

IMU-Net 79: September 2016

A Bimonthly Email Newsletter from the International Mathematical Union

Editor: Martin Raussen, Aalborg University, Denmark

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1. EDITORIAL: PREPARING IMO 2017 AND ICM 2018

In a ceremony I attended some time ago, Fields Medalist Artur Avila took the occasion to remind all journalists present of what he referred to (only half-jokingly, I suspect) as the “event of the decade in Rio de Janeiro: the International Congress of Mathematicians ICM 2018”. With a few “rehearsals”, such as the 2014 FIFA World Cup finals and the 2016 Olympic Games, now behind us, and the Paralympic Games soon to be over as well, Brazil is indeed becoming increasingly aware of its role as the host of the first ICM in the southern hemisphere. And the fact that the country’s recent troubles seem to be subsiding adds a note of optimism about it.

There are also local reasons for mathematics to make the headlines, though less pleasant: official data showing that progress in basic education is stalled, at best, have reignited the discussion on how to change the situation of mathematical teaching in our schools. The Biennium of Mathematics 2017-2018 is the latest response from the academic community.

A tribute to the coming realization of ICM 2018 (www.icm2018.org), and the International Mathematical Olympiad IMO 2017 (www.imo2017.org.br), both in Rio de Janeiro, the Biennium of Mathematics is a broad initiative sponsored by Brazil’s federal parliament, which aims to bring mathematics closer to the whole society, children and their families, pupils and their teachers, through a series of activities to be put in place across the country during the next two years. The official launching will be at the first Brazilian Math Festival, scheduled for 27-30 April, 2017.

In the meantime, the Organizing Committees of ICM 2018 and IMO 2017 are also working hard on the practical preparations for the two events, with the support of IMPA and the Brazilian Mathematical Society. Venues for both meetings, as well as for the IMU General Assembly 2018, have been booked and accommodation options for the General Assembly delegates have also been informed in the latest ICM Newsletter. Moreover, we started pre-registering volunteers.

In the next months we will setting a timeline for several other important steps to come, including submission of abstracts, requests for financial support (from mathematicians in developing countries) and registration to attend the Congress and the General Assembly. Keep also in mind that by mid-December we will have the second deadline for submissions of satellite meetings proposals.

2. CEIC: NOTES AND COMMENTS

Improved math rendering in Wikipedia using MathML

As of May 31, 2016, Wikipedia is using a new approach for rendering mathematical formulae. Bitmap images representing formulae were replaced with a combination of MathML (the web standard for mathematics on the web) and a fallback mechanism, which was introduced for browsers that do not support this web standard.

This approach makes formulae, machine readable and accessible to users with limited vision; and they look crisper on high resolution displays and in print. Moreover, it is now possible to copy and paste formulae into Microsoft Word or Wolfram Mathematica.

This approach was developed by MathML Association director, Moritz Schubotz. Find out more at <http://mathml-association.org/announcement/2016/05/31/wikipedia.html> or read our paper at <http://cicm-conference.org/2016/ceur-ws/W48.pdf>.

3. IMU-SIMONS AFRICAN FELLOWSHIPS PROGRAM – CALL FOR APPLICATIONS

Thanks to a generous donation by the Simons Foundation, the Commission for Developing Countries of the International Mathematical Union is launching the IMU-Simons African Fellowship Program to support research visits of mathematicians living and working in developing countries in Africa.

The grant covers travel, accommodation, visa, travel insurance and living costs up to USD 5,000 per mathematician. The duration of the visit should be of a reasonable length of time to allow fruitful interaction. In particular, the minimal length of a visit is one month.

Interested mathematicians must hold a valid doctoral degree and must be employed as a faculty member of a university or equivalent institution in a developing country in Africa.

For a list of applicable countries, further requirements and the online application form please go here: <http://www.mathunion.org/cdc/grants/imu-simons-african-fellowship-program/>

Deadlines:

- November 1, 2016 (Decisions will be made by December 15, 2016) for visits starting between January 2017 and January 2018
- January 15, 2017 (Decisions will be made by February 28, 2017) for visits starting between April 2017 and April 2018

In case of questions please contact the IMU Secretariat <cdc.grants@mathunion.org>.

4. FIELDS MEDAL SYMPOSIUM 2016

The Fields Institute, Toronto, Canada, will host the 2016 Fields medal symposium in honor of Manjul Bhargava (Fields Medal 2014) from Princeton University during November 1-4. The Symposium comprises three separate events:

- Scientific Program (November 1-4): aimed at a wide audience, including graduate students, mathematicians in other research areas, and scientists who use mathematics in an important way.
- Public Opening (November 1): includes a lecture for a general audience by Manjul Bhargava followed by a reception.
- Student Night (November 2): geared towards high school and undergraduate students with a lecture by Manjul Bhargava followed by a networking reception.

All events of the Fields Medal Symposium, including the public lectures, will be broadcast on line in real time, and will also be archived for future access.

The Fields Medal Symposium is free to attend but registration is required. [This website](#) informs about the detailed program and about registration.

5. TRIBUTE TO PROF. JEAN-CHRISTOPHE YOCOZ

Jean-Christophe Yoccoz died on September 3rd, 2016. With the passing away of Jean-Christophe Yoccoz, the Collège de France has lost one of its most brilliant members, a truly dazzling mathematician, who quickly emerged as the world leader in the theory of dynamical systems initiated in the late 19th century by Henri Poincaré. The theory deals with the long-term qualitative behavior of dynamical systems. It involves, for instance, understanding whether the solar system is stable. Can a planet suddenly be ejected from the system? Two types of radically different behaviors come into play. Either the movement can exhibit stable and "predictable" features or else it can exhibit chaotic features. The work carried out by Prof. Yoccoz provided greater insight into the boundary between these two behaviors.

As a former student of the École Normale Supérieure where he ranked first for the admissions exam in 1975, at the age of 18, and gold medal winner at the International Mathematical Olympiad in 1974, Jean-Christophe Yoccoz completed his thesis under Michael Herman in 1985 and was awarded the Fields Medal in 1994. In the same year, he became a member of the French Academy of Sciences and the Academy of Sciences in Brazil. In 1996, he took up the position of professor at the Collège de France for the Chair in Differential Equations and Dynamical Systems.

He obtained a number of decisive results for the most challenging problems related to dynamical systems, and his demonstrations combined extraordinary analytical prowess, superb geometric vision and utter mastery of the combinatorics illustrated by what is now referred to as "Yoccoz puzzles".

Jean-Christophe Yoccoz was a fun-loving man, with an unhesitating laugh even at the worst stages of his illness. He was discrete but warm-hearted and always available to help others. He knew how to stand firm on his stances while always remaining kind, good-humored and uncomplicated. He will be greatly missed.

Alain Connes, Etienne Ghys, Pierre-Louis Lions

(reprint from the [website](#) of Collège de France, Paris, with permission from the authors)

6. JONATHAN BORWEIN (1951-2016)

[Jonathan M. Borwein](#), Laureate Professor at the School of Mathematical and Physical Sciences and Director of the Centre for Computer-assisted Mathematical Research and Applications (CARMA) at the University of Newcastle in Australia (with many other appointments in Canada, Korea and elsewhere), passed away on August 2, 2016 at age 65 in London, Ontario. Jon was an incredibly active and versatile researcher working on the boundaries between mathematics and computer science and spanning a wide range of topics. The obituaries [O1](#), [O2](#), [O3](#) describe a few of his outstanding achievements – just glimpses of what he has contributed to the world of science.

Jon left his marks on IMU due to his involvement in the Committee of Electronic Information and Communication ([CEIC](#)). CEIC was established in 1998 to monitor this topic and advise the IMU and, through it, the worldwide mathematics community. Jon was a CEIC member from 1998 to 2010 and chaired CEIC from 2002 to 2008. Jon was a driving force in preparing Best Current Practices Documents on what we call collectively Open Access today, an activity that was championed in mathematics before the term was coined and has become a hot topic in the sciences and humanities. Everyone who has known Jon liked and enjoyed the enormous energy, dedication, and proactive attitude that he was able to induce into all his projects. Jon's passing is a great loss for his family and for the whole mathematical community.

Martin Grötschel (Berlin)

7. REMINDER: SECOND MATHEMATICS FOR PLANET EARTH (MPE) COMPETITION

A [second international MPE competition](#) for science museum exhibits (modules) was announced at the [Next Einstein Forum](#) in Dakar, Senegal on March 10, 2016. The competition is organized jointly by [Mathematics of Planet Earth](#) (MPE), the [International Basic Science Program](#) (IBSP) at UNESCO, the International Mathematical Union (IMU), the [International Commission of Mathematical Instruction](#) (ICMI) and [IMAGINARY](#).

The modules submitted to the competition will enrich the virtual [Open Source MPE Exhibition](#). They can be downloaded and adapted by science museums and schools and can serve as examples for inputs for the new competition. The modules submitted can be of four types:

- Program: An interactive software exhibit to be used either on the web or in a museum.
- Hands-on: A module explaining how to realize a physical module in a museum.
- Film: A short video that can be shown in an exhibition.
- Image gallery: A collection of images accompanied of their mathematical description.

The deadline for the new MPE competition is June 30 2017, and the competition will be judged by an international jury.

Prizes:

- First prize: 5000 US
 - Second prize: 2000 USD
 - Third prize: 1000 USD
 - Special prize for African module: 2000 USD.
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8. SUBSCRIBING TO IMU-NET

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