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A N N U A L R E P O R T
2017

THE WORLD ACADEMY OF SCIENCES

for the advancement of science in developing countries

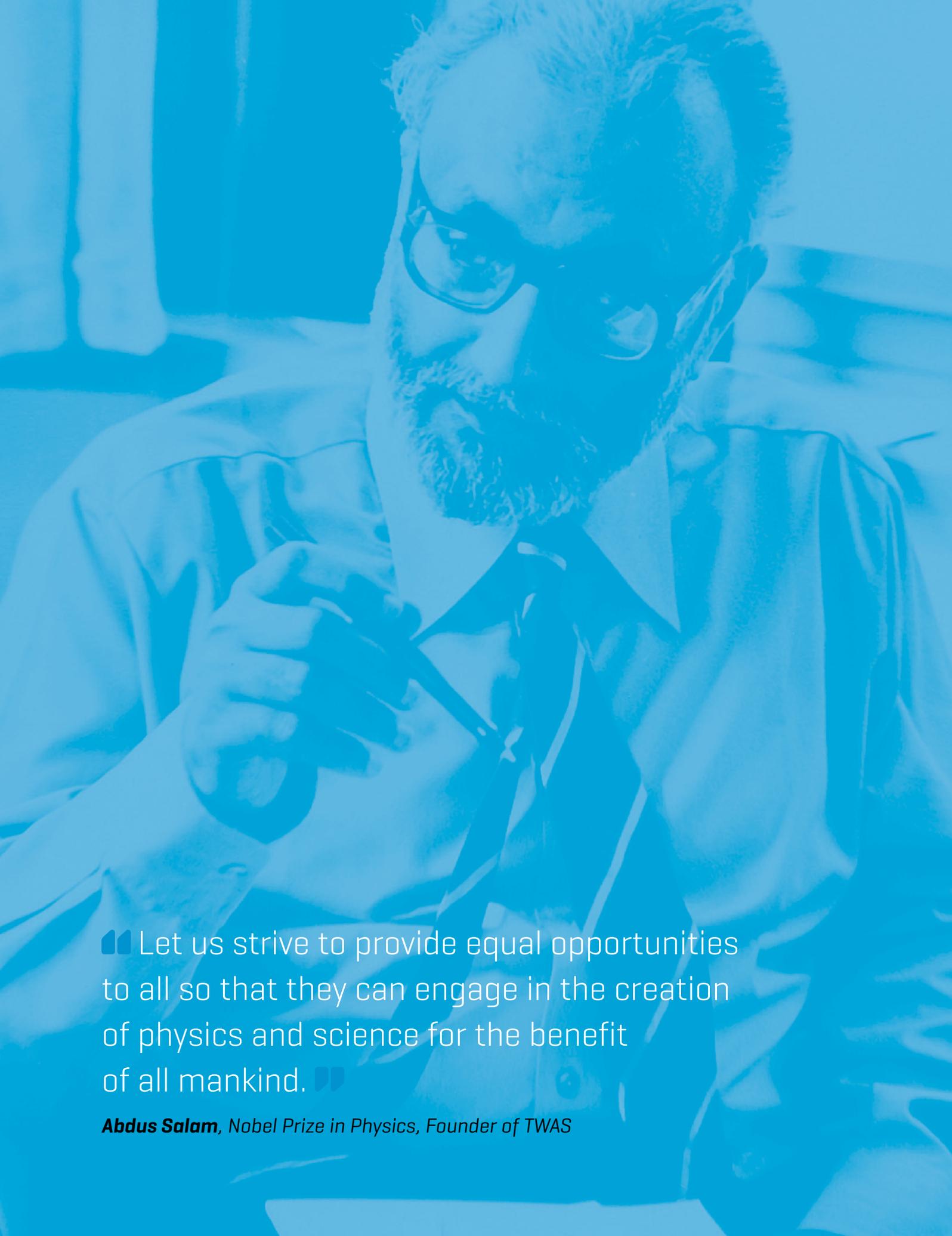
twas



ANNUAL REPORT
2017

THE WORLD ACADEMY OF SCIENCES

for the advancement of science in developing countries



“ Let us strive to provide equal opportunities to all so that they can engage in the creation of physics and science for the benefit of all mankind. ”

Abdus Salam, Nobel Prize in Physics, Founder of TWAS



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Cover photo: Saja Al Zoubi, a Syrian social scientist and former TWAS postdoctoral research fellow, left her home country in a time of war and conducted research in the refugee camps of Lebanon. She is featured in the 2017 TWAS documentary film, "Science in Exile". [Image by Nicole Leghissa]

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THE TWAS COUNCIL

The TWAS Council, elected by members every three years, is responsible for supervising all Academy affairs. The current Council was elected in January 2016 and will serve until the end of 2018.

President

Bai Chunli [China]

Immediate Past President

Jacob Palis [Brazil]

Vice-Presidents

Africa:

Moctar Toure [Senegal]

Arab Region:

Mohammed Hamdan [Jordan]

Central and South Asia:

Rabia Hussain [Pakistan]

East and Southeast Asia:

Khatijah M. Yusoff [Malaysia]

Latin America and Caribbean:

Manuel Limonta-Vidal [Cuba]

Secretary General

Ajay K. Sood [India]

Treasurer

Samira Omar Asem [Kuwait]

Council Members

Africa:

Robin Crewe [South Africa]

Arab Region:

Abdel Nasser Tawfik [Egypt]

Central and South Asia:

Habib Firouzabadi [Iran]

East and Southeast Asia:

Bishal Nath Upreti [Nepal]

Latin America and Caribbean:

Mahabir Prashad Gupta [Panama]

Ex-officio Council Member

Fernando Quevedo [Guatemala]

[Director, Abdus Salam International Centre for Theoretical Physics [ICTP]]

THE TWAS MISSION

TWAS – The World Academy of Sciences for the advancement of science in developing countries – works to advance sustainable prosperity through research, education, policy and diplomacy.

TWAS was founded in 1983 by a distinguished group of scientists from the developing world, under the leadership of Abdus Salam, the Pakistani physicist and Nobel Prize winner. Today, TWAS has about 1,220 elected Fellows representing 100 countries, 14 of them Nobel laureates. The Academy is based in Trieste, Italy, on the campus of the Abdus Salam International Centre for Theoretical Physics (ICTP). It receives core funding from the government of Italy, and essential programmatic funding from the Swedish International Development Cooperation Agency (Sida). The United Nations Educational, Scientific and Cultural Organization (UNESCO) administers TWAS funds and personnel.

Through more than three decades, TWAS's 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;
- Encourage scientific research and sharing of experiences in solving major problems facing developing countries.

2017:

STRIVING FOR EXCELLENCE



by **Bai Chunli**,
TWAS President

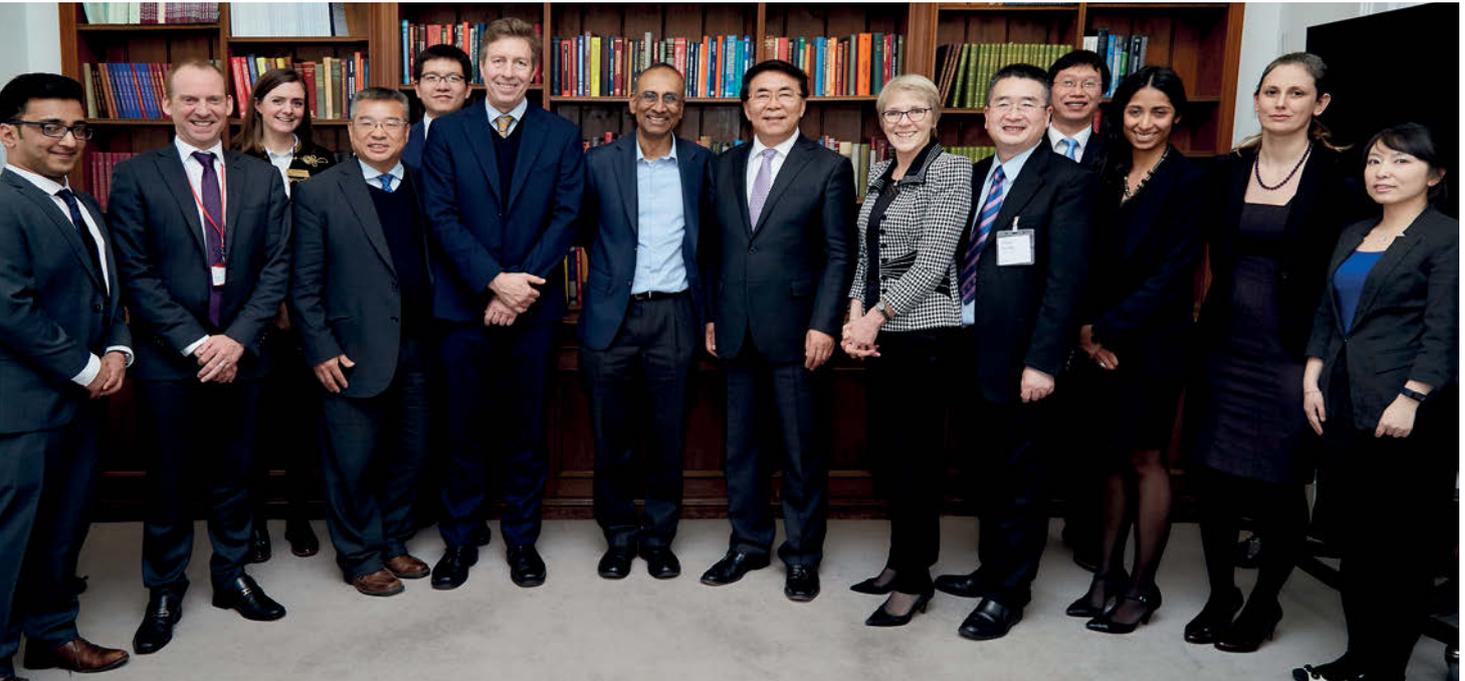
TWAS founder Abdus Salam won the Nobel Prize for physics in 1979, and in his brief but elegant remarks at the Nobel banquet, he urged the audience to join in a momentous quest: “Let us strive to provide equal opportunities to all so that they can engage in the creation of physics and science for the benefit of all mankind.”

For Salam, creating opportunities for young men and women in the developing world was a core principle in a career of public service, and when TWAS was founded a few years later, he set this as a central part of the Academy’s mission. Now, after steady progress across more than 30 years, we have achieved an historic milestone:

At the end of 2017, for the first time ever, more than 1,000 early-career scientists were studying for their PhDs under programmes offered by TWAS and its partners. To be exact, there were 1,070 – about 700 of them in the CAS-TWAS President’s PhD Fellowship programme that we founded in 2013. At the same time, our colleagues at the Organization for Women in Science for the Developing World [OWSD] had about 225 active PhD students, most of them in Africa.

This is a remarkable accomplishment, and our members and partners can justifiably be proud. Within a few years, if all goes well, more than a thousand new scientists will be at work in the world – conducting research, advising governments and businesses, and educating a new generation. They will be assuming leadership for the progress of science in the developing world.

One of them is Rwandan chemical engineer Kamana Emmanuel, pursuing his PhD at the University of Science and Technology of China. “I worked days and nights in the lab,” he recalls, “and I succeeded in the first project and I published a paper with my group members as a first author. This encouraged me to work further because I saw that everything could be possible.”



▲ Venkatraman Ramakrishnan, president of the Royal Society, and Bai Chunli, president of the Chinese Academy of Sciences and TWAS, led delegations who met in London for discussions about cooperation in science-for-development initiatives. [Photo: The Royal Society]

Our milestone reflects the expansion of many of our programmes in recent years, in every region of the developing world. Our established fellowship, research grant and visiting scientist programmes continue to have a powerful cumulative impact. More recent initiatives, such as the Solar Radiation Management Governance Initiative and the TWAS Young Affiliates Network (TYAN), are showing strong energy and growth.

One new project has achieved particular success: Our 2017 workshop on researchers displaced by war has helped to galvanise an international network of stakeholders, and they look to TWAS as a leader. Our film on this topic, "Science in Exile", premiered at the World Science Forum in Jordan and has since screened at prominent scientific meetings, cultural gatherings and universities worldwide.



▶ From left: Mohamed H.A. Hassan; Romain Murenzi.

These achievements remind us of how important our partners are to all of our work. Our relationship with Italy remains strong and enormously productive. The Swedish International Development Cooperation Agency (Sida) provides essential funding for our research grants and for OWSD, and it has supported our work with refugee scientists. In 2017, we forged a major new partnership with the Islamic Development Bank; together, we will build new programmes focused on the Bank's member countries, especially the 25 Least Developed Countries among its members. And I'm pleased to say that after a cordial visit to the Royal Society in London, our academies are now exploring new areas for cooperation.

Finally, I want to thank two men who have been instrumental in 2017 successes: When Executive Director Romain Murenzi was transferred to UNESCO headquarters in Paris in 2016, TWAS founding Executive Director Mohamed Hassan stepped in and served admirably on an interim basis until Prof. Murenzi returned in September 2017.

At a time of tremendous growth, we are grateful for their leadership – and leadership from the TWAS Council and many others – that helps to assure success in our shared mission. Working together, everything is indeed possible.

A YEAR 0

For TWAS, 2017 was a year of significant expansion in programmes, networks and the reach of its communication. The Academy continues to provide important opportunities to developing world researchers, and it is increasingly influential globally as a centre for science policy and diplomacy. Among the Academy's central accomplishments:

1 PhD fellowships hit milestone

For the first time in TWAS history, the number of PhD fellowship awardees on-site working on their degrees passed 1,000. As of the end of 2017, the Academy was sponsoring 1,070 active postgraduates, more than half hosted by the Chinese Academy of Sciences through the CAS-TWAS President's PhD Fellowship Programme. [For more on TWAS fellowships, see page 16]



2 At-risk scientists: a path-breaking workshop

Leaders from science, diplomacy and education explored the challenges confronting researchers fleeing violence and repression in their home countries at a first-of-its-kind workshop co-sponsored by TWAS. Workshop attendees, including several war-displaced scientists, collaborated to compose recommendations urging science organisations,



F IMPACT



3

thought-leaders declared their commitment to “Science for Peace”. Nearly 3,000 participants attended, and panelists included leaders of the world’s largest research organisations, science ministers and advisers. TWAS and the InterAcademy Partnership (IAP), focused on challenges important to the developing world – such as brain drain and development in Africa. It was also the scene of the world premiere of “Science in Exile”, TWAS’s new film on displaced and refugee scientists. [For more on science policy, see page 20]



4



5

universities, policymakers and others to identify at-risk researchers and assure that they can get back to work in their new countries. [For more on at-risk scientists, see page 24]

3 A leading role at the World Science Forum

TWAS had a significant presence at the 2017 World Science Forum in Jordan, where global

4 New prizes for women launched

The Academy has developed a new series of prizes for women, and in 2017 two of the three issued their first awards: The TWAS-Abdool Karim Prize for women scientists in low-income African countries went to a Kenyan epidemiologist, and the first TWAS-Samira Omar Innovation for Sustainability Prize, dedicated to scientists from LDCs, went to a leader in Ugandan conservation. [For more on prizes, see page 14]

5 Support from TWAS partners

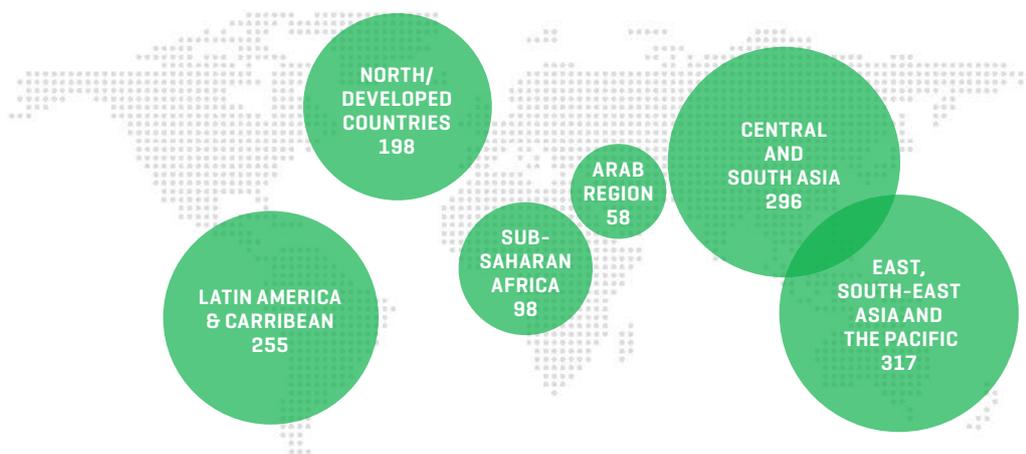
Two partners advanced key support for TWAS and its programmes. The Swedish International Development Cooperation Agency (Sida) contributed USD13.7 million over five years, reaffirming its support for the work of TWAS, OWSD and GenderInSITE. Also, the Islamic Development Bank (IDB) and TWAS signed an accord to explore cooperation in sustainability grants, training workshops and other areas of need in the 57 IDB countries. [For more on TWAS partners, see page 12]

WHO W

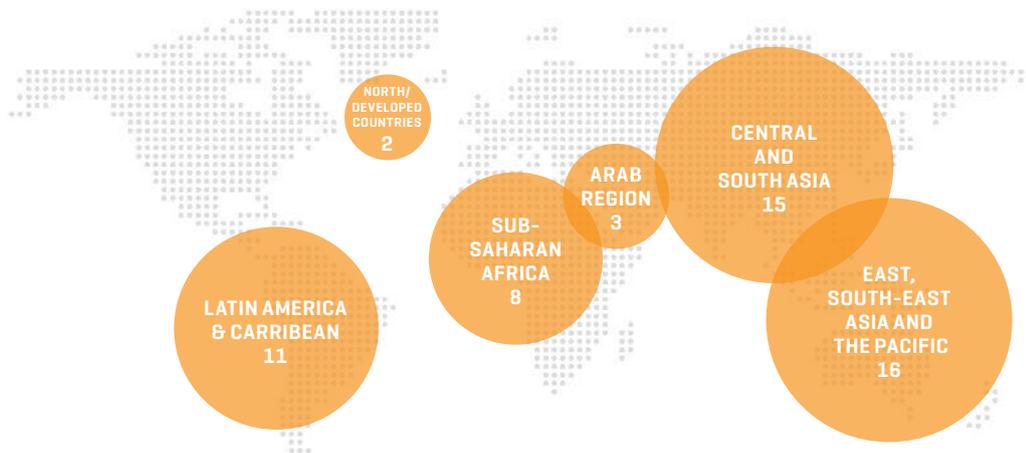
TWAS is a global, merit-based science academy, representing the elite of scientific accomplishment in or related to the developing world. Only those scientists who have achieved the highest level of international standards and have made significant contributions to the advancement of science can be elected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

In 2017, the TWAS Council decided that fellows elected in December of one year would be inducted the following year. So these charts represent the membership elected in 2017 but officially inducted with the start of 2018.

Fellows from developing countries, by region



TWAS Fellows elected in 2017, by region



For a full list of fellows inducted in 2017, please see page 42

Fellows

 **1,222**
TOTAL FELLOWS*

 **93**
COUNTRIES

 **84%**
LIVE AND WORK
IN DEVELOPING
COUNTRIES

 **14**
NOBEL PRIZE
LAUREATES

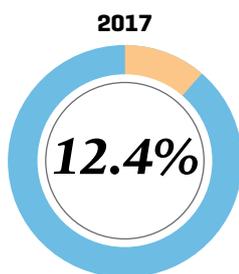
TWAS Fellows elected in 2017 by country:

- 12** CHINA
- 11** INDIA
- 5** BRAZIL
- 4** SOUTH AFRICA
- 3** TAIWAN, CHINA
- 1** ARGENTINA;
BANGLADESH;
CAMEROON; CHILE;
INDONESIA; IRAN,
ISLAMIC REP.;
KAZAKHSTAN; KENYA;
MEXICO; MOROCCO;
NORWAY; OMAN;
PANAMA; SUDAN;
TRINIDAD AND TOBAGO;
UGANDA; UNITED
STATES; UZBEKISTAN;
VENEZUELA;
ZIMBABWE

E ARE

FELLOWS AND YOUNG AFFILIATES

Women Fellows



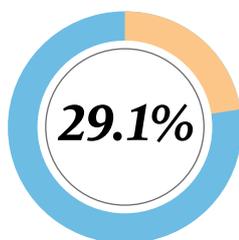
152 WOMEN OUT OF 1,222 MEMBERS*

1984



2 WOMEN OUT OF 55 MEMBERS

New Fellows



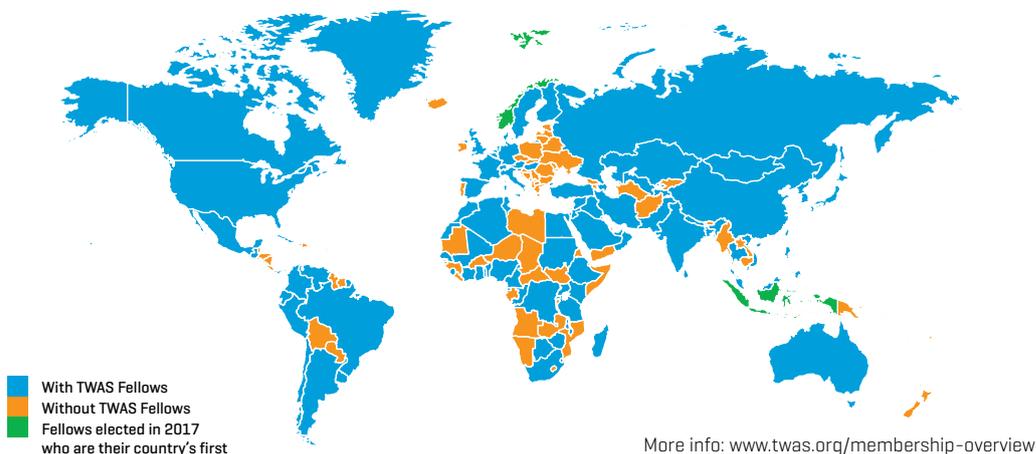
16 OUT OF 55 TWAS FELLOWS ELECTED IN 2017 WERE WOMEN

* Including fellows elected in 2017 for 2018

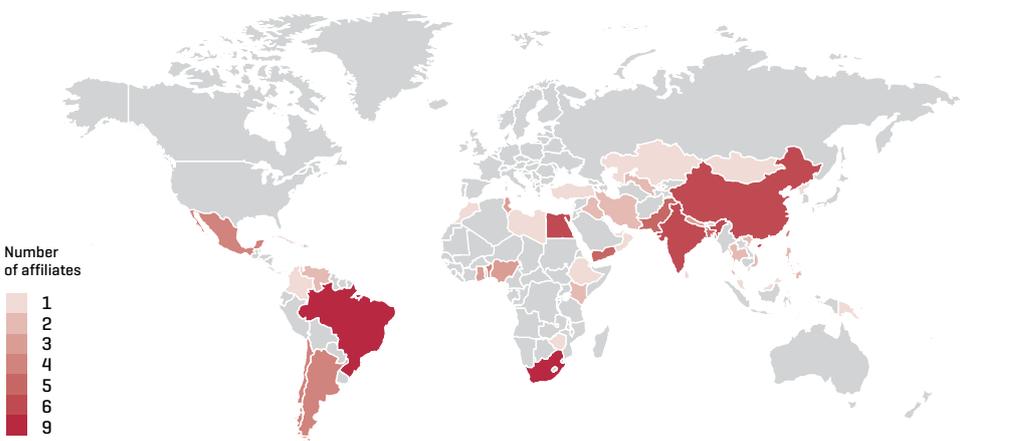
Four long-time allies provide indispensable support that makes the work of TWAS possible:

- **The Government of Italy** provides core funding.
- **The Swedish International Development Cooperation Agency (Sida)** supports TWAS research grants and science diplomacy initiatives, plus the Organization for Women in Science for the Developing World.
- **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 valuable administrative support.

Countries with and without TWAS Fellows



TWAS Young Affiliates in 2017 by country of residence



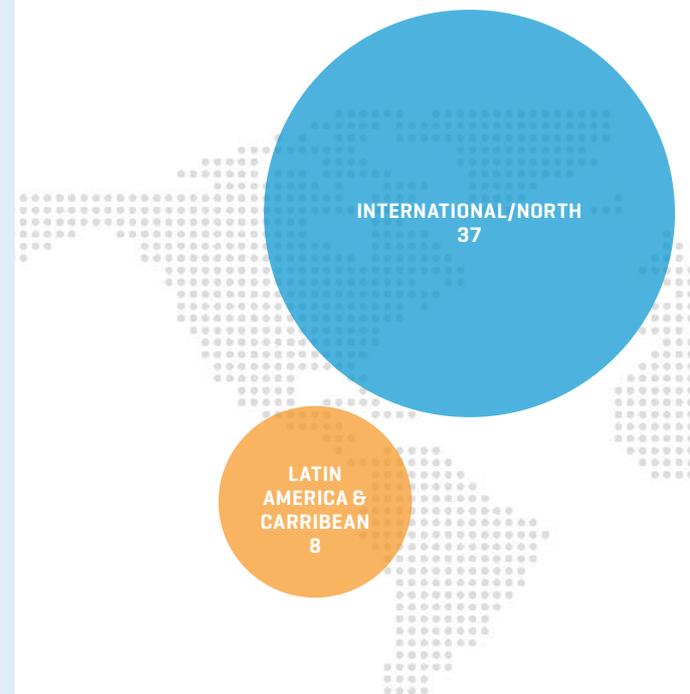
TWAS PA

INTERNATIONAL/NORTH

- Abdus Salam International Centre for Theoretical Physics [ICTP]
- Accademia dei Lincei, Italy
- Al-Fanar Media
- Alexander von Humboldt Foundation [AvH], Germany
- American Association for the Advancement of Science [AAAS]
- Biovision, France
- Elsevier Foundation, Netherlands
- Environmental Defense Fund [EDF], U.S.
- Euro-Mediterranean University [EMUNI], Slovenia
- Fondazione Internazionale Trieste [FIT]
- French Foundation for Rare Diseases
- GenderInSITE
- German Research Foundation [DFG]
- Global Research Council [GRC]
- Global Young Academy [GYA]
- Islamic Development Bank
- The InterAcademy Partnership [IAP]
- International Council for Science [ICSU]
- International Development Research Centre [IDRC], Canada
- International Mathematical Union [IMU], Germany
- International Network of Government Science Advice [INGSA]
- Istituto Nazionale di Oceanografia e di Geofisica Sperimentale [OGS], Italy
- The International School of Advanced Studies [SISSA]
- International Social Science Council [ISSC]
- Italian Ministry of Foreign Affairs and International Cooperation [MAECI]
- Japan Science and Technology Agency [JST]
- Lindau Nobel Laureate Meetings, Germany
- New York Academy of Sciences [NYAS]
- Organization for Women in Science for the Developing World [OWSD]
- The Royal Society, U.K.
- SciDev.Net
- Science Initiative Group [SIG]
- The Solar Radiation Management Governance Initiative [SRMGI]
- Standing Committee on Scientific and Technological Cooperation of the Organisation of Islamic Cooperation [COMSTECH]
- Swedish International Development Cooperation Agency [Sida]
- World Meteorological Organization [WMO]
- United Nations Organization for Education, Science and culture [UNESCO]

“ Working together,
everything is indeed possible. ”

TWAS President **Bai Chunli**



LATIN AMERICA & THE CARIBBEAN

- Academy of Sciences of Ecuador [ACE]
- Brazilian Academy of Sciences [ABC]
- Brazilian Council for Scientific and Technological Development [CNPq]
- The Caribbean Community [CARICOM]
- Ministry of Science and Technology of Argentina
- Ministry of Science, Technology and Innovation [MCTI], Brazil
- National Council for S&T Research [CONICET], Argentina
- National Council on Science and Technology [CONACYT], Mexico

RTNERS

ARAB REGION

- Bibliotheca Alexandrina, Egypt
- Kuwait Foundation for the Advancement of Sciences [KFAS]
- Lebanese Association for Scientific Research [LAsER]
- OPEC Fund for International Development [OFID]
- The Royal Scientific Society of Jordan

EAST AND SOUTH-EAST ASIA AND THE PACIFIC

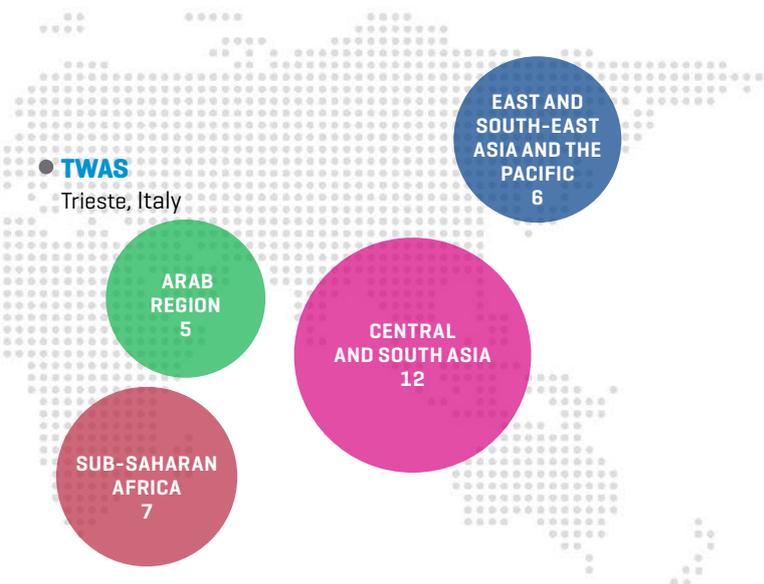
- Academia Sinica, Taiwan, China
- Center for Genetic Engineering and Biotechnology [BIOTEC], Thailand
- Chinese Academy of Sciences [CAS]
- International Science, Technology and Innovation Centre for South-South Cooperation [ISTIC], Malaysia
- Universiti Putra Malaysia [UPM]
- Universiti Sains Malaysia [USM]

CENTRAL AND SOUTH ASIA

- Centre of Excellence in Molecular Biology [CEMB], Pakistan
- Commission on Science and Technology for Sustainable Development in the South [COMSATS], Pakistan
- COMSATS Institute of Information Technology [CIIT], Pakistan
- Council of Scientific and Industrial Research [CSIR], India
- Department of Biotechnology [DBT], India
- Department of Science and Technology [DST], India
- Indian Association for the Cultivation of Science [IACS]
- International Center for Chemical and Biological Sciences [ICCBS], Pakistan
- Iranian Research Organization for Science and Technology [IROST]
- Jawaharlal Nehru Centre for Advanced Scientific Research [JNCASR]
- National Centre for Physics [NCP], Pakistan
- S.N. Bose National Centre for Basic Sciences [SNBNCBS]

SUB-SAHARAN AFRICA

- Academy of Science of South Africa [ASSAf]
- African Academy of Sciences [AAS]
- African Union [AU]
- Department of Science and Technology, South Africa [DST]
- International Centre of Insect Physiology and Ecology [icipe], Kenya
- National Research Foundation [NRF], South Africa
- Sudanese National Academy of Sciences [SNAS]

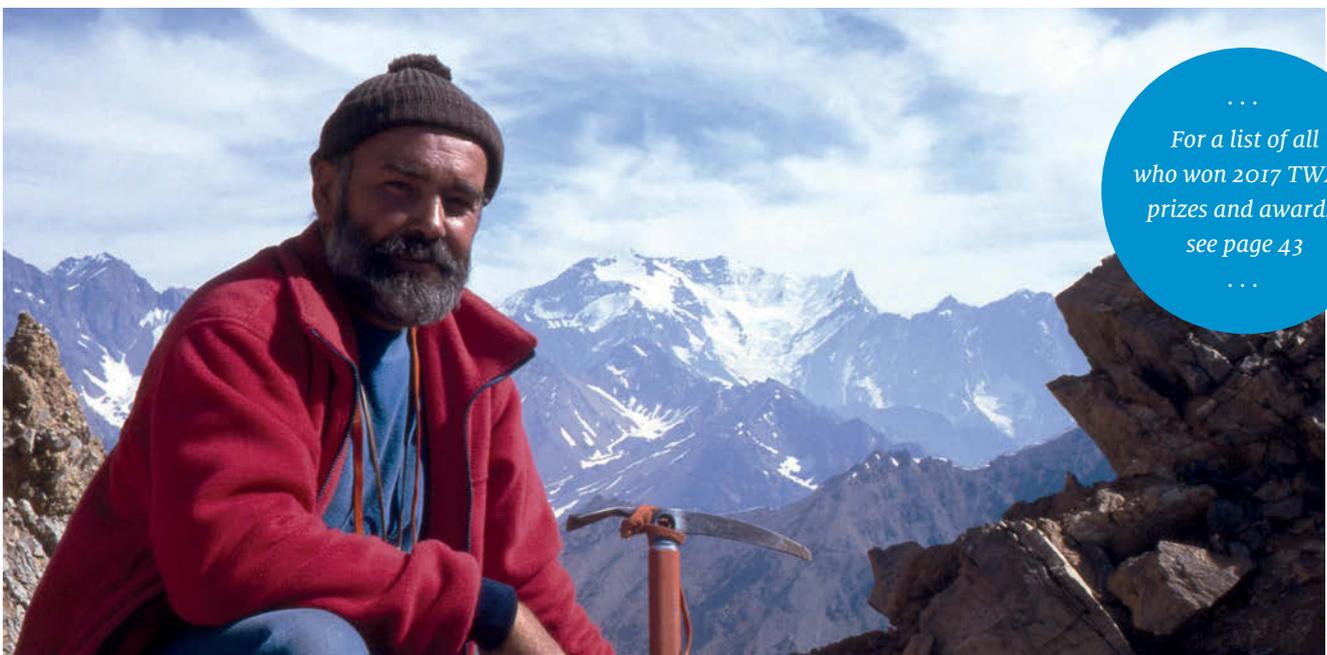


HONOURING SCIENTIFIC EXCELLENCE

TWAS has long recognized that prizes and awards provide an incentive for scientists to do their best work, while bringing global recognition to discoveries achieved by researchers in the developing world. [For a list of all who won 2017 TWAS prizes and awards, see page 43]

The 2017 TWAS-Lenovo Prize was awarded to Argentine geoscientist and 1998 TWAS Fellow **Victor Alberto Ramos**, for his work on the formation of the Andes, both shedding light on the story behind his home continent and studying the cause of strong earthquakes along the mountain range. Over decades, Ramos' work

▼ Victor Alberto Ramos at Portezuelo Navarro Mendoza in the Andes in 1987. [Photo provided]



...
For a list of all
who won 2017 TWAS
prizes and awards,
see page 43
...



▲ From left: Caroline Asimwe of Uganda; Kalulu Taba of the Democratic Republic of the Congo; Barbara Burmen of Kenya; Fathiah Zakham of Yemen; and Rémy Bertrand Teponno of Cameroon.

“ The TWAS award is truly an honour in my career. It’s a chance to be internationally recognized as an early-career female scientist already making a significant contribution to the advancement of my field. ”

Barbara Burmen, Kenyan epidemiologist and winner of the first TWAS-Abdool Karim Prize

Winners of Young Scientist Prizes from 2017



(Five winners)

JORDAN



(Two winners each)

BANGLADESH
COSTA RICA
CUBA
IRAN, ISL. REP.
MONGOLIA
NEPAL
PANAMA
UZBEKISTAN



(One winner each)

COLOMBIA
GUATEMALA
SRI LANKA
THAILAND
PHILIPPINES

helped reveal how the Andes and the underlying landmasses formed hundreds of millions of years ago.

The TWAS-Lenovo Prize is one of the most prestigious honours given to scientists from the developing world. It includes USD100,000 provided by Lenovo, the largest PC company in the world.

Learn more: www.twas.org/node/12487/

The Academy has developed a new series of prizes for women. The first-ever **TWAS-Abdool Karim Prize** for women scientists in low-income African countries for achievements in biology went to Kenyan epidemiologist **Barbara Burmen** for her research to improve screening methods for tuberculosis preventative therapy. The first **TWAS-Samira Omar Innovation for Sustainability Prize**, dedicated to scientists from the 47 Least Developed Countries, went to **Caroline Asimwe**, a leader in Ugandan conservation research who is protecting wildlife from illegal activities.

It was also the second year for the **TWAS-Fayzah M. Al-Kharafi Prize**, an annual award that recognizes exceptional women scientists from scientifically and technologically lagging countries. The winner was Yemeni microbiologist **Fathiah Zakham**, whose research

is focused on controlling the spread of drug-resistant tuberculosis. Zakham is currently in Switzerland, working in a postdoctoral position at the University Hospital of Lausanne.

Learn more about Burmen: www.twas.org/node/12474/

Learn more about Asimwe: www.twas.org/node/12475/

Learn more about Zakham: www.twas.org/node/12486/

The 2017 TWAS-C.N.R. Rao Prize went to **Kalulu Taba**, a 2015 TWAS Fellow and organic chemist at The University of Kinshasa in the Democratic Republic of the Congo. His research verified that local plants used by herbalists help purify water and treat malaria. His work also tests local herbal medicine traditions in the DRC, such as those practiced by trusted community members to treat diseases.

Learn more: www.twas.org/node/12477/

The 2017 TWAS-Atta-ur-Rahman Prize in chemistry went to **Rémy Bertrand Teponno**, an early-career chemist from Cameroon, who has identified plants that produce compounds with potentially far-reaching value in the global battle against antibiotic resistance.

Learn more: www.twas.org/node/12484/

EDUCATION & TRAINING

TWAS manages the world’s largest South-South PhD and postdoctoral research fellowship programme. Through the Academy, its associated organizations and partners, early-career researchers can get education and experience at world-class science institutions in Brazil, China, India, Malaysia, Mexico, Pakistan, Thailand and South Africa.

In 2017, TWAS reached a new milestone, for the first time surpassing 1,000 active PhD students. Most of them – 798 – are researchers

hosted by the Chinese Academy of Sciences through the CAS-TWAS President’s PhD Fellowship Programme. The Academy had never previously sponsored more than 801 at any given time.

Also, the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA) entered an agreement with TWAS to host postdoctoral scientists from developing countries.

PhD fellowships

 **378**
OFFERED

 **9** PARTNERS

 **5** COUNTRIES

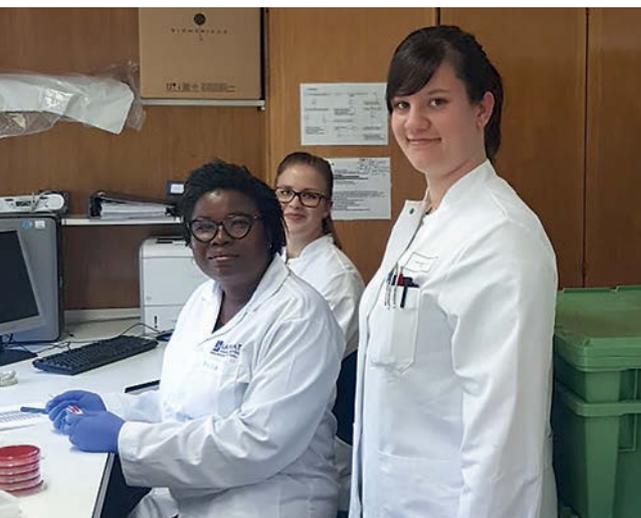
Postdoctoral fellowships

 **123**
OFFERED

 **10** PARTNERS

 **6** COUNTRIES

◀ Left: Adesola Oluwafunmilayo Olalekan of Nigeria, left, at a laboratory in Germany as part of the TWAS-DFG Cooperation Visits Programme. Right: Materials scientist Domingos Lusitâneo Pier Macuvele of Mozambique, third from left, in Brazil for the TWAS-CNPq fellowship.



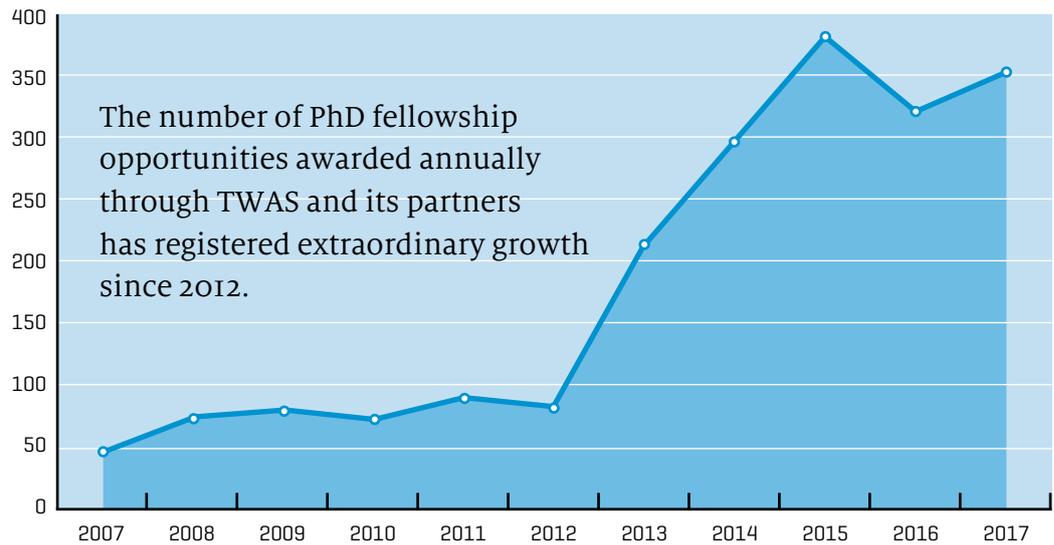
PhD fellows in 2017



1,070

TWAS PHD FELLOWS WERE ON-SITE AND WORKING TOWARD THEIR DEGREES.

TWAS PhD fellowships

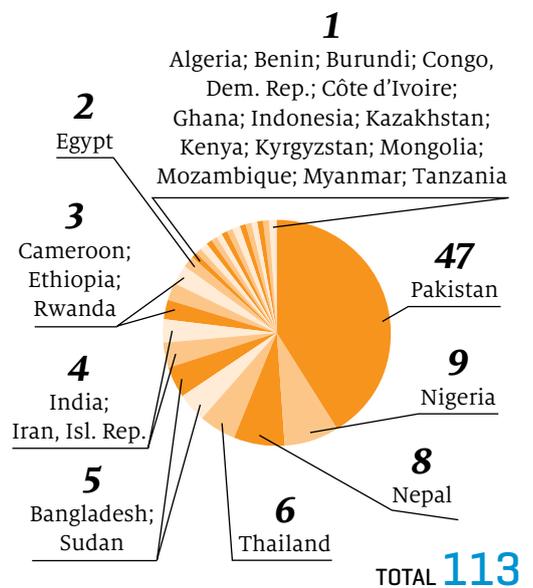


VISITING SCIENTISTS

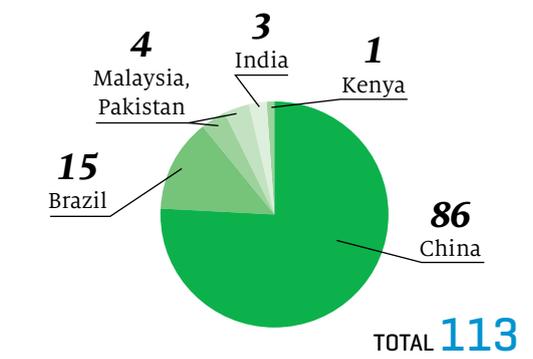
TWAS provides opportunities to established researchers from the South to pursue collaborative research and education or provide needed expertise in a country other than their own. In 2017, the programmes included:

- **TWAS-DFG Cooperation Visits Programme:** 35 early-career African scientists from 11 countries doing postdoctoral research in Germany under the guidance of the German Research Foundation [Deutsche Forschungsgemeinschaft - DFG]
- **TWAS-UNESCO Associateship:** 12 developing-world scientists from 11 countries
- **TWAS Research and Advanced Training Fellowship Programme:** Eight developing-world scientists from four countries
- **Visiting Expert Programme:** Four experts aiding scientific development in host countries
- **TWAS-Elsevier Foundation Sustainability Visiting Experts:** Six awardees from four countries

Home country for new 2017 PhD recipients



Country of training for new PhDs



“This programme is awesome. Its positive impact on research development cannot be overemphasised.”

Kenneth Gerald Ngwoke, a Nigerian plant chemistry researcher who conducted research on semiconductors in Germany through the TWAS-DFG-Cooperation Visits Programme

PROGRESS THROUGH RESEARCH

TWAS provides grants to researchers in targeted developing countries for specialized equipment, consumable supplies and scientific publications. These grants help

to lay a foundation for research in countries with scarce resources.

In 2017, TWAS Research Grants for Individuals provided up to USD15,000 to

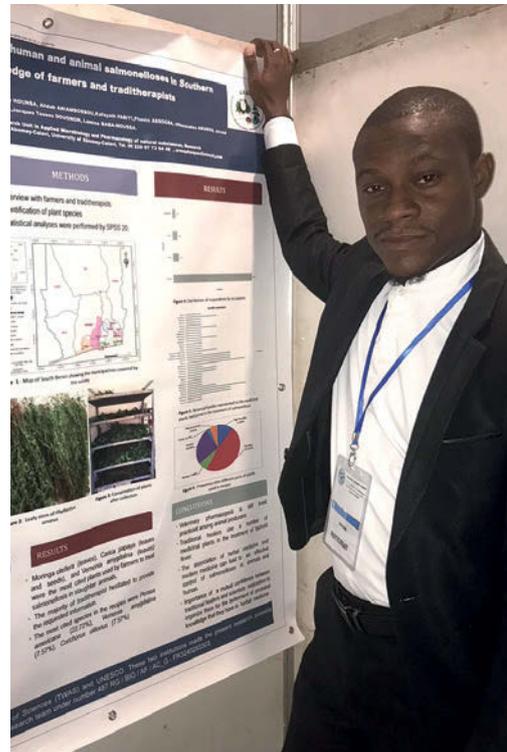
Research grants awarded in 2017



48 INDIVIDUAL GRANTS [48%]

22 GROUP GRANTS [22%]

30 TWAS-COMSTEC GRANTS [30%]



◀ Left: Physicist Zagarzusem Khurelbaatar of Mongolia shows an infrared light detector purchased with a TWAS research grant. Right: Medicinal plant researcher Tamegnon Victorien Dougnon of Benin stands by a poster on his research that was assisted by a TWAS grant. [Photos provided]

► Biological chemist Myrtha Karina of Indonesia has won four TWAS Research Grants over the course of her scientific career. (Photo provided)



Total number of research grants



2,446
OF RESEARCH GRANTS SINCE THE PROGRAMME BEGAN

Field of research

- 33** BIOLOGY
- 22** CHEMISTRY
- 10** PHYSICS
- 8** ENGINEERING SCIENCES
- 6** MATERIAL SCIENCES AND NANOTECHNOLOGY
- 6** PHARMACEUTICAL SCIENCES
- 5** MATHEMATICS
- 4** RENEWABLE ENERGY
- 3** EARTH SCIENCES
- 3** INFORMATION TECHNOLOGY AND COMPUTER SCIENCES

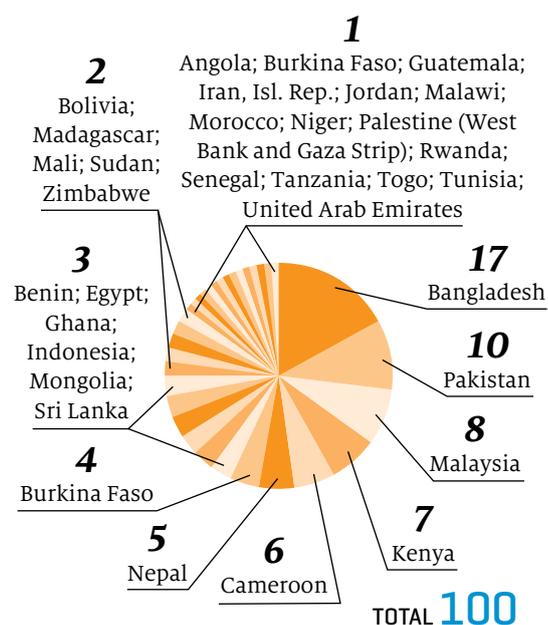
“ I became trusted to lead an internal research group. I was appointed to lead one division in my research institute and was asked to supervise students. Invitations as a keynote speaker in scientific meetings came as well. ”

Myrtha Karina, a principal investigator in the research unit for clean technology at the Indonesian Institute of Sciences in Jakarta, on the effects of winning a TWAS research grant.

young researchers in 66 developing countries identified by the Academy as lagging in science and technology. TWAS Research Grants for Groups provided up to USD30,000 to small research groups in those same countries. The Swedish International Development Cooperation Agency [Sida] supports both grant programmes. These grants totalled USD1.4 million: 42 out of 70, or 60%, went to Least-Developed Countries [LDCs] and 35% went to women.

TWAS also manages the TWAS-COMSTECH Joint Research Grants, which awards grants of up to USD15,000 to scientists in member states of the Organisation of Islamic Cooperation [OIC]. The programme is supported by the OIC’s Standing Committee on Scientific and Technological Cooperation [COMSTECH]. These grants totalled USD200,000, a sum that remains consistent every year.

Where did TWAS research grants go in 2017?



SUPPORTING SCIENCE POLICY

With an elite network of over 1,300 scientists from 90-plus countries and more than 30 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 Sustainable Development Goals.

In 2017, TWAS was a key participant in several initiatives in which policymakers explored new avenues for using science to support sustainable development and address challenges.

The World Science Forum: Science for Peace:

The opening ceremony of 2017 World Science Forum (WSF) took place 7 November at the Dead Sea in Jordan. Nearly 3,000 participants from about 140 countries attended, with speakers from 50 countries spread across five days. Panels were comprised of leaders of the world's largest research infrastructures and membership bodies, science ministers, journalists and others.

TWAS and its associated organisation, the InterAcademy Partnership (IAP), had a significant presence at the Forum, organising sessions on brain drain, refugee scientists and

the effectiveness of development to Africa. Also at the forum, participants made a closing declaration renewing their commitment to fight poverty and promote just, equitable and inclusive social development based on sustainable development and protection of the environment. The opening ceremony was broadcast live on Jordanian television

Learn more: www.twas.org/node/12448/
[Declaration of the 8th World Science Forum on Science for Peace: www.twas.org/node/12451/](http://www.twas.org/node/12451/)



**WORLD
SCIENCE
FORUM
2017 JORDAN**

Open data milestone: An accord to promote open access to big data that are the basis of advanced research surpassed 120 endorsements, with the list including prominent science organizations that support the principles of open data through dedicated commitments. The accord is called “Open Data in a Big Data World”, and TWAS is one of

► Top right: Jordan's King Abdullah II Ibn Al Hussein [second from right] and Princess Sumaya bint El Hassan [third from right] honour prominent scientists from their country at the World Science Forum in Jordan. [Credit: Royal Hashemite Court of Jordan]



“ Today, our future depends more than ever on scientists working together in a spirit of tough inquiry and mutual respect. For a resilient, sustainable future demands science at its innovative best. ”

*His Majesty King **Abdullah II Ibn Al Hussein** of the Hashemite Kingdom of Jordan, patron of the World Science Forum in Jordan*

▼ TWAS Executive Director
Romain Murenzi.



the four organizations that co-organized the “Science International” campaign behind it, alongside the InterAcademy Partnership (IAP), the International Council for Science (ICSU) and the International Social Science Council (ISSC).
[Learn more: www.twas.org/node/12180/](http://www.twas.org/node/12180/)

Murenzi returns as TWAS director: Rwandan physicist Romain Murenzi was named the executive director of The World Academy of Sciences, returning on 1 September 2017 to a position he held for five years from 2011 to 2016. He spent the previous 14 months at UNESCO headquarters in Paris, directing the

Division of Science Policy and Capacity Building in the Natural Sciences sector.

[Learn more: www.twas.org/node/12388/](http://www.twas.org/node/12388/)

Geoengineering research fund: In 2017, the Solar Radiation Management Governance Initiative (SRMGI) created a new research fund called Developing Country Impacts Modelling Analysis for SRM [DECIMALS] for modelling the impacts of the geoengineering technique across the developing world. Managed by TWAS, the fund will support developing-country scientists who want to analyse how geoengineering to limit solar radiation could affect their regions.

[Learn more: www.twas.org/node/12423/](http://www.twas.org/node/12423/)

The Nairobi Communiqué: High-level researchers and policy leaders from Africa and China pledged support for long-term cooperation in research focused on the nexus of climate, ecosystems and livelihoods following a two-day conference in Nairobi, Kenya. The conference was sponsored by UN Environment, the Chinese Academy of Sciences, the National Natural Sciences Foundation of China and TWAS.

[Learn more: www.twas.org/node/12410/](http://www.twas.org/node/12410/)

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 indispensable financial support.

Among the programme's 2017 activities were:

Summer course in science diplomacy: Held from 21 to 25 August in Trieste, Italy, the annual science diplomacy course probed the complex workings and potential value of science diplomacy for addressing global challenges and improving relations among nations.

TWAS co-organized the course, the fourth in as many years, with AAAS. It convened 45 scientists and government officials from 18 countries including Egypt, Indonesia, Italy, Nepal and Sri Lanka. It included numerous talks from

experts as well as a simulation exercise for participants.

The course featured a keynote presentation on the dangers posed by climate change to the remote island nation of Kiribati by Christine Greene, Kiribati's honorary counsel to the United States, and Greg Stone, chief scientist and executive vice president at Conservation International.

■ All photos: Participants in the 2017 AAAS-TWAS Science Diplomacy Summer Course. During the week-long course, participants will probe the complex workings and potential value of science diplomacy for addressing global challenges and improving relations among nations.





▲ Key figures in the 2017 AAAS-TWAS Course in Science Diplomacy (from left): Marga Gual Soler, AAAS Center for Science Diplomacy; Fernando Quevedo, director, Abdus Salam International Centre for Theoretical Physics; Mohamed Hassan, TWAS interim executive director; Mostafa El Feki, director, Bibliotheca Alexandrina; TWAS Fellow Yousef Sobouti, founder and director of the Institute for Advanced Studies in Basic Sciences (IASBS) in Zanjan, Iran; Peter McGrath, coordinator of the TWAS science diplomacy programme; and Mahlet Mesfin, deputy director of the AAAS Center for Science Diplomacy.

Iranian physicist Yousef Sobouti, a 1987 TWAS Fellow, delivered the Paolo Budinich Science Diplomacy Lecture with a focus on science and human understanding. In an era of great global challenges and geopolitical tension, Sobouti said, the scientific approach to considering problems and building knowledge can guide humanity toward peaceful solutions. [Read more about Kiribati: www.twas.org/node/12376/](http://www.twas.org/node/12376/) [Read more about Sobouti's talk: www.twas.org/node/12378/](http://www.twas.org/node/12378/)

Inaugural workshop in southern Africa: TWAS and AAAS led a one-day science diplomacy workshop in Windhoek, Namibia, on 22 May. More than 70 participants, representatives of the Southern African Research & Innovation Management Association (SARIMA), from 17 African countries, as well as a delegation from

the New Partnership for Africa's Development (NEPAD), attended. At the event, speakers explored how the border-jumping 2013-2016 Ebola outbreak in West Africa and the development of the Square Kilometre Array radio telescope prove that science diplomacy is important for Africa's continued development. [Learn more: www.twas.org/node/12246/](http://www.twas.org/node/12246/)

Two workshops on key issues: The TWAS science diplomacy programme coordinated a first-of-its-kind event designed to address the challenges confronting scientists displaced by conflict. [For more, see: Page 24]

TWAS also co-organized, with IAP and the Organisation for the Prohibition of Chemical Weapons (OPCW), a workshop exploring responsible research practices in chemistry and biochemistry. [For more, see Global Academy Networks: Page 28]



“It would be nice to share our sciences and find the common language [...] with all of our ancient arts and sciences, which have been stored and transferred in different ways... To help us to maintain that pristine area [in the Pacific Ocean], we need access to all of the science.”

Christine Greene, honorary consul from the remote island nation of Kiribati to the United States, on the importance of science diplomacy and communication

SUPPORTING SCIENTISTS AT RISK

As war and conflict tear countries apart in the developing world, scientists and engineers are among those forced to flee. Resources are limited, and often policymakers, journalists and the public are not aware of their work and their needs.

In 2017, TWAS and two partner organizations convened a first-of-its-kind workshop – held 13-17 March 2017 in Trieste, Italy – to build awareness of this issue, and to explore challenges and potential solutions. It also provided an important starting point involving





▲ Radwan Ziadeh of Syria (left), a senior analyst at the Arab Center in Washington, D.C., helped to set the scene during a workshop co-organised by TWAS that explored the phenomenon of scientists displaced by war. [Photo: Demis Albertacci]

“The movement of scientists, driven by conflict and war, cannot be treated as a temporary or emergency phenomenon. Rather, it is a permanent feature of globalisation and geopolitical instability.”

Refugee Scientists: Transnational Resources: Recommendations from a workshop

◀ From left: Zabeeh Ullah Sahil of the Organization for Women in Science for the Developing World (OWSD); Ulrike Albrecht, head of Strategy and External Relations at the Alexander von Humboldt Foundation; Raffaella Grego Tonegutti of the European Commission; Eqbal Dauqan, a Yemeni scientist living in Malaysia; James King of the Institute of International Education's Scholar Rescue Fund; Luciano Saso of the Networks of Universities from the Capitals of Europe in Rome, Italy; and Matteo Marsili of ICTP. [Photo: Demis Albertacci]

international scientists, policymakers and diplomats from South and North, and led to extensive news coverage in Italy and abroad.

The workshop, “Refugee Scientists: Transnational Resources” was organised by the TWAS Science Diplomacy programme, with help from the TWAS Public Information Office. It brought together 50 participants from 12 nations, including high-level policymakers, representatives of scientific and educational institutions and refugee agencies, and a half-dozen current or former displaced scientists. It also explored the experiences and needs of scientists displaced from Syria, Yemen, Afghanistan and Iraq.

After intensive discussions, the event produced a detailed set of recommendations for supporting refugee scientists, issued on 22

REFUGEE SCIENTISTS: TRANSNATIONAL RESOURCES

The March 2017 workshop was co-organised by:

- The World Academy of Sciences, Trieste, Italy
- Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS) [Trieste, Italy]
- Euro-Mediterranean University (EMUNI) [Piran, Slovenia]

Among the participants were:

- Radwan Ziadeh of Syria, senior analyst at the Arab Center in Washington, D.C.;
- Naeem M. Abdurrahman, former Libyan minister of Higher Education and Scientific Research;
- Charles Kleiner, then serving as head of the Capacity Development Unit at the International Center for Agricultural Research in the Dry Areas (ICARDA), in Amman, Jordan;
- Ulrike Albrecht, then head of the Department for Strategy and External Relations at the Alexander von Humboldt Foundation in Germany.

The Swedish International Development Cooperation Agency [Sida] provided funding for the workshop.

May 2017. They urged the creation of education and jobs programmes and other initiatives to support the social and professional integration of displaced researchers, and called for more research to understand the crisis. The scientists can contribute to their new countries, the report concluded, but their skills will also be crucial for rebuilding their home countries someday.

Learn more: <https://twas.org/refugee-scientists-transnational-resources>

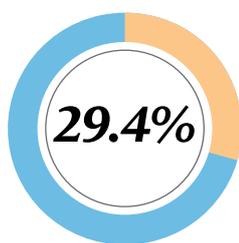
SCIENCE IN EXILE

TWAS's documentary film, “Science in Exile”, explores the struggles of scientists displaced by conflict. To learn more, see page 34.

ADVANCING WOMEN

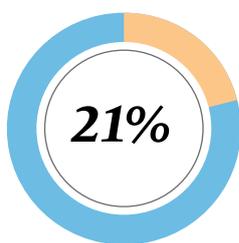
Supporting women in research is a central part of TWAS's mission. The Academy and its partners offer numerous opportunities to women in the developing world; they also help institutions learn how to support women researchers. This can be valuable for the careers of each individual researcher, but critical for activating a nation's full scientific potential.

PhDs created by TWAS in 2017



22 OUT OF **113** PHDs CREATED BY TWAS AND PARTNER INSTITUTIONS IN 2017 ARE WOMEN

PhD fellowships to women



76 OUT OF **354** PHD FELLOWSHIPS AWARDED BY TWAS IN 2017 WENT TO WOMEN

TWAS hosts two influential partners at its offices in Trieste, Italy:

The Organization for Women in Science for the Developing World (OWSD) emerged from a conference organized by TWAS in 1988. OWSD is the first international forum for women scientists from the developing and developed worlds to strengthen their roles in research and science leadership. It has more than 6,000 members, at least 90% of them women scientists from developing countries. OWSD PhD fellowships for women researchers receive support from the Swedish International Development Cooperation Agency [Sida].

In 2017, OWSD announced a new partnership with Canada's International Development Research Centre [IDRC] to provide fellowships for early-career women scientists to build strong research teams in host institutes throughout the South. The first cohort of fellows will be selected in 2018. OWSD also partners with the Elsevier Foundation to organize annual Awards for Early Career Women Scientists in the Developing World. The 2017 winners were physical scientists and engineers from Bangladesh, Ecuador, Ghana, Indonesia and Sudan, whose research



OWSD PhD fellowships for women from sub-Saharan Africa, LDCs

437 TOTAL

222 HAVE GRADUATED [46%]

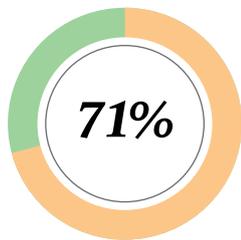
215 ARE ONSITE [47%]

Fellowships awarded 1998-2017.

► The winners of the 2017 OWSD-Elsevier Awards, from left: Felycia Edi Soetaredjo of Indonesia; María Fernanda Rivera Velásquez of Ecuador; Tanzima Hashem of Bangladesh; Grace Ofori-Sarpong of Ghana; and, by video in the background, Rania Mokhtar of Sudan. Mokhtar was unable to attend the 2017 AAAS Annual Meeting in Boston, U.S. [Photo: Alison Bert/Elsevier Foundation]

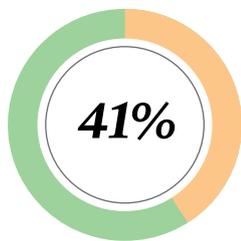


Scientists awarded PhD fellowships through OWSD in 2017



22 OUT OF **31** WERE FROM LEAST DEVELOPED COUNTRIES (LDCs)

Women who received PhDs through OWSD in 2017



11 OUT OF **27** WERE FROM LEAST DEVELOPED COUNTRIES (LDCs)

“ OWSD’s expanded programme should encourage more young women to pursue and advance in their research career, through leading research teams at home, participating in international networks and collaborating with industry for their results to help build more inclusive societies. ”

Naser Faruqi, director of technology and innovation at Canada’s International Development Research Centre (IDRC)

made important contributions in engineering, innovation and technology.

Learn more about OWSD: www.owsd.net
 Learn more about the OWSD-Elsevier Foundation Awards: www.owsd.net/career-development/awards

GenderInSITE (GIS) is an initiative dedicated to advancing science, technology, innovation and engineering policies and programmes focused on the importance of gender equality. GIS works to raise awareness among policymakers, institutional leaders and others. It’s hosted by OWSD and TWAS and supported by Sida.

In 2017, GenderInSITE cooperated to organise two high-level workshops on gender and STI related to the Sustainable Development Goals:

an April workshop in Buenos Aires, Argentina related to the Sustainable Development Goals, and a September workshop in Pretoria, South Africa, on gender and innovation. Both events were funded by the Elsevier Foundation.

GIS also provided gender perspective on influential scientific panels, including the UNESCO STEM and Gender Advancement Advisory Committee. GIS produced a booklet on the gender dimensions of six different aspects of sustainable development in four languages that was distributed at the World Science Forum, Gender Summit in Kigali and other events.

Learn more: www.genderinsite.net

GenderInSITE

GLOBAL ACADEMY NETWORKS

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

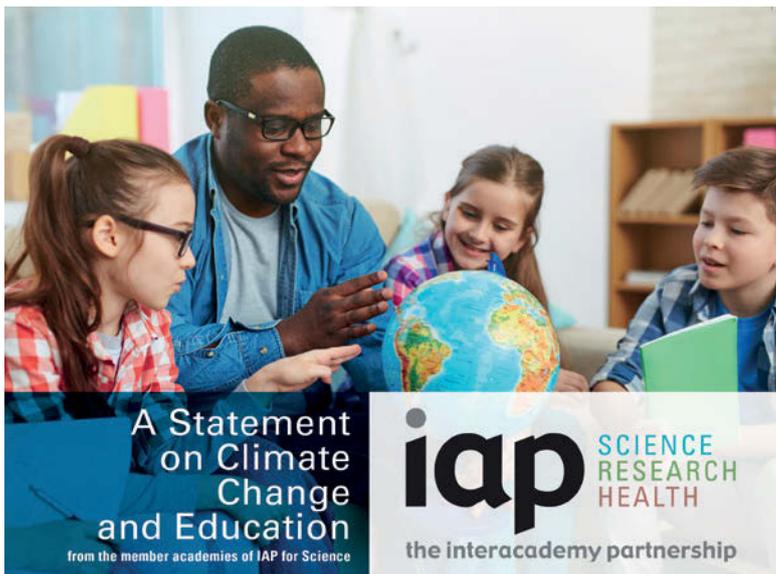
The InterAcademy Partnership (IAP), brings together more than 130 national and regional member academies of science and medicine to support the special role of science and its efforts to seek solutions to the world's most challenging problems. IAP's secretariat is based at TWAS headquarters in Trieste, Italy, and at the US National Academies of Science, Engineering and Medicine in Washington, D.C.

Several major accomplishments in 2017 stand out:

- IAP, alongside TWAS, had a significant role in the World Science Forum [See: Science Policy, Page 20].
- IAP co-organised an international workshop of experts in biotechnology, security and policy in October in Hanover, Germany, leading to a report on the security implications of genome-editing technology.
- IAP also held a workshop with the Organisation for the Prohibition of Chemical Weapons (OPCW) in September also in collaboration with

READ THE IAP REPORTS

- Assessing the Security Implications of Genome Editing Technology: Report of an international workshop www.bit.do/SecurityGenomes
- Science and Technology for Disaster Risk Reduction www.bit.do/DisasterRiskStmnt
- Statement on Climate Change and Education www.bit.do/CCandEdu





“ You sometimes need more courses and lectures to teach about ethics and applying them. We don’t have a clear way to build an ethics curriculum yet, so this workshop was definitely helpful. ”

Sindra Lutchmee Summoogum, a chemical and environmental engineer from the University of Mauritius, at the OPCW-IAP workshop on responsible research practices

▲ Graduates of the first OPCW-IAP workshop on responsible research practices.

▶ Alastair Hay leads a workshop exercise on responsible research practices in chemical and biochemical sciences.

the TWAS science diplomacy programme on responsible research practices in chemical and biochemical sciences. [See: Science Diplomacy, Page 22]

- IAP also issued statements on two important issues: one on science and technology for disaster risk reduction, and another on the importance of climate change education.

[Learn more: www.interacademies.org](http://www.interacademies.org)

The Chinese Academy of Sciences (CAS) is the hub of China’s ambitious research enterprise, and it has historically had close ties with TWAS. Eminent researcher Bai Chunli serves as president of both academies. CAS collaborates with TWAS on the CAS-TWAS President’s PhD Fellowship programme and the five CAS-TWAS Centres of Excellence, providing a substantial share of TWAS’s postgraduate fellowships. CAS



also hosts the TWAS Regional Office for East and South-East Asia and the Pacific.

[Learn more: english.cas.cn](http://english.cas.cn)

The TWAS Young Affiliates Network (TYAN)

was formed in 2016 to reinforce ties among the Academy’s Young Affiliates. They held their first international conference in Rio de Janeiro, Brazil from 22 to 24 August 2017. It drew nearly 60 Young Affiliates, representing 31 countries from Latin America, Africa, Asia and the Middle East, to search for solutions in the interests of their countries and the world.

[Learn more: www.twas.org/node/12427/](http://www.twas.org/node/12427/)

The Academy of Science of South Africa (ASSAf)

is one of Africa’s leading advocates for science and technology, and hosts TWAS’s Regional Office for Sub-Saharan Africa at its headquarters in Pretoria. In 2017, ASSAf and the regional office were part of a science diplomacy workshop led by TWAS and the American Association for the Advancement of Science [AAAS] in Windhoek, Namibia, on 22 May that included more than 70 participants from 17 African countries.

[Learn more: www.assaf.co.za](http://www.assaf.co.za)

Regional office website: www.twas-rossa.org.za



The International Mathematical Union (IMU)

collaborates with TWAS to sponsor a fellowship that provides scholars from the South with the financial backing to pursue PhDs in maths, with a goal of building a strong corps of mathematicians in developing countries. Three such scholars began their studies in 2017.

[Learn more: www.twas.org/node/11682/](http://www.twas.org/node/11682/)

REGIONAL OFFICES

...

The 2017 TWAS Regional Prizes were awarded for Public Understanding and Popularisation of Science .

...

TWAS offices in five major regions of the developing world perform vital Academy functions: They nominate scientists for prizes and select Young Affiliates. They organize conferences, and in the process they raise awareness of TWAS and its programmes among scientists in each region. And they help to advance support globally for science among policymakers and the public.

RIO DE JANEIRO, Brazil ●
Brazilian Academy of Sciences



► 2017 TWAS Regional Prize Winner: **Julieta Fierro**, Mexico

LATIN AMERICAN AND THE CARIBBEAN (TWAS-ROLAC)

Co-hosted, with the Brazilian Academy of Sciences, the inaugural international conference of the TWAS Young Affiliates Network [TYAN] in Rio de Janeiro in September, attended by 62 Young Affiliates. The same month, the office also hosted the 20th TWAS-ROLAC Young Scientists Conference in partnership with The International Council for Sciences [ICSU], inviting researchers who are pursuing biological research to present their work.

EAST AND SOUTH-EAST ASIA AND THE PACIFIC (TWAS-ROESEAP)

Helped organize several conferences in Beijing, China. These included the CAS-TWAS Symposium on Green Chemistry and Technology for Sustainable Development, held in September, and the Conference on Ecosystem-based Adaptation through South-South Cooperation in December, organised alongside UN Environment (UNEP).

▼ 2017 TWAS Regional Prize Winner: **Abdelnasser Tawfik**, Egypt



ARAB REGION (TWAS-ARO)

Supported the travel of five young Arab scientists to the World Science Forum in November in Jordan. ARO also sponsored numerous events, including its annual meeting in November, a roundtable on responsible science, a training programme on Earth and life sciences research and publications, and lectures and seminars on topics such as cancer and hurricanes.

▼ 2017 TWAS Regional Prize Winner: **Ulmas Mirsaidov**, Tajikistan



CENTRAL AND SOUTH ASIA (TWAS-ROCASA)

Organised an early-career scientists' conference on climate change and biodiversity in October in Sri Lanka, drawing 46 scholars from India, Bangladesh, Nepal, Bhutan and Sri Lanka – half of them women. The office also organised a conference on infectious diseases in September in Bangalore, drawing 50 researchers, including 14 from outside of India.

● **TRIESTE, Italy**
ITCP Campus

● **ALEXANDRIA, Egypt**
Bibliotheca Alexandrina

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

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

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

SUB-SAHARAN AFRICA (TWAS-ROSSA)

Held the Young Scientists' Conference in Boksburg, South Africa, in July, organising the event with national and international partners, including the South Africa chapter of OWSD. The conference focused on young scientists' role in providing science advice. ROSSA also participated in the Southern African Development Community's Science Academies Workshop in Ezulwini, Swaziland, in June; and the NASAC-Leopoldina Capacity Building Workshop in Nairobi, Kenya, in July.

► 2017 TWAS Regional Prize Winner: **Wilfred Fon Mbacham**, Cameroon



TWAS & ITALY

For over 30 years, TWAS has had a strong partnership with the Italian government, with the Italian Ministry of Foreign Affairs and International Cooperation (MAECI) serving as a focal point. Italy provides core funding to the Academy and makes possible its work to advance science in the developing world. Together, Italy and TWAS have helped developing countries build important skills from the inside, creating an environment that supports innovation.

Here are 2017 highlights of the Italy-TWAS partnership:

ESOF 2020: TWAS was one of several international and regional science organisations headquartered in Trieste that helped organise a successful bid to host the Euroscience Open Forum (ESOF) in Trieste in 2020. ESOF is the largest interdisciplinary science meeting in Europe. Dedicated to scientific research and innovation, it offers a unique framework for

▼ Trieste next speakers, from left: Thameur Chaibi of Tunisia; Nadia Pinaridi of Italy; Jauad El Kharraz of Morocco; and Tuğba Evrim Maden of Turkey.





“Trieste is one of the richest European hubs in terms of scientific expertise and opportunities. For this reason, we should commit to become an international attractor for students and high-level scientists. Their presence would bring clear benefits to our territory.”

Angela Brandi, Trieste town council member with mandate for education, schools, universities and research.

▲ Both photos: Italian scientist Luca Nardi of the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA), speaks with fellow researchers in a containment greenhouse. (Photo: ENEA)

interaction and debate for scientists, policy makers, business people and the general public. Other Trieste-based science institutes that worked on this accomplishment were The Abdus Salam Centre for Theoretical Physics (ICTP), The International Centre for Genetic Engineering and Biotechnology (ICGEB) and National Institute of Oceanography and Applied Geophysics (OGS). [Learn more: www.twas.org/node/12339/](http://www.twas.org/node/12339/)

New partnership with ENEA: Early-career scientists from LDCs will be able to spend up to one year pursuing advanced research in Italy under a new accord between TWAS and ENEA, the Italian National Agency for New Technologies, Energy and Sustainable Economic

Development. The joint programme offers post-doctoral researchers a valuable opportunity to work in Italy.

[Learn more: www.twas.org/node/12420/](http://www.twas.org/node/12420/)

Trieste Next: At the TWAS roundtable opening the annual science festival on 21 September, four scientists offered their advice on effective science cooperation in the Mediterranean basin. It included Thameur Chaibi, director of research at the National Research Institute for Rural Engineering, Water, and Forestry in Ariana, Tunisia; Tuğba Evrim Maden, a researcher in water policy from the Turkish Water Institute; Nadia Pinardi, professor in the department of physics and astronomy, Alma Mater Studiorum University of Bologna, Italy; and Jauad El Kharraz, head of research at the Middle East Desalination Research Center in Oman.

[Learn more: www.twas.org/node/12394/](http://www.twas.org/node/12394/)

Trieste science agreement: Representatives from 18 research centres, universities and other scientific bodies – including TWAS – on 14 June endorsed a Memorandum of Understanding aimed at encouraging improved coordination and long-term cooperation among scientific institutions in the Trieste System. The agreement extends and updates a previous MoU, and will be in effect for five years.

[Learn more: www.twas.org/node/12301/](http://www.twas.org/node/12301/)

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 public. Building on its successful website and social media commitment, the Public Information Office

[PIO] initiated several projects to expand the audience for TWAS ideas and initiatives.

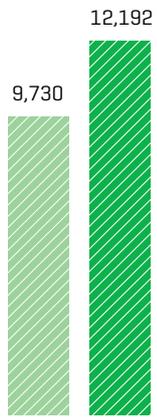
TWAS produced a high-impact documentary film, **"Science in Exile"**, which presents the stories of four scientists who have fled conflict zones in recent years. The film

▼ "Science in Exile", a documentary produced by TWAS, explores the human and professional challenges confronting scientists in flight from war.





Facebook



LIKES

+ 25.3%



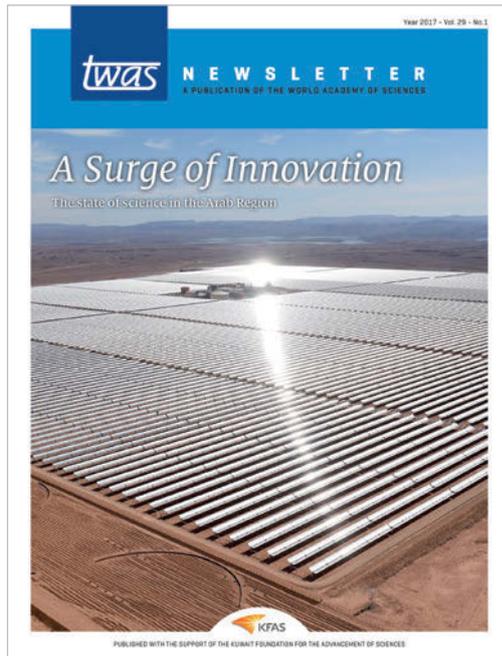
Twitter



FOLLOWERS

+ 24.5%

From 1 January to 31 December 2017.



explores how recent conflicts in Syria, Yemen and Iraq have threatened the researchers' lives, forcing them to suspend their work and flee their homelands. "Science in Exile" was directed by Italian filmmaker Nicole Leghissa and funded by the Swedish International Development Cooperation Agency [Sida] and the Friuli Venezia Giulia Audiovisual Fund in Italy.

The film premiered in November at the World Science Forum in Jordan, where the topic was explored in more depth during a session coordinated by the TWAS PIO and UNESCO. It was also shown in December at the U.S. National Academies of Science, Engineering and Medicine. "Exile" received extensive press coverage, including articles in *New Scientist*, *SciDev.net* and *The National* (United Arab Emirates).

[Learn more about the film:](http://www.twas.org/node/14265/)
www.twas.org/node/14265/
[Learn about the film's premiere:](http://www.twas.org/node/12447/)
www.twas.org/node/12447/

PIO guided the continuing expansion of the TWAS **Online Forms** system, adding applications for a programme of the Organization for Women in Science for the Developing World, most PhD and postdoctoral fellowships, two visiting

scientists programmes, and nominations for TWAS prizes. The system now covers most programmes at TWAS, including all PhD and postdoctoral fellowships and research grants. This system has created significant improvements for users, while saving staff time and resources.

twas Online Forms

Finally, the PIO published three issues of the **TWAS Newsletter**, focusing on the state of science in the Arab Region, refugee scientists, and The Academy's 2017 prize and award winners.

The Academy's bi-monthly e-bulletin, **TWAS Plus**, saw a 50.3% increase in subscribers, climbing from 19,840 to 29,822 during the year.

twas Plus

News and Opportunities
 from The World Academy of Sciences

FINANCIAL REPORT 2017

TWAS received a total of USD4,642,339.65 in funding for 2017, including USD6,611.54 in individual contributions. We are grateful for the generous contributions from our supporters – some who have aided our work for many years, and others who have joined them more recently. Their investments make possible our challenging and critical work in the developing world.

FINANCIAL REPORT 2017 (IN USD)

INCOME¹ 2017	
Balance brought forward 01.01.2017	363,955.96
1) Ministry of Foreign Affairs, Italy	1,429,972.26
2) Swedish International Development Cooperation [Sida]	1,781,777.84
3) Ministry of Science, Technology and Innovation - MCTI, Brazil	298,875.78
4) Lenovo Group Limited, China	270,000.00
5) Environmental Defense Fund, USA	157,315.00
6) Kuwait Foundation for the Advancement of Sciences [KFAS]	100,000.00
7) COMSTECH, Pakistan	99,910.00
8) Elsevier Foundation, Netherlands	80,000.00
9) Academia Sinica, Taiwan, China	50,000.00
10) Regione Autonoma Friuli Venezia Giulia, Italy	41,322.40
11) International Mathematical Union, Germany	34,300.00
12) National Academy of Sciences, USA	20,427.41
13) American Association for the Advancement of Science	10,000.00
14) Quarraisha Abdool Karim, South Africa	7,000.00
15) Dawood Foundation, Pakistan	6,965.00
16) CNR Rao, India	6,950.00
17) F.M.A. Al-Kharafi, Kuwait	6,000.00
18) Samira Omar Asem, Kuwait	6,000.00
19) Other Membership Fees ²	6,611.54
20) Interest income	64,181.00
21) Exchange difference	775.46
22) Net Transfer to TWAS Endowment Fund (Interest)	-200,000.00
	4,642,339.65

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.

² This amount comprises donations from TWAS members, Young Affiliates and other individuals (details next page).

EXPENDITURES 2017	App. Budget	Rev. Budget	Spent
1) Prizes			
1.1) TWAS Lenovo Science Prize	120,000	120,000	115,999.65
1.1.1) Prize cost	100,000	100,000	100,000.00
1.1.2) Other costs	20,000	20,000	15,999.65
1.2) TWAS prizes and medals	125,000	125,000	135,000.00
1.2.1) Prizes costs	120,000	120,000	135,000.00
1.2.2) Medals and other costs	5,000	5,000	
1.3) Prizes for young scientists	20,000	20,000	27,000.00
1.4) Fellows prizes	33,000	33,000	29,000.00
1.4.1) Prizes cost	23,000	23,000	23,000.00
1.4.2) Other costs	10,000	10,000	6,000.00
1.5) TWAS - Siwei Cheng Prize in Economic Sciences	13,000	13,000	10,000.00
1.5.1) Prizes costs	10,000	10,000	10,000.00
1.5.2) Other costs	3,000	3,000	
<i>Sub-total for [1]</i>	<i>311,000</i>	<i>311,000</i>	<i>316,999.65</i>
2) Research Grants			
2.1) Grants to individual scientists	225,000	225,000	222,756.79
2.2) Grants to research units	300,000	300,000	297,254.21
2.3) Support for MSc students	50,000	50,000	49,488.00
2.4) Selection committee	1,000	1,000	1,079.99
2.5) Regional Conference Young Scientists	80,000	80,000	79,227.93
2.6) Science diplomacy	18,000	18,000	17,820.54
2.7) Communications	10,000	10,000	9,829.03
2.8) Monitoring	25,000	25,000	
2.9) Staff and office space	160,000	160,000	158,685.51
2.10) Additional research grants	200,000	200,000	390,956.53
2.11) New funds for research grants		958,641	897,778.11
2.11.1) Young scientists – individuals		148,753	142,847.00
2.11.2) Young scientists – groups		189,300	181,784.00
2.11.3) MSc students		280,512	269,380.00
2.11.4) Conference		161,000	154,614.00
2.11.5) Open access		70,000	67,200.00
2.11.6) Other costs for staff and office space		109,076	81,953.11
<i>Sub-total for [2]</i>	<i>1,069,000</i>	<i>2,027,641</i>	<i>2,124,876.64</i>
3) Fellowships, Associateships and Professorships			
3.1) Fellowship programmes	234,000	234,000	237,585.86
3.2) Associateship, professorship & visiting programmes	110,000	110,000	103,699.44
<i>Sub-total for [3]</i>	<i>344,000</i>	<i>344,000</i>	<i>341,285.30</i>
4) Meetings			
4.1) Council and general meetings	30,000	30,000	29,983.22
4.2) Officers, Steering Committee and other meetings	20,000	20,000	47,387.58
<i>Sub-total for [4]</i>	<i>50,000</i>	<i>50,000</i>	<i>77,370.80</i>
5) Publications			
5.1) Publications	35,000	35,000	7,092.73
5.2) Other costs	15,000	15,000	15,000.00
<i>Sub-total for [5]</i>	<i>50,000</i>	<i>50,000</i>	<i>22,092.73</i>

Continue next page

EXPENDITURES 2017	App. Budget	Rev. Budget	Spent
6] Joint Projects			
6.1] TWAS Regional Offices	84,000	84,000	84,772.07
6.2] TWAS-ARO-KFAS Project	50,000	50,000	50,000.00
6.2.1] Regional Conference for Young Scientists	25,000	25,000	25,000.00
6.2.2] Regional awards	6,000	6,000	6,000.00
6.2.3] Biovision Conference	5,000	5,000	5,000.00
6.2.4] Young Affiliates	7,000	7,000	7,000.00
6.2.5] Other costs	7,000	7,000	7,000.00
6.3] TWAS/COMSTTECH Research Grant	200,000	200,000	199,924.00
6.4] AU-TWAS Young Scientists National Award	65,000	65,000	
6.5] TWAS-AAAS Science Diplomacy Programme	25,000	25,000	10,000.00
6.6] TWAS-Elsevier Project	111,515	111,515	65,842.87
6.6.1] Symposium, Fellowships and South-North Exchange Programme	101,515	101,515	55,842.87
6.6.2] Other costs	10,000	10,000	10,000.00
6.7] TWAS-SRMGI Project	138,324	138,324	134,566.65
6.7.1] Workshops	68,339	68,339	95,768.11
6.7.2] Other costs	69,985	69,985	38,798.54
6.8] TWAS-IMU Project	34,300	34,300	34,300.00
6.8.1] Fellowships	29,300	29,300	29,300.00
6.8.2] Other costs	5,000	5,000	5,000.00
6.9] TWAS-Lenovo Young Affiliates Network	282,293	282,293	89,134.74
6.10] Scientific Equipment to Rwanda	7,500	7,500	7,500.00
6.11] TWAS-OFID Project	6,154	6,154	37,901.67
6.12] TWAS-ENEA Project	84,000	84,000	8,644.74
6.12.1] Fellowships	74,000	74,000	
6.12.2] Other costs	10,000	10,000	8,644.74
<i>Sub-total for [6]</i>	<i>1,088,086</i>	<i>1,088,086</i>	<i>722,586.74</i>
7] Operational Expenses			
7.1] Staff costs	1,150,000	1,150,000	1,147,795.12
7.2] ICTP services	60,000	60,000	60,000.00
7.3] Communications	25,000	25,000	8,785.31
7.4] Travels	30,000	30,000	16,091.16
7.5] Library, office and other supplies	25,000	25,000	19,457.06
7.6] Other general operating expenses	25,000	25,000	24,932.54
<i>Sub-total for [7]</i>	<i>1,315,000</i>	<i>1,315,000</i>	<i>1,277,061.19</i>
Total expenditure	4,227,086	5,185,727	4,882,273.05
Savings on prior years' obligations			714,150.75
Excess (shortfall) of income over expenditure			474,217.35
Reserve Fund¹			
Amount available at the beginning of period			2,090,596.59
End of service entitlements			(52,454.99)
Reserve fund balance end of period			2,038,141.60

¹ The purpose of the Reserve Fund is to cover the end-of-service entitlements of TWAS staff.

TWAS ENDOWMENT FUND 1994-2017¹ (IN USD)

ORGANIZATIONS	CONTRIBUTIONS RECEIVED
1] Ministry of Sciences and Technology [China]	2,200,000
2] Ministry of Science & Technology [Brazil]	1,933,107
3] Department of Science & Technology [India]	1,000,000
4] National Science & Technology Council [Mexico]	689,155
5] Academia Sinica [Taiwan, China]	608,915
6] Ministry of Science & Technology [Nigeria]	586,779
7] Kuwait Foundation for the Advancement of Sciences, KFAS [Kuwait]	500,000
8] Ministry of Research, Science and Technology [Iran, I.R.]	269,183
9] Ministry of Science, Technology & the Environment [Malaysia]	100,000
10] Ministry of Science & Technology [Pakistan]	100,000
11] Secretariat of Science and Technology [Argentina]	55,000
12] Ministry of Modernization & Technology [Senegal]	52,887
13] Colombian Institute for the Development of Science & Technology – Colciencias [Colombia]	50,000
14] Ministry of State for Scientific Research [Egypt]	50,000
15] Atomic Energy Commission [Syria]	50,000
16] Ministry of Finance [Sudan]	49,850
17] National Centre for Science and Technology of Vietnam [Vietnam]	20,000
18] National Academy of Science and Technology [Philippines]	11,957
19] Ministry of Science & Technology [Bangladesh]	10,000
20] Ministry of Science, Technology and Higher Education [Tanzania]	4,529
21] Swedish Council of Higher Education [Sweden]	1,302
22] Office of the Prime Minister [Jamaica]	1,000
23] Instituto Venezolano de Investigaciones Cientificas (IVIC) [Venezuela]	300
<i>Subtotal</i>	8,343,964
<i>Plus other contributions²</i>	180,790
<i>Plus interest earned</i>	6,107,606
<i>Transfer to/from TWAS Fund in 2011 and 2013, 2014, 2015, 2016 and 2017</i>	(2,025,768)
TOTAL	12,606,592

¹ The aim of setting up this endowment fund was to build a fund of USD25 million, with interest earnings to cover costs of the secretariat and basic programmes.

² This amount comprises donations from TWAS members, individuals and other organisations' contributions (see separate list, next page)

**CONTRIBUTIONS TO THE ENDOWMENT FUND FROM TWAS MEMBERS,
INDIVIDUALS AND OTHERS (1994-2017)**

Wook Hyun Kwon, Korea Rep.	30,000	Lee Wu Yan-Hwa, Taiwan, China	1,000	H. Ramkissoon, Trinidad & Tobago	300
Bai Chunli, China	21,770	A. Paulrai, USA	992	Shi Changxu, China	300
M.H.A. Hassan, Sudan	13,104	Cheng, Hui-Ming, China	985	Su Zhao-Bin, China	300
J. Palis, Brazil	10,079	P. Ciarlet, France	985	Yu Lu, China	300
Science Initiative Group, USA	6,250	Lee Yuan T., Taiwan, China	977	R.P. Bambah, India	300
J.I. Vargas, Brazil	5,287	E.K.A. Edee, Togo	900	Zhao Zhongxian, China	300
S.S. Katiyar, India	4,100	Jean-Marie Lehn, France	840	Zhai Mingguo, China	300
A.V. Rama Rao, India	3,000	J. Döbereiner, Brazil	800	B. Tsetseg, Mongolia	300
Fuchu He, China	2,726	M. Munasinghe, Sri Lanka	750	Mei Hong, China	300
A. Hamoui, Syria	2,500	M. Akhtar, Pakistan	700	S. Sivaram, India	300
M. Peimbert, Mexico	2,500	B.L. Deekshatulu, India	700	Long Yiming, China	300
Lu Yong Xiang, China	2,300	Wu Yue-Liang, China	666	R. Garruto, USA	300
P. McGrath, UK	2,046	D. Balasubramanian, India	650	Sang Yup Lee, Korea Rep.	300
M. Iqbal Parker, South Africa	2,000	L. de la Pena Auerbach, Mexico	642	Li Jinghai, China	296
K. Namsrai, Mongolia	1,858	Un-Chul Paek, USA	634	Chao-Jun Li, China	292
M.V. Griffiths, USA	1,750	F.R.I. Kayanja, Uganda	600	M. O’Kane, Australia	288
R. Miledi, USA	1,320	Dong Shaojun, China	600	J.S. Yadav, India	285
L.N. Johnson, UK	1,281	L.F. Rodriguez, Mexico	600	Zhang Ya-Ping, China	285
B.N. Upreti, Nepal	1,237	Wang Erkang, China	600	Wang Fosong, China	280
J. Garidkhuu, Mongolia	1,221	Zhao Jincai, China	525	B.M. Abegaz, Ethiopia	272
F. El-Baz, Egypt	1,200	J. Allende, Chile	500	M. Limonta, Mexico	250
C.N.R. Rao, India	1,131	E.H.S. Diop, Senegal	500	T. Durrani, UK	200
E.W. Thulstrup, Denmark	1,062	M.V. George, India	500	A.K. Sood, India	200
A. Badran, Jordan	1,045	D.T. Lê, Vietnam	500	R. Ramaswamy, India	200
ANSTS, Senegal	1,029	Li Desheng, China	500	Chen Sai-Juan, China	200
E.M. Essien, Nigeria	1,000	G. Thottappilly, India	500	Chen Zhu, China	200
M. Klein, USA	1,000	C. Vieira, Brazil	500	A. Falodun, Nigeria	200
A. Kornhauser, Slovenia	1,000	Z.H. Zaidi, Pakistan	500	E. Igbinosa, Nigeria	200
A.O. Kuku, Nigeria	1,000	R. Crewe, South Africa	496	S. I. Ola, Nigeria	200
G.S. Khush, Philippines	1,000	S. Ayupov, Uzbekistan	495	E. Unuabonah, Nigeria	200
R. Murenzi, USA/Rwanda (KIST)	1,000	M. Clegg, USA	494	A. Bahri, Tunisia	143
Sang-Dai Park, Korea Rep.	1,000	Girish Agrawal, USA	488	H. Roesky, Germany	106
G.T. Prance, UK	1,000	Li Yiyi, China	465	R. Zare, USA	100
I. Serageldin, Egypt	1,000	I. Saavedra, Chile	443	M.A.J. Mariscotti, Argentina	100
Y. Sobouti, Iran, I.R.	1,000	A.H.O. Hajiyev, Azerbaijan	400	H.K. Majumder, India	100
H.E. Varmus, USA	1,000	S. J. Jabbur, Lebanon	400	K. Basu, USA	100
Y. Yuthavong, Thailand	1,000	M. Tchunte, Cameroon	400	U. Aswathanaray, India	100
J.L. Moran Lopez, Mexico	1,000	T. Obi, Nigeria	400	N. Kumar, India	100
K.E. Mshigeni, Tanzania	1,000	S.S. Hasnain, UK	400	S.M. Muhongo, South Africa	100
Wong Henry Nai Ching, China	1,000	M.P. Alpers, Australia	331	U. Colombo, Italy	97
Yam Vivian Wing-Wah, China	1,000	Mu Guoguang, China	330	A. Peerally, Canada	86
M. Hamdan, Jordan	1,000	H. Van Ginkel, The Netherlands	327	A.M. Cetto, Mexico	51
S.Q. Mehdi, Pakistan	1,000	A.C. Cerda, Chile	300	Ingrid Daubechies, USA	48
Shui-Chin Foundation, Taiwan, China	1,000	H. Chaimovich, Brazil	300	Total	180,790
Pei Gang, China	1,000	S. Datta, India	300		
CAPRISA, South Africa	1,000	L. Davidovich, Brazil	300		
P. Littlewood, UK	1,000	Min Enze, China	300		
I. Eltayeb, Oman	1,000	M.M. Peixoto, Brazil	300		

VOLUNTARY CONTRIBUTIONS RECEIVED FROM TWAS MEMBERS, YOUNG AFFILIATES AND OTHER INDIVIDUALS (2017)

Donations to the Programme Budget:

ABDOOL-KARIM, Quarraisha and (South Africa)	1,000.00
LI, Desheng (China)	975.70
JAGADISH, Chennupati (Australia)	962.70
FUCHS, Harald (Germany)	710.90
ROSSWAL, Thomas (France)	492.70
PRANCE, Ghilleen (UK)	292.50
TOURE, Moctar (Senegal)	292.50
TSAI, Ming-Daw (Taiwan, China)	292.50
LIMONTA-VIDAL, Manuel (Mexico)	200.00
AYUPOV, Shavkat Abdullaevich (Uzbekistan)	194.90
ALABOUDI, Amal (Jordan)	192.90
YANG, Huanming (China)	192.90
MURENZI, Romain (Italy)	97.30
ROESKY, Herbert (Germany)	97.30
PIRES, Luciana B. (Brazil)	48.50

LEPINE, Jacques (Brazil)	48.00
NILSEN, Margaret (USA)	38.74
From anonymous donors	676.40
Total	6,611.54

Donations to the Endowment Fund:

HASSAN, Mohamed H.A. (Sudan)	2,300.94
AGARWAL, Girish S. (USA)	487.70
LI, Chao-Jun (Canada)	292.50
PAULRAJ, Arogyaswami Joseph (USA)	292.50
UPRETI, Bishal Nath (Nepal)	200.00
DAUBECHIES, Ingrid (USA)	48.50
From anonymous donors	96.30
Total	3,913.34

Total donations combined to both funds 10,524.88

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

2017 TWAS FELLOWS AND YOUNG AFFILIATES

TWAS FELLOWS ELECTED IN 2017

Agricultural Sciences

DAKORA, Felix Dapare [South Africa]
 HUANG, Lusheng [China]
 SITHOLE-NIANG, Idah [Zimbabwe]
 SLAMET-LOEDIN, Inez [Indonesia]
 THOMSON, Jennifer Ann [South Africa]
 TSAI, Siu Mui [Brazil]

Structural, Cell and Molecular Biology

KHAN, Haseena [Bangladesh]
 LEE, Wen-Hwa [Taiwan, China / USA]
 MENCK, Carlos Frederico Martins [Brazil]
 ROY, Siddhartha [India]
 ZHOU, Qi [China]

Biological Systems and Organisms

KAMAU, Luna [Kenya]
 MARQUET, Pablo A. [Chile]
 RAO, Jagannatha Kosagisharaf [Panama]
 SCHOLES, Robert John [South Africa]
 STENSETH, Nils Christian [Norway]
 VISWESWARIAH, Sandhya [India]

Medical and Health Sciences incl.

Neurosciences

ALBARWANI, Sulayma [Oman]
 CHANG, Mei-Hwei [Taiwan, China]
 LEKE GANA FOMBAN, Rose [Cameroon]
 MADHI, Shabir Ahmed [South Africa]
 VICTORA, Cesar Gomes [Brazil]
 ZHANG, Xu [China]

Chemical Sciences

CHATTOPADHYAY, Amitabha [India]
 HAN, Buxing [China]
 KANTAM, Lakshmi Mannepalli [India]
 KHALID, Sami Ahmed [Sudan]
 LIU, Yunqi [China]

Engineering Sciences

CHEN, Shiyi [China]
 COLLINS, James [USA]
 KUMARAN, Viswanathan [India]
 PUN, Kit Fai [Trinidad and Tobago]
 WILLIAMS, Roberto Juan José [Argentina]
 ZOU, Zhigang [China]

Astronomy, Space and Earth Sciences

BRUZUAL, Gustavo [Venezuela]
 CHUNG, Sun-Lin [Taiwan, China]
 GUO, Zhengtang [China]
 LIZANO, Susana [Mexico]
 SAHNI, Varun [India]

Mathematical Sciences

ADIMURTHI, Adi [India]
 DIAZ CASADO, Lorenzo Justiniano [Brazil]
 DZHUMADIL'DAEV, Askar [Kazakhstan]
 ROZIKOV, Utkir [Uzbekistan]
 YASSEMI, Siamak [Iran, Isl. Rep.]
 ZHOU, Xiangyu [China]

Physics

CANUTO, Sylvio [Brazil]
 CHERKAQUI EL MOURSLI, Rajaa [Morocco]
 GONG, Qihuang [China]
 MINWALLA, Shiraz [India]
 SINHA, Sudeshna [India]
 XIE, Xin-Cheng [China]

Social and Economic Sciences

AGARWAL, Bina [India]
 CHEUNG, Fanny Miu-Ching [China]
 DURAIAPPAH, Anantha [India]
 KASIMBAZI, Emmanuel [Uganda]

NEW TWAS YOUNG AFFILIATES IN 2017

Sub-Saharan Africa:

- CHIMUSA, Emile Rugamika [South Africa]
- NKANSAH, Marian Asantewah [Ghana]
- SAAD, Dalia [South Africa]
- SALAKO, Kolawole Valere [Benin]
- YESHAK, Mariamawit Yonathan [Ethiopia]

Arab Region:

- AL-SALTI, Nasser Said Fayal [Oman]
- ARABI, Alya [United Arab Emirates]
- CHERIF, Rim [Tunisia]
- SABRY GAD ABOELMAGD, Yasser Mohammed [Egypt]
- ZAKHAM, Fathiah [Yemen]

Latin America & Caribbean:

- ACOSTA RODRIGUEZ, Eva Virginia [Argentina]
- FIGUEIREDO, Claudia [Brazil]
- GITTENS, Rolando A. [Panama]
- GONZALEZ MUNOZ, Pablo Alberto [Chile]
- VALDEZ LORENZO, Jose Ferran [Mexico]

East and Southeast Asia and Pacific:

- JARUWONGRUNGSEE, Kata [Thailand]
- POOTAKHAM, Wirulda [Nik] [Thailand]
- TUMENDELGER, Azzaya [Mongolia]
- ZHANG, Qian [China]

Central and South Asia:

- ADHIKARI, Basanta Raj [Nepal]
- DANDENIYA, Warshi Shamila [Sri Lanka]
- ISLAM, Abul Bashar Mir Md. Khademul [Bangladesh]
- MAHAM, Behrouz [Kazakhstan]
- PATRA, Arpita [India]

PRIZES AWARDED IN 2017

Honours from TWAS and its partners are among the most prestigious given for research in the developing world. They range from the TWAS-Lenovo Science Prize, which celebrates research of the highest impact, to prizes for early-career scientists. Prizes and awards create global recognition for discoveries and innovation by scientists in the South, while providing an incentive for other researchers to pursue excellence.

TWAS-Lenovo Prize (Earth sciences)

- Victor Alberto Ramos [Argentina]

C.N.R. Rao Prize for scientific research

- Kalulu Taba [Democratic Republic of the Congo]

Atta-ur-Rahman Prize in Chemistry

- Rémy Bertrand Teponno [Cameroon]

Fayzah M. Al-Kharafi Prize

- Fathiah Zakhm [Yemen]

TWAS-Samira Omar Innovation for Sustainability Prize

- Caroline Asiimwe [Uganda]

TWAS-Abdool Karim Prize

- Barbara Burmen [Kenya]

TWAS Regional Prizes in Public Understanding and Popularisation of Science

- Julieta Fierro [Mexico]
- Ulmas Mirsaidov [Tajikistan]
- Abdelnasser Tawfik [Egypt]
- Wilfred Fon Mbacham [Cameroon]

2017 OWS-Elsevier Foundation Awards for Early-Career Women Scientists

in the Developing World

- Tanzima Hashem [Bangladesh]
- Rania Mokhtar [Sudan]
- Grace Ofori-Sarpong [Ghana]
- Felycia Edi Soetaredjo [Indonesia]
- María Fernanda Rivera Velásquez [Ecuador]

TWAS Prizes for Young Scientists in Developing Countries

- Md. Atiqur Rahman [Bangladesh], physical sciences
- Ahmad Humayan Kabir [Bangladesh], biology
- Tatiana Arias Garzon [Colombia], biology
- Max Chavarría Vargas [Costa Rica], biology
- Luis Andrés Sandoval Vargas [Costa Rica], biology
- Yallé Caballero Mota [Cuba], computer science
- Luis Enrique Almaguer Mederos [Cuba], biomedicine
- Marlene Susana Arrechea Alvarado [Guatemala], chemical engineering
- Fereshteh Meshkani [Iran, Isl. Rep.], chemistry
- Azadeh Malekneja [Iran, Isl. Rep.], electrical engineering
- Ramia Al-Bakain [Jordan], chemical sciences

- Ala'a Al-Bakheit [Jordan], nutrition and health
- Samar Jaber [Jordan], energy and environment
- Moaz Altarawneh [Jordan], physics and material sciences
- Salah Aljbour [Jordan], engineering sciences
- Enkhtuul Surenjav [Mongolia], chemistry
- Odsuren Myagmarjav [Mongolia], physics
- Bishunu Prasad Marasini [Nepal], biology
- Sujit Kumar Shah [Nepal], chemistry
- Sher Jamal Khan [Pakistan], engineering sciences
- Tariq Mahmood [Pakistan], biology
- Sergio Ismael Martínez-Luis [Panama], chemistry
- Guadalupe Gonzalez [Panama], engineering sciences
- Nathaniel Hermosa [Philippines], physics
- Rangika Umesh Halwathura [Sri Lanka], physics
- Prasit Thongbai [Thailand], physics
- Aziz Ibragimov [Uzbekistan], chemistry
- Farruh Atamurotov [Uzbekistan], physics

THE TWAS SECRETARIAT

Executive Director's Office

Executive Director: Romain Murenzi
[from September 2017]

Interim Executive Director: Mohamed H.A. Hassan
[until September 2017]

Special Adviser: Giusto Sciarabba

Sandra Ravalico
Vanessa Varnier

Finance and Administration

Administrative Officer: Dag Harald Johannessen
[part-time] [until June 2017]

Administrative Officer ad interim: Genet Tilahun
[part-time] [from July 2017]

Marco Beltramini
Antonino Coppola
Patricia Presiren
Paola Vespa
Ezio Vuck

Programmes and Activities

Programme Coordinator: Massimo Paoli

Science Diplomacy coordinator: Peter McGrath

Sabina Caris
Sara Dalafi
Helen Martin
Antonella Mastrolia
Fabrizia Niscio
Payal Patel
Cristina Simoes

Public Information Office

Public Information Officer: Edward W. Lempinen

Francesca Pettoello

Cristina Serra

Sean Treacy

The Organization for Women in Science for the Developing World (OWSD)

Coordinator: Tonya Blowers

Tanja Bole

Sara Dalafi

Lucia Fanicchi

Marina Juricev

Silke Rosemarie Pranzetti [until August 2017]

Zabeeh Ullah Sahil [from February 2017]

GenderInSITE

Director: Alice Abreu

Erin Johnson

The InterAcademy Partnership (IAP)

Coordinator: Peter McGrath

Sabina Caris

Muthoni Kareithi

For specific contact details, see:

www.twas.org/contacts

TWAS ANNUAL REPORT 2017

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Romain Murenzi

Public Information Officer

Edward W. Lempinen

Coordinator

Sean Treacy

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Antonella Mastrolia
Peter McGrath
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Massimo Paoli
Payal Patel
Francesca Pettoello
Patricia Presiren
Cristina Serra
Cristina Simoes
Vanessa Varnier

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Studio Link, Trieste, Italy

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