The American Meteorological Society in collaboration with
the University of Wisconsin-Madison Space Science and Engineering Center

An interview with

Alain Ratier
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NATHANS: This is Jinny Nathans, librarian and curator at the American Meteorological Society. I'm here in Boston with Jean Phillips from the University of Wisconsin-Madison, SSEC [Space Science and Engineering Center] and Alain Ratier to do an oral history interview. We are at the Joint Satellite Conference and it is October 2, [2019]. I'll ask the first question, and then I'll retreat. How did you first get interested in meteorology?

RATIER: So when I was at university, Ecole Polytechnique in France, I was attracted by space, but there were very few opportunities. I was also attracted by research, and I was also interested in the sea. So I flipped a coin between the French Navy and meteorology. That started this way, and the coin went to meteorology. So I went to Météo France, which had a different name, and I started doing research in oceanography. In fact, the purpose was to model the ocean for the French Navy, actually. And it turned out that the limiting factor was observations because, you know, the scales in the ocean are much smaller, and you cannot or it's difficult to sound the ocean. So I came to the conclusion as a young engineer that there was no other way than to do altimetry, to do this type of modeling.

And then I went to CNES [Centre National d'Etudes Spatiales, the French national space agency]. There was an opportunity for a job at the French Space Agency in Toulouse, responsible for space oceanography, and this is the way. So I started with space oceanography. I was authorized to go. It was a competition, but I got the job. And then I was involved in TOPEX-Poseidon [Topography Experiment - Poseidon] as a program scientist, and also in the development of a multi-mission ocean data processing system, called AVISO, which is in existence today. And then I was offered to move to the headquarters to take atmospheric research and ocean programs— So I was involved in TOPEX, but then I was a key player in going to Jason [Jason was a satellite altimetry mission series] The history is that shortly after the launch of TOPEX-Poseidon, we met with NASA [National Aeronautics and Space Administration] in Washington to consider what we called "TOPEX follow on" at the time.

At the time, we had the Phase A being run by NASA, based on the same cooperation scheme—meaning U.S. satellite, French instrument, French launcher. But it turned out that there was a very difficult period in NASA, as they had budget problems. And on our side, we were entering the small satellite business. And there was a fierce competition in CNES to see what could be the first mission with the small satellite bus line. And I was involved, and we won the battle. It became what was not yet called Jason. But I was tasked to visit NASA headquarters—it was Bill Townsend who was Acting Associate Administrator at the time—to convince him that we should change completely the cooperation scheme. We had a French satellite, French altimeter, radiometer, and a U.S. launcher. So it was exactly the opposite. And I remember I had a face-to-face meeting with Bill in his office. It was a time where people could make more of a difference than today. And he said, "Why not?" [Laughs.]

And it went on, and Dan Goldin was approached. We brought it to him. But there was an obstacle because at that time, some U.S. industries were opposing the cooperation with CNES, to avoid that, we develop small satellites. So there was a piece of law in the Congress saying, "No way. You shall not cooperate with CNES." But sometimes you are lucky. And so I was battling for this program, and there was a government shutdown. It was in '96, I think. The Clinton administration had a shutdown, and when it was over, the piece of law had disappeared,

and we went. And of course, it cost much less to NASA, and the program was approved.

And amazingly, I left for EUMETSAT [European Organisation for the Exploitation of Meteorological Satellites] at that time. I left, I took my job as Deputy Director in charge of development, so MSG [Meteosat Second Generation], EPS [Enhanced Polar System], on the first of July. And the program, CNES, was in a very difficult situation at that time because we had had the failure of the Ariane 501. And France had to pay most of the recovery program, if you want, so it was a difficult time to get new programs approved. But in the end Goldin— When the new chairman of CNES, came to visit Goldin, he said, "What about Jason?" Because Goldin had supported the program to Congress, et cetera. And so when the new chairman of CNES came back, he understood he had to sell this program despite the difficulties. And the program was approved by the Board of Governors on the 4th of July, which is an amazing date. [They laugh.] So that's the story.

And then, to continue on that line, I promoted the involvement of EUMETSAT in Jason, for Jason-2. And we had a new convention, we had the possibility of optional programs in addition, and so I had a lot of interaction with the U.S. and with the U.K. to get approved the first optional program. And it happened! And then Jason-2, Jason-3, and now Jason-CS. And it started with TOPEX-Poseidon. I remember, just to give you an anecdote, the error budget was 13 centimeters, this was the requirement. And one of the oceanographers in Brest said, "If I don't have two-centimeter, I'm not interested." But we did one centimeter, and this was a fantastic development of oceanography. We had also GEOSAT [GEOdetic SATellite] before, which was very important for this development, for continuous data. So that's the altimetry.

When I moved to EUMETSAT, I was lucky enough to bring Jason, if you want. But I brought something else. I'd been very lucky because in CNES, when I was in charge of the Atmosphere and Ocean Programmes, we had prospective seminars where you need to have one priority for the community. If you have two priorities, you are dead because others have one. And it's a competition between atmosphere, solid earth, like in NASA. And at that time I managed to get IASI [Infrared Atmospheric Sounding Interferometer] as a first priority. And IASI was proposed as part of a research mission which did not happen, but IASI found its way to EUMETSAT, and to Metop], and to the Joint Polar System. So that's another interesting element.

And the other instrument, which has not yet flown as operational but is now on Metop second generation, it's called 3MI [Multi-viewing, Multi-channel and Multi-polarisation Imager]. The precursor was POLDER [POLarization and Directionality of the Earth's Reflectances], an instrument which we had on ADEOS [ADvanced Earth Observing Satellite]. It was a first—I was in charge of the first cooperation with Japan, and this was POLDER on ADEOS. The U.S. had ASCAT [Advanced SCATterometer] on ADEOS, so I met Mike Freilich on this occasion, and we built a nice relationship. Unfortunately, the ADEOS program, ADEOS-2 as well, were very short lived: nine months of data. But we had enough to demonstrate the value of polarimetry. And now it's 3MI on Metop-SG [Meteorological Operational satellite-Second Generation]. So you see another transition from research to operations—it was a topic addressed by Neil Jacobs today or the day before. So that's a satisfaction. It's a bit of luck, you have to be honest .

So then in CNES I became Director of the Program for the whole of Earth Observation I was also of course interacting a lot with the ESA [European Space Agency]. I was a delegate to the ESA Programme Board. And then in the first place, I played an interesting role. You know, the initial proposal for meteorology from the polar orbit was a program called POEM [Polar Orbiting Earth observation Mission]. Which was—

PHILLIPS: POEM?

RATIER: POEM, yes. It was Envisat plus meteorology. A monster that would have no operational future. So I've been one of those battling against this idea. And it was difficult. It was at the time where you had this idea, also from the U.S., to have a large platform serviced by the shuttle, all this nonsense. But it propagated to Europe, and this was the big idea of POEM. So we had a long fight, and I proposed a different scenario for earth observation in Europe, which was a three-satellite program including what became MetOp. It was in '90, in the early '90s. And at the ESA Ministerial Conference in '92, we wanted three, we got two [Enisat and Metop], but we got Metop. Metop was split and had an operational future, and then we could get the program with EUMETSAT and ESA to go on.

PHILLIPS: This was in the early '90s?

RATIER: '92 was the conference where it was decided. And I remember the President of CNES [René Pelat] coming back and saying, "Okay, two is less good than three, but it's much better than one." [laughs] And this was the start of MetOp, actually. Otherwise, we were totally stuck with the polar system in EUMETSAT.

And then I joined EUMETSAT. It was in '96. And so I was involved in the negotiations with the U.S. for the Initial Joint Polar System, the Joint Transition Agreement, and I was responsible for supervising the development of Meteosat Second-Generation and EPS [EUMETSAT Polar System]. So I have had the privilege to shape and to be involved in the first (EUMETSAT) development cycle, if you want. Meteosat was more or less inherited from ESA, and Meteosat Second-Generation and EPS were the first real EUMETSAT programs, whereby EUMETSAT became a technical agency.

PHILLIPS: So you talked a lot about international relationships and coordination for these programs, and you've been involved in crafting those relationships. You also mentioned that it's a little more difficult today than it was at other times.

RATIER: I think it's different.

PHILLIPS: Talk about that.

RATIER: In fact, in the early days—I'm talking about until 2000, so—there was a lot of confidence between people. You know, I talked to you about TOPEX and Jason. It's interesting. The history of TOPEX is that the French had a program to have an altimeter on the spot satellites, and the Americans had a TOPEX program, and there was the idea to cooperate. But on both sides, everybody was reluctant. You always prefer to do it yourself. I have not been

witnessing this, but I have been told the story, that the administrator of NASA asked thirteen people in his office, "Who is in favor of cooperating with France?" And there were (only) two in favor, and he said, "Thank you, gentlemen, we will cooperate with France." Against the (majority) opinion— And then there was a certain reluctance in the beginning. We were a junior partner, we had an altimeter with an allowance of five-minutes of operations per-orbit. But this cooperation was very successful, our altimeter worked very well, and there was increasing trust. Bill Townsend was then in charge of program management, and when I was in his office in '95 that relationship was very strong. Because we had been committed, we had been delivering, and this helped, and he said, "Yes, let us try." — And I was sent by my management in CNES, and I had a mandate, et cetera.

Today you have more systems, committees, approval. It's much more complex, which has its reasons. I'm not saying it's a bad thing. But the fact is that the inspiration, the leadership, has more difficulties to express itself because you have a lot of counter power, et cetera. It takes time. But the bottom line is that building a relationship, a long standing cooperation, which I have lived through with NASA and NOAA [National Oceanic and Atmospheric Administration], is still essential because you still have an excellent link, let's say, to understand the system, to understand the constraints of the other. It's really essential It's more complex, but it requires more intelligence on the constraints of the partner and how you play both ways. So it's a different game.

PHILLIPS: But it's possible and it's [inaudible].

RATIER: Yes, it works, it works. No, no, it's a different game, but I think it gives much more importance to the heritage of cooperation.

PHILLIPS: Yes.

RATIER: So you can do more because you have done a lot already. And it's the trust, the confidence, and of course the capability because we need to be on a par in terms of what we can deliver, I think. Unbalanced cooperation does not work very well.

PHILLIPS: That you have a history together.

RATIER: Yeah. Yeah. So, we have history with NASA, with NOAA, so and it's always— Connection, the personal connections, it's excellent. It's pleasant.

PHILLIPS: Yes. I want to skip to a different topic. When you arrived this morning, you mentioned that you had hoped there would be more young people here. And my question is more around how do we get them here?

RATIER: It is difficult. You know, first of all, you have the travel costs. The question is the sponsoring system? I don't know. How do you select people? Because people need to be funded to come over, or to come from the U.S right?

NATHANS: Yes.

RATIER: So you need to have an incentive to attract young people. That's very clear. So I don't know. But I'm surprised because normally you have more young people. At our conference at least in Europe, you have much more people. Because it's about networking, and it's not just for people who know each other and can have a new project together, et cetera. You need to bring the new generation. And honestly, I don't know, but I suspect—I was managing the research program in CNES and supporting fellows and so on—that there is something in there.

NATHANS: I think this particular conference is unusual, partly because of the time of year because school has just started at most universities, and also Boston is an extremely expensive city.

RATIER: Yes, I realize that. But you know, I was more thinking about PhDs. They are in the business, so…

NATHANS: Yes, and—

RATIER: In universities, yes, okay, they study and if they were in Boston or in Cambridge, some could be there.

NATHANS: Yes.

PHILLIPS: I think that they're—

NATHANS: I think there are a few, but it is not quite like the other conferences that I've been to.

RATIER: Yeah. But you're right, the fact that Boston is expensive, it may [inaudible].

PHILLIPS: I think that's a factor. I also think, though, that at the Annual Meeting there is a Student Conference, which is well-attended.

RATIER: Yes, but you have students— You have something here as well for students, but I don't know for whom [laughs].

PHILLIPS: And I guess my question is also maybe a little bit broader than that. How do we attract more young scientific minds?

RATIER: To our disciplines, you mean? Or to a meeting?

PHILLIPS: To the field.

RATIER: Yes, that's an interesting question. You know, I had, over time, some discussions with the U.S., actually, because there was a crisis also here to attract people to earth sciences and so on. I think there are a number of factors. First of all, and I talked also long ago with the Finnish, all people wanted to work with Nokia. They may want to work with Google now. So I think you

have salaries, it's clearly an issue.

In the U.S., I don't know, you have a system where you have many more interactions with the private sector, industries. Funding of projects, at least, is easier in the U.S. We are more public in Europe, and it's an obstacle. But, you know, the fact is that you need charismatic leaders. It starts at university, and you need charismatic leaders to inspire people. But today people want to be Elon Musk, you know, you have this fascination of the innovation, big money—

NATHANS: The billionaire personality.

RATIER: Yes, yes Communication is outrageous You know, I had recently a discussion. We had an intern, a young—Irish guy. He wanted to see me. He was in EUMETSAT for four months and wanted to see what I have done. He had the same question as you basically [they laugh]. And then we had a beer together and he told me that— [The] guy was very interested in space and Musk, he was fascinated.

NATHANS: Oh yeah.

RATIER: And at some point he told me, "Yes, but I want to achieve the right balance in life between profession—"

PHILLIPS: —Work and family.

RATIER: And then I told him that, "Do you believe Elon Musk has a balanced life?" And then I told him, "You need to decide what you want to do, if you want to do like Elon Musk, you need to be committed. You know, there are sacrifices." This applies also to if you want to bring something for science. So whether people are ready to make sacrifices today is an open question. And it's related to vocation. I had dinner with a spectroscopist from France. It was her life, what she wanted to do, she enjoyed it, et cetera. But now people want to change, so they want power, more and earlier. I think they want immediate success. Immediate reward, immediate recognition, which is not what you get with research and science, you need to be more patient.

So I think we are at a hinge point because of course you have a digital world, New Space et cetera but you have also climate change. And you start to realize that something is happening. So, I think we may have an opportunity to stimulate more vocations. But yes, this has to be a bit rewarding, and that's important, [that's] an issue. I believe, personally, it starts much before university. You need to do outreach to invite people through primary school to feel what we do. And this is what we do, we have an open door. You know, we need to spend time to explain to people what we do because we have the unique mixture of technology and science, and this is really an angle of attraction.

PHILLIPS: Speaking of starting when you're young, are there mentors that you've had throughout your career that you can talk about?

RATIER: Yep. I was lucky. When I was a young engineer at Météo France, the head of forecast was Michel Jarraud. I was the head of marine forecasting because my boss had left, so I did the

job for one year during my research assignment. And Michel Jarraud was my head of department, and he encouraged me and gave me a lot of freedom. You know, when you talk about vocation, if you are boxed, it is better if you get some freedom, guidance— So then, he was my first mentor— Then in CNES, my main mentor was André Lebeau. It's an interesting story because when I went to CNES, he was just appointed as chairman of Météo France, and I went to see him. I had never seen him, and I told him I wanted permission to apply to a post in CNES. He asked me, "Do you have a PhD? What do you want?" I said, "I want to do projects." And he disclosed to me a secret, he told me, "My plan is to relocate Météo France in Toulouse (CNES was in Toulouse) and I want somebody here." And then he let me go. And then when I was in CNES, he was appointed as the chairman of CNES.

He came from ESA. He has done space, oceanography, meteorology. It's amazing because what I did is also a mixture. And I think he also played a role when Tillmann Mohr was the DG [Director General] of EUMETSAT and was looking for somebody with experience in programs. I know he proposed my name, and then I was interviewed, but of course there was competition. And then we kept in touch all along. Another very important person is Gerard Brachet. When I was at CNES, he was a Director of Programs. So he selected me as (associate) Director for Earth Observation programs. We worked a lot, but in the evening, we always had open discussions. So it was very pleasant. I was lucky working with people being open, being ready to share.There are many others, but these ones have been very important for me.

PHILLIPS: In terms of a, you know, coordinated global earth observing system, what are you looking at in the future? What is emerging? What do we need?

RATIER: First of all, we need to reinforce what we have. We have CGMS [Coordination Group for Meteorological Satellites] and CEOS [Committee on Earth Observation Satellites], which work reasonably well . EUMETSAT is a permanent Secretary of CGMS, so we need to stimulate discussion on how best we can coordinate our assets. We work together well, but in the future, this will depend [on] how much you believe in multilateralism and this is a question for the United States. I remember John Kennedy explaining in the Cold War that we will have a ring of geostationary satellites for the GARP [Global Atmospheric Research Program]. He had the vision to create an area of neutrality where everybody could cooperate, and you know how it worked. I think we should keep meteorology as a neutral ground. But I'm not sure it will happen. This is what we discussed with WMO [World Meteorological Organization], this Vision 2040. You know, a feature of what we do is that nobody can do it all. We need coordination, we need integration, as we never have enough or good enough data, because we are science-driven, for forecasting, Earth system modeling, everything. So my plea is to consider that meteorology— like John Kennedy, but for operation purposes, this is the difference— has to be neutral, shared, multilateral. If you see slides presented yesterday, the Chinese satellites are not on the picture in a U.S. presentation. It's strange. It's not so strange, we understand the tension, the geopolitics. But is it wise? There are conflicts. We are not naive. We understand the world. But shall we make meteorology an area of competition and dominance? This is the question.

NATHANS: It's actually quite ironic, since right after Nixon went to China, the AMS [American Meteorological Society] went to China. And AMS has always had a very close relationship with the Chinese Meteorological Society. And in fact, when I was doing research for

the Centennial, there were a couple of quite long features in *BAMS* [*Bulletin of the American Meteorological Society*] showing the Americans on the Great Wall and having an extremely cordial visit, so it's a shame.

RATIER: Yes, yes. But cordiality remains.

NATHANS: Yes.

RATIER: I went to countries like Albania and countries which were on the other side during the Cold War, and which were under dictatorships, et cetera, and I met a lot of people of a certain age belonging to the Academy of Science. And I realized they had [kept continous] connections with people [counterparts] in France. So the connection has always remained despite politics. But it's research and science. Here we are talking about operational meteorology, which is different because operational meteorology serves many purposes.

PHILLIPS: Yes. But this polarity, as you referred to it, I mean, can it eventually affect data sharing across nations?

RATIER: Yes, of course it can.

PHILLIPS: We live in a global world, and systems affect, move, you know, across the globe. How do we maintain that?

RATIER: It's difficult. It's difficult because, again, you need to make it an area of neutrality. You have WMO. You need to create a win-win situation, accepting that if there are crises—there will be crises—and they will be handled as crises, as opposed to creating the crisis before it has any chance to happen. You know, if there are crises, there will be a measures and decisions [taken] by exception. Of course, planning capacity is another story, and this is where the issue is.

PHILLIPS: Is there anything else you would like to share or touch on that we didn't talk about?

RATIER: Well, I think the young generation is probably a very important topic, though there are certainly other things which may come to my mind after that, but so it would be. [Laughs.]

PHILLIPS: Okay. Thank you so much.

NATHANS: Thank you, thank you very much.

RATIER: You're welcome.

[END Of INTERVIEW.]

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