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ANNUAL REPORT 2022

THE WORLD ACADEMY OF SCIENCES

for the advancement of science in developing countries

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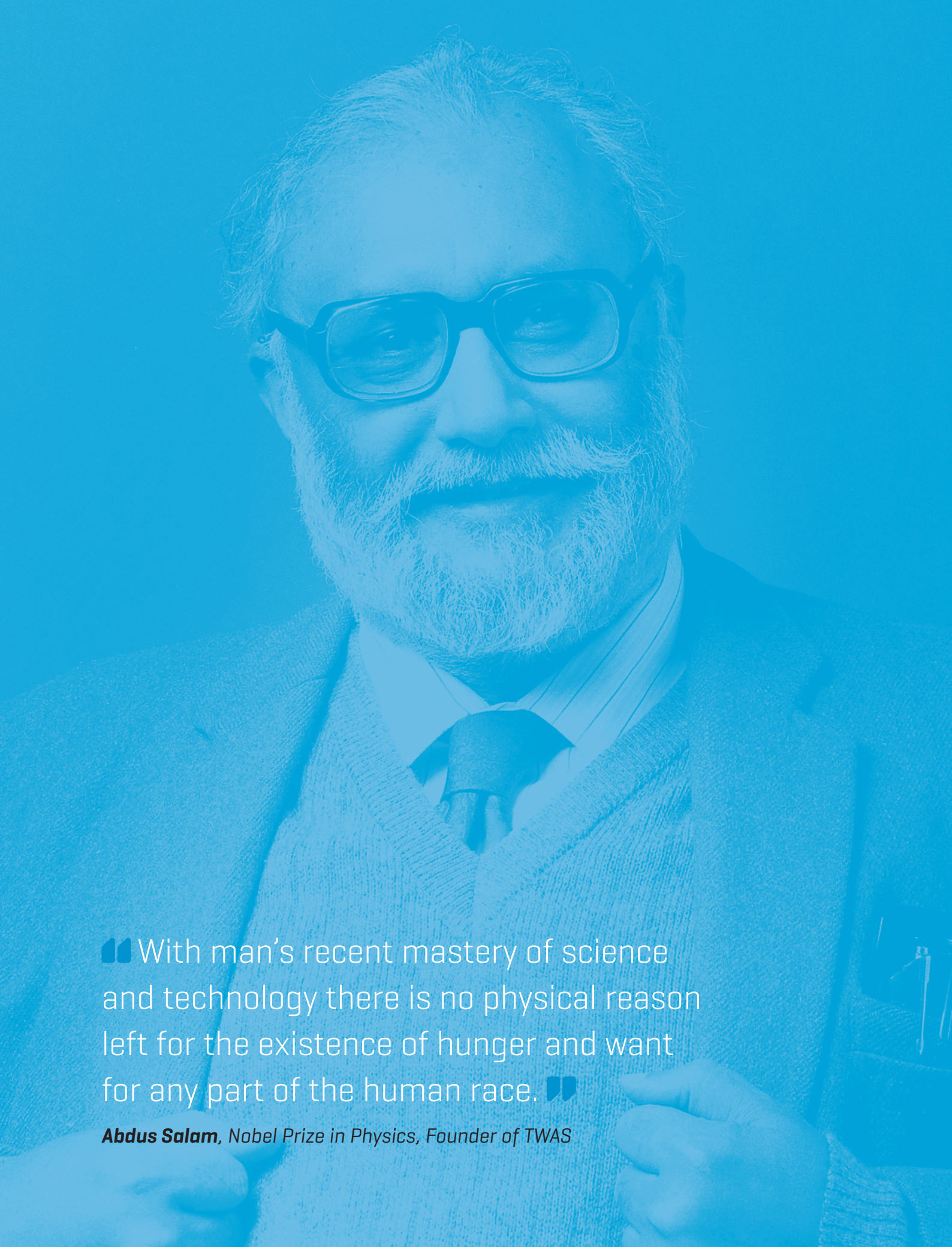


“With man’s recent mastery of science and technology there is no physical reason left for the existence of hunger and want for any part of the human race.”

***Abdus Salam**, Nobel Prize in Physics, Founder of TWAS*

▲ Participants, speakers and organizers of the Ernesto Illy Colloquia at the end of the opening ceremony of the Colloquia in the Budinich Hall of the International Centre for Theoretical Physics on 27 September 2022. [Photo: Paola Di Bella/TWAS]

Cover photo: Lydie-Stella Koutika of the Congo (center bottom), shown here with some fellow researchers, leads a team awarded with a TWAS-Elsevier Foundation Project Grant for Gender Equity and Climate Action in 2022. [Photo provided]

CONTENTS

TWAS COUNCIL

The TWAS Council, elected by the membership every four years, is responsible for supervising all of the Academy's affairs. The Council was elected in January 2019 to serve until the end of 2022.

President
Mohamed H.A. Hassan [Sudan]

Immediate Past President
Bai Chunli [China]

Vice-Presidents
Africa:
Moctar Touré [Senegal]
Arab Region:
Sabah AlMomin [Kuwait]
[Elected in December 2020 to serve for the remainder of the term after TWAS Council Member **Mohammed Hamdan** passed away, in February 2020]
Central and South Asia:
Dorairajan Balasubramanian [India]
East and South-East Asia:
Khatijah Yusoff [Malaysia]
Latin America and the Caribbean:
Manuel Limonta-Vidal [Cuba]

Secretary General
Luiz Davidovich [Brazil]

Treasurer
Yang Wei [China]

Council Members
Africa:
Roseanne Diab [South Africa]
Arab Region:
Abdel Nasser Tawfik [Egypt]
Central and South Asia:
Mohammad Shamsher Ali [Bangladesh]
East and South-East Asia:
Bishal Nath Upreti [Nepal]
Latin America and the Caribbean:
Sandra Díaz [Argentina]
[Elected in May 2021 to serve for the remainder of the term after TWAS Council Member **Mahabir Prashad Gupta** passed away in December 2020]

Ex-officio Council Member
Atish Dabholkar [India]
[Director, Abdus Salam International Centre for Theoretical Physics [ICTP]]

TWAS MISSION

The World Academy of Sciences for the advancement of science in developing countries (TWAS) supports sustainable prosperity through research, education, policy and diplomacy.

TWAS was founded in 1983 by a distinguished group of scientists from the global South and North, under the leadership of Abdus Salam, the Pakistani physicist and Nobel laureate. By the end of 2022, TWAS had 1,384 elected Fellows—12 of them Nobel laureates—representing 110 countries. The Academy is based in Trieste, Italy, on the campus of the Abdus Salam International Centre for Theoretical Physics (ICTP). TWAS is a programme unit of the United Nations Educational, Scientific and Cultural Organization (UNESCO), and receives its core funding from the Italian Ministry of Foreign Affairs and International Cooperation (MAECI). The Swedish International Development Cooperation Agency (Sida) also provides essential funding for TWAS programmes. Through four decades, the TWAS mission has remained consistent:

- Recognize, support and promote excellence in scientific research in the developing world,
- Respond to the needs of young scientists in countries that are lagging in science and technology,
- Promote South-South and South-North cooperation in science, technology and innovation, and
- Encourage scientific research and sharing of experiences in solving major challenges faced by developing countries.

ENTERING OUR 40TH YEAR, A NEW ERA LIES AHEAD

by **Mohamed H.A. Hassan**, *TWAS Immediate Past President*

As I look back on nearly four decades of TWAS history, and all of our accomplishments in developing stronger scientific foundations in the global South, one thing about 2022 stands out in particular. Even though the world is facing profound challenges, our next generation of scientists provides much hope for the future.

And we at TWAS have the privilege of being part of that. TWAS was founded in 1983 by a group of 42 eminent scientists under the leadership of Abdus Salam who became the founding president of the Academy. Salam's impressive legacy is that we now have a powerful array of programmes carefully crafted to assist our core mission from all angles. Every year, we continue to reach new milestones, and create innovative new programmes unlike anything yet seen.

And this Annual Report is a testament to the Academy's long and ongoing record of success. All of this success is creditable, with due thanks, to our most stalwart financial supporters, including: the Italian Ministry of Foreign Affairs and International Cooperation (MAECI), who provides core funding, the Swedish International Development Cooperation Agency (Sida), the German Federal Ministry of Education and Research (BMBF), and the governments of China, India, and Brazil. They provide programmatic support, as well as primary support for the Academy's endowment fund.

For example, our South-South PhD fellowships, celebrated a great milestone by graduating their 1,000th science doctorate in 2022. Our research grants, backed by Sida, have continued to provide direct financial support for supplies. Our recently established Seed Grants for New African Principal Investigators, sponsored by BMBF, is also excelling. Our various exchanges are also a critical part of our programmes, including cooperation visits sponsored by the German Research Foundation (DFG).

Our TWAS Young Affiliates programme directly connects the most promising early-career researchers with each other, as well as top-tier talent in the global South. And, of course, our Sida-supported programme in science diplomacy supplies developing world scientists with training to engage with the policy sphere, and has held its annual course for almost a full decade.

And we and our partners are embarking on new, brighter journeys. We have been holding events again that are at least partially in-person, combining the virtual tools we've learned to master during the COVID-19 pandemic, and hybridizing them with traditional interpersonal bonds formed by scientific events and conferences.

The chief event was of course the TWAS 16th General Conference, which was held mostly online but did have an in-person component with our valued hosts at Zhejiang University in Hangzhou, China. It is exciting to see how our primary event has transformed over the decades, and how digital technology allows

▲ The combined team from TWAS (on screen) and Zhejiang University (physically present) in Hangzhou, China, which organized the TWAS 16th General Conference. [Photo: Zhejiang University]

us to be inclusive of Academy scientists who cannot make a physical trip. My gratitude goes out to our long-time friends and partners at the Chinese Academy of Sciences (CAS) and the China Association for Science and Technology (CAST), who worked with us to keep the power of scientific conferences for developing-world scientists alive.

Also in 2022, we held the inaugural Ernesto Illy Colloquia, an event that was mostly in-person that we were happy to host in Trieste. I'm proud that with our partners at the Ernesto Illy Foundation we initiated this first-of-its-kind series of fora on sustainable coffee growing, with world-renowned experts in the field and some of the most talented young scientists from the developing world. Together, they are now embarking on a mission of innovation and collaboration to keep this important economic sector for the global South flourishing in the long-term.

Our partners, of course, are instrumental in providing indispensable support to our activities, and a driving force in the innovative approaches we continually add to our array of programmes. One fantastic example of this is our partnership with the Elsevier Foundation, which led to unique catalyst grants to eight all-women research teams in the global South to take concrete action in response to climate change. This programme is focused on the key priority for both TWAS and global science: gender equity. It is a valuable step to ensuring that women of science in science- and technology- lagging nations receive the opportunity to contribute to globally important scientific research.

In closing, these are just some examples of the impressive initiatives that TWAS and its partners are key facilitators for. In 2023, as we celebrate our 40th year, I will proudly pass on the TWAS presidency to the highly accomplished South African epidemiologist Quarraisha Abdool Karim, who has become an instrumental participant in TWAS activities. And as you continue to read through this report, you'll get a fuller, more detailed picture of how together we are transforming developing-world science to adapt to changing times—and see that our collective future, in turn, is full of promise.

A YEAR O

The year 2022 saw further growth and advancement for TWAS. With help from its partners, the Academy worked tirelessly on its core mission to strengthen science capacity in the global South through fellowships, grants, exchanges, special events, and leveraging its roles in international science policy and science diplomacy. Here are just a few of the Academy's central accomplishments:


1


2

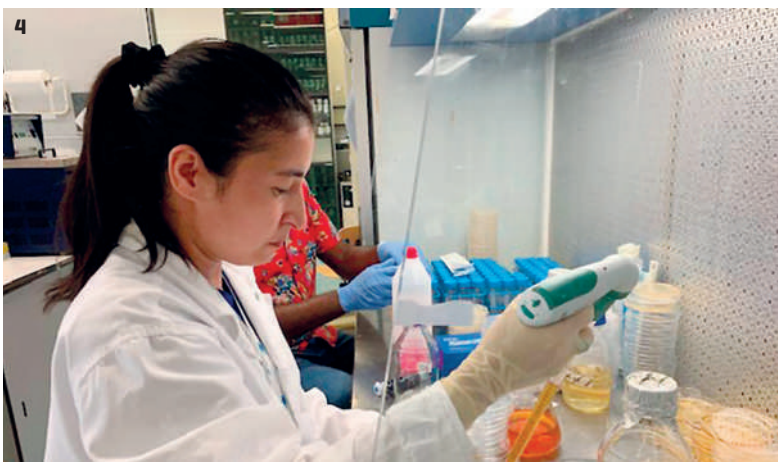
1 TWAS 16th General Conference

The Conference convened from 21–24 November and was the main highlight of 2022. The event was hosted by Zhejiang University (ZJU), in Hangzhou, China, and in collaboration with the Chinese Academy of Sciences (CAS) and the China Association for Science and Technology (CAST). Held both online as well as in-person in its host city of Hangzhou, China, the event registered an audience of 453 virtual participants from 75 countries, with about 60 more participants on-site in Hangzhou. [For more on the TWAS 16th General Conference, see page 14]

2 Ernesto Illy Colloquia

TWAS hosted the first-ever Ernesto Illy Colloquia, an event designed to examine ways to make coffee-growing sustainable on a global scale. The event was the result of a collaboration with the Ernesto Illy Foundation, and four more such events are planned so that participants can follow up on their progress and continually form new collaborations. It was also a hybrid event, taking place both in-person and online. [For more on science policy, see page 22]

F IMPACT



3 New grants programmes

The Sida-funded TWAS Research Grants Programme launched two entirely new avenues for developing-world researchers to acquire resources: One for equipment maintenance and another for collaborative, interdisciplinary research. The Academy also partnered with the Elsevier Foundation to provide unique catalyst grants to all-women research teams in the global South to take concrete action in response to climate change. [For more on research grants, see page 20]

4 New fellowships programmes

TWAS launched several new fellowships for developing-world scientists. One emerged from an agreement with the Alliance of International Science Organizations (ANSO) to found a five-year programme supporting 40 PhD students from the global South each year. TWAS also launched a collaboration with the Scientific and Technological Research Council of Türkiye (TÜBİTAK) to host PhD and postdoctoral fellowships. [For more on fellowships, see page 18]

5 New TWAS leadership

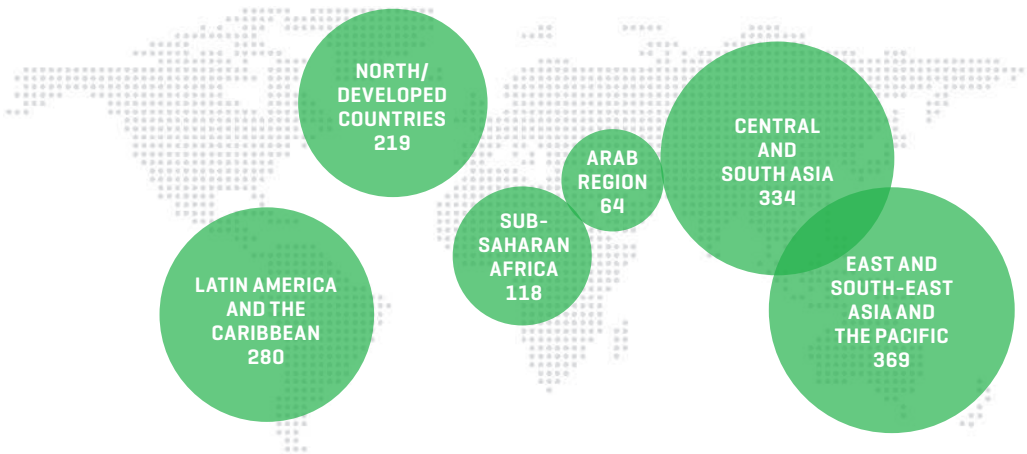
The Academy elected its new TWAS Council in 2022, to begin work in 2023, with two key gender-equity milestones. For the first time ever, the TWAS Council will have gender parity. Also, Quarraisha Abdool Karim of South Africa was named TWAS President. She will be the first woman to serve in that role in the history of TWAS. [For more on women in science, see page 26]

WHO W

As a global, merit-based science academy, TWAS represents the elite of scientific accomplishment in, or related to, the developing world. Only those scientists who have achieved the highest level of international standards—and have made significant contributions to the advancement of science—can be elected as lifetime Fellows.

In 2017, the TWAS Council decided that Fellows elected in December of one year would be inducted on 1 January of the following year. The charts below represent TWAS membership as of 31 December 2022 (including TWAS Fellows elected in 2022 but officially inducted in 2023).

Total TWAS Fellows, by region



TWAS Fellows elected in 2022, by region

For a full list of Fellows elected in 2022, please see page 42

Fellows

1,384 TOTAL FELLOWS

110 COUNTRIES

84% FROM DEVELOPING COUNTRIES

12 NOBEL PRIZE LAUREATES

TWAS Fellows elected in 2022 by country of residence

9 CHINA

8 BRAZIL

7 INDIA

3 UNITED STATES

2 BANGLADESH; ISLAMIC REPUBLIC OF IRAN; MALAYSIA; PAKISTAN; PHILIPPINES

1 ALGERIA*; CUBA; EGYPT; ETHIOPIA; KENYA; MALI*; MEXICO; NEPAL*; PERU*; QATAR*; SOUTH AFRICA; TAIWAN, CHINA; TRINIDAD AND TOBAGO*

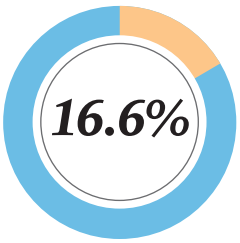
* From countries underrepresented at TWAS.

E ARE

TWAS FELLOWS AND YOUNG AFFILIATES

Women Fellows

2022

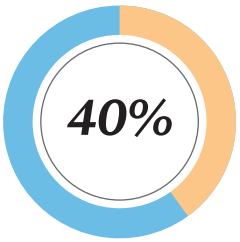


231 WOMEN OUT OF 1,384 FELLOWS

1984

2 WOMEN OUT OF 55 FELLOWS

New Fellows



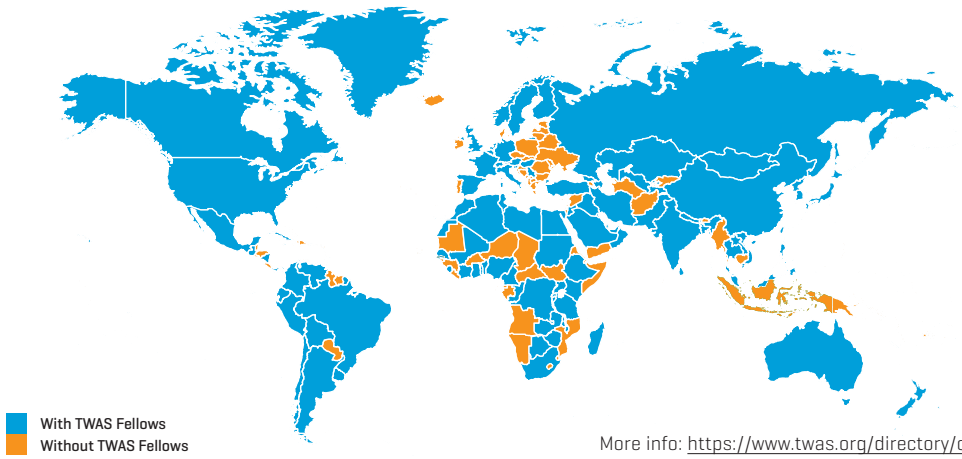
20 OUT OF 50 TWAS FELLOWS ELECTED IN 2022 WERE WOMEN

For a list of Fellows elected in 2022, please see page 42.

Four long-time supporters make the work of TWAS possible:

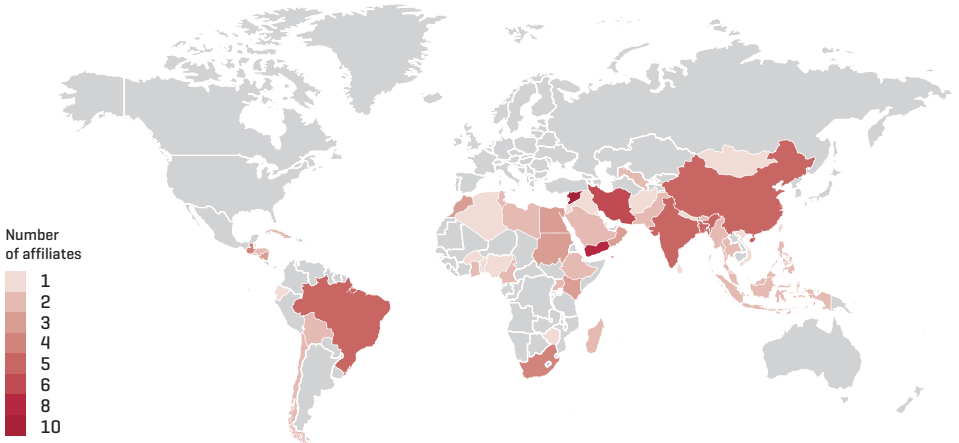
- **The Government of Italy, through the Ministry of Foreign Affairs and International Cooperation (MAECI)**, provides core funding;
- **The Swedish International Development Cooperation Agency (Sida)** supports TWAS research grants, science diplomacy and communications initiatives;
- **The United Nations Educational, Scientific and Cultural Organization (UNESCO)** administers TWAS funds and personnel;
- **The Abdus Salam International Centre for Theoretical Physics (ICTP)** hosts TWAS on its campus in Trieste, Italy, and provides administrative support.

Countries with and without TWAS Fellows



More info: https://www.twas.org/directory/overview

TWAS Young Affiliates in 2022 by country of residence*



* Scientists selected under the Islamic Development Bank-TWAS Refugee and Displaced Young Scientists Programme are classified by country of origin.

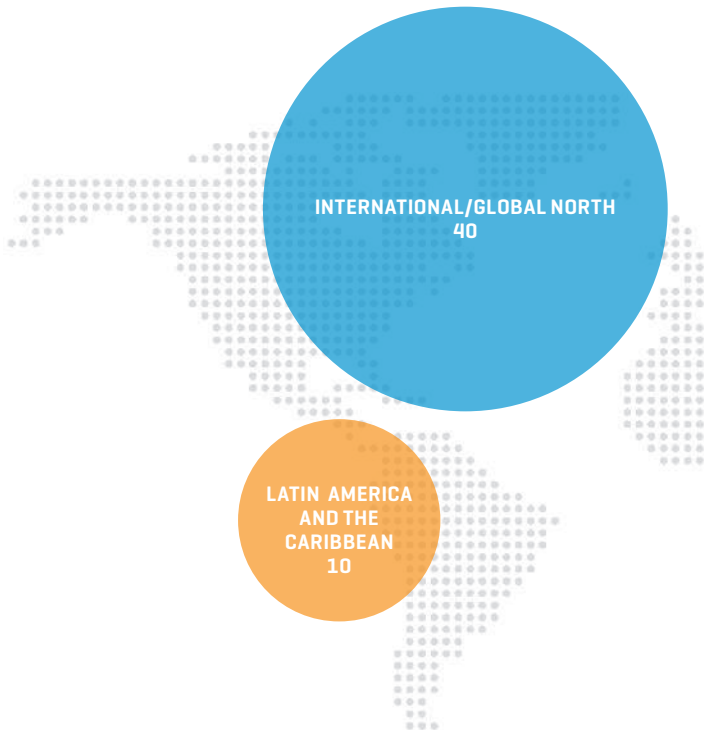
TWAS PA

INTERNATIONAL/GLOBAL NORTH

- Abdus Salam International Centre for Theoretical Physics (ICTP), Italy
- Accademia Nazionale dei Lincei, Italy
- American Association for the Advancement of Science (AAAS), United States
- Autonomous Region of Friuli Venezia Giulia (FVG), Italy
- Council for At-Risk Academics (CARA), United Kingdom
- Elsevier Foundation, Netherlands
- Ernesto Illy Foundation, Italy
- Federal Ministry of Education and Research (BMBF), Germany
- German Research Foundation (DFG), Germany
- Global Young Academy (GYA), Germany
- Institute for International Education, Scholar Rescue Fund (IIE-SRF), United States
- InterAcademy Partnership (IAP), Italy
- Intergovernmental Panel on Climate Change (IPCC), Switzerland
- International Centre for Genetic Engineering and Biotechnology (ICGEB), Italy
- International Development Research Centre (IDRC), Canada
- International Institute for Applied Systems Analysis (IIASA), Austria
- International Mathematical Union (IMU), Germany
- International Network for Governmental Science Advice (INGSA), New Zealand
- International School for Advanced Studies (SISSA), Italy
- International Science Council (ISC), France
- Islamic Development Bank (IsDB), Saudi Arabia
- Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), Italy
- Joint Research Centre, European Commission, Belgium
- Ministry of Foreign Affairs and International Cooperation (MAECI), Italy
- Lindau Nobel Laureate Meetings, Germany
- National Academies of Sciences, Engineering and Medicine, United States
- National Institute of Oceanography and Applied Geophysics (OGS), Italy
- OPEC Fund for International Development (OFID), Austria
- Organization for Women in Science for the Developing World (OWSD), Italy
- Royal Society, United Kingdom
- Scholars at Risk (SAR), United States
- SciDev.Net, United Kingdom
- Swedish International Development Cooperation Agency (Sida), Sweden
- The Scientific and Technological Research Council of Türkiye (TÜBITAK), Türkiye
- Trieste International Foundation for Progress and Freedom of Science (FIT), Italy
- TWAS Young Affiliates Network (TYAN), Italy
- United Nations Educational, Scientific and Cultural Organization (UNESCO), France
- United Nations Technology Bank for the Least Developed Countries (UNTB), Türkiye
- Using Science for/in Diplomacy For Addressing Global Challenges (S4D4C), European Union
- World Meteorological Organization (WMO), Switzerland

> Promoting science today is not only important: it is essential. This is true across the developing world and globally, given the long-term threats posed by biodiversity loss and climate change.

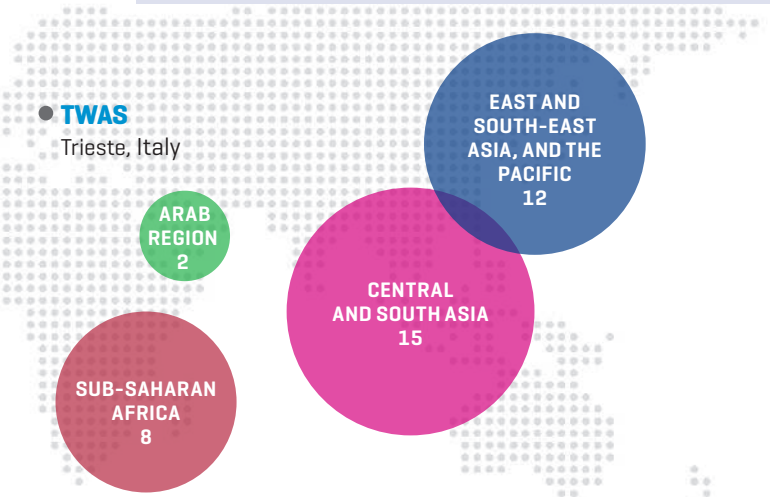
***Romain Murenzi**, TWAS executive director, at the 2022 World Science Forum in Cape Town, South Africa*



RTNERS

EAST AND SOUTH-EAST ASIA, AND THE PACIFIC

- Academia Sinica, Taiwan, China
- Academy of Sciences Malaysia, Malaysia
- Alliance of International Science Organizations (ANSO), China
- China Association for Science and Technology (CAST), China
- Chinese Academy of Sciences (CAS), China
- International Science, Technology and Innovation Centre for South-South Cooperation (ISTIC), Malaysia
- Lenovo Group Limited, China
- Ministry of Science and Technology of the People's Republic of China, China
- National Center for Genetic Engineering and Biotechnology (BIOTEC), Thailand
- Science University of Malaysia (USM), Malaysia
- University Putra Malaysia (UPM), Malaysia
- Zhejiang University (ZJU), China



LATIN AMERICA AND THE CARIBBEAN

- Brazilian Academy of Sciences, Brazil
- Caribbean Community (CARICOM), Guyana
- Chilean Academy of Sciences, Institute of Chile, Chile
- Ministry of Science, Technology and Innovation (MCTI), Brazil
- Ministry of Science, Technology and Innovation, Argentina
- National Council for Scientific and Technological Development (CNPq), Brazil
- National Agency for Research and Development (ANID), Chile
- National Council of Human Sciences and Technology (CONAHCYT), Mexico
- National Scientific and Technical Research Council (CONICET), Argentina
- São Paulo Research Foundation (FAPESP), Brazil

CENTRAL AND SOUTH ASIA

- Centre of Excellence in Molecular Biology (CEMB), University of the Punjab, Pakistan
- Commission on Science and Technology for Sustainable Development in the South (COMSATS), Pakistan
- COMSATS University Islamabad (CUI), Pakistan
- Council of Scientific and Industrial Research (CSIR), Ministry of Science and Technology, Government of India
- Department of Biotechnology, Ministry of Science and Technology, Government of India
- Department of Science and Technology (DST), Ministry of Science and Technology, Government of India
- Indian Association for the Cultivation of Science (IACS), India
- International Center for Chemical and Biological Sciences (ICCBS), Pakistan
- Ministry of Science, Research and Technology, Islamic Republic of Iran
- Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), India
- Organization of Islamic Cooperation Standing Committee on Scientific and Technological Cooperation (COMSTECH), Pakistan
- National Centre for Physics (NCP), Pakistan
- S.N. Bose National Centre for Basic Sciences (SNBNCBS), India
- The Dawood Foundation (TDF), Pakistan
- The Searle Company, Ltd., Pakistan

ARAB REGION

- Bibliotheca Alexandrina (BA), Egypt
- King Abdullah University of Science and Technology (KAUST), Saudi Arabia

SUB-SAHARAN AFRICA

- Academy of Science of South Africa (ASSAf), South Africa
- The African Academy of Sciences (AAS), Kenya
- African Union (AU), Ethiopia
- Department of Science and Innovation (DSI), South Africa
- International Centre of Insect Physiology and Ecology (icipe), Kenya
- Ministry of Higher Education, Science, Technology and Innovation, Angola
- National Research Foundation (NRF), South Africa
- Sudanese National Academy of Sciences (SNAS), Sudan

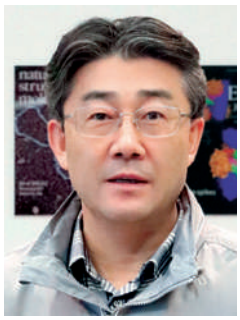
TWAS 16TH GENERAL CONFERENCE: HANGZHOU

With an agenda that explored accomplishments on the frontiers of scientific discovery, TWAS drew on its international community of researchers and policy experts to convene its 16th General Conference. The event was hybrid, taking place both online as well as in-person in its host city of Hangzhou, China.

The conference took place from 21 to 24 November 2022. It was hosted by **Zhejiang University** (ZJU), in Hangzhou, and was organized in collaboration with the **Chinese Academy of Sciences** (CAS) and the **China Association for Science and Technology** (CAST). The virtual format made it possible for hundreds of TWAS-connected researchers all over the world to participate. The theme of the conference was 'Basic Sciences for Evidence-Based Decision-Making and Sustainable Development in the Global South'.

On the occasion, the Academy welcomed a new president, South African TWAS Fellow

◀ Presentation of TWAS gift to host country: on behalf of H.E. XI Jinping, President of the People's Republic of China, accepted by H.E. Wan Gang (right), Vice Chairman of the 13th National Committee of the Chinese People's Political Consultative Conference (CPPCC) and President of the China Association for Science and Technology (CAST), presented by Prof. Hou Jianguo (left), President of the Chinese Academy of Sciences (CAS) and TWAS Vice President-elect for East and South-East Asia.




▶ Clockwise from top left: TWAS Medallists George Fu Gao, Rajaâ Cherkaoui El Moursli, Sok Ching Cheong, and Bruce Alberts.

Conference attendance

453 VIRTUAL PARTICIPANTS

~60 ON-SITE PARTICIPANTS

197 TWAS FELLOWS (58 WOMEN)

38 YOUNG AFFILIATES (11 WOMEN)

41 YOUNG AFFILIATE ALUMNI (12 WOMEN)

205 REGISTERED TWAS FELLOWSHIP GRADUATES

164 WOMEN

75 REPRESENTED COUNTRIES

Quarraisha Abdool Karim, and a new TWAS Council. In addition, 50 new TWAS Fellows were elected during the conference, raising the total membership to 1,384.

Highlights included:

Nobel lecture: Keynote speaker **Michael Rosbash** discussed what the timekeeping systems in biology reveal about nature, and how they demonstrate the power of basic science. A neuroscientist and chronobiologist at Brandeis University in the United States, he was among the winners of the 2017 Nobel Prize in Physiology or Medicine.

▶ Ren Shaobo, Chair of the University Council of ZJU, emphasized the importance of science for development during the opening day of the TWAS 16th General Conference.

> We are very delighted to see that many countries have been aware of the important role of basic sciences in enhancing decision-making capabilities and promoting sustainable development.

***Hou Jianguo**, president of the Chinese Academy of Sciences and co-chair of the TWAS 16th General Conference's ministerial session on the event's theme of basic sciences in support of informed and sustainable development in the global South*

Discourse on science and computing: Keynote speaker **Solomon Assefa**, vice-president of IBM Research, delivered a lecture on how science and computing can help humanity achieve a sustainable future. His talk focused mainly on the climate crisis, but also touched on key advancements in astronomy technology, future pandemics, and the food supply chain.

TWAS Medal Lectures: Four 2022 TWAS Medallists delivered talks on their areas of expertise:

- TWAS Fellow **Rajaâ Cherkaoui El Moursli**, an accomplished Moroccan physicist;
- TWAS Fellow **George Fu Gao**, a former director-general of the Chinese Centre for Disease Control and Prevention, and current vice-president of the National Natural Science Foundation of China;
- TWAS Fellow **Bruce Alberts**, a professor of science and education at the University of California, San Francisco;
- TWAS Young Affiliate Alumna **Sok Ching Cheong**, deputy chief scientific officer at Cancer Research Malaysia.

Hangzhou Declaration: On the final day of the conference, participants adopted the Hangzhou Declaration, which called for the strengthening of the scientific and technological capacity of developing countries.

HONOURING SCIENTIFIC EXCELLENCE

TWAS Awards provide a powerful incentive for scientists to excel on new levels, while bringing global recognition to the achievements of researchers from the developing world.

The Academy administers numerous awards—some of them annual, others conferred every two years. These awards are often named after generous and highly accomplished TWAS Fellows.

Additionally, this year the Academy hosted its second edition of the **TWAS Awards Webinar Series**, allowing its awardees to present on their celebrated research to a virtual audience.

- The **2022 TWAS Abdus Salam Medal** went to **Bai Chunli** of China, a former President of both TWAS and the Chinese Academy of Sciences (CAS), for his great contributions to the advancement of science and technology in the developing world, and to the growth of TWAS.

- The **2022 TWAS-Lenovo Science Award** went to geographer and sustainable development researcher **Fu Bojie**. His work focuses on finding evidence-based strategies to make sure civilization and nature can co-exist, and thus flourish together. The TWAS-Lenovo Award is

▼ Left: Sarobidy Rakotonarivo, left, carries out a choice experiment survey with participants in rural Madagascar in July 2014. [Photo provided]

Right: TWAS-Atta-ur-Rahman Award in Chemistry winner Anushka Rajapaksha of Sri Lanka, centre, conducts work with her colleagues in her lab. [Photo provided]

. . .
For a complete list of all 2022 TWAS Awards, see p. 43
. . .





▲ From left: Damalie Nakanjako, Sayera Banu, Nadia Haider, Khalil Ezzinbi, and Sun Yele.

one of the most prestigious honours given to scientists from the global South, and includes $100,000 provided by Lenovo Group Limited, the largest PC company in the world.

• The **2022 TWAS-Abdool Karim Award in Biological Sciences**—named after TWAS Fellow and incoming TWAS President Quarraisha Abdool Karim—honours women scientists from low-income African countries. It went to **Damalie Nakanjako** of Uganda, who has devoted her career to fighting HIV and other major diseases, such as tuberculosis. Her research is now paving the way for reducing the HIV burden in Uganda.

• The **2022 Fayzah M. Al-Kharafi Award** was shared between **Sayera Banu** of Bangladesh, who through basic research and health care initiatives on tuberculosis is affecting healthcare policies in her home country; and **Nadia Haider** of the Syrian Arab Republic, who identifies and describes economically useful plants through their DNA to help protect them from stress.

• The **2022 TWAS-Samira Omar Innovation for Sustainability Award**, dedicated to scientists from least developed countries working in an area directly relevant to sustainability, went to Malagasy socio-economist **Sarobidy Rakotonarivo**, who is working to ensure that villagers in remote parts of Africa are engaged with conservation measures that affect their lives.

• The **2022 TWAS-Atta-ur-Rahman Award in Chemistry**, which goes to young chemists in scientifically lagging countries, was given to **Anushka Rajapaksha** of Sri Lanka, who uses materials to protect natural resources in Sri Lanka from contamination by pharmaceuticals and heavy metals.

• The **2022 TWAS-Mohammad A. Hamdan Award** went to **Khalil Ezzinbi** of Morocco, who specializes in work important to reducing the complexity of systems analyzed by computer models, such as populations great and small.

• The **2022 TWAS-CAS Young Scientist Award for Frontier Science**, was given to **Sun Yele** of China, for outstanding contributions to the understanding of air pollution sources and formation mechanisms, and how air pollution interacts with the boundary layer.

▶ TWAS-Lenovo Science Award winner Fu Bojie, left, taking part in ecological restoration field work in the Loess Plateau of China in 2022. [Photo provided]

TWAS Awards

27
TOTAL IN 2022

44.4%
TO WOMEN

1258
TOTAL
1985-2022

18%
TO WOMEN

EDUCATION AND TRAINING

TWAS manages the world's largest programme for **South-South PhD and postdoctoral research fellowships**. Through the Academy, associated organizations, and partners, early-career researchers can continue their education and gain experience at world-class science institutions in the developing world. In 2022, these included China, India, Pakistan, Thailand and Türkiye.

By the end of 2022, a grand total of 2,362 scholars had accepted PhD opportunities from TWAS, with 778 actively pursuing their PhDs on-site at their host institutions. Furthermore, the fellowship programme reached an important

▼ Aakash Kumar of Pakistan is the TWAS Fellowship Programme's 1,000th PhD graduate, receiving his PhD from University of Science and Technology of China (USTC) in Hefei. [Photo provided]

VISITING SCIENTISTS

TWAS also provides opportunities to established researchers from the South to pursue collaborations and education, or to gather experience in a country other than their own. In 2022, the programmes included:

- **TWAS-UNESCO Associateship Scheme**: 22 developing-world scientists from 15 countries
- **TWAS Research and Advanced Training Fellowship Programme**: 15 developing-world scientists from 9 countries
- **TWAS-SISSA-Lincei Research Cooperation Visits**: 10 developing-world scientists from 9 countries
- **Visiting Expert Programme**: 10 experts from 9 countries aiding scientific development in the global South
- **UNTBLDC-TWAS-ICGEB South-North Programme for Exchanges and Collaborations**: 5 awards from 5 countries
- **UNTBLDC-TWAS-ICGEB South-South Programme for Exchanges and Collaborations**: 7 awards from 6 countries

PhD fellowships

81 AWARDED

6 PARTNERS

4 HOST COUNTRIES

Postdoctoral fellowships

37 AWARDED*

7 PARTNERS

4 HOST COUNTRIES

* this number may change, as awards from 2022 are still being processed

PhD fellowships programme, a full history:

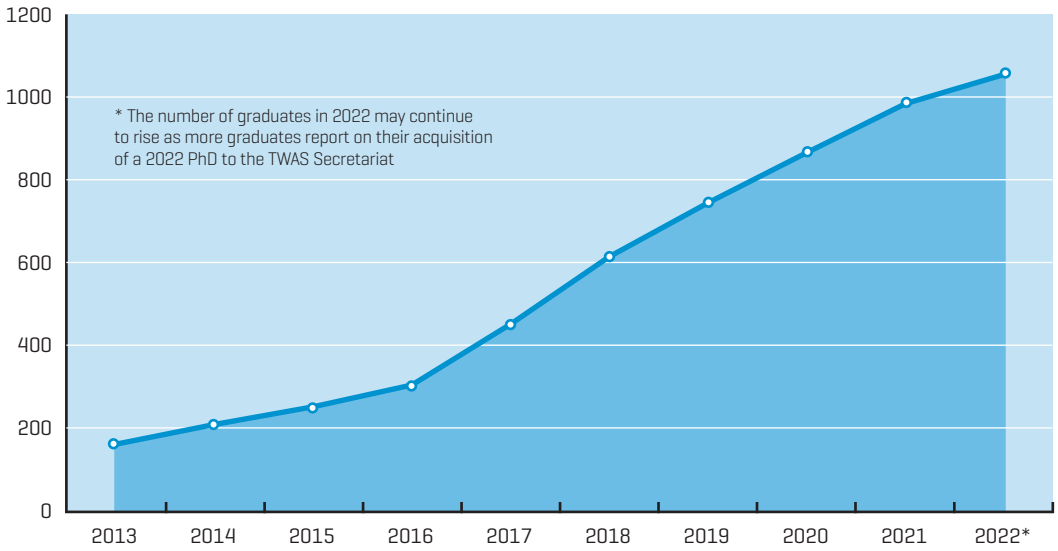
2,814
PHD FELLOWSHIP OPPORTUNITIES AWARDED SINCE THE INCEPTION OF THE PROGRAMME

2,362
FELLOWSHIPS ACCEPTED AND BEGUN BY DEVELOPING-WORLD SCIENTISTS

1,062
PHDs CONFIRMED TO HAVE BEEN GRADUATED BY THE END OF 2022

778
PHD FELLOWSHIP HOLDERS ONSITE WORKING TOWARD THEIR DEGREES DURING 2022

Cumulative total of all TWAS PhDs graduated over the last 10 years



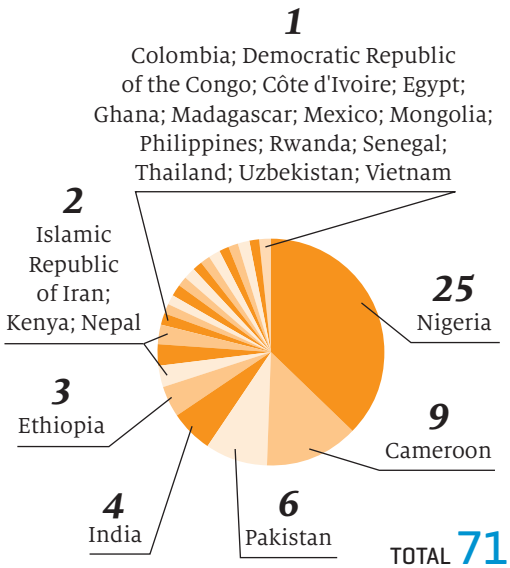
> My country is suffering an economic crisis right now and people are leaving. But I want to serve my country, because they need us now. With a PhD and knowledge of AI, we can do better things.

***Aakash Kumar** of Pakistan, the TWAS Fellowship Programme's 1,000th graduate*

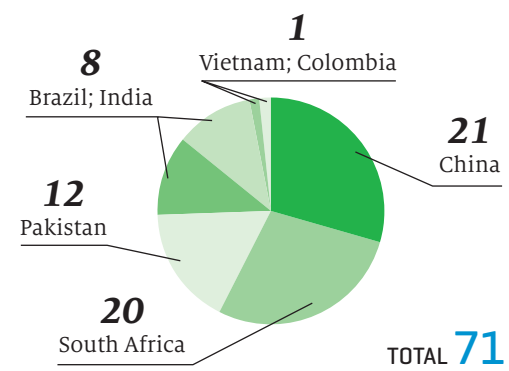
milestone in 2022, graduating its 1,000th PhD, with a total of 1,062 participants confirmed to have graduated by the end of the year.

Also in 2022, TWAS initiated two new fellowship programmes. One is the **ANSO-CAS-TWAS/UNESCO PhD Scholarship Programme**, supporting 40 PhD students from the global South per year seeking to pursue research in China. The other is the **TWAS-TÜBİTAK Postgraduate and Postdoctoral Fellowship Programme**, which launched a collaboration with the Scientific and Technological Research Council of Türkiye (TÜBİTAK) at their research centres and institutes.

Home country for new 2022 PhD recipients



Country of training for new PhDs



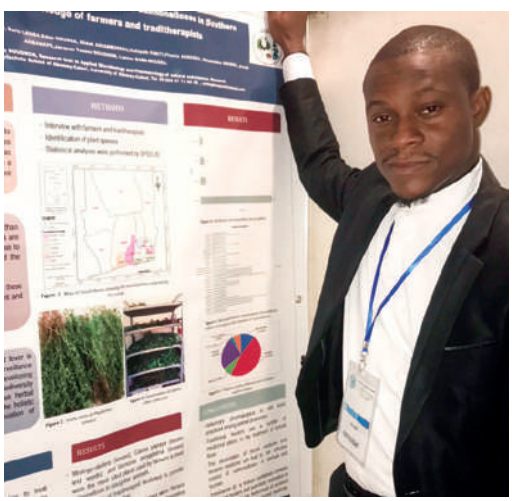
PROGRESS THROUGH RESEARCH

TWAS provides grants to researchers in targeted developing countries for specialized equipment, consumable supplies, scientific publications, and training of master's degree students. These grants help to lay a foundation for research in countries with scarce resources.

The **TWAS Research Grants** programme awards key funding to researchers in science-and-technology lagging countries (STLCs). It has been ongoing since 1986, and included **Grants for Individuals**, offering up to $20,000 to early-career researchers; and **Grants for Groups**, providing up to $40,000 to small research groups. The **Swedish International Development Cooperation Agency (Sida)** supported both grant programmes.

Sida also supported two completely new grants in 2022. **Grants for Maintenance** were awarded to previous research grant awardees to fund the repair of laboratory equipment they purchased with the preceding grant. **Collaborative Grants for Interdisciplinary Research** supported projects jointly carried out by two Principal Investigators.

> When you gain trust from The World Academy of Sciences, it's easier to get another grant and recognition from the international science community.
>
> ***Victorien Dougnon**, microbiologist and two time TWAS Research Grant awardee from Benin*

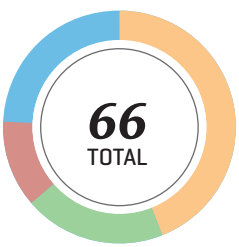


◀ TWAS Research Grant awardee Victorien Dougnon, a microbiologist from Benin.

TWAS Research Grants awarded

2,763
SINCE 1986

TWAS Research Grants awarded in 2022



29 INDIVIDUAL
13 GROUP
8 COLLABORATIVE
16 MAINTENANCE

▶ Project grant team leader Anushiya Shrestha of Nepal (right), who is the leader of a team that won a TWAS-Elsevier Foundation Grant for Gender Equity and Climate Action, working in the field. [Photo provided]

TWAS Research Grants awarded in 2022

$1,544,939 AMOUNT OF TWAS RESEARCH GRANTS

40 GRANTS TO LDCs (61.5% OF 67 TOTAL)

26 GRANTS TO WOMEN (40%)

Field of research of TWAS Research Grants*

24 BIOLOGY

13 CHEMISTRY

8 PHYSICS

4 MATHEMATICS

1 BIOCHEMISTRY

* The 16 grants for maintenance are not included because they were not categorized by field.

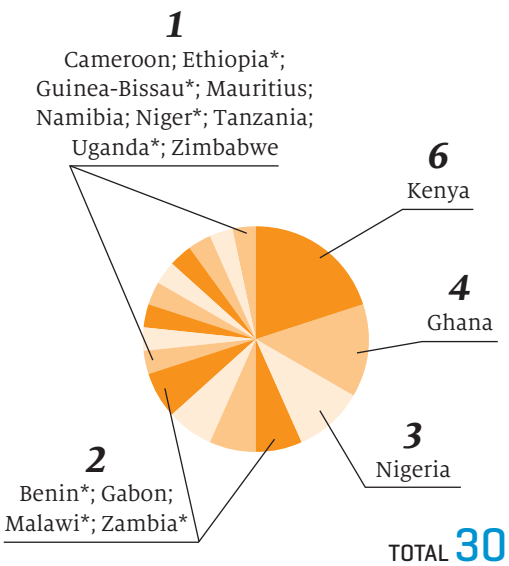
Field of research of SG-NAPI Grants

4 AGRICULTURE; BIOLOGY; CHEMISTRY; ENGINEERING; MEDICAL SCIENCES

3 EARTH SCIENCES; INFORMATION COMPUTER TECHNOLOGY

2 MATHEMATICS; PHYSICS

Where did SG-NAPI Grants go in 2022?

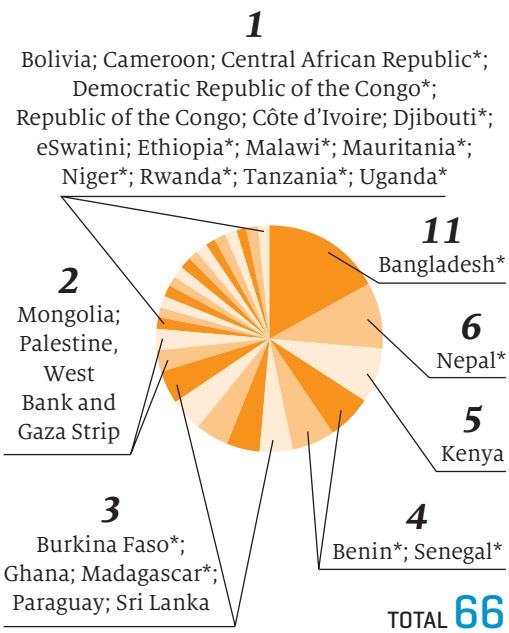


58 SG-NAPI GRANTS AWARDED SINCE 2021

* LDC

Another new grant programme was sponsored by the **Elsevier Foundation**, called **Project Grants for Gender Equity and Climate Action**. They were focused on projects, rather than research, and awarded to eight teams of two-to-five women for scientific projects related to climate change with the potential to produce tangible change. The leader of each project is a woman scientist, holding a PhD, living and conducting scientific work in an STLC.

Where did TWAS Research Grants go in 2022?



* LDC

Finally, with the support of the **German Federal Ministry of Education and Research (BMBF)**, TWAS continued its **Seed Grants for New African Principal Investigators (SG-NAPI)** for a third year. The programme awards up to $67,700 per grant to projects in sub-Saharan Africa with a focus on least developed countries, and seeks to facilitate the return of young scientists to Africa and help local researchers to establish their own laboratories.

SUPPORTING SCIENCE POLICY

With a network of over 1,380 eminent scientists from 110 countries and 40 years of experience in the global science community, TWAS is ideally positioned to provide advice on science policy for the developing world and support for the United Nations Sustainable Development Goals.

Ernesto Illy Colloquia: TWAS worked with the Ernesto Illy Foundation to co-organize a first-of-its-kind event called the 'Ernesto Illy Colloquia: Sustainability challenges in coffee-growing worldwide' on 27–29 September 2022.

Coffee is a significant commodity, and an important part of the world economy—especially in the global South, where a large majority of coffee crops are grown. And as climate change threatens agricultural practices that the coffee business has come to rely on, the sustainability of the sector is an important question at the **nexus of science and policy**.

This event aimed to address these challenges. It was hybrid, taking place both online and in-person at the Abdus Salam International Centre for Theoretical Physics (ICTP) campus in Trieste, Italy. In fact, it was the first event TWAS held with an in-person component since 2019, before the beginning of the COVID-19 pandemic.

Furthermore, the event linked young scientists with sustainability experts to advance coffee research and develop collaborations that support sustainable coffee cultivation.

Abdool Karim elected TWAS President: Quarraisha Abdool Karim, a world-leading AIDS researcher from South Africa, has been elected to serve as the seventh President of TWAS. Abdool Karim is the Associate Scientific Director of the Centre for the AIDS Programme of Research in South Africa (CAPRISA), a centre that undertakes high-impact globally relevant and locally responsive research on HIV, TB and SARS-CoV-2 epidemiology, pathogenesis, prevention and treatment. She is a strong advocate for health equity and has developed novel strategies to introduce AIDS treatment in high disease-burden settings and amid the COVID-19 pandemic.

Beginning 1 January 2023, she succeeds TWAS President Mohamed H.A. Hassan of Sudan, who took office in 2019. Her scientific excellence has been recognized through more than 30 honours and awards, including the 2014 TWAS-Lenovo Prize.

▲ Participants in the three-day Ernesto Illy Colloquia on sustainability challenges in coffee-growing worldwide work together in one of five break-out groups in the event. (Photo: Paola Di Bella/TWAS)

Participants in the Colloquia included 20 coffee researchers from developing countries selected by TWAS, and the 22 students pursuing the Ernesto Illy Foundation's Master Degree in Economics and Science of Coffee. Among the expert speakers were illycaffè S.p.A. Chair **Andrea Illy**, Chief Scientific Officer of illycaffè and Director of the Ernesto Illy Foundation **Furio Suggi Liverani**, TWAS Fellow and Ohio State University soil scientist **Rattan Lal**, and world-renowned sustainability expert **Jeffrey Sachs** of the United States.

Four more such events are planned so that participants can follow up on their progress and continually form new collaborations.

Advocacy for basic sciences: Basic sciences have long been a central focus for TWAS, which aims to strengthen science capacity across all disciplines in the developing world. In 2022, TWAS was an active participant in the International Year of Basic Science for Sustainable Development, with celebrations running from July 2022 to July 2023. The contribution of TWAS included a ministerial session at the TWAS 16th General Conference, the theme of which was 'Basic Sciences for Evidence-based Decision-making and Sustainable Development in the Global South'.

Advocacy for better pandemic surveillance: On 24 May, *Nature* published a correspondence from the TWAS Advisory Committee on COVID-19 (TACC). The statement proposed 'embedding a network of genetic-surveillance centres in the national health system of every country'.

"These kinds of events are really important because they help us to connect and to refresh our knowledge. I'm happy to go back home and take with me the feeling that we are all facing similar problems in our productive systems—in our coffee growing, and in the environment."

Julio Alvarado Quintana *of El Salvador, a research technician with the World Coffee Research Breeding Programme and participant in the Ernesto Illy Colloquia*

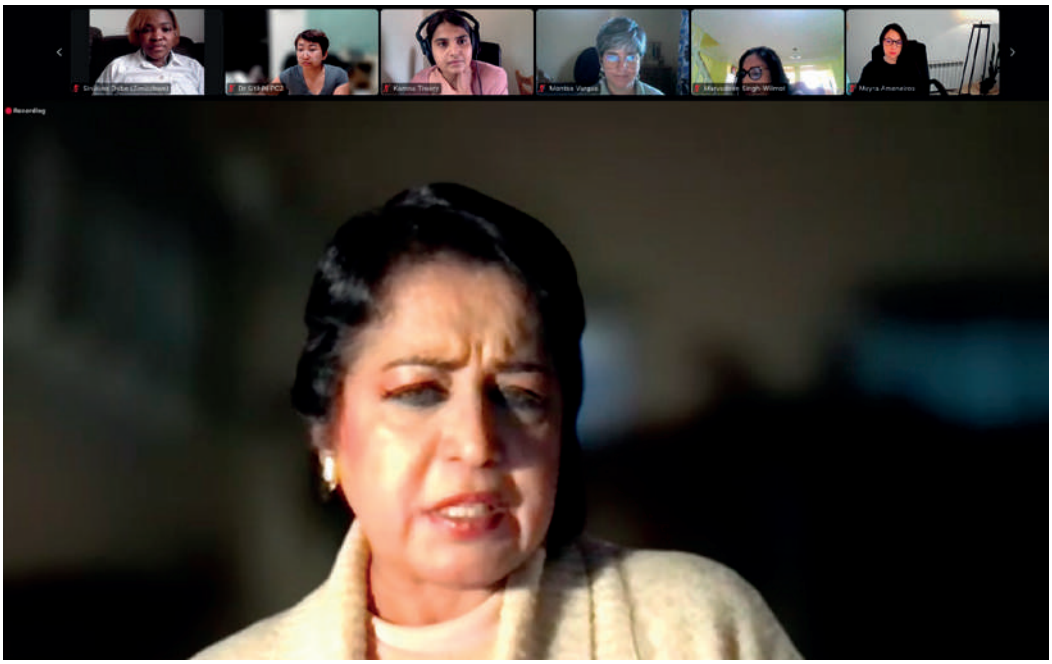
SCIENCE DIPLOMACY

To address regional and global challenges, the world requires effective partnerships between scientists, policymakers and diplomats. TWAS, based in Italy and with networks that span the world, is uniquely positioned to help bring these communities together.

Key partners of the science diplomacy programme include the **American Association for the Advancement of Science (AAAS)**, which collaborates with TWAS on an annual summer course, and the **Swedish International Development Cooperation Agency (Sida)**, which provides essential financial support.

In 2022, the Academy continued to use digital meetings, improving upon its flagship science diplomacy course while also holding a regionally themed science diplomacy gathering online.

◀ At the science diplomacy course, participants worked in pairs—an early-career scientist and a more experienced diplomat or policy-maker. They emerged with a rewarding, educational experience on science diplomacy.



▶ Former Mauritius President Ameenah Gurib-Fakim delivering the keynote address at the ninth AAAS-TWAS Science Diplomacy Course on 25 June 2022.

AAAS-TWAS Science Diplomacy Course participants and speakers were divided as follows:

48 PARTICIPANTS

24 REPRESENTED COUNTRIES

47 PARTICIPANTS FROM DEVELOPING COUNTRIES (98%)

33 WOMEN (68%)

16 FROM STLCs (33%)

6 FROM LDCs (13%)

24 YOUNG SCIENTISTS (AGE 40 OR BELOW) (50%)

24 POLICYMAKERS (50%)

16 SPEAKERS (8 FROM THE GLOBAL SOUTH)

AAAS-TWAS Science Diplomacy Course: The ninth edition of this prestigious, world-renowned course, held 25 July to 3 August, took place entirely online. And for the second time, attendees worked in 'participant pairs': Each early-career scientist collaborated with a more expert colleague, either a diplomat or a policymaker, to test the tools that are important in science diplomacy.

During the ten-day course, more than 15 experts shared their knowledge with 48 participants from 24 countries, including Ethiopia, Ghana, India, Kenya, Malaysia and Nigeria. The course had five thematic sessions: diplomacy for science, science in diplomacy, science for diplomacy, science advice, and careers in science diplomacy.

The event's keynote speaker was **Former President of Mauritius Ameenah Gurib-Fakim**, who touched on many of the challenges facing scientists and policymakers today—with a special focus on Africa and the promise of its young population.

In addition, each participant had to move across a virtual platform called 'Gather', using an avatar to move from one room to another, simulating an actual location with both general presentations and project-focused breakout groups. The participants were educated in topic-focused seminars, then 'participant pairs' engaged in extensive meetings in Gather. town, assuming roles of advocates of different interests.

Regional science diplomacy workshop: TWAS and its Central and South Asia Regional Partner (TWAS-CASAREP) held a regional workshop on science diplomacy online from 17–21 October 2022.

The workshop drew 47 participants from 25 countries. Of the attendees, 21 (45%) were women, 28 (60%) were from science-and-technology lagging countries, 21 (45%) were from least developed countries, 25 (53%) were 40 or younger, and 22 (47%) were policymakers. Eighteen speakers attended, all of them from developing countries.

> "Why is it important to attract youth? Sub-Saharan Africa has the advantage of 11 million young people entering the labour market every year, representing unrivalled brainpower."

*Former Mauritius President **Ameenah Gurib-Fakim**, during the ninth AAAS-TWAS Science Diplomacy Course keynote address*

EMPOWERING WOMEN

Supporting women in research is a central part of the mission of TWAS. The Academy and its partners offer numerous opportunities to women in the developing world, which are not only valuable for the careers of individual researchers, but critical for activating developing nations' full scientific potential.

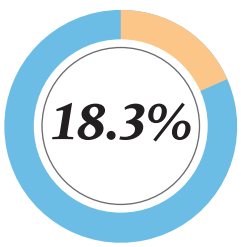
A major new programme specifically designed to support women in science in 2022 is the **TWAS-Elsevier Foundation Project Grants for Gender Equity and Climate Action**. Through this programme, eight winning teams were announced at an event at the 27th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27) on 15 November.

The projects have three common themes: to strengthen **gender equity**; to address the **climate-related needs** of local communities; and to **transfer knowledge** from scientific research to real-life scenarios.

The projects are entirely led and conducted by women researchers. The eight projects vary from seeking to establish sustainable home-gardens in Guatemala, to advancing climate literacy among women in Western Nepal and empowering women to improve local livelihoods through agroforestry in the Republic of Congo. The other projects will take place in Bangladesh, Kenya, Nicaragua, Tanzania, and Uganda. They are made possible by financial support from the Elsevier Foundation.

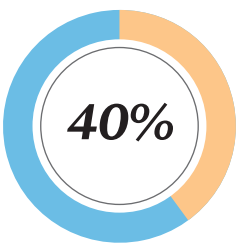
TWAS also hosts an influential partner building science capacity in the developing world at its offices in Trieste, Italy—its sister organization, the **Organization for Women in Science for the Developing World (OWSD)**.

TWAS PhDs graduates 2022



13 OUT OF 71
PHDs GRADUATES WERE WOMEN

PhD fellowships to women in 2022



26 OUT OF 66
PHD FELLOWSHIPS WERE AWARDED TO WOMEN






▶ Winners of the 2022 OWSD-Elsevier Foundation Award for Early-Career Women Scientists in the Developing World (clockwise from left): Flor de Mayo Gonzáles Miranda (Guatemala); Gawsia Wahidunnessa Chowdhury (Bangladesh); Heyddy Calderon (Nicaragua); Myriam Mujawamariya (Rwanda); Abeer Ahmed Qaed Ahmed (Yemen); and Ashani Savinda Ranathunga (Sri Lanka).

OWSD PhD Fellowships for women from sub-Saharan Africa, STLCs and LDCs

576 TOTAL AWARDED 1998-2022

368 HAVE GRADUATED

193 GRADUATES FROM LDCs

262 GRADUATES FROM SUB-SAHARAN AFRICA

25 TOTAL AWARDED IN 2022

17 TO LDCs

OWSD emerged from a conference organized by TWAS in 1988. It is the first international forum for women scientists from the developing and developed worlds with the objective of strengthening their roles in the development process and promoting their representation in science and technology leadership. As of the end of 2022, OWSD had 8,806 members and 51 national chapters. Seven of these chapters were established in 2022—from Chile, the Dominican Republic, Paraguay, Nicaragua, Niger, the Republic of the Congo, and Venezuela.

Over 85% of OWSD members are women with postgraduate degrees in science from developing countries, and 55% are under 40. Members come from 104 countries in the developing world.

Since 1998, the organization awarded the **OWSD PhD Fellowships for women in science** to women from sub-Saharan Africa and least developed countries and science-and-technology lagging countries, supported by the Swedish International Development Cooperation Agency (Sida).

It also hosted the **OWSD Early Career Fellowships**, supported by Canada's International Development Research Centre (IDRC). By the end of 2022, 61 fellows had been awarded under this programme, of whom 37 have completed their work and 22 are currently still undertaking their research.

OWSD also partners with the Elsevier Foundation to organize annual **Early Career Awards to Young Women Scientists**. The six awardees for 2022 were Gawsia Wahidunnessa Chowdhury (Bangladesh), Zoology; Flor de Mayo González Miranda (Guatemala), Engineering; Ashani Savinda Ranathunga (Sri Lanka), Engineering; Heyddy Calderon (Nicaragua), Geophysics; Abeer Ahmed Qaed Ahmed (Yemen), Microbiology; Myriam Mujawamariya (Rwanda), Biology.

GLOBAL ACADEMY NETWORKS

TWAS works in close association with several national science academies and international academy networks dedicated to advancing science in the developing world and promoting sustainable development.

The TWAS Young Affiliates Network (TYAN) was established in 2016 to bring fresh energy to the Academy, reinforce ties among the Academy's Young Affiliates and Young Affiliate Alumni, and further promote international collaboration. TYAN is composed of almost 400 scientists from 82 countries.

TYAN's activities in 2022 included a February workshop in mathematics, focusing on differential geometry, held online but based in Brazil and featuring accomplished scientists working in Latin America. Members of the TYAN Executive Committee also convened in Trieste, Italy, from 5–7 October. During the gathering, they met with TWAS Programme Coordinator Massimo Paoli to examine the outcomes of past activities and lay the foundation for the next five years. They also reviewed priorities and addressed funding challenges with TWAS Executive Director Romain Murenzi.

The InterAcademy Partnership (IAP) is a long-time TWAS partner based in its offices in Trieste, Italy. IAP brings together about 150 national, regional and global member academies, which collaborate to support the vital role of science in seeking evidence-based solutions to the world's most challenging problems.

In particular, IAP harnesses the expertise of the world's leading scientific minds to advance

▼ Group photo at the end of the IAP Triennial Conference and General Assembly. (Photo: G. Ortolani/IAP)

▲ Group photo of the TYAN Executive Committee members, taken at TWAS headquarters, in Trieste, Italy, on 6 October 2022. From left: Rosemary Tonjock, Franco Cabrerizo, TWAS Executive Director Romain Murenzi, Tasrina Rabia Choudhury, TWAS Programme Coordinator Massimo Paoli, Thomas dela Cruz, Jaqueline Mesquita, Bolanle Ojokoh and Roula Abdel-Massih. (Photo: C. Serra/TWAS)

sound policies, improve public health, promote excellence in science education, and achieve other development goals. Academy members constitute more than 30,000 leading scientists, engineers and health professionals in over 100 countries.

iap SCIENCE HEALTH POLICY
the interacademy partnership

Here are some major accomplishments of IAP in 2022:

- **The IAP Triennial Conference and General Assembly** took place for the first time in conjunction with the Worldwide Meeting of Young Academies. The conference itself was on 'Inclusive Excellence: Harnessing Knowledge for Sustainable Societies'.
- The release of a major report on **Climate Change and Health**, summarizing four regional reports in a global overview that was presented at COP27 and the World Health Summit.
- Release of an IAP Communique, **'Call for a Global Health Data Sharing Framework for Global Health Emergencies'**, which has influenced discussions within WHO on the issue of data for pandemics, and has informed discussions on the UN Pandemic Treaty.
- The release of an IAP Statement on the **Implications of Urbanization in Low- and Middle-income Countries**.

CHINESE ACADEMY OF SCIENCES

The Chinese Academy of Sciences (CAS) is the hub of China's ambitious research enterprise, and it has long-standing ties with TWAS. CAS collaborates with TWAS on the six CAS-TWAS Centres of Excellence, and on the TWAS-CAS Young Scientists Award for Frontier Science. CAS also participates in a key PhD fellowship programme—the ANSO-CAS-TWAS/UNESCO PhD Scholarship—and hosts the TWAS Regional Office for East and South-East Asia and the Pacific.

The Academy of Science of South Africa (ASSAf) is one of Africa's leading institutions advocating for science and technology, and hosts the TWAS Sub-Saharan Africa Regional Partner at its headquarters in Pretoria.

> "TYAN embodies great minds, and gives the opportunity to establish connections and initiatives among these young, great scientists. These initiatives will spur problem-solving actions to many of the challenges that the global South, in particular, is facing."
>
> ***Bolanle Ojokoh**, TYAN Co-Chair*

REGIONAL PARTNERS

TWAS partners in five regions of the developing world perform vital Academy functions.

They nominate scientists for TWAS regional awards and select Young Affiliates. They also organize conferences and raise awareness of TWAS and its programmes among scientists of their region. Finally, they help to advance support globally for science among policymakers and with the general public.

In 2022, each regional partner organized at least one **conference for young scientists**, with 10 events in total during the year, most held online, and reaching over 550 registered participants. Of the confirmed participants, 224 (41%) were women, 56 were from least developed countries (10%), and at least 189 (34%) were young scientists. The Regional Partners frequently collaborate with the **TWAS Young Affiliates Network (TYAN)** to advance the careers of young scientists in the regions.

Six 2022 TWAS Regional Awards were given for Science Diplomacy.

RIO DE JANEIRO, Brazil
Brazilian Academy of Sciences

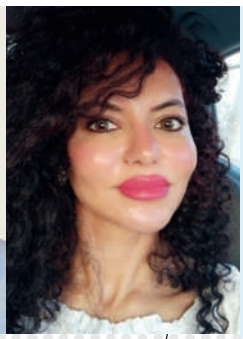
▼ 2022 TWAS Regional Award Winner: **Nísia Trindade Lima**, Brazil

The **Latin America and the Caribbean Regional Partner (TWAS-LACREP)** held three events, two online and one in-person, and all in collaboration with TYAN. The online events included a 21 February workshop on differential geometry, and a special workshop on 2 June focused on TYAN affairs. The in-person workshop was an advanced school in mathematics at the University of São Paulo, Brazil, held 7–11 November. Of the school's 71 participants, 28 were women, and 42 were young scientists under the age of 40.

▼ 2022 TWAS Regional Award Winner: **Tonni Kurniawan**, Indonesia

The **East and South-East Asia and the Pacific Regional Partner (TWAS-SAPREP)** held three events, one in-person and two online. The in-person event, the 2022 International Training Workshop on Open Science and SDGs, was held in August and drew 117 participants, including 23 young scientists and 32 women. The two events—a hybrid conference on innovation in agriculture that was held 23–25 August and a training course on industrial synthetic biotechnology that was held 12–23 December—received a combined 37 participants.

▼ 2022 TWAS Regional Award Winners: **Yahya Tayalati**, Morocco; **Sara Abdelsalam**, Egypt



The **Arab Regional Partner (TWAS-AREP)** held two online events, an online lecture on 2 November about education for sustainable development, and a training programme held 13–14 December for young scientists on biodiversity towards sustainable food systems in the Arab Region. The events combined attracted 190 participants, 119 of them women and 127 of them young scientists.

● **TRIESTE, Italy**
ICTP Campus

● **BEIJING, China**
Chinese Academy of Sciences

● **ALEXANDRIA, Egypt**
Bibliotheca Alexandrina

● **BANGALORE, India**
Jawaharlal Nehru Centre
for Advanced Scientific Research

The **Central and South Asia Regional Partner (TWAS-CASAREP)** held one online event, a science diplomacy workshop on healthcare, climate change, energy solutions and disaster management, from 17–21 October. The workshop drew 47 participants, 25 of them young scientists, 21 of them women, and 21 of them from least developed countries.

● **PRETORIA, South Africa**
Academy of Science of South Africa

▼ 2022 TWAS Regional Award Winner: **Oyewale Tomori**, Nigeria

The **sub-Saharan Africa Regional Partner (TWAS-SAREP)**, held one in-person meeting, a side-event at the Annual Meeting for African Science Academies, held in Kenya 28–30 November. The event drew 88 participants, 28 of whom were women.

▲ 2022 TWAS Regional Award Winner: **Yusuf Baran**, Türkiye

TWAS & ITALY

Since 1983, TWAS has had a strong partnership with the Italian Government, through the Italian Ministry of Foreign Affairs and International Cooperation (MAECI). Italy provides core funding to the Academy, thus making its work to advance science in the developing world possible and creating an environment that supports innovation. Together, Italy and TWAS have helped developing countries build critical skills. TWAS also cooperates closely with the Academy's host region, Friuli Venezia Giulia, and host city, Trieste.

Here are highlights of the TWAS-Italy partnership in 2022:

TWAS partnered with the Ernesto Illy Foundation, based in Trieste, to organize the first-ever **Ernesto Illy Colloquia**, from 27–29 September in Trieste. The event addressed key challenges in coffee research, growth and production. The news was picked up by more than 20 news organizations, including RAI FVG, *Il Piccolo*, and *Il Friuli*. For more information on the event, see page 22.

Additionally, TWAS was present at the 11th edition of **Trieste Next**, a science festival held annually in Trieste, Italy, that took place on 22–24 September.

For the event, the Academy organized an in-person round table titled 'Circular economy and biotechnology for sustainable development in the global South.' Participants at the round table included economic development expert Lucía Pittaluga of Uruguay, management professor Maria Colurcio of Italy, and TWAS

▼ TWAS maintained a gazebo at Trieste Next disseminating information about the Academy, alongside its sister organizations IAP and OWSD. (Photo: C. Serra/TWAS)

▲ Left: TWAS Fellow Muntaser Ibrahim, left, with TWAS Executive Director Romain Murenzi, at Trieste Next. (Photo: C. Serra/TWAS)

Right: The TWAS round table at Trieste Next. (Photo: C. Serra/TWAS)

Fellow Muntaser Ibrahim, a geneticist from Sudan.

More than 50 people attended the event, including local university students. TWAS was also present in Piazza dell'Unità d'Italia at the Trieste Next main grounds, alongside its sister organizations IAP and OWSD, where Academy staff distributed information about the Academy, and presented students with a board game about the United Nations Sustainable Development Goals.

TWAS also participated in the **European Researchers' Night**, an international event dedicated to the dialogue between research and citizens, organized in 14 Italian cities—including Trieste—across the whole week of 26 September to 1 October. The Academy held an interactive lesson on the SDGs at Trieste's High School Liceo Galileo Galilei, with more than 50 students in the audience.

Also, TWAS participated in a **Women in Science Photo Exhibition**, organized by SISSA MediaLab and hosted at the Trieste Convention Centre. The Academy contributed with a portrait of TWAS Fellow Quarraisha Abdool Karim, who was late in the year elected to a term as TWAS President to begin in January 2023.

▼ From left: Lucia Pittalunga, Maria Colurcio and Muntaser Ibrahim.

> "The potential of many mature scientists is wasted or not fully utilized. We should see scientists as a rare commodity and include them in the concept of cyclical economy, thus allowing a better usage of their talent and capacities."
>
> *TWAS Fellow **Muntaser Ibrahim**, a geneticist from Sudan, at Trieste Next*

A STORY TO COMMUNICATE

To have an impact on global science and policy, TWAS must convey its ideas and work to an international audience that includes not just scientists, but policymakers, journalists, educators, students, and the general public.

The TWAS communications strategy in 2022 increasingly relied on digital tools. Its website, **twas.org**, features a mix of articles and announcements about the Academy's activities. During the pandemic, TWAS relied on virtual tools to continue holding meetings, workshops, seminars, and conferences, though in 2022 with the Ernesto Illy Colloquia events began to have an in-person component again.

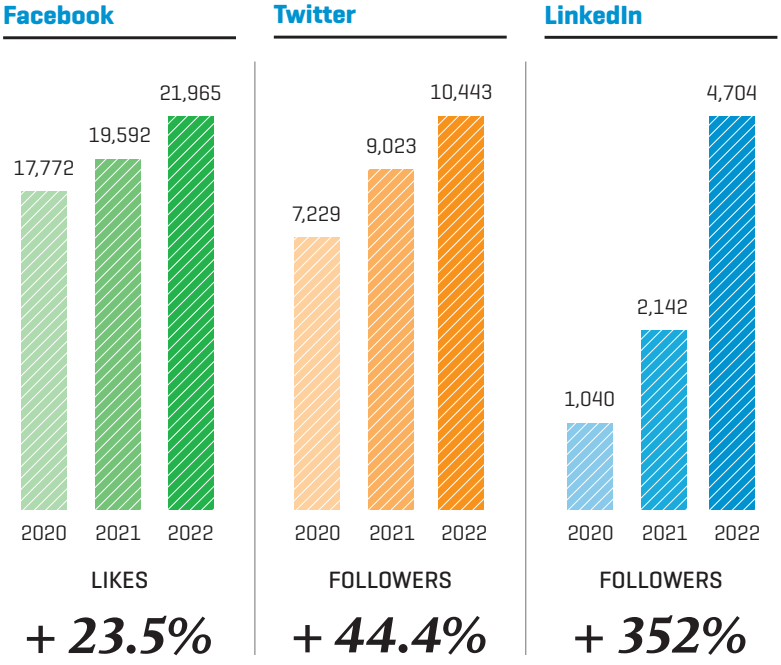
▼ TWAS-branded images shared on TWAS social media.

▲ A promotional graphic featuring the second TWAS Awards Webinar Series.

▶ TWAS Newsletters from 2022 focusing on the themes of TWAS awardees and the Academy's return to hosting in-person events.

TWAS also operates **social media** accounts on Twitter, Facebook, LinkedIn, Flickr, and YouTube, as well as an electronic bulletin **TWAS Plus**. It was a milestone year for the Academy's social media presence, as TWAS surpassed 10,000 followers on Twitter and 20,000 followers on Facebook.

At the end of 2022, the Academy initiated a new communication strategy, with a growing focus on the production of multimedia content, the development of graphic and video templates for social media, and implementing Search Engine Optimization (SEO) functionalities.



From 1 January to 31 December each year.

TWAS also used digital technology to hold **TWAS Awards Webinars** for its award winners, consisting of five webinars, from 26 May to 20 October, and live-streamed on the **TWAS YouTube channel**. Lectures by the Academy's four TWAS Medallists for 2022 were also recorded during the TWAS 16th General Conference and are available on the channel.

In 2022, the TWAS Public Information Unit also produced two **TWAS Newsletters** and the **2021 Annual Report**.

FINANCIAL REPORT 2022

Starting from the biennium 2020–2021, it was decided that the financial report for each odd-numbered year would cover two years, to bring it in line with UNESCO budget cycle.
In 2022, presented alone here because it is the first year of the current cycle, TWAS received a total of $6,505,188.56 in funding, including $3,655.56 in individual contributions. TWAS is grateful for the generous contributions from its numerous supporters. Their support helps make the Academy's critical work in the developing world possible.

2022 FINANCIAL REPORT (IN USD)

INCOME[1] 2022	
Balance brought forward 01.01.2022	728,086.73
1) Swedish International Development Cooperation Agency (Sida)	2,017,488.44
2) Ministry of Foreign Affairs and International Cooperation (MAECI), Italy	1,681,596.74
3) Lenovo Group Limited, China	173,910.00
4) Ministry of Science, Technology and Innovation (MCTI), Brazil	115,913.27
5) Elsevier Foundation, Netherlands	100,000.00
6) Academia Sinica, Taiwan, China	50,000.00
7) American Association for the Advancement of Science (AAAS), USA	9,000.00
8) The Searle Company, Ltd., Pakistan	7,258.06
9) Quarraisha Abdool Karim, South Africa	7,000.00
10) F.M.A. Al-Kharafi, Kuwait	6,000.00
11) Samira Omar Asem, Kuwait	5,970.00
12) National Agency for Research and Development (ANID), Chile	5,000.00
13) Other miscellaneous income	2,557.26
14) Interest income	96,194.00
15) Exchange difference	(785.94)
16) Transfer from Endowment Fund	1,500,000.00
TOTAL INCOME	**6,505,188.56**

[1] All contributions are expressed in US dollars and have been converted using the UN official rate of exchange in effect at the time the contributions were received.

EXPENDITURES 2022	App. Budget	Rev. Budget	Expenditure
1) Prizes			
1.1) TWAS Science Award	112,150.00	112,150.00	112,098.30
1.1.1) Award cost	*100,000.00*	*100,000.00*	*100,000.00*
1.1.2) Other costs	*12,150.00*	*12,150.00*	*12,098.30*
1.2) TWAS Awards	102,000.00	102,000.00	101,827.87
1.2.1) Award cost	*90,000.00*	*90,000.00*	*90,000.00*
1.2.2) Other costs	*12,000.00*	*12,000.00*	*11,827.87*
1.3) Fellows Awards	67,450.00	67,450.00	42,108.96
1.3.1) Award costs	*52,000.00*	*52,000.00*	*33,000.00*
1.3.2) Other costs	*15,450.00*	*15,450.00*	*9,108.96*
1.4) TWAS - Siwei Cheng Award in Economic Sciences	12,149.00	12,149.00	0.00
1.5.1) Award costs	*10,000.00*	*10,000.00*	*0.00*
1.5.2) Other costs	*2,149.00*	*2,149.00*	*0.00*
Sub-Total for (1)	***293,749.00***	***293,749.00***	***256,035.13***
2) Capacity Building in STLCs			
2.1) Research Grants	3,393,000.00	3,253,000.00	1,544,939.04
2.1.1) Activities	*2,763,000.00*	*2,713,000.00*	*1,287,187.13*
2.1.2) Implementation costs	*630,000.00*	*540,000.00*	*257,751.91*
2.2) Regional Partners	200,000.00	195,000.00	26,000.00
2.3) Science Diplomacy	106,000.00	91,000.00	25,739.70
2.4) Communication	30,000.00	30,000.00	0.00
2.5) PhD Fellowships for Climate Research in LDCs	1,794,000.00	1,772,500.00	15,788.25
2.5.1) Activities	*1,500,00.00*	*1,500,000.00*	*0.00*
2.5.2) Implementation costs	*294,000.00*	*272,500.00*	*15,788.25*
Sub-Total for (2)	***5,523,000.00***	***5,341,500.00***	***1,612,466.99***
3) Fellowships, Associateships and Professorships			
3.1) Fellowship Programmes	600,000.00	500,000.00	135,509.22
3.2) Associateship, Professorship and Visiting Programmes	311,525.00	311,525.00	192,864.39
Sub-Total for (3)	***911,525.00***	***811,525.00***	***328,373.61***
4) Meetings			
4.1) Council and General Meetings	170,000.00	40,000.00	23,502.74
4.2) Steering Committee and Other Official Meetings in Trieste	20,000.00	10,000.00	6,800.00
4.3) Activities to Promote Local Sciences	20,000.00	11,000.00	0.00
4.4) Official visits to TWAS Executive Director in Trieste	20,000.00	11,000.00	1,198.75
Sub-Total for (4)	***230,000.00***	***72,000.00***	***31,501.49***
5) Publications			
5.1) Publications	70,000.00	50,000.00	12,875.33
5.2) Other costs	23,460.00	16,730.00	0.00
Sub-Total for (5)	***93,460.00***	***66,730.00***	***12,875.33***

Continue next page

EXPENDITURES 2022	App. Budget	Rev. Budget	Expenditure
6) Joint Projects			
6.1) TWAS Regional Partners	120,000.00	120,000.00	31,000.00
6.2) TWAS - Arab Regional Partner Activities	93,460.00	73,460.00	18,000.00
6.2.1) Regional Conference for Young Scientists	*46,000.00*	*36,000.00*	*2,000.00*
6.2.2) Other activities	*40,000.00*	*30,000.00*	*10,000.00*
6.2.3) Other costs	*7,460.00*	*7,460.00*	*6,000.00*
6.3) Science Diplomacy Programme	20,000.00	20,000.00	9,500.00
6.4) Sustainability Orientated Activities	278,488.00	241,488.00	23,932.20
6.4.1) Symposium, Fellowships and South-North Exchange Programme	*214,488.00*	*148,488.00*	*200.00*
6.4.2) Other costs	*64,000.00*	*57,000.00*	*23,732.20*
6.5) Collaboration with ICTP Activities	100,000.00	108,000.00	58,000.00
6.6) Young Affiliates Network	242,880.00	112,880.00	54,929.48
6.6.1) Activities	*222,880.00*	*92,880.00*	*34,958.79*
6.6.2) Other costs	*20,000.00*	*20,000.00*	*19,970.69*
6.7) Coffee Research Conference	100,697.00	100,697.00	91,718.87
6.8) Additional funds for Research Grants	20,000.00	10,000.00	0.00
6.9) Solar Radiation Management Governance Initiative	70,000.00	70,000.00	17,061.57
6.9.1) Grants	*27,200.00*	*27,200.00*	*103.40*
6.9.2) Other Activities	*30,000.00*	*30,000.00*	*5,000.00*
6.9.3) Staff Costs	*12,800.00*	*12,800.00*	*11,958.17*
Sub-Total for (6)	***1,045,525.00***	***856,525.00***	***304,142.12***
7) Operational Expenses			
7.1) Staff Costs	3,000,000.00	2,800,000.00	1,160,024.80
7.2) ICTP Services	300,000.00	300,000.00	54,443.62
7.3) Communications	30,000.00	20,000.00	2,672.92
7.4) Strategic Communications	75,000.00	75,000.00	47,591.94
7.5) Travels	40,000.00	30,000.00	15,589.19
7.6) Fundraising Activities	10,000.00	10,000.00	4,725.19
7.7) Library, office and other supplies	50,000.00	35,000.00	4,547.46
7.8) Other general operating expenses	50,000.00	35,000.00	8,813.80
Sub-Total for (7)	***3,555,000.00***	***3,305,000.00***	***1,298,408.92***
Management Costs	**815,658.13**	**752,292.03**	**258,051.77**
Total Expenditure	**12,467,917.13**	**11,499,321.03**	**4,101,855.36**
Savings on prior years' obligations			258,486.34
Excess (shortfall) of income over expenditure			2,661,819.54
Reserve Fund[2]			
Amount available at the beginning of period			1,781,439.20
End of service entitlements			(189,903.61)
Reserve Fund balance end of period			**1,591,535.59**

[2] The purpose of the Reserve Fund is to cover the end-of-service entitlements of TWAS staff.

TWAS ENDOWMENT FUND 1994-2022[3] (IN USD)

ORGANIZATIONS	CONTRIBUTIONS RECEIVED
1] Ministry of Sciences and Technology, China	2,200,000
2] Ministry of Science and Technology, Brazil	1,933,107
3] Department of Science and Technology, India	1,000,000
4] Consejo Nacional de Ciencia y Tecnología, Mexico	739,155
5] Academia Sinica, Taiwan, China	608,915
6] Ministry of Science and Technology, Nigeria	586,779
7] Kuwait Foundation for the Advancement of Sciences (KFAS), Kuwait	500,000
8] Ministry of Research, Science and Technology, Islamic Republic of Iran	269,183
9] Mohammad Ahmad Hamdan, Jordan	171,000
10] Ministry of Science, Technology and Innovation, Malaysia	100,000
11] Ministry of Science and Technology, Pakistan	100,000
12] Secretariat of Science, Technology and Production Innovation, Argentina	55,000
13] Ministry of Modernization and Technology, Senegal	52,887
14] Administrative Department of Science, Technology and Innovation (COLCIENCIAS), Colombia	50,000
15] Ministry of Higher Education and Scientific Research, Egypt	50,000
16] Atomic Energy Commission of Syria, Syrian Arab Republic	50,000
17] Ministry of Finance and Economic Planning, Sudan	49,850
18] Vietnam Centre for Science and Technology Evaluation, Viet Nam	20,000
19] National Academy of Science and Technology, Philippines	11,957
20] Ministry of Science and Technology, Bangladesh	10,000
21] Ministry of Education, Science and Technology, United Republic of Tanzania	4,529
22] Shui-Chin Lee Foundation for Basic Science, Taiwan, China	4,000
23] Swedish Council for Higher Education, Sweden	1,302
24] Office of the Prime Minister, Jamaica	1,000
25] Instituto Venezolano de Investigaciones Científicas (IVIC), Venezuela	300
Subtotal	**8,568,964**
Plus other contributions[4]	193,577
Plus interest earned	7,197,953
Net Transfer to TWAS Fund (2011-2022)	-3,125,768
TOTAL	**12,834,726**

[3] The aim of establishing this endowment fund was to build a capital of $25 million to cover the secretariat costs and basic programmes.

[4] This amount comprises donations from TWAS Fellows, individuals and other organizations' contributions (see separate list, next page).

CONTRIBUTIONS TO THE ENDOWMENT FUND FROM TWAS FELLOWS, YOUNG AFFILIATES, AND OTHERS (1994-2022)

Wook Hyun Kwon, Korea Rep.	30,000
Bai Chunli, China	21,770
M.H.A. Hassan, Sudan	13,104
J. Palis, Brazil	10,079
Science Initiative Group, USA	6,250
J.I. Vargas, Brazil	5,287
S.S. Katiyar, India	4,100
A.V. Rama Rao, India	3,000
A. Hamoui, Syria	2,500
M. Peimbert, Mexico	2,500
Lu Yong Xiang, China	2,300
P. McGrath, UK	2,046
M. Iqbal Parker, South Africa	2,000
K. Namsrai, Mongolia	1,858
Phillip A. Griffiths, USA	1,750
H. Fuchs, Germany	1,703
B.N. Upreti, Nepal	1,644
Fuchu He, China	1,620
R. Miledi, USA	1,320
L.N. Johnson, UK	1,281
A. Paulrai, USA	1,236
J. Garidkhuu, Mongolia	1,221
F. El-Baz, Egypt	1,200
C.N.R. Rao, India	1,131
E.W. Thulstrup, Denmark	1,062
A. Badran, Jordan	1,045
Jih Ru Hwu, Taiwan, China	1,030
ANSTS, Senegal	1,029
A. Komhauser, Slovenia	1,000
A.O. Kuku, Nigeria	1,000
CAPRISA, South Africa	1,000
E.M. Essien, Nigeria	1,000
G.S. Khush, Philippines	1,000
G.T. Prance, UK	1,000
H.E. Varmus, USA	1,000
I. Eltayeb, Oman	1,000
I. Serageldin, Egypt	1,000
J. Huang, China	1,000
J.L. Moran Lopez, Mexico	1,000
K.E. Mshigeni, Tanzania	1,000
Lee Wu Yan-Hwa, Taiwan, China	1,000
M. Klein, USA	1,000
P. Littlewood, UK	1,000
Pei Gang, China	1,000
R. Murenzi, USA/Rwanda (KIST)	1,000
S.Q. Mehdi, Pakistan	1,000
Sang-Dai Park, Korea Rep.	1,000
Wong Henry Nai Ching, China	1,000
Y. Sobouti, Islamic Republic of Iran	1,000
Y. Yuthavong, Thailand	1,000
Yam Vivian Wing-Wah, China	1,000
Nan Cewen, China	990
Cheng, Hui-Ming, China	985
P. Ciarlet, France	985
Lee Yuan T., Taiwan, China	977
Gaoqing (Max) Lu, UK	966
M. Zhu, China	966
G. Agarwal, USA/India	963
A. Jain, USA	958
E.K.A. Edee, Togo	900
Mei Hong, China	879
J. Lehn, France	840
M. Clegg, USA	830
J. Döbereiner, Brazil	800
M. Munasinghe, Sri Lanka	750
L. de la Pena Auerbach, Mexico	742
B.L. Deekshatulu, India	700
M. Akhtar, Pakistan	700
Wu Yue-Liang, China	666
D. Balasubramanian, India	650
Un-Chul Paek, USA	634
Zhao Jincai, China	621
Dong Shaojun, China	600
F.R.I. Kayanja, Uganda	600
L.F. Rodriguez, Mexico	600
Wang Erkang, China	600
Long Yiming, China	589
C. Vieira, Brazil	500
D.T. Lê, Vietnam	500
E.H.S. Diop, Senegal	500
G. Thottappilly, India	500
Huanming Yang, China	500
J. Allende, Chile	500
J. Jisnuson, Thailand	500
Li Desheng, China	500
M.V. George, India	500
U.G. Cordani, Brazil	500
Z.H. Zaidi, Pakistan	500
R. Crewe, South Africa	496
S. Ayupov, Uzbekistan	495
M. Limonta, Mexico	491
M. Jamshidi, USA	488
E. Ayupov, Uzbekistan	483
P. Y. Kwok, Taiwan, China	483
S. Atluri, USA	483
Li Yiyi, China	465
I. Saavedra, Chile	443
A.H.O. Hajiyev, Azerbaijan	400
M. Tchuente, Cameroon	400
S. J. Jabbur, Lebanon	400
S.S. Hasnain, UK	400
T. Obi, Nigeria	400
N. Kumar, India	360
Mr and Mrs Andriambololona, Madagascar	352
M.P. Alpers, Australia	331
Mu Guoguang, China	330
H. Van Ginkel, The Netherlands	327
A.C. Cerda, Chile	300
B. Tsetseg, Mongolia	300
H. Chaimovich, Brazil	300
H. Ramkissoon, Trinidad & Tobago	300
L. Davidovich, Brazil	300
M.M. Peixoto, Brazil	300
Min Enze, China	300
R. Garruto, USA	300
R.P. Bambah, India	300
S. Datta, India	300
S. Sivaram, India	300
Sang Yup Lee, Korea Rep.	300
Shi Changxu, China	300
Su Zhao-Bin, China	300
Yu Lu, China	300
Zhai Mingguo, China	300
Zhao Zhongxian, China	300
Li Jinghai, China	296
F. Mayor Zaragoza, Spain	294
Chao-Jun Li, China	292
L. Kamau, Kenya	290
M. O'Kane, Australia	288
J.S. Yadav, India	285
Zhang Ya-Ping, China	285
Wang Fosong, China	280
B.M. Abegaz, Ethiopia	272
A. Falodun, Nigeria	200
A.K. Sood, India	200
Chen Sai-Juan, China	200
Chen Zhu, China	200
E. Igbinosa, Nigeria	200
E. Unuabonah, Nigeria	200
R. Ramaswamy, India	200
S. I. Ola, Nigeria	200
T. Durrani, UK	200
Ding Zhongli, China	193
C.F.M. Menck, Brazil	192
A.M. Cetto, Mexico	151
A. Bahri, Tunisia	143
H. Roesky, Germany	106
M. Jakovljevic, Serbia	106
H.K. Majumder, India	100
K. Basu, USA	100
M.A.J. Mariscotti, Argentina	100
R. Zare, USA	100
S.M. Muhongo, South Africa	100
U. Aswathanaray, India	100
P.E. Presiren, Italy	98
U. Colombo, Italy	97
S. Banerjee, India	96
M. Mansour, Switzerland	95
A. Peeraly, Canada	86
I. Daubechies, USA	48
TOTAL	**193,577**

VOLUNTARY CONTRIBUTIONS RECEIVED FROM TWAS FELLOWS, YOUNG AFFILIATES, AND OTHERS (2022 ONLY)

Individual donations[1] to the programme budget were received from:

Wang Xiaoyun, China
Jane Lubchenco, USA
Soroosh Sorooshian, USA
Sabah AlMomin, Kuwait
Vanderlan Bolzani, Brazil
Haseena Khan, Bangladesh
Gianmarco Pondrano Altavilla
and from one other anonymous donor.

Individual donations to the Endowment Fund were received from:

BGI Hong Kong Tech Co. Ltd.
Bishal Upreti, Nepal
Patricia Eleonora Presiren, Italy
and from one other anonymous donor.

[1] Names are listed in the order of amount donated, from most to least, in each category.

Every donation, large or small, directly supports the advancement of science, engineering and technology in developing nations and demonstrates commitment to the Academy's vital mission. To make a donation, please visit **www.twas.org/support-twas**

NEW TWAS FELLOWS AND TWAS YOUNG AFFILIATES

TWAS FELLOWS ELECTED IN 2022

Agricultural Sciences
- ASSEM, Shireen Kamal Assem Abd El-Halim (Egypt)
- IDERIS, Aini (Malaysia)
- JAYARAMAN, Jayaraj (Trinidad and Tobago)
- MAZZAFERA, Paulo (Brazil)
- YANG, Weicai (China)

Structural, Cell and Molecular Biology
- LI, Jinsong (China)
- PANT, Bijaya (Nepal)
- RANGAPPA, Kanchugarakoppal (India)
- VAN SLUYS, Marie-Anne (Brazil)

Biological Systems and Organisms
- BEYENE, Yonas (Ethiopia)
- MOMBA, Maggy Ndombo Benteke (South Africa)
- PANDEY, Ashok (India)
- PRIMAVERA, Jurgenne Honculada (Philippines)
- SHINWARI, Zabta Khan (Pakistan)

Medical and Health Sciences, including Neurosciences
- BOZZA, Patricia T. (Brazil)
- DIKSHIT, Madhu (India)
- GAMBOA VILELA, Dionicia Baziliza (Peru)
- HUNG, Mien-Chie (Taiwan, China)
- KABIR, Yearul (Bangladesh)
- OSIER, Faith Hope Among'in (Kenya)
- OVBIAGELE, Bruce (United States)
- QIAO, Jie (China)
- SANOGO, Rokia (Mali)
- WASAY, Mohammad (Pakistan)

Chemical Sciences
- CORDOBA DE TORRESI, Susana Ines (Brazil)
- GUO, Zijian (China)
- MUKHERJEE, Partha Sarathi (India)

Engineering Sciences
- BELLOT NORONHA, Fabio (Brazil)
- DJEFFAL, Fayçal (Algeria)
- FOTUHI-FIRUZABAD, Mahmud (Islamic Republic of Iran)
- HUANG, Tingwen (Qatar)
- RAO, Valipe Ramgopal (India)
- SHAHNAZ, Celia (Bangladesh)
- ZHANG, Yue (China)

Astronomy, Space and Earth Sciences
- ARETXAGA, Itziar (Mexico)
- DE GOUVEIA DAL PINO, Elisabete Maria (Brazil)
- ELTAHIR, Elfatih (United States)
- PIAO, Shilong (China)

Mathematical Sciences
- CABALLERO MOTA, Yaile (Cuba)
- MOSLEHIAN, Mohammad Sal (Islamic Republic of Iran)
- NUSSENZVEIG LOPES, Helena Judith (Brazil)
- PRASAD, Dipendra (India)
- YE, Xiangdong (China)

Physics
- DUAN, Wenhui (China)
- GOMES, Anderson Stevens Leonidas (Brazil)
- NAHAR, Sultana Nurun (United States)
- T SUBRAMANIAM, Ramesh (Malaysia)

Social and Economic Sciences
- BERNARDO, Allan B. I. (Philippines)
- CHAKRABORTI, Anirban (India)
- YANG, Cuihong (China)

TWAS YOUNG AFFILIATES SELECTED IN 2022

Sub-Saharan Africa
- ADEBO, Janet Adeyinka (Nigeria)
- ADEBO, Oluwafemi Ayodeji (Nigeria)
- EJIKEUGWU, Peter Chika (Nigeria)
- NDAGIRE, Catherine Tamale (Uganda)
- TESFAHANNES, Tesfay Gebremariam (Ethiopia)

Arab Region
- AL KHARUSI, Amira Said Mohammed (Oman)
- ALI, Gomaa A.M. (Egypt)
- BENCHAABANE, Aida (Tunisia)
- HANBALI, Ghadir (Palestine, West Bank and Gaza Strip)
- HASAN, Fuad Ameen Saad (Yemen)

Latin America and the Caribbean
- BERENGUER, Erika (Brazil)
- ECHEVERRÍA-GALINDO, Paula Gabriela (Guatemala)
- GONZÁLEZ ABREU, Yuslín (Cuba)
- PERAZA CASTANEDA, Elías Humberto (El Salvador)
- REYES CHÁVEZ, Johan David (Honduras)

East and South-East Asia and Pacific
- BALELA, Mary Donnabelle (Philippines)
- LAI, Khin Wee (Malaysia)
- SHEN, Ke (China)

Central and South Asia
- KHAKIMOV, Otabek Norbuta Ugli (Uzbekistan)
- NASERI, Naimeh (Islamic Republic of Iran)
- SHARMA, Prerna (India)
- SURVOY, Musrat Zahan (Bangladesh)

AWARDS CONFERRED IN 2022

TWAS-Lenovo Science Award
- FU, Bojie (China)

TWAS Medals
- GAO, George Fu (China)
- CHERKAOUI EL MOURSLI, Rajaâ (Morocco)
- ALBERTS, Bruce (USA)
- CHEONG, Sok Ching (Malaysia)

TWAS-CAS Young Scientist Award for Frontier Science in Physical Sciences
- SUN, Yele (China)

TWAS-Mohammad A. Hamdan Award
- EZZINBI, Khalil (Morocco)

2022 TWAS-Atta-ur-Rahman Award
- RAJAPAKSHA, Anushka Upamali (Sri Lanka)

TWAS-Samira Omar Innovation for Sustainability Award
- RAKOTONARIVO, Sarobidy (Madagascar)

TWAS-Fayzah M. Al-Kharafi Award (shared)
- BANU, Sayera (Bangladesh)
- HAIDER, Nadia (Syrian Arab Republic)

TWAS-Abdool Karim Award in Biological Sciences
- NAKANJAKO, Damalie (Uganda)

TWAS Awards for 2024 (announced in 2022)
- EKESI, Sunday (Kenya), agricultural sciences
- ZHAO, Fang-Jie (China), agricultural sciences
- TSAY, Yi-Fang (Taiwan, China), biology
- VARADARAJAN, Raghavan (India), biology
- ERDOGAN ORHAN, Ilkay (Türkiye), chemistry
- ZHANG, Suojiang (China), chemistry
- XU, Xing (China), Earth, astronomy and space sciences
- SALIT, Mohd Sapuan (Malaysia), engineering
- YOU, Jiangong (China), mathematics
- WEI, Fu-Chan (Taiwan, China), medical sciences
- FORBES, Andrew (South Africa), physics
- KWO, Jueinai (Taiwan, China), physics
- DE SOUZA MINAYO, Maria Cecilia (Brazil), social sciences

TWAS Regional Awards in Science Diplomacy
- ABDELSALAM, Sara (Egypt)
- BARAN, Yusuf (Turkey)
- KURNIAWAN, Tonni (Indonesia)
- TAYALATI, Yahya (Morocco)
- TOMORI, Oyewale (Nigeria)
- TRINDADE LIMA, Nísia (Brazil)

OWSD-Elsevier Foundation Awards for Early-Career Women Scientists in the Developing World
- AHMED QAED AHMED, Abeer (Yemen)
- CHOWDHURY, Gawsia Wahidunnessa (Bangladesh)
- CALDERON, Heyddy (Nicaragua)
- GONZÁLES MIRANDA, Flor de Mayo (Guatemala)
- MUJAWAMARIYA, Myriam (Rwanda)
- RANATHUNGA, Ashani Savinda (Sri Lanka)

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