

Talking IPMU: Three Years at IPMU

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Ooguri: First, I would like to congratulate you on successfully completing the 3 years of postdoctoral study at IPMU. You have been very productive in research and expanded the area of your study significantly. Now, you are moving on to the next position at CERN, which in this age of the LHC experiment is one of the best places for a high energy theorist to be. So, congratulations. I understand this is essentially your last week at IPMU, and you must be busy with packing and moving. I very much appreciate your sitting down with me for an interview during this busy week.

Deciding to join IPMU

Ooguri: I thought that we should reflect upon your 3 years at IPMU and talk about your experience here. But, before we even start with you arriving at IPMU, I want to hear how

¹ Now at CERN.

you had decided to come to IPMU. IPMU was officially established on October 1, 2007. We were notified about the approval of its funding less than a month before that date, so we had to scramble to launch the Institute. I remember that, within a month after IPMU had started, I received an email from you saying that you heard about a job opening and asking whether it's possible to have two positions for both you and Domenico Orlando, who is your husband. At that time, you were still in the middle of your first postdoctoral appointment at the University of Amsterdam. How did you hear about the position and why did you decide to contact me?

Reffert: I heard about it from you, actually, because I received a message that you had sent to colleagues about job openings at IPMU. It said there were 20 postdoc positions. I thought, well if there are so many of them, maybe there are two, for both my

husband and me. Many institutes have at most one opening per season in String Theory, so it's very difficult to find something for two people together.

Ooguri: When the institute started, we needed to attract a lot of young talent, especially from abroad. So, we sent out a massive amount of emails to scientists all over the world announcing the job opening, and I guess, Robbert Dijkgraaf,² who was your advisor, must have received my message.

Reffert: I don't remember who forwarded it, but it arrived in my mailbox.

Ooguri: Good, so our plan worked. We pay attention to diversity in the workplace, and we recognize that the two-body problem³ is one of the

² Distinguished University Professor at the University of Amsterdam and President of the Royal Netherlands Academy of Arts and Sciences.

³ The difficulty for an academic couple to find two positions at the same place so that they can live together.

serious issues for academic couples, often making it difficult, especially for female scientists, to advance their careers. You and Domenico were people we wanted to have here as scientists, and we were very happy to have been able to attract both of you to come to IPMU. But, I am also curious; was there any hesitation about moving to the part of the world which would be different from what you were used to, leaving the comfortable research group in Amsterdam?

Reffert: Not really. Of course, moving to a new institute, when you don't know how it will develop, is a risk. But, since excellent scientists like yourself backed it, it sounded like it was a risk one can take. Of course, Japan is very far and our parents prefer us to be closer to home, but we thought it would also be a very interesting experience and an adventure to go somewhere completely different, so we were excited about that.

Ooguri: I am glad to hear that.

Starting at IPMU

Ooguri: You arrived here in September of 2008, exactly 3 years ago. I heard you took the Trans-Siberian Railway to come to Japan. Is that true? That must have been an adventure in itself.

Reffert: Yes. Since we had the chance to go all the way to Tokyo, we really wanted to do it properly. On the airplane you wouldn't even notice what happens. You get on somewhere, you get off somewhere else. But, if you go by train, you really have this experience of going far.

Ooguri: That must have been an interesting trip. After arriving in Tokyo, was there any difficulty in getting settled, for example, finding housing and setting up your apartment?

Reffert: No, it was actually very easy because people from the IPMU Administrative Office took very good care of us here. They organized everything, and they helped us find an apartment, so it was very smooth.

Ooguri: I see. How about paperwork, such as immigration, registration, opening a bank account?

Reffert: All of this was very smooth because all the documents were prepared for us in advance and we just had to sign them. When we had to go to the town hall or to the bank, a translator was sent along with us. So, it was very easy, much easier than in some European countries. In Europe, they know that you can do it yourself, so they don't help you.

Life at IPMU

Ooguri: IPMU also offers Japanese language courses, and I remember you took some classes.

Reffert: Exactly. We are still taking classes, but less frequently. In the beginning, we had 6 hours per week, and now we're down to 1 and ½ hours per week. But, we are always interested in learning the language to experience the country more directly.

Ooguri: It helped you to get to see various parts of Japan that you would not have seen otherwise.

Reffert: I think it helps a lot. If you just want to stay at IPMU, of course, you don't need to speak Japanese because everyone speaks English. But, if you want to experience life in Japan, then it's really useful if you speak the language a little.

Ooguri: It opens doors, I guess.

Reffert: I think so, yes.

Ooguri: Since we're talking about life in Japan, I would like to hear your impressions of life in Tokyo. I understand you had an apartment in

Asakusa⁴ and commuted from there every day.

Reffert: That's correct.

Ooguri: Have you been plugged into the community of expatriates in Tokyo?

Reffert: Not so much, because most of our friends are actually at IPMU as well, in different disciplines but still mostly at IPMU. But, we also met some other expats through our hobbies like attending karate classes.

Ooguri: You took karate classes?

Reffert: Yes. Here on campus.

Ooguri: Oh, do they offer karate classes on campus?

Reffert: Yes.⁵ We also attend some yoga classes, where they are mostly expats. This way, we met some other people as well.

Ooguri: I see. Not only you met and socialized with scientists within IPMU, the Kashiwa campus offers opportunities for you to meet with people from other institutes.

Reffert: Actually, what's also very nice is that the International Office of the University of Tokyo on Kashiwa campus organizes very interesting outings to experience Japanese culture. For example, there was the Kabuki Theater, some excursions, and events like calligraphy classes or the tea ceremony, which you can attend for free, and we have made use of this as well. You meet a lot of other expats there that work on campus as well.

Ooguri: That is great. It serves two purposes. You get to learn Japanese culture, but through that you also meet with interesting people.

Reffert: Exactly.

Ooguri: I know that you have a popular blog⁶ that chronicles your life

⁴ One of traditional downtown areas in Tokyo.

⁵ Hakumon Karate Club (<http://hakumonkarate.web.fc2.com/english/index.html>).

⁶ <http://chipango.wordpress.com/>

in Japan. Have you got any response on that?

Reffert: Yes. What's interesting is that I had started the blog to be in touch with friends and family back in Europe, but it turns out that many Japanese people are also reading it. I get feedback from them, which surprised me at first because - why would they be interested in a foreigner's view? They already know what Japan is like. I thought it was more for people back in Europe to see what it's like in Japan. But actually, Japanese people also enjoy seeing a different point of view on their culture.

Ooguri: I see. I am also a reader of your blog. From that I learned that you have traveled extensively within Japan.

Reffert: That's correct.

Ooguri: You have covered all the four major islands.

Reffert: Almost, yes. We have not managed to go to Okinawa, though.

Ooguri: Right, but I meant Hokkaido, Honshu, Shikoku, and Kyushu. You have just been to the Tottori Sand Dune, and you are going to Kyoto one more time before leaving Japan.

Reffert: Yes, we enjoy traveling in Japan really a lot because it's a very interesting country—it's very different from where we come from. It's very suitable for traveling because the train system is so convenient. You can go very far in a short time, and all the facilities are very good. It's easy to get to the tourist attractions, which are really very interesting. I think that, if one just comes to Japan and doesn't travel, one really misses out on a very interesting experience.

Ooguri: Indeed, by reading your blog, I felt that I should visit these places. You have been to many interesting places in Japan that I myself have never been.

Reffert: But that's usually the case. In Switzerland, where I am from, many tourists know more sightseeing spots than I do because when you live in a country, you take it for granted. But, if you are new to the country, everything seems very interesting.

Ooguri: That is true in general. But, in your case, your curiosity to explore this country is palpable in your blog, and that is what makes it interesting to read.

Research at IPMU

Ooguri: Now, I would like to also talk about your research activities at IPMU. You have this very widely cited paper⁷ on the Hořava-Lifshitz gravity. Could you tell us about that?

Reffert: What happened was that a topic that we had worked on before, namely stochastic quantization, turned out to be very relevant to this new theory of gravity, which was suggested by Petr Hořava.⁸ We understood that we could successfully apply some of the knowledge we had gained on this topic and answer some important questions about his theory, in particular about its quantum behavior. We proved that the theory is renormalizable. It was very fortunate that we could apply our previous knowledge to a new and hot topic.

Ooguri: I understand that you were drawn to this area of research because of your interest in integrable systems, is that correct?

Reffert: That's correct, yes.

Ooguri: In Japan, there is a large and active community of people who are working on integrable models, both

in physics and mathematics. Have you had any contact with these people?

Reffert: Yes, indeed. There are some very distinguished scientists in this subject like, for example, Professors Jimbo and Miwa, and we were lucky to be able to meet and discuss with both of them.

Ooguri: Jimbo was a principal investigator at IPMU when you arrived here.

Reffert: That's right. We discussed with him when he was at IPMU. Later on, we met Professor Miwa at a conference in Kyoto.

Ooguri: I see. You also collaborated with Nicolai Reshetikhin,⁹ who is also in this general area of integrable systems. He visits IPMU frequently since he is on our external advisory board. That must have helped you to pursue this research.

Reffert: Yes, it's always much easier to finish a paper when it is possible for your collaborator to be with you or the other way around. That was very helpful.

Ooguri: One of the memorable events for me was to organize the Focus Week entitled "New Invariants and Wall Crossing" with you, Domenico and Yukinobu Toda, who is an IPMU mathematician. At that time, *Wall Crossing* was just emerging as an exciting new area, both in physics and mathematics. I was also writing a paper on this subject with Masahito Yamazaki, a graduate student at IPMU, and I thought that we should have more activities in this area at IPMU. Then, you and Domenico approached me and proposed exactly what we should be doing — that we should have a Focus Week. So, we joined forces and organized this meeting,

⁷ D. Orlando and S. Reffert, "On the Renormalizability of Hořava-Lifshitz-type Gravities," *Class. Quant. Grav.* **26** (2009) 115.

⁸ Professor at the University of California at Berkeley and a member of the IPMU Satellite at Berkeley.

⁹ Professor of Mathematics at the University of California at Berkeley and a member of the external advisory board of IPMU.

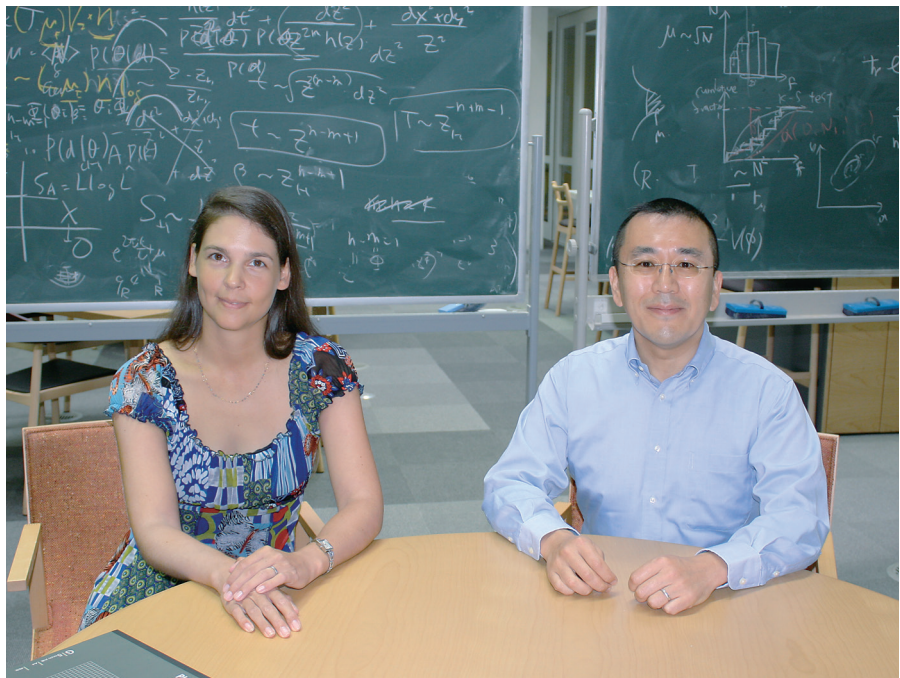
which was a great success. We had an almost equal number of mathematicians and physicists, as lecturers as well as participants, and they interacted very well, communicating at a deep level. How was your experience in organizing this?

Reffert: It was very interesting and, luckily, not very tiring at all, because the support staff from the IPMU Administrative Office took care of most of the heavy tasks of organizing. So, we could essentially just interact with the scientists we had invited. We were very happy that it was possible to attract very high caliber scientists to come to this workshop—to Japan.

Ooguri: I myself was amazed. We wanted to seize the opportunity in this emerging area and organized this event in a very short period of time. I remember contacting Hitoshi (Murayama) saying, “there is a breakthrough – we should have a workshop quickly.” He approved it instantly.

It was sometime in February, 2009, and a meeting was held in May. We had only 3 months to prepare. Usually, an international conference of this scale takes a year of preparation. Despite that, many of the leading mathematicians and physicists accepted our invitations. The International Office of IPMU helped us put together the conference on very short notice. We did it at the right time, and it was very successful.

I am not sure whether you remember or not, but the Focus Week was held in the midst of the H1N1 influenza pandemic, and it added a twist to this event.



Reffert: Absolutely. I remember being very worried that the meeting might have to be cancelled because international travel had to be restricted. We were nervous about that, but in the end we were able to hold the conference as planned, thanks to some additional security measures, such as checking the temperature of participants and providing hand sanitizers and masks, et cetera.

Ooguri: That’s right. When our conference was taking place, Japan was not yet infected by the swine flu, but there were countries which were officially declared as infected. The Japanese Government was nervous about lots of foreigners coming to international conferences. Indeed, when our meeting was taking place, there were many other conferences that had to be cancelled.

One of the reasons that we were able to go ahead and hold this workshop was that people at the IPMU Administrative Office did

a lot of work in complying with requests from the Government and the University Administration, and they took necessary measures, as you said, to ensure the health and well-being of the participants. That included handing out surgical masks and making sure that everybody knows how to wear and dispose of them properly. We also installed an infrared thermographic camera at the entrance of the conference room to monitor the body temperature of the participants. Participants took these steps with a sense of humor. In the end, it worked very well, I think.¹⁰

Reffert: Absolutely.

Ooguri: For me, this workshop was very helpful for my own research. It inspired me to work on a couple of new directions too.

Reffert: We were very fortunate to be able to interact directly with some of the mathematicians who naturally

¹⁰ A report on this Focus Week can be found at IPMU NEWS Vol. 6 (http://www.ipmu.jp/webfm_send/164).

have a bit of a different take on the problems than the physicists, so that was very helpful for us as well.

Ooguri: Talking about interacting with mathematicians, how was your experience at IPMU in this regard?

Reffert: It has been very good. First of all, we have a joint seminar where you can really attend the seminars for both physicists and mathematicians and ask questions. We have this introductory half hour at the beginning, before the actual talk. This I found very helpful for myself.

Ooguri: Yes, we have this rule that each speaker is asked to give a thirty-minute general presentation that is accessible to both mathematicians and physicists, and we then have a five minute break.

Reffert: Exactly.

Ooguri: During the short break, people are allowed to leave if they wish, and then we continue on to a more technical presentation. That seems to have been very popular. Indeed, we also used this format for the Focus Week we just talked about, and people liked it.

Reffert: Yes, I think it is very helpful to learn and understand the language of other fields better.

Ooguri: It is very important for us to make efforts to communicate with people in other areas of science and mathematics. I heard you interacted especially with Kyoji Saito¹¹ on various occasions?

Reffert: Yes, in fact Kyoji is very helpful. You can always just appear at his door if you have some mathematics questions, and he is always very happy to help you out.

Ooguri: Happy and enthusiastic.

Reffert: He is great.

¹¹ Principal Investigator and Professor of Mathematics at IPMU.

Outreach Activities at IPMU

Ooguri: Now, changing gears a little bit — you have helped IPMU a lot in the outreach activities. You gave talks at various levels. Could you tell us about your experience with these activities?

Reffert: I participated in a number of events, mostly geared towards students — even elementary school students, but also high school students — who have a special interest in science or mathematics. I think it's important to interact with these people. When I was in school, it was hard to see what it is really like to do research, because the way it is taught in school is much less interesting than it is in real life. So, I think maybe students don't get a good enough opinion of how interesting it would be to be a researcher. I think it's very important for young people to meet researchers and see that there is much more than what you are taught in the classroom.

Ooguri: I agree. Miyazoe-san¹² also has a blog. In her blog, she was describing one of the talks that you gave to, I think, high school students at a mathematics camp at the IPMU. Miyazoe-san wrote that she was impressed by your presentation on the scientist's life, and that it sounds like a very interesting life to have. I think it is wonderful that those young students had the opportunity to meet scientists in person and learn what life in science is like. That is something we should be doing in order to attract young talent to science.

I also enjoyed watching your short video "Ask a Scientist." It was very well prepared. How did you do it?

Reffert: It was actually a challenge to

¹² Fusae Miyazoe, a public information and outreach coordinator of IPMU.

explain String Theory in 2 minutes. I tried to do justice to the subject and at the same time be understandable for everyone. But, it was fun. A lot of people from other institutes on campus told me that they had seen it.

Ooguri: I was very impressed by the way you presented the difficult material in just 2 minutes, and using a chalkboard. It is a very interesting video to watch.¹³

Great Tohoku Earthquake

Ooguri: In the last year of your stay at IPMU – sadly - the Great Tohoku Earthquake struck on March 11. My heart goes out to people whose lives have been seriously affected by it. Both you and I were in Japan at the time of the earthquake. Could you tell us your experience?

Reffert: We were actually on a train going towards the Kashiwa campus when it happened. The train made an emergency stop before the earthquake struck.

Ooguri: So, the early warning system worked.

Reffert: Yes, the train suddenly stopped in the tunnel. After it stopped, the ground started shaking.

Ooguri: I see.

Reffert: Then, we didn't really know what had happened. We were asked to wait on the train for about 2 hours. We didn't know if the train was going to proceed, or whether the earthquake had been very bad or not, because on the train it was hard to tell.

Ooguri: Was the train in an underground tunnel?

Reffert: Yes. Finally they asked us to evacuate on foot. Everyone had to walk to the next station between the tracks. In the end, it was already late

¹³ Available at http://www.ipmu.jp/drupal/webfm_send/121

afternoon and we were about 20 kilometers away from home. We had to stay overnight in the emergency shelter that they opened up in the town hall of a very small town.

Ooguri: I see. I myself was working at IPMU on that day. I couldn't go home either.¹⁴

Reffert: Many people couldn't go home.

Ooguri: You're right. There is a word for that. *Kitaku nanmin* in Japanese, which means refugees who cannot go home.

Reffert: Exactly. We were treated very well at the shelter because the emergency procedures at this town hall were very efficient. They handed out emergency blankets and mats, so we could sleep on the floor in an auditorium. In the morning, they even made breakfast for us.

Ooguri: Wow.

Reffert: They must have made it at home. They had all sorts of things, like miso soup and *onigiri*. They also tried to give us some information about what trains were running because the train system was still...

Ooguri: On the next day, not all the trains were running.

Reffert: It was a bit difficult to return home and it took several hours, but we managed eventually.

Ooguri: Was there any damage to your home?

Reffert: Not really damage. A lot of things had fallen down because we live on the 8th floor. Everything that was on top of some surfaces had fallen down and also —inside the cupboards— stuff had moved and was like falling down when you opened the doors. But, there was

almost nothing broken.

Ooguri: That is fortunate. Has your life changed after the earthquake?

Reffert: For a little bit, of course there were changes, because the supply chains did not work so well and there were power shortages.

Ooguri: In the week immediately after the earthquake?

Reffert: Yes. The first week afterwards you could tell that there were problems, but it wasn't like a real problem. We always had enough food and water so we were okay. I think it was exaggerated on international TV how bad things were in Tokyo. Tokyo was essentially all right.

Ooguri: It is almost half a year since then. How are you feeling now?

Reffert: Luckily, in this region you don't feel much anymore. Of course, it is different in Tohoku. There are still some power-saving measures in Tokyo also. But, I don't think they are disruptive at all. I do not have any more trouble from them at all.

Ooguri: Yes, there was some concern, when the summer months started, when demand for electricity was expected to rise because of air conditioning, whether the electric company has enough capacity to supply electricity. In the end, I was amazed that the City of Tokyo functioned with 75 - 80% of the electricity that they normally use, without impacting life in any significant way.

Reffert: That's true. In fact, the changes are minimal, and I also find that, for example, it's not necessary to cool down the interior so much.

Ooguri: In some cases, it turned out to be better. For example, it used to be that when I go to a department store in summer in Tokyo, it was freezing cold inside.

Reffert: Yes, absolutely. I find this to

be an improvement as well.

Reflecting upon Three Years at IPMU

Ooguri: Now, you are departing from IPMU. Of course, we are sad that you are leaving us. But, on the other hand, we are very happy and proud that you are moving on to this wonderful position at CERN. To make it even better, both you and Domenico found positions at the same place. Could you tell us about your new positions?

Reffert: We are very excited, not only that we can be together again, but also that we can go to CERN, which is now a very exciting place to be because the LHC is running, and the search for the Higgs is really in full swing. Maybe during our time, we will witness the discovery. It's a very exciting place to go.

Ooguri: Congratulations. That is great.

Reffert: We are very happy that our time at IPMU has prepared us for this new position.

Ooguri: Thank you. Any final reflection or departing thoughts?

Reffert: Of course we are both sorry to leave because we enjoyed our stay at IPMU and in Japan in general very much because IPMU has a really nice and open working atmosphere. We were able to be very productive here. Also, Japan is really such an interesting country that we will miss it very much. We would really like to encourage other people to come to Japan and have this kind of experience, which is really enriching both scientifically and also on a personal level, I believe.

Ooguri: Thank you for joining us and being with us for the last 3 years. It was great to have both of you at IPMU. I wish you all the best for your next adventure.

Reffert: Thank you very much.

¹⁴ Serguey Petcov describes his experience of the earthquake and aftermath at IPMU in his article in IPMU NEWS Vol 14 (http://www.ipmu.jp/webfm_send/508).