakes . . .

A: I think we are in the middle of a difficult learning process at the moment. I am very much in favour of a lessons learned policy on the EU and also on the ESA side, but I think that the lesson learned so far is that difficulties lay not so much on the technical field, but rather on the political field; and this has led to repeating the same mistakes over and over again.

Q: Thank you for your direct answer. How would you see cooperation with Russia in GNSS, and I am referring to the possible interaction between Galileo and the Russian system Glonass? What kind of cooperation do we currently have with Russia on GNSS and how would you qualify Glonass as a competitor GNSS system that is developing and deploying quite fast at the moment?

A: Again, this is a topic on which I am not so well prepared. I think Europe and Russia do not yet have an agreement, as far as I know. There is a certain attempt to arrive at a mutual agreement on signal resilience and interoperability issues, but I don't know how far they are with that.

Q: Let us move on then to a more specific question: will Galileo be able to compete commercially on a global scale, because according to the timetable we have now in front of us, the Russian constellation is already complete and the Chinese will be also nearing completion by the time the European GNSS will be fully deployed. So with regard to the initial planning that we had some years ago, it now seems that there would be at least three other commercially

competitive systems facing Galileo. Do you think that this will affect its commercial position? Should we begin reconsidering its prospects on purely commercial grounds?

A: I am not sure. Galileo was supposed to be a commercial system, offering a number of services available to commercial users, such as the safety of life application. However, I do not think that the EU will be able in the end to field a purely commercial system running. I believe that what we will have would be a system indirectly creating huge benefits for the EU citizen. I would qualify these as social-economic benefits, rather that exclusively commercial. Therefore, I do not also really see the relevance of worrying about the competition. Competition is something that might occur at a certain moment, but I don't think that at any given moment our mobile phones would receive only GPS or Glonass signal either. But now we are talking about a commercial system, while we haven't already talked about the use of the system in general.

Q: So basically, in any case Galileo's prospects on purely commercial grounds are not very good at the moment.

A: No not at the moment and they have not been too good in the past either, and I would like to be perfectly clear on that. Galileo was set up as a commercial services' system, which in my sense would be the kind of service that would be able to create revenues: that is for me the meaning of commercial. There have been some studies in the past with the underline logic of a PPP model, which unfortunately failed. They failed for many reasons and some of them were already discussed, such as the politics behind it and the great number of stakeholders involved, with a lot of different interests at stake moving towards different directions at the same time. Last but not least, it was never really thought through that Galileo could not actually be a real commercial system. There would and should be, and we had made studies in the GSA on that, huge social-economic benefits from its use. I believe it is on these benefits that we should really concentrate on and look into them in detail, instead of all this continued discussion about its commercial prospects.

Q: So you think there should be a change of paradigm?

A: No, I don't think there should be a change of paradigm, but rather a change of attitude and direction in the programme. Let's say that I hope the EU is not talking so much anymore about the system's commercialisation.

Q: So, in this case wouldn't there also be grounds for improving cooperation with the US. The departure from Galileo's purely commercial approach you just described would also imply that the final system could be more open to coordination with the GPS satellites, for example.

A: If you not are talking about the PRS area, which in my opinion is anyhow not really commercial, I think the answer is yes it should be opened; and here I am not only talking as a European, but also as a world citizen. I really do see this kind of technologies as a strong baseline for international cooperation.

Q: How would this probable cooperation affect the GNSS industrial policy in Europe? If there would be some kind of joint development or use?

A: On this issue I don't really see the threat that other people see in it. I think that it is very important for Europe to clarify what is Galileo about. In my opinion, Galileo is about European space, European space research and European space industry; and this also includes space industry of not only a large scale, but also of a medium and small scale. That means that space technologies and European know-how in this field in general, would be in a position to provide concrete benefits to the people living in Europe. However, giving priority to European citizens does not mean that we can't exchange experience, or cooperate with the US. I do not believe that international cooperation in this area would entail any kind of negative consequences for the European industries. On the contrary, I believe that it will create much more synergies and eventually lead to a stronger support for the European space industry, simply because we are not sitting on an island anymore.

Q: On the other hand, Galileo was also conceived from the beginning as an expression of European independence. How much independence do you think we should have, or seek, on an operational as well as industrial level?

A: Again, and I am talking really as a citizen, for me it was never a question of independence, it was never a question of competition, and this view is shared by many of my colleagues working in the European GNSS programme. For me, it is a question of technology development in Europe; a question of not even ownership, but really about know-how, about technology and the ability to have a certain type of industry in Europe as well, and not only in the US or Russia. Striving to acquire and maintain this kind of knowledge and technical know how in Europe does not necessarily mean that the focus should be on being independent. On the contrary, the focus should be on having these industries in Europe, of being able to produce such space based systems for our own benefit, as well as for the benefit of strengthening our cooperation with other countries.

Q: But on the other hand, having this know-how in Europe is in itself a kind of independence.

A: Yes, sure, but there is not only focus on independence, because I think if you have an industrial policy, for example here in Bavaria a lot of investment is made in order to support the local space industry here, to concentrate it in the region and to

produce benefits for it. We do have an industrial region close to Munich, which is benefiting quite a lot from this very dedicated support of the Bavarian government. Nevertheless, that does not mean that Bavaria is the only region in Germany, Europe, or the World to have this particular know-how in space technologies. However, there are specific local benefits for the region, by concentrating this technology, this know-how, here, without necessarily focusing on getting independent, or creating a monopoly.

Q: But this is an expression of the industrial complications that existed. Like you said before, there were a number of actors or stakeholders that really tried to get as much as investment return as possible, either directly or indirectly. Isn't this kind of the same thing?

A: Yes, but again it is not really the issue of independence that is in the focus. It is really about creating and supporting this know-how in our countries and in Europe in general, as well as about being able to set up and operate this system. On the other hand, we are not the only ones, developing such technologies, nor are we all alone in our journey, without considering other countries, like the US. So, for me the focus is not on the issue of independence, not at all.

Q: So I guess the question would be which countries should have this know how.

A: That is something to be discussed. I gave the example of Bavaria, but Bavaria understands itself very much as part of the EU. I am talking a lot about Europe, because something that we also believe, and we know this because it is the reason for the existence of ESA, no European country is strong enough to have its own space industry independently from other countries in Europe, that is absolutely not the case, and this is why we need a common European space effort.

Q: But there is a joint interest in independence on an EU level vis-à-vis the rest of the world in certain technologies, or should I say not independence, but at least on acquiring and maintaining a certain number of critical technologies.

A: Right . . .

Q: Which would mean that this would be a kind of intellectual property issue, rather than of influence on an industrial level?

A: Yes, absolutely. We have engineers in Europe, we have a space industry, and we don't have to go outside Europe to look for equipment, in the case for example of a signal receiver or a certain type of clock. We don't have to go outside Europe, simply because we have this kind of expertise in our common European house. Consequently, we can create a lot of benefits for our in-house research area, meaning the EU research area. Again, this approach does not necessarily have to focus on the issue of independence.

Q: I think the point is of maintaining capabilities, and I am talking about development capabilities, without focusing so much on operational independence. So you believe that we should at least acquire a minimum of technological know-how and industrial capabilities, and preserve them?

A: Yes, absolutely.

Q: If I am not mistaken, Galileo was from the beginning a kind of vehicle for such a policy, is that right?

A: Yes, exactly.

Q: If this was the case, what changed and we got focused so much on the issue of commercialising Galileo's services?

A: The commercialisation issue, and I would be talking again about the programme's focus, shifted the programme's direction to a very different level, because if you talk about technology, if you talk about technology ownership, if you talk about socio-economic benefits, then you also have another justification for expenditures, and you have a very different view on certain problems, as well as on how they should be managed and financed. If you talk about something that is commercial, you talk about different financing structures, you talk about competition and you talk a lot about some of the issues I mentioned previously, which are not really applicable to the current Galileo system set up.

Q: Why is that, in your opinion?

A: Because Galileo, as it is set up right now and also as reality shows, is not something that is really for commercial use. It was supposed to offer commercial services, produce revenues and so on. However, that is not the logic of such system, because it is not mature enough yet. We might talk about it again in 20 or 30 years, but for the moment we are talking about technologies in Europe and nothing else.

Q: Thank you, for the last question I would like to talk about the legal aspects of PRS commercialisation. As far as I understand -correct me if I am wrong- PRS commercialisation could be considered as a kind of compromise between having some kind of revenues on the one hand and providing for a lot of free access services on the other. Would you share this estimate, and how do you think we could possibly commercialise the services that we ourselves are practically offering for free at the same time?

A: As you know very well, you can only sell something that has a value for someone who is able to pay a certain price for it.

Q: Is this clear for PRS?

A: No. This is why I was talking before about a very limited market, because you might use the benefit of having an encrypted signal, which could be a good value for money. However, this kind of product would not, in my opinion, be attractive to the "normal" user, but rather to the public users, such as military services, police services, boarder surveillance etc. These would be services at a very restricted level, and for such users it could be quite interesting to have a signal that is not open to everyone, or that it could not be jammed by everybody, incorporating high security and accuracy standards. Again, we are talking here about a form of use that is, according to my opinion, rather limited and restricted, also in respect to the market sector it would target. On top of that, we would be entering in the topic that we discussed before, regarding Europe's relations with third countries, and especially with the US.

Q: I see. In this respect, what could be the role of the ITU in regulating GNSS use, and would you foresee any legal implications emanating from PRS signal commercialisation, because of its accuracy?

A: ITU is not regulating the use of Galileo. As far as I understand, the ITU is responsible for the registration of the frequencies used by the different signals used by the satellites. The ITU could have a real role, but here I am far beyond my competence, in mediating in the case of problems regarding frequencies, but I don't know if one can talk of regulating Galileo, at least I am not aware of any discussion in this respect.

Q: Ok. As far as the question of liability is concerned, who do you think should have the authority, but also the responsibility, for GNSS in Europe?

A: That will be a different matter. For me it was always quite clear: the liability is addressed first of all to the owner, because it is the owner who is operating potentially dangerous services, including the system itself. This is an underlining principle, especially used in aviation. So there could be a potential liability of the owner first, and secondly you may potentially have a liability of the operator, because he is also running the system. Then, kit might also depend on how you have contractualisationship, for example, between users and the operator and/or someone else like the EU. Then, you might add another layer of complications: if the EU makes certain promises concerning the quality of the signal it is providing, there may also be a liability not only from the fact of the ownership itself, but also from raising expectations from the signal provided.

Q: So in your opinion, all these matters need to be resolved prior the use of Galileo, especially regarding the PRS signal?

A: If you talk about the commercialisation of PRS, then you have certainly to think about it first. I also think that the EU would be well advised to look deeper into that

for a moment, which is something I think they really try to avoid. This is because it is a very complicated and burdensome issue, but you have to look into it because you can not deny ownership and so on, but you should at least measure what you are going to promise.

Q: Thank you very much, is there anything else that you would like to add, especially as far as the governance issues that we discussed in the beginning are concerned?

A: As far as governance issues are concerned, I think that we really need to think about lessons learned, about what went wrong in the past and what we should avoid in the future. I think we need to do this prior to taking any further programme implementation steps. We raised some points already today during our discussion. In my opinion, everything begins from establishing clear competence mandates, dealing with clear decision programme procedures and clear accountability for them. I believe it's all about having a clear road for responsibility: who does what and who has which role and accountability. As long as you don't get this one straight, I don't think you will ever have a stable system, because what you will get would be a bits' and pieces thing. This bits' and pieces approach leads to making decisions that are quite short-term minded, simply because they are mostly of technical nature. Furthermore, acting in this mind frame only allows you to tackle problems one by one, as they come. However, we have found too often that a problem coming up was basically not something that just fell from the sky, but something that was actually foreseeable, albeit ignored on a political level. This is not the way to manage such a programme. Of course, I can only talk about what happened until February 2011, when I left the programme.

Q: What do you think should be the solution, what should be the administrative instance that should take care of this?

A: This is a question that is difficult to answer. I do not believe I would be able to provide a definite answer to a question that a lot of highly competent people have been considering for a number of years now. Nevertheless, as a first step I think we should at least straighten out who has the programme's leadership, who has its political guidance, and who is actually responsible for implementing it. I believe it would be best to have a maximum of two entities and not more: the one political and the other technical. As I explained before, the technical manager of the programme should enjoy a certain degree of independence, but he should also shoulder the project's accountability and responsibility. In any case however, I think we should avoid mixing the management of the political, technical and operational levels. As far as international cooperation on GNSS is concerned, something that I would also like to keep in mind is that, when we enter the system's

operational phase, we should start thinking getting private industry involved. Of course, Galileo's model is for the time being a contract model. This reality corresponds to the fact that so far Galileo, with or without the PRS commercial uses, is not in fact a commercial system. Consequently, both the programme's contracting and operating models should also bear this in mind.

Q: Should the system's operational exploitation follow the industrial model we have had so far, or should this change too?

A: The industrial model is at the moment highly impacted by the political model. I am not very familiar with the programme's industrial aspects, either as a whole, or as far as specific industry stakeholders are concerned. Therefore, I can not really make any distinctions between different companies that are building satellites, this is absolutely not what I would know or interfere with. However, I do think that if you open a reasonable competition procedure, bearing in mind that as I said Galileo's operations will not be really commercial, then I believe we should be able to get the best players on board, without meddling around with artificial shares.

Q: Thank you very much for your time and for our very interesting discussion today!

A: Thank you!

Fig. 4: *Artist's impression of a Galileo Satellite (source: ESA).*