IMU-Net 100: March 2020
A Bimonthly Email Newsletter from the International Mathematical Union
    Editor: Martin Raussen, Aalborg University, Denmark

Dear fellow mathematicians,

The COVID-19 pandemic and resulting health challenges continue to have a major impact in the world. The IMU is monitoring developments and will keep its Adhering Organizations informed about any consequences for IMU related activities. The IMU stands in solidarity with and support of those that continue to be afflicted by this scourge. We sincerely hope that we will all be able to return to normality as soon as possible.

Helge Holden   Carlos E.Kenig
Secretary General of the IMU   President of the IMU

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1. **EDITORIAL: DIVERSITY AND INCLUSION**

These are two of the most prominent nouns floating through academic and political discourse in the United States. In their most literal sense, diversity and inclusion refer to goals which almost all in the mathematics community share. When someone of any age, from any country, with any personal orientation does interesting mathematics, then our community celebrates that achievement.

However, access to personal growth and economic success through mathematics is much more challenging for most than it should be. The underrepresentation of various groups in mathematical research and education reflects the disadvantages faced by members of those groups. We should try to put into place programs, structures, and incentives, which enable mathematical talent to be achieved and mathematical skills to be made available to all.   While supporting and encouraging greater participation, we should avoid boycotts, proscriptions, and condemnations, which increasingly dominate public discourse. After all, this is contrary to the spirit of inclusivity.

The International Mathematical Union plays a prominent role in encouraging diversity and inclusion. Indeed, the International Congress of Mathematicians succeeds at a high level in involving mathematicians from around the world in the international mathematical community. At these Congresses, selected early career mathematicians have an opportunity to encounter a broad spectrum of mathematics pursued by some of the most accomplished mathematicians. Most senior participants are delighted to talk to those who they have not previously encountered, resulting in an event where both senior and junior participants find their own careers enhanced.

The ICM is the headline event of the IMU, followed by various activities on the ground. With its commissions (e.g., the Commission for Developing Countries) and its committees (e.g., the Committee for Women in Mathematics), the IMU with very limited resources aims to advance diversity and inclusion. Perhaps more could be done by the IMU if it served as a catalyst for efforts at the national level. As just one idea, why not "twin" national organizations in a way which is similar to the way various cities around the world are twinned? Why not single out best practices at the national level?

There are troubling counter-forces, which have disturbed me personally. Our mathematics community should promote mathematics: its discovery, its promotion, its educational mission, and its contribution to the world at large. Some groups within our community have targeted political agendas. I feel these agendas, whether or not we personally support them, should not interrupt our professional efforts in favor of diversity and inclusivity in the mathematical community. Mathematics can serve as a bridge across different strata, a bridge that can promote positive achievements. Mathematicians should be promoting diversity throughout the mathematical community, and should reject efforts to use "diversity" as an argument for exclusion. "Inclusion" signifies outreach to all, especially those who come from under-represented groups and/or difficult personal situations.

Mathematics should be the leader among academic disciplines in promoting diversity and inclusion. As mathematicians, we should reach across boundaries, be they political, gender, or ethnicity. In our professional lives, we should be ambassadors for mathematics and for the good it brings to society.

Eric M. Friedlander (Chair, US National Committee/Math and Dean's Professor, University of Southern California)

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2. **[CDC](): PROGRAMS AND SCHEDULES**

Conference Support Program. This program gives partial support to Mathematical Science based conferences organized in developing countries. The funds are for travel and accommodation only. The conference organizers must send the application form at least four months in advance.
Upcoming deadlines:
• April 15, 2020 for conferences starting after August 15, 2020.
• July 15, 2020 for conferences starting after November 15, 2020.
• October 1, 2020 for conferences starting after February 1, 2021.

IMU-Simons African Fellowship Program. This program is funded by the Simons Foundation, NY, USA and supports research sabbaticals for mathematicians from African developing countries employed

in Africa to travel to an internationally known mathematical center of excellence (worldwide) for collaborative research. All travel and living expenses of the grantees will be covered by the fellowship up to USD 5,000. Upcoming deadlines:
• April 15, 2020 for visits starting between August 1, 2020 and August 1, 2021.
• July 15, 2020 for visits starting between November 1, 2020 and November 1, 2021.
• October 1, 2020 for visits starting between January 15, 2021 and January 15, 2022.

Individual Research Travel Support Program. This program supports travel costs for research visits for a period of at least four weeks by mathematicians based in developing countries. The deadlines are the same as for the IMU-Simons African Fellowship Program above.

For more information, please visit the website http://www.mathunion.org/cdc

Olga Gil-Medrano (IMU-CDC Secretary for Policy)

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3. NEWS FROM CWM

a) The **CWM 2020 call for Networks, Schools and Workshops**
 https://www.mathunion.org/fileadmin/CWM/Initiatives/CWMCall2020.pdf
received 35 applications of which CWM was able to support 8.

In the selection of grants, priority was given to projects developing regional networks for Women in Mathematics in Africa, Latin America, and Asia. We are supporting the 3rd Meeting for Latin American Women in Mathematics in Colombia, a Workshop on Skills for Young Women Mathematicians in Chile, a Mentoring Workshop in India, the Women in Sage in Africa Workshop in Senegal, a Topics in Applied Mathematics School at Nesin village, Turkey, and the Second South East Asian Women Mathematicians meeting in Vietnam.

Upgrading and making perennial the May 12 initiative website

https://may12.womeninmaths.org/

was also approved, and the new website is now available.

Finally, the project of creating an exhibition on Russian Women in Mathematics taking place during (WM)² in Saint-Petersburg in 2022 was supported.

See more here https://www.mathunion.org/cwm/events/cwm-sponsored-events/2020

b) The final version of the **Gender Gap in Science Book** is now available at
 https://zenodo.org/record/3697223
An 8 pages booklet (English, French and Spanish versions) containing the summary of the results of the project and the full list of its recommendations can be found at https://gender-gap-in-science.org/promotional-materials/ .

The recommendations of the Gender Gap in Science Project have been sent to the Adhering Organizations of the International Mathematical Union by the IMU General Secretary.

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4. ICMI: ICME-14 POSTPONED. GA TO BE HELD AS WEB EVENT

Due to the global pandemic caused by the new coronavirus disease (COVID-19), ICMI and ICME-14 have decided, after careful discussion and consultation, to postpone ICME-14 by one year until the Northern Hemisphere summer of 2021. The specific dates of postponed ICME-14 and the details related to the conference organization, including information for those already registered, will be announced as soon as possible.

The General Assembly for ICMI, scheduled to take place just prior to ICME-14, will be organized as a web event in July 2020 in order to carry out the elections for the new Executive Committee of ICMI which will take office on 1 January 2021.

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5. INTERNATIONAL DAY OF MATHEMATICS (IDM)

1. The official launch at UNESCO has been cancelled and the African launch at the Next Einstein Forum has been postponed, both because of the COVID-19 epidemic. They have been replaced by a Live Global Launch at https://www.idm314.org/launch-2020.html, which premiered the worldwide video, MATHEMATICS IS **EVERYWHERE**. Throughout the whole day, special announcements were posted as well as videos, photos and experiences from the celebrations around the world.

2. The IDM has aroused worldwide enthusiasm with 1030 celebrations announced in more than 110 countries. Unfortunately, many celebrations were cancelled due to the COVID-19 epidemic. This led to spontaneous online presentations via videos and recorded talks and home celebrations of the IDM in many countries. About 15 000 unique users have visited the IDM website on March 14.

3. UNESCO published a webpage with the IDM: https://en.unesco.org/commemorations/mathematics, which is translated in the six languages of UNESCO.

4. We invite you to celebrate March 14 next year! A call for the 2021 theme is already out: send us your ideas at http://www.idm314.org. If you have not done so, register to the IDM newsletter at http://www.idm314.org. This is how you will be told of the 2021 theme and the new developments.

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6. MATHEMATICS SUBJECT CLASSIFICATION 2020 PUBLISHED

The latest revision MSC 2020 of the Mathematics Subject Classification (MSC) has been published, replacing the 2010 Mathematics Subject Classification (referred to as MSC2010). Searchable versions are available from the zbMATH site (https://zbmath.org/classification/) and the MathSciNet site (https://mathscinet.ams.org/mathscinet/searchMSC.html). As anticipated, there are no changes at the two-digit level, but several at the three-digit level, and hundreds at the five-digit level.
Mathematical Reviews (MR) and zbMATH collaborate on maintaining the Mathematics Subject Classification.

7. MATHEMATICAL CONGRESS OF THE AMERICAS 2021

The [third Mathematical Congress of the Americas](#) will take place in Buenos Aires (Argentina) in the week 19-24 July, 2021. Its goal is to internationally highlight the excellence of mathematical achievements in the Americas and foster collaborations among researchers, students, institutions and mathematical societies in the Americas.
More information, including the list of plenary and invited speakers: http://www.mca2021.org/ .

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8. LOUIS NIRENBERG (1925-2020)

Louis Nirenberg died in New York City on January 26, 2020 at the age of 94.

He was a leading mathematician, whose fundamental contributions in the field of partial differential equations were hugely influential. This area of mathematics provides the language we use to describe—and the techniques we use to analyze—diverse problems from many fields, including geometry, physics, and engineering. Louis' earliest work, in the 1950's, solved two longstanding problems from geometry by proving new estimates for fully-nonlinear elliptic equations. Over the course of his long and productive career his achievements included the solution of many other important problems, and—equally significant—the introduction of many new ideas and techniques.

Louis was born in 1925 in Hamilton, Ontario, but grew up in Montreal. He studied Mathematics and Physics at McGill University, graduating in 1945, then came to New York University as a Mathematics masters student. The postwar years were a remarkable time for mathematics at NYU—his fellow students included Eugene Isaacson, Peter Lax, Joseph Keller, Martin Kruskal, Cathleen Morawetz, Harold Grad, and Avron Douglis. Louis remained at NYU for his entire career: after completing his PhD in 1949 with guidance from James Stoker and Kurt Friedrichs, he held a two-year postdoctoral position then joined the faculty in 1951. His title was Professor of Mathematics from 1957 until 1999, when he retired and became Professor Emeritus. He was Director of the Courant Institute from 1970 to 1972.

Louis' impact was partly due to his exquisite taste in problems. One very successful mode was to recognize, through specific challenges, the need for new tools or estimates. His ability to identify such challenges—and to find the required tools or estimates—was a major driver of his impact. His early work on problems from geometry had this character; other examples include his papers in the 60's with Joseph Kohn on problems from complex differential geometry; and those in the 80's with Haim Brezis on nonlinear elliptic equations with critical exponents.

A different, equally successful mode was to identify tools that were clearly important, then systematically explore their power. His work on the regularity of solutions of linear elliptic equations and systems had this character; it was done in the 50's and 60's with Shmuel Agmon and Avron Douglis. Another example is his work on the symmetry of solutions of nonlinear partial differential equations using the "method of moving planes" and the "sliding method," developed in the 80's and 90's with Basilis Gidas, Wei-Ming Ni, and Henry Berestycki.

Louis also loved challenges—particularly ones involving estimates or inequalities—and this was the motivation for many projects. One example is his work on solutions of the incompressible Navier-Stokes equations, which describe for example the flow of water. We still don't know whether its solutions are smooth or not, so it is natural to ask about the size of the set where they are not smooth. The estimates Louis proved in the 80's with Luis Caffarelli and Robert Kohn remain the state of the art.

A gifted teacher and mentor, Louis was advisor to 46 PhD students (starting with Walter Littman in 1956 and ending with Kanishka Perera in 1997), and he also had a formative influence on many postdocs and collaborators.

Lively and gregarious, Louis loved music, art, and film almost as much as he loved mathematics. He maintained close friendships with many colleagues around the world. He loved to travel, and to host visitors. He particularly enjoyed working with others; as a result, almost all his papers were coauthored.

Louis received many prestigious awards, including the Abel Prize (2015), the American Mathematical Society's Leroy P. Steele Prizes for Seminal Contribution to Research (2014) and Lifetime Achievement (1994), the International Mathematical Union's Chern Medal (2010), the National Medal of Science (1995), the Canadian Mathematical Society's Jeffery-Williams Prize (1987), the Crafoord Prize (1982), and the American Mathematical Society's Bôcher Prize (1959).

He became a member of the American Academy of Arts and Sciences in 1965, a member of the National Academy of Sciences in 1969, and a Fellow of the American Mathematical Society in 2013. He was also a member of numerous honorary societies in other countries, including Accademia dei Lincei (1978), Accademia Mediterranea della Scienza (1982), Académie des Sciences (1989), Istituto Lombardo Accademia Scienze e Lettere (1991), Ukrainian Academy of Sciences (1994), and Norwegian Academy of Sciences and Letters (2015). He received honorary degrees from McGill University (1986), University of Pisa (1990), Université de Paris IX Paris-Dauphine (1990), McMaster University (2000), University of British Columbia (2010); and he was named Honorary Professor by Nankai University (1987), Zhejiang University (1988), and Peking University (2016).

Louis is survived by his son Marc, his daughter Lisa and her partner, Joseph Ganci, his grandchildren Jimmy and Alma, his sister Deborah, and his partner Nanette.

Additional information about Louis, including video, is available at the Simons Foundation's "Science Lives" website, via this link: https://www.simonsfoundation.org/2014/04/21/louis-nirenberg/

An autobiography is included in a recent book *The Abel Prize 2013-2017* (H. Holden and R. Piene eds, Springer-Verlag, 2019, pp 379-389).

This obituary appeared originally on the website of the Courant Institute of Mathematical Sciences, New York City University. It is authored by Jalal Shatah and Robert V. Kohn, both at the Courant Institute. Reprinted here with kind permission.

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9. WOLF PRIZE AND ABEL PRIZE AWARDED

The [2020 Wolf Prize](#) in Mathematics will be awarded jointly to **Yakov Eliashberg** (Stanford University, CA, USA) and **Simon Donaldson** (Imperial College, Ondon, UK and Simons Center for Geometry and Physics, Stony Book University, Long Island, USA) "for their contributions to differential geometry and topology."

The [2020 Abel Prize](#) winners are **Hillel Furstenberg** (Hebrew University of Jerusalem, Israel) and **Gregory Margulis** (Yale University, USA) "for pioneering the use of methods from probability and dynamics in group theory, number theory and combinatorics.

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