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ESOF 2020 in Trieste

High-level forum hosts dialogue on science and policy

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Science diplomacy – a bridge to the future

To solve regional and global challenges, the world needs partnerships between scientists, policymakers and diplomats. They come together at **TWAS workshops and courses**.

Photo: Tartarin2009/flickr

www.twas.org/science-diplomacy

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▲ Top: Prefect of Trieste Valerio Valenti, Italian Minister of Economic Development Stefano Patuanelli, Italian President of the Council of Ministers Giuseppe Conte, Friuli-Venezia Giulia Region President Massimiliano Fedriga, and ESOF 2020 Champion Stefano Fantoni. [Photo: ESOF 2020]
Above: TWAS Fellow Salim Abdool Karim

Cover picture: One of numerous science-inspired art exhibits at ESOF 2020. [Photo: ESOF 2020]

▼ TWAS's Executive Director Romain Murenzi endorsing an agreement with ICGEB.


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A TIME FOR A DIALOGUE ON SCIENCE

▲ Mohamed H.A. Hassan, TWAS President

Never has the need been so clear for an open discourse on science and how it will influence the world — not just among scientists, but between scientists and policymakers, and also scientists and the public.

The problem of COVID-19, for which science will in time provide some answers, is the example of this that is understandably on so many people's minds. But this is also true of work to combat climate change, to achieve food security, to bring education to everyone, and to achieve the dream of eradicating poverty. For all these noble goals, scientific research and the work of bringing the benefits of science to all people everywhere are indispensable.

It's for this reason that we at TWAS are proud to have been a partner in bringing the EuroScience Open Forum to Trieste in 2020. And we are pleased to see that despite the challenges of COVID-19, this marvellous conference moved forward and kindled exactly the kind of thoughtful discourse on science, policy, and our lives that we needed.

EuroScience accomplished this with innovation, combining the traditional in-person event with the latest information and communications technology so that panelists and audience members both could attend online from anywhere in the world. This made ESOF 2020 in Trieste a first-of-its-kind occasion, a scientific conference of this size hybridising both social and virtual space with great success.

At the event, there were many panels and remarks to remember. One speech stood out to me in particular, by Cardinal Pietro Parolin, the Secretary of State for the Holy See, during ESOF 2020's opening ceremony. These words in particular held meaning:

"If we want to survive, and if we want life on this planet to survive, then we will have to learn to assume responsibility for our common home on the global level. The breadth and depth of this challenge have been clearly and empirically demonstrated thanks to the dedicated work of many scientists, including some of you gathered here, either in person or online. Understanding the mechanisms by which we can protect and defend our common home and life is a precious and irreplaceable contribution that science makes to the human community."

I agree. It is well-known, at this point, that so many of science's greatest challenges in this time are both global and intertwined, with a need for cooperation with political and philosophical leaders.

It is important that science build bridges across the many divides that separate us from each other so that we can come together and leverage the power of science to save lives — from disease, from poverty, and from the harmful effects of climate change. This is why events such as ESOF are so important. They show us how scientific research connects to the issues that affect all of us, and challenges us to prosper together through our common humanity.

At TWAS, we try to nurture science in many of the poorest parts of the world, so that all people may use its powerful tools for the common good. We know well that a global crisis can weigh heavily on people of the least-developed countries in particular, and thus the need for technological strength there is strong.

So I thank the Cardinal for his moving words, and I thank ESOF for joining us in Trieste this year. I hope they will inspire many others to think, learn, consider and act. Let us all work hard so that our common home may prosper in the interest of the many generations yet to come.

Mohamed H.A. Hassan
TWAS President

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ICTP Campus
Strada Costiera 11
34151 Trieste, Italy
tel: +39 040 2240327
e-mail: info@twas.org
website: www.twas.org

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IN THE NEWS

Predicting outbreaks with satellites

This year, everyone on the planet was plunged into a brave new world, as the coronavirus pandemic swept the globe in a matter of weeks. An ally in the battle to contain this and future epidemics could come, not from earth, but from space. And the benefits of space technologies are being seen in all facets of life.
Satellites are helping communities recover from the destruction of wars and natural disasters. And from satellites could help predict future coronavirus outbreaks around the globe.

SciDev.Net:
www.bit.do/SatelliteVirus

African nations missing from coronavirus trials

The World Health Organization said it wants many more African nations to participate in its SOLIDARITY trial, a global study of four potential COVID-19 treatments. The call came as a new international consortium of researchers urged faster action on clinical research in countries with weak health systems.
Of the more than 300 clinical trials that were launched to find a treatment for COVID-19 in the pandemic's early stages, most were in China and South Korea. And more were on the way in the European Union and the United States. But very few took place in Africa, Latin America and south and southeast Asia.

Nature:
www.bit.do/AfricaCOVID

Lack of equipment leads to worries in India

An online survey among 410 IAS officials by the Central government has revealed that there is acute shortage of medical infrastructure in India to deal with COVID-19.
Seventy-one per cent of the total respondents said sufficient ventilators were not available in their respective jurisdictions. Of 266 respondents, 100 disagreed, 91 strongly disagreed, 23 chose to remain neutral and nine agreed to a question regarding sufficient availability of ventilators.

Down to Earth:
www.bit.do/EquipmentWorries

Syrian refugee develops super-seeds

The work of Safaa Kumari focuses on a quiet yet devastating development crisis. Climate-fuelled virus epidemics affecting fava beans, lentils and chickpeas are spreading from Syria to Ethiopia, gradually destroying the livelihoods of low-income populations.
Known as "poor man's meat", these pulses are vital for both income generation and food security in many parts of the world. For 10 years, Kumari worked to find a solution. Finally, she discovered a bean variety naturally resistant to one of the viruses: the fava bean necrotic yellow virus.

The Guardian:
www.bit.do/SuperSeeds

Hong Kong, Singapore tout coronavirus strategy

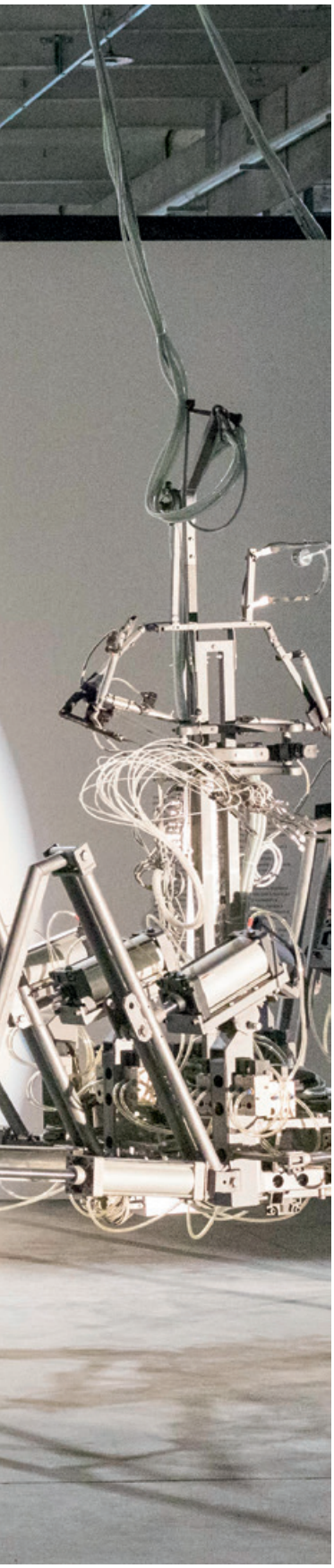
Despite setbacks, Hong Kong's and Singapore's targeted strategies for fighting COVID-19 may yet succeed — and provide a model for other countries emerging from their first wave of cases.
When the pandemic first emerged, both Hong Kong and Singapore had certain advantages. After suffering major outbreaks of severe acute respiratory syndrome in 2003, they had built up response capabilities and laid preparedness plans.

Science Magazine:
www.bit.do/HKSingCOVID

EUROSCIENCE OPEN FORUM

ESOF 2020 COMES TO TRIESTE

One of numerous science-inspired art exhibits at ESOF 2020. (Photo: ESOF 2020)



TWAS, working with other Trieste-based international scientific centres, was a part of the prestigious 2020 EuroScience Open Forum in the city.

Due to the COVID-19 pandemic, health systems, the economy, and daily life for countless people worldwide are all in a state of transformation. And as a result, the year 2020 has proven to be a challenge for scientists and policymakers alike.

And so, naturally, the virus was the hot topic across many sessions during the EuroScience Open Forum in Trieste, or ESOF 2020, an event that set new standards for how to hold a major scientific conference in the modern day. The event pulled off an impressive feat, melding its traditional in-person speeches and sessions with information-technology so that, each day, over 1,000 people could attend remotely.

EuroScience is a European grassroots organisation of scientists and all those with an interest in science. It serves as the voice of European researchers across disciplines and countries, and promotes dialogue with researchers worldwide.

The biennial forum of ESOF is well-established as the biggest general science conference in Europe, functioning as the European meeting place for scientists, science educators, media, politicians, industry and the public. It was organized for the first time in Stockholm in 2004 and has since been held every two years, travelling to Munich, Barcelona, Turin, Dublin, Copenhagen, Manchester -- and this year, TWAS's home city of Trieste, Italy. At ESOF 2010 in Turin, TWAS organised a round table, inviting renowned scientists and journalists to address biodiversity protection.

ESOF focuses on science, policy making and economics. It routinely offers a programme rich with not only a variety of topics but an assortment of high-level speakers. The conference aims to present scientific and technological developments at the cutting edge, from natural sciences to social sciences and humanities. It also endeavours to stimulate the European public's awareness of and interest in science and technology; and foster a European dialogue on science and technology, society and policy.

TWAS is one of many international and regional science organisations headquartered in Trieste, helping to make Trieste a true international capital of science. The Academy was among a number of local partners to help organise the bid for ESOF 2020. Others included the Abdus Salam International Centre for Theoretical Physics (ICTP), the International Centre for Genetic Engineering and Biotechnology (ICGEB), and the National Institute of Oceanography and Applied Geophysics (OGS). TWAS's sister organisations, the InterAcademy Partnership (IAP) and the Organisation for Women in Science for the Developing World (OWSD) were also ESOF partner organisations.

"It was an enormous pleasure and great honour to be a part of ESOF 2020. And it was inspiring to see so many brilliant minds and scientific leaders come together, both in-person and via the Internet, to take part in the important conversations the forum hosted," said TWAS Executive Director Romain Murenzi. "COVID-19 is a strong reminder of the importance of not only science, but global cooperation to ensure that people everywhere are able to receive the benefits of scientific research. This ethos was strongly embodied by the talks and sessions that took place at ESOF."

HONOURING SCIENCE IN TRIESTE

Trieste has been home to the development of important international and national institutes for research, technology transfer and the dissemination of science, bringing to the city a concentration of research workers among the highest in the world. As a Central

◀ ESOF 2020 is inaugurated with a ribbon cutting on 2 September. (Photo: ESOF 2020)

European city, Trieste has also long served as a focal point for strengthening links with Central and Eastern European scientists, businesses, politicians and citizens – a legacy ESOF 2020 fit into comfortably.

The arrival of ESOF in Trieste was a major and at times emotional moment. A city awarded with ESOF is given the title of "European City of Science" and becomes a focal point for discussion about all the most important and contentious topics in science, both among scientists and within the whole city. It was a way to honour the city's tradition of hosting research.

Furthermore, the event inspired many by demonstrating how a major conference could account for COVID-19. ESOF 2020 was originally scheduled for 5-9 July, until the virus rendered it impossible to do so. So the event was delayed until 2-6 September, and organisers adjusted the programme to include a high volume of virtual panels and hybrid panels – which included a mix of virtual and in-person attendees.

Of the 150 events of the forum on the calendar, about 70 were held completely online,

> "ESOF 2020 has provided an innovative hybrid organisational model, something that should not be taken for granted."
>
> *ESOF 2020 Champion Stefano Fantoni*

▲ During ESOF 2020, the audience looks on during a discussion on the U.N. Sustainable Development Goals. (Photo: ESOF 2020)

◀ The front entrance of ESOF 2020. (Photo: ESOF 2020)

and another 70 were hybridised. Only 10 events were entirely in-person. Plenary meetings, as well as presentations by high-level speakers, were made available through live-streaming.

About 2,500 people registered for ESOF 2020, including over 1,000 who participated in person and roughly 1,400 people who connected remotely on a daily basis. On average, each event was attended online by about 300 people, and the event saw 4,300 virtual visits overall. Online observers came from 52 countries across 5 continents.

ESOF 2020 also had considerable media coverage, with more than 700 mentions in print and on the web during the days of the conference. Additionally there were 60 television segments, of which 30 were at a national level, as well as 30 mentions on national and regional radio.

All events were held in the Old Port of Trieste, at the heart of the new Trieste Convention Centre – TCC. The multifunctional congress centre was inaugurated with ESOF. The event also included 25 artistic exhibitions about science and scientific progress.

A HIGH-LEVEL GATHERING

ESOF 2020 offered a programme of high-impact topics, including climate change, sustainable development, COVID-19, migration, equal gender opportunities in science, and more.

It also assembled an impressive number of high-level figures. The opening ceremony

on 2 September brought together numerous important persons including: Cardinal Piero Parolin, Secretary of State for the Holy See; Gaetano Manfredi, Ministry of Education, University and Research; and Fabiola Gianotti, the Director of CERN.

The closing ceremony on 6 September included a speech by Italian President of the Council of Ministers Giuseppe Conte; as well as remarks from Italian Minister of Economic Development Stefano Patuanelli, and also Mariachiara Tallandini, a professor of science, law and democracy.

"Trieste is the Italian city with the highest number of researchers per number of inhabitants. Here are concentrated scientific centres of absolute international importance," said Conte in his remarks to the closing ceremony audience. "So today is an important and symbolic moment to also launch this future perspective; we must work on technological innovation, on the most advanced technologies, and Italian scientists are at the forefront of this."

Also speaking at the opening were EuroScience President Michael Matlosz; Trieste Mayor Robert Dipiazza; Friuli Venezia Giulia Region President Massimiliano Fedriga; Fabrizio Nicoletti, from the Italian Ministry for Foreign Affairs; Sanja Damjanovic, Ministry of Science from Montenegro; Emmanuel Nzimande, Minister of Science and Technology of South Africa; and Stefano Fantoni, ESOF2020 Champion.

"ESOF 2020 has provided an innovative hybrid organisational model, something that should not be taken for granted. On top of that I would like to highlight the scientific relevance of the discussions made in the past days," said Fantoni.

Two Nobel laureates, crystallographer Ada Yonath and experimental physicist Barry Clark Barish, also participated in the conference.

▲ From left: Prefect of Trieste Valerio Valenti, Italian Minister of Economic Development Stefano Patuanelli, Italian President of the Council of Ministers Giuseppe Conte, Friuli-Venezia Giulia Region President Massimiliano Fedriga, and ESOF 2020 Champion Stefano Fantoni. [Photo: ESOF 2020]

▶ Italian President of the Council of Ministers Giuseppe Conte spoke at the closing ceremony of ESOF 2020. (Photo: ESOF 2020)

DISPLACED SCIENTISTS AND OTHER KEY ISSUES

TWAS participated in one of the forum's high-profile events, called "Permanent Insecurity: A Science International strategy to support displaced and refugee scientists and science students."

In this event, TWAS was one of the high-level global science organisations – along with the InterAcademy Partnership (IAP) and the International Science Council (ISC) – to address the challenges of responding to the needs of scientists displaced by war and other conflicts. Speakers provided various points of view on the matter of displaced scientists and examined how to provide long-term support, while also welcoming input and raising awareness of the issue.

Another highlight was the session 'Beyond the Lab: Career Paths between Science and Policy', designed to trigger a discussion on alternative career opportunities for professionals with a scientific academic background. The aim was to raise awareness of interesting career paths on the interfaces between the areas of Science and Policy. In the session, partners of the S4D4C Horizon 2020 project — including TWAS which was represented by the Academy's science diplomacy coordinator, Peter McGrath — analysed several cases where science diplomacy was crucial.

TWAS, with its long experience in science diplomacy, is one of 10 partners in the EU Horizon 2020-funded S4D4C consortium. Both TWAS and S4D4C support current and future science diplomacy capacity — in Europe and elsewhere — especially for the development of solutions for global challenges.

> "Trieste is the Italian city with the highest number of researchers per number of inhabitants. Here are concentrated scientific centres of absolute international importance."
>
> *Italian President of the Council of Ministers Giuseppe Conte*

Illustrating this commitment to science diplomacy, TWAS President Mohamed H.A. Hassan took part in the session "Scientific Diplomacy for Freedom: Inter-Cultural Dialogue for Science". Hassan discussed the importance of science diplomacy as a tool for moving towards a solution to the pandemic and its ripple effects on other facets of people's lives, such as the economy. Hassan spoke alongside Lassina Zerbo, the executive secretary of the Comprehensive Nuclear-Test-Ban Treaty Organization, who in 2019 presented a TWAS-

▼ From left: Cardinal Pietro Parolin, Secretary of State for the Holy See, speaks during the ESOF 2020 opening ceremony; Fabiola Gianotti, Director of CERN, speaks durng the ESOF 2020 opening ceremony. (Photo: ESOF 2020)

In collaboration with Rai, the Italian public service broadcaster, a series of eight videos and 10 podcasts entitled Magazzino 26, in homage to the historic building of Porto Vecchio, were created to describe Trieste, the European City of Science. OWSD Programme Manager, Evgenia Markvardt, is featured. The videos are available on Raicultura while the podcasts can be found on Radio 3.
See the videos: www.raicultura.it/speciali/esof2020/
See the podcasts: www.raiplayradio.it/programmi/magazzino26

Paolo Budinich Science Diplomacy Lecture. The panel was moderated by Mounir Ghribi, who is in charge of the international cooperation and strategic partnerships at OGS in Trieste.

One TWAS Fellow in particular, Salim Abdool Karim, played a prominent role in the event. Karim chairs the South African COVID-19 Ministerial Advisory Committee and is the Director of the Centre for the AIDS Programme of Research in South Africa (CAPRISA). He both took part in a special press event with journalists to answer their questions, and offered his insight in the prominent session "If COVID-19 is the 9/11 moment for global public health, what needs to happen next?" during which panelists discussed how COVID-19 will impact public health systems and norms in the long-term.

HONOURS AND CALLS FOR ACTION

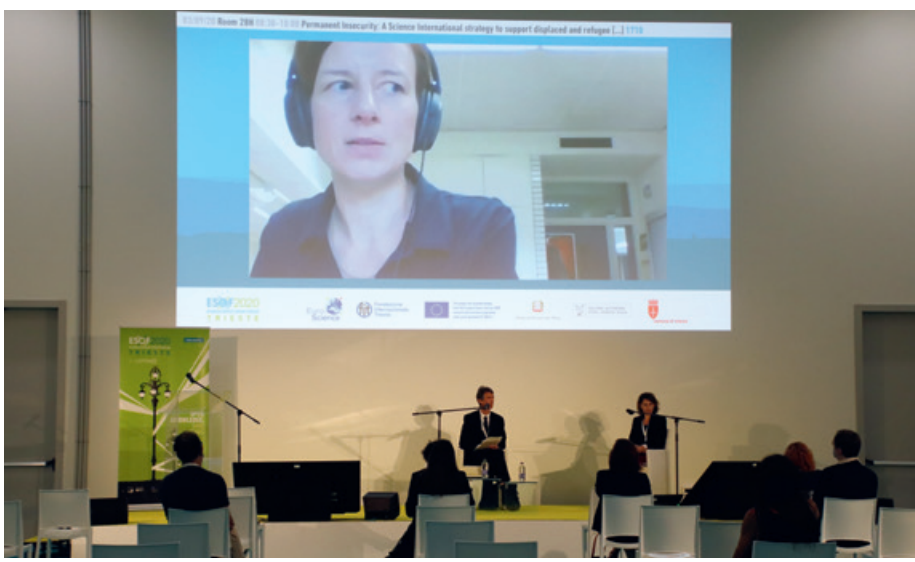
ESOF also proved to be the perfect setting for an important breaking announcement from OWSD: that the organisation, which supports women throughout the developing world to achieve and advance their scientific careers, was among only six shortlisted organizations for the NATURE Research Awards for Inspiring and Innovating Science, in the Science Outreach category. Selected entries for this prestigious international award have "shown exceptional vision, insight and/or imagination and demonstrated that they encourage, support or promote the interest of girls and/or women in STEM."

To celebrate this announcement during ESOF, two OWSD members gave press conferences: Uduak Okomo from The Gambia spoke about her research on neonatal and maternal health in West Africa; and Mayrse Nkoua from Brazzaville, Congo described bringing electricity to a clinic in Brazzaville using nanotechnology. OWSD also organised an event at the Antico Caffè San Marco in Trieste, for the ESOF Science in the City festival, including OWSD Fellows online and in dialogue with students from the University of Trieste.

Also, alongside TWAS, IAP was deeply involved in several events at ESOF, among them the TWAS/IAP session "Permanent Insecurity: A Science International strategy to support displaced and refugee scientists and science students", which was moderated by McGrath, who is also the coordinator of IAP.

Part of the panel was Ghanya Al-Naqeb, a nutritional scientist from Yemen who was featured in the TWAS film 'Science in Exile' and spoke on her experience as a scientist displaced from her home country by geopolitical strife. Also speaking at the event were Alain Prochiantz, professor emeritus at Collège de France, who spoke on his familiarity with the issue, and neurophysicist Marie-José van Tol, who spoke on the Dutch Young Academy's science buddies programme for scholars at risk.

▲ In-person attendees observe virtual sessions taking place as part of ESOF 2020. (Photo: ESOF 2020)



> The standard phases of clinical vaccine trials must proceed with appropriate scientific rigour, in particular the collection of the robust evidence needed to demonstrate large-scale safety and efficacy. *IAP President Volker ter Meulen*

◀ The session "Permanent Insecurity: A Science International strategy to support displaced and refugee scientists and science students" at ESOF 2020. On screen is Marie-José van Tol of the Dutch Young Academy. (Photo: ESOF 2020)

Also at ESOF, IAP issued a statement: "A Call to Action: Furthering the fight against falsified and substandard medical products", which urged decision-makers worldwide to work toward ensuring the safety and quality of medical care. IAP also presented its Communiqué on the Development and Distribution of Vaccines against COVID-19. The analysis highlighted the essential role vaccines will play in controlling the current pandemic and enabling people to return to their daily lives.

"The race for a COVID-19 vaccine must not be allowed to hurt the public: while there is a pressing need to accelerate this process to the greatest degree possible, there are also grave dangers if corners are cut," said IAP President Volker ter Meulen. "The standard phases of clinical vaccine trials must proceed with appropriate scientific rigour, in particular the collection of the robust evidence needed to demonstrate large-scale safety and efficacy."

ESOF's press conference room also hosted a virtual meeting with Wafa Skalli, Chair of the IAP Science Education Programme (SEP). Skalli is a mechanical engineer based in Paris, focused on translational research in clinical biomechanics, orthopaedics and musculoskeletal modelling. ◘

Q&A COVID-19 AND SOUTH AFRICA: COMMUNICATION IS KEY

by **Cristina Serra**

Building trust in scientists and protecting at-risk sections of the population helped the management of the early epidemic in South Africa, said TWAS Fellow Salim Abdool Karim at ESOF, Trieste.

Months after the first cases of SARS-CoV-2 infection, the world has since adjusted to new needs and conditions. But the first weeks after the disease spread turned out to be the most critical for delivering the right messages and preparing appropriate responses.

Salim Abdool Karim, the director of the Centre for the AIDS Programme of Research in South Africa (CAPRISA) in Durban, South Africa, is a clinical infectious diseases epidemiologist of international repute for his achievements in HIV prevention and treatment. He is also a 2009 TWAS Fellow.

In South Africa, he was and still is, an authoritative voice not only for the scientific community but also for the public. He was named the chair of the South African Ministerial Advisory Committee on COVID-19 and serves as a member of the African Task Force for Coronavirus, and as a member of the Lancet Commission on COVID-19. In the first weeks of the pandemic, he published an overview of how South Africa is slowing the transmission of SARS-CoV-2 and combatting the virus. He also advised the population through TV and radio interviews.

Professor Abdool Karim was a guest speaker in one of the events that TWAS organized at ESOF 2020, the international EuroScience Open Forum that took place in Trieste, Italy, from 2-6 September.

On 3 September he released an interview that provided insights about the South African response to COVID-19 and described key issues relevant for lowering the risk of infection. What follows is the interview that focused on the early months of the pandemic, from March until September.

Professor Abdool Karim, how did the South African scientific community address the COVID-19 infection in its early days?

● Since our first case on 5 March, our understanding of the epidemic has been evolving. On 15 March, the President of South Africa declared the "state of disaster". We closed schools and banned international travel for an initial five-week lockdown. This

Salim Abdool Karim (Photo provided)

is when we increased our efforts to understand this virus, sharing experiences with colleagues worldwide on how we and they were responding to COVID-19.

Communication is playing an important part in the COVID-19 response. How did the scientific community manage to contain the dissemination of untrusted news that usually happens, especially through the Internet, in times of exceptional events?

● We tried to deliver scientifically rigorous messages because we realised that providing the population with reputable news was important also for prevention. The government established a ministerial advisory committee that advises the Minister of Health. I chair this committee, and in that role, it's my responsibility that we deal with key challenges to provide the best available scientific advice. I am also the co-chair of a consortium coordinating the clinical trials in Africa under the African Union, which was created to encourage and foster clinical trials of COVID-19 vaccines in Africa. We knew we had to do the best we could learning from other coronaviruses and influenza to extrapolate what would be the best course of action.

Were you able to publish any scientific results in such a short time?

● Sure we did. We published a paper in the *New England Journal of Medicine* looking at the South African response from a clinical perspective; and then a paper with my wife, Dr. Quarraisha Abdool Karim, in *Science*, looking at COVID-19 and how it affected HIV and tuberculosis (TB). But we also engaged in public education programmes. Over the last 4-5 months, I have contributed to TV and radio interviews, online articles, posted on social media. Much of the coverage, three quarters, was inside South Africa, but there was also substantial coverage outside South Africa.

As a government advisor, you were requested to look at the South African situation after the first cases were reported, to suggest strategies and effective responses. What was your advice?

● I developed an eight-stage response whose steps are overlapping. Stage one is about preparation: it is focused on surveillance and community education. Then I listed the importance of primary prevention: all those risk-reducing measures that we know can decrease the infection (social distancing, hand-washing, wearing masks). Lockdown

and active case-finding were next. The remaining steps were focused on hotspots surveillance and the role of medical care: protecting staff from the infections and granting hospital space and equipment to ill people. Last but not least, I urged on the importance of implementing burial capacity and managing the psychological and social impact of the epidemic, building vigilance through the tracking of antibody levels in the population and vaccine administration, if available.

Some numbers in Africa were puzzling: many cases of people infected with Coronavirus, but not many deaths. Why?

● This was enigmatic to me. Why didn't we have the severe epidemic of coronavirus as in some other countries such as Italy? I don't have a good explanation, but a number of hypotheses: early lockdowns and cross-reactive immunity, for example. Another explanation of why the death rate is lower in Africa could be that we have a younger population. But again, that only accounts for a part and not all of the difference. The epidemics actually came later in Africa than it did in Europe, and steps were already taken to protect the elderly. Most of the old age homes in South Africa are very restrictive, you cannot meet with an elderly person inside: they have to be outside, at a certain distance because doctors are very concerned about the virus spreading. So the protection given to old-age homes could have been one of the reasons, and perhaps also slightly lower rates of diabetes, and so on. Put all these observations together and we might have the answer.

> "The risk of infection among school children is as high out of school as it is in school. Hence, it is appropriate for them to go back to school in South Africa."
>
> *Salim Abdool Karim*

Anti-vax movements and distrust towards science are quite common nowadays. What is the situation in South Africa?

● Anti-vaccine lobbies are a strong presence in our country like they are in the U.S. They create conspiracies that Bill Gates is testing his vaccines on Africa. These lobbies use social media mainly to share misinformation.
I myself have been attacked on social media for my positions supporting vaccines. But they are a very concerted group, they are small, they are media-savvy and they use that to create hesitancy in people about the safety of vaccines. Unfortunately, in the COVID situation, they present a particularly serious problem for us.

Over the months this virus has apparently changed: we see more positives but fewer deaths (as of September). Is its genome changing? Are we becoming stronger?

● It's difficult to give a straightforward answer to this question. In general, the proportion of a population that becomes infected during the first wave is around 3-10%. In the case of the Coronavirus, looking at studies that tested people for antibodies we see that only 5% of people were infected. From February to September we sequenced the genome of over 1000 viruses and we saw very minor changes

Salim Abdool Karim
(Photo provided)

in the genetic makeup of the virus, one genetic change per month at most. These mutations have not changed the virus in any meaningful way. What's more, the virus's main protein, called "spike protein", used to bind to human cells seems genetically very stable. And that's a good sign because most of the vaccines are targeting the spike protein, and most of them are using European strains of the virus which are the same strains we have in Africa.

At CAPRISA, where your wife (also a TWAS Fellow) serves as the associate scientific director, scientists are equally committed to AIDS and tuberculosis. Did COVID-19 distract

away from these two conditions, jeopardizing the treatment of HIV/TB patients?

● South Africa's population is about 58 million, and we have 7.7 million who live with HIV. In South Africa, we have one of the biggest HIV treatment programmes in the world, with nearly 5 million people under treatment. Unfortunately, we still have 2-3 million people who have not yet initiated the treatment, and that's part of our concern and challenge because they do not know that they have HIV, because it's a silent disease until you are in an advanced stage. Young women, in particular, have the highest rate of HIV, often in combination with TB, and they are our biggest concern. During the early stages of the epidemic, we observed that people with AIDS and/or TB were initially hesitant to go to clinics to receive their standard treatment. They were concerned that if they'd go to the hospital they would get COVID because they knew we were admitting patients for that. So we had to work hard to overcome that reluctance, explaining that our hospitals and health care services have adequate triage protocols. When we admit COVID patients they are taken in a completely different way, and patients without COVID are not mixed with the others. It took us a while to get that message to pass, but eventually, we succeeded.

What would be the consequences of a high drop-out rate among HIV and TB patients?

● High drop-out rates could compromise years of strategic planning, programming and monitoring for both diseases. If that happened we may end up with patients developing drug resistance because stopping treatment undermines viral suppression. We would start seeing more transmission of resistant forms, which would compromise and undermine all the valuable efforts that we made to try to control HIV. Thankfully we did not witness this worst-case scenario: patients are now going regularly to hospitals to collect their medication.

Can you comment about the return to schools in South Africa?

● Issues related to schools are among the most controversial of all. In South Africa, school is particularly important for children because in the poorest neighbourhoods 18 per cent of children attending schools depend on the schools' nutrition programmes, for their daily meal. If schools are closed, they do not get their daily meal. And that's a big problem. Another challenge is that when children are not in school, they are not at home in isolation. Rather they are playing in the neighbourhoods often interacting with other children and adults. The risk of coronavirus infection among school children is as high out of school as it is in school. Hence, it is appropriate for children to go back to school in South Africa. ◘

THE 'WARNING BELL' OF COVID-19

ESOF panel brings together experts, including a TWAS Fellow and UNESCO official, to weigh the lessons of the pandemic and its legacy to come in global public health

by **Sean Treacy**

The impact of COVID-19 on the world is difficult to deny. And so how will it transform the systems across the planet that manage and respond to public health crises? And will these changes be the kinds of changes that should happen?

These questions were central to a high-level panel at ESOF, moderated by the Financial Times Science Editor Clive Cookson, and featuring numerous experts on world health systems. Among them were the Chair of South Africa's COVID-19 Ministerial Advisory Committee and TWAS Fellow Salim Abdool Karim, and Director of UNESCO's Regional Bureau for Sciences in Latin America and the Caribbean Lidia Brito, who is also the former director of UNESCO's Division of Science Policy and Sustainable Development. TWAS is a programme unit of UNESCO.

The shared premise of the panel, who together issued a call for change, was that just as the 9/11 attacks changed many lives with regards to the nature of state security, COVID-19 should leave a similar legacy on our international and national public health systems. Together, they sought to assess what went wrong in the initial response to the pandemic, as well as what went well, and determine what consequences of the pandemic are yet to be appreciated.

"When I think about the immediate reactions we saw to this pandemic," said Karim, "it was to blame China and it was to blame the WHO. But, deflecting and blaming doesn't help in this pandemic. Instead, we've got to find solutions."

▲ Moderator and Financial Times Science Editor Clive Cookson.

Science was important to the response in South Africa, Karim reflected, because it provided the information necessary to guide the path forward through the pandemic.

Still, he called COVID-19 "a warning bell of worse to come" that governments and scientists must heed and take as a cue to strengthen public health systems. He said that the world's governments and scientists need to be prepared not only for future waves of this virus, but the economic consequences that have highlighted "fault lines" of race, gender and class, amongst others, in our societies. As an example, he cited the class divide between those with Internet and those without, and how seriously disadvantaged people without Internet are in the pandemic.

"So how we bridge those divides is going to be important. And how we bridge the divides of our inequities is going to be important," said Karim.

"This is not just a moment to deal with a virus in our community, but also to deal with the underlying inequities that make this virus and this epidemic more severe."

Brito said there were positive elements of the science systems' response to the pandemic that the world can take heart in.

"They were able really to come across and try to find answers to very complex questions. And I think the fact that science responded so quickly also created an important environment that strengthened trust in science," said Brito. "I think the fact that society now is listening to scientists and is really trying to follow the progress of scientific knowledge in this pandemic, it's a very positive trend. And I would say that the trend will help us most here and also for the next ones that will come."

Strengthening trust in science is crucial, Brito said. In countries where the existing systems struggle to take care of their people, trust is lost and the task becomes even more difficult.

"It's going to be important in the future when we are talking about vaccines and treatments and so on," she said. "The right of everybody to access the benefits of science should be a part of this discussion."

Brito noted that her home country of Uruguay benefited from the creation of a scientific advisory committee that worked alongside with the government in the early stages of the crisis. Bringing scientists into the decision-making process also allows scientific communities to talk directly to the society they're in, strengthening the conversation between science policy and the population.

▲ TWAS Fellow and Chair of South Africa's COVID-19 Ministerial Advisory Committee Salim Abdool Karim.

▼ Director of UNESCO's Regional Bureau for Sciences in Latin America and the Caribbean Lidia Brito.

> "... deflecting and blaming doesn't help in this pandemic. Instead, we've got to find solutions."
>
> *TWAS Fellow Salim Abdool Karim*

"More than anything, than any other time, we really need to talk about science diplomacy," she added. "We need to make sure that when we discuss agreements, we also discuss how we can build scientific collaboration. Open science is a very important aspect of UNESCO's work. How can we make sure that we create systems where science is really a crucial part of the investments that governments do, now that we need scientific evidence to really make the right decisions in difficult and complex times." ■

See the full session here: https://youtu.be/IMXOZG3GJr0

▼ Massimiliano Fedriga, President of Friuli-Venezia Giulia Region at ESOF 2020.

▲ Numerous scientific institutions in Trieste, Italy, partnered to bring ESOF 2020 to Trieste.

▼ Seating in the main auditorium for ESOF 2020 was spaced out to account for social distancing necessary to mitigate the spread of COVID-19.

▲ Italian President of the Council of Ministers Giuseppe Conte speaks with the press outside ESOF 2020 after arriving.

▲ One of numerous science-inspired art exhibits at ESOF 2020.

All photos are by ESOF 2020

▼ The main stage at ESOF 2020.

▼ One of numerous science-inspired art exhibits at ESOF 2020.

▲ ESOF 2020 attendees gather around Italian President of the Council of Ministers Giuseppe Conte for a photo.

▼ Attendees browse the numerous science-inspired art exhibits at ESOF 2020.

▲ One of many science-inspired exhibits at ESOF 2020.

▲ The CYBORN exhibit at ESOF 2020.

All photos are by ESOF 2020

▼ The city of Leiden, the Netherlands, will host ESOF 2022.

ICGEB, TWAS JOIN TO ADVANCE THE GLOBAL SOUTH

Through a new partnership, ICGEB and TWAS aim to advance biotechnology research for economic and social development in the global South.

by **Cristina Serra**

By endorsing a Memorandum of Understanding, ICGEB and TWAS made a commitment to implement joint activities to build capacity in biotechnology and related fields in the global South. The accord was signed on 22 June 2020, at the ICGEB Headquarters in Trieste, Italy, between ICGEB Director-General Lawrence Banks and TWAS Executive Director Romain Murenzi.

The two Trieste-based institutes have agreed to collaborate in the implementation of common activities, which include grant proposals, conferences, courses, exchange programmes, and fellowships. For both the institutes, the focus is on Least Developed Countries (LDCs), women scientists and the African continent.

Lawrence Banks stated: "The ICGEB and TWAS are at the forefront for promoting international scientific diplomacy and cooperation and we share many of the same goals - using science for development and ensuring that the fruits of modern molecular biology can improve the lives of our populations all over the world. This coming together of ICGEB and TWAS is a perfect synergy and will greatly strengthen each of our own programmes and ensure that we fulfill our noble missions."

With the Sustainable Development Goals in mind, especially those linked to health, food and energy security, and gender equality, the joint activities will cover the strategic areas of biotechnology and related fields. This will be done by fostering cooperation on the promotion of exchange programmes for visiting experts and researchers, both from and to ICGEB's laboratories and its Regional and Affiliated Centres, thereby promoting South-South and North-South cooperation.

Romain Murenzi added: "Biotechnology is a growing field in many developing countries, with applications for food production and health, amongst others. TWAS has been implementing programmes for capacity building in the global South since it was founded by Abdus Salam and his colleagues, in Trieste in 1983. Collaborating with the ICGEB is a natural step. We expect our synergies to yield new programmes, increasing our impact on the developing world and clearing more paths toward sustainable development."

The two Institutes also agree to implement a joint fellowship programme for postdoctoral researchers in biotechnology and related topics with special consideration being given to women from Africa. The awardees will be hosted at one of ICGEB's three laboratories in Italy, India or South Africa, or at one of its Affiliated or Regional Research Centres.

ICGEB's programmes for capacity building have been operating for more than 30 years. As an instrument of foreign policy and scientific diplomacy, it assists emerging economies, and promotes autonomous growth through the

▶ ICGEB Director-General Lawrence Banks (left) and TWAS Executive Director Romain Murenzi after endorsing the MoU.

> We expect our synergies to yield new programmes, increasing our impact on the developing world and clearing more paths toward sustainable development.

TWAS Executive Director Romain Murenzi

use of biotechnology for economic and social development.

The signing of this agreement takes place a decade since the passing of ICGEB's founding father and Director General, Prof. Arturo Falaschi. His legacy lives on in driving the mission and vision of the Organisation to bring advanced research, training, and capacity enhancement to developing and emerging economies.

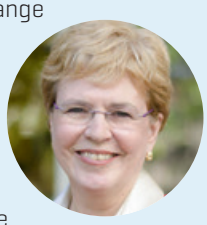
Over the past years, TWAS supported numerous projects in biotechnology in more than 30 developing countries. Also, back in 2013, in a joint effort with the Chinese Academy of Sciences, TWAS established strategic centres of excellence in Beijing, including the CAS-TWAS Biotechnology Centre of Excellence. Its director, Prof. Yin Li, later published a report titled "Biotechnology in the Developing World: Growth and Competitiveness", which was endorsed by TWAS.

The Memorandum of Understanding with the ICGEB is, therefore, a milestone for TWAS in its mission to strengthen science and research in developing countries. In particular, the sister institutes of the ICGEB in South Africa and India are ideally placed to complement and support some of TWAS's ongoing initiatives that are based on South-South cooperation. ◘

PEOPLE, PLACES & EVENTS

LUBCHENCO NAMED TO THE PONTIFICAL ACADEMY OF SCIENCES

Jane Lubchenco, distinguished university professor at Oregon State University and a 2004 TWAS Fellow, was elected to the Pontifical Academy of Sciences. The honour acknowledges a career dedicated to creating and sharing ecological knowledge to benefit humanity, but especially demonstrating that the ocean can mitigate climate change and provide food security, jobs, and revenue to support development and alleviate poverty.



Lubchenco, a marine ecologist by training, stands as a worldwide expert in ocean ecosystem resilience, climate change and human well-being. She was named by U.S. President Barack Obama as the State Department's first science envoy for the ocean.

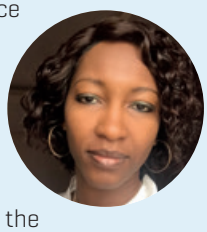
A passionate advocate of sustainability, she champions the importance of sustainable aquaculture and sustainable fisheries to promote food security and marine protected areas to promote a healthy ocean.

She is also a member of the National Academy of Sciences and the Royal Society. In 2014, Lubchenco received the TWAS Medal for her discovery of fundamental ecological and evolutionary relationships among animals and plants in coastal systems.

The Pontifical Academy is one of the world's oldest scientific bodies, founded early in the 17th century. Its members receive lifetime appointments based on their eminent original scientific studies and of their acknowledged moral personality.

AMINATOU KONE ADVANCES HER CAREER

Aminatou Kone, an assistant professor in molecular biology at the University of Science, Techniques and Technology of Bamako, Mali, since 2018 and currently in charge of lectures with the same university is advancing through her career thanks to the support of a TWAS fund. With Elsevier, she has recently authored a paper where she proves the effectiveness of artesunate treatment against the malaria parasite in Mali.



With a master degree in biology and a PhD in medical sciences, she's been studying malaria drug resistance epidemiology since 2002, initially with an internship and now as a research assistant, since 2014. TWAS has granted her postdoctoral support, in 2018, which allowed her to be autonomous in conducting and managing a research project. Since then, she has been addressing topics of interest, in particular the molecular resistance of malaria parasites to antimalarial drugs but also the human and parasite genetic diversity and their implication in malaria control and elimination.

IN MEMORIAM

Professor **Mohammad Ahmad Hamdan** from Jordan, the TWAS vice president for the Arab Region and a TWAS Fellow since 1988 passed away in February 2020.

He was an esteemed mathematician: he obtained his PhD in mathematical statistics (1963) from Sydney University and focused on a branch of statistics called estimation theory, as well as on the concept of distributions in probability theory.

A committed scientist, he embraced TWAS and its mission showing his unceasing support to science and technology in developing countries.

In Jordan, he served as minister of education and higher education and scientific research, and as secretary-general, higher council for science and technology. He was also president and founding member of the Yarmouk University, of the Jordanian state-run Hashemite University and the Arab Open University.

At TWAS he was elected vice president for the Arab Region from 2016-18, and re-elected for a second term (2019-2022). A few months before his departure, Professor Hamdan linked his name to the Academy's, establishing a prize in his name, making as an individual TWAS Fellow the single largest donation ever. Every two years an award of USD 5,000 will be given to a mathematical scientist working and living in Africa or the Arab region.

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Do you have news for People, Places & Events?

Please send an email to Cristina Serra (cserra@twas.org) with a brief explanation, link to more details, photos with credits and contact information.

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United Nations Educational, Scientific and Cultural Organization

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The World Academy of Sciences for the advancement of science in developing countries – TWAS – works to support 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 laureate. Today, TWAS has almost 1,300 elected Fellows from more than 100 countries; 14 of them are Nobel laureates. It is based in Trieste, Italy, on the campus of the **Abdus Salam International Centre for Theoretical Physics (ICTP)**.

Through more than three decades, the Academy'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 and engineering research and sharing of experiences in solving major problems facing developing countries.

TWAS and its partners offer more than 460 fellowships per year to scientists in the developing world for PhD studies and post-doctoral research. TWAS prizes and awards are among the most prestigious given for scientific work in the developing world. The Academy distributes nearly USD1 million in research grants every year to individual scientists and research groups. It supports visiting scientists and provides funding for regional and international science meetings.

TWAS hosts and works in association with two allied organizations on the ICTP campus:

The Organization for Women in Science for the Developing World (OWSD). At its founding in 1989, OWSD was the first international forum uniting women scientists from the developing and developed worlds. Today, OWSD has more than 9,000 members. Their objective is to strengthen the role of women in the development process and promote their representation in scientific and technological leadership.

The InterAcademy Partnership (IAP) represents more than 140 national and regional science and medical academies worldwide. IAP provides high-quality analysis and advice on science, health and development to national and international policymakers and the public; supports programmes on scientific capacity-building, education and communication; leads efforts to expand international science cooperation; and promotes the involvement of women and young scientists in all its activities.

TWAS receives core funding from the Italian Ministry of Foreign Affairs and International Cooperation, and key programmatic funding from the Swedish International Development Cooperation Agency (Sida). It is a programme unit of UNESCO.

www.twas.org

ICTP

iap SCIENCE HEALTH POLICY
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