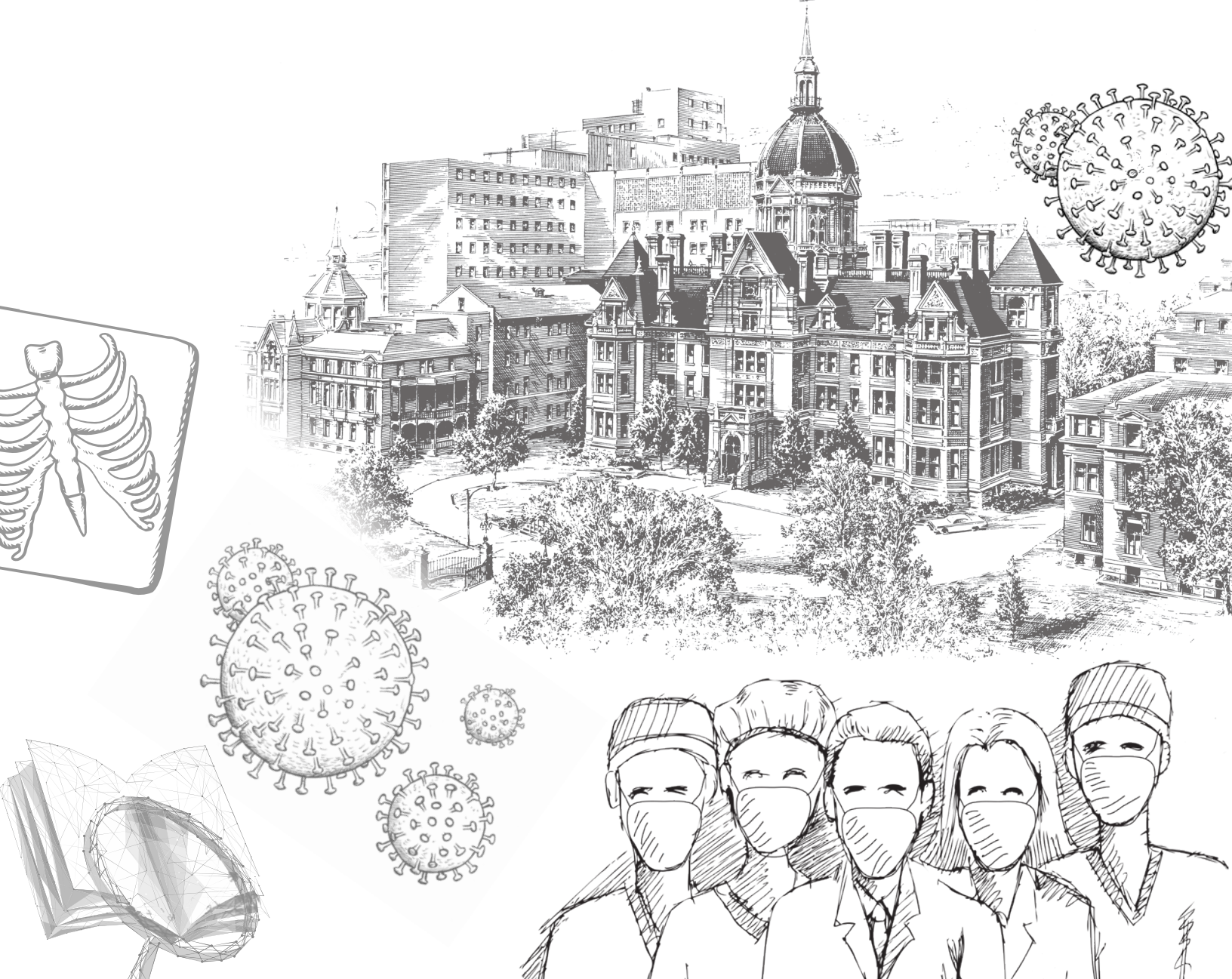


WINTER 2020



RadiologyUpdate

THE RUSSELL H. MORGAN DEPARTMENT OF RADIOLOGY AND RADIOLOGICAL SCIENCE



**The COVID-19
Response From
Across The
Department**
p. 4-5



**Establishing the
Medical Physics
Master's Program**
p. 7



**The Inaugural
Bearman and
Zerhouni
Professorships**
p. 13-15

CHAIR'S MESSAGE



Karen Horton, M.D.

The Johns Hopkins Department of Radiology and Radiological Science experienced an unprecedented year as we, along with the rest of the world, responded to the COVID-19 pandemic. Within radiology, our clinical teams, trainees, researchers and administrators came together as one team to care for our patients, the community and each other. It was truly inspiring to witness their dedication to clinical care while continuing to advance our goals of education and research.

I am particularly delighted to announce that two endowed professorships have been established this past year. **Pamela Johnson** is the inaugural recipient of the Sheldon B. Bearman, M.D. Professorship in Radiology, and **Hanzhang Lu** is the inaugural recipient of the Elias A. Zerhouni, M.D. Professorship.

These professorships allow innovative research and unparalleled mentorship to continue in the Russell H. Morgan Department of Radiology and Radiological Science while honoring the legacies of Drs. Bearman and Zerhouni. Additionally, I'm proud to note that a record number of Johns Hopkins radiologists were recognized by *Baltimore Magazine* and the *Washingtonian* as "Top Docs" of 2020. Congratulations to Drs. **Andrew Akman, Nafi Aygun, Nik Bhagat, Laura Fayad, Elliot Fishman, Kelvin Hong, Brian Johnson, Pamela Johnson, Steven Rowe, Harjit Singh, Lilja Solnes, and Abhishek Srinivas.**

CLINICAL

During the initial onset of COVID-19, many of our ambulatory sites shifted to a limited

capacity as we reassessed safety protocols and workflows to follow guidelines of the U.S. Centers for Disease Control and Prevention and the Johns Hopkins Hospital Department of Hospital Epidemiology and Infection Control. Our clinical staff members embraced the changes, and, through careful monitoring, we have safely transitioned to full services again.

We also continued to expand and upgrade our locations, finishing the Bethesda renovations and equipment upgrades. This upcoming year, we anticipate further expansion at Columbia.

RESEARCH

Despite the ramp down of on-campus research activities, our faculty members continued to actively apply for funding and

pivot to new avenues of remote work. They not only donated their own lab supplies for the frontline clinical teams but also coordinated a support network to create and donate cloth masks to faculty members and employees.

Grant funding progressed. Sixteen grants were awarded between April and June, and we acquired cutting-edge research imaging equipment, including the first magnetic particle imaging scanner on the East Coast and an optoacoustic scanner. Under Zaver Bhujwalla's leadership, we have been able to restart phase 1 of on-site research.

EDUCATION

For the second year in a row, our department was named #1 in *U.S. News & World Report's* best medical school rankings for radiology, and we have maintained our #6 ranking in Doximity's Residency Navigator, where nuclear medicine continues to be ranked #1.

Our residents and trainees have rallied together and embraced remote learning opportunities, including the use of virtual patient cases. **Elliot Fishman's** CTisus iPearls app won its second Minnie award as the Best Educational Mobile App. We also launched a new master's degree program in medical physics, spearheaded by **George Sgouros**, director of the radiological physics division, which is set to commence in Fall 2021.

After a challenging year, our department remains stronger than ever. We look forward, confident that our team will continue to overcome any additional challenges that may be heading our way. Enjoy the newsletter, and I welcome any of our alumni and donors to reach out to me with any questions.

Sincerely,

Karen M. Horton

Martin W. Donner Professor of Radiology

Director, Department of Radiology and Radiological Science

Mr. Johns Hopkins changed the course of history with one bold stroke of his pen by signing a will that would create The Johns Hopkins University.



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To learn more about these and other creative ways to support the Department of Radiology and Radiological Science, contact:

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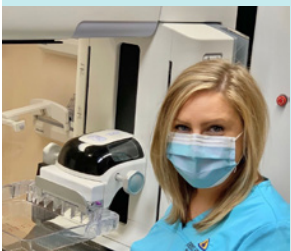
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Russell H. Morgan Department of
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Johns Hopkins Radiology B



Clockwise from top left: Interventional radiologists; radiologist in reading room; radiology nurses; MRI technologists, mammography technologist

CLINICAL

As COVID-19 spread across the world, the Johns Hopkins Radiology Department rose to the challenge of providing care during a pandemic. Faculty and staff members showed their dedication to providing high-quality patient care in many ways. Here are a few highlights.

Radiologists and the clinical team created an “Air Traffic Control” service to screen patients and map out safe imaging access. In conjunction with the Johns Hopkins COVID-19 Response Outpatient Clinic at Bayview, a dedicated imaging center was created. Select services were expanded out to Johns Hopkins hospitals as part of an integrated health system response to deliver safe and expeditious care.

Radiology technologists committed themselves to new screening, cleaning, and personal protective equipment requirements. They ensured all patients received care as safely as possible. During the first surge in COVID-19 cases, select Johns Hopkins Medical Imaging staff were redeployed to JHH Radiology and other JHMI sites to help.

Radiology nurses volunteered for the short-staffed ICU and acute care nursing units. Those with appropriate backgrounds learned updated unit, patient care, and documentation standards and changing infectious disease and PPE guidelines. Meanwhile, those who remained in radiology assisted with increased patient screening and maintaining operations. Radiology nurses and technologists also volunteered to train as transport and safety officers.

Interventional radiologists who normally perform procedures in the lab were deployed to COVID-19 units to perform bedside procedures. This allowed for less patient transport and increased safety for patients and staff. While working outside the department, radiologists stayed overnight and worked late to ensure patient care was met with the same high-quality standards.

Our radiology family worked in many ways to support each other during this pandemic, embracing our strategic goal of working like one organization.

attles COVID-19

RESEARCH

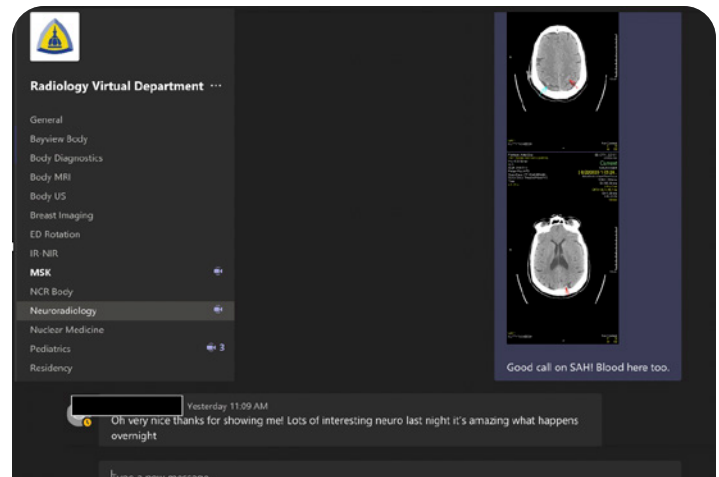
During the COVID-19 pandemic, Johns Hopkins Radiology has continued its research efforts while prioritizing the health and safety of all researchers, staff, and community members. When all but the most critical in-person research activities were shut down in March, this did not deter the Radiology research faculty, fellows, and staff who continued to remotely analyze data, publish manuscripts, and submit grant applications and progress reports.

Faculty members actively participated in virtual scientific meetings sponsored by the American Association for Cancer Research (AACR), the International Society for Magnetic Resonance in Medicine (ISMRM) and the World Molecular Imaging Congress (WMIC) and gave multiple scientific presentations and talks along with fellows. The COVID-19 Research Working Group was formed to coordinate information gathering, funding opportunities, and virtual meetings with outside experts to discuss Radiology's role in future projects.

Essential personnel ensured service center instruments and equipment were safely maintained, liquid nitrogen cell freezers were filled, and that the lab equipment was kept running smoothly. In mid-June, faculty and administrative staff formed the Radiology Research Restart Committee to plan lab density, develop reopening plans, commission signage and sort through additional information for the eventual return to in-person work in the lab.



Research faculty making masks to protect essential staff during shutdown



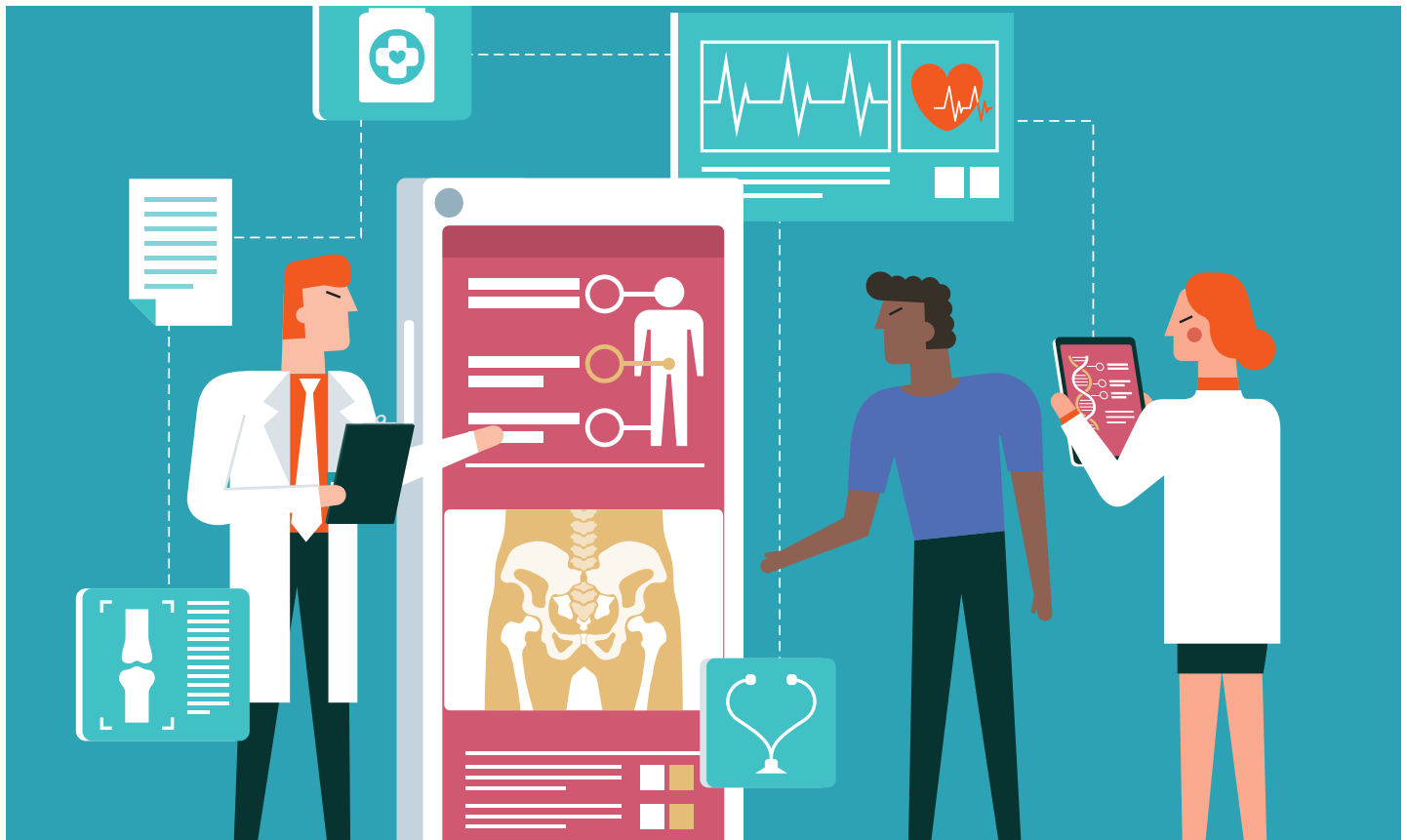
Neuroradiology residents' virtual meeting room

EDUCATION

With the shift to remote work, the Radiology Department prioritized community and connectivity for clinical faculty and trainees.

Video conferencing was rapidly adopted to mimic the interactions of a physical reading room as closely as possible. Division leaders became Zoom superusers in the beginning and then shifted to Microsoft Teams with the creation of a Radiology Virtual Department to support clinical and educational activities. Microsoft Teams allowed for divisions to have their own channels and for multiple meetings to happen simultaneously. Participants could view activity within their own channel and the presence of those outside the channel. There are now more than 70 users per day participating in educational activities and clinical meetings. The channels also serve as a virtual water cooler and facilitate a sense of community through the chat and post functions.

Faculty leaders of the resident team also created a call-prep curriculum to help first-year residents manage safety guidelines and schedule changes. In preparation for their required overnight calls, the format included real-time feedback and constant communication with the chief residents to ensure they were fully supported.



Residency Update: A Silver Lining in the Pandemic

Prior to the advent of COVID-19, radiology residency director **Lilja Solnes** was already working tirelessly to ensure the residency program was on top of its game. Ensuring that Johns Hopkins’ radiologists remain among the best trained in the world requires that they be trained in the latest techniques and technologies.

Long before the pandemic, Solnes and her team were exploring using Zoom video conferencing software to create virtual classrooms where residents could attend lectures and pose questions as if in a real-world classroom. The pandemic altered the trajectory of that evolution.

“The pandemic forced us into overdrive in refining these technologies as quickly and incorporating them as broadly as possible in the department,” Solnes says.

In that regard, COVID-19 produced one surprising outcome that Solnes had not anticipated: a lack of patients. Fearful of contracting the virus in a hospital

setting, people were not showing up in emergency rooms and even for regular appointments. This is a problem for a residency program.

“You need a certain volume of cases for residents to learn,” Solnes says. So she did what an enterprising residency director does: She adapted.

Along with her associate program director, **Cheng Ting Lin**, Solnes developed a series of virtual patients for their first-year residents to evaluate. These patients were based on real-world cases and were intended to present the sort of complexity and variety that a first-year resident might encounter in a busy hospital. With a dearth of patients and the strictures of social distancing paramount, the old in-person model had to be transferred to the virtual environment.

While this process was a learning experience for Solnes and for the residents, it was most profound for the faculty, many of whom were

unaccustomed to live video conferencing technologies.

“Basically overnight, we had to get everyone on Zoom,” Solnes says. “I have to say that the faculty were amazing because they just stepped in and learned how to use it, which really showed their commitment to education.”

In many ways, she says, the virtual learning platform significantly enhances the traditional teaching model at Johns Hopkins. Because the institution has long-term patient data on the cases presented virtually and can present the same case to each resident as a “new” case, it makes it much easier to assess whether a resident has correctly read a study and how they are performing relative to their peers.

“As a silver lining to the pandemic, we now plan to incorporate more virtual learning and platforms in our educational program,” Solnes says.

Medical Physics: A Rapidly Evolving Field

The remarkable evolution of medical imagery and radiotherapy over the last several decades has yielded a panoply of sophisticated machines that provide unprecedented insight into patient physiology and powerful treatments for serious diseases.

Most radiologists, however, are trained to evaluate the product of these sophisticated machines — the images — or to use them to fight disease, not necessarily to understand how the technologies work nor how to ensure that the multimillion-dollar machines are performing optimally. That important

task is the purview of the medical physicist, says the director of the master's degree program in medical physics,

George Sgouros.

“Our job is to train medical physicists to be responsible for quality control and maintenance of diagnostic equipment, CT scanners, X-rays, MRI scanners, single-photon emission CT — virtually everything involved in imaging patients,” Sgouros says.

One really big part of the field is supporting external beam radiotherapy, which treats cancerous tumors. It is the medical physicist's role to ensure exact

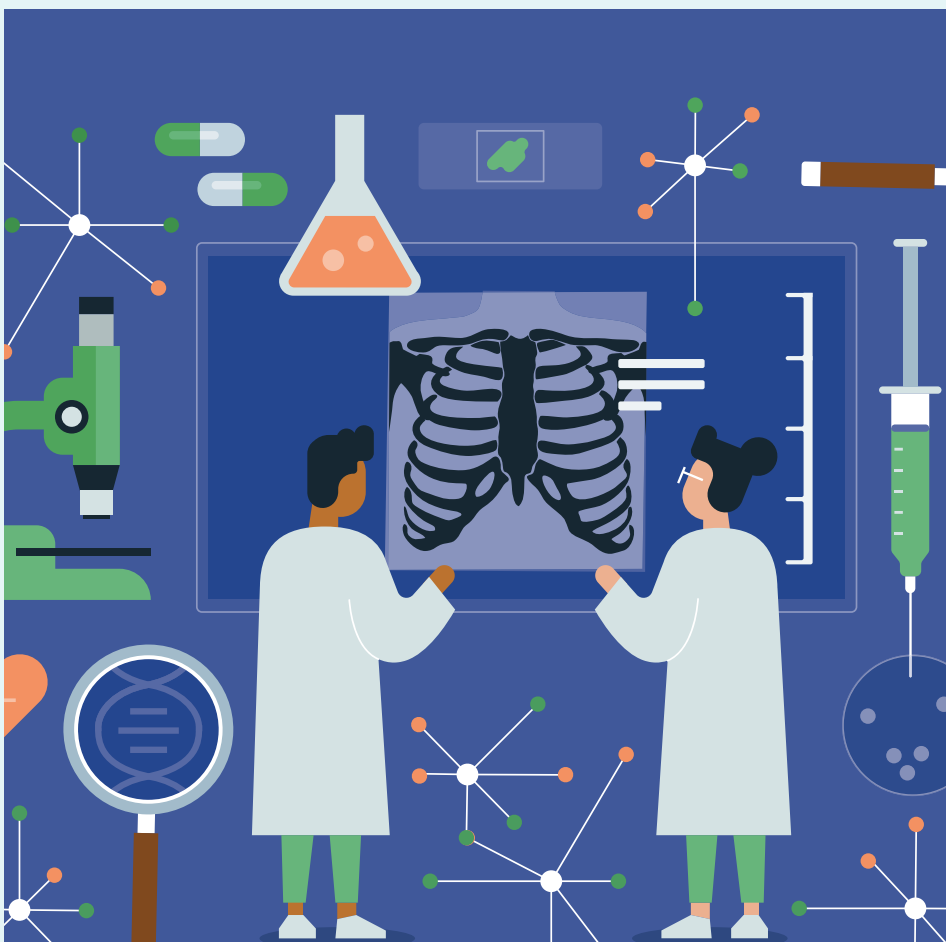
dosage of radiation to guarantee effective treatment without the potential harm that too much radiation might cause.

“We train medical physicists how to come up with a plan to orient the radiation beams, to specify how long they're on, how the beam is shaped and so forth,” Sgouros says. “This is very precise work that can have detrimental outcomes if not performed with great skill.”

One of the newest and most exciting areas in medical physics in recent years, Sgouros says, is radiopharmaceutical therapy, in which radiation is delivered not by a beam from outside the body but by attaching radioactive atoms to molecules that are delivered through the bloodstream directly to the tumor deep inside the body.

“This field bridges the diagnostic and therapeutic physics,” Sgouros says. The student, he says, must be well-versed not only in the physics of radiation delivery and the biology and physiology of radioactive molecules delivered through the blood but also in how tumors and normal tissues respond to radiation. If that were not enough, all that knowledge must then be combined with nuclear medicine imaging physics.

The complexity of science explains the fact that Johns Hopkins will be offering the only radiopharmaceutical therapy training program in Maryland. “These students are entering a very promising field at the outset,” says Sgouros.



Improving Care, Lowering Costs



Effective Jan. 1, 2021, the Protecting Access to Medicare Act imposes new requirements for providers who want to prescribe a CT, MRI or nuclear medicine study for a Medicare fee-for-service patient.

Under the regulations adopted by the Centers for Medicare and Medicaid Services (CMS) to implement the new law, ordering providers must consult an interactive electronic tool called a clinical decision support mechanism (CDSM) to ensure that the scan or test is medically warranted. Each CDSM must be approved by CMS.

The CDSM tool, in turn, relies on a set of guidelines known as appropriate use criteria (AUC) that assess the appropriateness of the scan or test. AUC are evidence-based rules that can only be developed, modified or endorsed by qualified, provider-led entities that have demonstrated that they can meet stringent requirements specified by CMS.

“It’s a pretty complicated system, but it is designed to protect patients from expensive tests unless they are necessary,” says **Pamela Johnson**, a professor of radiology and radiological science and the vice president of care transformation for the Johns Hopkins Health System.

Johnson recently led an effort to see the Johns Hopkins University School of Medicine named as one of a handful of leading organizations tapped to develop AUC. Unlike many other health systems, at Johns Hopkins, the AUC are woven into diagnostic and care management guidelines that reach beyond medical imaging to include other tests and treatments. As an illustration, Johnson points to the Johns Hopkins University back pain guideline that not only guides appropriate imaging but might also help reduce the overprescription of opioid medications and guide the patient to an appropriate specialist.

“What this means in practical terms is that we don’t have to rely on criteria developed by another organization,” Johnson says. “Johns Hopkins gets to write its own rules based on high-quality evidence to decide when we think imaging or another medical procedure is appropriate.”

It was a huge effort across the enterprise, Johnson says. It took months just to get the green light from CMS to develop criteria. Then, she had to assemble a team of 40–50 doctors from multiple specialties to research and develop the evidence-based criteria, with

consensus from all participating Johns Hopkins-affiliated entities. Johnson says the group met three to four times each week for the six months it took to assemble the initial set of rules.

Johnson counts it as a big win for the Johns Hopkins School of Medicine, and now that the rules are published, she says Johns Hopkins will share its best practices with other organizations. Most importantly, Johnson notes, being in the driver’s seat translates directly into better patient care.

“Having the legal authority to develop our own appropriate use criteria has had unforeseen benefits,” Johnson notes. The team is now building out the library of AUC beyond the CMS 8 Priority Clinical Areas (headache, neck pain, low back pain, shoulder pain, hip pain, coronary artery disease, pulmonary embolism and lung cancer), to other common clinical scenarios, like knee pain and abdominal pain.

The original CMS 8 Priority Clinical Areas cover about 40% of advanced imaging orders, providing a strong foundation for a data driven expansion strategy that best serves our patients and providers. ■

ALUMNI RECEPTIONS

The Johns Hopkins Radiology Alumni Reception at Radiological Society of North America (RSNA)

In December 2019, the Russell H. Morgan Department of Radiology and Radiological Science held its annual alumni reception at R29 in the Franklin building in Chicago. The gathering reflected the ever-growing size, diversity and strength of the Johns Hopkins radiology community.

A global network of alumni were in attendance, as were numerous Johns Hopkins faculty, residents and fellows.



RSNA 2019: Zaver Bhujwala, Stacey Baldwin, Clifford Weiss, Pamela Johnson, Mahadevappa Mahesh

The Johns Hopkins ASNR20 Zoom Reunion

The Division of Neuroradiology in the Russell H. Morgan Department of Radiology and Radiological Science held its annual alumni reunion in June via Zoom. The virtual event was an opportunity for alumni, current faculty, residents and fellows to catch up and network with former colleagues and friends.



RSNA 2019: Karen Horton, Elliot Fishman, Katarzyna Macura

Contribute to the Johns Hopkins Radiology Alumni Association

We count on members like you to fund and enhance our programs and initiatives. Your tax-deductible contribution (\$100 annual dues suggested) helps us fund the latest advancements in radiological technology and specialized training for our physicians, residents and fellows.

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Thank you for your support!

ASNR20 led by Haris Sair



Artificial Intelligence

Transforms COVID-19 Radiology

As part of a multidisciplinary group working to better predict the trajectory of COVID-19-positive patients once admitted to the hospital, **Bharath Ambale-Venkatesh**, an assistant professor of radiology and radiological science, has turned to artificial intelligence (AI) to make sense of the vast amount of patient biomarkers now available.

Ambale-Venkatesh was involved previously in the Multi-Ethnic Study of Atherosclerosis, which used similar AI techniques — in particular, machine learning and deep learning — to analyze MRI scans, electrocardiograms, blood tests, patient surveys and histories from 3,000 people to determine which of 35 different markers best predicted patient outcomes.

His collaborators on the COVID-19 work include experts from the Cardiovascular Imaging Core Lab and statisticians from the Bloomberg School of Public Health. They have access to patient data through Johns Hopkins CADRE (COVID-19 and Data Research Evaluation). The researchers' goal is to comb through more than 1,000 markers for COVID-19 that are currently available to determine which are the most clinically useful for predicting not just disease progression, but a patient's likelihood of survival.

"When COVID-19 first happened, there was a lot of uncertainty about who survives and who doesn't. Age was a big marker, but everything outside of that was largely unknown," Ambale-Venkatesh says of the ongoing AI effort.

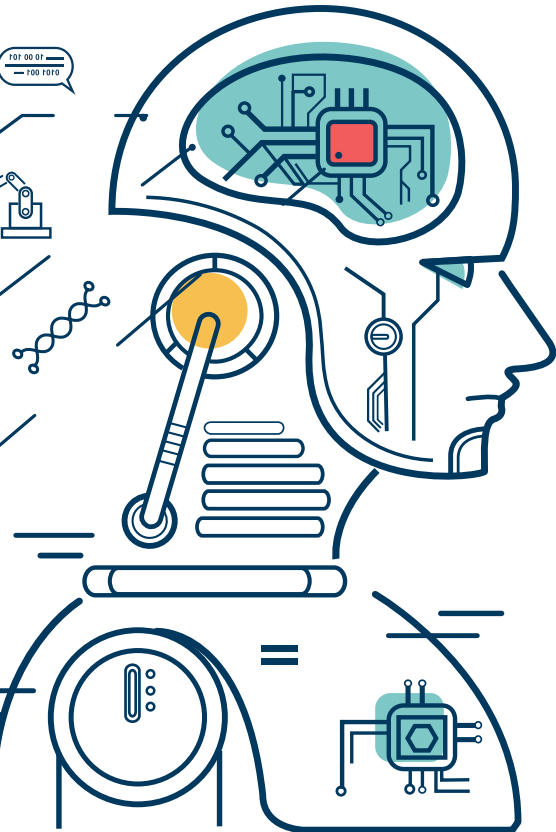
Early on in the pandemic, Ambale-Venkatesh prioritized X-ray scans and

EKGs for COVID-19 diagnosis, as the accuracy of existing tests was unreliable. As reverse transcription polymerase chain reaction testing for the disease continues to become more accurate, the role of imaging evolved to keep pace. Now, X-ray scans and EKGs are used to determine the severity rather than the presence of the disease.

The fundamentals involved in analyzing these markers has remained the same, but the field of radiology (like others in medicine) is learning new things along the way. The challenge is in adapting to that ever-changing understanding of COVID-19, according to Ambale-Venkatesh. "I have never worked on a clinical condition whose understanding evolves as fast," he says.

In this work, Ambale-Venkatesh was one of the earliest applicants to tap into CADRE, which pulls directly from patient electronic health records across five Johns Hopkins Health System hospitals. In particular, the availability of X-rays and EKGs within 24 hours of the patient being admitted has increased doctors' effectiveness in identifying key COVID-19 markers.

Ambale-Venkatesh foresees the lessons learned from COVID-19 to be lasting — yielding information that he and others will be studying for many years to come. As such, he has worked to assimilate his COVID-19 findings into his existing research. "I don't think of COVID-19 so much as an interruption to what I was working on already," he says, "but rather important work that will become a big part of imaging and clinical studies across many fields." ■



“When COVID-19 first happened, there was a lot of uncertainty about who survives and who doesn’t. Age was a big marker, but everything outside of that was largely unknown.”

—BHARATH AMBALE-VENKATESH

Newly Renovated Imaging Suites

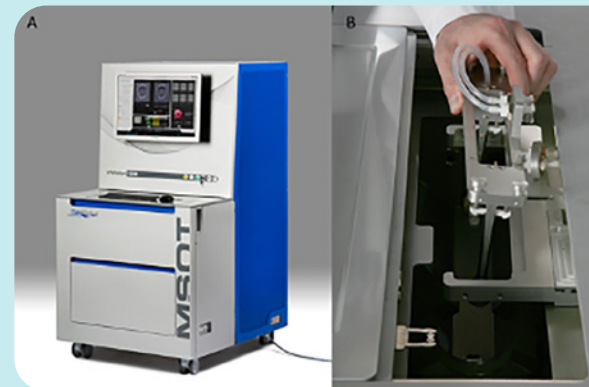
Johns Hopkins Medical Imaging at Bethesda has undergone a striking renovation of its main waiting areas and exam rooms, with more to come for the dedicated women's imaging suite. This includes brand-new equipment, including 3T and 1.5T MRI, CT, and X-ray to allow for further expansion of services. The waiting areas reflect the importance of integrating imaging as part of a patient's wellness journey. Thanks to the dedication of the Bethesda team, patients could continue to receive excellent care throughout the construction process and the new design now reflects a positive environment that matches the high standards of quality and safety that Johns Hopkins always provides.



Research Acquisitions and Progress

In a multidisciplinary team effort under the leadership of Vice Chair of Research **Zaver Bhujwala**, investigators from Radiology and six other departments across Johns Hopkins University successfully submitted a National Institutes of Health High-End Instrument application to obtain funding to purchase the iThera MSOT inVision 512-echo scanner. It was installed in September 2020 in dedicated space within our brand-new satellite facility in Cancer Research Building 2 (CRB2).

The MSOT inVision 512-echo is the first and only tomographic OA imaging system that integrates simultaneous tomographic optoacoustic and



tomographic reflection mode ultrasound acquisitions. It will significantly advance the ability of Johns Hopkins faculty to understand and treat human diseases. The integration of the MSOT scanner within the multimodal imaging abilities of the MRB Molecular Imaging Service Center and Cancer Functional Imaging Core will significantly advance current and future research efforts of the faculty.

Radiology History: Evolving Role of the Technologist, First Fifty Years

BY BOB GAYLER

The word community has always been closely associated with the Radiology Department at Johns Hopkins and is perhaps most evident in the close relationship between radiologists and technical staff members.

The fundamental nature of this key relationship was established more than 100 years ago when **W. Ross Mitchell** became the first technical staff member in the division, hired by pioneering physician **Frederick H. Baetjer**, the head of the X-ray division at Johns Hopkins. **William Halsted**, professor of surgery had selected Baetjer to direct the X-ray division in the Department of Surgery. Since those days, the division became a department in 1946 and has grown into an organization of expert staff of radiologists, technologists, nurses, and support staff to bring essential, often

life-saving imaging and therapy services to patients.

Mitchell had a background as a photographer and became adept at the myriad technical requirements of early use X-ray methods — mixing chemicals, developing glass plates and conditioning X-ray tubes.

“The first X-ray plate I developed was from a gastrointestinal series. When I put it in the tray of developer and started to gently rock it back and forth, I wondered what the doctors could make out of all those shadows which began to appear,” Mitchell recalled in a 1969 interview with **Rosemary Longo**, a 1965 graduate of the Johns Hopkins School of Radiologic Technology.

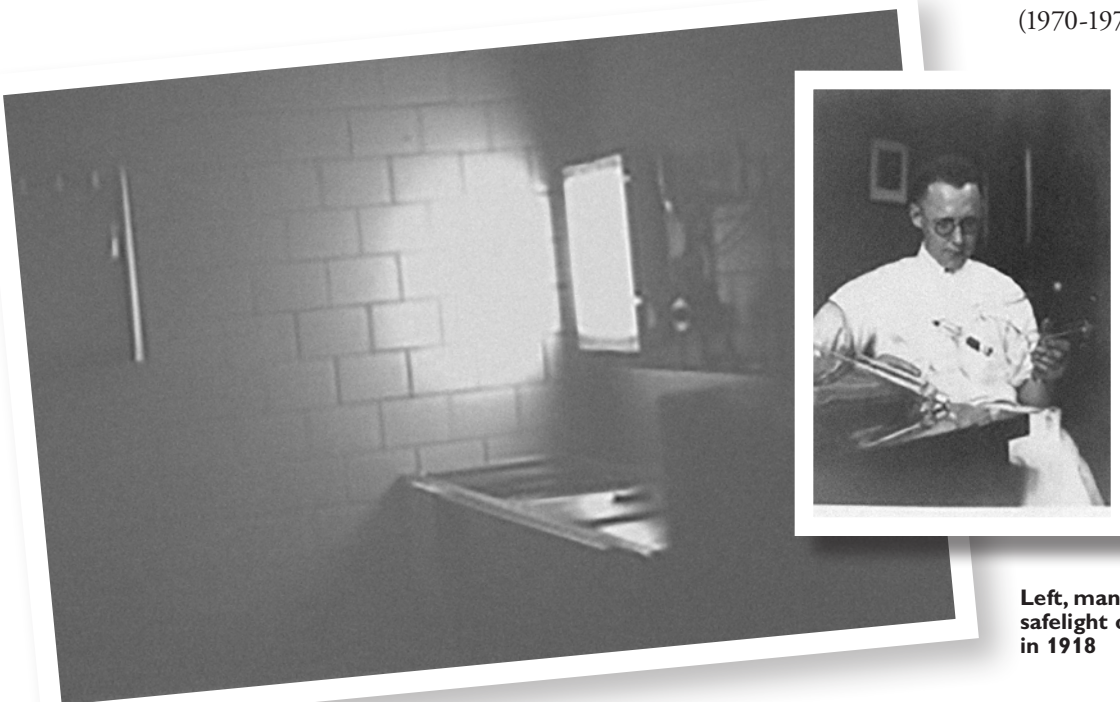
At the time, Mitchell was one of only three non-physicians in the division;

the others were a secretary and an orderly. In the early years, nurses began to learn the skills that Mitchell had honed—how to operate the equipment effectively and safely, the intricacies of chemically processing X-ray plates initially, then film, and the fine art of patient positioning for imaging with safety.

In 1939, technologist training became more formalized with the launch of a distinct program by chief radiologist **John Pierson**. The division added new roles to support increasing exam volumes and needs for prompt image availability in the operating rooms. The role of technologists and other support staff was so fundamental to the smooth functioning of the department that renowned radiologist **Russell Morgan**, former chairman of the department (1946-1970) and then dean of the Johns Hopkins University School of Medicine (1970-1975), once described clerk/

darkroom technician **Peggy Sutton** as the most important person in the department.

That expression of the importance of the team has only grown with the advent of new imaging and therapeutic applications in recent decades. ■



Left, manual processing darkroom with safelight on, and right, **W. Ross Mitchell** in 1918

A Matter of Pride

When **Sheldon Bearman** completed his radiology residency at the Johns Hopkins University School of Medicine in 1974, he had already published five peer-reviewed articles — three on diagnostic ultrasound, which appeared in the esteemed journal *Radiology* — plus completed a presentation before the Radiological Society of North America.

“A presentation like that is an honor for a resident,” Bearman says now. “I discussed the differential diagnosis of pediatric abdominal masses.”

Bearman attributes this personal accomplishment to the remarkably collaborative environment he experienced during his residency years at Johns Hopkins.

Today, Bearman is retired and looks back at that period as one that set his career on a notable upward trajectory. Bearman became a leader in the then-emerging field of ultrasound, and later CT and MRI, as part of a distinguished career in private practice.

His career included election as a fellow of the American College of Radiology and tenures as president of the medical staff of Franklin Square Hospital in Baltimore, chair of the department of imaging at Northwest Hospital Center, president of the Baltimore County Medical Society, and treasurer of the Maryland State Medical Society. Bearman also served on boards of multiple nonprofit organizations. In between those duties, he managed to maintain ties to the schools of medicine at Johns Hopkins and the University of Maryland as a part-time faculty member.

Recently, the Herbert Bearman

Foundation, a Baltimore-based philanthropic organization that provides funding for projects that seek to improve the lives of individuals living in greater Baltimore, South Florida and Israel, endowed the **Sheldon B. Bearman, M.D. Professorship** in the Russell H. Morgan Department of Radiology and Radiological Science. The university named **Pamela Johnson** as the inaugural recipient of the Bearman Professorship. Johnson is vice chair of quality and safety, a professor in the Department of Radiology and Radiological Science, and vice president of care transformation for the Johns Hopkins Health System.

This permanent endowment generates income each year to allow the chairholder to pursue radiological research as well as encourage original resident research that would be difficult if not impossible without the dedicated funding. Bearman was particularly interested in ensuring that the endowment sets aside time for the recipient to teach and mentor the next generation of residents and fellows, passing on their expertise and skills to future radiologists, as his mentors did for him.

“Dr. Bearman was instrumental in the early development and adoption of ultrasound here,” notes **Karen Horton**, director of the Department of Radiology and Radiological Science. “He was a visionary, and he and his family have been longtime supporters of our department, dedicated to helping us advance our education mission.”

Says Bearman, “In talking it over with department chair Dr. Horton, there were



Left, Pamela Johnson, M.D.



Sheldon Bearman, M.D.

several possibilities as to what to do with the professorship. The one that appealed most to me was to promote resident research, so that residents could get involved, like I did. That early opportunity gave me a certain start that I think others should enjoy.”

In that respect, Johnson has been ranked by the Johns Hopkins radiology residents as the number one educator in the department multiple years, recognized by the international Aunt Minnie organization as the Most Effective Educator in the world in 2017 and awarded the Costs of Care Teaching Value Award in 2018. During her four years serving as residency director, in 2016, during Johnson’s tenure as residency director, the Radiology Residency Program at Johns Hopkins was selected via a national poll on Aunt Minnie as the best in the country.

“That’s the great thing about Hopkins,” Johnson says of the specific focus of the professorship. “I was a resident here, and it’s a very nurturing place.”

“I take pride in my time at Hopkins,” Bearman says. “I think it was a great boost to my career. I received top-notch training, but most of all, opportunity. Hopkins is a good thing for the world, and I want to see that legacy continue.” ■

A Journey of Discovery

To most American families, the notion that a child might aspire to be a doctor would be met with peals of glee, but for the parents of **Elias Zerhouni**, this was not quite the case. His father and mother held other aspirations for their child.

“I was steeped in an environment where education was of primary importance,” Zerhouni recalls. “My father, a mathematician and physicist, was more enamored with science and engineering than he was with medicine or law. He thought I should go in that direction. My mother agreed.”

Zerhouni didn't necessarily disagree. He pursued math and physics with zeal in high school. But a stint volunteering with the rural poor in the mountains of Algeria led the young Zerhouni to an epiphany of sorts.

“I saw the poverty and the people suffering from tuberculosis, having no doctors and no way to get treated. I was touched by that,” Zerhouni says of his decision to enter medicine.

After completing his medical degree at the University of Algiers, he decided to take the American board exams, almost on a whim, despite knowing little English. When his scores returned, his mentors at the University of Algiers were stunned to learn he had passed on his first attempt — the first-ever student at the university to pass the American exams.

Soon, Zerhouni was off to Baltimore to become a resident in radiology at the Johns Hopkins University School of Medicine. He became chief resident, a



Elias Zerhouni, M.D.

Hanzhang Lu, M.D., right

professor, director of the Russell H. Morgan Department of Radiology and Radiological Science, and eventually vice dean for clinical affairs and research for the school of medicine while conducting field-altering research. In 2002, he was nominated by President George W. Bush to head the National Institutes of Health (NIH), a position he held until 2008.

In 2009, Zerhouni became a senior fellow at the Bill & Melinda Gates Foundation and concurrently served as one of the country's first presidential science envoys under the Obama administration to foster scientific and technological collaboration with other nations. Starting in 2011, he held the position of president for global research and development at French pharmaceutical company Sanofi, until his retirement in 2018. Since March 2019, Zerhouni has served as professor emeritus and special adviser to the Dean/CEO.

Before launching that illustrious

career in medicine, Zerhouni sheepishly admits he almost quit medical school, finding the field too rote and the science unexciting, just as his father had predicted. It was only when his uncle, a fellow radiologist, showed him the world's first CT scan that everything changed.

“I thought, this is exactly what I want — a mix between physics, mathematics, computer science, biology and medicine,” Zerhouni remembers. “For me, it was a revelation.”

Upon completing his tenure at NIH, Zerhouni returned to the friendly halls of Johns Hopkins, where he continued to teach, conduct research and see patients.

“Dr. Zerhouni is legendary at our institution — first as a resident, then as director of radiology and later as head of NIH. His legacy is one of excellence and innovation,” says **Karen Horton**, director of the department. “We are grateful for his continued support of the Hopkins mission. I truly value his investment in and loyalty to our department.”

Recently, a new professorship was endowed in the department — the **Elias A. Zerhouni, M.D. Professorship**, established with donations from Elias and Nadia Zerhouni, alumni, faculty members and colleagues. The income from the endowment allows the recipient to focus additional time on teaching and mentoring future generations of radiologists.

“Hopkins is my home away from home. I have the deepest admiration and respect for the institution. It's my intellectual family. There's no other place in America that I would rather have a professorship with my name affiliated,”



Zerhouni says of this honor.

The inaugural recipient of the professorship is **Hanzhang Lu**, professor of radiology and chief of the neurofunction section of the magnetic resonance research division. Lu is an internationally recognized leader in MRI of brain function and physiology who has developed new MRI techniques to evaluate the brain's vascular physiology,

metabolism and function, and their clinical applications.

"It is an honor and a privilege to be the inaugural recipient of the Zerhouni Professorship, as it will provide the resources for me to pursue innovative and groundbreaking advances in the field of MR research, with the ultimate goals of improving patient care and training the next generation of leaders in

the field. I am truly grateful to be part of this meaningful way to honor Elias Zerhouni's legacy and dedication to the field," says Lu.

"Dr. Lu represents the future in brain sciences," says Zerhouni. "This is the real last frontier of cognitive sciences and neurosciences, and he is an emerging leader in the field." ■

CONVERSATION SERIES

Leading Change: Perspectives from Outside of Medicine

THE RUSSELL H. MORGAN DEPARTMENT OF RADIOLOGY AND RADIOLOGICAL SCIENCE presented another installment of the series "Leading Change: Perspectives from Outside of Medicine."

The series invites business leaders to speak to the Johns Hopkins community about their expertise offering high-quality services and experiences to customers and how that can be translated to medicine. Lectures switched to an online format during the COVID-19 pandemic; we welcome your virtual attendance. Additional 2021 speakers will be announced soon.

For more information, please contact Stephanie Blackwood at 410-955-5173 or sblack29@jhmi.edu. ■

2020–2021 Lecture Series:



Michel Ballard
Vice President/
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Data Products
at Conde' Nast,
on Leadership:
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William Brody
Former President
of Johns Hopkins
University and Salk
Institute,
"Brother, can
you spare me a
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to know about
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Bonita Stewart
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bit.ly/1UOaHSb, along with comments from current residents or recent graduates. Read the great things that our trainees are saying about the Johns Hopkins diagnostic radiology program bit.ly/2xwdESp. If you would like to participate in this process in the future, simply register as a Doximity member at this link: bit.ly/2PN3Yu7.

Ways to Give...

For those interested in making a tax-deductible contribution in support of any program or research project in the Russell H. Morgan Department of Radiology and Radiological Science, please contact the Development Office at 443-287-7958 or cvera3@jhmi.edu, or visit <https://bit.ly/RadGiving>.

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