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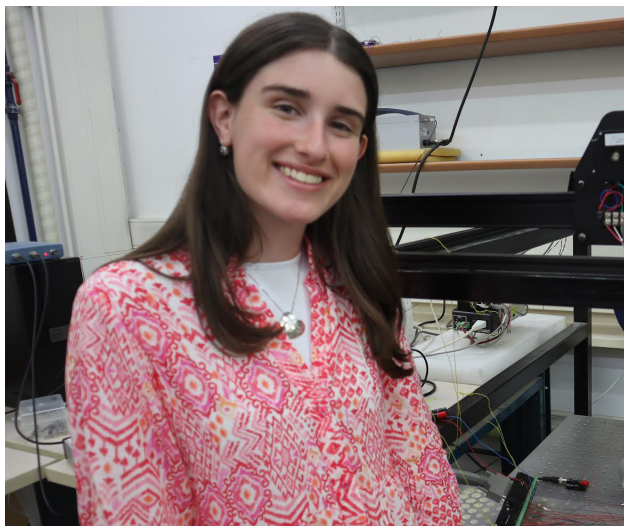
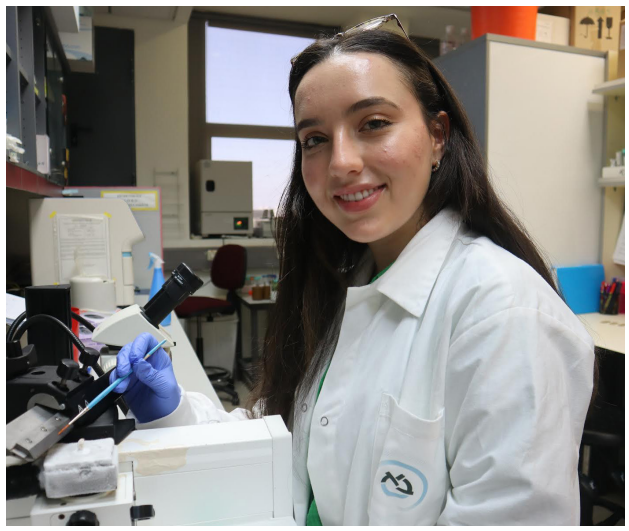
Florida undergrads advance STEM research at Israel's Bar-Ilan University

By Linda Chase
Contributing Editor





Sophia Purow, left, and Esther Nahon are participants in the Summer Science Research Internship Program.
PHOTOS BY MARYAM YOUNESS

Two South Florida students are among 29 college undergraduates participating in the 14th annual Summer Science Research Internship Program. A joint Bar-Ilan University (BIU)-Yeshiva University (YU) initiative, the program enables students to gain hands-on experience in emerging scientific fields while being mentored by Israel's finest scientists.

This year's cohort is comprised of students from Yeshiva College, Stern College for Women, Columbia University, Cornell University, Rutgers University, The Cooper Union, Queens College, Brooklyn College, Touro College, Lander College, and the State University of New York at Binghamton. Among them are Esther Nahon from Bay Harbor Islands and Sophia Purow from Fort Lauderdale. Both are students at Stern College.

During the seven-week research experience, the students conduct intensive internships in STEM research with faculty members from BIU's Institute for Nanotechnology and Advanced Materials, Gonda (Goldschmied) Multidisciplinary Brain Research Center, Alexander Kofkin Faculty of Engineering, Mina and Everard Goodman Faculty of Life Sciences, Faculty of Education and the Departments of Mathematics, Chemistry, Physics and Psychology. The program also includes one-day enrichment trips to sites around the country. This year's itinerary has included visits to the Teperberg Winery, Israel Aerospace Industries, the National Library and the Volcani Institute for Agricultural Research. This year has also included a visit to the sites of the October 7 massacre: Re'im, where the Nova Festival took place in Tkuma, which features an exhibition of destroyed cars, the city of Sderot and more. One farmer the group met explained how the terrorists breached the border and stormed into Israel that day. The program also includes lectures by BIU scholars on a wide range of topics, as well as night activities, Torah learning and Shabbatonim at YU's Gruss Institute in Jerusalem, where the group is housed.

Nahon is thrilled with the program. "I couldn't picture it being any better," she enthuses. "I'm with an amazing group of students who are open minded and excited to learn from a research and religious perspective. During the day there is exciting simulation in the lab and at night we're all together enjoying life in Israel — it's the best of both worlds."

The 21-year-old is working for Prof. Eitan Okun, head of the Paul Feder Laboratory for Alzheimer's Disease Research at BIU's Gonda (Goldschmied) Multidisciplinary Brain Research Center. Okun's lab studies the role of specific immune cells in the brain of those suffering from Alzheimer's disease (AD). They are focusing on understanding the nature of amyloid-beta (Aβ), a protein that accumulates in the neural tissue of those with AD and acts as one of the pathology's leading biomarkers. The researchers are analyzing immune cells in animal models to propose different methods and vaccines to best target, and hopefully reduce, the harmful buildup of Aβ via modulating the body's own immune system.

Nahon is particularly grateful for the opportunity to learn more about Alzheimer's, as her grandfather suffered from the disease. "Unfortunately, we don't know the cause or how to treat it and I felt a sort of obligation to seize the opportunity to help find a cure for this disease that affects so many people."

Nahon has been particularly surprised at how much she's grasped after just a few weeks. At first she thought the lab experience would be very intense and daunting, but with time she's become more comfortable with the people in the lab, the machinery, and the lab protocols.

"Everyone in the lab is kind and willing to teach," she says, adding that her experience will greatly contribute to understanding the material in her future lab classes. Nahon will soon enter her senior

Turn to Undergrads, Page 14

Dutch Holocaust survivor Shelley Lazarus shares story of survival

By Linda Chase
Contributing Editor

Amsterdam, the capital of the Netherlands, had a Jewish population of more than 75,000 in 1940. In all, at least 80 percent of the prewar Dutch Jewish community perished during the Holocaust. When I visited Shelley Lazarus in her home, she shared her story of survival.

"I was born May 17th, 1939 in Amsterdam. My father, Joseph Maykels, was an antique book dealer and my mother, Elizabeth Vanderhorst, was a designer of men's clothing patterns. The Germans invaded the Netherlands one week before my first birthday on May 10, 1940. My father feared he would be apprehended by the Nazis and hid in a nearby monastery. My mother, on the other hand, was a native of Paterson, New Jersey and assumed being American-born would keep her from harm. My father came out of hiding when he found out that my grandparents were being arrested and deported. My parents and I were soon apprehended as well."

Shelley recalled being deported

"My parents and I were first transferred to Westerbork. The camp was originally established in 1939 by the Dutch before the German invasion of the Netherlands. It began as a refugee camp for German Jewish refugees who had fled Nazi persecution. In 1942, German officials took over and transformed Westerbork into a transit

Holocaust survivor Shelley Lazarus.
PHOTO BY LINDA CHASE

camp for Dutch Jews. Westerbork became a site where Jews (including my family) were temporarily held before deportation to killing centers and other concentration camps. Only 5,000 Jews out of more than 100,000 who passed through Westerbork survived. From Westerbork we were deported to Bergen-Belsen Concentration Camp. My mother and I were imprisoned in the women's barracks where my mother worked in the kitchen. My father was confined to the men's quarters. At night my mother would look through the barbed wire fence to get a glimpse of my father. One night a man approached the fence and handed my mother a note containing the address of a family that was caring for his child. He feared that he wouldn't survive, and asked my mother to seek out the family if she survived. My father did not survive the war. My mother actually married the man who lived at that address following the war."

Shelley recalled the horrific conditions in the camp

"The camp was unable to accommodate the sudden influx of thousands of prisoners and all the basic services. The lack of food, water and sanitation led to an outbreak of typhus. My mother came down with typhus and was suffering from the disease when the Germans decided to move us out of the camp. The Germans intended to drown us in the Elbe (one of Central Europe's major rivers) and transferred us by train bound for the river. The train was intercepted by American and Canadian soldiers and my mother and I were saved. Out of 267 family members, only my mother, two cousins and I survived. Both of my cousins live in Israel."

Shelley reflected on life after liberation

"Following liberation, my mother and I traveled home to Amsterdam where my mother was placed in a hospital to treat her bout with typhus. When I went to visit my mother, she was delirious from her illness and did not recognize me. She kept telling the hospital staff that I died during the war. My mother eventually recovered and recognized me again. During the time that my mother was treated, I remember walking in an open field and seeing a plane flying closely overhead. To this day I still have a fear of loud airplane engines. I also have a fear of elevators and basements due to my enclosed confinement during the war. HIAS assisted us with a place to live since our former home was occupied. After living in Amsterdam for a while, my mother and I moved to Haarlem, a port city located outside of Amsterdam in the northwest Netherlands. We lived in Haarlem for two years and I enrolled in school for the first time in my life."

Shelley recalled moving to America

"My great aunt who lived in Paterson, New Jersey sponsored our move to the US. In Paterson, I completed my public education and became interested in art. As an artist my work includes watercolor paintings and sculpting. I met my first husband and we moved to Boston where we raised our two daughters. After my husband died I remarried and moved to Florida in 2003. My second husband died in 2013. 10 years ago I met my boyfriend, Irwin. I have four grandchildren and five great-grandchildren."

Shelley shared her words of wisdom

"Enjoy everyday to the fullest. I'm lucky to live in Florida where everything is green, colorful and clean."

Undergrads

from Page 1

year at Stern College, where she's majoring in biology on the neuroscience track. While she's not sure what her future holds, this summer has clarified that studying for a master's at Bar-Ilan and a possible career in research may be in the cards.

A passion for physics

Working in Prof. Patrick Sebbah's lab at BIU's Department of Physics has been a perfect fit for Purow. In fact, her voice resonates with excitement as she shares her enthusiasm for the field. "Majoring in physics is more of a passion and a hobby than a career," says the 21-year-old, who's doing a double major in physics and math at Stern College. "I'm very fascinated and intrigued by physics and it's something that I want to dedicate my life to. I just love the subject."

Her work this summer has focused on black holes. Gravitational waves are ripples in spacetime caused by cosmic events like merging black holes. When black holes collide, they create these waves, which can be detected on Earth. Surrounding a black hole is a region called the photon sphere, where gravity is so strong that photons (light particles) can be trapped and orbit the black hole. After a merger, the black hole rings like a bell in specific patterns known as quasinormal modes. These vibrations are influenced by the properties of the photon sphere and provide insights into the black hole's mass, spin and structure.

Prof. Sebbah's lab aims to observe these vibration modes through analogue experiments. By vibrating metallic curved shells, the researchers mimic the behavior of waves near a black hole and "listen" to the gravitational waves they emit. Purow's role in the research involved running simulations and conducting experiments to identify these modes and determine their locations. She discovered that the vibration modes are tightly confined in a circular pattern near the photon sphere. This research will enhance our understanding of wave behavior in curved space, particularly in environments resembling those around black holes.

Working alongside Sebbah and his graduate students, Purow says she's loved conducting experiments and working simulation and is pleased with the exposure she's gained working in a physics lab and learning about physics research.

"I've always considered going into a field of research so this program has helped me realize even more that this is what I want to do. It's one of the first times I've been exposed to this world and being in Israel and at an Israeli university gave me clarity that this is definitely something I'd like to pursue," she says.

About to enter her senior year, Purow hopes to make Aliyah right after college and begin grad school soon after.

"I've always had Aliyah as a goal in mind, and to be in Israel in general. The current situation enhanced my desire to get to Israel and be here as much as possible this summer. The program has been amazing and I'm with a great group of people. It's a great way to pursue academic interests, have a good time, live life and be in Israel."

Program director Prof. Arlene Gordon, from the BIU Department of Chemistry said, "Working with leading faculty members and graduate students specializing in a wide range of research from Alzheimer's disease and depression to aging and language acquisition and much more, this program offers students a unique opportunity to conduct research in BIU's state-of-the-art labs and to become acquainted with researchers from all the diverse sectors of Israeli society." Prof. Gordon pairs students with BIU faculty members and research assignments that would best enhance their summer experience and promote individual growth and career development.

The BIU-YU Summer Science Program falls under the aegis of Bar-Ilan University's International School. Applications for the 2025 program will soon be available. The program is generously funded by the late Dr. Mordecai Katz OBM and Dr. Monique Katz, the Irving I. Stone Foundation and the Zoltan Erenyi Fund.