“Empowering women to advance the sciences, engineering and technology is critical to solving many of the challenges faced by both the developing and the developed world. Our goal is to ensure that Faculty for the Future Fellows are equipped with the knowledge and skills necessary for them to teach, research, drive innovation and help their societies implement change leading to increased prosperity and economic development.”

Mr. Sola Oyinlola
Chairman Africa & Global Head of Sustainability, Schlumberger
President, Schlumberger Foundation (President from 12 Dec 2013 to March 2015)
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Introduction

Word from the President

When it comes to leading change from within, the world’s developing nations possess vast reservoirs of untapped talent. Research shows that creating more opportunities for women to develop their knowledge and skills and assume leadership positions, especially in the fields of science, technology, engineering and mathematics (STEM), can contribute significantly to their countries’ prosperity and social cohesion.

Empowering women to advance in STEM helps correct the gender gap in these academic and career disciplines, and ignites a potentially powerful pool of generally untapped talent. STEM can initiate and accelerate differentiated development, and contribution to increasing the human talent pool in STEM is critical to promoting a nation’s development potential.

The Schlumberger Foundation, essentially through its Faculty for the Future flagship program, is committed to supporting talented women scientists from developing countries by helping them to pursue advanced graduate studies at leading universities abroad. Upon returning to their home countries, Faculty for the Future Fellows plant the seeds of lasting economic, social and technological advancement by strengthening the academic and research faculties of their institutions, using their technological expertise and passion to address public policy issues, and engage in their societies to advance development. When they are so engaged, fellows serve as role models to attract more women into STEM fields of study.

The goal of the Schlumberger Foundation is to ensure that Faculty for the Future Fellows are equipped with the knowledge, skills and human networks necessary for them to teach, research, drive innovation and help their societies implement change leading to increased prosperity and economic development. The Schlumberger Foundation has been pursuing this goal in developing countries all around the world for ten years, during which time it has awarded more than 400 grants to women from 69 countries, studying in 25 advanced universities outside their home countries.

By enabling STEM, the Faculty for the Future supports women who aspire to changing their world, creating shared prosperity, and fostering innovation to help address global society’s myriad problems.
Financial Overview

In 2014, the Schlumberger Foundation continued to focus entirely on its flagship Faculty for the Future program which is steadily growing from strength to strength and visibly turning into a formidable network of women scientists and researchers. The program continues to contribute to decreasing the gender gap in STEM activities by reducing barriers that prevent women from developing countries achieving their educational aspirations. The Faculty for the Future program helps break down the barriers of silence, empowering women to become the influential voices that will lead to positive local impact and change while utilizing their newly acquired technical skills and tapping into a rich, international scientific network that was once just a shelved book too high to reach.

A total of 84 new grants were awarded in March 2014 (25% increase YoY) in addition to 91 renewed grants (8% increase YoY). Grant spend increased by 29% YoY reaching $7.4M this year. A total of $3M was disbursed to grantees studying in universities in the US (vs $2.5M last year) while $2.3M was disbursed to grantees in the UK (vs $1.8M last year). The remainder was disbursed to students at universities in Australia, Canada, Europe, Japan, Malaysia and South Africa.

The Faculty for the Future online application website closed on November 21st 2014 with a record 1,030 new applications (vs. 558 last year) up by 84%. Additionally, 137 renewal applications were submitted representing a 51% increase from 2014. Post-Doctoral research students accounted for 13% of the new grantee population.
THE FACULTY FOR THE FUTURE PROGRAM IN 2014
405 FELLOWS FROM 69 COUNTRIES STUDYING IN 25 HOST COUNTRIES

Faculty for the Future Program
Recipients of the 405 Faculty for the Future Fellowships awarded to date come from developing and emerging economies representing most of the world’s continents. They have benefitted from attending leading research institutes in 25 host countries around the world.

In 2014 the choice of disciplines continued to embrace the core scientific domains (chemistry, physics and mathematics) while other fields such as civil & environmental engineering, agriculture, bioengineering, environmental sciences, computer engineering, hydrology, nutrition and medicine were also prominent with many research projects directly focused on home country related issues.
### The Faculty for the Future Program in 2014

**405 Fellows from 69 Countries Studying in 25 Host Countries**

**United States:**
- 14 Massachusetts Institute of Technology
- 10 Texas A&M University
- 9 Georgia Institute of Technology
- 9 Harvard University
- 8 University of Texas at Austin
- 5 Pennsylvania State University
- 5 University of Florida
- 4 California Institute of Technology
- 4 Cornell University
- 4 Purdue University
- 4 University of Illinois
- 3 Arizona State University
- 3 Carnegie Mellon University
- 3 Johns Hopkins University
- 3 Louisiana State University
- 3 Northwestern University
- 3 Rice University
- 3 University of California, Irvine
- 3 University of Georgia
- 3 Stanford University
- 3 Yale University
- 2 Columbia University
- 2 Duke University
- 2 Iowa State University
- 2 North Carolina State University
- 2 Oklahoma State University
- 2 Syracuse University
- 2 University of Arizona
- 2 University of California, Berkeley
- 2 University of Pittsburgh
- 2 University of South Florida
- 2 University of Wyoming
- 1 Auburn University
- 1 Boston University
- 1 Colorado School of Mines
- 1 Drexel University
- 1 Georgia Mason University
- 1 Indiana University-Purdue University Indianopolis
- 1 Michigan State University
- 1 Missouri University of Science and Technology
- 1 Montana State University
- 1 National Institutes of Health

**United Kingdom:**
- 26 University of Cambridge
- 10 University of Nottingham
- 8 University of Manchester
- 6 Imperial College London
- 5 University of Oxford
- 4 University College London
- 4 University of Leeds
- 4 University of Southampton
- 4 University of York
- 3 Lancaster University
- 3 University of Surrey
- 2 King’s College London
- 2 Newcastle University
- 2 University of Dundee
- 2 University of Leicester
- 2 University of Reading
- 2 University of Sheffield

**South Africa:**
- 5 University of Cape Town
- 5 University of the Witwatersrand
- 4 Rhodes University
- 2 University of Pretoria
- 1 Nelson Mandela Metropolitan University
- 1 University of Michigan
- 1 University of Nebraska
- 1 University of North Carolina
- 1 University of Notre Dame
- 1 University of Utah
- 1 Vanderbilt University

**Germany:**
- 2 Saarland University
- 2 University of Bonn
- 2 University of Leipzig
- 1 Carlson Ossetsky
- 1 University of Oldenburg
- 1 Centre for Solar Energy and Hydrogen Chemistry
- 1 Darmstadt University of Technology
- 1 Hamburg University of Applied Science
- 1 Hamburg University of Technology
- 1 Heidelberg University, Ruperto Carola
- 1 Helmholtz Center for Ocean Research Kiel
- 1 Humboldt University of Berlin
- 1 Research Baden-Württemberg

**Netherlands:**
- 4 University of Groningen
- 4 Delft University of Technology
- 4 UNESCO-IHE Institute for Water Education
- 2 University of Amsterdam
- 1 University of Hull
- 1 University of London
- 1 University of Portsmouth
- 1 University of Stirling

**Australia:**
- 4 University of Queensland
- 3 University of Sydney
- 2 University of Canterbury
- 2 University of Technology Sydney
- 1 Australian National University
- 1 James Cook University
- 1 Monash University
- 1 Queensland University of Technology
- 1 University of Canberra
- 1 University of Melbourne

**Sweden:**
- 6 Umea University
- 1 Uppsala University
- 1 Swedish University of Agricultural Sciences

**Canada:**
- 2 McGill University
- 2 McMaster University
- 1 University of British Columbia
- 1 Ecole Polytechnique de Montréal
- 1 National Institute of Scientific Research-IRS, Montreal
- 1 Queen’s University
- 1 University of Calgary
- 1 University of Toronto
- 1 University of Waterloo
- 1 University of Western Ontario

**Japan:**
- 3 Kyoto University
- 1 Hokkaido University
- 1 Keio University
- 1 Kyushu University

**South Korea:**
- 1 Ewha Womans University
- 1 Gwangju Institute of Science and Technology

**Spain:**
- 1 Polytechnic University of Valencia
- 1 University of Barcelona

**Austria:**
- 1 Vienna University of Technology

**China:**
- 1 China University of Petroleum

**Denmark:**
- 1 Technical University of Denmark

**Belgium:**
- 1 Ghent University
- 1 Catholic University of Leuven

**Finland:**
- 1 University of Oulu

**Ireland:**
- 1 University College Cork

**Italy:**
- 1 Polytechnic University of Milan

**Brazil:**
- 1 University of Oulu

**Mexico:**
- 1 National Autonomous University of Mexico

**Russian Federation:**
- 1 Moscow Institute of Physics and Technology

Number of Fellows studying (or have studied) in host country
THE FACULTY FOR THE FUTURE PROGRAM IN 2014
405 FELLOWS FROM 69 COUNTRIES STUDYING IN 25 HOST COUNTRIES

AMERICAS
1 United States: 159
2 Canada: 14
3 Mexico: 11 / 1
4 Colombia: 10
5 Brazil: 5
6 Argentina: 3
7 Ecuador: 3
8 Peru: 3
9 Costa Rica: 1
10 Dominican Rep.: 1
11 Guyana: 1
12 Nicaragua: 1
13 Paraguay: 1
14 Trinidad & Tobago: 1
15 Venezuela: 1

EUROPE
16 United Kingdom: 107
17 Germany: 19
18 Netherlands: 17
19 France: 8
20 Belgium: 6
21 Sweden: 3
22 Italy: 2
23 Spain: 2
24 Austria: 1
25 Denmark: 1
26 Finland: 1
27 Ireland: 1
28 Norway: 1
29 Russia: 1 / 4
30 Ukraine: 2

MIDDLE EAST
31 Iran: 9
32 Turkey: 7
33 Jordan: 3
34 Palestinian Territories: 2
35 Syria: 2
36 Iraq: 1
37 Yemen: 1

AFRICA
38 South Africa: 26 / 3
39 Nigeria: 53
40 Kenya: 14
41 Ghana: 13
42 Egypt: 9
43 Tanzania: 8
44 Zimbabwe: 8
45 Sudan: 6
46 Uganda: 6
47 Ethiopia: 6
48 Algeria: 4
49 Cameroon: 4
50 Madagascar: 4
51 Namibia: 4
52 Rwanda: 4
53 Lesotho: 3
54 Botswana: 2
55 Malawi: 2
56 Benin: 1
57 Liberia: 1
58 Libya: 1
59 Mauritius: 1
60 Mozambique: 1
61 Sierra Leone: 1
62 Somalia: 1
63 Sudan (Rep. of): 1
64 Swaziland: 1
65 Togo: 1

ASIA
66 Japan: 9
67 Indonesia: 2 / 34
68 Malaysia: 2 / 3
69 South Korea: 2 / 1
70 China: 1 / 24
71 India: 43
72 Pakistan: 26
73 Bangladesh: 8
74 Nepal: 6
75 Philippines: 5
76 Vietnam: 5
77 Sri Lanka: 4
78 Thailand: 3
79 Myanmar: 2
80 Afghanistan: 1
81 Armenia: 1
82 Fiji: 1
83 Kyrgyzstan: 1
84 Mongolia: 1
85 Papua New Guinea: 1

OCEANIA
86 Australia: 15

"Fellows" refers to current and former grantees of the program.
The Schlumberger Foundation

Brief History

The Schlumberger Foundation is a non-profit organization overseen by a Board of Directors and managed and administered by Schlumberger employees. It operates under two legal entities, the Schlumberger Foundation Inc., registered in 1954 in the United States and the Schlumberger Stichting Fund registered in 1985 in the Netherlands.

The first reference to a Foundation created in the United States was in the 1954 Schlumberger Annual Report as follows: “Through the years we have relied heavily on our universities as the source of the technical personnel to whom so much of our progress is due. As an acknowledgement of the essential role that these universities have played in our past growth and will play in our future, your Board of Directors has created the Schlumberger Foundation for the purpose of establishing scholarships and fellowships for scientific studies.”

Since its inception the Foundation has focused on funding a variety of programs in scientific education all over the world:

- University Endowments were established over a 23 year period starting in 1976 to finance Chairs at Rice University in Houston, USA; Massachusetts Institute of Technology in the United States and Cambridge in the United Kingdom, to name just a few. Since then other endowments were established with other universities in the United States such as University of Michigan, Georgia Institute of Technology, University of Texas at Austin, Missouri Institute of Science and Technology, Stanford University, University of California Berkeley and University of Alberta in Canada. Likewise, endowments were made to a few universities in developing countries, such as the American University in Egypt, for instance.
- In 2003, the Foundation became a sponsoring partner with “Africa Array” which was established to create new geo-scientific research and training programs and rebuild existing ones in Africa with Africans for Africans.
- In 2004, the Faculty for the Future program was launched to provide funding to women from emerging economies to undertake advanced graduate study in the fields of science, technology, engineering and mathematics (STEM) in the best faculties for their disciplines overseas. Today, the Faculty of the Future Program is the sole flagship program funded by the Schlumberger Foundation. The long term goal is to address the gender gap in STEM disciplines by selecting the most talented female scientists, providing them with a unique opportunity to develop their skills and exposing them to vital international experience and networking, thereby training them to become future faculty researcher leaders, change agents and policy makers back in their home regions where they are ultimately expected to return.
- In 2005, “Lab in a Lorry” got under way as a joint initiative with the Institute of Physics in the United Kingdom, giving young people the opportunity to explore science through hands-on experiments and attracting over 1,000 volunteers from the scientific world to share their knowledge.
- From 2005–2007 the Foundation had a partnership with United World Colleges (UWC) to fund students from disadvantaged backgrounds with an interest and talent in science to study at UWC colleges. A total of 21 students graduated from this program.
Grant Selection Process

The online application web site opens in September of each year and closes by mid-November. The final selection of candidates is made by the Schlumberger Foundation Board in March of the following year. Every year the number of applications has increased reaching a record 1,000 in 2014.

The Selection Process is comprised of 3 distinct rounds.

**Round 1:** All applications are reviewed for general eligibility: i.e., completeness, coherence, quality of the application and relevance of the discipline chosen in line with the core objectives of the Faculty for the Future program.

**Round 2:** A panel of scientists from different Schlumberger Research Centers and operating locations around the world is invited to review a set of applications each. This “scientific round” as it is referred to internally, is critical to the whole selection process, as it requires scientific expertise in such fields as physics, chemistry, mathematics, geology and engineering. The reviewers are tasked with the selection of the top applications in their batch to go forward to the interviews. During this scientific round, the panel of in-house scientists evaluate the academic performance, the research proposals, the personal essays and references of each application and a score is assigned to a pre-defined set of criteria which include amongst others, the quality and scientific interest of the research proposal, the relevance of the research proposal to the home country of the applicant, the level of preparation and communication that has been engaged in by the applicant with a future host supervisor, and the return home plans, upon completion of studies.

**Round 3:** At this point of the selection process, an interview panel made up of the Schlumberger Foundation Board Members conduct telephone interviews with each of the applicants to gain more insight into each candidate. During the call, the interviewers gauge the communication skills of the candidates and are attentive to the level of energy and drive demonstrated by the candidate; they question the motivation of these women to undertake the arduous route of a PhD degree while ascertaining the potential these candidates have to meet the objectives of the Faculty for the Future program. They assess the leadership skills and the role model capacity of the future fellows to inspire other women to venture into the realm of STEM.

Finally, the interviewer determines the engagement of the future Fellows with the broader community and society in general, by questioning their involvement in extracurricular or innovative development activities in their home country or in their host country communities.

At the end of Round 3, there is a discussion and recommendation amongst the Board Members in order to take the final decision.
What are Faculty for the Future Alumnae doing now?
The following selection of Faculty for the Future Alumnae illustrate the
diverse range of remarkable women who have flourished in their field
of research and who are passionate about sharing their knowledge and
expertise in their home regions to improve, in a multitude of ways, living
conditions and education alike. These scientists who have chosen to
return to their homelands are the very essence of the Faculty for the
Future program and they continue to hone their leadership skills with
each small victory secured along the path to change.
Dawn Fox was born in Bartica, Guyana. Her decision to pursue a career in chemical sciences was supported by two strong female role models—her mother, who inspired her to be strong and independent, and a female chemistry teacher whose courses sharpened her analytical reasoning skills and whose encouragement instilled her with self-confidence. After completing her MSc in Chemical and Materials Engineering at the University of Auckland in New Zealand, she returned home to a teaching appointment in the Department of Chemistry at the University of Guyana. In 2008, Dawn was awarded a doctoral grant from the Faculty for the Future program for researching ways of safely removing arsenic from groundwater using cactus mucilage. This research was carried out at the University of South Florida (USF), United States, where she graduated in 2011. Since then, Dawn has rejoined her faculty in Guyana where she teaches senior level courses in analytical, inorganic and physical chemistry. Moreover, she is channeling the technical and transferable skills and expertise gained during her studies to bring about positive change and transformation at her home institution and further afield.

Dawn feels that that the most important beneficiaries of her skills learned abroad are her students. Apart from the technical content of the courses she teaches, she is an advocate and tutor for learning support services. She says the types of fundamental scientific literacy skills and advanced knowledge she is able to impart are filling a real need for her students and colleagues alike.

Dawn’s primary focus is on building interest and competence in sustainable engineered solutions for environmental problems. She supervises student projects on water remediation that deal with heavy metal pollutant removal and also sustainable wastewater treatment. She says “both problems are real needs in our society and I am excited that I can really lead efforts towards finding solutions that are accessible in our emerging economy.” To this end, she has been collaborating with a professor from her host university (USF) to spearhead an engineering/

Two national trusts are also capitalizing on her expertise in remediation and science education. She is presently working on a multidisciplinary team to formulate and implement a reclamation plan for forest areas that have been impacted by mining. This is an important challenge for developing countries trying to balance the need for economic growth with an equally important need to preserve irreplaceable biodiversity and non-renewable assets such as forests.

In August 2013, Dawn co-chaired her faculty’s First International Conference on Sustainable Development. She used this opportunity to broach the sensitive issue of gender disparity in STEM—a cause that she credits the Faculty for the Future program for awakening in her. In addition, she is collaborating with science educators both nationwide and regionally to plan and implement a science education policy that will be most advantageous to local needs.

Dawn’s own words best sum up her perspective on how she is contributing: “I believe that, even more important than the advanced technical skills, what I have really gained, and am privileged to share, is knowing that I can tangibly change a small part of the world for the better and I can show others how to do it as well. To me, this is true empowerment.”
Dr Maria FIGUEROA

Finding my feet in the world

Born and raised in Bogotá, Colombia, Maria Figueroa obtained her undergraduate degree in Biology from the University of the Andes in 2000. She obtained her MSc degree in Science Education from Columbia University, New York, United States, in 2004, as a Fulbright scholar. She then returned home and worked for six years with Pequeños Científicos, an inquiry-based science education program that she co-founded in Colombia that trains teachers in methodologies for teaching science in public schools.

Maria was awarded three grants from The Faculty for the Future program to carry out her PhD research in science education at Stanford University (2009–2011). Her research, with specific focus on measurement and assessment, has led her to develop the best methodologies of assessing science as well as assessing general competencies such as critical thinking and quantitative reasoning. Maria describes her experience at Stanford as truly life-changing. In addition to learning important technical skills required for rigorous academic research, she was able to interact daily with a vibrant educational community, developing her abilities to communicate and share expertise and knowledge.

Maria was involved in a project that has had a major national impact in Colombia. It included research on assessing general competencies at a national level, and was carried out in conjunction with the Colombian Assessment Institute. The result of this research has helped in setting-up the national exit exam for university students, who now answer open-ended questions as part of their exam. Another project, which studied predictors of university success using standardized testing and high school grades, has also had a major impact. As a result of this research, the University of the Andes shifted from only using standardized test results as their admission criteria to including high school grade point averages (GPAs) as part of the selection process.

Maria is currently an Advisor to the Colombian Assessment Institute on how best to modify national educational assessments in the country. Recently, Maria has taken up the position of Dean of Education at the Externado University of Colombia, where 11,000 students have enrolled. In addition to her administration role, she will continue teaching courses in assessment and science education and is involved in diverse projects that will have a great impact on education in Colombia. She is currently working with the Deans of different faculties at the Universidad Externado, establishing criteria for evaluating faculty members, defining what it actually means to be a good professor, and how teacher effectiveness is understood. Maria is also involved in the training of the different professors at the University. Through her great love of teaching and knowledge sharing, Maria has become a leader in training, quite literally, the “Faculty for the Future”!
Dr Edu INAM

Passing on my knowledge

Edu Inam graduated with a PhD in Chemistry from Loughborough University, United Kingdom, in 2005. She then went to the United Nations University, Tokyo, Japan to study International Cooperation and Development, and Environmental Change. In 2007, Edu obtained a Korean government postdoctoral fellowship to continue her research on Environmental Monitoring and Risk Assessment at the International Environmental Research Center, Gwangju Institute of Science and Technology (GIST), South Korea. While in South Korea she obtained a Faculty for the Future Fellowship, which enabled her to continue her research for an additional two years.

From there, Edu has gone from strength to strength. She is currently a senior lecturer in Chemistry, and the founder of a new research center called the International Center for Energy and Environmental Sustainability Research (ICEESR), at the University of Uyo, Nigeria. She is also the current president of the Organization for Women in Science for the Developing World (OWSD), University of Uyo. With now over ten years’ experience in teaching and research, she has also worked as a consultant for the World Bank and the United Nations Development Program sponsored projects in Akwa Ibom State, Nigeria.

Edu has brought back to her home region her internationally acquired knowledge and leading edge research methods from world-class institutions. The development of simple technologies that improve the quality of life of rural communities, while in parallel ensuring environmental sustainability, remain Edu’s major research interest.

In 2013, Edu successfully brought to fruition a collaborative research and training program between her former host university (GIST) and the University of Uyo. Twenty-five scientists from Nigeria and neighboring countries of Ghana, Equatorial Guinea and Cameroun will be trained in water quality monitoring and sustainable water resources management in South Korea. In parallel, Edu’s research center (ICEESR) in partnership with GIST, will investigate the levels of emerging organic contaminants and the health risk they pose to human and aquatic biota with a view towards formulating technical guidelines that will safeguard the public and aquatic health, as well as protecting water resources in the Niger Delta region of Nigeria. This collaboration is expected to run for up to three years, and its main goal is to build indigenous capacity as well as technological knowledge transfer in Nigeria.

Edu’s devoted attention to improving the lives of those around her through her science education has captured the imagination of numerous other women. Through her pioneering efforts at constantly pursuing the goal of elevating women to higher rungs on the educational ladder, Edu initiated and hosted a “Women in Science and Technology International Conference” in June 2013 at Oyo University, which was attended by 250 female participants from both within and outside Nigeria. The major outcome of this event was the unanimous adoption that the conference is to become a biannual “Women in Science and Technology” event in Nigeria. The 2015 conference will be held at Federal University of Technology Akure.

Through her guided steering and inspiring examples, Edu has incited other women to take up scientific disciplines and accompany her on her long path towards changing the mindset and accelerating the empowerment of women in the world of science and technology. This way, she knows that her home region will be better equipped to meet not just the current challenges, but also to help materialize the vision of the Millennium Development Goals.
Dr. Radhika MADHAVAN

Making a difference

Radhika Madhavan was born in New Delhi, India. She gained an undergraduate degree in Electronics Engineering from The Maharaja Sayajirao University of Baroda, securing two gold medals for academic excellence. She followed up with a Master in Technology degree in Biomedical Engineering from the Indian Institute of Technology in Mumbai, where she worked on a project funded by the Government of India to design an artificial hand for below-elbow amputees. In 2007 she obtained her PhD in bioengineering at the Georgia Institute of Technology, United States, with financial support from the Faculty for the Future program during her final year.

Radhika then returned to Bangalore for three years to carry out post-doctoral research at the National Center for Biological Sciences, Tata Institute of Fundamental Research, where she explored the relationship between structure and function in the brain to develop techniques to measure large-scale individual synaptic weights in hippocampal circuits using electrophysiology and optical imaging techniques.

Limited by the research techniques available to her in India, in 2010, Radhika accepted a post-doctoral position at Boston Children’s Hospital, Harvard Medical School, United States. It is here where she was finally able to apply the fruits of her research techniques to the human body following standard surgical procedures and work closely with the some of the world’s top neuroscientists and neurosurgeons. The heart of her research today continues to focus on the electrical activity in the brain in order to develop devices to cure neurological disorders, bridging skillfully the gap between engineering and biology.

Today, Radhika has come to realize that, with the vast amount of experience and know-how she has gained from state-of-the-art techniques, she is now probably the only person in India who can apply this type of highly specialized research associated with standard surgical procedures. With this unique advantage and skill set, Radhika is now applying for a home return grant from the Indian Government to help her carve out a clear future for herself as one of the country’s leading neuroscientists. She is confident that she will make a marked and unequivocal difference to neurological scientific research in her home country.

Radhika is tireless in her efforts to spread her knowledge back in her home country, giving annual talks in major cities and research institutes on her findings. She continues to regularly publish important articles and conference papers.
Dr Esther NGUMBI
Creating sustainable communities

Esther Ngumbi was born and raised in Kwale, Coast Province, Kenya. In 2002, she completed her MSc degree in Biochemistry and Zoology at Kenyatta University. In 2008, she began studying for her PhD in entomology at Auburn University, United States, and was funded for her final year there by the Faculty for the Future program. Esther’s research involved insect pests affecting crops, one of the most serious constraints on food security worldwide. Women, who contribute most to food production while making up about 67% of the labor force in developing countries, including Kenya, are especially vulnerable to the risks associated with pesticide use. Results from her research have helped advance the understanding of insect sensory systems; provide new insights in olfaction in parasitoids; and open avenues for improved insect pest management. Additionally, her pioneering research on plant growth promoting rhizobacteria led to a US patent in 2013.

Following her doctoral studies, Esther pursued two postdoctoral research positions. The first was at the Georgia Institute of Technology, United States, the first year of which was funded by the Faculty for the Future program, where she investigated induced defenses in fresh water plants. The second was at Auburn University, United States, where she is currently a Research Fellow.

In early 2011, Esther worked in partnership with Auburn’s Women in Science and Engineering Institute to initiate a mentoring program for girls back in Kenya. Additionally, she is working toward the establishment of a science and leadership center in Kenya to facilitate sustainable growth of the African continent through science and technology. Esther is excited about a future of working with young talented African girls to prepare and mentor them for future careers in science, engineering and leadership. Esther plans to be a researcher at the International Center of Insect Physiology and Ecology in the near future. Meanwhile, she teaches at Egerton University in Kenya for three months every year.

Active in a number of professional associations, Esther is an advocate for ending world hunger. She speaks on this topic at conferences and interacts with policy makers from organizations such as the World Bank, USAID and the United Nations. Esther is also bringing about sustainable social change in her native community through the many initiatives she has started. These include active involvement in the building of the Faulu Academy, an elementary school for children; projects for greenhouses in an effort to develop sustainable farming; clean drinking water projects; and a computer literacy program for local students.

Esther serves as a board member in several organizations that are working in Africa, including Mpule Institute Youth ARISE initiative; Just Save One Inc.; and Pamoja Kenya Mentorship Alliance, an alliance of Kenyans and global elites extending networking and mentorship services to young school children located in underprivileged remote areas of Kenya.

The energy that Esther pumps into all her activities is quite simply boundless. Esther describes herself as an activist, a “hard-core” scientist, and one who wants to use her intellect to create sustainable communities with clean water, good schools, greenhouses, daycare centers and all of the privileges that come with living in a developed country. Esther’s energy has also been rippling through various circles in her host country—the United States. As a result she was invited to join the judging panel for the 2014 Agricultural Innovation Prize, the first and biggest competition of its kind to be organized in the US. Esther fully intends to continue making the waves that result in making things happen in those places where they are most needed.
Sujata Ray was born and raised in Kolkata, India. She completed her PhD in the Department of Civil Engineering at Princeton University, United States. In 2007 Sujata was awarded a post-doctorate grant from the Faculty for the Future program to conduct research at the University of Cambridge, United Kingdom. During this period she optimized a low-cost anaerobic biogas digester for rural energy sufficiency and subsequently went on to apply the fruits of her research in a dairy farm village in the Tulungagung Regency, East Java Province. Her conviction on the pertinence of her research for villages such as this led to another award for a two-year implementation grant from a car manufacturing company in Japan. As a result of this project, the villagers from Samar Village have not only stopped discarding waste from farming into the local rivers, but have understood that they can turn farm waste into fuel for household energy through the use of Sujata’s anaerobic biogas digester. They have also succeeded in building a small fertilizer factory and, little by little, through the continual support of Sujata, this community is tangibly going from strength to strength.

Sujata’s keen interest and appetite for reaching out to the world around her does not stop there. Her most recent concern, which happens also to be a new, fast-growing, voluntary research topic for her, focuses on the challenges of the work-life balance faced by women in general and female scientists in particular. Currently, Sujata is applying for grants to help fund this social outreach program, which she is determined to develop further so that women can be assured that a career in the sciences can be successfully combined with a motherhood that is also fulfilling and gratifying.

Wiratni, a chemical engineer, has shown unstinting dedication when it comes to the transfer of knowledge in her homeland, Indonesia. After three years back in her Alma Mater—the Gadjah Mada University in Yogyakarta—Wiratni has recently been appointed Deputy Head of the Chemical Engineering Department, a prestigious salute to her academic prowess and her influential clout.

Wiratni completed her post-doctoral research funded through the Faculty for the Future program at Cornell University, United States, in 2008. During this period she optimized a low-cost anaerobic biogas digester for rural energy sufficiency, and subsequently went on to apply the fruits of her research in a dairy farm village in the Tulungagung Regency, East Java Province. Her conviction on the pertinence of her research for villages such as this led to another award for a two-year implementation grant from a car manufacturing company in Japan. As a result of this project, the villagers from Samar Village have not only stopped discarding waste from farming into the local rivers, but have understood that they can turn farm waste into fuel for household energy through the use of Wiratni’s anaerobic biogas digester. They have also succeeded in building a small fertilizer factory and, little by little, through the continual support of Wiratni, this community is tangibly going from strength to strength.

Wiratni indeed breathes the essence of the Faculty for the Future program through her strong belief that one has to help people to help themselves—especially in rural communities, where 60% of the Indonesian population lives. “It is rewarding to witness the increased quality of life that these communities enjoy” says Wiratni. She is planning to replicate this biogas installation in many other remote places in her home region.
The vast geographical expanse of Mongolia, combined with a rapidly growing population thirsting for the benefits of a university education, makes the development of suitable e-Learning systems particularly urgent in this part of the globe. Uranchimeg Tudevdagva, born and raised in a traditional Mongolian yurt in Ulaanbaatar, has never wavered from her resolute path to contribute to the development of virtual laboratories in which teaching can be carried out with the aid of man-machine systems. More specifically, Uranchimeg has been involved with a computer-supported consulting and training center for young lecturers in the engineering sciences.

Conscious of the strong link between high quality online education and the challenge of encouraging the youth of Mongolia to stay in the countryside, Uranchimeg was awarded a post-doctoral research fellowship at the Chemnitz University, Germany, from the Faculty for the Future program in 2011 and 2012. Over these two years she carried out in-depth development of evaluation models and quality management of e-Learning programs. The model she developed—the SURE StrUcture oRiented Evaluation model—has been recognized internationally and can be applied not only to the evaluation of e-learning but also to the evaluation of further complex systems and processes such as the robustness of technical systems, efficiency of administration processes, and assessment processes. The results of her research have already been successfully implemented on the online Masters courses run by her home university, the Mongolian University of Science and Technology in Ulaanbaatar.

Uranchimeg is now back there where she has resumed her former position as Associate Professor in the Power Engineering School. She is currently Director of the Quality Assurance Center of Teaching at the Mongolian University of Science and Technology, and she is the first woman scientist of her home university to obtain a Doctor of Science.
degree (Habilitation degree) from a German university. Uranchimeg is also a member of the international Institute of Electrical and Electronics Engineers (IEEE) and the ‘Young Scientists’ Association for Technology and Innovation.

In recognition of her outstanding achievements, Uranchimeg was awarded Top Woman Scientist of the Year 2013 from the Mongolian Women in Science Association. Her long-term ambition is to establish an evaluation center for e-learning in her home university and support activities in e-Learning in Mongolia. She also plans to continue to develop virtual laboratories for use in teaching and in advanced training for engineers working in remote locations.