

30th Anniversary Celebration of the National Science Foundation's Engineering Research Centers Program

Wednesday, Oct. 28, 2015

Exhibits

Advanced Self-Powered Systems of Integrated Sensors and Technologies (ASSIST): Learn how ASSIST is enabling a paradigm shift in health informatics by creating wearable, body-powered nanotechnologies that monitor individual health parameters and environmental exposures. Long-term, scientifically accurate sensing enables patients, doctors and scientists to make direct correlations between health parameters and environmental exposures. This information leads to improved chronic disease prediction, management and treatment.

Center for Compact and Efficient Fluid Power (CCEFP): CCEFP seeks to transform the fluid power industry—how it is researched, applied and studied. The center will demonstrate technology designed to reduce petroleum consumption and energy use; make fluid power clean, quiet and safe; and exploit the attributes of fluid power in a new generation of human-scale devices and equipment.

Center for Integrated Access Networks (CIAN): CIAN develops silicon chips that process light instead of electricity. These chips will form the building blocks for a faster Internet capable of handling more data and connecting more devices. Come see these new chips and learn how they will be used!

Center for Biorenewable Chemicals (CBiRC): CBiRC enables the transformation of the biorenewable chemical industry through the optimized coupling of biocatalysis and chemical catalysis. It brings together biologists, biochemists and chemists with engineers to solve problems facing the industry all along the value chain. Its efforts have opened up new catalysts and technologies for advanced biomanufacturing and sustainable production of biorenewable chemicals.

Center for Sensorimotor Neural Engineering (CSNE): Researchers at CSNE are designing brain-interfacing systems that help restore function and mobility to patients with stroke, spinal cord injury or other neurological disorders. CSNE will demonstrate a smartwatch-based sensing system designed to improve brain stimulation therapies for patients with Parkinson's disease.

C-SOPS: Revolutionizing Advanced Pharmaceutical Manufacturing: The Engineering Research Center for Structured Organic Particulate Systems brings together a cross-disciplinary team of engineers and scientists as well as industry leaders to improve the way pharmaceuticals, foods and agriculture products are manufactured.

Engineering Research Center for Revolutionizing Metallic Biomaterials (RMB): RMB's groundbreaking research could dramatically change implantable medical devices. The center seeks to facilitate the creation of biodegradable, metallic medical devices for craniofacial, dental, orthopedic, cardiovascular, thoracic and neural applications. Device prototypes and videos describing the center and its technology will be available for viewing.

FREEDM Systems Center: Come and learn how FREEDM is creating the energy Internet, a network of distributed energy resources utilizing secure communications for intelligent power management,

enabled through advances in power electronics. Research priorities include power electronics, controls theory, solid state transformers, fault isolation devices, and power systems simulation and demonstration.

Mid-InfraRed Technologies for Health and the Environment (MIRTHE): MIRTHE will demonstrate a compact laser-based sensor that can quantify the emissions and dynamics of methane released to the atmosphere by human activities. The sensor's small size makes it suitable for use on many platforms (hand-held, UAV, stationary). Methane is of concern because it has a strong radiative effect and is a leading human-driven greenhouse gas.

Nanomanufacturing Systems for Mobile Computing and Energy Technologies (NASCENT): NASCENT develops transformational technologies to shape the future of mobile computing and energy devices. Its demo will include flexible foils of crystalline silicon exfoliated from silicon wafers and nanoscale photonic structures fabricated on flexible polymer substrates.

QESST--Revolutionizing Energy for the World: Come and examine different types of solar cells and see solar energy in action at the Quantum Energy and Sustainable Solar Technologies Center exhibit. Small, solar-powered cars will race under a light stand. An armband with a flexible solar cell attached will be available for visitors to try on, and different solar cell configurations will allow visitors to compare the power different solar technologies produce for given illuminations.

ReNUWit: Learn about the Center for Re-Inventing the Nation's Urban Water Infrastructure's research, and technologies related to urban water systems. Explore sustainable biofuel production and wastewater treatment, open water unit process wetlands, resource recovery, storm water treatment, "smart" managed aquifer recharge technologies and more.

Smart Lighting Engineering Research Center (Smart Lighting ERC): Learn how future lighting systems will enhance health, increase productivity and save energy. Such systems will be able to "think" and provide "The Right Light When and Where You Need It™." You will see videos of testbeds that demonstrate intelligent controls for autonomous lighting systems that can adapt to human needs and environmental changes.

A Decade of Synthetic Biology at Synberc: The Synthetic Biology Engineering Research Center will demonstrate its work to create a platform using engineered human tissues embedded with synthetic sensors to measure the toxicity and efficacy of a wide variety of drug candidates. It also will describe a Web of Registries, or global genetic parts database, which would enable researchers to share and build biological systems from a vast resource of biological parts. Finally, learn about applications of synthetic biology and invest "BioBucks" in your favorite projects!

Ultra-wide Resilient Electric Energy Transmission Networks (CURENT): One of the most important technical challenges facing the nation today is addressing societal energy needs without relying on fossil fuels. Electric power system transmission infrastructure will play a critical role in any viable solution. Stop by this booth to learn how research at CURENT is laying the foundation for large-scale deployment of renewable power generation.

Translational Applications of Nanoscale Multiferroic Systems (TANMS): TANMS has developed a new way to control magnetism in the small scale previously thought impossible! The center is developing a fundamentally new approach, coupling electricity to magnetism using engineered nanoscale multiferroic elements to enable increased energy efficiency, reduced physical size and increased power output in consumer electronics.