Center of Excellence
WIRELESS AND INFORMATION TECHNOLOGY
AT STONY BROOK UNIVERSITY

NEWSLETTER
MAY 2017

Stony Brook University Incubator Showcase 2017, Our Economic Development Ecosystem, Next Generation Tech, Hearing Data

CEWIT is an unparalleled resource, advancing the science and technology underlying the next epoch of the information revolution.

Office of Economic Development

INCUBATOR SHOWCASE 2017

JUNE 8, 2017 · 9:00AM · CEWIT

Join us for an exclusive opportunity to meet Stony Brook University's 50+ member incubator companies and experience first-hand, the technologies our entrepreneurs are developing and introducing to the marketplace.

Special guest speaker Brian Keil, Empire State Development's Managing Director of New York Ventures.

Find out what hundreds of companies have already discovered — **Stony Brook University is the place to help your business grow.**

Come discover for yourself, RSVP today.

Economic Development

AT STONY BROOK UNIVERSITY

ECONOMIC DEVELOPMENT ECOSYSTEM

Happening Here: The Office of Economic Development is an ecosystem of scientific and business collaboration whose centers and programs continue to drive innovation

Stony Brook University's Office of Economic Development is comprised of the University's two NYSTAR-designated Centers of Excellence in both advanced energy and wireless and information technology (CEWIT), three Centers for Advanced Technology in sensor systems, biotechnology, and integrated electric energy systems, as well as three business incubators focusing on high-tech, clean energy, and agriculture with a number of supporting programs including the Small Business Development Center, the Center for Corporate Education, the Strategic Partnership for Industrial Resurgence, and the Manufacturing and Technology Resource Consortium.

Together, our teams kickoff the second annual Stony Brook University Incubator Showcase on June 8, 2017 at CEWIT. The Showcase is an exclusive opportunity to meet our 50+ member incubator companies and experience first-hand, the technologies our entrepreneurs are developing and introducing to the marketplace, as well as the impact of our economic development programs. **Join us as we welcome over 300 potential investors, strategic partners, fellow researchers and entrepreneurs, and special guest speaker, Brian Keil, Empire State Development's Managing Director of New York Ventures for a discussion on Empire State Development programs for funding startup ventures.**

Building a Better Battery at the Advanced Energy Center

Over at the NYSTAR-designated Advanced Energy Center (AEC), the in-house Center for Mesoscale Transport Properties (m2M) is leading the way in energy storage. At the Center, the properties of complex battery systems are studied to minimize heat and optimize the performance of electrical energy storage devices. "This is a very prestigious DOE Center and it has positioned Stony Brook at the cutting edge of energy storage research in the world," Dr. Fotis Sotiropoulos, dean of the College of Engineering and Applied Sciences (CEAS).

AEC's operations are greatly contributing to the University's efforts in developing clean, sustainable energy sources, which are regarded as some of the leading solutions addressing the alarming, worldwide energy consumption crisis.

Stony Brook University Projects Sweep Long Island Bioscience Hub's Latest Round

The Center for Biotechnology, and integral partner in the Long Island Bioscience Hub, announces the Hub's fourth financing round, with $400,000 backing five different Stony Brook University research projects targeting advanced medical-imaging applications, computer-based drug discoveries and a range of new pharmaceutical treatments — the first time in four funding rounds that a single member institution has claimed all of the research grants.

The 2017 Long Island Innovation Boot Camp

Supported and led by a number of Office of Economic Development sponsors, including the Center for Biotechnology, the Clean Energy Business Incubator Program, the Small Business Development Center, and CEWIT, the 10th annual Innovation Boot Camp featured eight teams, or idea champions, bringing outstanding technology to the table. Idea champions included CEWIT affiliated faculty Dr. Anurag Purwar whose modular robot, machine, and structural design kit called SnappyXO allows rapid prototyping of motions and structures, and Dr. Klaus Mueller whose project focused on visualization, visual analytics, and high-performance computing. Also participating, Carlo Brovero a CEBIP affiliate whose startup, StorEn, is peddling a proprietary vanadium-flow battery for stationary energy storage.

Welcoming New Direction at the Calverton Incubator

Chris Kempner takes the led at the Calverton Business Incubator which houses roughly 25 early-stage companies, including more than a dozen food and/or beverage firms leveraging the incubator's state-of-the-art kitchen facilities. Her primary focus will be to greatly strengthen Calverton's contributions to the East End economy, noting, "Together, we can undertake a concerted effort to reach out to eastern Long Island economic-development officials and political leaders to accomplish the goals of creating more jobs and economic growth for the region."

The Debrief with Imin Kao

Stony Brook University mechanical engineering professor Imin Kao is the executive director of both the Strategic Partnership for Industrial Resurgence (SPIR) and the newly SBU-anchored Manufacturing and Technology Resource Consortium (MTRC). The two organizations are Office of Economic Development staples that pair regional companies and industries with University R&D expertise to develop innovative solutions and broaden business on Long Island.

Focusing on biotechnology, the MTRC has partners at Farmingdale State College, Cold Spring Harbor and Brookhaven National Lab, and the Composite Prototyping Center.
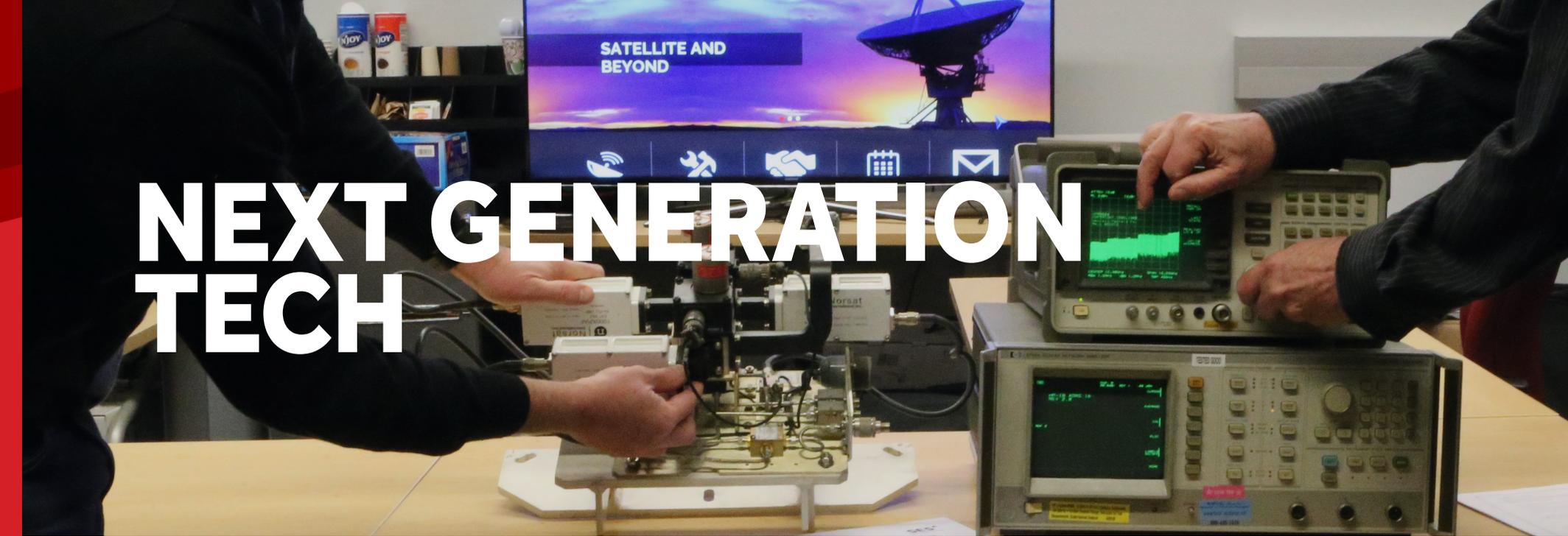
NEXT GENERATION TECH

Iconic corporations of Long Island's past have created a crop of regional startups, many of which are now CEWIT partners

Though no longer the Long Island-based super giants of the past, the senior executives of pioneering Long Island tech companies including Symbol Technologies, CA Technologies, and Northrop Grumman Corporation, have created a crop of regional startups over the years, some of which have tens of millions of dollars in annual revenue.

Mark Lesko, executive dean at Hofstra University's Center for Entrepreneurship, said that **executives who spend time in major corporations have advantages when they strike out on their own. "They bring a high level of expertise," he said. Executives at Long Island's seedling companies said their new enterprises carry the DNA of the giants they sprang from.**

Former Northrop Grumman workers have created about 10 smaller companies that maintain a strong aerospace ecosystem on Long Island. Psychologist Anita D'Amico was team leader of Northrop Grumman's information warfare group, leaving that company in 1999 after 14 years. The following year she launched Secure Decisions, a new unit of Northport-based software company Applied Visions. Secure Decisions helps U.S. government officials make sense of cybersecurity data.

D'Amico is director of Secure Decisions and chief executive of **Applied Visions' 2015 spinoff, Code Dx, a member of the CEWIT technology incubator which makes software to plug software security holes.**

"What I got from Northrop Grumman was a sense of fearlessness," D'Amico said. "When I went to a small business, I came with a sense of empowerment and the processes and procedures that are needed to run a business: bidding, budgeting, customer reporting."

From Symbol Technologies, the Holtsville-based bar codes and handheld scanners pioneers, Mitch Maiman co-founded Intelligent Product Solutions Inc., a core CEWIT industry partner. IPS is a full-service product design company that develops products such as a smart pill bottle, which lets you know if you miss a dose, and bicycles that report their location via wireless technology.

Maiman said that he learned from Symbol "how to recruit and hire really talented people," including some from his former employer. Privately held Intelligent Product Solutions had revenue of about $15 million in 2016.

When CA Technologies' data modeling software unit was bought in April 2016 by Laguna Hills California, private equity firm Parallax Capital Partners, the former executive of CA's cloud computing and storage business, Adam Famularo, became chief executive of the company, erwin Inc., now based in Melville.

Famularo said erwin has more than 150 employees, including about 20 on Long Island. The chief operating officer is Jim McGarry, an operating partner at Parallax Capital and former

sales and business development executive at CA. Data modeling wasn't considered a core business of CA, **Famularo said: "We had this bigger vision." Famularo serves on CEWIT's industrial advisory board and erwin, a key strategic partner of the Center.**

Serial entrepreneur David Hershberg carries his corporate culture with him. Founding Hauppauge-based Globecomm Systems Inc. in 1997, Hershberg grew the company's revenue to $350 million and the headcount to more than 500. Private equity firm Wasserstein & Co. in December 2013 bought publicly traded Globecomm for $340 million.

Hershberg waited until his noncompete agreement ran out, then started yet another satellite company, STS Global Inc., in March 2015, also based in the tech incubator program at CEWIT.

"It's the third time around," he said. He staffed the CEWIT, Stony Brook-based company with former Globecomm colleagues. The new private equity owners "laid off a lot of key individuals. That's why we started this company," he said. Bookings are strong at STS, he said. He is trying to find an investment bank to raise $2.5 million for the startup, which has nine employees, plus contractors around the world.

STS Global is a dynamic satellite communications + telecommunications company where great engineering minds and outstanding experience intersect to deliver end-to-end solutions. Their customers include the United Nations, U.S. Air Force and DirecTV. "I think we're going to grow this company just like we did the last two," he said. STS "was a ready-made company," Hershberg said. "They're all good people. They're the people who made Globecomm worth $340 million."
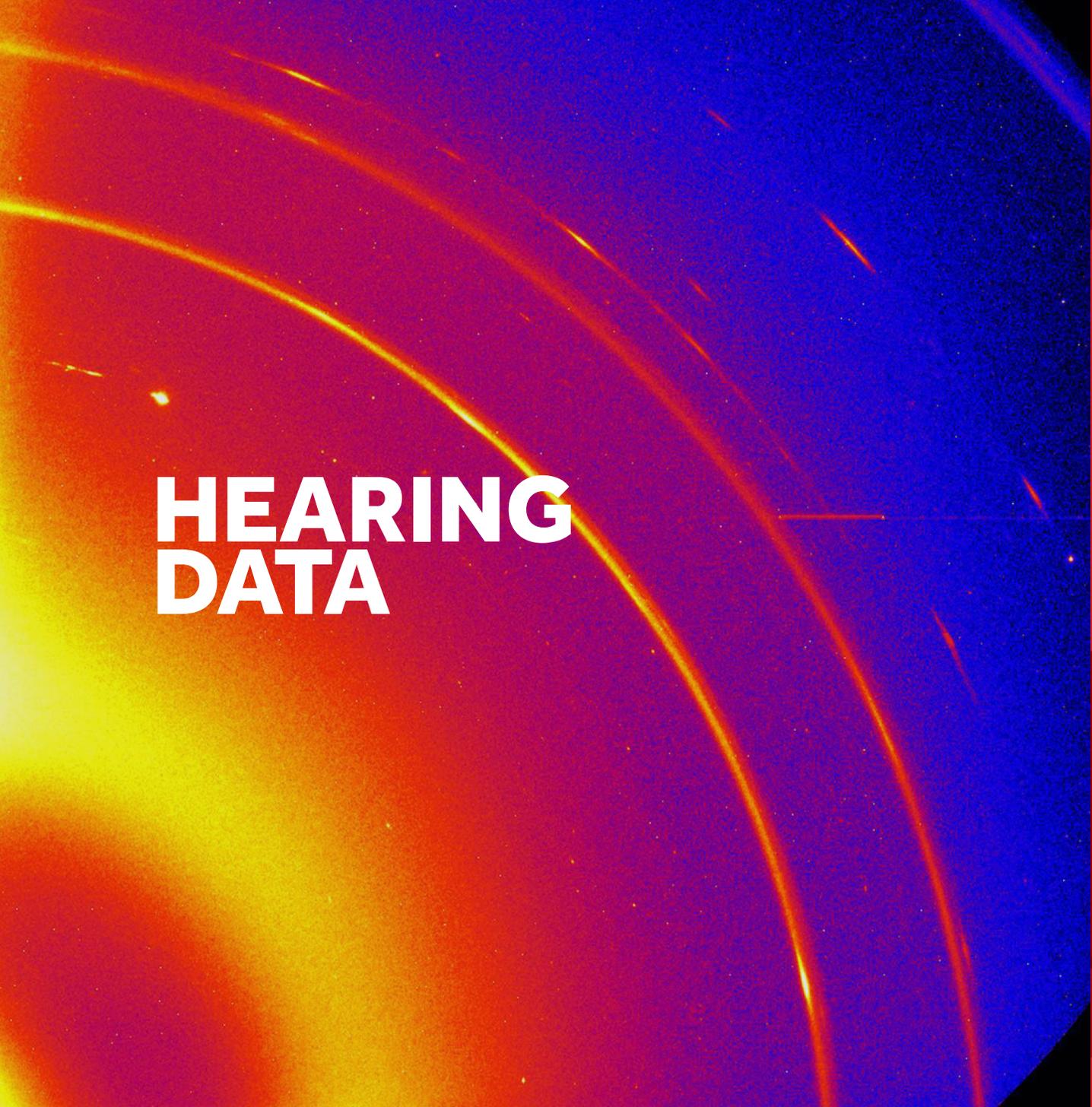
HEARING
DATA

Data Sonification: The transformative tool in the time of massively multiplying information

In 2013, researchers claimed that more than 90% of mankind's recorded data was generated in just a two-year span. Sound is one creative way of parsing through those piling numbers.

Data sonification is when real data is translated into sound values. Numbers are turned into scales of pitches, volume, rhythms, and the like.

The exact genesis of data sonification may be lost to history. Some early studies in the 1950s started to play with data and sound, but there was no name for it at the time, according to John Neuhoff, a professor of psychology and neuroscience at the College of Wooster in Ohio.

The field was arguably formalized decades later, in 1992, when scientists and musicians started discussing the practice at the International Community for Auditory Display in New Mexico.

Since then, scientists and musicians have continued using sound to supplement or reach beyond visual representations of data. Much of sonification has taken place in the fields of oceanography and astronomy as they entail large datasets that already have a time component. Data sonification has the advantage of being an experience. Users have to listen to data over a course of time, rather than giving it a single glance.

At Stony Brook University, cellist, composer, and computer music professor **Dr. Margaret Schedel, is hoping to use data sonification to help people with Parkinson's disease walk more seamlessly.** The team attached motion sensors onto feet to record information on the gait of people with and without Parkinson's. Then they translated different qualities of those gaits — how long it takes for each step to occur, or which part of the foot lands on the ground first — to sounds.

Though the song was reportedly terrible, the researchers are now developing lightweight wearable sensors that feed motion data into a smart phone, which will allow individuals to hear, and potentially correct, their gaits in real time. In a pilot study, individuals with Parkinson's disease recognized distortion in music and corrected it using a sliding bar on an iPad screen. The hope is that these individuals will also be adept at correcting distortion by adjusting their gaits.

Schedel further collaborated with materials scientist Kevin Yager of Brookhaven National Laboratory to develop a method for sonifying nanomaterials structures.

Yager used a technique known as X-ray scattering to visualize the structure and Schedel matched different qualities of the structures to different qualities of sound. For example, she increased pitch as atoms were packed more closely together.

Schedel and Yager believe researchers could use this approach to audibly screen for errors in nanomaterial structure data collection.

Schedel also advised a music doctoral student, Levy Lorenzo who, working with Stony Brook University mathematician Tony Phillips, sonified one month of tidal data from Venice and another month from Ancona, Italy. For each piece, Lorenzo translated the two high and two low tides each day into musical notes. As the tide rose and fell, so did the pitch. He played the Venice piece on a single instrument, the marimba. For Ancona, Lorenzo experimented with more complex sound by assigning a different woodwind instrument to play each of the four daily tidal extremes.

Phillips finds tidal data interesting from a mathematical perspective because it follows an almost periodic function: a function that comes close to repeating itself, but never quite does. **By sonifying tides, Phillips believes he can illustrate this mathematical concept in a way that is more accessible than data plotted on a graph.** "If you listen to it, it's like a song that sort of repeats itself, but not exactly. It keeps changing and keeps changing and keeps changing."

At Stony Brook University, Schedel remains in demand. Researchers regularly approach her for collaborations. She's exploring, for example, the possibility of sonifying healthcare records with Stony Brook's Department of Biomedical Informatics. Schedel sees potential, as doctors and nurses are already trained to use their ears as they work.

Schedel still composes music, but she spends about half of her time on data sonification projects. **"I'm able to bring a novel aspect to their research and, ideally, help."**

OUR COMMUNITY

The Advanced Energy Center

Center for Advanced Technology in Diagnostic Tools and Sensor Systems (Sensor CAT)

The Center for Biotechnology

The Center for Corporate Education and Training at Stony Brook University

The Clean Energy Business Incubator Program (CEBIP)

The College of Business at Stony Brook University

The College of Engineering and Applied Sciences at Stony Brook University

Empire State Development: NYSTAR

IEEE Long Island Section

Long Island High Technology Incubator

The Manufacturing and Technology Research Consortium (MTRC)

The New York Academy of Sciences

Small Business Development Center at Stony Brook University

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UPCOMING EVENTS

June 8, 2017 · Office of Economic Development 2017 Incubator Company Showcase, Stony Brook University

June 9, 2017 · Long Island Capital Alliance: Cybersecurity & Defense Capital Forum

June 14, 2017 · Small Business Development Center: Navigating the World of Small Business Loans

June 19, 2017 · SBU CCE Workshop: Emotional Intelligence-Stress Less

November 7 & 8, 2017 · CEWIT2017 Conference & Expo on Emerging Technologies for a Smarter World

March 26-28, 2018 · Advanced Energy Conference 2018