On the International Day of Mathematics

Betül Tanbay

To celebrate the beauty and importance of mathematics and its essential role in everyone's life, the International Mathematical Union (IMU) has led the initiative to have UNESCO proclaim March 14 as the International Day of Mathematics (IDM). On November 26, 2019, the 40th General Conference of UNESCO approved the proclamation.

March 14 was already known as *Pi Day* and was being celebrated in many countries around the world. This certainly helped the approval, but it all would not have happened without the efforts of Christiane Rousseau from the University of Montreal, the initiator of the project at the IMU.

The second name to mention right away is Andreas Daniel Matt, director of IMAGINARY, a non-profit organization dedicated to communicating modern mathematics. The IMAGINARY team won the call for hosting the IDM website: www.idm314.org.

The IMU executive board gathered a group of mathematicians to constitute the first IDM-Governing Board, and the first decision taken was to have a theme for each year. We started with an ambitious one for the first IDM, to be celebrated on March 14, 2020: *Mathematics is everywhere.*

A wonderful webpage was prepared in seven languages to show the use of mathematics in different subjects and issues: https://everywhere.idm314.org/, and a map was presented to access the activities all around the planet, on which more than a thousand activities were announced: www.idm314.org/2020-idm.html

Two parallel international launch events were planned, the first one in Paris at the UNESCO Headquarters, and the second one as a plenary event at the *Next Einstein Forum* 2020 in Nairobi, Kenya.

The whole world knows what happened just before: *Pandemic was everywhere*. Despite huge lockdowns, hundreds of activities still took place, one of the biggest ones being realized by the Istanbul municipality, an IMAGINARY exhibition in the main underground station hallways of the 16-million megalopolis.

Despite the general panic, the pandemic has also been an occasion to see that *Mathematics was indeed everywhere*, as the whole world started talking about rates of change, geometric or exponential growth, the R_0 reproduction index, analyzing graphs and understanding probabilities. Mathematics and statistics have been essential tools for decision makers in predicting the evolution of the disease and optimizing mitigation strategies with limited resources.

In view of the pandemic, the 2021 theme was chosen to be *"Mathematics for a Better World"*. As the role played by mathematics in building a better world goes well beyond the response to the pandemic, schools were invited to explore examples such as the mathematics of *fair division*, which has so many applications in designing economic and social policies.

This time, with the experience of the previous year, almost all activities have been prepared online. The result was still quite a success: more than seven hundred events throughout the world[1], a poster challenge to which more than 2000 posters were submitted[2], and again a webpage in five languages on the different uses of mathematics[3].

More and more theme proposals arrive to IDM theme calls, and the selected theme of IDM22 was proposed by Yuliya Nesterova, a graduate student from the University of Ottawa in Canada. She
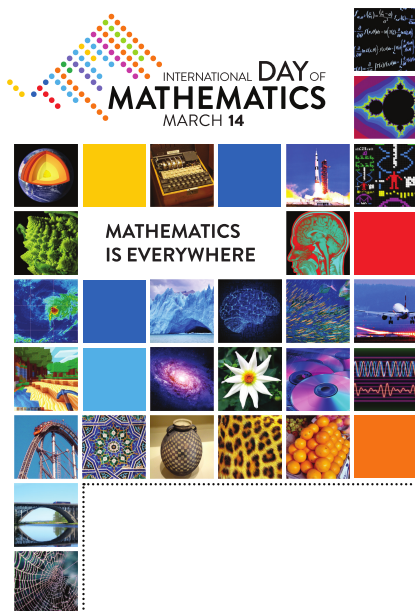

A photo from the Mathematics Unites photo challenge: a Fibonacci spiral formation by the students of Sri. H. D. Devegowda Government First Grade College, Paduvalahippe, India.

---

[1] https://www.idm314.org/2021-idm.html
[2] https://www.idm314.org/2021-poster-challenge-gallery.html
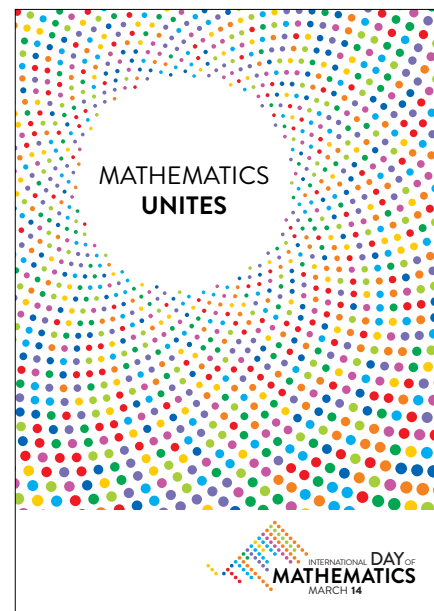[3] https://betterworld.idm314.org/

Poster of IDM 2020

Poster of IDM 2021

Poster of IDM 2022

explains: "Mathematics unites, to signal that it is a common language we all have and a common subject with which to find one another."

At a time when we, as humans on this planet, urgently need a common language other than our mother tongue, a common value other than our credit cards, a common ground other than politics, to solve our common problems, the choice of the theme seemed more than adequate. A few months after this beautiful theme was chosen, it was even more disappointing than the pandemic to face a war in Europe just a few days before March 14, 2022.

Despite the terrible polarization the war hinted to, mathematicians tried to unite, and IDM 2022 is still being celebrated on all continents: from Uzbekistan to the Philippines, from Guinea to Rwanda, from Dominican Republic to Peru, from Moldova to Montenegro. An international live celebration[4] in five languages (Arabic, English, French, Portuguese, and Spanish) took place on March 14. Also, a 48-hour live coverage[5] on the IDM website started at 00:00 New Zealand time and ended at 24:00 Pacific time. The international celebration was complemented by national and local competitions, conferences, exhibitions, and talks, organized by mathematical societies, research institutes, museums, schools, universities. The *Mathematics Unites* photo challenge generated more than three thousand entries; some the most beautiful and inspiring photos are displayed in galleries: www.idm314.org/2022-photo-challenge-gallery-intro.html.

People and organizations all over the world announced almost two thousand events in their cities: www.idm314.org/#theme2022.

A special series of online teacher training sessions with participants from Africa and Latin America accompanying IDM will take place during the next five years. It will start in the fall of 2022 with a Portuguese workshop for primary and secondary mathematics teachers from Mozambique, Angola, Portugal, Cap Verde and São Tomé and Príncipe. The series is part of the Global-South IDM project and is supported by the Simons Foundation with the goal to further engage with Africa and Latin America and to expand the network for local IDM celebrations.

For IDM22, UNESCO has published a tool kit called *Mathematics for Action: Supporting Science-Based Decision Making*, launched[6] on March 14, 2022. The open access tool kit[7] consists of a collection of lively two-page briefs highlighting the role of mathematics in addressing the Sustainable Development Goals of the UN 2030 Agenda, for instance, how to monitor an epidemic, to model climate change, or to measure biodiversity.

So, here we are, heading for a new theme in the middle of the year 2022, in the midst of pandemics and wars. If the number 0 is an absorbing element for mathematical multiplication, war is an absorbing element for human multiplication and well-being. It is loss no matter what the results may be.

Were we too ambitious when we declared that "mathematics is everywhere"? Could mathematics help us live in "a better world"?

---

[4] https://www.idm314.org/2022-global-event-program.html
[5] https://www.idm314.org/launch-2022.html

[6] https://en.unesco.org/commemorations/mathematics
[7] https://unesdoc.unesco.org/ark:/48223/pf0000380883.locale=en

How can mathematics unite, in times when neighbors become enemies?

But still, I believe there is a reason why mathematicians choose and keep ambitious themes. Once we are convinced of a statement, we cannot abandon the goal of proving it right. We cannot afford discouragement. In a world of post-truth, I believe mathematicians are among the best placed to make affirmative statements. Maybe because mathematics is about interrogations, because it teaches us to ask questions! A true statement is reached by raising the right questions. If mathematicians feel that something important is to be proven, they know they must work a lot, consistently and beyond their own lifetime, using past experience and trusting future developments. Einstein's words are well known: "the important thing is not to stop questioning".

I wish all of us peace, health, and the courage to ask the right questions.

———

Betül Tanbay is a professor in functional analysis at the Boğaziçi University in Istanbul. She was founder and first co-director of the Istanbul Center for Mathematical Sciences. She was the first female president of the Turkish Mathematical Society, and she has also served and serves in many committees of the IMU or EMS. Tanbay received her undergraduate degree from Université Louis Pasteur, Strasbourg in 1982, and graduate degrees from UC Berkeley in 1989.

tanbay@boun.edu.tr