

NJIT biologist uncovers a 99-million-year-old amber fossil

NJIT'S ACADEMIC RESPONSE TO THE PANDEMIC

FACILITIES PROJECTS BUILD AND BRIGHTEN CAMPUS AND COMMUNITY

HONORS COLLEGE CELEBRATES A MILESTONE

EXPLORATIONS OF NATURE

EXECUTIVE SUMMARY



EMBRACING CHANGE

appy New Year! The past several months certainly have been challenging, requiring us to assess, adapt and alter how we go about our daily lives. While the circumstances necessitating such change are difficult, embracing new ways to live and learn can render positive and productive results.

In this issue of *NJIT Magazine*, we take a look at the university's academic response to the COVID-19 pandemic. It began with a prompt change to fully virtual instruction to finish the spring 2020 semester, and has continued this academic year with a comprehensive implementation of converged learning. This mode of instruction, pioneered by NJIT in 2013, essentially breaks down the distinction between face-toface and remote learning, with students attending the same class at the same time either in person or virtually. More than 7,000 students registered for at least one or more converged courses in fall 2020, and were able to have the same educational experience as their classmates, regardless of their physical location.

We also welcomed change to our physical campus and the surrounding community. Throughout recent years, NJIT has completed more than \$400 million in capital projects that have renovated and preserved historic structures, such as the Central King Building, and constructed new facilities that serve both the university and the community, such as the Wellness and Events Center. The economic impact of these efforts, together with NJIT's growing research prowess and many other contributions to business and industry, has been substantial: more than \$853 million on the City of Newark and over \$2.8 billion on the State of New Jersey. Plans for further investment are underway and are highlighted in this issue.

Other stories of interest include the fascinating studies being conducted by NJIT faculty who explore the natural environment. From dinosaur-era ants to diminutive worms to singing whales, this extraordinary research has sent our investigators to distant corners of the world and spurred international collaborations. And we mark a milestone at Albert Dorman Honors College (ADHC), which recently celebrated a quarter of a century of providing students who demonstrate excellence and engagement in their academic activities with a rich, individualized educational experience. As the first dean of ADHC, I am particularly pleased by all the college has accomplished.

We welcome your feedback, as always, and hope you enjoy this issue of NJIT Magazine!

A 10/00m

NJIT MAGAZINE Winter 2021

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The university has drawn upon its technological resources and knowhow to provide a comprehensive converged-learning experience for its students.

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NJIT has completed over \$400 million in capital projects that have both improved the university's physical campus and benefited the local community.

Albert Dorman Honors College Celebrates a Milestone **20**

The college marked its 25th anniversary with a virtual tour, videos and reflection.

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ABSTRACTS

TIME CAPSULE WILL INFORM FUTURE HIGHLANDERS

Newark College of Engineering (NCE) will install a time capsule on the NJIT campus to commemorate the NCE Centennial. The capsule will be interred in March 2021 and opened at the college's Bicentennial in 2119.

"A time capsule is a sealed historic cache of goods and information, intended to communicate with future people, and serve as a resource for future archaeologists, anthropologists and historians," explained Jaskirat Sodhi, senior university lecturer, mechanical and industrial engineering, who spearheaded the project with NCE Dean Moshe Kam, Director of Experiential Learning Dan Brateris and Coordinator for Infrastructure and Outreach Carolina Yanez. "The capsule is interred for a long period, between 50 and 150 years, and is to be retrieved and opened at the end of that period by members of a future generation. It includes personal notes, pictures, artifacts

and letters representing daily lives and routines during the era when the capsule was first sealed."

The team collected NCE artifacts from 1919 to the present, and conducted a collegewide survey to gain fresh ideas about the content of the capsule. The proposed items include old and new images of NCE and NJIT, papers, newsletters, books and patents authored by faculty and students, lab prototypes, NCE yearbooks and distinctive souvenirs. Several letters "to our future successors" were written especially for the capsule by students, faculty members and administrators.

Kam noted, "As we celebrated the NCE Centennial in 2019, we had many questions about the environment and atmosphere in the college in 1919. If we had access to a time capsule from 1919, perhaps we could get good answers to these questions. While we are not likely to be around



Senior University Lecturer Jaskirat Sodhi closes up the NCE time capsule, which contains, among many items, Centennial celebration souvenirs (inset) and is scheduled to be opened in 2119.

when the 2021 time capsule is retrieved and opened in 2119, we hope that it will be meaningful and interesting to our successors, by helping them find out what life at NCE was like in 2019, and in the very unusual year of the pandemic, 2020."



GSA Gift Assists NJIT Students in Need

ighlanders helping other Highlanders continues, with a \$50,000 commitment from NJIT's Graduate Student Association

(GSA) to the Highlander Student Emergency Fund (HSEF). Established some 10 years ago, the fund provides grants of up to \$500 for emergency expenses, ranging from housing to books to tuition and more.

"We had some extra funds in our reserve account and we've been looking for an appropriate way to spend that," said GSA President John Stefan, a physics doctoral student from North Brunswick. "We are trying to help our graduate students, but we also want to make sure that the needs of the NJIT community itself are being taken care of. We know that it's an especially difficult time for some people."

The HSEF has been particularly active during the pandemic, awarding grants totaling more than \$236,000 to over 500 students as of late November. Prior to the GSA gift, the fund received more than \$255,000 in gifts from alumni, faculty, staff, students and friends between April and Thanksgiving 2020. This amount includes a donation of \$50,000 from the NJIT Student Senate.

ABSTRACTS

Tuchman School of Management's New FinTech Major Answers Marketplace Demand



Associate Dean Zhipeng (Alan) Yan leads the FinTech program.

N JIT's Martin Tuchman School of Management (MTSM) is adding a B.S. in financial technology that's inspired by the pressing need of corporations on Wall Street and beyond to hire a new generation of workers who are skilled in the latest trends of applying computing to commerce.

FinTech, as the field is known, is a category of software and online services that helps people better use and understand finance. Crowdfunding, cryptocurrency, market analysis and mobile payments all fall under the FinTech umbrella. But it's hard to find experts.

Big companies "really do not need another finance person. They need a FinTech person," explained MTSM Dean Oya Tukel. "We have to adjust ourselves accordingly in the universities. It's all around us, but people don't realize it. Those are the jobs that are well paid and in demand."

In addition to traditional finance, the new major, which begins in fall 2021, will cover the theories and evolution of financial technology, so that students understand context rather than just facts. They'll also learn about analytics, data-driven financial modeling, financial data mining and machine learning, and innovations such as bitcoin, cloud computing, crowdfunding, the Internet-ofthings and peer-to-peer lending. The major requires 120 credits and includes courses that are redesigned or new, including Artificial Intelligence for Business, Blockchain Technology for Business, and Data Mining and Machine Learning.

The new offering expands MTSM's existing FinTech concentration, which debuted in 2017 and saw 35 students enrolled as of 2020. The major is expected to begin with 40 students, produce its first graduates in spring 2024 and reach enrollment of 200 by 2024-25. Also, business administration majors can still opt for the concentration.

YING WU COLLEGE OF COMPUTING GRAD EARNS FULBRIGHT SCHOLARSHIP

Matthew Cherrey has never traveled overseas but always wanted to do so, particularly to Germany, where his family has roots. Now he's getting an opportunity, representing NJIT next year as a Fulbright Research Award Scholar.

The Ying Wu College of Computing alumnus and future graduate student will travel to Darmstadt, just south of Frankfurt, to spend several months at the Darmstadt University of Technology. Working with a team led by prominent internet security expert Professor Marc Fischlin, Cherrey's research will address the growing need for stronger, safer internet security protocols. Cherrey previously was a software engineering intern at Facebook.

Beyond his family connections to the country, Cherrey chose Germany because of the European Union's (EU) strong focus on data privacy. Germany, with its vibrant industrial sector, is leading the charge among EU nations to improve computer privacy and security. Experts like Fischlin are pursuing new solutions to these challenges.

"I was eager to connect with Professor Fischlin," said Cherrey, who earned a B.S. in computer science in May. "I was immediately drawn to his expertise in cryptography and network security protocols, and I am excited to work with him to develop and implement a general model of a safe network security protocol."

"I am proud that a talented young computer scientist like Matthew will represent NJIT, YWCC and the United States as a Fulbright Scholar," said YWCC Dean Craig Gotsman. "International collaboration is a fertile breeding ground for good ideas and can only benefit science and technology. I look forward to hearing



about Matthew's experience in Germany and how he can continue that here at NJIT as a graduate student working with our own strong cybersecurity research group."

Cherrey, also an Honors graduate, is NJIT's fifth Fulbright winner. Daniel Meza of Hillier College of Architecture and Design also earned the award this year.

A B S T R A C T S

AT CONVOCATION, NJIT ALUMNA ASKS, 'WILL YOU BE A HELPER?'

uoting Fred Rogers, NJIT alumna Gabrielle Rejouis urged Class of 2024 students to be helpers and foster communities during the university's annual convocation.

"You all have a contribution to make," said Rejouis '15, an Albert Dorman Honors College Scholar who majored in history and now is a senior policy manager at Color of Change. "Your contribution might be a new program or policy at NJIT. It might be winning an election or getting a research grant. On the other hand, your contribution might be backing up a classmate during class discussion. It might be affirming someone's expression or identity. Your contribution might be building a friendship.

"The latter contributions don't get you interviewed or win awards. But they are remembered and make a difference," she added. "You have the potential to change lives with your skills and your kindness."

Rejouis concluded with, "We're in a moment where we need positive changes. The next generation will look to us for help.



When the time comes, will you be a helper?"

President Joel S. Bloom celebrated the 1,316 students entering NJIT, noting their diversity and academic achievement, including a collective high school grade point average of 3.6. They come from 18 countries and 23 states.

"You'll spend the coming years with people who are driven, talented and diverse," Bloom said. "Embrace the opportunity you have to learn from one another and support one another."

During the ceremony, professors and students were honored with five awards and seven levels of promotions.

Earning the Presidential Leadership Award, which recognizes both undergraduate and graduate students, were Newark College of Engineering's (NCE) Ayushi Sangoi '20, an Honors Scholar who earned a bachelor's in biomedical engineering and computer engineering, and William Ho, who's pursuing a Ph.D. in chemical engineering. In particular,

NJIT cited Sangoi's passion for service, education and advocacy, and Ho's energy, enthusiasm and commitment to helping others.

Winning the Overseers Excellence in Research Prize and Medal were Distinguished Professor of Biomedical Engineering Namas Chandra and Distinguished Professor of Applied Mathematics Lou

President Joel S. Bloom



Kondic. Chandra is a pioneer in the study of blast-induced brain injuries and associated neurotraumas, and Kondic is an expert in complex fluid dynamics and granular flows.

The Constance A. Murray Diversity Award was bestowed upon James Geller, a professor and former associate dean for research at Ying Wu College of Computing (YWCC), for fostering diversity with a demonstrated commitment to fairness and equality.

The Excellence in Research Award recognized six faculty members at five schools: Qiang Tang at YWCC; Xiaoyang Xu at NCE; Haisu Zhang at Martin Tuchman School of Management (MTSM); Gabrielle Esperdy at Hillier College of Architecture and Design; and Wenda Cao and Maurie Cohen at the College of Science and Liberal Arts.

Earning the Overseers Excellence in Service Award were Associate Professor of Finance Michael Ehrlich of MTSM and four individuals in the Office of Digital Learning: Nicole Bosca, Blake Haggerty, Cassandra Sardo and Amal Shah.

Among the faculty members honored for promotions were three who rose to master teacher: Cesar Bandera at MTSM, Ecevit Bilgili in the Department of Chemical and Materials Engineering and Stephen Pemberton in the Federated Department of History.

A B S T R A C T S



Charles A. Colton

New Recognition Society Honors Donors to NJIT

The Colton Society, NJIT's newest recognition circle, welcomed 63 inaugural members at a virtual induction event held Oct. 29 and hosted by NJIT President Joel S. Bloom and NJIT First Lady Diane Bloom. Membership in the society is extended to donors whose lifetime giving exceeds \$500,000.

"Our success in launching the Colton Society reflects NJIT's rise to prominence as a science and technology powerhouse. With more than \$160 million in research expenditures and a \$2.8 billion annual impact on the State of New Jersey, NJIT has joined the ranks of the nation's premier polytechnic universities," said Kenneth Alexo Jr., vice president, Development and Alumni Relations. "We would not have come so far, so fast, without the leadership and support of our Colton Society donors. Their investments in programs, facilities and, above all, our talented and hardworking students, have ensured that we remain true to our founding value of excellence and affordability. Our gratitude for their generosity cannot be overstated."

The society is named in honor of Charles A. Colton, founding director of the Newark Technical School, which opened in 1881 and later became New Jersey Institute of Technology. A plaque bearing the names of the members was unveiled at the online event and hangs in Eberhardt Hall. Nearly half of the benefactors are NJIT alumni.

ANALYST AT NJ TRANSIT EARNS DATA MINING CERTIFICATE AT NJIT@JERSEYCITY

Voluminous amounts of data can be overwhelming to even the most experienced professional. That was the experience of Roberto Rivera, a senior research analyst with NJ TRANSIT and one of the first six graduates of NJIT@JerseyCity (jerseycity.njit.edu). Spending his days immersed in large data sets, Rivera realized that continuing his education would provide the additional skills and training he needed to manage the increasingly data-intensive nature of his work.

At NJIT@JerseyCity, Rivera earned a certificate in data mining. The hub, which opened in the fall of 2019, focuses on the needs of professionals interested in graduate-level education, offering parttime and full-time master's and certificate programs in data science, computer science and cybersecurity.

"My current role at NJ TRANSIT requires discovering patterns and relationships in the data in order to help make better business decisions," Rivera said. "The data mining certificate program at Jersey City had an intense workload, but I now have a clear idea on how to automate, collect, manage, calculate and analyze the processing of data and information more efficiently."

In addition to benefiting from a curriculum created and taught by data science experts, Rivera enjoyed sharing a classroom with people who are passionate about furthering their education and applying new knowledge to their work.

Fueled by the certificate, Rivera is continuing his education at NJIT as he pursues a master's in information systems,



with the academic credits from his certificate counting toward the degree. "I hope to be able to get better at my job, enhance my career, become an authority, build my credibility and set myself apart in the job market," he explained. "NJIT@JerseyCity helped prepare me to achieve those goals and more."

A B S T R A C T S



HILLIER COLLEGE TURNS AD HOC RELATIONSHIPS INTO DESIGN COLLABORATIVE

aculty from Hillier College of Architecture and Design are formalizing ad hoc relationships with NJIT departments, the City of Newark, local neighborhood groups and private developers into a new entity called the Newark Design Collaborative.

Doing so will transition students from theoretical studio instruction to practical real-world projects, explained Hillier's Tony Schuman, professor of architecture and co-organizer of the collaborative. Newark, for one, has plenty to do as it develops its next master plan, which is due in 2023, according to City Planner Christopher Watson, who's also pursuing a doctorate in urban systems at NJIT.

Previous Newark student projects produced a massive handmade model of the entire city, a 3D-printed model of downtown, a preservation plan for parts of the abandoned Essex County Jail and a design called Music Village in the historic Lincoln Park neighborhood. There have also been many research papers and studio designs for other city landmarks, including Newark Liberty International Airport and Branch Brook Park.

To support the collaborative, organizers plan to create a downtown Newark facility featuring studios, an exhibit gallery and possibly event space or meeting rooms.

Among the participants in the collaborative are Jonathan Curley, senior university lecturer in the humanities department, who taught a seminar called "Newark Narrative"; Pallavi Shinde, a senior planner for Newark who holds a Master of Infrastructure Planning from NJIT; Samer Hanini '99, '03, a managing partner at real estate firm Hanini Group and member of the Hillier College advisory board; and Anthony Smith, executive director of Lincoln Park/Coast Cultural District, whose members aim to improve the downtown neighborhood. That organization produces an annual music festival and other efforts to position A model of Newark, here in the Newark Public Library, is now at Newark City Hall. Photo Credit: People Power Planning Newark

the area as an arts and entertainment hub.

Schuman's enthusiasm for the project is palpable. "The essence of the Newark Design Collaborative is community engagement, which poses two essential questions: How does the community benefit and what do the students learn? The work we do at Hillier College helps the city strive toward a more equitable and sustainable future, and provides our students with a rich learning experience that provides insight and encourages empathy," he said.

Student participant Mateo Aristizabal, who has a B.Arch. and is studying for a Master of Infrastructure Planning, will serve as a teaching assistant in the collaborative studios.

A Newark neighborhood that Aristizabal would like to help is the northeast tip of the historic Ironbound district, located just 1 mile from the Covanta Essex County Resource Recovery Facility. Research suggests that pediatric illnesses there are related to the air residents breathe, he explained. He's also concerned about gentrification throughout the city, where the opinions of longtime residents may be ignored by those who prioritize profits. And as a fitness enthusiast, he'd like to incorporate health and recreation into future designs.

Such perspectives resonate with Watson, the city planner. "What the community needs to know is, when you collaborate like this, you really link the theoretical with the practical," Watson said. "It's a great way for students to really get hands-on experience while in school and hands-on experience at places where they're going to be employed."

POINT BY POINT

The Latest News About NJIT Sports njithighlanders.com



SAAC RELEASES 'WHEN THE BLACK SQUARES FADE'

The NJIT Student-Athlete Advisory Committee (SAAC) released a video, *When The Black Squares Fade*, that reinforces the Highlander student-athlete community's commitment to social justice. The video's name is derived from Blackout Tuesday, a collective action protesting racism and police brutality following the killings of George Floyd, Ahmaud Arbery and Breonna Taylor; many activists took to social media June 2 to post black squares and the SAAC executive board posted a statement in support of the movement on its Instagram.

"We wanted to show our athletes and the world that NJIT has not forgotten about the atrocities committed against these individuals and that we will continue to fight to bring awareness to issues that affect our very own," noted Logan Heft, SAAC vice president and financial technology major. "To do this, we thought a video that was written, read and produced entirely by student athletes would act as a powerful vessel for our message."

When The Black Squares Fade features over a dozen diverse student-athletes, from many different NJIT sports, speaking emphatically about doing their part to make the world a better place. Participants submitted their own videos, which were spliced together to create the final product. SAAC posted it on Instagram and, as of early October, received more than 2,000 views and hundreds of likes.

"We hope that a video like this will never be necessary again," Heft added. "However, with this being said, NJIT SAAC is committed to fighting for and standing with its athletes from all different walks of life."

RING CEREMONY PAYS TRIBUTE TO 2019 ASUN MEN'S SOCCER CHAMPIONS



The NJIT Department of Athletics honored the 2019 men's soccer team with a ring ceremony, held Sept. 16 on Lubetkin Field at Mal Simon Stadium, to commemorate the team's Athletic Sun Conference (ASUN) Championship last November. The team's historic season culminated with the university's first-ever ASUN Conference Championship in any sport. In the ASUN Championship game, the top-seeded Highlanders defeated No. 2 Florida Gulf Coast University, 2-1. Rising junior and ASUN Tournament Most Valuable Player Regsan Watkins scored the championship-winning goal in the 86th minute of the title match.

With the victory, the Highlanders advanced to the NCAA Tournament for both the first time at the Division I level and since 1974.

NJIT also captured the ASUN Conference regular season title and garnered four major ASUN Conference awards: Coach of the Year (Fernando Barboto), Player of the Year (Rene White), Goalkeeper of the Year (Samuel Reisgys) and Rookie of the Year (Alejandro Rabell).

The Highlanders, who finished with a Division I school-record 10 wins, ranked in the Top 10 of the United Soccer Coaches Atlantic Region poll all season, with its highest ranking, No. 2, coming during the second week of the season. NJIT closed the season ranked fifth out of 10 teams.

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RALPH MADDALENA '75, '77 IS MAKING A DIFFERENCE

"I CAN REMEMBER IT LIKE IT WAS YESTERDAY," Ralph Maddalena '75, M.S. '77 says, reminiscing about one particular winter night when he was an NJIT student. "It was after 9 p.m. and snowing. I had just finished basketball practice and was waiting for the bus, adding up the hours of homework still ahead of me. All I could think was, 'This had better be worth it!' I later realized that, of course, it was."

Those disciplined years at NJIT prepared Ralph for an accomplished 30-year career at ExxonMobil. With bachelor's and master's degrees in civil engineering, Ralph has worked in 28 countries around the world, and his projects have ranged from leading water quality initiatives that protected U.S. communities' drinking water supplies to heading an international consortium to market natural gas from Sakhalin Island in Russia.

Ralph's affinity for sports, both as a basketball player and an avid runner, has influenced his giving to NJIT. A longtime donor to the university's basketball program, Ralph recently joined the 1881 Society when he and his wife Pam created the *Pam and Ralph Maddalena '75 Endowed Scholarship* by including NJIT in their estate plans. The Maddalena Scholarship will provide much-needed financial aid for a student athlete pursuing a STEM degree. It is a wonderful expression of Ralph's gratitude toward NJIT, as well as a legacy that will benefit NJIT students for generations to come.

Ralph is passionate about the value of giving to the university. "I would encourage anyone who is thinking about making a gift to NJIT to just do it," he says. "Find a way to make a gift, because it will have such a positive impact on a deserving student's life."

To learn more about Ralph and the legacy he and his wife Pam have created at NJIT, please visit "Donor Stories" at <u>njit.giftplans.org</u>.

For further information on the 1881 Society or to discuss leaving a legacy at NJIT through a planned gift, please contact:

Beth S. Kornstein Associate Vice President, Planned Giving 973-596-8548 elizabeth.s.kornstein@njit.edu • <u>njit.giftplans.org</u>



Your legacy begins today.

EXPLORATIONS

Top left: A macro image of two ants walking in the evening. Photo Credit: iStock/Chadked Top right: A remora fish readies to feed and skim along a whale body. Photo Credit: Stanford University, Cascadia Research Collective and Journal of Experimental Biology Bottom left: Phil Barden, NJIT biologist, displays "hell ant" fossils in his lab at NJIT.

Bottom right: C. elegans worms are expanded nearly 2.5x their size. Photo Credit: NJIT/MIT



OF NATURE

NJIT's elevation to the highest classification of research activity among

doctoral universities (R1 Carnegie Classification®) has brought with it

some extraordinary explorations of our natural world, sparking both

scientific discovery and the imagination of millions worldwide. These

fascinating inquiries have spurred international research collaborations

and support from the National Science Foundation, among many other

prestigious grants and awards, while featuring in prominent high-impact journals and across international news headlines.

Here, we look back on recent investigations that have taken NJIT faculty

to distant corners of the world, and even millions of years into the past.

DISCOVERING VLAD THE IMPALER AND THE "HELL ANTS"

The fossil discovery of a prehistoric ant with scythe-like mandibles and a metal-reinforced horn on its head used for impaling its victims would be a crowning find for any paleontologist. In 2017, that seemed the case for NJIT biologist Phil Barden when his team uncovered a 99-million-year-old amber fossil encasing such a predator — a long-extinct ant species from the Cretaceous Period, appropriately named "Vlad the Impaler" (*Linguamyrmex vladi*) after the infamous Wallachian ruler from the 1400s.

However, Barden's latest fossil discovery this year rivals that of Vlad and offers deeper insight into its enigmatic family of 16 known ant members, known as the "hell ants" (haidomyrmecine), which used their distinctive headgear to successfully hunt prey for nearly 20 million years before vanishing with many early ant groups around the Cretaceous–Paleogene extinction event 65 million years ago.

In findings published in *Current Biology*, Barden's team unveiled a stunning fossil preserving a newly identified hell ant species — *Ceratomyrmex ellenbergeri* — as it embraced its unsuspecting final victim almost 100 million years ago, an extinct relative of the cockroach known as *Caputoraptor elegans*. The ancient encounter, locked in amber recovered from the country of Myanmar, presents some of the first direct evidence that shows how it and other hell ants once used their killer features unlike any living ant today.

"Fossilized behavior is exceedingly rare, predation especially so. As paleontologists, we speculate about the function of ancient adaptations using available evidence, but to see an extinct predator caught in the



act of capturing its prey is invaluable," said Barden. "This fossilized predation confirms our hypothesis for how hell ant mouthparts worked. ... The only way for prey to be captured in such an arrangement is for the ant mouthparts to move up and downward in a direction unlike that of all living ants and nearly all insects."

Barden is continuing to study what ultimately led to the hell ants' demise, and is leading an NJIT student-faculty collaboration to make digital and 3D models of the Cretaceous-era insects that are being displayed at museums throughout the Northeast.

NJIT BIOLOGISTS HELP "SUPERSIZE" A TINY WORM WITH BIG POTENTIAL

The diminutive worm, *Caenorhabditis* (*C. elegans*), isn't so small of a figure in the labs of researchers. In fact, its small stature — roughly the size of a comma in length — is its biggest asset in that it's helped make it the only animal to have its compact connectome of 302 neurons and their 7,000 synaptic connections fully mapped. Recently in the journal *eLife*, NJIT, MIT and Stanford researchers developed a new advanced imaging technique — called expansion of *C. elegans* (ExCel) — that has allowed them to physically blow the worm up in size to study it in greater detail with only a basic microscope, potentially making the nematode even more valuable and accessible as a model for exploring the nervous system.

"The last time that all the synapses were mapped in a single animal was in 1986, and it took the researchers 15 years using electron microscopy to map a single nervous system. ... The tracing of neurons and finding of synapses were done manually on large photoprints," said Gal Haspel, collaborating author of the paper and professor in NJIT's Department of Biological Sciences. "The most important advancement with this new approach is that microscopic resolution can be improved by expanding the sample instead of improving the optics, which has given us a greater ability to see the nematode's synaptic connections among neurons - only about 50 nanometers in size - with a standard confocal microscope."

With ExCel — capable of imaging fluorescent proteins after fivefold linear expansion — the team has been able to locate and tag the nematode's synaptic connections, something previously not possible according to Haspel. Gaining the ability to florescent tag such proteins at such resolution could open new doors for more advanced studies of synaptic connections in other animals.

"Now, we'd like to collect connectivity data from multiple animals and establish the variability of connectivity and its distribution in the nervous system," said Haspel.

RECOVERING OCEANS OF SOUND FROM HUMPBACK WHALE ORCA-STRAS

With clarinet in-hand, NJIT Distinguished Professor of Humanities and worldrenowned jazz musician David Rothenberg has spent decades traveling around the world to investigate the sounds of nature, creating music alongside everything from birds to whales to insects. He has even been referred to as an "interspecies musician." Recently, Rothenberg collaborated with Pattern Radio, a project in partnership with Google and the National Oceanic and Atmospheric Administration, to collect thousands of hours of whale songs from miles below the ocean's surface.

His method for communication with this species is simple: dropping an underwater speaker deep into the ocean so the whale can hear the music played, along with a hydrophone hooked up to headphones so Rothenberg can hear the reactions from the whales. Rothenberg has traveled to the Arctic and many other far reaches of the world to submerge mics and capture the melodic and rhythmic sounds of belugas, sperm whales, humpbacks and more.

"Beluga whales have always been interested in human music, so much so that they'd hang around boats when sailors were singing. Their songs contain so much sonic diversity that they can be turned into almost anything," Rothenberg said. "From echolocation creaks to social whistles and grunts, these white whales have it all. The way so many animals communicate is in a way much more like music than like language."

The results have been presented both in raw and musically sequenced forms by Rothenberg and his son, the experimental pop producer and sound designer Umru Rothenberg. They have teamed up to release a sample collection aptly titled *Whale Sounds* on Splice.com, a Netflix-style supplier of sound samples for music producers.

INTERNATIONAL STUDY UNCOVERS SECRET SURFING LIFE OF REMORAS HITCHHIKING ON BLUE WHALES

Sticking to the bodies of sharks and other larger marine life is a well-known specialty of remora fishes (Echeneidae), accomplished through super-powered suction disks on their heads. But now, NJIT researchers have led a study that has fully documented the "suckerfish" in hitchhiking action below the ocean's surface, uncovering a more refined skill set the fish uses for navigating intense hydrodynamics aboard a 100-foot blue whale (*Balaenoptera musculus*).

In the *Journal of Experimental Biology*, an international research team, studying the complex fluid environments of blue whales off the California coast, successfully captured the first-ever continuous recording of remora behavior on their host, using advanced biosensing tags with videorecording capabilities.

"Whales are like their own floating island, basically like their own little ecosystems. ...To get a look into the flow environment of blue whales within a millimeter resolution through this study is extremely exciting," said Brooke Flammang, assistant professor of biology at NJIT and the study's corresponding author. "Through coincidence, our recordings captured how remoras interact in this environment and are able to use the distinct flow dynamics of these whales to their advantage. It is incredible, because we've really known next to nothing about how remoras behave on their hosts in the wild over any prolonged period of time."

The study shows that remoras successfully hitchhike aboard baleen whales more than 30 times their size by selecting the most flow-optimal regions on the whale's body to stick to, such as behind the whale's blowhole and dorsal fin, where drag resistance for the fish is reduced by as much as 84%. The researchers also discovered remoras can freely move around to feed and socialize even as their whale host hits burst speeds of more than 5 meters per second, by utilizing surfing and skimming behaviors along special low-drag traveling lanes that exist just off the surface of the whale's body. The team is using their new insights into the remora's preferred low-drag attachment locations to better inform how they might tag and track whales in studies to come.

Author: Jesse Jenkins is an NJIT Magazine contributing writer.

Researchers discover a worker of the hell ant Ceratomyrmex ellenbergeri grasping a nymph of Caputoraptor elegans (Alienoptera) preserved in amber dated to ~99 Ma (mega annum). Photo Credit: NJIT, Chinese Academy of Sciences and University of Rennes, France



STRATEGY FOR NJIT Responds to the Pandemic



Ten months ago, as the COVID-19 pandemic began its inexorable march across the country, NJIT, along with higher education institutions nationwide, faced an unprecedented challenge: how to best move to fully remote instruction, both quickly and safely. Immediately, the university drew upon its technological resources and know-how to provide a virtual learning experience for its more than 11,000 students while completing the spring 2020 semester as scheduled.

Within a span of two weeks, the Digital Learning and Technology Support team at NJIT helped prepare faculty to teach online effectively and assisted students who lacked the means to engage. More than University Lecturer Catherine Siemann conducts her Honors Humanities class with students attending either in person or, via the back-wall screen, from a virtual location.

150 document cameras, tablet laptops and drawing tablets were distributed to faculty, and dozens of computers were delivered to students in need of virtual access to their

INSTRUCTION: in Ferward-Thinking Fashien

classes. Additionally, over 6,700 Webex sessions were held and nearly 2,000 videos were created through Kaltura, a platform enabling live and on-demand video presentations.

Making modifications to the spring semester would turn out to be just the start of a more than six-month-long undertaking, to not only finish the past academic year but also ready for the next one. NJIT's initial COVID-19 Task Force handed over the reins to a Pandemic Recovery Steering Committee that comprised more than 80 individuals and a Pandemic Advisory Committee that featured broad representation from the campus community.

"Since first presented with the onset of the COVID-19 pandemic, senior administrators have worked alongside the Faculty Senate's leadership, individual faculty and staff members, union representatives, health care experts, students and others on committees and subcommittees, and through consultation, in order to draw upon diverse and informed perspectives and make difficult decisions in the best interests of our university community," noted NJIT President Joel S. Bloom.

Among those perspectives and decisions, which proved critical to the development of an overall Pandemic Recovery Plan, was the resolve to implement converged learning together with traditional online instruction. Converged learning, pioneered by NJIT since 2013, essentially breaks down the distinction between face-to-face and remote learning, with students attending the same class at the same time either in person or virtually. With this model, students have the same educational experience regardless of their physical location, and professors can see, interact with and work simultaneously in real-time with all attendees.

As NJIT Provost and Senior Executive Vice President Fadi P. Deek emphasized, NJIT always has invested in technology that allows students to learn from the classroom, the residence hall, their home or wherever it is most convenient for them to do so. Between March and November 2020, utilization of Webex and Kaltura increased, with upwards of 163,800 sessions and more than 31,800 uploaded videos, respectively.

With regard to classroom occupancy this academic year, he explained that no more than 18 students are enrolled in any in-person course, versus the usual 30. Of this reduced group, only nine students at a time are permitted to attend in person, with the other half of the class participating remotely. Students with concerns about coming to the classroom can continue to learn virtually, while those eager for face-to-face instruction can engage accordingly whenever possible.

Inside the classrooms, other measures are



Seating is designated according to colored dots on student desks.

being taken to ensure the safety of students and faculty, including designated seating to facilitate social distancing, sanitization of seats and desks after every use and enhanced air exchange in buildings. Additionally, face coverings are required for all faculty, students and staff, and plexiglass screens



DID YOU KNOW?

When the Spanish flu caused Newark schools to close in the fall of 1918, NJIT (then known as the Newark Technical School) remained open for radio classes conducted weekday evenings for the government, according to *Newark Evening News*. As written in the paper, there was "an attendance of about fifty at the radio classes and as the course is only six or eight weeks, and new groups come in as rapidly as others finish, it was decided that because of these facts and because it is federal work requiring haste, this department should remain open."



have been installed as an extra physical barrier between students and instructors.

"We know from available research that in-person learning is an important component of a STEM curriculum, and our students have made their strong desire for such opportunities clear," Bloom pointed out, adding that more than 7,000 students Mobile plexiglass screens placed in front of instructors' desks offer an extra barrier between teachers and students.

registered for at least one or more converged courses for the fall semester.

Victoria Youssef, a first-year biology major, is one of those students. She regularly attends her chemistry and calculus lectures and chemistry

lab in person, while participating in her humanities course, freshman seminar and biology lecture and recitation remotely. Her experience with converged learning is going well, she says, with her instructors posting more resources, recording their lectures and providing assistance via virtual office hours.

"I love the fact that I have the convenience

of learning either at home or in school, depending on my schedule and whether or not I want to go into school," said Youssef, who commutes from Livingston, N.J. As for being on campus, she remarked, "I feel very safe in all of my classes, because every seat is assigned a color and I am always 6+ feet apart from everyone."

"The importance of having students, faculty and staff on campus cannot be understated. We all are integral to the NJIT community," Deek stressed. "We've had to make a number of behavioral, physical and technological modifications. We've had to adopt new principles for learning, working and living. ... But the students are, by choice, in the classrooms."

Author: Julie Jacobs is the editor of NJIT Magazine.



COMPUTING PROFESSOR'S APP MANAGES NJIT CONVERGED LEARNING

Coordinating converged learning for thousands of students across hundreds of course sections could easily become a logistical nightmare. Enter back2classroom.app, developed to automatically coordinate the in-person versus virtual participation of students enrolled in a class.

This benefits the university by generating detailed analytics that give a campuswide view of student presence, allowing NJIT to know the in-person utilization rate on any given day, or time of day, for different buildings, classrooms and common spaces frequented by students. There are easy-to-follow user guides for students and faculty. Students use the app to reserve or cancel their in-person participation in a class, download their reserved spots to their calendars and mark their attendance for a spot for in-person or remote instruction. Faculty reference the app to see student statuses and can take attendance. "The goal of this app is to provide equal opportunity to all students to participate in classroom-based learning," said Pantelis Monogioudis, professor of practice at Ying Wu College of Computing, who leads the team of developers with Aegean AI Inc., a software-as-service company co-founded by Monogioudis and students from New York University. "The app implements NJIT's detailed Pandemic Recovery Plan, which lays out attendance limits and protocols, establishing a round-robin policy for classroom attendance."

An additional benefit is the app's potential to support and enhance contact tracing efforts, if needed, thanks to its tracking capabilities. Monogioudis also looks forward to expanding use of the app to include common spaces popular with students such as libraries, meeting rooms, group study spaces and dining halls.

- Dean G. Mudgett, director of marketing and communications, Ying Wu College of Computing

FACILITIES PROJECTS BUILD AND BRIGHTEN BOTH CAMPUS AND COMMUNITY



Throughout recent years, NJIT has completed more than \$400 million in capital projects that have improved the university's physical campus, while creating jobs and amenities that benefit the local community. Our university's annual economic impact on the State of New Jersey is more than \$2.8 billion, and NJIT's impact on the City of Newark exceeds \$853 million. The capital projects we have completed in recent years have included both the renovation of historic structures and the construction of new facilities that serve the needs of the campus and community. We are not yet done, though, and will continue to invest in our surrounding community in ways that contribute to economic growth, as well as public safety and well-being.

Above, left: Last year, NJIT purchased the Warren Street School. The university is now working with a private partner to develop the property into student housing, while maintaining the school's history through design elements in the new structure (above, right). The anticipated opening for the complex is 2022.



Eberhardt Hall, erected in 1857, was meticulously restored by NJIT to maintain its authenticity and is today listed in the National Register of Historic Buildings.

PRESERVING HISTORIC STRUCTURES

Formerly the Newark Orphan Asylum and an Elizabethan Gothic Revival building created by prominent architect John Welch in 1857, Eberhardt Hall was renovated by NJIT in 2005 and serves as a home for the development and alumni relations office, as well as the host site for multiple events and meetings. NJIT purchased the building in 1947 and named it in honor of Fred Eberhardt, who served on the university's board of trustees from 1910 until his death in 1946. In restoring Eberhardt Hall, which is listed in the National Register of Historic Buildings, NJIT took great care to ensure period authenticity.

Once home to thousands of Newark Central High School students, the Central King Building (CKB) at NJIT exemplifies intelligent, creative and economically impactful urban redevelopment that preserves the architectural and historical significance of a structure, while serving modern students, industry and the local community. The \$86 million CKB renovation was the largest single project funded by the State of New Jersey through the 2012 Building Our Future Bond Act. The building now is a hub for innovation and collaborative learning. It is home to classrooms, teaching and research laboratories, spaces for academic advising and pre-professional mentoring, a STEM tutoring center, a writing center, a math emporium and the New Jersey Innovation Institute, which is a catalyst for workforce and economic development.

EXPANDING THE CAMPUS

In 2013, NJIT opened the Warren Street Village, a three-acre mixed-use complex that includes the residential Albert Dorman Honors College, separate houses for NJIT's fraternities and sororities, a convenience store and Smashburger, among other amenities. The Village was the first phase of the multiphase NJIT Campus Gateway Redevelopment plan, a part of the City of Newark Broad Street Station District Redevelopment Plan.

NJIT's Wellness and Events Center (WEC) opened in fall 2017 as an iconic multipurpose building that provides wellness facilities, large-scale space for NCAA Division I athletics, professional conferencing space (it hosted two successive years of the Amazon Alexa international voice technology conference) and space for major academic events and career fairs, as well as social settings for NJIT students, faculty and staff. The design of the threestory, 220,000-square-foot building features a number of flexible spaces that can be quickly configured to support the numerous and varied missions of the university community. The WEC has proudly hosted numerous Essex County and Newark community events since it opened.

Makerspace at NJIT opened its doors in December 2017 and recently completed an expansion. Makerspace is a trainingfocused, rapid prototyping facility that is central to both NJIT's hands-on learning mission and its growing relationship with New Jersey's manufacturing community. The 20,000-square-foot space operates equipment ranging from small 3D printers to large industrial machining centers, such as precision-measurement and laser-cutting

NJIT's \$86 million Central King Building renovation, which preserved the building's architectural significance, serves as a hub for innovation and collaborative learning.







machines, as well as a Direct Metal Laser Sintering 3D printer, which was donated by Stryker and created the first 3D-printed porous metal hip implant approved for use by the FDA. It is a dual-use facility that helps prepare the workforce of the future, while also serving the needs of industry, particularly manufacturing businesses. The facility provides opportunities for industrial partners to participate as mentors, trainers and instructors, for companies to collaborate with students and faculty members on research and development projects, and for employees to receive customized training tailored to their needs. Makerspace at NJIT also has played a critical role in manufacturing face shields for front-line medical personnel in the battle against COVID-19.

ON THE HORIZON

NJIT has acquired two properties adjacent to its campus that have great potential for positive impact on both the university and the community. These properties include the former Mueller's Wholesale Flower Distribution building and the former Warren Street School. While our vision for both of these properties was a catalyst for our decision to acquire them, we also recognized and are acting upon the reality that these properties have posed a hazard to both NJIT and its neighbors.

The Mueller's Flower Shop building is an antiquated wooden structure in severe disrepair and is a significant fire hazard. The structure actually includes several buildings wrapped by an external shell and lacks architectural character or value. Therefore, we are in the process of razing this structure in order to mitigate the fire hazard it presents to our community. The location will be converted into an attractive green space on a temporary basis. We believe that adding a small park at the corner of our open campus will be of great benefit and serve as a passive recreation and aesthetically pleasing resource for our campus and local communities. NJIT intends to transform the antiquated Mueller's Flower Shop building (left) into an attractive, welcoming green space (right) for both the university campus and local community.

In 2019, NJIT purchased the Warren Street School, which had been vacant and was severely damaged by a fire. After purchasing this property, NJIT went through an RFP process and has reached an agreement with a private partner to develop the property into housing for NJIT students. We anticipate opening the new housing complex as soon as fall 2022 and have been successful in securing commitments from the developer to keep costs at affordable, market rates and to incorporate the history of the Warren Street School into certain design elements of the new structure.

Author: Matthew Golden is Chief Strategy Officer in the Office of Strategic Initiatives at NJIT.



ALBERT DORMAN HONORS COLLEGE CELEBRATES A MILESTONE ANNIVERSARY

Joan and Albert Dorman '45, '99 HON



n the first of a series of events honoring its 25th anniversary, Albert Dorman Honors College held a live, online celebration. Reflecting on the anniversary of the college that he endowed, NJIT alumnus Albert Dorman '45, '99 HON revisited his remarks from its inauguration, and they are as relevant today as they were in 1995 — perhaps even more so.

"I said to these brilliant, young students, 'Learn to manage controversy so that it may lead to consensus. Learn to meld strongly held differing opinions into an action plan for the common good. Recognize our differences, but emphasize our similarities. Pay homage to our different beginnings, but concentrate on our potential common ending," said Dorman.

In 1995, Dorman also challenged students to "make it a lifelong duty to help define and achieve important social as well as scientific goals and to help inform an unscientific segment of the body politic."

Looking back on those words today, Dorman said, "I'm proud to say that almost all of these students and graduates have followed those remarks." He added that "particularly in these days, where the country is so divided, it's so important for us to find common goals, to reach common aims that are good for all."

Those who attended the virtual celebration included current students, professors, administrators, board members, alumni and generous benefactors such as Dorman, who, with his wife, Joan, also endowed two faculty fellowships. Through a virtual tour of the college's building led by students, videos and the words of Dean Louis I. Hamilton and NJIT President Joel S. Bloom — the founding dean of the college — the event captured what students and alumni love about the institution and the people behind it.

Dorman, Bloom and Hamilton noted the contributions of others through the years, including the founder of the preceding Honors Program, Richard Sher, and previous and current members of the Honors College board of visitors like former Chairs Stephen Cordes '72, Paul Kastner '73, Dick Sweeney '82, '18 HON and Richard Schatzberg '93 and Vice Chair Mike Smith '95.

Students shared their favorite classes and projects, and Bloom and Hamilton reflected on the past and the future, with all expressing admiration and gratitude for Dorman, who earned a bachelor's in mechanical engineering at NJIT at the age of 19 and rose to become founding chairman and CEO of the global engineering firm AECOM.

The building tour focused on common areas, such as lobbies, labs and lounges where students can converge to tackle school work or simply share a meal, watch a movie or play a grand piano, at least before the coronavirus forced them to limit their face-to-face interaction and embrace online alternatives. Indeed, making personal connections is as core to ADHC today as it was before its building opened in 1995. Back then, Bloom was dean of a program that included personal touches such as dinners at his home and annual camping retreats for first-year students that alumni still cherish and bond over. He said it was all about developing human capital — something that Dorman also touted.

"What we're trying to build here at NJIT and in the Honors College and in our Educational Opportunity Program is the human capital. And the way you engage people is by personal relationships," Bloom explained.

Hamilton described the college as a place that offers a rich, creative and "profound" education that connects the dots between technical expertise and liberal arts and serves society by addressing its most critical issues. And today, that's home to about 700 students, including 139 who arrived this fall. Collectively, they'll deliver 40,000 hours of community service during the 2020-21 academic year.

Author: Andrew McMains is an NJIT Magazine contributing editor. Offer your support to the Highlander Nation with a gift today, and make an immediate impact!



Consider a donation in support of the Highlander Student Emergency Fund, which provides relief to students facing financial adversity.

njit.edu/givenow



MAL & FRIENDS

After a quarter of a century delighting readers with alumni news and stories, Mal Simon is retiring his column. Professor emeritus of physical education and athletics, Mal was director of physical education and athletics, and men's soccer coach, for 30 years. In 1993, he received the Cullimore Medal for his service to the university. While we will miss his column, Mal encourages everyone to continue to stay in touch!

And now, the latest news from Mal.

This column marks 25 years of my writing for alumni publications, beginning in 1996 for the *Alumni Voice* and continuing to today for *NJIT Magazine*. I began my literary career when I retired, with a "Thanks for the Memories" letter followed by two years penning the column "Doc and Mal" with the legendary Doc Estrin, both in the *Voice*, and then when Doc passed away, getting my own byline with "Mal and Friends."

I've truly enjoyed being in touch with alumni, many whom I knew as students at NCE/NJIT and others whom I met for the first time through a phone call or written communication. It has been an honor and pleasure to write about so many distinguished men and women. I have been awed by the achievements of these alumni. But it is now time to step down, so this column will be my "swan song." And now, as Jackie Gleason said on *The Honeymooners*, "Away we go."

When we last heard about **GEORGE TIKIJIAN** and his wife, Nancy, we had bypassed a host of years and they had already settled in Indiana. George had said he didn't think he could write anything, but once he started he became a writing machine that could not turn off. I had to tell him I would have to edit his story due to word limitations, but he told me not to worry because his children and grandchildren love hearing the stories.

George talks about some twists and turns in his life. He expected to major in mechanical engineering, but after hearing a physics professor wax eloquently about electricity, George realized he was more suited to the mysteries of invisible electrons than gears and cams, so he changed his major to electrical engineering in his sophomore year. He also almost dropped out of AFROTC. When he and Nancy got married, George agonized over the pros and cons of AFROTC, but in the end decided to stay in the corps. However, he was almost dropped from the program due to failing an eye test on the first day of AFROTC summer camp and could not be an Air Force officer. But George, being an ornery cuss, said "Nobody throws me out of anything." He spent the next semester proving that his eyesight was well within the acceptable range. His efforts paid off and at graduation he was sworn in as a second lieutenant in the USAF.

George spent three years in Air Force research and development. During the course of their marriage, George and



George and Nancy Tikijian



George Tikijian

Nancy lived in Rome and Florence. Sounds exotic, except that Rome was in New York and Florence in South

Carolina. His first duty assignment was at the Verona (also New York, not Italy) test site, where he worked on methods and equipment to foil enemy radar jammers and spoofers.

One of his major projects was in radio frequency interference (RFI) with Sperry in Clearwater, Fla. RFI is the disruption of an electronic signal caused by electric noise from another device. His project was to develop a mobile test system that could measure and record electronic emissions from ultralow frequencies through to 40 GHz. The final result was the MSM63 system involving two vehicles, one a van packed with electronic receivers, and the other an antenna truck (a cherry picker with antennae) that could be extended 100 feet in the air. It was an interesting experience for a 24-year-old brand-new engineer to shepherd a \$1.5 million stateof-the-art project.

ALUMNI CIRCUIT

During his three-year term, George managed to make a few mistakes that could have been deleterious to his career. In the RFI project noted before, he bought two trucks as government equipment and gave them to Sperry as governmentfurnished equipment. By purchasing directly, he did not have to pay the federal excise tax that one would think was an economical way to save the USAF money. However, he soon learned this was not the military way. He received a call from a major general who explained that all such purchases must go through his department. After chewing out George without mercy, the major general told him to never do it again.

In another unusual case, George was called on the carpet by a U.S. Navy captain at the Pentagon. The captain wanted to know why George had requisitioned a U.S. Navy diesel submarine even though his project was located 250 miles from any ocean. George said he really didn't need the submarine, but he or the Navy captain could not figure out how the requisition passed up the USAF chain of command and over to the U.S. Navy before being noticed. George finally learned that the part number for his requisition, which was for a special resistor for a U.S. Navy project, was taken from an old technical manual and the digits were wrong. George also bent a few rules on other R & D projects, but had no trouble because his direct supervisor was a career civilian who would give George assignments, but made it clear he did not want to know how each task was accomplished

George said that he learned some good life lessons in the USAF. By treating senior NCOs with respect, they can save you from stupid or arrogant mistakes, and sometimes it is better to ask forgiveness than permission. Sounds like good advice to get around red tape and get things done.

After his release from the USAF, George worked for Weston Instruments briefly before starting as a full-time assistant instructor in NCE's electrical engineering (EE) department and graduate student working on his MSEE at night. His income as a teaching assistant was abysmal, although he was scheduled for an increase that would raise it to pitiful. George received his MSEE in June 1965.

He toyed briefly about going on for a Ph.D., but decided against it after his mother said, "Four years college, three years Air Force, and then two more years of college. Aren't you ever going to get a paying job?" So he went to work for Union Carbide in New Jersey and continued as an EE adjunct instructor at NJIT until 1973, when Union Carbide transferred him to Indianapolis, where he and Nancy live in Zionsville enjoying a well-deserved retirement.

It was a pleasant surprise to hear from PETERIS JANSONS '67 BSEE. Pete was always a quiet person, so it was not unusual for Pete to simply write, "Greetings from your Latvian goalie." After earning a BSEE at NCE, Pete continued his education at Fairleigh Dickinson University, where he received an MSEE. He began his professional career as an engineer at Picatinny Arsenal, working on many different programs. His first program was the Sprint/Spartan anti-ballistic missile program. He also worked on several 155mm smartmunitions programs. He ended his career at Picatinny before retiring as project manager of the M109-Paladin, which is a self-propelled 155mm howitzer.

Pete was a steady, strong athlete who was a four-year starter on the soccer team, playing two years as a halfback and two years as goalie. His teammates

> voted him Most Valuable Player in his senior year. He reminded me about what he believed was our most exciting game, at Hartwick College when we lost 1-0 on a penalty kick with only 30 seconds remaining in the game.

Pete and his wife, Inara, recently celebrated their 50th wedding anniversary with a family trip to Costa Rica. They have two children and five grandchildren



with whom they really enjoy spending time and traveling. They live in Chicago near three of their grandchildren. Their hobby is traveling the world and so far they have visited 75 countries. Pete and Inara have encouraged their children and grandchildren to remember their Latvian heritage and are proud that they are fluent in Latvian and several other languages.

I decided to end my literary career with this interesting and historical bit from



'56 BSEE, '64 **MSMGT**. Jim never misses an opportunity to remind me that he was the person responsible for getting Bob Swanson, Paul Hauser and me to be judges to select the

Queen of NCE's 1956 AFROTC Ball. This time, however, his purpose in writing was to tell me a story about HOLGER JENSEN '56 BSEE, who had a unique way of remembering the annual Pi Day celebration March 14. I must tell you that Holger graduated four months before I started teaching at NCE, so I did not witness this event, and also that he has passed away, so I am taking Jim at his word(s). Following is almost how Jim tells the story.



"Holger memorized Pi to 100 places while a student at NCE. This could be a world record. He was a close buddy of mine growing

up in Clifton, N.J., and we were in most of the same classes, K-12. He dared to step out. Here's how it happened. Around 1954, something got him to memorize Pi to 30 places on his own. He casually showed it off one day to some NCE classmates. Well, you can just guess that it couldn't stop there. Goaded on, Holger decided to memorize three more places per day, daring to set a goal of 100. Within a week he had a big following, all coming to The Commons lunchroom daily to hear him go another three — all with their brown bag lunches that all NCE students brought from home daily. Each day more fans and a louder roar for another three. Holger was always correct, with 'official monitors/ judges' designated. 66, 69, 71... Well, the big day finally came. 100! Virtually every NCE student (hundreds) were there for the momentous occasion. And as always, Holger got it the first try. You can just imagine the whooping, clapping, awe, admiration and hero worship. Such a significant and unique event must not be

forgotten in NCE lore."

During our years at NCE/NJIT, my wife, Diane, and I have had many wonderful experiences and have made many unforgettable friends. I've tried to come up with a pithy goodbye, but decided to close with the same words I used in my 1996 Alumni Voice letter: Bob Hope's "Thanks for the Memories."



And finally, as said by Porky Pig of Loony Tunes fame, "That's all, folks!"

Texas Instruments engineers Kelvin Siebeng '19 and Jeffrey Jude-Ibe '20 take to the Trinity Skyline Trail in their new hometown, Dallas.

Engineering Graduates Bring Tech Skills and Gwara Gwara to the Lone Star State

hen Jeffrey Jude-Ibe '20 flew to Dallas in September to begin work as a quality engineer at Texas Instruments (TI), Kelvin Siebeng '19, the person who put the semiconductor giant on Jude-Ibe's job-search horizon, picked him up at the airport. With three full-time offers from major corporations and another from the FBI at his choosing, Siebeng also cemented the deal.

"Kelvin described TI as a company that re-engineers itself constantly to meet the market's demands. As an engineer, I like that idea of constantly learning and adapting," he noted, adding that he'd highlighted other key considerations for a recent college graduate starting out in the world: the company's strong employee retention programs and profit-sharing.

Siebeng, a manufacturing supervisor for the company for the past year, oversees production of its core technology, the semiconductor chip, "from scratch — from the moment the silicon comes into the lab to the moment the finished chip leaves it. I'm involved from start to finish." As a budding entrepreneur who would like to launch his own startup someday, his job affords a close-up view of the heart of an industry and the technical prowess, soft skills and discipline required to run it optimally.

But he saw a fitting role there for Jude-Ibe, who is more interested in power electronics, based on the company's huge business supplying devices to the automotive, industrial and personal electronics markets, among others.

"We manufacture, test and sell analog and embedded semiconductor chips that read real-world signals such as temperature, pressure and humidity, process the data digitally, and then send it back in analog signals to be read by the consumer," Jude-Ibe explained, noting that the chips speed up the process of "making real-time decisions."

His job is to analyze digital power controllers that are returned to the company to determine what happened when the embedded processer chips in digital power supplies and controller devices fail.

The two are now roommates in Dallas. While they pursued different majors in college — Siebeng in industrial engineering and Jude-Ibe in electrical engineering — they overlapped in organizations such as the National Society of Black Engineers and the African Student Association. Siebeng's family moved to the United States from Accra, Ghana, when he was in high school, while Jude-Ibe, who was born in New York, has extended family in Nigeria's Imo State.

Indeed, Jude-Ibe traces his fascination with engineering back to his many visits with cousins in his family's village. "The houses run on generators and whenever they'd fail, I would go out to help fix them with my dad. I chose the power track because of those experiences with



generators — and seeing how impactful they are in communities."

Both also love Afrobeats and may be the first devotees to entertain Dallas with live performances of mesmerizing, liquid moves such as "gwara gwara," the South African dance craze. Thursday evenings, the two take to the Trinity Skyline Trail that overlooks the Margaret Hunt Hill Bridge and the skyscrapers of downtown Dallas, turn on their JBL speaker and begin gyrating.

"There is a lot of simultaneous upper body and leg movement — it's 'body wiggly' — and people will sometimes ask us, 'How do you make those moves?"" Siebeng noted of awestruck observers.

His friend's final pitch, Jude-Ibe recounted, was Dallas itself. "He said that the folks here are very welcoming, the weather is great, the food is 'delish' and expenses are cheap. And he always seemed to be up to something fun whenever we spoke."

His move to Texas, it turns out, has been as smooth as his dance moves.

"It hasn't been a culture shock at all. I love the food, especially barbecue. Kelvin told me how much he appreciated the Dallas community. I definitely get a sense of that southern hospitality here."

Author: Tracey L. Regan is an NJIT Magazine *contributing writer.*



Promoting Justice Through Architectural Design: BRYAN C. LEE JR. '08

fter completing his undergraduate studies at Ohio State University, where he was involved with the National Organization of Minority Architects (NOMAS) student chapter, Bryan C. Lee Jr. '08 came to NJIT's Hillier College of Architecture and Design for an M.Arch. in 2006 and became co-president of the NJIT NOMAS chapter. He graduated two years later with a license to practice and in 2008 formed his own consulting firm in the midst of the financial crisis.

"I graduated maybe a month before the market crashed, and what happened was that there were essentially no jobs. I started a practice right out of grad school and I spent about two years working as a consultant with clients across the New York, New Jersey and Philadelphia area," said Lee. "That December, I wrote out everything I wanted to see myself doing in this practice and how I wanted to practice architecture, if I was going to. Frankly, I was a little disillusioned. I didn't know if I wanted to continue. I didn't believe that this profession cared about who I cared about."

In 2010, he got involved in coaching football as well as community activism and design with the community-based preapprenticeship program YouthBuild, at the University of Orange. While there, his work began in earnest in what has come to be known as "Design Justice," a movement that centers on new systems, spaces and models that address, mitigate, eliminate and repair injustice through design.

Lee has since become a recognized voice

in the movement, holding workshops across the country since 2015, and is both co-founder and co-organizer of Design as Protest (DAP). DAP is a coalition of design and arts activists and educators, with a core group that includes De Nichols, Michael Ford, V. Mitch McEwen, Sunni Patterson and Taylor Holloway leading the effort and focusing on the role of design in social issues, in particular racism.

"For every injustice in the world, there is an architecture, a plan, a design that sustains it," Lee remarked, citing a highway built through a thriving black community as only one example of many destructive urban renewal projects across the U.S. in the '60s. "In New Orleans, this highway infrastructure development resulted in the loss of 400 black-owned businesses and just as many live oak trees, cutting through the park spaces that tied the community together."

Engaging in the rigorous and creative inquiry that is central to the practice of architecture and design, in order to understand how spaces and places contribute to and manifest injustice, the DAP collective develops and disseminates an educational program tailored to empower designers and activists in the Design Justice movement. The data and research team at DAP is responsible for the development of the Design Justice Index, the definitions, concepts and frameworks that are the guiding foundation for practicing anti-racist design.

Building on his experience with DAP and

his work as Place + Civic design director for the Arts Council of New Orleans, in 2017 Lee launched Colloqate Design, a multidisciplinary Architecture + Design Justice practice focused on expanding community access to, and building power through, the design of social, civic and cultural spaces. Colloqate is now home to the Design Justice Platform to support the work of Design Justice in all its forms, whether as a not-for-profit design firm, educational platform or resource for designers and activists.

Lee presented a soon-to-be-published work on the Design Justice platform and movement at the Hillier College Design Showcase 2020. There, he laid out a clear set of principles to guide students and practitioners: honor the voices of an existing community that have the deepest knowledge of community needs; work to build collective power; develop roles and opportunities for community members to actively engage in the design process; understand the stories and history of a place that make it meaningful and valuable; seek to repair harms of the past; and always stay committed to getting to the root of the issues as expressed in the social spaces and places of the built environment.

Author: Amy Stinchcombe is communications coordinator at Hillier College of Architecture and Design.

BOHDAN C. HRYNIEWICZ '54 wrote

a book titled, *My Boyhood War, Warsaw* 1944, now available at Amazon. It includes a description of his time at NCE.

WILLIAM R. DEMMER '55 has

enjoyed retirement with his wife in south Florida for the last 25 years. Despite recent health issues, he enjoyed spending last Christmas with over 20 members of his family.

PHILIP F. MINALGA '66, M.S. '71

fondly recalls Professor Stelzenmuller, who opened his eyes to engineering design and helped him become an expert in filter design.

STEVE M. ROHDE '67 was recently announced as a member of the Society of Automotive Engineers' Contributor of the Year Class that recognizes engineers for their ongoing commitment and contributions to the organization and the entire mobility industry.

ROBERT A. ROSSI '67 has been elected a Fellow by the Board of the American Institute of Chemical Engineers, in recognition of his 53 years of diversified industrial chemical engineering practice and service to the profession. For the past 12 years, he has been a process engineering consultant to Carbon Engineering Ltd., in Squamish, British Columbia, Canada. The company is developing technology to directly remove carbon dioxide from the air to remediate climate change, and he has five related U.S. and Canadian patents. At NJIT, he was a board member of the Alumni Association and currently serves on the Industrial Advisory Board for the NCE Department of Chemical and Materials Engineering. In 2016, he received a Distinguished Alumni Achievement Award. He is forever grateful to NJIT for setting him on the path of professionalism, constant learning and service.

JOSEPH E. SALMON M.S. '68 has

been happily retired for several years, after a satisfying engineering career. Joseph and wife Ginny are enjoying life and cheering their grandchildren's achievements in school and on the soccer field.

JOHN E. TRAINA '68, M.S. '72 is

working on his third startup company, making machines that produce eyeglass lenses using the technology known as freeform surfacing. He will be introducing a new product next month, which will change the way lens blanks are held for machining. He was also proud to celebrate his 56th wedding anniversary with his wife Nancy.

JAMES J. CARROLL '69 was proud to receive professor emeritus status from the board of trustees of Georgian Court University. James retired from the university this year after 29 years, and 37 years in academia. He will continue to provide forensic services to the legal community.

1970s

HARRY T. ROMAN '70, M.S. '74 published his 30th IEEE USA E-book titled *Electrical Engineering Activities for Use in the Classroom*, for middle and high school students.

KENNETH C. SCHIFFTNER '70 is

an editor for the upcoming third edition of the *Air Pollution Control Equipment Selection Guide*. The new edition includes an extensive new section focused on maximizing the performance of the specific type of equipment selected. Previous editions have found homes on the reference shelves of engineers, regulatory personnel and air-pollution control-equipment operators and maintenance professionals.

KEVIN G. PAGE '73 plans to retire from his work in land development design next December.

RAJNI C. SHAH M.S. '78 is proud of his three children, including two doctors and one pharmacist.

MICHAEL R. CLARKE '81, M.S. '86

retired from the Ocean County Vocational Technical School after teaching computer science for 18 years. Previously, Michael worked as a senior computer systems analyst for Microwarehouse in Lakewood, N.J., and computer manager for UMA Shoe Company in Carlstadt, N.J. Michael served five years in the Air Force as a computer systems officer, five years in the U.S. Army Reserve as a weapons instructor, and three years in the Active Army as a military police dog handler.

PETER J. GRAZIANO '81 has retired after 40 years of working in the computer technology field. He plans to clean house, improve his health, spend time with his wife and pursue his passions of archery and bowhunting.

ROLANDO A. ORGUEIRA '82 is president of R.O.'S Electric Service, Inc.

ROBERT C. COHEN '83, M.S. '84, M.S. '87, president, Digital, Robotics, and Enabling Technologies at Stryker Corporation, spoke at the 2020 Irish Medtech Business Leaders Virtual Conference, a world-class event that brings together the world's leading business leaders and international experts on many pertinent topics including: medtech at the center of a health care revolution to deliver 'whole person health care,' new technologies, Ireland as a global hub for digital health, building stronger supply chains, the future of work and how leaders are responding to COVID-19.

GREGORY A. KELLY P.E., M.S. '91

has been named president and CEO of STV, a leader in providing engineering, architectural, planning, environmental



and program management and construction management services for transportation systems, infrastructure, buildings, energy and other facilities. In his new role, he is responsible for guiding the firm toward achieving its short- and long-term strategic goals with an emphasis on performance, business development, technology and human capital. He is based in New York.

MICHAEL W. WELLET P.E., C.P.E.,

'95, M.S. '01, CEO of Whitman, has accepted a board of advisers position at Seton Hall University's Stillman School of Business, with the school's Transformative Leadership Program. As a member of the board of advisers, Michael will participate in a curriculum development advisory role with his real-world experience providing hands-on training that prepares students to ask relevant questions, manage and lead others, and communicate opportunities and strategies.

MICHAEL J. HANRAHAN '96H

has been named a new principal of Clarke Caton Hintz. Michael is based at the firm's headquarters in Trenton, N.J., and earned the promotion after more than 20 years with the practice. He has led many of the firm's architecture projects, with a specialty in revitalizing historic buildings such as the Hunterdon County Courthouse, home of the famed Lindbergh baby kidnapping trial of the 1930s. He has been an active member of the New Jersey chapter of the American Institute of Architects since 1999 and rose to AIA-NJ president in 2011. Currently, Michael is working on the restoration of both Lambert Castle for Passaic County and the Hoboken Public Library.

THOMAS J. PETITE CERT '98,

M.S. '02 started a new role as vice president, Medidata Technology Program Management Office, at Medidata Solutions. He works directly with Medidata's product, engineering and service teams to ensure the implementation of agile processes and the execution of product delivery.

PRASHANTI ARRABOTHU M.S. '99

was a featured speaker at TechSparks 2020, a conference that brings together leaders from the tech industry, venture capitalists and women from all walks of life to give a boost to women's entrepreneurship.

SAMER J. HANINI '99, M.S. '04

is the founder and managing partner of Newark-based Hanini Group. He participated in the second episode of the *American Building* podcast by Michael Graves Architecture, which talked about the People's Bank Building, his recently completed 120,000-square-foot mixed-use project in downtown Passaic, N.J.

ED JIMENEZ M.A. '00 recently joined the Princeton University Office of Capital Projects management team. He is proud to contribute to the design and development of the new Lake Campus and preservation of main campus facilities. Since graduation, he has been fortunate to experience multiple building types and delivery methods working in the Philadelphia and Princeton area with FFMG, Hillier, AECOM and HDR.

BRUCE M. BELLAK '03, MMBA '05

took the PMP[°] exam in October and passed on his first attempt.

MATTHEW R. DOREY '06 has been employed by Presidio, Inc. as a senior account executive in the IT industry for the past eight years. He has been married for nine years to wife Megan, with whom he has proudly raised their 5-year-old daughter Emma.

APARNA J. SHAH M.S. '07, to

help make a positive difference in his community, has proudly begun to volunteer as a local government officer, in addition to his job in service delivery-IT. **ANDREW M. WOO '08** is proud to move into a new house!

DANIELLE L. GREEN M.S. '11 was accepted to the Leadership Psychology Doctorate Program at William James College in Newton, Mass., this past January. She recently became the chief operating officer of SPAN Parent Advocacy Network in Newark, N.J.

AMEY R. SAWANT M.S. '12 loves his job at LG Mobile. He is progressing professionally and enjoying the lack of red tape. "When you love what you do, it isn't work any more — it's passion!" Amey recommends not focusing on money in the beginning; focus on figuring out what you love.

HITESH MONGA '13 has enjoyed traveling the world after graduating, and is thankful that NJIT opened his eyes to the many opportunities he has pursued.

WILLIAM H. PENNOCK III '13H

spoke at NJIT's Engineers Without Borders (EWB) student chapter Oct. 1, 2020. William is a former EWB NJIT member and current mentor for the Ecuador Water Distribution project.

MATTHEW W. NAWN M.S. '14 has been managing the restoration of a former Newark city subway car for the nonprofit Baltimore Streetcar Museum in inner city Baltimore, Md., since 2014. This historic vehicle carried countless NJIT students and Newark residents from 1954 until it was retired in 2001. Upon completion of the extensive restoration work in 2021, the vehicle will return to operating condition and serve to educate current and future generations of museum visitors about public transportation, especially from Newark.

ANNA H. SRIGIRI '14 and **WILLIAM H. PENNOCK III '13H** are proud to announce the birth of their second child

1940s 1990s 2000s 1980s 1970s CLASS NOTES (1950s) 1950s

in June. William has also started a position as associate professor (tenure track) at NJIT in the Department of Civil and Environmental Engineering. They are proud NJIT sweethearts and happy to be part of the NJIT family for the long haul!

JUAN S. CORDOVA '15 is working on a \$113 million reconstruction project in Far Rockaway, Queens, N.Y., despite the pandemic. The project includes new underground sewers and water mains, and reconstruction of the streets, including a new community plaza. This is part of the New York City Department of Design and Construction's efforts to revitalize the area. He attributes his success to his NJIT degree, which encouraged him to work for the betterment of society.

CYNTHIA AHMED '17H is currently a third-year J.D. candidate at Harvard Law School. Cynthia is a proud firstgeneration Bangladeshi-American and an enthusiastic New Jersey native. She is also a proud product of the public school system, having attended public schools in New Jersey for her K-college education. At Harvard Law School, Cynthia currently serves as the president of the South Asian Law Students Association, vice president of the Muslim Law Students Association and Women of Color chair in the Women's Law Student Association, and is involved with various other law school activities. She is passionate about making Harvard a more inclusive, representative and supportive space for diverse people, in the full sense of diversity. As vice chair for policy, Cynthia strives to help students across the Harvard graduate schools build collaboration and successfully advocate for policy changes and initiatives that serve all of our communities.

RYAN J. CONWAY '17 has joined McCrone Inc. in its Salisbury, Md., office as a design engineer. Ryan joins McCrone from Vista Design, Inc., where he was a civil project engineer.

MARY GESCHWINDT '17H is pursuing a Master of Urban Planning at the Harvard Graduate School of Design.

SIXTO R. BAEZ MONEGRO M.S. '19

worked as a dishwasher when he first came to the United States. After receiving his degree from NJIT, he is now manager at New York City Transit, the largest transportation agency in North America.

IN MEMORIAM

John P. Humphrey '36 Joseph T. Kelley '49 Frank S. Gutleber '52 Frederick L. Johnson '54 Charles R. Yorio '54 Theodore L. Beeler '60 Roger F. Hone '60 Marvin S. Zigman '60 Arthur E. Fuerherm '64 Kenneth D. Meola '64 George D. Calder '66 Richard L. MacGregor '66 Donald J. Sime '68 Dennis R. Surbrug '70 John T. Olthof '74 Robert G. Kilian '76 Frederick E. Oliver '78 Nestor M. Nonato '79 John P. Fell '83 Ronald A. Sticco '85 Irving Pressley McPhail '15 HON

VJIT

Highlander History Project

The Highlander History Project is a record of favorite memories, heartfelt stories, anecdotes about professors and classmates, and campus recollections from NJIT alumni. The project, now complete, will compile these stories into a printed publication for alumni. **2,738 1**, respondents st

1,811 stories

635 photos

All alumni are invited to share their accomplishments and milestones for possible inclusion in *NJIT Magazine* at niit.edu/development/class-notes.

RECENT VIRTUAL EVENTS

Young Alumni Trivia Night

Virtual Holiday Wine Tasting

Cyber Resilience: Decrease Risk, Empower Growth

Virtual Celebration of Dr. Angelo Perna's Life and Legacy

Highlander Chat: Building Corporate Partnerships With Universities

Robert C. Cohen '83, '84, '87 Chairman, NJIT Board of Trustees President of Digital, Robotics, and Enabling Technologies at Stryker Corporation

Highlander Chat: Living Entrepreneurship

Marjorie A. Perry '05 MBA Chairwoman, NJIT Board of Overseers President and CEO, MZM Construction

Highlander Chat: Embodying the Spirit of Dr. Herman A. "Doc" Estrin

Alexis Telyczka '20 Inaugural Recipient College of Science and Liberal Arts "Spirit of Doc" Award

Virtual Tour of NJIT Campus

Presented by Juliana Schlichting '23 NJIT Student Ambassador

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The real-life Grovers Mill, in West Windsor, N.J., site of the 1938 radio version of The War of the Worlds.

HISTORIC SCIENCE FICTION OFFERS LESSONS FOR LIVING WITH PANDEMICS

Science fiction sometimes shows us the future, but really just shows us ourselves, asserts Associate Professor of Humanities and sci-fi aficionado Nancy Steffen-Fluhr.

She was teaching the 2014 novel Station Eleven, about a troupe of actors and musicians struggling for normalcy after a global pandemic kills most of the world's population, in spring 2020 right as COVID-19 formed in Asia, reached America and found its way to Newark.

"First time I ever taught it. I didn't know we were having a pandemic," joked Steffen-Fluhr, who teaches science fiction as a 400-level humanities senior seminar and a 300-level literature course. She is also director of NJIT's Murray Center for Women in Technology.

Station Eleven, by Canadian author Emily St. John, won Britain's Arthur C. Clarke award for best sci-fi book of the year and other prestigious honors. But it may have improved with age, due to relevance. It could be a warning, even though it has a happy ending where the main characters stumble on a community rebuilding itself. "The notion that you can see the future is a reassuring fantasy. But science fiction isn't really a window; it's a mirror. At its best, it creates a kind of metaspace from which we can see the shape of the present," Steffen-Fluhr observed. "But the future itself eludes us. Life is full of surprises, as we have recently been reminded."

She asked students what possessions they would want to take along if COVID-19 or some future pandemic ever became as bad as in *Station Eleven*. She was pleasantly surprised that they didn't automatically say their smartphones, instead desiring the information therein. Memories such as pictures, messages and gifts were the most common answers. For humankind, merely surviving a pandemic isn't sufficient if our new normal lacks social bonds, she said.

In good sci-fi, she observed, "There's an intense sense of existential vulnerability. It pulls the ground out from under our feet, even if it usually restores our sense of equilibrium at the end."

Too many pandemic stories use disease only as an excuse to bring on zombies or

special effects; however, there is plenty we can learn from more realistic science such as depicted in the 2011 film *Contagion*, Steffen-Fluhr said. "But it won't make you necessarily feel better," she added. The plot features heroic government leaders, which many people today would see as differing from reality.

Steffen-Fluhr also cited British author H.G. Wells' 1897 story *The War of the Worlds* — better known here in New Jersey for Orson Welles' 1938 variant as a radio drama, set at the real-life Grovers Mill in West Windsor Township — for its surprise ending where marauding Martians are revealed as utterly vulnerable to human germs.

"Science fiction rarely gets the future exactly right. It's more like a collective whistling in the dark. But the best of it reminds us that, for all our dreams of transcendence, we are part of the web of life and not outside of it — a good thing to remember as we put on our face masks each day."

Author: Evan Koblentz is an NJIT Magazine contributing writer.

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