BOSTON UNIVERSITY Department of Electrical & Computer Engineering

ECE 2022 FALL NEWSLETTER

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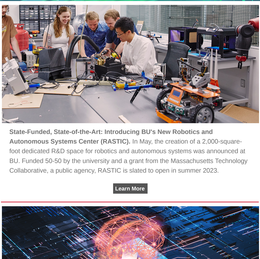

State-Funded, State-of-the-Art: Introducing BU's New Robotics and Autonomous Systems Center (RASTIC). In May, the creation of a 2,000-square-foot dedicated R&D space for robotics and autonomous systems was announced at BU. Funded 50-50 by the university and a grant from the Massachusetts Technology Collaborative, a public agency, RASTIC is slated to open in summer 2023.

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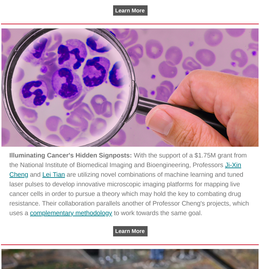

MADE with Machine Learning: With the help of advanced, physics-informed machine learning (PIML) techniques, Professors Enrico Bellotti & Luca Dal Negro are setting out to transform the status quo of electronic device design, with the support of a $2.5M grant from the Army Research Office. They plan to use the development of UWBG semiconductor devices capable of operating in the millimeter-wave frequency spectrum with 10x the power density as a test case.

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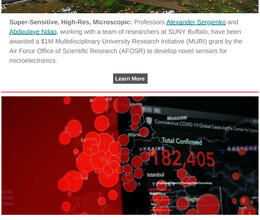

Illuminating Cancer's Hidden Signposts: With the support of a $1.75M grant from the National Institute of Biomedical Imaging and Bioengineering, Professors Ji-Xin Cheng and Lei Tian are utilizing novel combinations of machine learning and tuned laser pulses to develop innovative microscopic imaging platforms for mapping live cancer cells in order to pursue a theory which may hold the key to combating drug resistance. Their collaboration parallels another of Professor Cheng's projects, which uses a complementary methodology to work towards the same goal.

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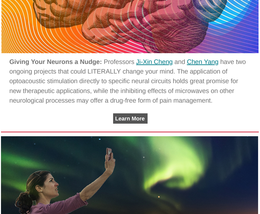

Super-Sensitive, High-Res, Microscopic: Professors Alexander Sergienko and Abdulaziz Nijlas, working with a team of researchers at SUNY Buffalo, have been awarded a $1M Multidisciplinary University Research Initiative (MURI) grant by the Air Force Office of Scientific Research (AFOSR) to develop novel sensors for microelectronics.

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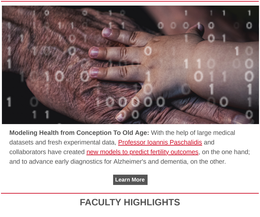

Preventing the Next COVID-19: A multidisciplinary team of BU researchers have come together to predict and prevent future pandemics with the assistance of a $1M NSF grant. Professor Ioannis Paschalidis, one of the Primary Investigators on the project, will bring his extensive experience with predictive healthcare models to bear on the problem.

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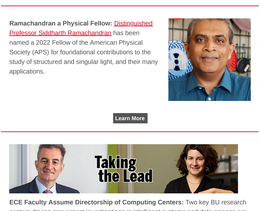

Giving Your Neurons a Nudge: Professors Ji-Xin Cheng and Chen Yang have two ongoing projects that could LITERALLY change your mind. The application of optoacoustic stimulation directly to specific neural circuits holds great promise for new therapeutic applications, while the inhibiting effects of microwaves on other neurological processes may offer a drug-free form of pain management.

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Missed A Turn? There Might Be a Storm in Space. With support from NASA, Professor Toshi Nishimura is leading the most comprehensive study to date on scintillation, an ionospheric phenomenon that interferes with GPS signals. An improved understanding of scintillation will be essential to circumventing its effects on the technology that has become so critical to most people's daily lives.

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Modeling Health from Conception To Old Age: With the help of large medical datasets and fresh experimental data, Professor Ioannis Paschalidis and collaborators have created new models to predict fertility outcomes, on the one hand; and to advance early diagnostics for Alzheimer's and dementia, on the other.

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FACULTY HIGHLIGHTS

Another Feather in an Ample Cap: The Materials Research Society named eminent Professor Emeritus Theodore Moustakas to their 2022 class of fellows, becoming the latest in a lengthy list of institutions to pay tribute to his career and its impact on industry and society.

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Ramachandran a Physical Fellow: Distinguished Professor Siddharth Ramachandran has been named a 2022 Fellow of the American Physical Society (APS) for foundational contributions to the study of structured and singular light, and their many applications.

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ECE Faculty Assume Directorship of Computing Centers: Two key BU research centers driving convergent investigations in intelligent systems and data science are now under the leadership of ECE faculty. Professor Ioannis Paschalidis has been appointed director of the RAIK B. Hariri Institute for Computing, while Professor Ayse Coskun has taken the helm of the Center for Information & Systems Engineering.

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