NIST's Michael Boss to Receive Tech Transfer Award for MRI Calibration Standard

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National Institute of Standards and Technology (NIST) physicist Michael Boss will receive the 2015 Federal Laboratory Consortium (FLC) Award for Excellence in Technology Transfer, according to the FLC.

Boss designed a tool called a phantom for calibrating magnetic resonance imaging (MRI) scanners. The head-sized phantom is designed to standardize imaging of the diffusion of water molecules, a technique that can be useful in diagnosing traumatic brain injury (TBI), neurodegenerative diseases such as Alzheimer's, and cancer in various parts of the body. To scale up production to meet demand, reduce phantom costs, and improve durability, Boss worked with Elizabeth Mirowski of High Precision Devices Inc. (Boulder, Colo.), the firm that commercialized the technology. NIST has applied for a patent* on the phantom, which was commercialized only a year after it was first conceived.

The FLC award recognizes employees of member laboratories and non-laboratory staff who have accomplished outstanding work in the process of transferring federally developed technology to the commercial market.

The new phantom supports an international trend toward making MRI more quantitative, helping to ensure that scans are accurate as well as comparable to images made by other scanners in different locations at different times. Boss developed the prototype phantom in collaboration with the National Cancer Institute and the Radiological Society of North America's Quantitative Imaging Biomarker Alliance. Its shell is filled with containers of polymer solutions representing different rates of water diffusion in the brain. In a key advance, the phantom is cooled with ice water, eliminating measurement variability caused by temperature differences across MRI scanners. The phantom has been adopted for quality control in multi-site clinical trials in the United States and Europe to study the effects of TBI.

The awards ceremony will be held April 29 at the FLC national meeting in Denver. More information about the award can be found at: www.federallabs.org/awards/.

*U.S. Provisional Patent Application serial number 62/064494, MRI Phantom, Method for Making and Use of Same. Assignee: National Institute of Standards and Technology. Inventor: Michael Boss.

NIST physicist Michael Boss with his prototype diffusion phantom for calibrating magnetic resonance imaging (MRI) scanners. The phantom contains 13 vials of polymer solutions that represent various rates of diffusion of water molecules. Diffusion rates are used in diagnosing traumatic brain injury and neurodegenerative diseases. The phantom has been commercialized and is being used in clinical trials.

Credit: von Dauster/NIST
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