

# International Summer School for Students

There are many attractive summer opportunities in mathematics for high school or college students. The AMS site [www.ams.org/programs/students/high-school/emp-math-camps](http://www.ams.org/programs/students/high-school/emp-math-camps) lists about forty summer math camps and programs for high school students, and the site [www.ams.org/programs/students/undergrad/emp-reu](http://www.ams.org/programs/students/undergrad/emp-reu) lists eighty-five research experience for undergraduates (REU) summer programs.

We are writing to discuss a new initiative: the International Mathematical Summer School for Students. The first school took place in Bremen in July of 2011; the next one will be in Lyon in August of 2012. The plan is to have the school every year, alternating between Germany and France.

The school differs from the above-mentioned summer camps and REU programs in a couple of ways. First, the summer school participants belong to both groups, high school and college students: specifically, the rising high school seniors, the fresh high school graduates, and the college freshmen and sophomores.

Second, the school is international: there were close to one hundred participants in Bremen, representing twenty-nine countries (the language of the school is English). By regions: Western Europe, forty-one students; Eastern Europe, twenty-four; North America, seven; South America, eight; Asia, six; Africa, six. By age: twenty-two students with two years of university education, twenty-two with one year, twenty-nine who had completed high school but not yet started university, and nineteen still at high school.

The school is inspired by the Russian summer school “Contemporary Mathematics” that has been running for ten years at Dubna near Moscow ([www.mccme.ru/dubna/](http://www.mccme.ru/dubna/), the site is in Russian); close to two hundred videos of the lectures are posted at [www.mathnet.ru/php/conference.phtml?eventID=15&confid=149&option\\_lang=eng](http://www.mathnet.ru/php/conference.phtml?eventID=15&confid=149&option_lang=eng), some of them in English).

The main idea of the school is simple: to invite bright students of mathematics from across the world and to have them learn from—and actively interact with—leading international mathematicians. The instructors were selected by the following criteria: they should present contemporary research in their areas and should be able to communicate in a not-too-technical way; and they should share their excitement and be willing to spend time with the students during the breaks and after classes. To quote from the interview with one of the lecturers, Don Zagier, describing his “random” path to research mathematics early on his career:

...in college, even, nobody told me what the interesting things are that point to research. It was only in graduate school that I finally found out what modern mathematics is about.

(This interview, along with the videos of the lectures, is available at the website of the school <http://math.jacobs-university.de/summerschool/index.php>).

Indeed, to many participants, doing advanced mathematics mostly meant being good at solving olympiad problems

(many of the participants were members of their national teams for the International Mathematical Olympiad). Judging by the questionnaires filled out at the end of the school, most of the students left with a much wider view of what mathematicians actually do.

Due to space limitations, we cannot give a complete list of the speakers and the topics of their talks. There were nine days of lectures (and one full day devoted to an excursion)—thirty-seven lectures altogether, given by fourteen instructors. Some lectures were plenary, and some ran in two parallel sessions; each speaker gave at least one plenary talk. We cannot help mentioning a few names: J. Conway, J. Hubbard, T. Tokieda (his series of talks “Geometry and physics” was probably the most popular among the students), W. Werner, D. Zagier, G. Ziegler (the authors of this note were among the speakers as well).

What impact did the school have on its participants? We asked them in a questionnaire at the end of the program. A sample of their responses captures their enthusiasm:

...helped me rediscover the beauty of mathematics and it made me reconsider a career in mathematical research.

...highlighted how fun mathematics can be and how diverse the mathematical areas are which one can choose from.

...I am now sure that I want to go into research and more or less which areas I want to go into.

...inspiring to see such successful mathematicians who are happy and love their jobs.

...interaction/communication with world-class mathematicians had a great impact on my views, changed a bit my perception of mathematics. I am thinking about becoming a mathematician.

...I understood better that mathematics is a lot more than mathematical olympiads.

...now I am really sure that math is all I want to focus on in my future.

...the school made me think that mathematicians can be happy people... Also, I see mathematics as more unified.

...I have often felt very lonely in my life, and when I arrived here and got a chance to interact with other participants, that feeling vanished. I can not express how much happiness this has brought to me, and I have all intentions of continuing with mathematics, to be a part of this wonderful community. If I had any doubts before—they're all gone now, this is what I want to do.

—Etienne Ghys  
*Ecole Normale Supérieure de Lyon*  
[etienne.ghys@ens-lyon.fr](mailto:etienne.ghys@ens-lyon.fr)

—Sergei Tabachnikov  
*Pennsylvania State University*  
[tabachni@math.psu.edu](mailto:tabachni@math.psu.edu)