

The New IMU Needs You!

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Prior to the 2006 International Congress of Mathematicians in Madrid, Spain, the article “The IMU and you” by then-president of the International Mathematical Union (IMU) John Ball described the work of the IMU, our professional world organization. (See *Notices of the AMS*, Vol. 52, No. 10, pp. 1208–1210.) The range of the IMU’s activities has definitely changed since 2006. Most notable is an expanded set of activities aimed at fostering the growth of mathematics in the developing world.

Most of us are well aware of the International Congress of Mathematicians (ICM), which gives us the opportunity to enjoy hearing about some of the world’s best mathematics, especially new developments during the previous four years, and to witness live the awarding of the Fields Medals, long mathematics’ most prestigious prize.

But IMU could impinge on your life in many more ways. Would it appeal to you to travel to a developing country to teach a short course in your specialty to eager students? To exchange ideas about teaching with mathematicians and mathematics educators around the world? To write or translate a vignette about mathematics for the Klein blog? Or to make a tax-deductible donation to support the graduate studies of a young person on the way to becoming one of the first mathematics Ph.D.’s in his or her country? If any of these piques your interest, please read on.

ICM. Four years have rolled by since the last Congress took place in Hyderabad, India. The next

ICM takes place August 12–23, 2014, in Seoul, South Korea. Information about ICM 2014 can be found at <http://www.icm2014.org/en/about/welcome>. In addition to high-level mathematics, there are many auxiliary activities, including panels on a wide range of topics, plus cultural events. There are also numerous specialized satellite meetings before and after the ICM. We encourage mathematicians to come and enjoy the rich variety of mathematics on display, as well as to enjoy the warm hospitality of our Korean colleagues.

IMU. The scientific union representing mathematics throughout the world is the IMU. Historically, the IMU has provided the organizational structure for selecting speakers and sites for the ICMs and for awarding the Fields Medals. The IMU is led by a president and an executive committee, with a secretariat charged with carrying out the IMU’s business. Every four years, just prior to the ICM, the General Assembly (GA) of the IMU, consisting of delegates from the seventy-odd member countries, holds a two-day meeting during which it passes legislation concerning IMU policies and governance. The GA also elects the next executive committee and selects the site for the next ICM. Until recently, the IMU called home wherever the secretary of the IMU happened to be. It was decided in 2006 to call for proposals for a permanent office. The IMU understood that the permanent office would greatly simplify certain practical matters, including building institutional memory and making it easier to award funds to citizens around the world. It would also facilitate the IMU’s goals for fostering mathematics. In 2010 the GA considered three attractive finalists, and the Weierstrass Institute in Berlin, Germany, was chosen as permanent host. The IMU’s home base, supported by substantial funding from the German government, opened in January 2011 in a suite of rooms in the center of Berlin.

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The U.S. participates in the IMU through the National Academy of Sciences, working via the U.S. National Committee for Mathematics (USNC/M). Information about the USNC/M can be found at <http://sites.nationalacademies.org/PGA/biso/IMU/index.htm>.

Invitations to speak at an ICM are viewed as singular honors; even more prestigious and rare are the various prizes, including the Fields Medal and Nevanlinna Prize for outstanding mathematics by a researcher under forty, with Nevanlinna restricted to work in information sciences; the Gauss Prize in applied mathematics; and the newest ones, a medal named for Shiing-Shen Chern and awarded for lifetime achievement and the Leelavati prize for contributions to increase public awareness of mathematics. The IMU is also involved in the awarding of the Abel Prize and the Ramanujan Prize, but these are awarded outside the ICMs.

The IMU serves as the voice of mathematicians around the world in other ways. For instance, it collaborated with UNESCO on Mathematics of Planet Earth (MPE) Day at UNESCO in March 2013 and on the inauguration of an international Open Source MPE Exhibition to be presented at ICM 2014.

ICMI & CEIC. Historically, the IMU has had one standing commission, the International Commission on Mathematical Instruction (ICMI, pronounced “ick-me”), which was founded in Rome in 1908 and became a commission of the IMU in 1952. ICMI has a wide range of activities, including publications, workshops, and a prestigious quadrennial International Congress on Mathematical Education (ICME), all aimed at fostering the exchange of ideas and methods to improve the quality of mathematics education at all levels throughout the world. Recently, the annual Capacity and Network Projects have been held in several areas of the developing world, with the aim of building capacity in mathematics education and creating sustainable regional networks. Writing or translating a “vignette” for the Klein Project would be a very welcome way in which an AMS member could contribute to the work of the IMU. For examples of vignettes and to learn more about this program, see blog.kleinproject.org. In 1998, the Committee on Electronic Information and Communication (CEIC) was created. Information about ICMI and CEIC activities can be found via the links [/icmi](http://www.mathunion.org/icmi) and [/ceic](http://www.mathunion.org/ceic) at the home site <http://www.mathunion.org>.

CDC/VLP. The IMU’s newest commission reflects a deepened understanding of the need for mathematical community across the globe. With the permanent office in 2011 came establishment and funding of the IMU’s newest commission, the Commission for Developing Countries (CDC), building on earlier activities and collaborations among member countries. One important activity in which the USNC/M and U.S.-based mathematicians

have been very much involved, is the Volunteer Lecture Program (VLP). In this program, mathematicians teach master’s level courses of a few weeks’ duration in countries lacking the infrastructure for mathematical instruction at that level. To date, the USNC/M, with support from the NSF, AMS (American Mathematical Society), SIAM (Society for Industrial and Applied Mathematics) and individuals, has sent over twenty-five mathematicians to teach in programs in Algeria, Cambodia, El Salvador, Nigeria, and Tanzania. Those who have taught in these programs speak of them with great enthusiasm. The new CDC, administered and supported by the IMU office, will be able to expand this activity to other countries. The challenges are many, most especially identifying an appropriate host institution. The lecturers receive expenses but no salary, but the opportunity to teach eager students in the developing world proves to be sufficient attraction. When a call went out a few years ago for U.S. participants in the VLP, there was a great response. Other countries also participate in the VLP, notably Japan, France, Spain, the United Kingdom, and Norway.

In some cases a country could not support even a master’s program, but we were able to send a few students to nearby programs, using donations for scholarships. In this way Laotian students have attended the Cambodian program. University of Massachusetts professor Eduardo Cattani said about his experience teaching introductory real analysis at the Royal University of Phnom Penh that “I am convinced that for many of the students this Master’s program is not only a career step but a transformative experience as well.”

The cost of a scholarship for a student in such programs is minimal, and the potential impact for the student is enormous. Anyone wishing to contribute to these activities is invited to volunteer as a lecturer and/or to make tax-deductible contributions to Friends of the International Mathematical Union (FIMU), which is administered by the AMS. At present FIMU is considering a program through which U.S. mathematicians could “adopt” a graduate student in a developing nation. If you would be interested in this, please let us know!

MENAO. Another IMU activity in support of mathematical development in emerging nations is a day-long event called Mathematics in Emerging Nations: Achievements and Opportunities (MENAO). It will take place at the COEX Convention & Exhibition Center in Seoul, Korea, on Tuesday, August 12, 2014, just prior to the opening ceremonies of the 2014 International Congress of Mathematicians and in the same location. The IMU wishes to make MENAO a premier event, of compelling interest to all organizations, governmental agencies, and individuals that have contributed to international mathematical development or are potentially interested in doing so. About 100

MENAO participants/discussants will take part by invitation, and observers will be admitted via registration on a first-come, first-served basis.

The MENAO event will benefit from a remarkable act of generosity by Korea, the host country for ICM 2014. Korea has itself experienced a phenomenal mathematical development over the last fifty years, one that proceeded hand-in-hand with its economic and educational development. As an act of solidarity with their colleagues in emerging nations, the Korean ICM hosts are currently inviting 1,000 mathematicians and advanced mathematics graduate students from the developing world to attend ICM 2014 (“NANUM 2014” invitation program), all expenses paid. (Nanum is a Korean word meaning “gracious and unconditional sharing”.)

The goal of the MENAO event is to listen to the voices of mathematicians and aspiring advanced students of mathematics from the developing world: to share success stories of development via partnerships between the local mathematical communities, their governments, and international agencies and foundations and to review the current status of those efforts and future needs. The latter topic will be consolidated in a series of recently written “regional reports” that IMU will make available at the MENAO event.

The MENAO event will feature personal stories of mathematicians, country-specific development stories, both from the perspective of mathematicians in those countries and from the perspective of their international partners. An in-depth look at the Korean story will be narrated by key figures in the various stages of its mathematical development. Finally, relationships between mathematical development and economic development will be explored by internationally renowned economists.

WiM. A recent initiative at the IMU aims to provide resources for women in mathematics. Opportunities for women vary widely among countries, and IMU is currently establishing a website with an array of links aimed at supplying information and encouragement. This Women in Mathematics (WiM) initiative involves IMU staff working with an international advisory board of senior women mathematicians. Other activities focused on women at the ICM have included the ICM Emmy Noether Lecture, first given at ICM 1994 under the sponsorship of the Association for Women in Mathematics (AWM), then made a permanent activity under the IMU aegis at the 2010 GA. The International Congress of Women Mathematicians (ICWM) was held in Hyderabad on the two days prior to ICM 2010, organized by the European Women in Mathematics (EWM), the European Mathematical Society, and AWM, alongside a local committee doing the hard work on site. The organization of future ICWMs is now part of IMU’s charge, again with assistance from organizations such as AWM and EWM. In 2014 the ICWM will be hosted by the

Korean Women in Mathematical Sciences (KWMS). A full day’s meeting will be held at Ewha Womans University on August 12, and then ICWM will continue at the ICM site on August 14, the afternoon of the ICM Emmy Noether Lecture. For details see <https://sites.google.com/site/icwm2014/>.

ICSU. There is an outer layer of the union above, namely the International Council for Science (ICSU, pronounced “ick-sue”), founded in 1931. The “U” here is vestigial, from an older name ending in Scientific Unions. ICSU is comprised of thirty-one Scientific Union Members, including the IMU, 120 National Scientific Members from 140 countries, and twenty-two International Scientific Associates. ICSU supports freedom and responsibility in science. It is the voice of the scientific community at the United Nations on programs related to climate change and sustainability, and it works for the accessibility and preservation of relevant data. ICSU networks the scientific unions through meetings and its grant program. One ICSU grant allowed the IMU to organize a summer school “Mathematics of climate change, related hazards and risks”, jointly with the International Union of Geodesy and Geophysics (IUGG) and the International Union of Theoretical and Applied Mechanics (IUTAM) in July 2013. The ICSU grant program also has ICM’s Capacity and Network Projects (CANP) described above. ICSU deserves to be better known by mathematicians and is a candidate for a future *Notices* article. Until then, please see <http://www.icsu.org> to learn more about the wide variety of ICSU activities.

**Developing a 21st Century
GLOBAL LIBRARY
for Mathematics Research**

Sponsored by the Sloan Foundation, the IMU’s Committee on Electronic Information and Communication (CEIC) and the U.S. National Academies Board on Mathematical Sciences and Their Applications (BMS) have just completed a preliminary study of what it would take to coordinate a Global Library for mathematical researchers, and what such an effort could make possible.

The IMU’s CEIC organized a workshop in Washington, DC, in June 2012, to review existing efforts; then the BMS commissioned an NRC report, which was published a few weeks ago. It can be obtained from the National Academies Press (www.nap.edu) or from the arXiv ([arXiv:1404.1905](https://arxiv.org/abs/1404.1905)).

The Sloan Foundation, IMU, and BMS are now gathering feedback before they proceed to the next steps. There will be a panel discussion on this topic at ICM 2014 in Seoul, on August 20; another one is planned for JMM 2015.