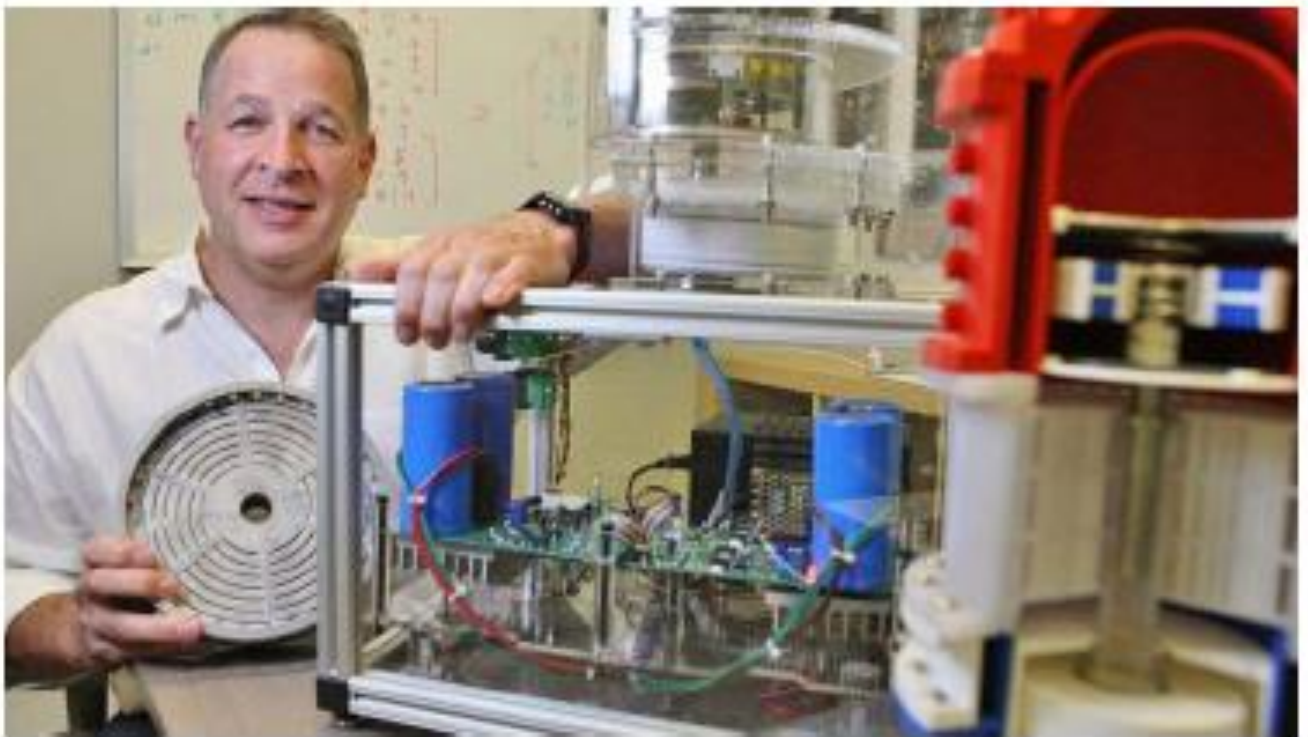


# Innovate LI Article

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## Hofstra Mechatronics Lift SBU Startup



Pumped up: ThermoLift CEO Paul Schwartz is jazzed about his 2012 startup's collaboration with Hofstra University's Center for Innovation.

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By GREGORY ZELLER //

Well, that worked just like they drew it up.

Inside three short months, **ThermoLift**'s strategic research partnership with Hofstra University's **Center for Innovation** has engineered advanced mechatronic controls for the Stony Brook-based startup's cutting-edge heat pump technology.

Attacking a design problem with a mechatronics solution – combining mechanical, electronic, computerized and control systems – helps his company take a big step toward a critical testing phase, according to ThermoLift CEO Paul Schwartz, who directly credited Center for Innovation founder and Director **Kevin Craig** for the successful upgrade.

ThermoLift is creating a cold-climate, natural gas-powered device that combines a home or business' heating, air conditioning and water-temperature controls into a single appliance. The dilemma at hand involved a series of small, highly sensitive displacers – roughly 5-inch metal cylinders – inside the appliance's highly sensitive electronic motion-control system.



Kevin Craig: Mecha man.

The displacers, which move inside the machine, were slamming home “like a hammer on a nail,” Schwartz told Innovate LI, creating operational and aesthetic problems.

“You want to approach the nail and tap it very softly,” Schwartz noted. “So controlling the landing is the critical factor. We needed to create that motion control without the abrupt landing.”

Enter Craig and the Center for Innovation, which since June has offered ThermoLift “state-of-the-art mechatronic technologies combined with industrial experience to develop our complex controller requirements,” Schwartz said.

Not only were the Center for Innovation’s big thinkers able to mitigate the rat-a-tatting, they were able to program variables into the electronic controls for different stages of the ThermoLift machine’s cycle, facilitating smoother transitions between full-load and part-load conditions, according to Schwartz.

“They did a world-class engineering job,” the CEO said.

Such innovations are Job No. 1 at the center, which forms collaborative alliances that help private companies solve design challenges while exposing Hofstra School of Engineering and Applied Science students to real-world engineering applications.

The partnerships generally run three to six months – ThermoLift has already re-upped for a second round – and the intellectual property rights remain with the companies.

“The center is fulfilling its promise of fostering industrial innovation and simultaneously enhancing the education of Hofstra engineering students,” said Craig, who joined the Hofstra faculty after 18 years at Rensselaer Polytechnic Institute, where the West Point and Columbia University graduate taught mechanical engineering and developed the institute’s first Mechatronics Program in 1992.

Craig, a fellow of the American Society of Mechanical Engineers, graduated 20 PhD students over those 18 years, while designing and conducting hands-on,

customized mechatronics workshops for engineers at Xerox, Procter & Gamble and other major international corporations.

That's an attractive backstory for ThermoLift, a 2012 startup launched by Schwartz and former Volkswagen engine and power-train engineer Peter Hofbauer. Thanks to Craig and his young Hofstra innovators, ThermoLift is now ready to step up testing of its second-generation prototype, which is designed to reduce greenhouse gas emissions while cutting a structure's HVAC costs by as much as 50 percent.

The startup's R&D efforts – supported by the U.S. Department of Energy and the New York Energy Research and Development Authority, among others – have had a **big few months**, including a series of technological upgrades and the issuance of ThermoLift's first international patent.

The Center for Innovation's mechatronics expertise didn't only add to ThermoLift's hot summer – it added to the company's staff. Hofstra's ThermoLift collaborators included four PhDs on the university faculty and some of the school's most accomplished engineering students, including Christos Dimosthenous, who graduated Hofstra in May with an engineering bachelor's degree and is now a full-time engineer at ThermoLift.

Next up for the resident of Stony Brook University's **Advanced Energy Research and Technology Center**, which also receives business development support from SBU's **Clean Energy Business Incubator Program**, is to integrate the Center for Innovation's solutions into its Gen-2 device, followed by rigorous internal performance evaluations.

Schwartz said he's not sure yet what specific issue his engineers will tackle next in their ongoing collaboration with Craig and his students, though he's "thrilled to have a continued relationship [with the Center for Innovation] as we approach production."



The positive ThermoLift collaboration is a prime example of the new center fulfilling its promise, according to Sina Rabbany, dean of the School of Engineering and Applied Science.

“Kevin has positioned engineering at Hofstra at the nexus between education and industrial practice,” Rabbany said. “The Center for Innovation offers previously untapped opportunities for academic and industrial participants to interact in projects that benefit all concerned.

“As the center grows its operations, it expands our footprint in the Long Island economy.”

**TOPICS:** AERTC CEBIP

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