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The Jacob Blaustein  
Institutes for  
Desert Research

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# From the Director

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Prof. Boris Zaltzman

Dear Reader,

In this brochure, we present to you eight of our students, sharing short stories of young researchers at the beginning of their scientific careers.

Since the establishment of the Albert Katz International School for Desert Studies more than 17 years ago, the Jacob Blaustein Institutes for Desert Research (BIDR) have been privileged to welcome young scholars from all around the world. The American Associates Student Village unites students from the West, the Middle East, Asia and Africa. Israeli students live together with those from Jordan and Palestine. Upon graduation, some of these students join the private sector, some remain in academia and some educate the next generation. However, in whichever area or country they end up, our graduates bring with them the unique atmosphere of peace, openness, cooperation and creativity that they enjoyed and learned to create at Sede Boqer. In my view, both the School and the Institutes, as a whole, are essential elements of the Ben-Gurion Memorial Site, working to implement David Ben-Gurion's vision of the Negev. Many of us have had the chance to witness the way in which Ben-Gurion University has changed

the face of Beer-Sheva, transforming it from a neglected city into a flourishing center, spearheading innovations in hi-tech, medicine and education. Now may be the time for the Sede Boqer Campus to do the same further south in the Negev. Our unique location gives us a great opportunity, both to excel in Desert Research and to implement our social and educational mission. It goes without saying that our students play a crucial role in the research, but they also help us develop solutions to the broader societal issues. We, the faculty and the students, are a team united by a common dream: to make the Negev bloom and, ideally, to make the world a better place too.

Hundreds of our graduates around the world serve as our ambassadors of peace. The diversity of personalities constituting our student team is illustrated in this brochure. What backgrounds do they come from? What do the Institutes give to them? How do they contribute to the Institutes? And finally, what do our ambassadors look like? I hope that through looking at our young ambassadors and learning their stories, you will feel the unique atmosphere prevailing at the Jacob Blaustein Institutes.

# Assylay Kurmanbayeva

Kazakhstan

The French Associates Institute  
for Agriculture and Biotechnology  
of Drylands



"...the more you know, the more you understand what you don't know. When I find new unexpected results, I have to go deeper."

Assylay Kurmanbayeva grew up in the Central Asian country of Kazakhstan, in the town of Khromtau, the site of a mine that produces a third of the world's supply of chromium. The daughter of a miner and a nurse, Assylay, upon receiving a government scholarship, moved to Astana, the capital of Kazakhstan, to attend university. After earning her master's degree in biotechnology, she worked for three and a half years at the National Center for Biotechnology in Astana. Realizing that since science is still a young field in Kazakhstan, she wanted to do her doctoral work elsewhere, she moved to the BIDR to work with Prof. Moshe Sagi and pursue her PhD in the French Associates Institute for Agriculture and Biotechnology of Drylands. Here she studies halophytes, plants that can grow under the saline conditions often found in arid regions. She specifically tests the effect of sulfur on two halophytes, *salicornia* and *sarcocornia*, which are eaten, primarily in Europe, in various preparations. Her aim is to increase the productivity and quality of these important foodstuffs. Assylay

has found the BIDR to be extremely productive ground, academically, and her studies here have pushed her to a higher scientific level. As she puts it, "before coming here, I thought I knew something about science but in fact, the more you know, the more you understand what you don't know. When I find new unexpected results, I have to go deeper." She also loves the freedom and autonomy here, coupled with the strong support of her supervisor, and she notes that at the BIDR, "you are judged only according to your knowledge," not by background or status symbols. Ultimately, she hopes to return to Kazakhstan and join the members of the growing young Kazakh scientific community who, as she says, "are trying to absorb all the good things from around the world in order to implement what we learn abroad at home." According to Assylay, the good things at the BIDR are myriad, including a low-stress, mind-freeing environment and the unwavering support of her supervisor.



# Vivian Mau

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## Brazil

Zuckerberg Institute  
for Water Research

Vivian Mau was born and raised in Brazil, before moving with her parents at the age of 15 to Montreal, Canada. There she did her undergraduate degree at McGill University in environmental engineering, spending one summer at the BIDR working with Prof. Amit Gross in the Zuckerberg Institute for Water Research (SIWR). In 2014, she made aliyah to Israel, and began her master's degree under the supervision of Prof. Gross in the ZIWR's Department of Environmental Hydrology and Microbiology. She has just begun the PhD program, extending her MSc research. Vivian studies the treatment of wet organic waste, specifically chicken manure. She examines a specific treatment technology called hydrothermal carbonization that uses heat and pressure to essentially transform the manure into coal. As she puts it, "what takes millions of years to happen in nature, we are doing in the lab in a few hours." This coal can then be used as an energy source, which was the focus of her master's work. For her PhD research, Vivian will also examine how this coal can be used as a soil amendment to improve soil characteristics and as an absorbent for

the gases produced in the carbonization process. In addition, the process has a liquid phase full of nutrients that can potentially be used as fertilizer for agricultural crops. Thus, Vivian's research examines ways that poultry manure, a potential pollutant of water bodies, can be transformed into a useful product. After completing her degree, she hopes to stay in Israel, ideally working in the field of environmental engineering, trying to put her research into practice. She believes that her education and experience here will serve her well since it has, as she notes, "given me a great deal of independence, making me able to work on my own as well as on a team." She also emphasizes the strong connections here between her fellow graduate students, as well as between students and their supervisors, describing conversations with faculty members about the philosophy of science and informal discussions with student colleagues reviewing key concepts in the field. Most importantly, Vivian is excited about and dedicated to her research, which she hopes can be a useful tool in the larger world.

"what takes millions of years to happen in nature, we are doing in the lab in a few hours."



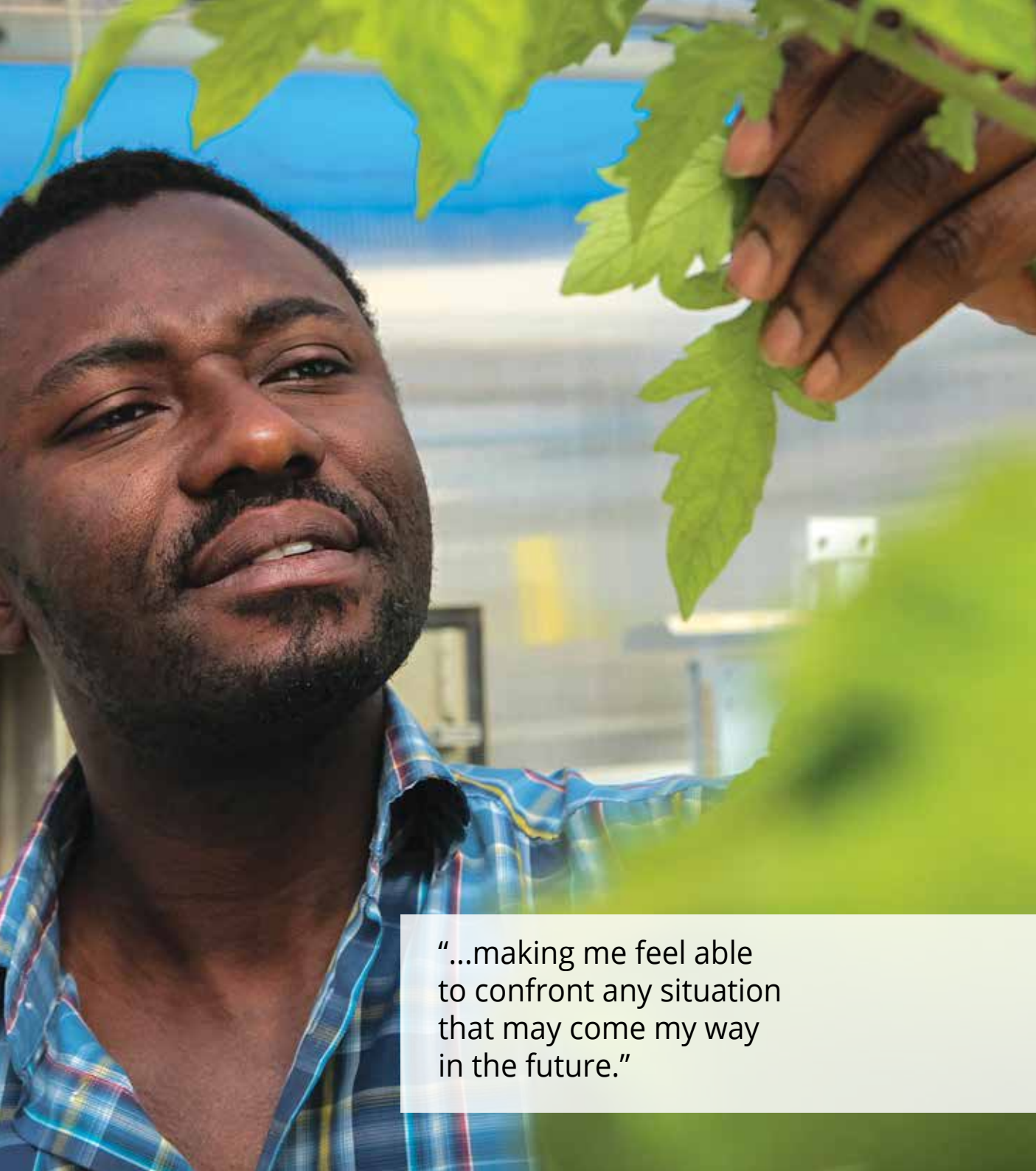


# Moses Kwame Aidoo

## Ghana

The French Associates Institute  
for Agriculture and Biotechnology  
of Drylands

Moses Aidoo grew up in Dunkwa-on-Offin, a small farming village in the Central Region of southern Ghana. From there, he moved to do his undergraduate studies at the University for Development Studies in northern Ghana. After completing his studies, he relocated first to Kumasi, a commercial city in the heart of Ghana, and then, after winning a scholarship, to the Faculty of Agriculture of the Hebrew University in Rehovot, Israel to pursue his master's degree. After performing laboratory work at the BIDR, he decided to continue his PhD here in the French Associates Institute for Agriculture and Biotechnology of Drylands, working with Profs. Aaron Fait, Shimon Rachmilevitch, and Naftali Lazarovitch. Moses studies the mechanisms that plants use to survive low temperature stress, especially at the root zone. Specifically, he examines the effects of cold temperatures on bell pepper roots to determine how certain plant genotypes develop a tolerance to this stress. Moses credits his supervisors with giving him the tools he needs to develop as a scientist. As he puts it, "they give me all the support I want anytime I ask" and this has in turn, "given me the opportunity to discover my scientific potential." He believes that the entire environment at the BIDR has allowed him to develop his own stress-tolerance mechanisms, noting that he has "learned to manage my own affairs and work, making me feel able to confront any situation that may come my way in the future." Moses hopes that after finishing his PhD, he will return to Ghana, ideally to secure a university position, as he says, "in order to impart there what I have learned here."



"...making me feel able  
to confront any situation  
that may come my way  
in the future."

# Snehil Srivastava

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## India

The French Associates Institute  
for Agriculture and Biotechnology  
of Drylands

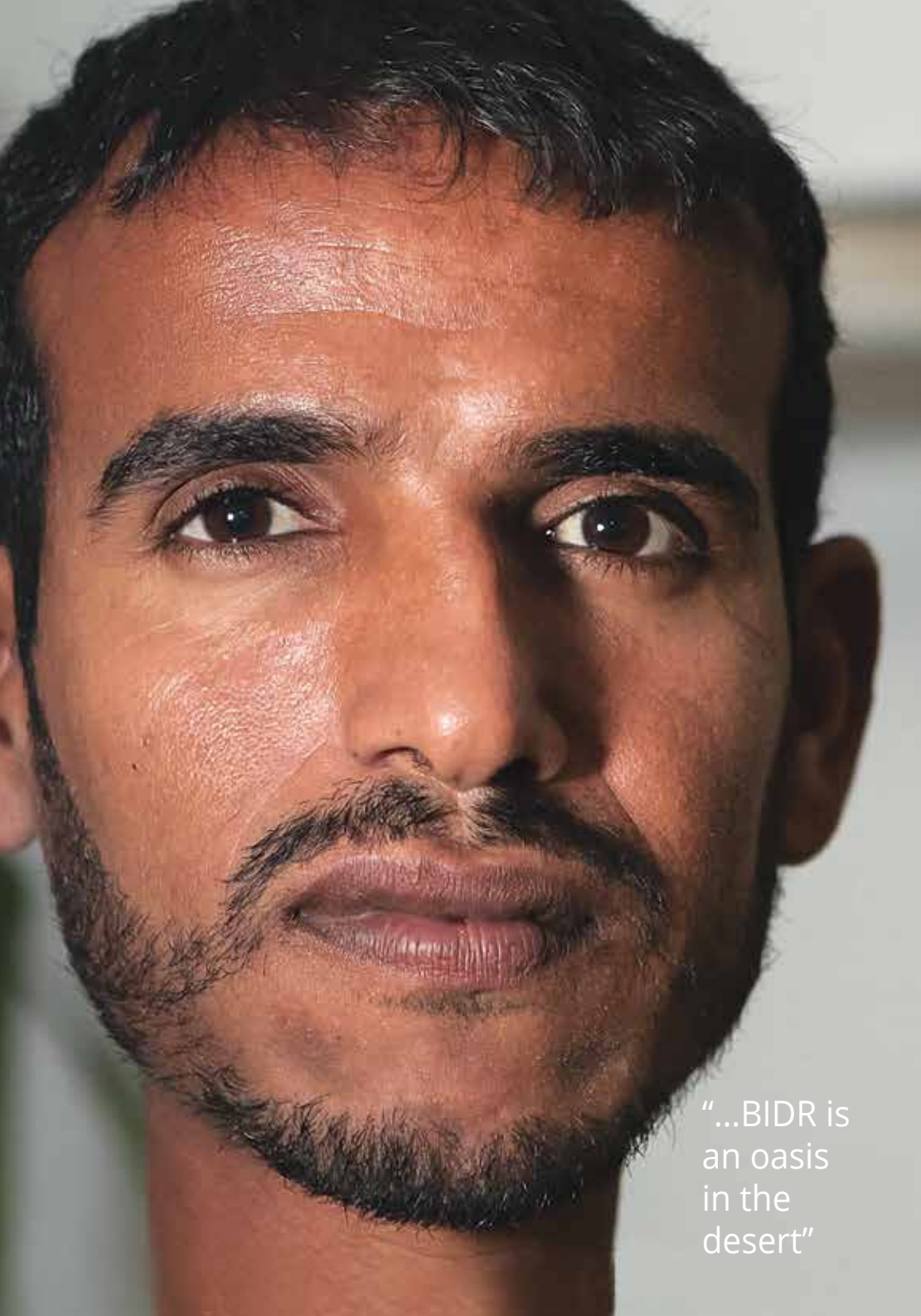
Snehil Sarkari grew up in Lucknow, the capital city of the state of Uttar Pradesh in northern India—a large urban center, hosting numerous government offices, with a population of more than two million. From there she moved to Bangalore University in southern India to complete her bachelor's and master's degrees in biotechnology. Her journey then brought her to Israel three years ago when her husband began a postdoctoral position at the BIDR in the French Associates Institute for Agriculture and Biotechnology of Drylands. Snehil took a hiatus from her academic work to look after their infant son. But after two years, Snehil and her husband decided that she should resume her career by entering the graduate program at the French Associates Institute for Agriculture and Biotechnology of Drylands to complete another master's degree. She gives much credit to her husband as both an inspiration, in his dedication to science, and as

an equal partner, who has given her the time, assistance, and support to be both a mother and a hard-working graduate student. Under the supervision of Dr. Noemi Tel-Zur, Snehil studies grafted plants, specifically citrus trees. She examines whether the grafted shoot affects the tree roots and vice versa to determine whether and how the shoot-root interactions affect the quality of the resulting citrus fruit, *Citrus reticulata*. She describes the BIDR as a "fantastic place" that is "accepting of all kinds of people from all over the world." Snehil hopes to continue with her PhD work in an as yet undetermined location, but she knows that wherever she and her family go next, she will take with her the experimental techniques she learned here, as well as the ability to adapt. As Snehil puts it, "now we can adjust to any place," proving that after her experience at the BIDR, she too can be successfully transplanted into new environments.

"...now we can adjust  
to any place"







“...BIDR is  
an oasis  
in the  
desert”

# Ramadan Abu Rjal

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Israel

The Swiss Institute for Dryland  
Environmental and Energy Research

Ramadan Abu Rjal was born in the unrecognized village of El Ser, moving with his family when he was eight years old to Shaqib al-Salam or Segev Shalom, one of seven Bedouin townships in the Negev Desert in southern Israel. Currently, he is a PhD student in the Alexandre Yersin Department of Solar Energy and Environmental Physics, Swiss Institute for Dryland Environmental and Energy Research, under the supervision of Profs. Isaak Rubinstein, Boris Zaltzman and Leonid Prigozhin. Ramadan studies the electrodiffusion of ions in an aqueous medium. Within this broader topic, he focuses on a phenomenon known as concentration polarization, which occurs when a DC electric current passes through a permselective interface. Although this may sound esoteric to the non-expert, this phenomenon plays a major role in water desalination, through the membrane technique called electrodialysis, and also is important in

various processes that have a wide range of applications including energy conservation in fuel cells, semiconductor device technology, and DNA analysis. Ramadan considers the BIDR to be an “oasis in the desert” and believes that pursuing his graduate studies here is, as he puts it, “one of the best decisions I have ever made.” He cites the unfailing and kind support and guidance, in matters practical, intellectual and emotional, proffered by his supervisors as key to his successful academic pursuits. Ramadan also looks to his mother as an inspiration in her strength and perseverance in the face of obstacles. As he states, “she never gives up...whatever I have become today is only because of her.” This deep well of both personal and professional support will surely provide sustenance for Ramadan in all his future endeavors.



# Tanya Saroglou

Greece

The Swiss Institute for Dryland  
Environmental and Energy Research

Tanya Saroglou grew up in Thessaloniki, the second largest city in Greece. During and after the completion of her undergraduate and graduate work in the United Kingdom at Kingston University, University College London, and the University of Edinburgh, she found herself repeatedly crossing paths, even via her landlady in Greece, with Prof. Isaac Meir, a compatriot and researcher in desert architecture in the Bona Terra Department of Man in the Desert, located within the Swiss Institute for Dryland Environmental and Energy Research (SIDEER). Since she had studied architecture and was deeply involved in sustainable development work, this connection and resulting communications seemed increasingly propitious, especially given Greece's growing economic instability. Ultimately, she came here to pursue her PhD, focusing on the sustainability of high-rise buildings, specifically examining ways in which to reduce their energy consumption through design, rather than the use of technologies. This design strategy considers the relation of the building to the climate in which it is located, a thinking that, as Tanya notes, hasn't historically been very apparent in the planning of high-rise structures. Tanya acknowledges that while it might seem "a bit of a contradiction to be studying high-rise buildings in Sede Boqer," she emphasizes not just the relative proximity to Tel Aviv but also the strong academic community at the BIDR. She served on the organizing committee of the annual SIDEER Graduate Student Symposium, which was a great success and for Tanya, a "very important experience." By making buildings more climatically responsive, she hopes to work toward "creating a different and better feeling environment for the people who live and work in high-rises," perhaps bringing a sense of the environment here to improving life in the cities.



"...creating a different and better feeling environment for the people who live and work in high-rises"



# Irene Steves

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USA

The Swiss Institute for Dryland  
Environmental and Energy Research

“...to interact with people from a lot of different countries is very important... on a social level but also for future collaborations.”



The remote desert setting of Sede Boqer is a long way from the crowded hustle and bustle of Silicon Valley, but Irene Steves sees certain connections between her home in the California Bay Area and the BIDR. Here in the first year of her MSc program in Desert Ecology in the Swiss Institute for Dryland Environmental and Energy Research, Irene notes that both places share a vibrant international community, environmentally conscious thinking, and a spirit of innovation and creativity. After completing her undergraduate degree at the University of California, Berkeley, Irene held an internship position with a woman who had done graduate and postdoctoral work at the BIDR. Inspired, Irene came here to work with Prof. Berry Pinshow, studying arthropod burrows, primarily the burrows of spiders and scorpions, to discover how the burrow design features assist the animals in interacting with

their desert environment. She is also interested in conservation causes and the way that, as she puts it, “the research tools, techniques, methods and thinking that I am learning here can help in conservation work.” Her focus on making connections, through interdisciplinary work and bringing together science and policy, has been sharpened by the campus community at the BIDR. She points to the variety of student-run projects, including a volunteer food cooperative, jointly operated with community members, that offers local organic dry goods once a month. She notes the significance of this collaborative international community when she says, “having the opportunity to interact with people from a lot of different countries is very important...on a social level but also for future collaborations.” For Irene, the BIDR academic community will serve as an inspiration, whatever her future path may be.

# Diana Ferrando

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Peru

Zuckerberg Institute  
for Water Research

Diana Ferrando grew up in the town of Piura in northern Peru, whose arid climate closely resembles that of Israel's Negev Desert. Near the conclusion of her undergraduate studies in civil engineering at the University of Piura, Diana worked on a project developing a recirculating vertical flow wetland to treat domestic wastewater for use in irrigating trees at her university, carried out in partnership with Israeli academics, including Prof. Amit Gross from the Zuckerberg Institute for Water Research (ZIWR). As a result of the project, Diana was offered a scholarship to pursue her master's degree at the BIDR under the supervision of Prof. Gross. She then continued in the PhD program in the ZIWR's Department of Desalination and Water Treatment under the supervision of Prof. Moshe Herzberg and will submit her dissertation in the near future. In her research, Diana focused on biofouling, the build-up of sticky substances, called biofilm, on membranes during the desalination process known as reverse osmosis. Specifically, she studied extracellular polymeric substances, which constitute the main component of the

biofilm layer, and the influence of specific changes on these substances' properties in order to reduce biofouling, thus helping to decrease the operational and maintenance costs of water desalination systems. Diana speaks very highly of the warm and supportive academic community here in Sede Boqer, describing it as "a big family" in which she felt "protected and cared about." After completing her degree, Diana hopes to enter industry to apply what she has learned. Ideally, she hopes to, as she puts it, "bring what I have learned here in Israel, the technologies and the knowledge, to my country of Peru." Just as importantly, she hopes to encourage the Peruvian government and people to begin prioritizing water treatment and environmental thinking to plan ahead for future water scarcity since her country does not have the economic resources to just "fix the problem" after it emerges. In all her undertakings, Diana is inspired by her nearly two-year-old son. As she states, "he always keeps me thinking that I can do something to improve his world."



"...I can do something to improve his world."



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## The Jacob Blaustein Institutes for Desert Research

Ben-Gurion University of the Negev  
Sede Boqer Campus