



EPSCoR Programs in Kentucky



NSF, DOE, NASA, USDA, and DOD EPSCoR agency programs were the source in FY 10 for **\$13 million** in competitively awarded R&D funding to Kentucky researchers. Since 2001, over **\$128 million** has been competitively won from NSF, DOE, and NASA EPSCoR alone. These investments have been used to build infrastructure in the Commonwealth's **Priority Research Areas** as evidenced by the creation of the following centers, institutes and major thrust initiatives:

Materials and Advanced Manufacturing

- **CAM** : Center for Advanced Materials at UK (www.kynsfepscor.org/cam)
- **MNTC**: Micro/Nano Technology Center at UofL (<http://louisville.edu/micronano>)
- **CeNSE** : Center for Nanoscale Science and Engineering at UK (www.engr.uky.edu/~cense/)
- **KY NanoNET**: a collaboration network supporting micro/nanotechnology research statewide (www.kynanonet.org)

Human Health and Development

- **Bioengineering** : a thrust at UofL to explore the interaction of the body and engineered devices along with promoting bioengineering innovation (<http://louisville.edu/speed/engineeringplatforms>)
- **Metabolomics** : a thrust at UofL focusing on how the cellular profile of biological systems change due to stress with applications in human and ecosystem health (<http://research.louisville.edu/metabolomics>)

Energy Technology and Environmental Science

- **ERTL**: Environmental Research and Training Lab at UK (<http://ertl.uky.edu>)
- **ERI**: Environmental Research Institute at ECU (www.environmentalresearchinstitute.eku.edu)
- **VOEIS**: Virtual Observatory and Ecological Information System at Murray State in collaboration with Montana State University to develop environmental sensing/tracking technology (www.murraystate.edu/qacd/cos/hbs/VOEIS)

Bioscience

- **KY SPACE** : Developing technology (Cubesats) and applications at UK and Morehead to enable small scale bioscience in space (www.kentuckyspace.com)
- **Genomics**: a thrust at UK to map specific genomes of microbes, plants and animals , (www.kynsfepscor.org/investments_2008_2013.html#ecological_genomics)
- **Proteomics**: a thrust at UK funded by both the NSF and NIH to study and characterize proteins, (www.mc.uky.edu/biochemistry/cores.asp)

Information Technologies and Communication

- **VisCenter** Center for Visualization & Virtual Environments at UK (www.vis.uky.edu)
- **Cyberinfrastructure Planning**: a statewide collaborative effort to identify Kentucky's future cyberinfrastructure needs and solicit federal support to enhance the Commonwealth's cyber backbone.

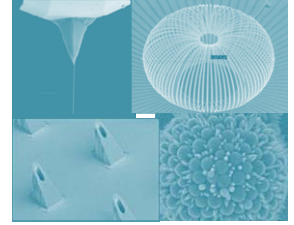
EPSCoR Funding (Fed+State match) Awarded to Kentucky by:

	NSF + Cofunding	NASA	DOE	USDA	DOD	FY Totals
FY00-01	\$5,363,348	\$727,650	\$800,000	\$0	\$1,152,361	\$8,043,359
FY01-02	\$9,414,595	\$1,951,111	\$800,000	\$0	\$2,274,113	\$14,439,819
FY02-03	\$10,738,537	\$2,217,018	\$1,377,924	\$185,497	\$0	\$14,518,976
FY03-04	\$7,922,320	\$2,216,786	\$1,865,126	\$318,000	\$0	\$12,322,232
FY04-05	\$6,485,283	\$2,561,099	\$457,051	\$863,099	\$0	\$10,366,532
FY05-06	\$10,625,146	\$2,843,182	\$337,485	\$2,876,046	\$0	\$16,681,859
FY06-07	\$9,631,788	\$1,873,633	\$250,000	\$1,026,091	\$623,956	\$13,405,468
FY07-08	\$8,236,430	\$1,776,801	\$877,565	\$2,098,985	\$1,486,426	\$14,476,207
FY08-09	\$5,999,877	\$1,913,481	\$1,075,909	\$1,609,798	\$697,297	\$11,296,362
FY09-10	\$6,975,414	\$3,223,163	\$880,036	\$1,089,578	\$869,204	\$13,037,395
FY01-10	\$81,392,738	\$21,303,924	\$8,721,096	\$10,067,094	\$7,103,357	\$128,588,209

EPSCoR Program Highlights

Nano-Science **Engineering the Materials of Tomorrow**

- NSF EPSCoR funding is supporting a world-class, 10,000 sq. ft., 7 bay cleanroom facility where Kentucky teachers, students and businesses design and fabricate micro/nano devices, like small retinal implants that can wirelessly monitor ocular pressure for glaucoma patients. ([MNTC](#))*
- **Six (6) biomedical start-up companies** have formed as a result of the resource growth in the micro/nanotechnology area.



Human Health **Finding ways to Improve Healthcare and Reduce Cost**

- NSF EPSCoR researchers are studying bone cell growth properties to recommend better materials for use in hip implants . ([Bioengineering](#))*
- NSF EPSCoR researchers are using powerful superconducting magnets and radio waves to profile how disease cells such as Alzheimers will respond to potential treatments. ([Metabolomics](#))*
- KY Researchers are improving chemotherapy treatments for cancer by using instrumentation purchased with EPSCoR funds to study the protein products of cells in the body. ([Proteomics](#))*
- EPSCoR investments have also led to **14 patents being issued** and **3 being licensed** for use primarily in the area of medical instrumentation.



Energy **Developing Alternate Energies**

- DOE EPSCoR researchers are using nanomaterials to convert light, heat, and water into energy. Knowledge gained will help to design better solar panels, and potentially utilize photolysis (or the splitting) of water to produce hydrogen more efficiently.



Environment **Monitoring Water Quality**

- NSF EPSCoR researchers are placing sensors in lakes & streams in Kentucky and Montana to determine the impact of climate, human demographics, and land use on water quality and ecological health. ([VOEIS](#))*
- NSF EPSCoR researchers are collecting water samples in southeast Kentucky rivers and streams to identified areas where raw sewage and acid mine drainage are major environmental and human health concerns. ([ERI](#))*



Space **Utilizing the Potential of Microgravity**

- NASA EPSCoR students and faculty are designing CubeLabs for flight on the International Space Station (ISS) for various experiments such as to test cancer cell growth in a microgravity environment. ([KYSpace](#))*



Workforce Development **Training Tomorrow's Scientists & Engineers**

- EPSCoR funding has provided jobs for 3,000 scientific researchers, including 800 students in KY's academic institutions since 2003. EPSCoR graduate students have completed 80 M.S. degrees and 38 Ph.Ds increasing the number of highly trained Kentuckians in Science, Technology, Engineering & Math (STEM) fields.
- NASA EPSCoR funded programs are placing students in summer internships with aerospace industries, planetaria, and observatories.



Commercializing Technologies **Crossing Disciplines: Putting the 'Science' in Art**

- An NSF EPSCoR funded research center developed the technology to project large, high definition images. They recently collaborated with the UK Opera Theater to develop 'digital' sets, thereby saving time and money needed to build more extensive physical backdrops for their productions. They are licensing this technology to the Atlanta Opera, and are exploring company spin-offs. ([VisCenter](#))*

* See other side for descriptions