GALLOGLY COLLEGE OF ENGINEERING
STEPHENSON SCHOOL OF BIOMEDICAL ENGINEERING
The UNIVERSITY of OKLAHOMA

Leadership Lecture Series 2026-2027

HARNESSING LIGHT FOR ACCESSIBLE AND PRECISION HEALTHCARE



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Thurman J. White Forum
Conference Room A

ABSTRACT

Advances in molecular probes, optical sensors, photonic devices, computation, and artificial intelligence are expanding the capabilities of light to detect disease, monitor physiology, guide surgical interventions, and treat lesions. These advances are also making optical technologies increasingly compact, affordable, and accessible. This lecture will highlight our work in molecular imaging and sensing, wearable and portable optical technologies, advanced optical imaging, fluorescence-guided surgery, and light-based therapies. These examples illustrate how discoveries at the interface of chemistry, physics, engineering, and medicine can be translated into practical technologies that address important clinical needs. A central theme is that scientific sophistication need not require technological complexity. By combining molecular innovations with advances in optical engineering and computation, we can develop practical tools for use in major medical centers, community hospitals, and resource-limited settings. Such innovations can expand access to precision healthcare, improve clinical outcomes, and accelerate the translation of biomedical engineering discoveries into technologies with broad societal impact.

BIO

Dr. Samuel Achilefu is the inaugural Chair and Professor of the Biomedical Engineering Department at the University of Texas Southwestern Medical Center in Dallas, Texas, USA. He also holds the Lyda Hill Distinguished University Chair and is a Professor of Radiology and the Simons Cancer Center. He is an international leader in optical and multimodal imaging, image-guided cancer surgery, portable imaging devices, and nanotechnology. His innovative research and more than 70 U.S. patents have significantly contributed to laboratory and clinical medicine. Dr. Achilefu is a member of the National Academies of Engineering and Medicine. He is also a fellow of the National Academy of Inventors, AAAS, AIMBE, and many other professional societies. He has received over 20 national and international awards, including the Briton Chance Award.