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SEAMS School on Numbers, Matrices and Graphs Institut Teknologi Bandung (ITB), Bandung, Indonesia November 4-16, 2013

From November 6 to November 11, I participated to the *SEAMS School on Numbers, Matrices and Graphs* (the school started on November 4 and ended on November 16). I was sharing the course *An Introduction to Number Theory with applications to cryptography and coding theory* with Fidel Nemenzo and Djoko Supriyanto. We had a coordination with Fidel (we met the week before in Mandalay) in order to split the topic between us. My course was on number theory. The reference I gave is the booklet by André Weil *Number Theory for Beginners*, a copy of which was distributed to each participant before I started the course. I gave one more course than what was scheduled, after Fidel Nemenzo cancelled his participation at the last moment; he was supposed to lecture on *Cryptography*, my first and last courses where on this topic. See my presentation

<http://www.math.jussieu.fr/~miw/articles/pdf/Cryptography2013VI.pdf>

I also wrote a short note for the students on the structure of finite abelian groups

<http://www.math.jussieu.fr/~miw/articles/pdf/FiniteAbelianGroupsSEAMS2013.pdf>

I distributed a list of exercises

<http://www.math.jussieu.fr/~miw/articles/pdf/ExercisesSEAMS2013.pdf>

mainly taken from Weil's book. In the evenings, the participants were divided into 5 groups consisting of 5 - 6 members each, and the groups were assigned to work on small exercises. This practice was already introduced by Edy Tri Baskoro for the first CIMPA Research School in Indonesia in 2009 (see below) and I find it very efficient: it enables the participants as well as the speakers to know better what the students understand. The experience on my side is that at least one participant was able to solve almost all exercises essentially correctly, while at the same time some of the participants had a very hard time to solve even the easiest exercises. However, even for them, I believe that his or her participation to such an international school may have lasting consequences; they acquired a unique experience of what is mathematics; also, such international contacts certainly open their mind.

The courses took place in a room (Auditorium Campus Center, Multimedia Room 9311) near the department of Mathematics with a good equipment for projection (beamer) as well as white boards. Tea and coffee breaks (with snacks), lunches (including typical Indonesian food, especially *Minangkabau Rendang*) were served in a room next to the conference room. A wifi access was available for everybody.

Together with the 9 foreign participants (Cambodia: 3, Malaysia: 2, Vietnam: 2, Philippines: 1, Thailand: 1) I was accommodated in the Bumi Sawunggalung Hotel which belongs to ITB and is close to the campus. It is a comfortable place with wifi access.

I also attended courses given by Intan Muchtadi and Edy Tri Baskoro on graph theory.

On Saturday there was an excursion open for all participants (28 of them participated, 20 from Indonesia and 8 from abroad, plus Edy and myself) to Tangkuban Perahu, a volcano which was still active two weeks before we visited it. We walked up to Domas Crater, crossing a jungle with impressive high trees. This trip gave the opportunity to have informal discussions and to share on many different topics (also to take a large number of photos). Such social activities contribute to a very friendly atmosphere. A nice typical lunch was offered in a good restaurant before coming back to Bandung.

The first CIMPA Research School in Indonesia was organized in the Institut Teknologi Bandung (ITB) in 2009, on *Extremal Problems and Hamiltonicity in Graphs* (reports by Edy Tri Baskoro and Michel Jambu):

<http://www.cimpa-icpam.org/spip.php?article76>

Two CIMPA Schools took place in Indonesia in 2011, one in Universitas Gadjah Mada, Yogyakarta, on *Non-linear Computational Geometry* (reports by Sri Wahyuni and Bernard Mourrain) and by Michel Jambu and Richard Grin

<http://www.cimpa-icpam.org/spip.php?article313>

the second one (a CIMPA-ICTP Research School) in Institut Teknologi Bandung on *Geometric representation theory* (reports by Intan Muchtadi and Alexander Zimmermann and by Michel Jambu and Richard Grin)

<http://www.cimpa-icpam.org/spip.php?article309>

There will be a fourth CIMPA Research School in Indonesia in 2014 (August 25 – September 5) at Institut Teknologi Bandung on *Mathematical and Statistical Methods for Imaging*

<http://www.cimpa-icpam.org/spip.php?article579>

Therefore our colleagues from Indonesia, in particular Edy Tri Baskoro, have a good experience of organizing such events, and this SEAMS School is not an exception: it is a success which will have lasting consequences, no doubt that the participants will remember this experience.

SEAMS schools have a tradition which is not as long as CIMPA's ones; there is much more flexibility in organizing a SEAMS School, which is a very good point. The level of a SEAMS School maybe on the average slightly lower than the level of a CIMPA School, but the difference is not substantial, the level of such research

schools varies quite a lot (depending partly on the places where they take place). In principle a SEAMS School is somewhat lighter than a CIMPA School - however this one had a length (two weeks, 10 working days) and a number of participants (around 35) not much less than some CIMPA Schools, but received less funds from CIMPA – besides, this support is only for foreign participants, even when some participants from Indonesia went to Bandung from very far! One might consider having shorter SEAMS Schools which would be easier to organize.

My international flight was supported partly by myself, partly by CIMPA, while my local expenses were fully taken care of by ITB.

After my last course on Monday 11 (followed by songs given by the groups of participants, one group for each country of origin), I went to Jakarta in a car from ITB with Irwansyah (I had already met him in the CIMPA School of Manila last July, and he was in Jakarta when I arrived on November 4 to go with me to Bandung). I had a meeting in the French Embassy with Joël Le Bail, *Attaché de coopération universitaire, scientifique et technique* at the *Institut Français Indonesia*. In spite of the fact that I arrived later than the scheduled appointment, due to heavy traffic jam in Jakarta, I was warmly welcomed by him and his staff, Arie Soedibjo, *Adjointe de l'attaché de coopération universitaire, scientifique et technique*, Hélène Pichot, *Chargée de mission coopération scientifique* and Marion Noirot, *responsable coopération universitaire*. Joël Le Bail already knew CIMPA and some of his active members. The French Embassy supports the cooperation between Indonesian and France, even if this is not the first priority. There are already Indonesian students in France on exchange programs, but there is space for increasing their number. The Embassy will support the forthcoming CIMPA Research School in ITB in 2014.

I wish to conclude by congratulating Edy Tri Baskoro for his dedication to mathematics and to his students. He is doing an excellent job. I wish also to thank him, his wife and his colleagues for their great hospitality.

Michel Waldschmidt.