



MARÍA EUGENIA CABRERA CATALÁN

Latin America & the Caribbean

Physics

Junior Professor,
School of Physical Sciences and Mathematics
University of San Carlos of Guatemala

Guatemala City, Guatemala

Dr. Cabrera Catalán is a physicist studying dark matter, the most abundant component of matter in our universe known only by its gravitational interactions and important to developing a more fundamental theory of nature. She studies the interaction between newly discovered particles such as the Higgs boson; understanding these dynamics can help scientists to understand the interactions that could be expected between weakly coupled dark matter particles in particle collider experiments, or seen by underground detectors that attempt to measure how dark matter interacts with the Earth.

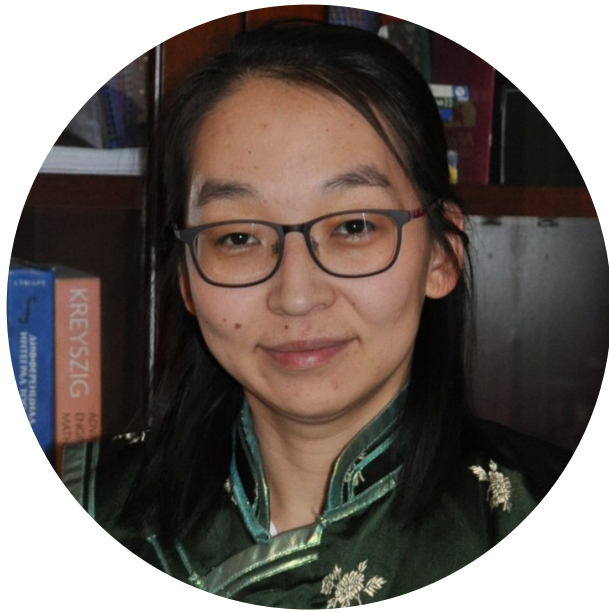
Dr. Cabrera Catalán first became interested in physics in secondary school, thanks to a special physics teacher. She enrolled for a degree in the subject at the University of San Carlos of Guatemala (USAC), followed by a postgraduate diploma programme at the Abdus Salam International Centre for Theoretical Physics in Italy. There she became fascinated by high energy physics and made this the focus of her PhD research at the Institute for Theoretical Physics in Madrid, Spain. When she graduated in 2011, Cum Laude and with the distinction of Doctor Europaeus, she became the first woman with a physics degree from a public Guatemalan university to earn a PhD in the subject.

Following a postdoctoral position at the University of Amsterdam, during a second postdoc at the University of Sao Paulo in 2016, Dr. Cabrera Catalán learned that her alma mater USAC was opening permanent research positions in Physics and Mathematics for the first time, with 75% of time dedicated to research. Six months later she accepted one of these positions, making her the first (and until recently only) woman in her institute with a PhD. Now she is working to put her country and region on the world physics map, having helped to organize the first Central American Meeting of High Energy Physics, Cosmology and High Energy Astrophysics in 2020, and dedicating some of her time to supervising and tutoring undergraduate students in particle physics.

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Receiving this award reinforces my commitment to create and support initiatives to strength research programs in Guatemala. It empowers me to keep working to show Guatemalans the importance of being part of a worldwide effort to produce and spread scientific knowledge and build better societies.

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KHONGORZUL DORJGOTOV

Asia & the Pacific

Mathematics

Senior Lecturer,
Department of Applied Mathematics
National University of Mongolia

Ulaan Baatar, Mongolia

Dr. Dorjgotov is a mathematician whose research focuses on fractional differential equations (FDEs), an emerging field in applied and theoretical mathematics with many applications in a variety of fields in science and engineering. FDEs have been recognized as an excellent tool for describing complex systems and processes in many applied sciences including physics, chemistry, biology and economics. The study of these types of equations is becoming increasingly popular as they can more accurately model a given physical system or process than conventional differential equations.

Dr. Dorjgotov began studying applied mathematics as an undergraduate student at the National University of Mongolia (NUM), where she won an award for best research in a student competition. She continued on to do her Master's degree in the same subject, before winning a MEXT Japanese government scholarship for doctoral study at Kyushu University in Japan. It was there that she first started her research on FDEs, focusing on Lie theory and symmetry approach. She outcompeted many international students during the final year of her PhD to win Best Poster at the 2017 Forum Math-for-Industry. After completing her PhD, she returned to Mongolia, becoming one of few women with a mathematics PhD in the country. She began working as a lecturer at NUM in 2018.

Now, Dr. Dorjgotov is working to establish the study of fractional calculus in Mongolia. In addition to working as a senior lecturer and supervising graduate students, she also strives to increase collaboration between the industrial and academic sectors. To this end she recently organized, with fellow researchers, the first Mongolian "Study Group" workshops, an internationally recognized method of technology and knowledge transfer between academic mathematicians and industrial sectors. Dr. Dorjgotov hopes that not only the industrial representatives but also decision makers will be able to apply the results of mathematical research to do their jobs more effectively.

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Receiving this award gives me much-needed recognition and acknowledgement of my work. It is a great encouragement and leverage to expand my research and to inspire fellow researchers and students in Mongolia.

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GHADA DUSHAQ

Arab region

Physics

Postdoctoral researcher,
Photonics Research Lab
New York University Abu Dhabi
Abu Dhabi, United Arab Emirates

Dr. Dushaq's work in applied physics investigates new and innovative materials, structures, and process technologies in order to improve the performance of high-speed optoelectronics, nano-electronics, and photonics devices. Her research on the use of silicon, germanium, III-V compound semiconductors, and other materials can improve the efficiency and address limitations of currently available technologies.

Dr. Dushaq received her Bachelor's degree in Physics and Mathematics from BirZeit University, Palestine in 2009 with distinction. She went on to graduate with an MSc in Physics from the University of Jordan in 2012 funded by the German Academic Exchange Service (DAAD), followed by a PhD in Microsystems Engineering from Masdar Institute of Science and Technology (Khalifa University) in Abu Dhabi, under a cooperative programme with the Massachusetts Institute of Technology. She graduated with her doctorate in 2017.

Dr. Dushaq has received several awards for her research, including the International Association of Advanced Materials (IAAM) Scientist Medal for 2018, the Post-Doctoral Conference and Travel Award from New York University Abu Dhabi in 2018, and the Falling Walls Lab prize in 2020, for her work on "Breaking the Wall of High-Speed Optical Communication", awarded at the World Science Summit in Berlin, 2020. She has published over 35 papers in international peer-reviewed scientific journals and conference proceedings. She is also a reviewer for several scientific journals including *Optics Express*, *Advanced Optical Materials*, *Scientific Reports*, *Applied Optics*, *Optical Materials Express*, *Journal of Applied Physics*, *Photovoltaic Specialist Conferences (IEEE PVSC)*, and *Journal of Materials Science*. She is a member of the Optical Society (OSA), the Electrochemical Society (ECS), the American Physical Society (APS), and the Materials Research Society (MRS).

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I am extremely honored to be receiving this award. It is truly rewarding to feel that all the hard work, dedication and devotion to my research has really paid off. It also motivates me to continue striving for excellence in my academic and professional pursuits and to encourage young girls in advancement of their careers.

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IMALKA MUNAWEERA

Asia & the Pacific

Inorganic/materials chemistry

Senior Lecturer,
Department of Chemistry,
University of Sri Jayewardenepura
Nugegoda, Sri Lanka

Dr. Munaweer's work is focused on the development of nanoparticles and nanofibre composites that can be applied in a range of different functions, from drug delivery in the pharmaceutical industry, to water filtration, to slow-release fertilizer systems in agriculture. She has made particular advances in using nanotechnology to produce environmentally-friendly and cost-effective crop fertilizers, and in developing chemoradiotherapeutic formulations and radiotherapeutic bandages for use in lung and skin cancer treatment.

Dr. Munaweer first became interested in functional and applied materials as an undergraduate at the University of Peradeniya, where she worked on applications of iron oxide nanoparticles. As a master's student at the University of Moratuwa, she gravitated towards nanofertilizer research, for which she received the National Science and Technology Award in 2010 and holds two U.S. patents. She continued on to do a PhD at the University of Texas at Dallas in the USA, where she developed an innovative approach that could ultimately enable clinicians to target and aggressively reduce tumor burden in cancer patients. She also holds two U.S.-granted patents for this technology.

Following three years as a postdoctoral researcher at the University of Texas Southwestern Medical School, Dr. Munaweer worked as an Assistant Professor at Texas Prairieview A&M University before returning to her home country, Sri Lanka, where she has worked since 2019. She is the recipient of a Sri Lankan NRC-PPP grant, in 2019, and a research grant from TWAS, the World Academy of Sciences, in 2020. Besides having won several awards and having published many papers in prestigious journals including *Nature Scientific Reports*, *Biomaterials*, and *ACS Applied Materials and Interfaces*, she also has more than ten years' experience mentoring high school, undergraduate and graduate students.

“ *This prestigious award motivates me to conduct impactful research that will bring enormous benefits and solutions to the burning issues in the world that we live in. It will also motivate all woman scientists who need support to engage in quality research, and the whole world will benefit as a result of their achievements.* ”



MARIAN ASANTEWAH NKANSAH

Africa

Environmental chemistry

Associate Professor,
Department of Chemistry,
Kwame Nkrumah Univ. of Science & Technology
Kumasi, Ghana

Dr. Nkansah's research is focused on identifying and characterizing the presence of both inorganic and organic contaminants in water, food, soil, the atmosphere and other environmental matrices, as well as on developing strategies for environmental remediation. By preparing and analyzing samples from different environments, she can determine the levels present and effects of contaminants such as heavy metals, persistent organic pollutants (POPs) and polycyclic aromatic hydrocarbons (PAHs), which are generated by urbanization, industrial activities, artisanal activities and mining. It is important to Dr. Nkansah to also make the public aware about the risks of heavy metals, which she has found in unexpected places such as spices, lipstick, edible clay, and classroom dust.

Growing up as one of six children during an economically difficult period for Ghana, Dr. Nkansah from an early age had a desire to give back to society. After completing her bachelor's and master's degrees in Chemistry at Kwame Nkrumah University of Science and Technology (KNUST), she travelled to the University of Bergen-Norway to pursue a PhD in Environmental Chemistry, which she received in 2012. She then returned to KNUST where she worked as Lecturer and then Senior Lecturer before being promoted to Associate Professor in 2019, making her the youngest woman at the university to hold this position.

Besides her research, which has resulted in 33 peer-reviewed articles and books, as well as teaching at the undergraduate and graduate levels, Dr. Nkansah has undertaken training in science diplomacy and is involved in advocacy and initiatives of the Ghana Academy of Arts and Sciences and of Women in STEM-Ghana. She mentors both school children and younger colleagues. Her many achievements have resulted in recognitions such as the TWAS F.M Al-Kharafi Prize in 2016, a feature in the first book on *Women in Science: Inspiring Stories from Africa*, and a slot on the commemorative Periodic Table of Younger Chemists, by the International Union of Pure and Applied Chemistry (IUPAC), in 2019.

“ *This award is a huge endorsement of my scientific and professional endeavors. It is definitely going to further increase my visibility and offer more opportunities for growth and impact of my causes, including research on environmental contamination, mentorship and outreach.* ”