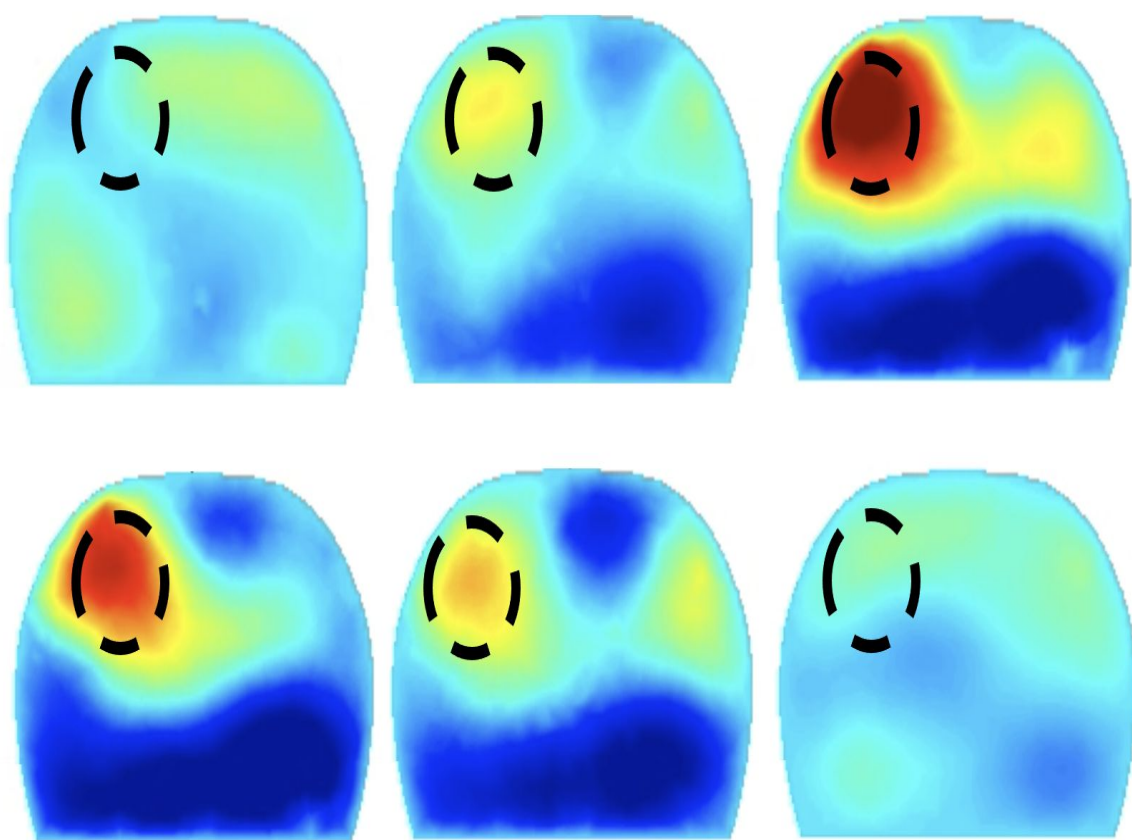## 2022 – 2023 Seminar Series

Optical Sensing and Monitoring of Diseases: From Arthritis to Diabetes and Cancer

Andreas Hielscher
Professor and Department Chair,
Biomedical Engineering
New York University
New York, NY

Deep tissue optical tomographic imaging (DOTI) seeks to obtain functional information about tissues to assist in the diagnosis, monitoring, and treatment of various diseases. In this imaging modality, near-infrared light is employed to illuminate the body part under investigation and transmitted and reflected light intensities are measured. So-called model-based iterative image reconstruction algorithms are then used to convert this information into 3-dimensional tomographic concentration maps of oxy-hemoglobin (HbO2), deoxy-hemoglobin (Hb), and total hemoglobin (THb). Furthermore, other physiologically important parameters such as oxygen saturation (StO2), water content, tissue scattering, etc. can be obtained. Over the last decade, considerable progress has been made towards clinically viable DOTI systems that assess brain function, cancer (e.g. breast, prostate, and skin), peripheral artery disease, and joint diseases. In addition to providing insights on hardware design and image reconstruction software, the presentation will focus on recent results obtain in clinical studies involving breast cancer, peripheral artery disease in diabetics, and lupus arthritis. Moreover, most recent advance in making DOTI a wearable technology will be described. Novel flexible electronics allow the integration of related hardware into fabrics, which provides for a more user-friendly interface and in-home monitoring capabilities.

(For more information have a look at https://wp.nyu.edu/tandonschoolofengineering-cbl/)

Wednesday, November 30th @ 11:45AM

Laufer Center
Lecture Hall Room 101

Stony Brook University

Faculty Host: Yi-Xian Qin