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From: Sanchez Galiano, Ana Maria
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KYNN News and Events Oct - Nov 2012

KYNN Overview

Editor: [Ana Sanchez Galiano](#)

The Kentucky nanoNET (KY nanoNET or simply KYNN) is a Kentucky NSF EPSCoR initiative for developing an "electronic parkway" within the Commonwealth for tying together all the various facilities, resources and people involved in micro/nanotechnology, advanced materials, and MEMS (micro-electro-mechanical systems). NSF projects the field of nanotechnology to explode from a \$400B industry today to a \$2.5T industry by 2020. To accommodate that tremendous level of growth, it is predicted that 2,000,000 nanotechnologists will need to be trained by 2020, a hundred fold increase in the number today (20,000). The NSF-supported KYNN initiative will help position the state of Kentucky to be an active participant in that economic opportunity. KYNN presently consists of 17 distinct nodes and over 90 researchers and continues to grow each week. Please enjoy this newsletter and contact [Ana Sanchez Galiano](#) or [Dr. Kevin Walsh](#) to get involved with KYNN.

Equipment Spotlight

In each newsletter, a signature tool from one of the KYNN nodes is highlighted. Today we present the I-V and C-V Characterization System from the Space Science Center at Morehead State University.

Please contact [Ana Sanchez Galiano](#) to get your capability listed in a future newsletter edition.



I-V and C-V Characterization System

The I-V and C-V characterization system consists of an Agilent B1500A semiconductor device analyzer and a Cascade SUMMIT 11000B-M probe station (8 inch). The device analyzer contains one mainframe, one high power source/monitor unit (HPSMU) module, three medium power source/monitor unit (MPSMU) modules and one multi-frequency capacitance measurement unit (MFCMU) module. The mainframe can sink a current of 4.2 A. The HPSMU module has the maximum force voltage and current of ± 200 V and ± 1 A with resolution of 2 μ V and 10 fA. The MPSMU module has the maximum force voltage and current of ± 100 V and ± 100 mA with resolution of 0.5 μ V and 10 fA. The MFCMU module provides a frequency range of 1 kHz to 5 MHz and a maximum dc bias of ± 100 V. The probe station consists of an anti-vibration table, a microscope, a micro-chamber, thermal chuck and controller, and DC probes. The micro-chamber can provide semi-protective environment for the reliability testing of devices, like RF MEMS switches, which are sensitive to contamination and moisture. The micro-chamber can also provide dark environment for light-sensitive devices, like solar cells. The thermal chuck can be controlled in the temperature range of room temperature to 300°C with a ± 0.5 °C accuracy. This is a useful feature for thermal stress testing of electronic devices. This characterization system allows for all types of I-V measurement with multi-channel I/V sweep capability on devices with up to five connection terminals. It also supports the high-frequency (up to 5 MHz) and quasi-static C-V measurements. In addition, the probe station is equipped with RF probes whose coplanar wave guide fingers have a pitch of 150 μ m. This enables it to interface with a network analyzer to carry out on-wafer RF measurements.

How to access:

For information about the equipment and access to the Space Science Center at Morehead State University, please contact Qingzhou Xu @ q.xu@moreheadstate.edu

or visit the Morehead Space Science Center's website : <http://www.moreheadstate.edu/ssc/>

KY NANO NEWS

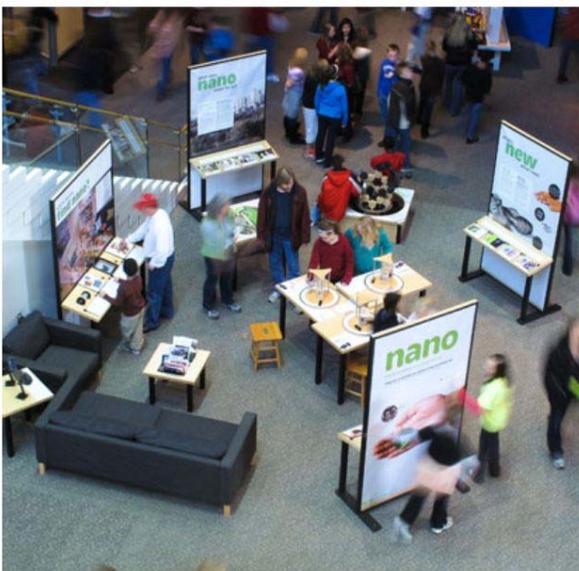
Kentucky Science Center Houses Hands-On Nano Exhibit

The Kentucky Science Center brings Science to life with exciting, interactive exhibits that engage your hands, your mind and your imagination. [1] The museum recently acquired an interactive new exhibition that engages family audiences in nanoscale science, engineering, and technology. Hands-on exhibits present the basics of nanoscience and engineering, introduce some real world applications, and explore the societal and ethical implications of this new technology [2].

About the exhibition:

Nano was created by the Nanoscale Informal Science Education Network (NISE Network) with support from the National Science Foundation. The Nano exhibition is intended for long-term display in museums across the United States, where it will engage millions of people. Up to fifty copies of Nano will be fabricated; all copies will be identical and distributed to museum partners free of charge. The exhibition complements NanoDays events and other NISE Network educational experiences [2]. [Read more...](#)

Other recent NISE Network initiatives included a 'Nano in Society' workshop that stressed learning conversations as a strategy to engage the public with nanoscience.



Sources: [1] <http://www.kysciencecenter.org/site/exhibits/> [2] <http://www.whatisnano.org/nano-exhibit>

Recent Events from KYNN Nodes

Fifth Annual NanoTechnology

This past month Sullivan University held their Healthcare, science, and teaching research and related material on Sullivan University College of Pharmacy to community and around the United States. Louisville Belknap Campus next summer. KyNN has developed a partnership between Sullivan University, Western Kentucky University, University of Kentucky and UofL to collaboratively host an annual Ky Nanotechnology Symposium.



Symposium

Annual Nanotechnology Symposium @ Sullivan University in Louisville, KY. professionals were invited to attend this event as guest speakers, presenting nanotechnology advancements and applications. It is part of the initiative of promote education and applications of Nanotechnology within the local The 6th Annual Nanotechnology Symposium will be held @ the University of

Photos by [Sullivan University/Centera](#). This event took place September 21 - 22, 2012 @ Sullivan University.

KYNN KORE – Photomask Program

KORE (Kentucky Optical REsources) is KYNN's program for supplying high-quality photomasks and advanced lithographic processes such as e-beam lithography and greyscale lithography. KORE is available to both KYNN members and outside users. For more information, see details listed below or visit <http://kynanonet.org/kore1/>



KORE News: KORE has recently launched a web portal exclusively for Mask Generation and Lithographic Services www.louisvillephotomask.com KORE clients are now able to submit their photomask order and explore the many available capabilities in lithographic fabrication the Micro/Nano Technology Center offers through this initiative.

KYNN KRUNCH – Shared Software Program

KRUNCH (Kentucky Research Users of Nano CAD Hub) is KYNN's shared software program which offers commercial micro/nano/MEMS CAD tools to its academic KY members at no cost. Presently four commercial software packages are offered (Tanner Tools, Coventorware, Intellisense, Silvaco). For more information, see details listed below or visit <http://kynanonet.org/krunch/>

KRUNCH News:

- **Sign up for KRUNCH Software: Fill out the [Krunch Access Request form](#)**

KYNN is operated out of the University of Louisville Shumaker Research Building, home to the nationally-recognized Micro/NanoTechnology Center (MNTC). The MNTC encompasses core facilities for micro and nano fabrication, packaging, metrology & testing. The center includes a 10,000 sq. ft, 7-bay, class 100/1000 cleanroom, the largest in the state of Kentucky.

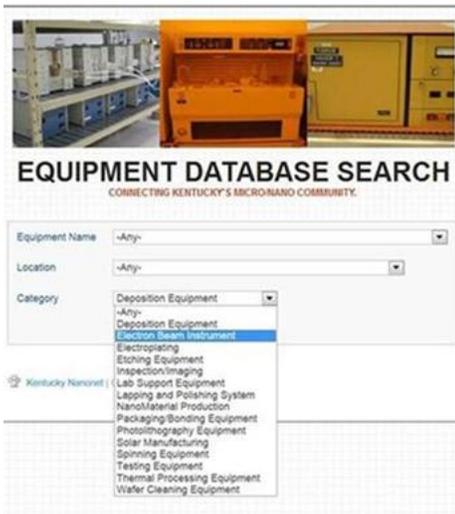
KYNN Researcher Database

The new KY nanoNET [Researcher Database](#) contains a comprehensive listing of individuals in Kentucky who are involved in the fields of microtechnology, nanotechnology, MEMS, and advanced materials. Its goal is to promote joint collaboration and facilitate the sharing of available resources and information in the State of Kentucky.



KYNN Equipment Database

This resource is designed to give a clear picture of the vast number of tools and capabilities that are available within the state and the Ky nanoNET. The [equipment database](#) will be constantly evolving as KyNN Nodes add new tools and process.



KYNN Participating Nodes

What's In A Node?

The basic structure of the Kentucky Nanonet is similar in visualization to a simple computer network. The KyNN is made up of laboratories, research centers and departments across the State of Kentucky that have an interest in some aspect of Micro/Nanotechnology. These Nodes vary in size and scope, but all share the common bond of Micro/Nanotechnology.

Like a traditional network, the Nodes have joined the KyNN to improve inter-University communication and collaboration. The KyNN also maintains an inventory of equipment and processes that are available at the various Nodes to allow researchers in the State to better leverage the available infrastructure.

[INTERESTED IN BECOMING A KENTUCKY NANONET NODE?](#)

LIST OF CURRENT KY NANONET NODES:

- [EKU Department of Chemistry](#)
- [The ElectroOptics Research Institute and Nanotechnology Center \(ERINC\)](#)
- [UofL Conn Center for Renewable Energy Research](#)
- [MOREHEAD RF Micro-Characterization Lab](#)
- [MURRAY State MicroElectronics Lab](#)
- [Sullivan University College of Pharmacy](#)
- [UK Catalyst Research and Testing Center](#)
- [UK Center for Advanced Materials \(CAM\)](#)
- [UK Center for Nanoscale Science & Engineering \(CeNSE\)](#)
- [UK Electron Microscopy Center \(EMC\)](#)
- [UK Imaging Center](#)
- [UK Mass Spectrometry Facility](#)
- [UofL Micro/Nano Technology Center \(MNTC\)](#)
- [UofL Rapid Prototyping Center](#)
- [UofL Wireless & IC Design Laboratory](#)
- [WKU Nondestructive Analysis \(NOVA\) Center](#)
- [UK Center for Applied Energy Research \(CAER\)](#)

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