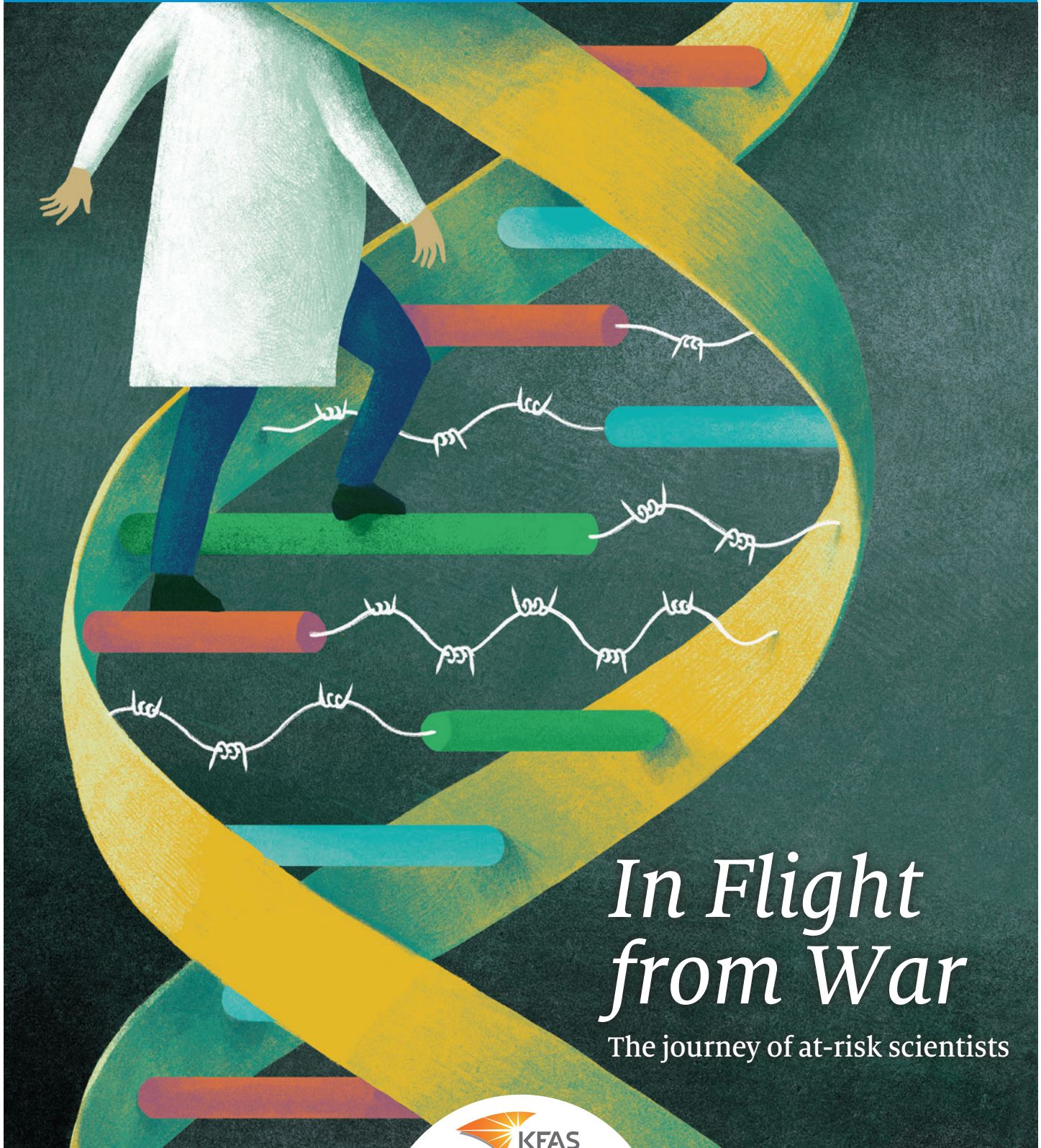


*twas*

# NEWSLETTER

A PUBLICATION OF THE WORLD ACADEMY OF SCIENCES



## *In Flight from War*

The journey of at-risk scientists



**Our work on refugee and displaced scientists has included engagement and cooperation at every level – local, national and international.**

**We are grateful to the following organisations for sharing their expertise and interest:**

- Abdus Salam International Centre for Theoretical Physics, Italy
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**Swedish International Development Cooperation Agency**





▲ [top] The scientific community must be more proactive in taking care of colleagues arriving from war-torn areas; [below] "Science in Exile" is a film in which displaced scientists speak for themselves.

**Cover:** Illustration by Jan Sedmak

▼ Two promising initiatives are emerging to support displaced researchers.



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EDITORIAL

# OUR OBLIGATION TO DISPLACED SCIENTISTS



▲ Romain Murenzi,  
TWAS Executive Director

Syria, Afghanistan, Yemen, Iraq – in these countries, violent conflict and insecurity in recent years have driven millions of people from their homes. Each has its own history, its own political and cultural dynamics. But in each one, and in many other troubled countries, circumstances drive people to a difficult conclusion: that life at home poses intolerable risks. And so they leave, joining a stream of refugees and displaced people that today is unprecedented in the years since World War II.

They arrive in Jordan or Lebanon, or in Italy or Germany or Canada. They worry about how they will eat, where they will sleep, where they will work. Sometimes they are welcomed, but often their new neighbours have their own worries – about the spread of conflict or about terrorism, about how the newcomers might change their home culture. On all sides, there is great uneasiness.

In the North, and even in countries adjoining the war zones, there are misconceptions about those who are seeking refuge from war. We tend to see them simplistically. In fact, though, there is a spectrum of migrants. While some are poor and have limited education, others have skills and rich experience. Some are scientists and engineers, doctors and nurses, science teachers and promising science students.

At TWAS, we count those people in the broad scientific community as members of *our* community, and we see it as imperative to understand their experiences and needs. Forced departure from their home countries can seem like a one-time disruption, but in fact the repercussions can last years, or even generations. And the costs to the individuals and their countries can be enormous.

Consider the cost of educating one PhD-level scientist. Countries such as Syria and Iraq have had schools and universities that were the envy of their neighbours; the schools produced a capable corps of researchers and doctors. For

each individual scientist, the cumulative costs of education and training amounts to tens of thousands or even hundreds of thousands of dollars. If half of a country's scientific workforce flees, that investment is compromised. The benefits go to a new country, or they are lost altogether.

When the conflict ends and the time comes to rebuild, the country will have lost a generation of trained scientists and a generation of students. This will cripple the recovery, and the costs will be compounded. Without a strong science sector to support economic growth development, there will be fewer opportunities for everyone. Poverty will be perpetuated. Instability will persist. More people will leave. We see a similar pattern rising from other conflicts in the global South – for example in Venezuela, Mali, the Central African Republic and South Sudan. And it affects not just the country, but also the region and the world.

Confronted by these circumstances, TWAS has focused intently in recent months on the challenge of displaced scientists. Thanks to the Swedish International Development Cooperation Agency (Sida), the Kuwait Foundation for the Advancement of Sciences (KFAS), the Bibliotheca Alexandrina and others, we have been able to provide support to scientists in the region. We have been able to connect with them, to aid their work and to tell their stories.

In just the past few years, we have provided fellowships to displaced scientists. Yemeni medical researcher Fathiah Zakham, after enduring terrible challenges at home in Yemen, recently won the TWAS-Fayzah M. Al-Kharafi Prize for women scientists from S&T-lagging countries; today she has a fellowship in Switzerland. Planning is now underway to bring the most promising displaced scientists into our Young Affiliates programme.



### Harnessing Science to Help Refugees

An estimated 80 million people around the world have been displaced in the wake of violence and conflict, driven from their homes and in many cases their countries. What can scientists, engineers, and health professionals do to help these people?

And how can they help their colleagues who have been displaced? In December the National Academies' Committee on Human Rights held a symposium to explore these questions. In his keynote address, former United Nations Deputy High Commissioner for Refugees Alexander Aleksovich explained that one of the biggest challenges to the resettlement of many refugees is their skills. Profoundly often displaced for political, ethnic, religious or other reasons, they are often unable to fully participate in their new location. Some of the panel discussions that followed shared

into how technology can help respond to challenges linked to displacement, including helping refugees move fully and safely to their new countries. An organization called Partnerships for Resettlement is developing a map that



### ISSUES & EVENTS PHYSICS TODAY

#### Displaced scientists strive to restart professional lives in new lands

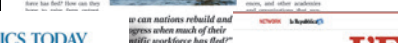


Record numbers of scientists are fleeing persecution and conflict. Most universities and communities can benefit from the brain gain.

As the number of displaced scientists grows, the need to help them restart their professional lives in new lands becomes more urgent. Many scientists, engineers, and health professionals are fleeing their home countries due to political, ethnic, or religious persecution. They are often highly skilled and have valuable expertise to offer their new countries. However, they often face significant challenges in finding employment and integrating into their new communities. Many universities and research institutions are beginning to recognize the value of these displaced scientists and are developing programs to help them restart their professional lives. This includes providing language training, professional development opportunities, and networking support. Some institutions are also offering financial support to help cover the costs of relocation and initial living expenses. The goal is to help these scientists and engineers contribute to the scientific and technological advancement of their new countries.

### EDITORIAL Migration—the choices we face

More than 1 million refugees and migrants are trying to leave their homes in 2016, and more than 200 million people live in the world's poorest nations. Many of these people have fled their homes due to political, ethnic, or religious persecution. They are often highly skilled and have valuable expertise to offer their new countries. However, they often face significant challenges in finding employment and integrating into their new communities. Many universities and research institutions are beginning to recognize the value of these displaced scientists and are developing programs to help them restart their professional lives. This includes providing language training, professional development opportunities, and networking support. Some institutions are also offering financial support to help cover the costs of relocation and initial living expenses. The goal is to help these scientists and engineers contribute to the scientific and technological advancement of their new countries.



### How nations rebuild and progress when much of their workforce has fled?

When a large number of scientists and engineers leave a country, it can have a significant impact on the country's economic and technological development. However, there are ways to mitigate these effects. One approach is to invest in education and training to develop a new workforce. Another approach is to attract foreign investment and expertise to help rebuild the country's infrastructure and economy. Some countries have successfully done this, and their experiences can provide valuable lessons for other nations facing similar challenges.

▲ Issues related to war-displaced scientists – and the work of TWAS and its partners – have drawn international press coverage.

For almost 35 years, TWAS has worked to build science in the developing world and to prevent brain drain in countries where every scientist and every engineer is a vital resource. South-South cooperation has been central to this effort. But when researchers, fleeing war, arrive in Europe or North America, what can we do for them there? This creates a challenge that TWAS has never before confronted.

We start with an assumption that they want to return home. And so, no matter where they are, they are important assets for the developing world.

Through its science diplomacy programme, TWAS has brought countries from the South and North together to explore the issues. We are working with partners – including those within the UN system – to find ways to increase support and improve policy. And our new film, "Science in Exile", is bringing the story of displaced scientists to conferences and universities all over the world.

For displaced scientists, the road home is not always direct, and the journey may take many years. But laws in their host countries may not

offer an easy way to normalise their lives, and resources may be lacking to support their work. This should be a target for South-South and South-North policy and diplomacy cooperation.

Above all, we must always take the long-view: Today's displaced scientists and engineers will have children in their new countries, and these children may have their own potential to be talented researchers in 20 or 30 years, and to make valuable contributions to scientific knowledge. All countries, and the science communities in those countries, therefore have an obligation to provide sustained support. This is essential for the continuing advance of science, development and prosperous communities everywhere.

**Romain Murenzi**  
TWAS Executive Director





# SCIENTISTS IN TIMES OF WAR

*As researchers and students flee countries in crisis,  
is the global community doing enough?*

We are living in a time of unprecedented human migration. Wars, civil conflicts and political turmoil are to blame for many of these movements, with an acute impact recently in countries such as Syria, Iraq, Afghanistan and Yemen. Millions have arrived in neighbouring nations, and in Europe and North America, where they are often perceived as generally poor and unskilled, incapable of enriching their new host societies.

In fact, Iraq, Syria and other countries had strong science and engineering institutions before recent wars and conflicts. And clearly, the trained personnel of such institutions have been affected as much as the rest of the population. When conflict emerges, when it transforms to pervasive violence and war, all must make a choice: weighing the risks of remaining at home against the upheaval of taking flight.

In countries such as Jordan, Lebanon and Turkey, as well as in many countries of Europe, governments and organisations have mounted difficult but admirable efforts to support refugees and others displaced by war. But there has been little recognition of refugee and displaced scientists, neither of their potential nor of their needs. The oversight has troubling implications, because this highly-trained cadre of professionals has great value. Tailored policies and initiatives to support them are essential.

How many displaced scientists are there? The cohort is actually quite broad and diverse: highly educated and trained men and women,

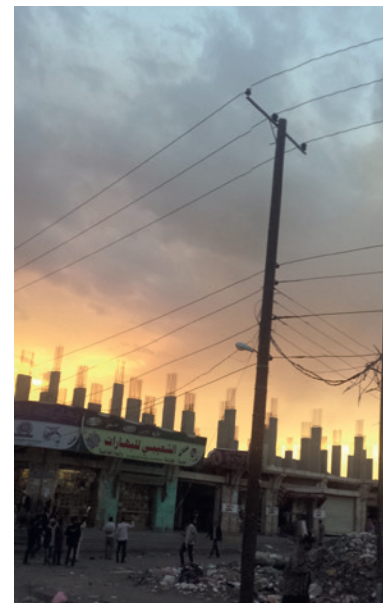
including not just scientists, but social scientists, engineers, doctors and medical personnel, university faculty, advanced students and others who fit within the scope of science-related disciplines.

But measuring the scientific exodus is a difficult challenge, and we don't currently have a count. [See article "The Unknown Number" on page 9.] However, consider the following rough estimate: According to the 2015 UNESCO Science Report, Iraq several years ago had 426 researchers per 1 million population. Given that there were some 4 million Iraqi refugees around the world at the peak of the crisis in Iraq, this equates to more than 1,600 displaced scientists at the time. No doubt there are other ways to estimate the scale of this migration of scientific talent, but in just the past decade it clearly numbers in the thousands, perhaps tens of thousands.

And that presents an urgent challenge: Unless integrated in new host countries as practicing scientists or allowed to continue their studies as students, the exodus of this valuable talent represents a loss to both the country of origin and the global scientific community.

## INVESTING IN SCIENTIFIC PROGRESS

Figures for 2016 released by the United Nations High Commissioner for Refugees reveal the enormity of the current migration: 65.6 million people forcibly displaced, including 22.5 million registered refugees and nearly 14 million internally displaced persons.



▲ War has shattered the normalcy of daily life – and of scientific life – in Yemen and other war-ravaged nations.

It is not only sudden outbreaks of violence that compel people to flee. Unfolding environmental disasters such as prolonged droughts, land degradation and food scarcity – caused or exacerbated by climate change – are also causing people to move in search of better lives. According to one estimate, tens of millions of people, or even hundreds of millions, could be forced to leave the Sahel region of West Africa by the end of this century due to climate change and the related problems of water and food scarcity.



It must also be said that the scientific community has too often not been proactive in taking care of colleagues arriving from war-torn areas.

Although unrest, war and negative environmental changes disproportionately affect the world's poorest regions and countries with low baseline levels of scientific capacity, nevertheless there are researchers living and working in these regions. In the context of poverty and the ongoing humanitarian crisis, they have too often been overlooked.

Because of the low numbers of scientists per capita in many of the affected regions and countries, any such loss of expertise becomes

all the more significant. If they remain in refugee camps and other holding centres, they become lost assets. If left unassisted, their knowledge and skills will gradually decline, and in time they will no longer be able to contribute to scientific progress. Deteriorating self-esteem also has a lasting impact. The longer they remain jobless or under-employed in low-skilled jobs in the new country of residence – a typical occurrence – their chances of returning to professional careers diminish.

In contrast, if they are identified and provided with effective support for integration into new universities, research institutions, teaching hospitals and private enterprises, such scientists and science students can be a valuable resource. They would be able to continue on their scientific path, improve their research capabilities and knowledge, and thus greatly contribute to the society where they have come to reside. They would also retain the skills that would allow them to return home someday and help rebuild their own nations.

What is more, because they typically connect with colleagues in the diaspora and maintain links with their home countries, these researchers can act as a bridge between the scientific communities of their home and host countries. They are also keen to return home once conditions improve and, having built a network of contacts while away, they can pave the way for enhanced international scientific cooperation – for the benefit of both countries.

Host country governments, however, often have been slow to recognize this win-win potential. In most cases, government agencies make no systematic effort to identify scientists among the influx of refugees and displaced persons arriving at their borders. And even if they are identified, stronger policies would help ensure that they are enrolled again in classes or assisted back to work.

It must also be said that the scientific community has too often not been proactive in taking care of colleagues arriving from war-torn areas. This is partly because of the sheer numbers of refugees and migrants arriving at the same time. And perhaps all of us suffer from stereotypes that don't expect such expertise from troubled developing nations.



But it is also because scientific leaders, policymakers, and the public have not been sensitized to the issue of refugee and displaced scientists. This is surprising: Over the past 20 years or more, the day-to-day practice of science has come to depend increasingly on multinational research teams. These teams are built on the mutual respect and appreciation of all partners' contributions to a common goal.

### AN OBLIGATION FOR THE RESEARCH COMMUNITY

Obtaining a reliable census of displaced scientists should be a key starting point for both national policies and the international scientific community. For countries which have taken in many refugees, this could help guide plans for training and employment. Scientific institutions, meanwhile, could use such studies to appeal to their colleagues. As the value of international cooperation stands at the heart of scientific collaboration, the scientific community has an inherent responsibility to respond to the challenging situation of refugee and displaced scientists.

Some excellent policies and programmes do exist, and some refugee and displaced scientists are making a successful transition. Organizations such as the Institute of International Education-Scholar Rescue Fund, the Council for At-Risk Academics and Scholars at Risk have long been working in this field, though not focused specifically on the science sector. However, such programmes are scattered and fragmented, and vary widely in scale from country to country. A lack of coordination between the programmes that do exist also means that there is no mechanism for taking the lessons learned from one successful initiative and replicating them more broadly.

To provide an initial opportunity to consider the dynamics and dimensions of these issues, our three organizations – TWAS, the EuroMediterranean University (EMUNI) and the *Istituto nazionale di oceanografia e di geofisica sperimentale* (OGS) – convened a workshop in Trieste, Italy, from 13-17 March 2017.

The timing of the event could have been regarded as less than ideal. Through 2015 and 2016, strong anti-immigrant sentiments were



“ It is time, therefore, to move away from the current reactive response. Integrated national, regional and, if possible, global efforts are required. ”

being expressed by some parts of European society, and the leadership of some European countries was taking a hardline stance against arriving migrants. Then, on 27 January 2017, just six weeks before the meeting in Trieste, US President Donald Trump signed his first executive order that severely restricted citizens of seven Muslim-majority countries from entry into the United States. The global scientific community reacted strongly against this executive order, with statements from such groups as the European University Association, the International Council for Science (ICSU), the InterAcademy Partnership (IAP) and a letter signed by 51 Nobel laureates and more than 20,000 US university faculty members.

Despite this global political background, the event in Trieste demonstrated that there was broad consensus and willingness to do more to assist refugee and displaced scientists. The workshop deliberations produced a series of practical, focused recommendations (reproduced





▲ Zaid Alhajjaj, right, is working toward his PhD in pharmaceutical biotechnology at Martin Luther University in Halle-Wittenberg, Germany. [Image by Nicole Leghissa]

on pages 29-36]. The recommendations, aimed at different sectors of society – from governments to scientific institutions, and from funding agencies to the media – rightly assert that a holistic, cross-sectoral response is required.

The workshop concluded that mass migration cannot be treated as a temporary or emergency phenomenon. Rather, it is likely to be a “permanent feature of globalisation and geopolitical instability.” As the general population is affected, so too is the scientific community.

### COORDINATED, INTEGRATED RESPONSE

Since the workshop in March 2017, we have seen an exodus of the Rohingya people from Myanmar into Bangladesh, and people fleeing civil strife in Venezuela, not to mention the impacts of ongoing conflicts such as those in Syria and Yemen.

Dislocations caused by growing populations, food and water insecurity, climate change and other factors are not likely to diminish.

It is time, therefore, to move away from the current reactive response. Integrated national, regional and, if possible, global efforts are required. Robust policies and programmes must be designed that will enable countries to get ahead of the curve. The alternative – a state of permanent emergency – will not be effective in meeting the challenge and will be doomed to produce frustrating outcomes.

An institutional adjustment is needed, and it must reflect the network dimension of the issue. The primary actors must be governments, reception centres, international organizations and science funding agencies, with the involvement of NGOs, universities, research centres and the wider community. Only with a coordinated and integrated response will it be

possible to address the situation of refugee and displaced scientists in a sustainable way. The policy and institutional responses must be such that the skills of refugee and displaced scientists are used wisely – for the benefit of both the individual and the host country – while preserving and preferably also developing them so that someday those same skills can be used to help rebuild countries that are today suffering from war or turmoil.

Organising the 2017 workshop has given TWAS, EMUNI and OGS a leading position on an issue of tremendous scientific and policy importance in Europe, the Middle East and North Africa [MENA] region, and elsewhere. At the same time, we have seen other agencies, universities and researchers increase their action in this area.

It is encouraging that three major international scientific organizations – TWAS, IAP and the International Science Council [newly merged from ICSU and the International Social Sciences Council] – coming together under the Science International banner – are now addressing this issue and expect to take forward the recommendations of the TWAS-EMUNI-OGS document to more concrete actions.

Meanwhile, the universities and research centres of Trieste and Udine in the Italian region of Friuli Venezia Giulia are coming together to use their combined facilities and networks to address the issue of refugee and displaced scientists in Italy, perhaps extending to the wider central European region in the future. These are good examples of what can be done *now* to identify displaced researchers and help them to continue their work or their studies, thus helping to increase their social and economic value and preserve human capital.

Such examples demonstrate how the scientific community can take a lead on this issue, and also set some precedents for the joined-up, holistic response that is required.

This will be a demanding, long-term project – and science diplomacy can be a useful tool for developing plans, engaging policymakers and building international cooperation. Strong links to the public are essential. Above all, the global scientific community must be engaged to do more for vulnerable colleagues. ■

### AUTHORS

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# An 'unprecedented' exodus of scholars

*War and authoritarianism are driving a historic exodus of researchers, with a deep impact in developing countries.*

By **James King**, assistant director  
Institute of International Education - Scholar Rescue Fund

Today, more scholars have been displaced by conflict or threatened by authoritarianism and extremism than ever before. This has had an outsized effect on scientists. Whether due to higher education emergencies or political repression, researchers and faculty from countries like Syria, Yemen and Venezuela, among others, are being forced from their homes and universities at an unprecedented rate.

This sad reality is reflected in the increasing number of applications to IIE's Scholar Rescue Fund. We received more applications in 2017 than any year in our history, and current rates indicate that 2018 may reach another record high. Overall, the demand for assistance from threatened scholars has increased by 50% since 2015.

The current crisis affects the global South disproportionately, impacting both the nations experiencing large-scale displacement and those where the scholars are seeking safe haven. IIE-SRF is committed to building partnerships in the global South to address the current needs. To date, we have partnered with nine higher education institutions across Asia and the Pacific, 12 institutions in Sub-Saharan Africa, and 68 institutions in the Middle East-North Africa region to host more than 175 scholars in all. By connecting threatened

and displaced scientists with higher education institutions within their respective regions, we hope to limit brain drain, bring resources to underserved academic communities, and highlight exemplary work in these regions.

We are adapting to new challenges as they emerge around the world, and this requires creative placements and novel types of scientific collaboration. For example, the dismantling of Yemen's higher education system has resulted in a staggering jump in applications to IIE-SRF, many of whom seek academic opportunities in the STEM fields within their home region or elsewhere in the global South, particularly Malaysia and India. 75% of current IIE-SRF scholars from Yemen have a STEM background.

It is essential that we pool our collective resources and expertise to both help scientists relocate from imminent danger to safe countries with supportive scientific environments, and also provide academic opportunities for refugee scientists. In doing so, we preserve intellectual capital in times of crisis and help host communities benefit from the skills offered by displaced populations. Perhaps most importantly, we avoid losing these scholars' contributions ▣



# THE UNKNOWN NUMBER

*As crises escalate, so does the number of displaced scientists.  
But a precise overall count is elusive.*

 by Sean Treacy

Two years have passed since R.M., a Syrian scientist, fled her country with her family. She left by plane, without telling anyone. She had been waiting for her chance – about three years before that, a former apartment of hers had already been destroyed by an air attack. And now, if she were to return, she'd likely be punished with imprisonment.

R.M. was relocated to Canada with the help of Scholars at Risk and to stay anonymous, she asked to go only by her initials. She recalls that her university department in Syria had 16 faculty members. But now, she says, six to eight of them have left due to the Syrian civil war, leaving the faculty at half its original size. And she is just one of thousands of displaced researchers affected by conflicts in troubled parts of the world.

"It was impossible to continue living there," R.M. said. "Our home was nearly aflame like an oil refinery. There was a big fire. So I left and I had nothing but a laptop, my kids and a few clothes."

Though it is rarely noted in news accounts of the mass migration caused by recent wars, scientists engineers and others in science-related fields are among those fleeing for their lives. These researchers find themselves in new countries, in need of support for their careers and aid integrating with their host countries. And it falls to policymakers and the scientific community to chart a path forward.

But to do so, they must be able to address a core question: Just how many displaced scientists are there?

The answer? Nobody knows.

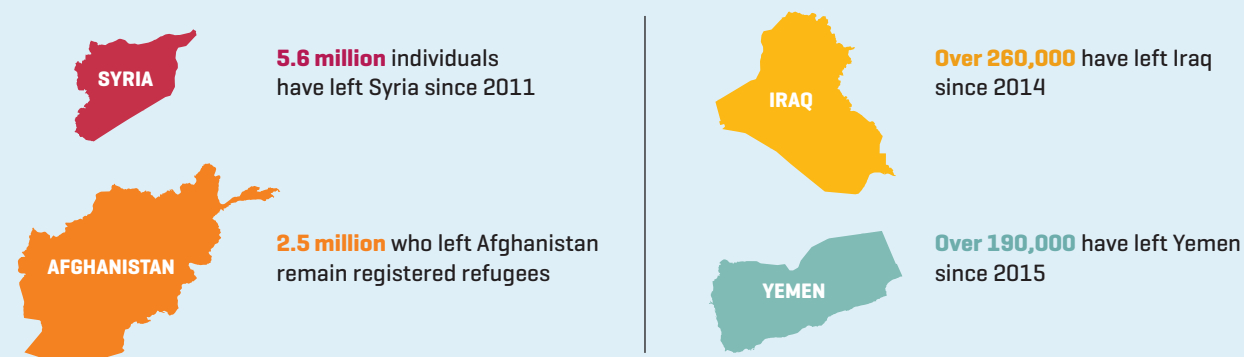
And that has important implications for policy and for science, both in the nations adjacent to the countries in conflict and to the nations of Europe and North America.

James King, assistant director of the U.S.-based Institute of International Education's Scholar Rescue Fund (IIE-SRF), says that being able to more clearly illustrate the magnitude of the crisis would allow IIE-SRF and other organizations to seek more funding and

## BY THE NUMBERS

Credit: UNHCR

*A total of 22.5 million people qualify as refugees*





additional university hosts. The organisation has argued that it's important for U.N. agencies that track refugees to de-aggregate university-age people from refugee counts and categorize asylum-seekers by professional and educational background.

But still, no effort to identify displaced scientists in this way exists. The best that organizations like IIE-SRF can do is piece together an estimate distilled from broad refugee counts, nations' pre-war data on higher education, applications for assistance, and stories like R.M.'s.

"It's very imperfect," said King, "but it at least gives you a sense of the scale. It's not hundreds, it's thousands – and that alone I think is useful."

But considering the impact of recent wars and conflicts in Syria, Iraq, Yemen and Afghanistan, and counting a cohort that includes scientists, engineers, medical professionals and advanced students in these fields, the number probably exceeds 10,000.

### THE NUMBERS AT HAND

As of the end of 2016, the United Nations High Commissioner for Refugees (UNHCR) tallied 65.6 million displaced people in the world, including 22.5 million who qualify as refugees, and 10 million who are considered stateless. An estimated 5.6 million have left Syria since 2011; over 260,000 have left Iraq since 2014, many driven away by the conflicts with Islamic State. Over 190,000 have left Yemen. In addition, millions of people are displaced within those countries as well.

The greatest number of those who have fled are now in neighbouring countries, UNCHR reports. For example, there are at least a million in Lebanon and 740,000 in Jordan. The UNHCR estimates that over 5.1 million refugees were in Europe by the end of 2016, whatever their profession – about 2.9 million in Turkey, and 2.3 million in the remaining European states.

But there is no count of how many among them are in the science-related fields. So without a full census, or a science-based projection, how can we estimate the number?

The 2015 UNESCO Science Report details how many citizens in countries are scientists. For example, the UNESCO report says that

## NUMBER OF DISPLACED SCIENTISTS

### *The Iraq example*

Iraq has had about **400 researchers** per **1 million people**



Since there were **4 million Iraqis displaced** at the height of the Iraq crisis in 2007, about **1,600 displaced Iraqis were probably scientists**.

Iraq, before the latest conflict, had about 400 researchers per 1 million people. At the peak of the Iraq War crisis in 2007, some 4 million Iraqis were displaced, so a rough projection might be that 1,600 of them were scientists.

The numbers of scientists are not available for pre-crisis Syria, Yemen or Afghanistan. Still, the rough projection from Iraq seems to suggest that the number of scientists among those displaced from those four countries combined has a floor in the thousands.

But additional signals and clues can be sifted from news accounts and other data.

According to a 2016 report in Foreign Policy, Syria had roughly 31,000 doctors before the conflict – and the report cited an estimate from Physicians for Human Rights that half have left the country. According to the German Medical Association, among 430,000 Syrian refugees recently taken in by Germany, some 1,500 are working doctors.

Students are also a significant part of the refugee population. A 2016 report by Chemistry World found that Germany welcomed 271 Syrian masters and PhD students that year, under a programme administered by the German Academic Exchange Service (DAAD). They received over 5,000 applications – about five times what DAAD anticipated.

### A DRAMATIC RISE IN APPLICATIONS

Important to understanding the volume of displaced scientists are three organizations that lead the way in finding new homes for academics fleeing peril. They provide the most clear indications of how many displaced scientists there are in the world: IIE-SRF, which arranges and co-funds fellowships for threatened

▼ James King, assistant director of Institute of International Education – Scholar Rescue Fund.





▲ From top: Stephen Wordsworth, executive director, Council of At-Risk Academics, and Shreya Balhara, program associate for protection services, Scholars at Risk.

scholars to continue their work in safety at partnering academic institutions worldwide; CARA, The Council for At-Risk Academics, a British non-governmental organization that provides two- or three-year stays in various countries for displaced academics; and Scholars at Risk, an international network of institutions and individuals which arranges for temporary academic positions at member universities and colleges.

Numbers collected by the major scholar-rescue organisations can also deepen understanding of the scientists among the broader migration from conflict zones.

In recent years, they report, application numbers have been climbing. “That’s a reflection of the situations in many countries around the world where higher education has been decimated by war or targeted repression,” said King.

IIE-SRF saw a 50% increase in applications from 2015 to 2017, driven by the Syrian crisis and also the aftermath of the 2016 coup attempt in Turkey. In 2017, SRF supported 200 scholars from 25 countries.

Allan E. Goodman, president of the Institute of International Education, estimated that among scholars supported by SRF, 30-40% are in the science and medical professions.

The top three countries IIE-SRF has received applications from are Iraq, Syria and Turkey. Last year they accounted for around two-thirds of the 200 scholars supported by IIE-SRF. In recent months, IIE-SRF has also seen a jump

“The haziness of the available numbers illustrates an important reality: when it comes to understanding the full scope of the problem, more support and funding for research is essential.”

in the number of Yemeni applicants – a 25% increase between all of 2017 and the first five months of 2018. IIE-SRF also reported the top five risks such researchers face: Risk of arrest or imprisonment; insecurity or conflict; wrongful dismissal; harassment and intimidation; or fear of being killed or kidnapped.

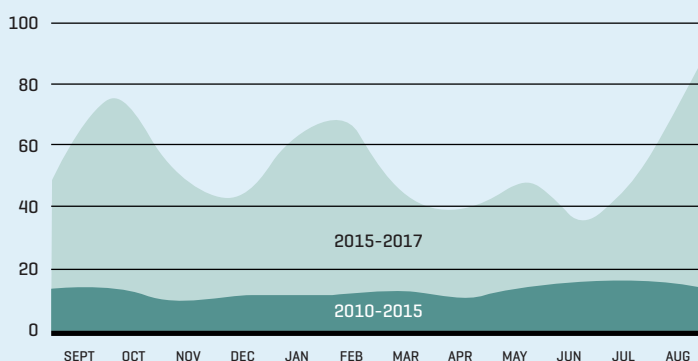
Stephen Wordsworth, executive director of CARA, said his organisation has a sense of where scientists’ situations are most dire. And in recent years, their level of inquiries about placements is at its peak, mostly because of applications from Syria, due to the civil war, and Turkey, due to political conflict there. “Say two or three years ago, we were getting four or five inquiries a week,” he said. “Come late summer 2016, it was about 20 a week. Now it has come down again to about 10, but that’s still high by historical levels.”

Shreya Balhara, the program associate for protection services of Scholars at Risk, said her organization saw a similar trend, and at the moment, Turkish scholars now make up the largest portion of their applications since July 2016, growing from 23 before 2016 to a cumulative total of 831 as of June 2018.

Iraqi, too, has endured a significant loss of professionals in the science sector, dating back to the U.S. invasion in 2003. Soon after IIE-SRF was founded in 2002, it undertook urgent work with support from the U.S. State Department and private foundations to rescue Iraqi scholars threatened by the Iraq War that began in 2003 and in the ensuing sectarian violence. The Guardian estimated in 2017 that 450 academics had been killed since 2003.

## SCHOLARS IN CRISIS

Average monthly applications to Scholars at Risk [2010-2017]





Many scholars returned home to Iraq during the calmer period from 2007 to 2014. But the escalating attacks of Islamic State in 2014 created a whole new refugee crisis, and academics began contacting support agencies all over again. Scholars at Risk counted 35 reported attacks on Iraq university professionals from May 2015 to September 2016.

As the conflict with Islamic State raged in Iraq, the impact was deep – and measurable. Research physicist Ahmed Al-Tabbakh, a TWAS Young Affiliate at Al-Nahrain University in Baghdad, reports that number of faculty members at Iraqi universities dropped by more than 5,000 – from 40,993 to 35,362 – between the spring term and the fall term in 2014. Nobody tracked where they had gone, Al-Tabbakh said.

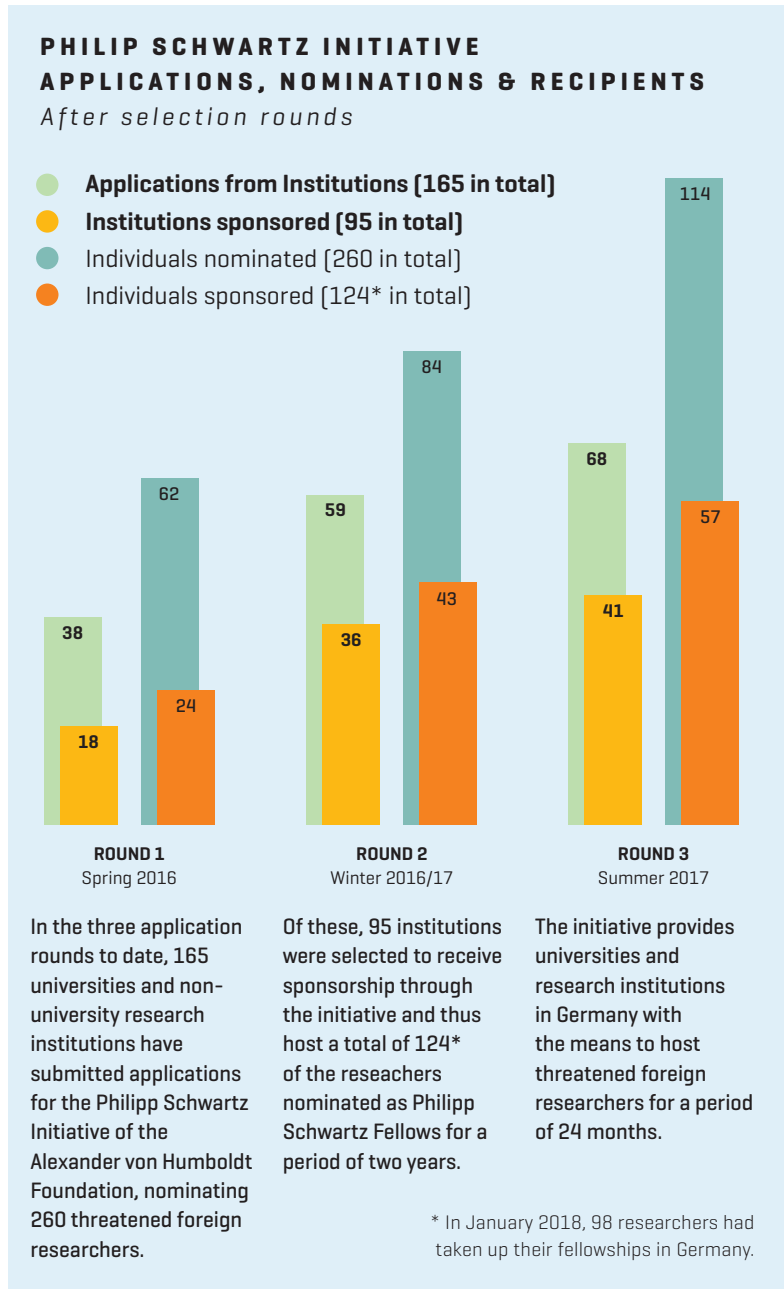
Now, with Islamic State largely defeated, faculty are starting to return home. But some are finding the research infrastructure damaged or destroyed. The University of Mosul, for example, suffered extensive damage.

“A fairly high percentage of Iraqi professors have returned back. Are they returning to a good situation? Not necessarily,” King said. “A more hopeful situation than three years ago? Absolutely. The challenge for us is to determine ways to find ways to support Iraqi higher education as Iraq transitions back into a better functioning state.”

### THE CHALLENGES AHEAD

The haziness of the available numbers illustrates an important reality: when it comes to understanding the full scope of the problem, more support and funding for research is essential. That effort is needed today, for countries such as Syria, Afghanistan, Iraq and Yemen, and also for countries such as Venezuela, where thousands of professionals are reportedly leaving the country. Almost inevitably, the future will bring other conflicts that drive science-related communities into exile.

A comprehensive set of recommendations issued in May 2017 from a high-level meeting of experts co-organised by TWAS argues that science organisations, universities and policymakers should undertake broad efforts to identify research professionals among war refugees. It calls for accessible new refugee



databases that track scientists and their educational level, fields of expertise and movements. It urges policymakers that this effort is important because precisely tracking displaced researchers will help assure that they can get back to work in their new countries.

“Such affected scientists with scientific, medical or other professional training can be a valuable resource if identified and provided with support for integration into the research/academic environment in their new countries,” says the recommendation. “They are able

**PHILIP SCHWARTZ INITIATIVE***Frequency of fellows' countries of origin*

- 1 — Turkey [70 individuals]
- 2 — Syria [38]
- 3 — Iraq [5]
- 4 — Yemen [2]
- 5 — Venezuela [2]

to contribute to society, including research output, in the country where they reside. They typically also retain links with their home countries, becoming connected with likeminded individuals in a diaspora.”

The challenge is no small task. The reason the numbers are not precise is that organizations like IIE-SRF, CARA and Scholars At Risk exist to find and help the scientists they have funding for, not to build a database that can estimate the size of the problem, said David Wheeler, editor, Al Fanar Media, a news outlet that regularly covers the plights of displaced researchers.

“Nobody really has the money to estimate the size of the problem or put together any kind of clear database,” said Wheeler.

Refugees endure chaos, uncertainty, and major decisions under intense life-or-death pressure. So documentation proving the status as researchers often gets left behind, making data collection on their status as researchers difficult.

“You have to look at the heart of what the refugee experience is,” Wheeler said. “If a mortar shell drops on your home in the middle of the night, you don’t think about whether you have your bachelor’s degree or PhD certification. You just get out of there fast, if you can, with your family. Likewise, if government security comes to your house, and your family tells you they were looking for you, you don’t worry about whether you have your laptop with you. You run.”

This also makes placement hard, because students need transcripts and faculty members need PhD certification to get a job at a university. So the organizations and scientists both urge the universities or ministries to make special exceptions, leading to lengthy

delays. Displaced researchers also lose their professional contacts’ emails and phone numbers. And for students, transcripts serve as educational passports and they need to be able to store and maintain those records securely. There are options, including the potential of a cloud-based online system for storing displaced academics’ essential documents which could help not just the students but numerical record-keeping efforts in general.

Finally, the organizations also don’t actively seek out scholars to rescue. They rely completely on numbers in their application pool – made up of researchers who seek them out. Researchers who don’t go through this application process go mostly unnoticed, and an overall database would help these agencies identify those displaced scientists who fall through the cracks.

“Nobody really has the money to estimate the size of the problem or put together any kind of clear database.”

*David Wheeler, editor, Al Fanar Media*

“We only know the numbers of those who apply,” said Balhara. “Some countries are quite restrictive about internet access, so some people might feel fearful about connecting with an outside entity or just aren’t able to access that information online.”

Science diplomacy can be a critically important tool in building international cooperation to address these issues. Governments, international organizations, civil society, businesses and universities are all well-positioned to collaborate to aid refugee scientists, said Canadian Daryl Copeland, an author and veteran diplomat who participated the Trieste workshop that drafted the recommendations.

“But they face a knowledge and information gap,” Copeland said. “The problem of how best to harness the untapped potential resource of diaspora and refugee scientists ... falls squarely within the province of science diplomacy.”

▼ David Wheeler, editor, Al Fanar Media



# The importance of science for displaced students

*Like every community, refugee communities need problem-solving scientists. But current trends are alarming.*

By **Mustapha Jazar**, founder and director  
Lebanese Association for Scientific Research [LAsER]  
Tripoli, Lebanon

**P**roviding refugees and internally displaced persons (IDP) with their basic right to education – and higher education – can empower these individuals to build their lives and restore what was lost. More than ever, scientists are needed to rebuild their countries in time of crisis or conflict.

Whether it be engineers to build houses, teachers to design effective new curricula, entrepreneurs to rebuild the economy or programmers to create the next technology, education is the one force that drives development of a vulnerable community.

During crisis, wars and conflict, higher education is often considered a luxury. But the loss of resources will directly cause the scientific community to dwindle or even disappear, and as a result, the whole society will suffer.

Often people see refugees as competition for jobs and an economic burden. But at LAsER, we consider them a workforce with a positive

impact on both the economy of the refugee community and the local economy of the host community. Refugees need teachers to teach adjusted curriculums, health workers to meet the needs of the wounded, entrepreneurs to create businesses and journalists to tell the story. Scientists fill the need for research and problem-solving within their own community – and they are often hired by the host community.

To provide refugees and IDP with an opportunity to pursue higher education is to provide hope. Whether they are in their new host community or when they return to their home country, education is the master key to enhance both refugees and host communities.

But the numbers are alarming: Enrolment of Syrian refugees in higher education is around 3% for people of university age, and just 1.4% for those of age for secondary school. The sad but inevitable conclusion is that this crisis will affect Syrian society for generations. Very soon, Syrian scientists will be extremely rare. ■





# Q&A JOURNEY TO AN UNCERTAIN FUTURE

*The risks of violence forced three researchers to flee. Now in Europe, they find new challenges – and new hope.*

**F**or most people, it is a journey beyond imagination: Your homeland is consumed by fighting, your colleagues are injured or killed, and your own life is in danger. If you are a researcher, committed to your work and your community, what do you do?

For three scientists – displaced from Syria, Iraq and Yemen – a period of struggle and dislocation has been followed by landing in Europe and working to rebuild their lives. In interviews with TWAS writer Cristina Serra, all described great relief, even as they face continuing challenges in their new countries.

They are Saja Al Zoubi of Syria, Zaid Alhajjaj of Iraq and Ghanya Al-Naqeb of Yemen.

Each of the three is featured in the new TWAS film, “Science in Exile”, directed by Nicole Leghissa of Italy. [See story on p. 23]

*The interviews have been lightly edited for clarity and length.*

**Why did you leave your home country, and under what circumstances?**

**Al Zoubi:** My research is social and economic and I had to work in rural areas, often crossing areas controlled

by different groups. It was extremely risky to continue working in Syria due to kidnapping, shootings and muggers, with a deteriorating security situation and breakdown of law and order.

**Alhajjaj:** I left Iraq in 2015, because I was looking for better education chances. The German education system is known worldwide for its exclusivity, both in quality and quantity. I applied and I was granted a scholarship by the German Academic exchange service [DAAD]. Had they not accepted me, I would have definitely applied again.

**Al-Naqeb:** After the conflict and the war between the Al-Houthi group and Saudi Arabia and the rest of the coalition, life had become difficult

for most of the people in Yemen. As a female academician, it was very hard to continue my life and teach in the faculty of agriculture at Sana’a University.

I worked hard with a few of my colleagues and my students to establish a small animal housing unit, for my experiments. But after aerial assaults on Yemen, we were left with no water and electricity. All my animals died, and most of my students were displaced. I could not do any scientific work, so I really needed to get another place outside Yemen to continue my scientific career and to live with integrity.

**When you fled, did you already know where to go? Did you have a precise idea of the life you would find at your destination?**

**Al Zoubi:** Yes, the decision was to stay in Lebanon for a temporary

## PROFILES

**Saja Al Zoubi** of Syria, a developmental economist and former TWAS postdoctoral fellow, arrived recently in the UK as an Oxford University research fellow. Her work is focused on livelihoods and gender involving Syrian refugees and others displaced within Syria.

**Zaid Alhajjaj** of Iraq is now pursuing his PhD in pharmaceutical biotechnology at Martin Luther University Halle-Wittenberg, Germany.

**Ghanya Al-Naqeb** of Yemen is now working at the University of Würzburg in Germany. Her research is focused on the therapeutic properties of natural products extracted from native Yemeni plants. In 2016, she won the OWSD-Elsevier Foundation Award for Early-Career Women Scientists in Developing Countries.



“ Once I return to Syria, I hope I can also contribute in training younger Syrian generations of researchers. ” *Saja Al Zoubi*

residence. Meanwhile, I was preparing for something better. I became worried when all the scenarios I proposed changed, because Syrians are not welcome in most countries, including Lebanon.

**Alhajjaj:** At the time when my decision was made, I had a precise idea of where to go. I was not afraid, although the whole country of Iraq was in war with ISIS. I was born in 1980 and since then I only lived with wars and dictatorships – actually I was not even worried because I have been through worse times. The best way to describe feelings at that time is my hope in a better life, rather than fear and worries.

**Al-Naqeb:** Yes, I decided to go to Germany because I was in contact with Professor Klaus Krickeberg, who helped me to do my research in Germany through the Philipp Schwartz Initiative of the Alexander von Humboldt Foundation. I got to know Professor Krickeberg through TWAS, where he is a Fellow.

#### **How did you manage to arrive in your new country?**

**Al Zoubi:** I went across two stages: the first and temporary stage was in Lebanon, while I was working on enhancing the livelihood of Syrian refugees. But I contacted different universities and organizations, then I found my opportunity at Oxford



Saja Al Zoubi

University with the support of a British organization. This allowed me to continue working on my research.

**Alhajjaj:** I had a scholarship and then I applied for a visa and travelled normally. Aside from some complex procedures and delays to get the visa, there were no major difficulties.

**Al-Naqeb:** I was awarded the 2016 OWSD-Elsevier Foundation Award for Early Career Women Scientists in the Developing World, in biological sciences. This gave me more visibility in the media. Professor Krickeberg heard about my story through the TWAS film produced by Italian filmmaker Nicole Leghissa. He contacted TWAS and, together with Professor Leane Lehmann, chair of food chemistry in the University of Würzburg, they helped me to find the fellowship from the Philipp Schwartz Initiative.

Due to the war, the Yemeni German embassy was closed so I had to travel to Sudan to apply for the visa. After four months in Sudan, I reached Germany, in December 2017.

#### **What did you expect to find in the host country – and what have you actually found?**

**Al Zoubi:** It's good to have this feeling of complete security and safety, as I feel fully welcomed to stay and work, particularly at a prestigious institution like Oxford University. Although I have got support and facilities, I am still facing a few challenges in order to figure out funding opportunities for my research.

**Alhajjaj:** Everything went according to my expectations, but I expected the European system of immigration to be a bit more efficient in distinguishing

among people with different scientific backgrounds. Here in Germany, a foreign scientist who is not a refugee needs to apply for residence permission along with thousands of refugees, and to wait at least four months to get an appointment to apply for extension of residence permission.

**Al-Naqeb:** I expected to find very good laboratories with all the equipment necessary for my research. Actually, I found that the food chemistry laboratories are very well-equipped with all I need.

#### Were you able to resume your work in the place where you live now?

**Al Zoubi:** For sure – I am proposing a research to work on refugee issues, but I need more support and connections, especially with

related institutions and donors. Meanwhile I am working on scientific publishing and academic supervision.

**Alhajjaj:** Yes, I have been working as a researcher, exercising independent thinking and seeking my PhD in the field of pharmaceutical biotechnology for nearly three years without any difficulties.

“ I think the best definition of scientist is that of a person who devoted his life to make the life of others as easy and good as possible. ”

Zaid Alhajjaj



Zaid Alhajjaj

**Al-Naqeb:** Yes, I have started doing the first steps to continue my research.

#### What were major difficulties/constraints you faced in your new work environment?

**Al Zoubi:** I experienced some problems with research funds and a permanent job. I want to feel I am settled down without fearing about my future and my family when my contract is over, at the beginning of 2020.

**Alhajjaj:** In spite of minor difficulties to integrate in the new research and scientific society in the beginning, which is normal for any new employee, I cannot think of any major issues.

**Al-Naqeb:** Living in any new place poses some difficulties. In my case, the major problem is the German language. Sometimes I find it difficult to communicate with colleagues in the lab, and that also limits me in having connections or to mix with German friends. I'm trying to learn German, but that will take time.

#### Did you ever perceive hostility as a migrant in the new country?

**Al Zoubi:** In the UK I've always felt safe and fully welcomed to stay and work.

**Alhajjaj:** Racism and hostility against immigrants is available everywhere [including my home country]. This has happened several times, but the question is: would this stop me? I do believe it would not.

**Al-Naqeb:** No, I never faced any hostility against immigrants in Germany. Even though Germany is a new environment, new culture and new life, I feel fully safe and they have always treated me in a very kind and good way. Here, I felt that I have gone back again to the scientific life.



Ghanya Al-Naqeb

**Do you think that your work is making a contribution to science, or the university, community or country where you now live?**

**Al Zoubi:** My research is based on quantitative and qualitative data for Syrian refugees, and that gives an added value to the understanding of the refugees' situation and the challenges they face in Lebanon. With my experience in rural research, I had the opportunity to contribute in rural development programmes, particularly those for women.

**Alhajjaj:** My work is, for sure, contributing to science in my field. It would provide new conceptual insights into knowledge of production of therapeutic proteins and other bio-medicines, both on cost and innovation. It will also add value to my recent university and the

scientific community. I think the best definition of scientist is that of a person who devoted his life to make the life of others as easy and good as possible.

**Al-Naqeb:** Yes, I am continuing my research, which is focused on natural products isolated from plants. The aim is disease prevention through the determination of the mechanism of action. This will open up avenues for income generation and evidence-based practices.

**What are your plans for the future?**

**Al Zoubi:** I would like to keep working on enhancing the refugees livelihood as a researcher in Oxford University and as an academic as well. Meanwhile, my aim is finding an opportunity to collaborate with humanitarian and development organisations,

“ I needed to get another place outside Yemen to continue my scientific career and to live with integrity. ”

*Ghanya Al-Naqeb*

using the research outputs I found in practical projects. Since I have a good knowledge of the needs of refugees and displaced people, of their challenges and potential interventions to improve their livelihood, I want to use this knowledge and establish good income opportunities, support children and youth education, and ... focus on enhancing women's capacities through vocational training and cooperative micro enterprises.

**Alhajjaj:** My short-term plans would be finishing my studies to get the PhD degree. After finishing my PhD, I will try to pursue work in the field of science or industry. With a PhD degree from Germany, it is logical to continue staying in Germany or within the European Union in general. Long-term expectations or plans would be finding a job to pursue my life adventure: to serve for science and to be able to raise a happy family. I would not ask for more than that.

**Al-Naqeb:** To be honest, I have no idea about what will happen to me in two years, when the Philipp Schwartz Initiative fellowship is over. My long-term plans depend on the situation in Yemen. Of course, I would love to go back and work at Sana`a University, among my family and my students. If the situation in my country does not become stable, I will do my best to find an academic or researcher position in any university in Germany, or in another European country. □

# How can we support at-risk scholars?

*For big institutions and committed individuals, there are many vitally important ways to help threatened scientists.*

By **Rose Anderson**, director of protection services  
Scholars at Risk

**H**ow can we support at-risk scholars? This is a question that we at Scholars at Risk hear often from university staff, professors, associations and students who are eager to help academics who are facing threats in their home countries or those who were forced to flee and are starting over in a new country.

**Universities** have a key role. The SAR global network includes more than 500 universities and institutions in 41 countries committed to promoting academic freedom and protecting threatened scholars, including many scientists and engineers. When we are asked by a university how they can assist scholars, we suggest that they invite a scholar to fill an existing vacancy or a new visiting position. Integration into a new university requires a good mentor who can help the academic acclimate to the new setting and pursue professional development, including skills courses, recertifications and publishing opportunities.

**Students and other individuals** can encourage their institution or alma mater to become a member of the SAR network or nominate a scholar in need of support. Further, they may have skills or connections that might be useful to an academic who is new to the country. They also can play a vital role in lobbying their university to become engaged in these issues. Through SAR Student Advocacy Seminars, students gain real-life skills by taking on an individual case and working with faculty to research and plan advocacy actions for wrongfully imprisoned scholars.

**Associations** can help by waiving or reducing membership and conference fees for refugee and displaced scientists. This would provide vital networking and research collaborations for those trying to rebuild their careers.

While the scale of the refugee crisis and threats to academic freedom around the world can be daunting, we find cause for optimism in the numbers of those who are stepping up to help. ■


**SCHOLARS AT RISK**  
N E T W O R K

 protection  advocacy  learning



# A WAY FORWARD FOR DISPLACED RESEARCHERS

*An international workshop in Trieste, Italy, explored the experience and needs of scientists fleeing war.*

 by Sean Treacy and Edward Lempinen

As scientists and engineers are forced to flee from war and conflict in their home countries, many are in deep need of support from the international community. But resources are limited, and few among policy and science leaders are even aware of their needs. To build that awareness, three partner organisations convened a workshop to help the international community find answers on what must be done, and how to take action.

At the workshop, examples were presented of how countries and individual scientists are helping the newly arrived researchers. It provided a starting point for conversation involving international scientists, policymakers and diplomats from South and North – a conversation that is creating new links between displaced scientists, scientific centres and organisations that support at-risk scholars.

The event was one of the first of its kind to focus on the experiences and needs of scientists displaced from Syria, Yemen, Afghanistan and Iraq. Held 13–17 March 2017 in Trieste, Italy, 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.

The workshop, “Refugee Scientists: Transnational Resources” was co-organised by The World Academy of Sciences [TWAS] and Istituto Nazionale di Oceanografia e di Geofisica Sperimentale [OGS], both based in Trieste, and Euro-Mediterranean University [EMUNI], based in Piran, Slovenia. Each of the organisers has

networks linking Europe to the developing world, especially the Middle East and North Africa. The Swedish International Development Cooperation Agency [Sida] provided key financial support. The TWAS Science Diplomacy office coordinated the meeting.

“We believe that their skills and experience should not be lost and we strongly encourage them to struggle and overcome all obstacles and to preserve their scientific knowledge, both for their careers and for the benefit of their new home countries,” said OGS President Maria Cristina Pedicchio. “It is also important to raise public awareness on the plight of refugee scientists and create all necessary conditions to support their integration.”

EMUNI President Abdelhamid El-Zoheiry added: “In today’s interconnected and dynamic world, diplomacy is not exclusively practiced by the conventional state actors. We should regard science diplomacy as a tool for foreign policy, as an instrument to advance the scientific research and as a platform for inter-cultural dialogue and tolerance.”

“For more than three decades, our Academy has worked to build scientific strength in the developing world,” said Mohamed Hassan, then the interim executive director of TWAS. “Today, it is important that we help to bring North and South together to assess how to best support these scientists and their work.”

The workshop featured the voices of several researchers who had experienced life as displaced scientist first-hand. Eqbal Dauqan, a Yemeni biochemist who was living in Malaysia,

► From left, Zabeeh Ullah Sahil of Afghanistan, now working at the Organization for Women in Science for the Developing World; Ulrike Albrecht, head [retired] of the Department Strategy and External Relations Alexander von Humboldt Foundation [now retired]; Raffaella Greco Tonegutti, in charge of Migration, Directorate General for Research and Innovation of the European Commission; displaced Yemeni scientist Eqbal Dauqan, now an assistant professor at the University of Agder in Krestiansand, Norway; James King, assistant director of Institute of International Education - Scholar Rescue Fund; Luciano Saso from the Networks of Universities from the Capitals of Europe [UNICA], Rome, Italy; and Matteo Marsili, physicist, of the Abdus Salam International Centre for Theoretical Physics [ICTP] in Trieste, Italy.

sketched an intense and heartfelt portrait of the hurdles and needs that scientists face when they are forced to flee from wars and persecution.

"I'm proud I'm a Yemeni scientist, and I'm not interested in getting citizenship from other countries," she said. "Should I experience difficulties entering some countries or even staying in Malaysia, and if the only solution is to change my nationality, I'd refuse this solution and I will go back home, even if walking on foot."

and Ulrike Albrecht, then head of the Department for Strategy and External Relations at the Alexander von Humboldt Foundation in Germany.

Ziadeh detailed the intensity of the devastation experienced by refugees, including others forced to flee from Syria.

After the Arab Spring in Syria, he said, the regime of President Bashar al-Assad used its air force, one of the largest in the Middle East, to indiscriminately drop bombs onto its own civilians. Many survivors, rich or poor and



“ It is also important to raise public awareness on the plight of refugee scientists and create all necessary conditions to support their integration. ” *Maria Cristina Pedicchia, president, Istituto Nazionale di Oceanografia e di Geofisica Sperimentale [OGS]*

#### THE ROLE FOR SCIENCE DIPLOMACY

Among other participants were, Radwan Ziadeh of Syria, now a senior analyst at the Arab Center in Washington, D.C.; Naeem M. Abdurrahman, former Libyan minister of Higher Education and Scientific Research; Charles Kleinermann, then serving as head of the Capacity Development Unit at the International Center for Agricultural Research in the Dry Areas, in Amman, Jordan;

regardless of their civilian profession, became refugees. But, said Ziadeh, they had no choice. "You're inside your house," he said, "and you don't know if in the next day or even the next minute if you will be alive or dead."

After intensive discussions, the event produced a broad set of recommendations for supporting refugee scientists, issued on 22 May 2017. [The full recommendations can be read on page 29.]


The recommendations urged the creation of education and jobs programmes and other initiatives to support the social and professional integration of refugee scientists, engineers and doctors, as well as students in related fields. They also call for research to more fully understand the demographics and experience of refugee scientists and to assess which programmes are most effective at supporting them. ■

Learn more:  
[www.twas.org/node/12145/](http://www.twas.org/node/12145/)



# IN NEW FILM, SCIENCE IS A HUMAN STORY

*“Science in Exile”, a new film from TWAS, explores the flight of scientists from war – and their search for a safe place to continue their work.*

 by Edward Lempinen

They are scientists in developing countries, committed to a life of research. Working in a wide range of fields, they are pursuing knowledge and innovations that will improve life for the people in their countries and their regions. But then comes a conflict, a war. Universities are bombed. Colleagues are killed. And the thousands of scientists who remain – what should they do? where should they go?

These scientists are the focus of “Science in Exile”, a new documentary directed by Italian filmmaker Nicole Leghissa and produced by The World Academy of Sciences [TWAS]. The film explores how recent conflict in Syria, Yemen, and Iraq has threatened the lives of four researchers – two women and two men – forcing them to suspend their work and flee their homelands.

“Science in Exile” is a story of science, but also a deeply human story. It takes viewers into the lives of scientists and social scientists with years of training and experience who are struggling to find a place in new lands—a safe place where they can continue their research. It also features organisations in the Middle East, Europe and globally who are working to support scientists displaced by conflict.

“These scientists are so important to the development of their home countries, and when they are forced to flee, this is deeply damaging,” said TWAS Executive Director Romain Murenzi. “Science in Exile” shows why the global scientific community must support them until they can return home in a time of peace.”

“Science in Exile” (37 minutes; 2017) was

produced with generous contributions from the Swedish International Development Cooperation Agency [Sida] and the Friuli Venezia Giulia Audiovisual Fund.

The film’s first showing came in November 2017 at the World Science Forum in Jordan. Since then, it has been screened or scheduled in nearly a dozen countries – from the Middle East and Africa to Latin America.

It was screened by the U.S. National Academies of Science, Engineering and Medicine international Committee on Human Rights; at the Annual Meeting of the American Association for the Advancement of Science in Austin, Texas; and at the Institute of International Education-Scholar Rescue Fund Forum in New York City. It also has screened at universities in Canada, Italy, Germany, Sweden, Finland and Nigeria.

Saja Taha Al Zoubi is a Syrian social scientist and former TWAS postdoctoral fellow who is featured in the film. “In Syria I became well-known in my field,” Al Zoubi explains. “The research area of equity – and gender equity in particular – is interpreted as having political or ideological motives, which is very dangerous. If you stand by the government, you will be the object of the opposition, and if you show sympathy for the opposition, you will be targeted by the other side.”

For more than a year, Al Zoubi lived an uncertain life in Lebanon’s Beqaa Valley: Her work focused on the makeshift camps that shelter thousands of displaced Syrian agricultural families, many headed by women.

▶ “Science in Exile”, a 37-minute documentary, has been screened at major science events and at scientific institutions in a dozen countries.





A documentary film from  
**THE WORLD ACADEMY OF SCIENCES**

*twas*

# SCIENCE IN EXILE

*Four researchers, in flight from war.  
They dream of science in a time of peace.*

## **Statement: Nicole Leghissa, director**

Through this film I really wanted the displaced scientists speak for themselves.

My choice since the beginning was to build the story's structure following the protagonists' own words and perspectives. I spent a long time looking for the right persons, and I established with them a very personal relationship.

We became friends and they opened to me the doors of their lives, thoughts, fears and hopes. They did it because they trusted me and because they thought that this film could be useful to support scientists like them.

All the people who participated in this documentary, in front and behind the camera, did it for the same purpose: to have an impact, to support change.

At the same time, she faced continual risk that her visa would not be renewed, and that she would be forced to return to the dangers of Syria.

But after the film was complete, Al Zoubi won a research fellowship at Oxford University.

The film also features Zaid Alhajjaj of Iraq, a PhD candidate in pharmaceutical biotechnology now working in Germany; Ghanya Naji Al-Naqeb, a Yemeni nutritional scientist now working in Germany; and Ahmad Sadiddin, a Syrian economist focused on agriculture and development, now working in Italy. [See Q&A with these three scientists beginning on page 15.]

Leghissa, the film's director, has worked for international production companies and broadcasters such as HBO, Channel 4 and ARTE. For the past five years, she has collaborated with TWAS and the Organization for Women in Science for the Developing World [OWSD].


"Science in Exile" was planned and filmed over a period of one year in 2016 and 2017. Leghissa traveled to South Africa, Lebanon, Sudan, Germany, Italy and the UK. ▣

**To screen "Science in Exile" at your school or organisation, please contact [scienceinexile@twas.org](mailto:scienceinexile@twas.org)**



# LOCAL NETWORKS, GLOBAL NETWORKS

*Two major initiatives will work to build policy and programmes for displaced scientists*

 by Edward Lempinen

With global awareness growing about the challenges that confront displaced researchers, two promising initiatives are emerging to support them: one involving four prominent international science and social science bodies, and the other organised by major scientific institutions based in Trieste, Italy.

Each project has a different scope and a different focus, but they share a common commitment to create policy and programmes that support scientists in flight from war and conflict. And they are building new international alliances between scientific bodies, organisations that serve threatened scholars, and humanitarian agencies.

“Many countries were caught unprepared by the recent upswing in human migration,” said Volker ter Meulen, president of the InterAcademy Partnership (IAP). “We know there are scientists, medics and other trained personnel among these displaced persons, and we believe the scientific community has a responsibility to do all it can to assist them. That is why IAP has joined with other partners in Trieste to work on this at a local/regional level,

and why the Science International group has agreed to work on this issue at the global level.”

IAP and The World Academy of Sciences (TWAS) are partners based in Trieste, and both have been involved with other high-level scientific bodies to plan and organise the initiatives.

## SCIENCE INTERNATIONAL: POLICY VISION

Science International is a collaboration involving four core organisations: the International Council for Science (ICSU); the International Social Sciences Council (ISSC); IAP; and TWAS. (ISSC and ICSU are merging in July 2018 to form the International Science Council.) Together, they represent more than 280 national, regional and global science organisations worldwide, with individual members at the highest levels of scientific research, policy and education.

In 2018-2019, Science International will focus on scientists, engineers and other research professionals and students who are displaced by war and conflict. A North-South leadership group has been formed, and scientific organisations are being surveyed about their experience with displaced scientists. A working group is slated to meet for the first time in Trieste in June 2018, beginning the research and discussion that will produce major policy recommendations.

The effort is “critically important”, said ISSC Executive Director Mathieu Denis. “Through our combined membership and networks, we can help mobilise expertise, raise awareness among



◀ From left: Fernando Quevedo, director, Abdus Salam International Centre for Theoretical Physics (ICTP); Maurizio Fermiglia, rector, University of Trieste (Italy).

our institutions, connect initiatives, learn from what others are doing and help address the fate of thousands of refugee and displaced scientists worldwide.”

Science International is not a new organisation, but rather an ongoing collaboration to develop and promote strong policies for science at the global level. The first initiative spanned 2015-2017, when the partners developed an accord – “Open Data in a Big Data World” – urging open access to big data that are increasingly central to advanced research. For developing countries, the accord found, open data provides an essential means to participate more fully in the global research enterprise.

By mid-2017, the accord had received more than 120 endorsements from organisations worldwide.

For the new initiative, there is a core working group of four scholars:

TWAS Vice President Mohammad Ahmad Hamdan, Arab Open University in Jordan; for ICSU, Valérie Schini-Kerth, University of Strasbourg (France); for IAP, Robin Perutz, University of York (UK); and for ISSC, Pascale Laborier, Université Paris Nanterre.

### TRIESTE INITIATIVE: THINK GLOBAL, ACT LOCAL

At the Abdus Salam International Centre for Theoretical Physics, Director Fernando Quevedo in August 2017 convened a meeting of Trieste science leaders to consider cooperative ventures on behalf of refugee and displaced scientists in Trieste and the Friuli Venezia Giulia region in northeastern Italy.

The result: nine local and regional institutions have agreed to work together to “offer opportunities to affected scientists to enrich their professional skills, to foster their human and professional development and integration, and encourage their reintegration in their country of origin once conditions allow”.

“We have been receiving an increasing number of requests for support from scientists who were forced to leave their countries because of conflicts,” said Quevedo. “I am glad this initiative has received the support of all research institutions in Trieste. This will help covering all scientific fields.”



▲ From top: Heide Hackmann, executive director of the International Council for Science (ICSU); Mathieu Denis, executive director, the International Social Sciences Council (ISSC).

Maurizio Fermeglia, rector of the University of Trieste, noted that the Trieste System of science institutions was built on a core idea: to internationalise science for the benefit of the global population. “No one in the Trieste System is considered a ‘foreigner’ – everyone is regarded as a scientist,” Fermeglia explained. “With this in mind, we decided unanimously to create the ‘Trieste group’ for supporting displaced and refugee scientists. I personally believe that this action can not only preserve the scientists’ skills, but also enhance dialog among people in the interest of peace.”

In addition to Quevedo and Fermeglia, the initial meeting was attended by Mauro Giacca, director-general of the International Centre for Genetic Engineering and Biotechnology [ICGEB]; Stefano Ruffo, director of the International School for Advanced Studies (SISSA); and Mohamed Hassan, then interim executive director of TWAS.

“No one in the Trieste System is considered a ‘foreigner’ – everyone is regarded as a scientist.”

*Maurizio Fermeglia, rector, University of Trieste*

Other science research organisations have joined the initiative: Italy’s Istituto nazionale di oceanografia e di geofisica sperimentale (OGS); the University of Udine; the Trieste International Foundation for Progress and Freedom of Sciences (FIT); and the Osservatorio Astronomico di Trieste, part of Italy’s National Institute of Astrophysics (INAF). ■

# New skills, new perspectives

*Displaced scientists arrive in their new countries  
with important needs – and with valuable scientific skills.*

By **Ulrike Albrecht**, head [retired]  
Department Strategy and External Relations  
Alexander von Humboldt Foundation

**T**oday scholars at risk are really partners in German universities. It brings us enormous advantage to have them here. Let me give an example. We have many German archaeologists who have worked with Syrian archeologists in the past. This collaboration is incredibly important for German scientists because, due to the Syrian war, they cannot dig any more in Syria. So, they are working together with Syrian colleagues on the virtual rescue of monuments because some of them have been heavily destroyed.

Foreign scholars are often incredibly active in building networks. Kader Konuk, a Turkish researcher, came to Germany two years ago from the U.S. With other scientists she has established the Academy in Exile, a platform for refugees and researchers at risk. This allows these researchers, whether in Germany or other countries, to talk together.

Hosting displaced scientists means more

than helping and engaging in humanitarian issues. Of course, the Humboldt Foundation, through its Philipp Schwartz Initiative, supports them as part of its mission. But they also bring in a different perspective: we are forced to re-think of what is happening in the world. We have to deal with the universities and the future of democracy. It's not the problem of people from Syria – it's our common problem, it's what's happening in the world at the moment.

Some countries like Sweden and Norway are already very active and a step further towards displaced scholars. They include in their normal procedures funds for threatened scientists. And these people are incredibly thankful for the very personal support from hosting universities. However, they want to be accepted as researchers, not always as threatened scholars. We receive a lot of gratitude but, at the same time, there is a lot of self-confidence when they ask: What's next? ▣



**Alexander von Humboldt**  
Stiftung/Foundation

# RESOURCES AND OPPORTUNITIES

*A number of organisations, institutions and publications around the world provide support and information focused on scientists, engineers, medical professionals and other researchers, including advanced students, who are at-risk because of war or conflict. The list below describes some of the most prominent among them.*

## SUPPORT FOR THREATENED SCIENTISTS, ENGINEERS, MEDICAL PROFESSIONALS AND OTHERS IN RESEARCH-RELATED FIELDS

### Science4Refugees | EURAXESS portal

<https://euraxess.ec.europa.eu/jobs/science4refugees>

The European Commission's initiative helps refugees and displaced researchers with job- and internship-placement support and other resources.

### Institute of International Education-Scholar Rescue Fund (IIE-SRF)

[www.scholarrescuefund.org](http://www.scholarrescuefund.org)

US-based SRF provides fellowships for qualified scholars and arranges visiting academic positions with partnering institutions of higher learning and research around the world.

### Council for At-Risk Academics [CARA]

[www.cara.ngo](http://www.cara.ngo)

CARA, based in the UK, provides support to academics in immediate danger and those forced into exile, helping them to reach a place where they can continue their work in safety.

### Scholars at Risk [SAR]

[www.scholarsatrisk.org](http://www.scholarsatrisk.org)

A US-based international network of higher education institutions and individuals that arranges temporary research and teaching positions at institutions in the global SAR network.

### Philipp Schwartz Initiative - Alexander von Humboldt Foundation

[www.humboldt-foundation.de/web/philipp-schwartz-initiative-en.html](http://www.humboldt-foundation.de/web/philipp-schwartz-initiative-en.html)

Provides universities and research institutions in Germany with the means to host threatened foreign researchers for a period of 24 months.

### The Baden-Württemberg Fund for Persecuted Scholars

[www.scholarrescuefund.org/scholars/baden-wuerttemberg-fund](http://www.scholarrescuefund.org/scholars/baden-wuerttemberg-fund)

Supports visiting research appointments at higher education institutions within Baden-Württemberg, Germany.

### PAUSE Programme

[www.college-de-france.fr/site/en-program-pause/index.htm](http://www.college-de-france.fr/site/en-program-pause/index.htm)

A French government initiative that convenes major French education and research institutions to facilitate the hosting of scientists from crisis zones, enabling them to integrate and ensuring continuity in their research.

### The Netherlands Organisation for Scientific Research [NWO]

[www.nwo.nl/en/news-and-events/news/2018/05/nwo-launches-new-refugees-in-science-pilot.html](http://www.nwo.nl/en/news-and-events/news/2018/05/nwo-launches-new-refugees-in-science-pilot.html)

A new pilot programme, Refugees in Science, aims to fund one-year appointments for academics who have fled their home countries and wish to continue their work in the Netherlands.

### Global Young Academy – At-Risk and Refugee Scholar Membership Initiative

<https://globalyoungacademy.net/activities/at-risk-and-refugee-membership-initiative>

A flagship project to enable re-integration of exceptional early-career at-risk and refugee scholars into research through a GYA mentorship programme.

## SUPPORT FOR DISPLACED STUDENTS

### The Lebanese Association for Scientific Research [LASER]

[www.facebook.com/LASERLebanon/](http://www.facebook.com/LASERLebanon/)

LASER's pioneering Scholarships for Syrians programme has provided undergraduate scholarships for hundreds of young refugees, plus some master's degree scholarships to train teachers.

### German Academic Exchange Service [DAAD]

[www.daad.de/der-daad/fluechtlinge/en](http://www.daad.de/der-daad/fluechtlinge/en)

In collaboration with universities and partner organisations, the DAAD is developing various programmes to promote integration of refugees at German universities.

## INTERNATIONAL ORGANISATIONS

**International Organization for Migration**

[www.iom.int](http://www.iom.int)

IOM promotes humane and orderly migration for the benefit of all. Among key focus areas: policy advice to governments; international cooperation; research; and humanitarian assistance.

**UNHCR, the UN Refugee Agency**

[www.unhcr.org](http://www.unhcr.org)

Provides comprehensive protection and support to displaced people. At times of crisis UNHCR provides shelter, health care clean water and other support. Through research and advocacy, it seeks to inform policy.

## RESEARCH AND POLICY

**InHERE**

<https://www.inhereproject.eu>

Works to strengthen knowledge sharing, peer-support and academic partnership to facilitate integration and access of refugees in European higher education institutions.

**Norwegian Refugee Council**

[www.nrc.no](http://www.nrc.no)

An independent organisation working in 31 countries to support people who have been forced to flee. Focus areas range from camp management to research, education and policy.

**Berlin Institute for Integration and Migration Research at Humboldt University in Germany**

[www.bim.hu-berlin.de/en/about](http://www.bim.hu-berlin.de/en/about)

Six departments from various Berlin institutes contribute research knowledge in fields ranging from social, cultural, educational and sports sciences to medicine and psychology.

**Refugee Studies Centre - University of Oxford**

[www.rsc.ox.ac.uk](http://www.rsc.ox.ac.uk)

Works to build knowledge and understanding of the causes and effects of forced migration to help improve the lives of vulnerable populations.

## PUBLICATIONS

**Al-Fanar Media**

[www.al-fanarmedia.org](http://www.al-fanarmedia.org)

Al-Fanar Media provides balanced, accurate and independent coverage of all aspects of academic life in the Arab world. Published in English and Arabic.

**SciDev.net**

[www.scidev.net](http://www.scidev.net)

SciDev provides news and analysis about the issues of science and technology in global development.

**Journal of Refugee Studies**

[academic.oup.com/jrs](http://academic.oup.com/jrs)

The journal provides a forum for exploration of the complex problems of forced migration and national, regional and international responses.

**Journal of Interrupted Studies**

[www.jis-oxford.co.uk](http://www.jis-oxford.co.uk)

An interdisciplinary journal dedicated to the work of academics, especially in the sciences and humanities, whose work has been interrupted by forced migration.

**Interruptions: New Perspectives on Migration**

[blog.jis-oxford.co.uk](http://blog.jis-oxford.co.uk)

A blog-forum for discussion of migration and migrants' rights, featuring journalism, personal essays, fiction, poetry, photography and art of those affected by migration.

TWAS is maintaining an updated, permanent list of resources for refugee and displaced scientists at [www.twas.org/node/12145/](http://www.twas.org/node/12145/)

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# Refugee Scientists: Transnational Resources

## Recommendations from a workshop

13-17 March 2017

Trieste, Italy



*Organised by:*



**The World Academy of Sciences (TWAS)**  
for the advancement of science in developing countries  
Trieste, Italy



**Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS)**  
Trieste, Italy



**Euro-Mediterranean University (EMUNI)**  
Piran, Slovenia



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# REFUGEE SCIENTISTS: TRANSNATIONAL RESOURCES

*People around the world are leaving their homes in record numbers<sup>1</sup>. Wars, civil conflict and political instability are to blame for many of these movements. Figures released by the United Nations High Commissioner for Refugees (UNHCR) reveal that, at the end of 2015, more than 65 million people globally had been displaced, with 21.3 million of them registered refugees and 3.2 million asylum seekers. Of the total, 40.8 million people have been displaced within their own countries.*

In other cases, slowly unfolding environmental disasters such as prolonged droughts, land degradation and food scarcity, caused or exacerbated by climate change, are also causing people to move in search of better lives.

The humanitarian aspect is an element common to both cases. This document, however, will focus on those at immediate risk from war, civil strife or political unrest, whether still in their home country, already abroad, or with official refugee status [hereafter referred to as “affected scientists”].

The situation is currently particularly acute in the wider Middle East and North Africa (MENA) region, with refugees exiting such countries as Afghanistan, Iraq, Libya, Palestine, Syria and Yemen, among others.

This ongoing historic event has created considerable political and social unrest in many countries along the main migration routes and especially in the preferred destination countries such as Germany, Sweden and the UK. In many places, there is a groundswell of public opinion – or at least a vociferous sector of society – that speaks out against accepting migrants and refugees into their communities.

*This statement and the related recommendations are the product of a workshop, “Refugee Scientists: Transnational Resources”, held 13-17 March 2017 in Trieste, Italy.*

*The workshop was attended by more than 50 participants from 19 nations, including representatives of national and international organizations, scholars, government bodies, funding agencies, agencies working with and for refugees and refugees themselves. The workshop was hosted by The World Academy of Sciences (TWAS), the Istituto Nazionale di Oceanografia e di Geofisica Sperimentale (OGS), and the Euro-Mediterranean University (EMUNI). Support was provided by the Swedish International Development Cooperation Agency (Sida).*

*To learn more about the workshop, visit [www.twas.org/node/12145/](http://www.twas.org/node/12145/)*

<sup>1</sup> See, for example, ‘The year Europe buckled under the biggest refugee crisis since World War 2’: [news.vice.com/article/the-year-europe-buckled-under-the-biggest-refugee-crisis-since-world-war-ii](http://news.vice.com/article/the-year-europe-buckled-under-the-biggest-refugee-crisis-since-world-war-ii), and ‘Migration’ Are more people on the move than ever before?’: [www.bbc.com/news/world-32912867](http://www.bbc.com/news/world-32912867).



But wars and civil strife do not only affect poorly educated, low-skilled people. Indeed, among those currently seeking refuge far from their home countries are many highly qualified individuals. Even taking into account the typical low level of investment in science and technology in countries affected by conflict, there are many qualified scientists, medical personnel, engineers and other technically trained people among the displaced people. [To give just one rough estimate, Iraq several years ago had 426 researchers per 1 million population<sup>2</sup>. Given that there were some 4 million Iraqi refugees around the world at the peak of the crisis in Iraq, this projects to more than 1,600 displaced scientists at the time.]

Indeed, there exists a diaspora of scientists, medical personnel and engineers – plus others training in such fields – often with few opportunities to earn a decent living.

Appropriate occupation is crucial for the effective inclusion of highly qualified affected scientists as it allows for economic and social participation as well as personal fulfilment. Many affected scientists experience high levels of unemployment and their skills are significantly underutilized. They are often under-employed in low-skilled and temporary or low-paying jobs. Thus, their chances of returning to professional careers often diminish the longer they are jobless in the new country of residence as they become de-skilled and lose self-esteem.

Such affected scientists with scientific, medical or other professional training can be a valuable resource if identified and provided with support for integration into the research/academic environment in their new countries. They are able to contribute to society, including research output, in the country where they reside. They typically also retain links with their home countries, becoming connected with like-minded individuals in a diaspora.

They are often also keen to return home once conditions improve. In this case, having been integrated into the scientific community of the host country means that they will have maintained and enhanced their scientific learning and skills. In addition, it is likely that they will have built a network of contacts that can lead to international research collaborations once they return that can be used to help build strong partnerships between host and home countries – for the benefit of both – and especially those countries hosting expatriate think-tanks.

<sup>2</sup> UNESCO Science Report: Towards 2030 [2015].  
[http://en.unesco.org/unesco\\_science\\_report](http://en.unesco.org/unesco_science_report)

# RECOMMENDATIONS

*There are many benefits to assisting qualified displaced scientists, engineers and medical personnel integrate into universities, research institutions, teaching hospitals and other placements – both in the short term in the host country, but also in the long term as they return to their home countries.*

*However, the current wave of refugees and migrants has meant that any initiatives that have tried to help refugee scientists and other scholars at risk have been swamped, and host country governments have been slow to respond to this need. In order to improve the situation, workshop participants propose a number of recommendations targeted towards different communities:*

**Target community: refugee scientists, scientists displaced by war, civil strife or political unrest, and scientists at risk from such events but still in their home country (“affected scientists”)**

- Inform yourself about the challenges likely to be encountered in the receiving country.
- Inform yourself about the immigration policies, employment prospects and scientific and refugee support programmes (run by governments, NGOs and/or scientific institutions themselves) available in the receiving country;
- If possible, carry diplomas, degree certificates, and medical records (e.g. vaccination certificates) and other such documents with you, or upload digital copies to the cloud before leaving home;
- Make yourself – and your qualifications – known to the authorities in the receiving country;
- Investigate and take advantage of existing instruments such as fellowships, visiting scientist and other exchange programmes, as well as any support programmes dedicated to refugee scientists and at-risk scholars;
- Establish contacts with existing scientific and diaspora networks to share information.

**Target community: the diaspora (including faith-based organizations)**

- Establish relations with refugee processing centres, preferably coordinated at city or region level;
- Establish a network designed to assist other affected scientists, e.g. by creating online sources of information, social media sites for providing information and responding to queries;
- Establish mentoring mechanisms;
- Help others to establish networking mechanisms and access information.

**Target community: the scientific community (including universities, research institutions, teaching hospitals, scientific societies, think-tanks and others)**

- Establish relations with refugee-processing centres, preferably coordinated at city or region level;
- Provide voluntary, short-term job opportunities in various fields of specialization and encourage affected scientists to engage in these opportunities. This will help to identify qualified persons and discover the benefits that can be realised with available talents and skills;

- If full employment of affected scientists is impossible (e.g. while they are waiting for the administrative clearances), develop ways to support affected scientists that will allow them to advance their careers as well as to benefit the relevant organization;
- Accelerate the process of reviewing degree certificates, for example by establishing national standards for degree equivalence between universities in the origin countries and universities in destination countries;
- Provide opportunities to affected scientists to continue pursuing their education from where they had left off in their home country;
- Consider establishing a fund to allow affected scientists to integrate as soon as practical [e.g. a permanent 'emergency fund'];
- Establish fellowships for affected scientists;
- Encourage academies of science, medicine and engineering to reserve membership slots for affected scientists and engage such new members on academy committees and in other academy proceedings;
- Establish connections between universities and research centres in the displaced scientists' host country with similar institutions in their countries of origin;
- Engage in outreach to affected scientists and offer targeted grant and scholarship support to expedite the continuation of their research/teaching;
- Publicise openings and actively recruit from among members of the scientific diaspora;
- Develop a communications strategy utilising institutional websites and social networks, targeting the traditional media and leveraging social/digital media. Such a strategy should be aimed at disseminating successful case studies and highlighting positive human-interest stories. Track and analyse mainstream media coverage;
- Collaborate with other universities, research centres and similar institutions. Network and share information.
- Establish databases of refugees with suitable expertise. Keep track of their movements between research centres, universities, and other institutions, subject to personal data / privacy laws;
- Make available and accessible reliable data on the numbers, educational level and fields of expertise of refugees – use openly accessible web platforms and commonly recognized keywords;
- Seek practical improvements in data-sharing laws with the national personal data protection agencies in line with national and international data-protection and privacy-protection standards;
- Identify specific successful initiatives and facilitate their replication;
- Offer employment and career counseling, including to those affected scientists not yet affiliated with an institution;
- Liaise with chambers of commerce and the business sector to encourage internships, apprenticeships and on-the-job training;
- Instigate resettlement support and family support programmes;
- Establish a focal point or welcome office that can guide and advise newly arrived scientists;
- Prepare a comprehensive handbook of advice and orientation to assist new arrivals in all matters related to integration;
- Undertake scientific studies and gather statistics to better understand refugee and migration phenomena. Share research findings;
- Plan for employment and professional development opportunities, including tailor-made training and up-skilling;
- Develop an internet-based clearinghouse that collects available opportunities for affected scientists, and which allows affected scientists to post their biodata and immediate interests for host institutions.
- Establish micro-credit schemes for affected scientists wishing to establish small S&T-based businesses.

#### **Target community: host governments**

- Accelerate visa systems and approval of asylum applications. Facilitate the quick social and professional integration of scientists in the host country;

#### **Target community: home countries [after crisis is over / return to normality]**

- Recognising that the progress of the country requires strong intellectual input, make science as high a priority as possible;

- Prioritise areas of expertise required to rebuild research, teaching, healthcare infrastructure;
- Provide incentives [e.g. tax exemptions, competitive salaries, laboratory facilities and promising positions] to persuade qualified individuals to return;
- Develop reintegration programmes and mechanisms to expedite return that are also sensitive to the community of scientists who remained in the country;
- Work with key host-country agencies and databases to identify and contact affected scientists;
- Identify diaspora communities that can help contact scientists and people with other relevant expertise when their skills are needed back in their home countries;
- Identify funding sources – including international donors, development banks, foundations and other partners – to invest in scientific and research infrastructures.

#### **Target community: research funding agencies**

- Establish grant programmes [with rapid processing times] that would assist universities, research centres, teaching hospitals and other science-related institutions to employ qualified affected scientists with remuneration at a level sufficient for them to support their families;
- Provide ring-fenced funds for joint academic projects involving refugees and other displaced scientists;
- Reach out to the media, government officials, civil society groups and others to raise awareness of the need for action to help such scientists and highlight benefits and successful case studies;
- Establish awards for superior academic performance by refugees.

#### **Target community: private sector**

- Provide opportunities for internships, apprenticeships and on-the-job training;
- Consider affected scientists as a strategic resource that can introduce valuable new perspectives and diversity to enrich companies;

- Promote the employability of the affected scientists.

#### **Target community: the news media**

- Consider running positive, human-interest stories and case studies of personal and professional success by affected scientists. Investigate also the root causes, missed opportunities and costs of displacement of affected scientists;
- Run more stories on the nature of work performed by affected scientists. Popularize science;
- Encourage and stimulate objective, balanced and fair coverage of relevant issues. Discourage sensational, biased and inaccurate coverage;
- Highlight the issue of affected scientists within the context of broader refugee coverage.

#### **Target community: international organizations**

- Organize an international conference on affected scientists to help formulate an effective and coordinated response;
- Consider the establishment of an Intergovernmental Panel on Refugee Academics.

#### **Target community: international organizations and NGOs**

- Establish a global society or association of affected scientists;
- Encourage national host governments to make special concessions for affected scientists;
- Encourage home-country governments [once conflict has ended] to invest in science, technology and innovation as drivers of national development;
- Engage the news media and highlight success stories;
- Establish an information clearinghouse system, for example by linking to or cross-linking existing databases and/or filling the gaps in such information resources.

# CONCLUSION

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Workshop participants shared a fundamental recognition: All affected scientists – women and men, senior and junior – deserve safe places to live and relevant employment while they are away from their home countries. As the recommendations here make clear, meeting these needs will require a holistic, cross-sectoral response.

Further, we recognize that the implementation of measures to support affected scientists and to provide academic opportunities to affected students will likely create stresses on institutions in the hosting countries at all levels, from education and research institutions to government. This risks creating a situation of permanent emergency that will not be efficient in meeting the challenge and that will be more likely to produce frustrating outcomes.

For this reason, responses require institutional adaptation at all levels, by creating new jobs and *ad hoc* professional positions, with the required background and competencies. These adjustments must be made across a network of institutions that work with refugees and other affected scientists: governments, universities, international institutions, non-governmental organisations, and the wider community of social services. Only in this way will it be possible to address the situation of affected scientists in a sustainable, rather than a reactive, manner.

## ANNEX:

# THE RESEARCH AGENDA

It is an overarching priority to develop a broad, integrated research agenda focused on the phenomenon of scientists, engineers, medical workers and others working in science-related fields, and on advanced students in those fields, who are at immediate risk from war, civil strife or political unrest [hereafter referred to as “affected scientists”]. They may be still in their home countries, already abroad, or with official refugee status.

The agenda should be based on a new paradigm: 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.

This field should be encouraged as a new interdisciplinary sub-specialty within the field of migration studies, with appropriate support from governments, funding agencies and research institutions.

The research agenda must focus on conditions of science in the countries of origin and on the need to integrate affected scientists effectively and efficiently into the scientific communities in their new nations. It should recognize the value of supporting efforts to continue their training and to build their careers, so that they can make contributions to their new countries and someday help to rebuild their home countries.

Toward that end, near-term research is needed to understand the current context and dynamics. This research can support the immediate need to identify affected scientists to inform policies and programmes to assure their integration into their new countries. Longer-term research must monitor and evaluate the social and professional evolution of the affected scientists and the scientific, social and economic impact of their work.

It is essential that this research be conducted in the scientists’ home regions and in their new countries and be conducted by researchers in both the North and the South. Collaborative South-North research should be strongly encouraged to obtain important insights and to build capacity both in the South and the North.

These efforts generally could focus in several areas:

- **Demographic research** to quantify and assess characteristics of affected scientists individually and as a group;
- **Social research** to assess their social and professional integration;
- **Policy research** to support action by institutions of government, science and education related to all aspects of this phenomenon;
- **Science diplomacy research** to support cooperative relations between all countries affected by the migration of these scientists, and especially to strengthen South-South and South-North cooperation on related issues.

This research takes on great urgency during a time in which rising political and social turbulence is compromising science, innovation, development and the free circulation of scientists and scientific knowledge.

# 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**.



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[www.twas.org/science-diplomacy](http://www.twas.org/science-diplomacy)

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.

**T**WAS 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 from nearly 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 over 490 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 more than 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 6,000 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 130 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.

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