Coating material embedded with solar cells brings unique and economical solar technology to market

Dr. Chester Wilson, Louisiana Tech University

Award Title	Louisiana Consortium for Innovation in Manufacturing and Materials (CIMM)
NSF Award Number:	1541079
Principal Investigator:	Michael Khonsari
Lead Institution Name:	Louisiana Tech University
Start Date:	August 1, 2015
End Date:	July 31, 2020
Highlight Submission Date:	April 30, 2018

What is the outcome or accomplishment? (1-2 short sentences describing it and why it is transformative; 50 word max. suggested)*

Louisiana Tech University researchers are working to bring to market a less expensive and more universal solar power technology through the NSF I-Corps program. Dr. Chester Wilson's team will be further developing their strategy to bring this CIMM developed technology to market at the Spring 2018 I-Corps cohort in San Antonio, Texas.

What is the impact? (1-2 simple sentences describing the benefits for science, industry, society, the economy, national security, *etc.*; suggested 50 word maximum)

Solar energy is the ideal alternative energy source for replacing traditional sources that are exhaustive and environmentally destructive. Solar power is an excellent alternative energy source, but the technology involved can be costly. Making solar energy more economical and accessible is vital for bringing it to the forefront of the global energy market. This project's solar cell embedded coating is substantially cheaper than traditional solar panels and can be implemented onto structures where solar panels would not be feasible.

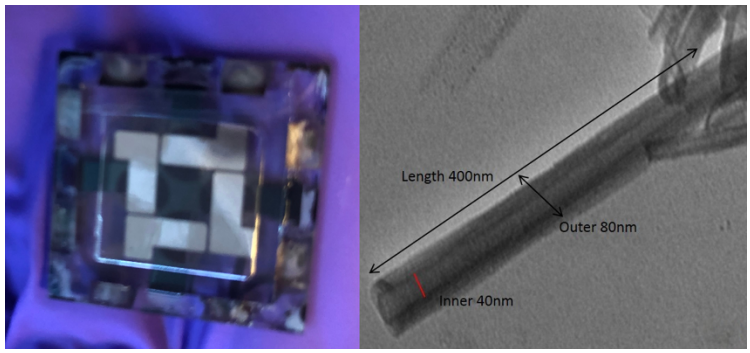
What explanation/background does the lay reader need to understand the significance of this outcome? (1-2 paragraphs that might include, for example, more on who, when, where; NSF's role; support from multiple directorates/offices; what makes this accomplishment unique; additional intellectual merits; or broader impacts such as education, outreach, or infrastructure improvement that are integral to this outcome; suggested 150 word maximum)

Dr. Chester Wilson's research team at Louisiana Tech University has identified significant potential for commercialization in their perovskite solar cell technology. Not only have they improved the lifetime of perovskite solar cells and eliminated their toxicity, they are developing techniques for embedding these solar energy harvesting nanoparticles into a coating. This coating can be applied to other materials (e.g. roofing shingles) to add solar energy capabilities.

The Louisiana Tech University team has won an NSF I-Corps award, which provides $50K over a six month period to commercialize their technology. They will be participating in the Spring

2018 Cohort in San Antonio, where they will be further developing their strategy to bring this technology to market. The NSF I-Corps program accelerates the economic and societal benefits of NSF-funded research that are ready to move toward commercialization. During this program, Dr. Wilson's team will primarily be conducting market research and customer discovery. Successful execution of this project will solve problems with current solar energy solutions and be a step towards bringing clean energy to the forefront of the U.S. energy market.

Photo:



(L) Perovskite solar cells on a chip. These provide more efficient solar power than silicon cells. (R) Transmission electron microscopy image of graphene nanoscroll technology that replaces the electrodes on the material, extending its lifetime ten-fold and making this solar technology more affordable. *Credit: Dr. Chester Wilson, Louisiana Tech University.*

Louisiana Tech University researchers, Dr. Chester Wilson, Nicholas Groden, and Joshua Joffrion, at the Southwest NSF I-Corps cohort in San Antonio. *Credit: Dr. Chester Wilson, Louisiana Tech University.*