The Energy Gap

Collaboration between the Smart Villages Initiative and the Global Young Academy

Currently, forty-seven percent of the world’s population is rural, yet rural inhabitants make up seventy percent of the world’s poor. Around fifteen percent (1.1 billion people) of the world’s population is living without access to energy. Furthermore, evidence shows strong links between electricity access and a nation’s level of development. The Smart Villages Initiative (SVI) links these statistics and points to energy access as a catalyst for sustainable development. Because national grid infrastructure does not reach rural, impoverished areas, the SVI is committed to finding sustainable energy options for off-grid communities worldwide, looking to decentralised solutions and using renewable energy sources. The initiative aims both to improve global health through the introduction of clean power supplies for cooking, lighting and communication, and to enable rural communities to redirect energy previously devoted to finding and paying for fuel into enterprises that will enhance economic security, enable cultural preservation and protect the environment in which they live.

Throughout 2016, the GYA brought together a team of seven members to work with SVI: co-leads Almas Awan (Brazil) and Moritz Riede (UK) and members Sherien Elagroudy (Egypt), Lim Boon Han (Malaysia), Mari-Vaughn Johnson (USA), Karly Kehoe (Canada) and Uttam Shrestha (Australia). In November, Karly and Almas attended a workshop in Punta Cana, co-hosted by the Smart Villages Initiative and the Academy of Sciences of the Dominican Republic. The workshop focused on renewable energy for rural communities in Central America, the Caribbean and Mexico. Examples of innovative solutions currently underway were highlighted and potential future developments, including risks, challenges and benefits associated with the regional and international cooperation, were discussed.

The workshop revealed that not only success stories, but also failures can provide invaluable information on why certain solutions have not worked. Another issue that arose was the greater need to consider the role of women in the process of creating energy solutions for off-grid communities. It is not enough to look at the impact that new technologies have on women’s lives. More needs to be done to consider women’s role as designers of technologies, as cultural communicators and as end-users.

Co-operation between the SVI and involved GYA members will continue, with a co-organised South Asia and Southeast Asia regional wrap-up workshop planned in Bangkok, Thailand in March 2017.
New Faces in 2016

Maria Ivanova joins the GYA Advisory Board

The Global Young Academy (GYA) is honoured to welcome Prof. Maria Ivanova as an advisory board (AB) member for her first term 2016-2019. Prof. Ivanova is an Associate Professor of Global Governance and Director of the Center for Governance and Sustainability at the John W. McCormack Graduate School of Policy & Global Studies, University of Massachusetts Boston, USA. She received her PhD in International Environmental Policy from Yale University in 2006, and has been involved in a variety of research projects and publications since, including in the fields of global governance, climate change and the UN Sustainable Development Goals. Presently, she studies the implementation and effectiveness of international agreements and has a particular interest in East Africa. She is a member of the Scientific Advisory Board of the UN Secretary-General and a Board member of the UN University Institute for the Advanced Study of Sustainability (UNU-IAS).

The role of the GYA Advisory Board is to advise the Executive Committee (EC) with respect to the development, activities, public promotion and general operations of the GYA. Co-chairs and the EC may consult with the Advisory Board at any time, and the board members are invited to attend the GYA Annual General Meeting and the annual EC meetings.

Eminent members of the global scientific, scholarly or research communities are elected by the EC to the GYA Advisory Board. Board members have demonstrated a passion for supporting the development of early career researchers and scholars, and have diverse disciplinary, career and national backgrounds. The AB is currently made up of eight members, and can comprise of a maximum of nine members. Any member of the GYA may propose candidates for election to the Advisory Board, and candidates must be elected by a unanimous vote of the EC. Advisory Board members serve up to two three-year terms.

GYA Advisory Board

Prof Dr Bruce Alberts (USA)
(2nd term 2015 – 2018)

Prof Dr Howard Alper (Canada)
(2nd term 2015 – 2018)

Prof Dr Yuko Harayama (Japan)
(1st term Feb. 2015 – May 2018)

Prof Dr Mohamed Hassan (Sudan)
(2nd term 2015 – 2018)

Prof Dr Maria Ivanova (Bulgaria)
(1st term Feb. 2016 – May 2019)

Prof Dr Kevin Marsh (Kenya)
(1st term Nov. 2015 – May 2019)

Prof Dr Helmut Schwarz (Germany)
(2nd term 2015 – 2018)

Dr Narong Sirilertworakul (Thailand)
(new 2017: 1st term 2017 – 2020)

See: https://globalyoungacademy.net/AB
The European Commission is committed to making Open Access (OA) models of scholarly publishing a cornerstone of its Open Science policy, and in May 2016, the EU Council discussed transitioning towards an Open Science System for member states, adopting conclusions on this process. Many young scientists in Europe and across the globe actively welcome these developments, but are wary of a one-size-fits-all open access mandate.

In an intense working process, the Young Academies of Europe and the Global Young Academy (GYA) published two position statements on Open Access and Open Data, respectively. The GYA was represented by its Open Science working group, led by GYA member Sabina Leonelli. The Position Statements, presented to the European Commission at the Open Science Conference in Amsterdam in April 2016, urge European policy makers to consider key recommendations from the perspective of young researchers.

The statement on Open Access highlights, among other aspects, the need to continue to protect standards of scholarly excellence, to promote inclusiveness in publishing, to consider different publishing habits in different disciplines and to ensure financial sustainability and transparency in publishing. The Open Data statement recommends a staged adoption of Open Data rather than a blanket policy, keeping in mind that different solutions are necessary for different kinds of data. Long-term sustainability and support with respect to data management and reuse are also key points in the statement. Sabina Leonelli emphasised, “The whole discussion on Open Data is around the fact that data needs to be available, and not just available but also reusable.”

In May 2016, the EU established the Open Science Policy Platform (OSSP), bringing together high-level representatives from European (open) science stakeholders. As a GYA representative, Sabina Leonelli was selected to participate in the OSSP, and she attended its first meeting in Brussels in September. The OSPP advises the EU Commission on the formulation, development and implementation of open science policy, and can additionally provide advice and recommendations on any cross-cutting issue affecting Open Science.

Meanwhile, to increase submissions to Open Access outlets, members of the GYA Open Access working group (Eva Alisic, Rob Jenkins, Sabina Leonelli and Arianna Betti) started the More Open Access Pledge. Over 320 early- and mid-career researchers from around the globe pledged to submit at least one manuscript to an Open Access outlet by the end of 2016.

More Open Access Pledge: [https://moreopenaccess.net/](https://moreopenaccess.net/)

Position statement on Open Access: [https://globalyoungacademy.net/opaccess](https://globalyoungacademy.net/opaccess)

Position statement on Open Data: [https://globalyoungacademy.net/opdata](https://globalyoungacademy.net/opdata)
The 2016 Global Young Academy (GYA) Annual General Meeting (AGM) and Conference, with the theme “Bridging Worlds Through Science” was attended by 95 GYA members from 33 countries.

Bridging worlds through science is what we do on a day-to-day basis in the GYA. Our collaboration and communication is constantly mediated through a passion for promoting the sciences and humanities, across nations, cultures, languages and disciplines. This everyday bridge building laid the foundation for dynamic discussions on the many aspects of science diplomacy. In a panel discussion with GYA members Mari-Vaughn Johnson and Vidushi Neergheen-Bhujun and speakers Helmut Schwarz, President of the Humboldt Foundation, Daya Reddy, Co-Chair of IAP Research and Zafra Lerman, President of The Malta Conferences Foundation, the role of science in policy advice and in international relations and the nuanced means of forging connections in challenging situations were discussed. Beyond a formal definition of science diplomacy, GYA members brought up the question of different roles scientists play related to politics, including the political nature of research and the establishment of research projects.

Tangent to science diplomacy, Open Science was a core theme of this year’s conference. The second panel discussion focused on the link between science diplomacy and Open Science efforts by governments and scientific programmes. Executive Director of the International Council for Science Committee on Data for Science and Technology (ICSU CoDATA), Simon Hodson, spoke about his organisation’s active interest in pushing forward standards for intelligent Open Data at an international level. Engaged GYA members from the two working groups Open Science and Global Access to Research Software (GARS) discussed the benefits and challenges to different open access models.

To expand the space in which members can follow up on their common interests in a less formal manner, the idea of Incubator Groups was introduced at this year’s AGM. Incubator groups can kick-start new ideas non-competitively before possibly forming a full-fledged working group.

Dinners and mingling with local young scientists, a canal boat ride on the Utrecht, and the variety of venues visited for meetings embedded the international meeting nicely in the local space and culture. Finally, with much appreciation of the efforts she put into the founding of the GYA and its growth over the last six years, managing director Heidi Wedel (2010 - 2016) was given a heartfelt farewell and new Managing Director Beate Wagner was warmly welcomed.

“I love the idea that all of us are & should be scientific diplomats - just by interacting with each other in a respectful way with a similar goal can build trust that lays the groundwork for political diplomatic relations. Our individual actions matter.”

Anina Rich (Australia)
Advancing Young Scientists in International Dialogue

GYA at the G7 Science & Technology Ministers’ Summit in Tsukuba City, Japan

Global Young Academy (GYA) alumna Ranjini Bandypadhyay (India), Associate Professor at the Raman Research Institute (RRI, India), represented the GYA at the G7 Science & Technology Ministers’ Summit, which took place 15 to 17 May 2016 in Tsukuba City, Japan. Ranjini was a panel speaker at the conference for the section “Gender and Human Resource Development for Science, Technology and Innovation”.

In her presentation, Ranjini also highlighted the role of women’s participation in Science, Technology and Innovation (STI) and discussed how the next generation of STI leaders can successfully be promoted globally. She emphasised the importance of academic institutions, such as the GYA and the National Young Academies, in increasing young scientists’ chances to be heard and become involved in political debates. The presentation was followed by a profound discussion, during which policy makers reaffirmed their strong commitment to the cause of young scientists in general and to women researchers in particular. Ranjini assessed the lecture and the follow-up discussion as positive: “I had made a strong pitch for a research visa to enhance mobility of researchers and I believe this was very well received”, she said after the conference.

Prior to the conference, the GYA submitted recommendations on the expansion of the participation of women and the next generation of global leaders in STI, with the aim to strengthen the position of young scientists in international dialogue and science-policy collaboration. Some of these recommendations were reflected in the final conference paper – the Tsukuba communiqué – which was adopted by the G7 Science and Technology Ministers during the summit. In the communiqué, the Ministers once more expressed the high importance of science, technology and innovation for general social stability and successfully addressing current and future global challenges.

Both Ranjini’s speech and the GYA’s contribution to the communiqué can be seen as major steps for the empowerment of young researchers that will have lasting effects in fostering the link between science and politics, researcher and policy makers. The GYA is making efforts to be actively involved in coming G7 Science and Technology Minister’s meetings in Italy (2017) and Canada (2018).

From the Tsukuba Communiqué:

“We recognized that STI, especially when empowered by ICT, has great potential to bring prosperity to all, regardless of age, gender, language or region. We are therefore committed to work toward inclusive innovation.”
A Common Voice

Support for evidence-based policy as an interdisciplinary effort

Hosted by the Joint Research Centre (JRC) and jointly sponsored by the European Union, African Union, and the International Institute for Applied Systems Analysis (IIASA) in Ispra, Italy (31 August – 2 September 2016), the workshop was designed to allow participants to develop skills necessary for improving the integration of evidence into policy making. Specifically, the workshop aimed to empower African and European scientists and policymakers to better understand the demands, constraints, and everyday realities experienced by scientists and policymakers so that both parties may develop better lines of communication and thereby make evidence-based policy more accessible.

Global Young Academy (GYA) Co-chair Mari-Vaughn Johnson attended the event on behalf of the GYA, along with two-hundred policy makers and scientists from across Africa and Europe. Many of the participants were early or early-mid career professionals who showed distinct potential in leadership and are likely to play central roles in future discussions around Food, Energy and Water (FEW) in EU, AU, and global discussions. Vladimir Sucha, Director General, DG JRC, European Commission gave an inspiring keynote lecture, noting that science and policy are worlds in collision and urging scientists to understand this as an interaction with exchange, out of which we create something new. In a communicative environment of mutual respect, change is possible, and should be expected: science is in a constant flux. Mari-Vaughn left this plenary with renewed optimism for the work of the GYA, which strives to develop a common voice out of myriad diversities, based on mutual understanding.

The panelists also shared valuable insights. Pavel Kabat, Director General and CEO of IIASA emphasized that succeeding at addressing issues around the FEW nexus and the sustainable development goals (SDGs) is imperative to the future of humanity. He encouraged scientists to make connections and stop the paradigm of sectoral policy-making and silo-ed science. Peter Gluckman, Chair of INGSA and Chief Science Advisor to the Prime Minister of New Zealand, encouraged scientists to take an active role in providing policy makers with data, even when we feel that we do not have enough data to fully answer the questions at hand; we know more than we think we know. Dr. Gluckman referred to this as “postnormal science” – science that is complex, with many unknowns and necessary uncertainties. Despite those gaps, decision-making remains urgent. He also cautioned that scientists must consider values beyond facts, consider the roles of indigenous and local knowledge, belief and tradition. We must learn to interact with the policy community at local, national, and global scales, as the globalization of science is a challenge and an opportunity.

“Honesty and trustworthiness are paramount if we want science to make a difference.”

Mari-Vaughn Johnson
Our membership comes from six continents and spans across a diverse range of disciplines.

Graphics: Rob Jenkins, Kevin Bolte / GYA
Over the past five years the GYA and its members have been a driving force behind the establishment of NYAs. During 2016 one new NYA has been launched.

Map: Florian Wiencek, Kevin Bolte / GYA
Ever since its foundation, the Global Young Academy (GYA) and its members have been a driving force behind the establishment of National Young Academies (NYAs), of which there are now 31 worldwide. 2016 was another important year for GYA activities aiming to strengthen NYA networks, with two large meetings taking place to foster regional collaboration between NYAs.

After the first such conference in 2014, the 2nd Africa Young Academies Regional Conference entitled “Empowering the Next Generation of Scientists in Africa” took place in October 2016 in Mauritius. It brought together representatives from all existing NYAs in Africa, as well as NYA Initiatives and young as well as senior scientists from other countries in the Network of African Science Academies (NASAC). The meeting was organised by the GYA with support from the University of Mauritius and the Mauritius Academy of Science and Technology, and was funded by the Robert Bosch Foundation.

The main objective of this conference was to explore new ways to continue to empower the next generation of scientists in Africa by pushing forward the agenda for establishing more NYAs in African countries over the coming years, and facilitating synergies between these and Senior Academies, in addition to discussing the effective contribution of NYAs to African scientific sustainable development. Further objectives included the engagement of African scientists in the diaspora for the advancement of Young Scientists on the African continent, so that indigenous research excellence can be further developed on the continent.

Furthermore, the conference scheme served as a model for the First Asia National Young Academy Meeting “Advancing Synergies in Asian NYAs” in Bangkok, Thailand, in December 2016, which was jointly organised by the Thai Young Scientists Academy (TYSA), the GYA, the National Science and Technology Development Agency (NSTDA) and the National Science Museum (NSM).

This meeting was the first of its kind for leaders of NYAs in Asia to convene to exchange experiences, share lessons learned and discuss common challenges, e.g. funding, getting all members involved, diaspora engagement with young scientists in Asia, and improving relationships with some senior academies. The meeting succeeded in building and strengthening a network of NYAs, the GYA, and various stakeholders; to promote research collaboration opportunities; and to develop a strategy and action plan for NYAs within the region and beyond.
After its inauguration in 2015, the Africa Science Leadership Programme (ASLP) as the first ever programme of its kind continued to thrive in 2016.

The Programme was started by Global Young Academy (GYA) member Eva Alisic and GYA alumnus and project leader Bernard Slippers, and is backed by various other GYA members and members of National Young Academies in Africa. It is an initiative of the University of Pretoria and the GYA, with generous financial support by the Robert Bosch Foundation. It aims to train mid-career African academics from all disciplines in the areas of advanced leadership skills, such as team management and research development, with the intention of enabling them to contribute to the development of a new paradigm for science in Africa. ASLP focuses on enabling young leaders to solve the complex issues facing both Africa and the global community.

As such, the ASLP marks an important step towards closing the gap between developing and developed countries in career support and development opportunities. With its pan-African outlook, the programme offers the region essential new mentoring and support structures to create a network of academic leaders on the continent.

Twenty-two outstanding young scientists from a wide variety of disciplines including the social sciences and humanities, seven of whom are GYA members, from all major regions in Africa participated in the second round of the ASLP in 2016. The programme commenced in April 2016 with a week-long in-person workshop on ‘Leading a new paradigm for African Science’ in Pretoria, South Africa, and continued with a second workshop in October 2016. This event brought together 15 young leaders from different African countries and varying scientific disciplines.

The workshop programme presented an opportunity for discussions on leadership style, effective group and workshop structures, methodology, and funding. As a highlight, a talk by innovative science communicator and plant biotechnology expert Professor Nox Makunga from Stellenbosch University focused on an increasingly significant skill for young researchers: effective science communication.

After the meeting, participants then continued to study science leadership issues in more detail and applied new skills to their individual jobs at home. They will meet for a final session of the 2016 ASLP in March 2017.

Due to the success of rounds 1 and 2, the GYA has now also been looking at how it can develop similar leadership programmes and mechanisms in other world regions and in 2016, the programme saw its successful transfer to the Asian continent, with the ASEAN Science Leadership Programme holding its first meeting in Bangkok, Thailand in June 2016.

For more information on the Africa Science Leadership Programme, please visit:
https://globalyoungacademy.net/aslc
https://globalyoungacademy.net/aslp
https://globalyoungacademy.net/aslp2
What does thinking sound like?

Music at the crossroads of neuroscience, computer science and art

A new Global Young Academy (GYA) working group (WG) – “Science + Art = Peace and Justice” – launched its collaboration with the dynamic workshop “The Well-Tempered Brain” in August 2016 at the Summerhall exhibition space in Edinburgh, Scotland. The Science + Art WG emerged under the leadership of Alexander (Sasha) Kagansky (UK/Russia) with the aim to explore connections between neuroscience, aesthetics, electronic music production, computer science and philosophy.

The launch event focused on music and brought together ca. 20 participants – experts in cell biology, neurobiology, bioinformatics, computer science, philosophy, visual art, classical music, jazz and more – including GYA members Sasha Kagansky (UK/Russia), Martin Dominik (UK), Borys Wrobel (Poland), Kit Yee Chan (UK), Srinjoy Mitras (UK), and Bartlomiej Kolodziejczyk (Australia). Harry Whalley, an award-winning composer, has previously used EEG sensors to make music, and now Dr Paul Roach (University of Keele, and alumnus of the NESTA Crucible programme for interdisciplinary innovation) has developed a micro device “brain-on-chip” in the lab to capture live and simultaneously the data from 64 neurons from various parts of the brain. At the Well-Tempered Brain workshop, using computers, EEG sensors and synthesizers, data sets from human brain activity were turned into sound and explored.

The electric pulses created by interactions between neurons in the brain are commonly expressed visually in graphs, but can also be sonified, and even composed into music. “A group of neurons can be imagined like a group of instruments within an orchestra”, explains molecular biologist Sasha Kagansky. The process of sonification involves recording the electric signals from the brain in separate digital channels. This data is grouped and clustered, and using this information, the composer maps tones and selects and uses rhythmic structures in the existing data set. The entire procedure uses several hardware and software solutions, and the resulting complex sound structures and music compositions are truly interdisciplinary.

Beyond its aesthetic value, the cross-disciplinary nature of the working group encourages researchers to take a more open perspective beyond their specific fields, inspiring better understanding of other research fields as well as creativity and inclusivity in their own work. By reshaping science as art and art as connected to science, the working group also aims to open the minds of the broader public.

The short movie “Nano-Thought Symphonies – The Well-Tempered Brain” (https://vimeo.com/183865879) showcased selected impressions from the event. Full length audios are made available by Mark Matthes and Anton Koch and Sergey Kostyrko. Links and more information on this project at https://globalyoungacademy.net/thinking
Interdisciplinarity is one of the key strengths of the Global Young Academy (GYA). Our members bring with them expertise in disciplines ranging from the physical sciences to the humanities, and everywhere in between, and use their diverse backgrounds to collaborate and contribute to highly interdisciplinary working group projects.

World Science Day provided us with a fitting outlet to acknowledge and celebrate interdisciplinarity in science by launching the film Beyond Discipline, which was directed by GYA member Alexander (Sasha) Kagansky in collaboration with Paul Maguire, and in association with the University of Edinburgh, Scotland. The film highlights research projects from a variety of disciplines at the university with the goal of functioning as a bridge between these different fields.

Beyond Discipline grew out of Sasha’s personal experience as a biologist and his frustration with the lack of exchange of knowledge across disciplines in academia. In order to succeed in their respective disciplines, he says, scientists generally develop highly-specialized and detailed knowledge structures and languages which can make it challenging to work in interdisciplinary teams. The common language of science provides us with a tool with which we can deconstruct these knowledge structures in order to work together more successfully.

The film takes us on a one-hour journey through today’s world of science. Strung together in an ongoing dialogue on interdisciplinary research, we meet representatives of a number of disciplines, including art, philosophy, neuroscience, mathematics, education, and sociology. Featured are Nobel Prize winner Peter Higgs, highly regarded professors such as Joyce Tait and Richard G. Morris, and emerging young scientists from varying fields of research. In conversation with these researchers, a discussion of interdisciplinarity as both a challenge and an opportunity for innovative academic work develops.

To Sasha Kagansky, interdisciplinarity is a “process which allows us to widen our academic horizons and to test our hypotheses in different systems of thought. [It’s a process which will] create a sum that is greater than its parts”. With Beyond Discipline he reminds us of this potential.

Watch “Beyond Discipline” here:
https://vimeo.com/189619910
What challenges do young scientists face?
Exploring the state of young scientists in Southeast Asia

The Global Young Academy (GYA) ended the year on a high mark with the completion of our second study of the Global State of Young Scientists (GloSYS). While our first GloSYS study was intended to provide a preliminary overview of how early-career researchers are doing across the globe, our second study took a more focused approach. The GloSYS ASEAN project was a first of what we envision to be a collection of regional studies with the aim of increasing our understanding of the context in which young scientists do their work, and the motivations and challenges that shape their career trajectories. The ASEAN study explored these issues in the context of four countries in Southeast Asia: Indonesia, Thailand, Malaysia, and Singapore.

The GloSYS studies integrate three different kinds of data: pre-existing data on key indicators related to each country’s young scientist population, responses to a survey created by the GYA, and data obtained through semi-structured interviews. All-in-all, 444 young scientists completed the survey, and eighteen participated in the interviews.

In the GloSYS ASEAN sample, around 70% of respondents were satisfied or very satisfied with their overall working conditions. Young scientists were especially satisfied with their flexible work hours, being confronted with challenging tasks as a part of their careers, and the social status associated with their profession. They were least satisfied with regards to infrastructure (rooms and equipment) and income. The obstacles most commonly reported by the young scientists who participated in the GloSYS ASEAN study were a lack both of funding opportunities and support in identifying and applying for funding, a lack of resources and personnel, and a lack of training and mentoring.

Among the key recommendations made in the report are to ensure that young scientists have the time to conduct research by reducing unnecessary administrative duties and providing properly-trained support staff, to amend bonded PhD programmes to allow young researchers to continue their stay abroad post PhD if they are offered a postdoc position, and to support future research on the state of young scientists in the region by improving statistical information available about this group and supporting longitudinal research that aims to understand the unique challenges young scientists face.

Read more:
https://globalyoungacademy.net/GloSYS
The Global Young Academy (GYA) was founded in 2010 with the vision to be the voice of young scientists around the world. The GYA empowers early-career researchers to lead international, interdisciplinary and intergenerational dialogue by developing and mobilising talent from six continents. Its purpose is to promote reason and inclusiveness in global decision-making. Members are chosen for their demonstrated excellence in scientific achievement and commitment to service. Currently there are 200 members and 134 alumni from 70 countries. The academy is hosted at the German National Academy of Sciences Leopoldina in Halle (Saale). The GYA received its seed funding from the Volkswagen Foundation and since 2014, has been funded by the German Federal Ministry of Education and Research (BMBF). It has been supported by the IAP: the Global Network of Science Academies. The GYA has also benefited from project funding from a variety of donors and partners.