

## An interview with Professor Ragni Piene (05.01.2011):

(by Katarzyna Piaskowska)

- 1. You were a member of the Working Group for the Abel Prize. Now you are the Chair of the Abel Committee recommending the laureates. When working for establishing the Prize, did you have a clear vision of what kind of mathematical achievements the Committee should award?**

After the establishment of the Prize had been decided, there were discussions about the statutes of the Fund, and of the criteria for selecting the laureates. We had suggested that the Norwegian Academy of Science and Letters should “own” the prize, i.e., administer the capital return of the Fund and give out the prize. This would be a way of giving the Academy a task, and money, and increase the activities of the Academy in general. I would like to add that the Abel Prize has been followed by the Kavli Prizes (in Astrophysics, in Nanoscience, and in Neuroscience), also the responsibility of the Academy. The Kavli Prize money is donated by Fred Kavli through the Kavli Foundation, whereas the money for all the Kavli Prize activities comes from the Ministry. The organization – the way the committees are formed, and the statutes – is modeled on the Abel Prize.

One important decision we made from the beginning was that the Prize Committee should be international, as opposed to the Nobel Prizes where the committees are national. The history of the Nobel Prizes shows – especially in the early days of the Prizes – that there were conflicts within the committees and that bad decisions were made accordingly. To have an international committee consisting of outstanding mathematicians representing a much broader and deeper expertise than a small country like Norway can possibly provide, is crucial for making good decisions. Also, it was felt that the international mathematical community should be directly involved in the Prize, and we have obtained that by having IMU and EMS nominate the members of the Abel Committee.

Another decision was that nominations should be open – anybody can nominate (of course self-nominations are not acceptable!). But most importantly, we discussed what criteria should be used in the selection process. The outcome of the discussion is what is written in the call for nominations, and I would like to quote it (since we spent a lot of time formulating it):

*The Abel Prize is an international prize for outstanding scientific work in the field of mathematics, including mathematical aspects of computer science, mathematical physics, probability, numerical analysis and scientific computing, statistics, and also applications of mathematics in the sciences.*

*The prize is meant to recognize contributions of extraordinary depth and influence to the mathematical sciences. Such work may have resolved fundamental problems, created powerful new techniques, introduced unifying principles or opened up major new fields of research. The intent is to award prizes over the course of time in a broad range of fields within the mathematical sciences.*

- 2. Going back to the beginnings of the prize and circumstances leading to its setting up: When did you hear about the idea of the international Abel Prize in mathematics for the first time? Have you believed in this project from the very beginning?**

I heard about it some time after Arild Stubhaug had met Tormod Hermansen at a book signing, at the time the “working group” was formed. The idea of a prize seemed a bit unreal at the time, though I think we all thought it was possible that it could actually happen...

There were many things that in some way were leading up to the establishment of the prize. For example, it was pretty clear that the Abel Bicentennial had to be celebrated in 2002. Someone suggested that Norway should bid to hold the ICM in 2002; this proposal was considered unrealistic by many, but then Jacob Palis, who was a Secretary of IMU at the time, explicitly asked Norway to put in a bid. The main reason for this was that IMU knew that China was planning to bid, but that there might be political issues (within China, or concerning human rights in China) that would make that bid actually not happening or being difficult to accept. Therefore we were told that a Norwegian bid would be a “back-up” bid, probably not being even voted on at the General Assembly of IMU, but that we would need to be prepared that we could in fact get the bid. So a group of us started to prepare the bid, with the more realistic intention of organizing an Abel Bicentennial Conference instead of the ICM. We coordinated this work with our preparations for the World Mathematical Year in 2000. We had meetings with the Minister of Education and Research and were able to obtain some financial support. It turned out to be much harder – in fact impossible – to find any private sponsors, by the way.

I was the Norwegian delegate to the General Assembly of IMU in Dresden in 1998. Since by then it was clear that China would be able to host the ICM, and that the Executive Committee of IMU recommended Beijing as the site, I of course offered to withdraw the Norwegian bid. However, some delegates insisted that there be a formal vote (since they wanted to protest against the Chinese because of the human rights problem), so there was a written ballot, resulting in favor of China as expected. I congratulated the Chinese, and invited everyone to the Abel Bicentennial Conference in Oslo in June 2002.

**3. From your point of view, what was the deciding factor for setting up the Niels Henrik Abel Memorial Fund? Could you point out one moment during those years at the beginning of the last decade that you consider to be the most important for this over one-hundred-years-old idea becoming the reality?**

Some of us in the working group wondered about how and when the decision was made. In the summer of 2001 the working group was called to a meeting in the Ministry of Education and Research. The Minister was not present (probably on vacation), but we noted with interest that a person from the Ministry of Finance was there. We sensed a very positive atmosphere at this meeting. Of course we don't know if this meeting was the crucial event. There is a saying: “When the cat is away, the mice are dancing on the table.” In any case, not long afterwards, the prime minister participated in a meeting at the University, organized by the student association of the Labor Party, in connection with the election campaign. In his speech at the meeting the prime minister announced the creation of the Fund and the Prize. This is how we got to know – we were not told beforehand! How and why the decision was made, we don't know – maybe someone in the Ministry thought this would be a great item for the prime minister to use in his election campaign...

Probably a very important aspect of the Prize, one that we had stressed whenever meeting with politicians and Ministry people, was that it would contribute to inspire and motivate children and young people to become more interested in mathematics and natural sciences. I should add that we had collected letters of support from various “key

persons” in Norway, as well as strong support from the International Mathematical Union and the European Mathematical Society.

**4. Comparing for instance with the Fields Medal or the Clay Mathematics Institute's Millennium Prizes what differs the Abel Prize from the other existing prizes?**

We never wanted to challenge the Fields Medal, which will continue to have a very special status and be the most prestigious prize for young mathematicians. The Clay prizes are for having solved particular, given problems. There are many other prizes in mathematics too, and in some sense we are of course competing with all of them. We are very ambitious for the Abel Prize – in the sense that we would like to see it as the “Nobel” in mathematics.

**5. There are plenty of beautiful mathematical results published every year – in pure as well as in applied mathematics. Is it possible to receive the Abel Prize for the only one yet outstanding result – or is it rather a *lifetime achievement* award?**

It is possible. Atiyah and Singer received the prize for the discovery and proof of the Index Theorem (and for “their outstanding role in building new bridges between mathematics and theoretical physics”). A problem with awarding the prize for one result, rather than for a lifetime achievement, is that there are often many people who have been crucial in the work leading up to a particular result. It is always difficult to weigh the various contributions, and – as we know from the history of the Nobel Prizes – to decide where the “cut off line” goes. Moreover, awarding the Prize jointly to a group of people could be perceived as a devaluation of the prize. Of course these issues are continuously discussed in the committees. Maybe over time there will be changes?

**6. The Abel Prize is also very often compared with the Nobel Prizes. However, those of the Nobel Prizes that are awarded in science (i.e. medicine, chemistry, physics and economy) refer to the directly applicable discoveries that have substantial impact on the society, sometimes even our everyday life... Since the influence of some achievements in mathematics on our lives is sometimes difficult to explain don't you fear that the Prize will remain recognized only among professionals not having actually such an impact as Nobel Prizes?**

When we compare the Abel Prize with the Nobel Prizes, we do not necessarily think of the way the Nobel Laureates are chosen, but of the status of the Nobel Prizes as the most prestigious prizes in those sciences. Of course it is a big challenge to promote the Abel Prize, since it is in some cases quite hard to convey to the general public what the work of the laureates is about, and why it is so important.

Every year Christian Skau and Martin Raussen conduct an interview with the Laureate (Laureates...) – these interviews are sent on Norwegian TV, and they appear in the Notices of the American Mathematical Society and in the European Mathematical Society Newsletter. Helge Holden and I have edited the book “The Abel Prize 2003–2007 The first five years”, which contains short autobiographical pieces by the laureates and longer articles about their work and includes the Skau–Raussen interviews on a CD. We are currently preparing the second volume in this series. Of course these books are not meant for a general audience, but for a general mathematical audience. But there are also people right now thinking about making a TV series, for a general audience, about

each laureate, where one actually tries to explain something about the mathematics and the importance of the laureates' work.

**7. Have you noticed an interest of international media while working in the Committee? Do you think that the broad popularization is important for mathematics?**

It is also a big challenge to get mass media to be interested in science in general and in mathematics in particular. Having the Abel Prize helps, but it takes work to get anywhere. And yes, I do think popularization is very important for mathematics.

I have myself only been on the Committee for half a year, so I cannot say I have been run down by media – in fact, I have only been contacted once, by the British *Plus magazine* for an interview, while I was at the ICM in Hyderabad. I experienced somewhat more attention in 2002 after having been elected to the Executive Committee of the International Mathematical Union – the first woman ever on that committee.

**8. Nowadays mathematics fires the popular imagination with the Hollywood movies such as “Beautiful Mind” based on the biography of John Nash by Sylvia Nasar, or “Proof” based on a worldwide famous play by David Auburn. On the other hand it is still absolutely socially acceptable to admit an ignorance in mathematics as it seems to be very abstract, distant and difficult subject. Do you think that mathematics is for everybody?**

Yes, in some sense mathematics is for everybody because mathematics is everywhere. How to really make mathematics available for everyone is a very great challenge. But good popularizers exist! For example, last fall at the University of Oslo we had lectures, with large and not-only-mathematical audiences, by Marcus du Sautoy, Cédric Villani, Simon Singh,... And we all try: ten years ago, in relation to the World Mathematical Year 2000, I co-edited a book series (unfortunately we had to stop after three books) about mathematics for a very general audience – one about geometry, relating Dante's universe to a hypersphere, one about game theory, and a novel about number theory.... So mathematics is really out there, we just have to keep showing it!

**9. One of the aims of the Memorial Fund is to encourage young people to be interested in the subject of mathematics. In this purpose also the Holmboe Memorial Prize was established in its frames. What is the situation in mathematics education in Norway now? Have you observed any new tendencies and do you think it may be connected with the activity of the Fund?**

For the situation of math education in the schools in Norway now, I am not the right person to comment, since I have had no serious contact with what goes on there since my son was in school. My feeling is that there is a lack of teachers with enough mathematics background.

As I already mentioned, the “children and youth” profile of the Abel Prize related activities probably played a crucial role in the creation of the prize and such activities are considered a high priority area. The Abel Board has appointed a separate committee responsible for these activities. Concerning the each year's Abel activities like the Niels Henrik Abel competitions and the KappAbel, I am certain they have been very important for many, many school pupils all over the country. Both receive financial support from the Abel Fund.

**10. What outcome in your opinion has the Abel Prize been having since the first laureate awarded in 2003? What do you think about the recognition and status of the Prize itself and its development over the years?**

On the national level, the creation of the prize – and the activities surrounding the prize – has certainly increased the awareness of mathematics in society. On the international level, we are pleased to see the recognition that the prize has obtained. It is more and more often referred to as the most prestigious prize in mathematics, and both the International Mathematical Union and the European Mathematical Society have played important roles. The members of the Abel Committee are chosen on the basis of nominations from these two organizations, and this makes them in a certain sense “co-owners” of the prize. On the web pages of IMU there is a link to the Abel Prize, and the names of the Abel Laureates were included in the IMU president's speech at the ICM in Hyderabad last August. There was also for the first time, as a special event, an Abel Lecture (by Varadhan) at the ICM.

**11. Do you have a feeling of participating in the history of mathematics?**

Certainly all the work leading up to the creation of the prize is now part of the history.

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