UMass Amherst Announces 2015 ‘Armstrong Fund for Science’ Awards

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AMHERST, Mass. – Chemical engineering assistant professor Sarah Perry and physics assistant professor Jun Yan have been named the Armstrong Fund for Science winners for 2015, which this year is granting $20,000 to each researcher to encourage transformative research on campus that introduces new ways of thinking about pressing scientific or technical challenges. They will be recognized at the UMass Amherst Honors Dinner on April 22.

Perry’s project, “Bio-inspired thermostable vaccine formulations,” is intended to develop a synthetic formulation method to maintain the stability and effectiveness of tetanus vaccine without the need for refrigeration. “Our approach makes use of a materials platform, which can mimic the natural ways in which proteins are stabilized inside cells,” she says. “It has the potential to be applied to a wide range of biotechnological problems.”

In developing countries, Perry points out, where infectious diseases cause more than 17 million deaths a year, one of the most significant challenges associated with access to vaccinations is the cost and difficulty of maintaining the “cold chain” for the drugs during transportation, storage and handling.
These problems can account for 80 percent of vaccination cost, can mean the loss of nearly half of vaccines produced and can limit vaccine campaigns and disaster relief efforts.

She will partner with MassBiologics at UMass Medical School, which develops and manufactures vaccines industrially. Support from the Armstrong Fund will help to develop on-campus expertise in vaccine development and formulation, Perry says, and will strengthen and support translational life science initiatives. It will also allow her to pursue federal and other national grants in the future.

Yan’s project, “Detecting quantum flows in reduced dimensions,” will address an anticipated bottleneck in the use of silicon transistors related to difficulties in size scaling, which threatens to slow the boom in high-tech discoveries and development of new devices. The goal is lighter, faster and more intelligent portable electronics, Yan says.

He and colleagues propose to use tungsten diselenide instead of silicon in transistors to achieve smooth quantum flows in electronic devices. “This fundamentally different approach may revolutionize digital technology and reach super-fast processing speeds with minimal power consumption, which is impossible to achieve in today’s computers,” he notes. His lab at UMass Amherst is “uniquely positioned to carry out this investigation,” he adds, because of the wavelength of lasers available and the ability to “tune” them rather than only using fixed wavelengths.

Benefactors John and Elizabeth Armstrong established their Fund for Science in 2006 to identify and support promising research directions that do not yet have enough data for application to standard funding channels. “Elizabeth and I want to promote major scientific advances in society by supporting researchers with bold vision, documented credentials and a passion for results,” Armstrong says.

The UMass Amherst Office of Research and Engagement headed by Vice Chancellor Michael Malone administers Armstrong grants in a competitive proposal process. He says, “The campus greatly appreciates the Armstrongs’ generosity and confidence in our institution and faculty. Giving our faculty opportunities to innovate and excel in their research is an extraordinary gesture.”

Armstrong awardees agree to present a public “Science for Non-scientists” lecture when their work is complete.