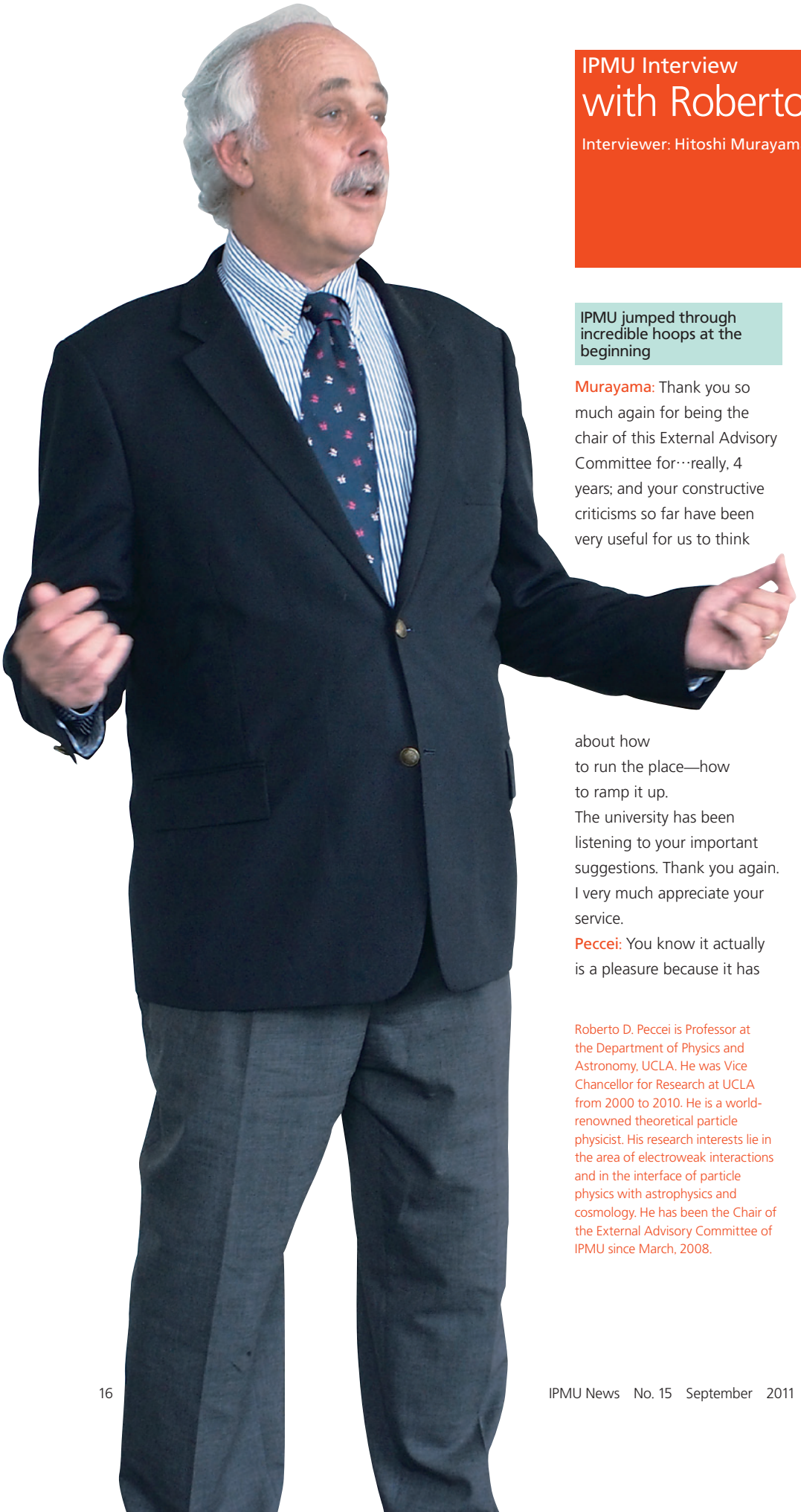

IPMU Interview

with Roberto D. Peccei

Interviewer: Hitoshi Murayama

IPMU jumped through incredible hoops at the beginning

Murayama: Thank you so much again for being the chair of this External Advisory Committee for···really, 4 years; and your constructive criticisms so far have been very useful for us to think about how to run the place—how to ramp it up. The university has been listening to your important suggestions. Thank you again. I very much appreciate your service.

Peccei: You know it actually is a pleasure because it has been fun to see something grow from an idea to, really, a reality, and you now live in a wonderful building. There's lots of good science being done. You have in very short order become an international institute that other people recognize, and so spending some time reviewing IPMU is really a pleasure. It's not a duty at all.

Murayama: Thank you for saying that. Maybe you can give me your impression on what you saw at the very beginning. You just mentioned that it was just an idea, and I agree with you—it was just an idea at the infancy. How has it developed from your point of view?

Peccei: From my point of view it was quite clear that Japan made a big strategic move in trying to start these WPI, as they are called. They picked some good areas to do that and clearly picking the area that I am closest to, which concerns the physics and mathematics of the universe, was an excellent idea. And it is also important, I think, that these institutes are associated with first-class universities or institutions. You could have not been more strategic—in

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picking a better place—than the University of Tokyo.

I think I felt in the beginning that you were starting on very good grounds. First of all, the institute had you. It's true, that's important! Second, there was real commitment from the university administration, originally from Professor Komiyama, and now also from the new President, Professor Hamada, and both of them really were very committed. I have been around for a long time and it is really important to have an institutional backing. You, obviously, had lots of backing from the University of Tokyo, and also you were very well funded because that's what the Japanese government wanted to do. It was very good beginnings.

But, even if you have good beginnings, it doesn't necessarily always develop this way. And I think that one of the things that I appreciated was the commitment that you had, and Nakamura-san had, toward, actually making IPMU a success. That was quite clear, that was very important, and you were asked to jump through incredible hoops.

Murayama: Hoops, and we jumped through them!

Peccei: To some extent I think that External Advisory Committee felt some responsibility to give you as much protection and advice as we could because…

Murayama: Absolutely.

Peccei: …we saw a good idea developing and we just wanted it to be successful. But the success is yours. We're just sort of bystanders and trying to suggest things that might be helpful.

Lots of important things Univ. of Tokyo did for IPMU

Murayama: You just mentioned that institutional backing is very important and I am sure being in a role of Vice Chancellor of Research at UCLA, you have seen in some cases things actually don't quite work the way they are envisioned. What could have been the pitfalls, something we might have to actually be careful about in the future too?

Peccei: Well, for example, the worst type of problem that could happen is that the institution is just interested in the money that you bring in and doesn't really care about you, and so, will exploit you and pay lip service until you have money. Then, when the money stops, says goodbye to you. Well, certainly this is not the case of Tokyo University. I have seen, particularly in the States where people can be very hardnosed, good initiatives that have really failed. It was fine when the faculty brought money in, but the moment they didn't bring money in, the institution

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lost interest. Here, I found that actually Tokyo University really did think how best to help you, and did lots of important things for IPMU; for example, it agreed to build a building for you. Of course, they are beneficiaries of this thing too, but there was a real commitment.

Murayama: I remember, I think it was at the first External Advisory Committee, and I mentioned that the university is building a building for us and you looked very puzzled, actually, that building a permanent building for a non-permanent institution, how is that possible.

Peccei: Right. I think that that kind of commitment was important. Of course that commitment has escalated with TODIAS and now with this initiative they really want to embed IPMU into the university properly. However, I think that all of the backing of the University of Tokyo would have meant little if you couldn't bring here a group of people that did first-class science, that are committed to the topic that the institute is focusing on. I emphasized the institutional backing but that doesn't work unless you are also a first-class institute or you grow into a first-class institute and that has happened and that's been very important.

Murayama: Amongst the kind of science presentation, the posters we have seen yesterday, what is the kind of aspect of those presentations that you found interesting?

Peccei: I know that the part that, to me, is really very remarkable is the interdisciplinarity of the projects. I mean, I think you and I have sort of gotten used to it. But if you were to jump back, there're people that have changed careers doing different things that they themselves might not realize. Most of what was discussed really addressed problems in more than one field of science using techniques from one part of science to do something in another part of science.

You have sort of made a very smooth transition into a highly interdisciplinary institute. I know one of the important questions you face is always whether you can integrate mathematicians. Yes, you have actually integrated mathematicians in the sense that some of the physicists have *become* mathematicians without themselves realizing that they have made a transition, and vice versa. Some of the physicists have also become observers. You have become, in a way, an observer for the Subaru project.

That is extremely healthy in my view. I mean in my job as vice chancellor for research, I was the only person really whose brief was to look horizontally across the whole university to see whether the different sides collaborated. I grew very, very fond of interdisciplinary programs and in some ways I grew to understand what programs were really interdisciplinary and what programs were just painted interdisciplinary. IPMU is really interdisciplinary. You have to be careful here. For instance, you can do something in somebody else's field and then perhaps you are the best physicist that does some kind of medicine but that doesn't mean that you're doing good medicine. In your case, you really are truly interdisciplinary and doing very good science in different places. That is the wonderful aspect of IPMU

Relation between IPMU and traditional departments being positive interference

Murayama: I'm sure you have seen many new centers coming up within UCLA campus. One of the things we should still worry about is the relationship between the traditional departments which exist at the University of Tokyo and how we can either learn from them, how we can help them, how we can work with them. What was the sort of success model in the case of UCLA?

Peccei: I have a success model. If you look at the university at large, in your case, you need to look at slightly more restrictive but I think it's basically the same concept. In my case, I had to make sure that the deans, who were always interested in furthering their school, and this is natural, were also willing to play with other deans to work on some areas where they overlap.

I think you have the same situation here. Instead of talking about schools, you're really talking about various departments. Chairs of the various departments will have their agendas; they would

like to make the mathematics department or the physics department better, and I think that's perfectly fine. But your job as director is to try to convince them that at times it'd be good if they collaborate with IPMU and that your institution is helping them to achieve, not only what they want to achieve in their own discipline, but also giving them a little bit of help to achieve things that are occurring in the interface, that actually will, in the end, make their discipline even better.

I think that you ought to play this role here. I think the most difficult thing that I see, which is partly due to the structure of Japanese university, is this business of the graduate students. I mean you're, obviously, doing a good job with the graduate students but that has to come a little bit more natural from the departments. But, this is clearly where you are going, which is the right thing to do. You have to figure how to do more as a very large marriage broker.

Murayama: Oh, I see.

Peccei: But basically making people understand that by helping you grow better or by having IPMU being strong, it actually makes their units also strong. It doesn't take away anything. It actually adds—because it's positive and not negative interference.

Murayama: Yeah. That's a great way of looking at it.

At least I am trying to help the physics department in a way at least I could, like trying to talk to freshmen and sophomores one time and trying to impress them that physics is really an active, vibrant and exciting field, and apparently that seems to have stimulated some of them declaring their major in physics and so on and so forth.

Peccei: Yeah. I mean every place is a little bit different. There are different mores that you have to live by. But the idea is that you are doing things that will be positive. It's important to emphasize that.

Common problems WPI institutes could work together

Murayama: You also referred to the fact that WPI is sort of a national initiative and institute, not only this place, but five other places right now. Again, being in the capacity of vice chancellor of research for long time, you can probably look at the other centers and fields and see how maybe we can work together in some way or if Japan as a whole can open up in some ways—what do you see as the future direction?

Peccei: Actually, a good microcosm of this happened in the University of California about 10 years ago, when the State of California had money, believe it or not, actually!

Murayama: It's hard to believe now!

Peccei: They invested in these California Institutes for Science and Innovation and created four institutes funded by 100 million from the state plus 200 million that you had to raise as matching funds, and they established four of these institutes in different areas. We had one jointly with Santa Barbara in nanoscience; Berkeley had one jointly with Davis and with other branches of UC basically on internet kind of things. Then there was also an institute that did basically genomics and biomedical research based in UC San Francisco.

But anyway, these were quite different institutes and they were created by the state because they wanted to have California be prepared for the future in terms of new disciplines and new ideas that would develop. Even though they covered different kinds of science, for example, the fourth institute which was based in the University of San Diego was in telecommunications, there was sufficient overlap, not intellectual, but from the fact that each of these institutes were created to help the state be better prepared for the future. I compare this to the WPI effort because, again, the WPI wants to have Japan have some real leading institutes in forefront areas of science where they are recognized and that will push science and technology forward in Japan. This is very similar to what happened in California.

What happened is that even though the institutes were competing against one another for funds, just like you are, there was still a commonality because the institutes were put together to achieve a sort of grander goal. There was helpful cooperation in that respect among the institute directors, even though you had to compete because you were

going after the same pot of money.

Murayama: That's right.

Peccei: But there was a commonality because you had similar problems you were trying to really solve. In your case and the one of the WPI program, I think, the most difficult and challenging problem, is really to have a large proportion of foreign visitors. This you have done very well and very easily, but it's not an easy thing to do.

Murayama: That's right.

Peccei: So, there are certainly common problems that you have where I think the WPI institutes could very well work together.

Murayama: So we should work on that, then. Good. So, having seen this WPI instituted and you have seen IPMU grow over the 4-year period, looking from outside, has that changed the perception of a Japanese science community in anyway? What was the view of Japan before WPI and how is it now?

WPI is something very non-Japanese, healthy thing for Japan to do

Peccei: Well, I think that what has been noted outside, in a sense, is the fact that Japan wanted to make an investment to create world-class institutes. Certainly, it was noted in our field. I think there is certainly no physicist that doesn't know about IPMU, even if they may not quite know exactly what Japan is doing. But, it's clear that IPMU is a new kid on the block, but one that is really very well prepared to compete with the best.

I think it was important for Japan to do what it did, particularly since there has been a tremendous amount of recent investment in science by China and also now by India to some extent. Although, Japan has invested in science for a long long time, it didn't really ever try to be pushy and say well, "We would like to be at the top." In this case, they actually said something very non-Japanese, "We would like to compete and here is what we created." I think that that was a very good thing to do actually. This is a personal opinion, but I felt that this was a very healthy thing for Japan to do.

Maybe it also was at the right time given the reform in the university system in Japan. So it probably was the right time to do this kind of thing. Even though it's a little bit difficult to understand what the criteria of organizational improvement in the WPI review is, it is actually helpful. As I understand it, what they really want is help against the resistance to change the system in important ways. So you really have a precursor path to follow.

Murayama: Are there examples in the UC system that some institute was created within the UC system and somehow it started to change the whole UC organization over time? I am asking this because sometimes I feel kind of powerless. You see, I took on such a big monster, in a way. So, how could this be possible at all?

Peccei: Yeah. I'll give you an example. It doesn't totally answer what you have said and what you ask, but let me go back to these California Institutes of Science and Innovation. They were created to basically provide a bridge between what the university does and the outside, if you wish, the corporate community, because most of the topics were topics which were going to be important to the State of California in terms of their development in creating the new industries for the future.

Murayama: I see.

Peccei: These institutes in a way are quite different than the traditional organized research units of the University of California. The University of California has, as you know, many of these ORUs, Organized Research Units. These were created over time but they started being created about 50 years ago and in some way reflected the University of California then. Some of these ORUs have done well and continue to do well, but others have sort of become more ossified as structures in universities tend to do.

So, by creating new things, you get change. If you look at the University of California as a whole—then you realize that the research in the University of California is not just represented by these ORUs; in fact, it is very much broader. These institutes are an example—but so are many other things that are moving much more rapidly. In some ways, creating new structures forces the university to look at what the existing structure is. I think there is a similar process going on here. Now, how successful is it going to be, or are people going to be so impressed to say, oh, we're all going to go this way. That I do not know, it's a long process. But I think it is part of a natural evolutionary process. I view both the WPI initiative and IPMU in particular, as very positive things. Even though it looks a little bit quixotic to imagine that you will actually be able to change the system, it's a normal way to change a system.

Murayama: I see. I wouldn't have expected that.

Peccei: But I think you are at least hitting a few windmills pretty well.

Murayama: Interesting.

Peccei: I'm actually quite positive on this role of IPMU actually. I think that this is one of the nicest and more important aspects of the institute.

Murayama: One sort of aspect of trying to create this international institute is that some may wonder "Why do we have to do this?" Yourself being—having a very international career and living in Argentina, Germany, Italy, the US, and

also being an international scientific career as well—so, in your mind, what is sort of really important about being international, being global.

Peccei: I think you cannot survive right now unless you are international. We are international in our own profession, very much so. But I think the importance in my view of this institute for Japan is that it shows that Japan really has an interest in being regarded as a forefront international country. They are prepared to invest to be that. Not that they are *not* at the forefront internationally, because they *are*. But Japan is not as well recognized as it should be. This is one way to sort of say "You know guys, we're really here to play." I think, as I said, I consider it to be a very positive thing. You are fortunate that there was a period of time when there was money in Japan too!

Murayama: That's right.

Peccei: You could think of doing these things then. That's one of the important points. You have certain windows in time when it is possible to invest in some things. There are other windows in time where there are many other things that are occurring, so that you cannot invest in new initiatives. But it's important that countries and universities and individuals take advantage of those moments in time in which it is possible to make some steps forward and take advantage of that. It's really nice to see that you guys have taken advantage of that.

To understand the universe, many more tools than the telescope needed

Murayama: I guess the last thing I would like to ask you is now on the scientific side. I truly believe that developing particle physics and astrophysics and mathematics really have a lot of common interest among them and it's really the right time to actually get together and try to think of the new steps. In your view, looking into this history of particle physics already for decades, where are we going from here? What is the next right thing to do scientifically? Where is the next breakthrough?

Peccei: I think the theme here is the right theme to make progress. You ought to really understand the universe. IPMU wants to understand the universe…

Murayama: Yeah, we are part of it.

Peccei: Yeah, to understand the universe you cannot only do astronomy. You also have to do particle physics. You have to have the tools that mathematics brings. You have to have the willingness to explore short distance physics. You really have to look at a broader gamut of disciplines. I think four centuries ago, if you wanted to understand the universe, you did need to invent the telescope that looked at the universe. Now, you need many more tools. You are trying to bring all the people that have tools that will help us understand the universe together. I think that that is the mission. I mean your mission is the universe, yes a little bit broad, but the right mission.

I should tell you that I was recently in South America. I have lots of nephews.

Murayama: I see.

Peccei: One of them asked me of what I was doing and I said, well, one of the things I was doing was that I was the chair of this external committee for the physics and mathematics of the universe and he just laughed. He said, "Well that is certainly pretentious!"

But I told him, "Look, I mean if you want to understand the universe, you have to do just this. You have to put all these things together." We actually had a very good discussion. After at first being very amused by this, in the end he understood that you need all of this to understand the Universe. I think the mission of IPMU is absolutely central and inspiring. If you just tell people with a straight face, correctly, "I am just interested in understanding the universe," I think you are doing well.

Murayama: That's interesting. I never imagined that the name of the institute can invoke that kind of reaction.

Peccei: Well, it's ambitious. You want to understand the universe. I mean most people are happy if they understand whatever was the morning news.

Murayama: Which is very hard to understand.

Peccei: Yeah, which is even more—it's harder to understand than the universe, but it's sort of ambitious and it follows sort of the steps of giants. Now, whether you will be able to take a giant step, that's always very hard to tell but you are going I think in the right direction. I mean at least—maybe I am just deeply prejudiced because that's my interest too, but I think it is what you're trying to do and I think this is wonderful.

Murayama: You mentioned to me yesterday that you've been wearing IPMU T-shirt at the beach and people ask you about questions on what this is about and stuff. What do you tell them actually?

Peccei: Well, I think they are a little shy to ask me. It's interesting. I mean in fact, one time I met actually a young Japanese couple in a beach that could actually read the kanji.

Murayama: Yeah, okay.

Peccei: They kept looking at me. And then I said, oh yes, that's right, but they were too shy to ask me exactly how come I had on this very strange T-shirt.

Murayama: Okay. We should start selling that T-shirt all over the world.

Peccei: Absolutely. I think you would do extremely well.