KY EPSCoR’s Role in Facilitating Academic Research

Liz Knapp, Assistant Director
KY Statewide EPSCoR Program

Science & Health Research Funding in KY Center for Research and Development, Bowling Green, KY

April 28, 2014
What is KY EPSCoR?

- **infrastructure** building program at KYs colleges & universities for:
  - STEM research,
  - applied innovation, and
  - education & workforce development

- A **federally** initiated–**state** matched partnership
What are our Goals?

- For faculty:
  - Independent federally funded researchers

- For the state:
  - Establishing Research Centers of Excellence
What Areas Do We Fund?

- Research Priority Areas:
  - Material Science & Advanced Manufacturing
  - Human Health & Personalized Medicine
  - Energy & Environmental Technologies
  - Biosciences & Agriculture
  - Information Technology & New Media
How Do We Accomplish Our Goals?

- **Nurturing research talent**
  - Providing seed grants and match funding for federal awards

- **Coordinating R&D interests:**
  - Annual conference,
  - sponsoring workshops, events
  - statewide committee meetings, members from academia (6 comprehensive, + 2 research institutions), industry,
  - Subcommittee organizational structure

- **State Support** – annual program funding through CPE
  - House Bill 572, 2000 Kentucky Innovation Act (KIA)

- **Federal level Communication**
  - National Coalition of EPSCoR/IDeA States
  - Washington Council – that has lobbying authority

**Annual Budget**

~ $1,460,000
Who Provides the Federal Funding?

7 Federal Agencies
Collective Funding Sources:

7 Federal Agencies + State Matching ($1.5 million/yr)

- **EPSCoR Programs**
  - NSF
  - DOE
  - NASA
  - DOD (program suspended in 2010)
  - EPA (program suspended since 2004)

- **IDeA** (Institutional Development Awards)
  - NIH

- **AFRI** (Agriculture & Food Research Initiative)
  - USDA

No state matching

EPSCoR Funding to Kentucky 2000-2013

- Federal $295.3 M
- KY EPSCoR $28.3 M
- Institutional $27.9 M

8% 8% 84%
State Level Program Organization

KY EPSCoR Statewide Committee

KY EPSCoR Program Director & Assistant Director

KY NSF EPSCoR Subcommittee
- UK
  - www.kynsfepsocor.org

KY DOE EPSCoR Subcommittee
- UK
  - www.kydooepscor.org

KY NASA EPSCoR Subcommittee
- UK
  - nasa.engr.uky.edu

KBRIN NIH - IDeA Subcommittee
- UofL
  - www.kbrin.louisville.edu
Kentucky Statewide EPSCoR Committee

Director of Statewide EPSCoR Program

KY NSF EPSCoR Subcommittee
KY DOE EPSCoR Subcommittee
KY NASA EPSCoR Subcommittee
NIH - IDeA Subcommittee

State Level Program Organization:

Federal Programs:
KY EPSCOR Program

• Rick Kurzynske, Director

• Liz Knapp, Assistant Director

www.kyepscor.org

@ KY_EPSCoR

KYEPSCoR
## KY EPSCoR Infrastructure Seeding Program

<table>
<thead>
<tr>
<th>Grant Categories</th>
<th>Full Name</th>
<th>Abbrev</th>
<th>Purpose</th>
<th>Period</th>
<th>Max Amounts</th>
<th>Cash Matching</th>
<th>Eligibility</th>
<th>Award Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Start-up Fund</td>
<td>RSF</td>
<td></td>
<td>Provide funding to attract high quality applicants for the establishment of new STEM research &amp; teaching faculty positions.</td>
<td>1 - 2 years</td>
<td>$10,000 - $35,000</td>
<td>1:1</td>
<td>KY’s 6 Comprehensive Universities: EKU, KSU, MoSU, MuSU, NKU, WKU</td>
<td>Submit a research proposal(s) for Federal Funding</td>
</tr>
<tr>
<td>Collaborative Research Initiation Grant</td>
<td>CRIG</td>
<td></td>
<td>To bring groups together to discuss the possible formation of multi-investigator programs, centers, or institutes</td>
<td>up to 1 year</td>
<td>$10,000</td>
<td>None Required</td>
<td>Faculty members or researchers from any of KY’s state colleges or universities</td>
<td>Pursue Federal funding</td>
</tr>
<tr>
<td>Collaborative Research Development Grant</td>
<td>CRDG</td>
<td></td>
<td>To seek extramural funding for a major research initiative.</td>
<td>up to 1 year (renewable for a 2nd yr)</td>
<td>$30,000 / year</td>
<td>None Required</td>
<td>Faculty members or researchers from any of KY’s state colleges or universities</td>
<td>Must submit a proposal(s) seeking funding for a major research initiative</td>
</tr>
<tr>
<td>National Laboratory Initiative</td>
<td>NLI</td>
<td></td>
<td>Travel funds to develop strong individual and institutional relationships with national laboratories and research centers</td>
<td>up to 1 year</td>
<td>$1,500 for a visit, $5,000 for residence, up to 12 months</td>
<td>None Required</td>
<td>Faculty members or researchers from any of KY’s colleges or universities</td>
<td>Pursue federal funding</td>
</tr>
</tbody>
</table>

Rolling receipt until funds exhausted ~ ($80 - $100k /FY available)
Research Start-up Fund awardees

RSF Awardees 2002-2008
<table>
<thead>
<tr>
<th>Type</th>
<th>First</th>
<th>Last</th>
<th>Org</th>
<th>Title</th>
<th>Start</th>
<th>End</th>
<th>KY EP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Frank</td>
<td>Shaw</td>
<td>EKU</td>
<td>Protein Biochemistry &amp; Proteomics between The EKU Department of Chemistry and The UK Department of Molecular &amp; Cellular Biochemistry</td>
<td>4/15/02</td>
<td>4/15/04</td>
<td>$20,000</td>
</tr>
<tr>
<td>2</td>
<td>James</td>
<td>Watters</td>
<td>UofL</td>
<td>Permeable Reactive Barriers: Applicability to Radionuclides and Other Hazardous Materials</td>
<td>10/1/02</td>
<td>9/30/04</td>
<td>$20,000</td>
</tr>
<tr>
<td>3</td>
<td>Terry</td>
<td>McCreary</td>
<td>Murray</td>
<td>To Pursue an NSF Project to Perform Research, Design and Testing of Alternate Rocket Propellants &amp; Motors.</td>
<td>1/1/04</td>
<td>12/31/04</td>
<td>$10,000</td>
</tr>
<tr>
<td>4</td>
<td>Maeve</td>
<td>McCarthy</td>
<td>Murray</td>
<td>Biomathematics at Murray</td>
<td>8/1/04</td>
<td>11/30/05</td>
<td>$10,000</td>
</tr>
<tr>
<td>5</td>
<td>Gang</td>
<td>Cao</td>
<td>UK</td>
<td>Novel Electronic Oxides: Living on the Edge</td>
<td>11/1/04</td>
<td>10/31/05</td>
<td>$10,000</td>
</tr>
<tr>
<td>6</td>
<td>Charles</td>
<td>Ziegler</td>
<td>UofL</td>
<td>Establishment of an Institute for Democracy and Development</td>
<td>5/1/05</td>
<td>4/30/07</td>
<td>$10,000</td>
</tr>
<tr>
<td>7</td>
<td>Yousef</td>
<td>Kwaik</td>
<td>UofL</td>
<td>Interdisciplinary Studies in Biodefense and Emerging Infectious Diseases</td>
<td>11/1/06</td>
<td>10/31/07</td>
<td>$10,000</td>
</tr>
<tr>
<td>8</td>
<td>Lakshmi</td>
<td>Narasimhan</td>
<td>WKU</td>
<td>Kentucky EPSCoR Intensive Workshop on High Performance Computing for Informatics and Biosciences</td>
<td>3/1/07</td>
<td>6/30/08</td>
<td>$10,000</td>
</tr>
<tr>
<td>9</td>
<td>Yuan</td>
<td>Liao</td>
<td>UK</td>
<td>Exploring New Operating and Control Algorithms for the Composite Electric Power System</td>
<td>6/15/08</td>
<td>12/31/09</td>
<td>$10,000</td>
</tr>
<tr>
<td>10</td>
<td>Edward</td>
<td>Kintzel</td>
<td>WKU</td>
<td>Phase I CRIG: Establishment of the WKU Nondestructive Analysis Center (WKU NOVA Center)</td>
<td>7/1/10</td>
<td>2/29/12</td>
<td>$10,000</td>
</tr>
</tbody>
</table>
EPSCoR Funded Centers & Initiatives

- CAM  Center for Advanced Materials  UK
- MNTC  Micro/Nano Technology Center  UofL
- CeNSE  Center for Nanoscale Science and Engineering  UK
- KY NanoNET  collaborative network statewide
- ERTL  Environmental Research and Training Lab  UK
- ERI  Eastern KY, Environmental Research Institute  EKU
- VOEIS  Virtual Observatory & Ecological Information System  Murry
- KY SPACE  collaborative, UK & Morehead
- VisCenter  Center for Visualization & Virtual Environments  UK
- NOVA  Nondestructive Analysis Center  WKU
- Bioengineering  UofL & UK
- Metabolomics  UofL
- Genomics  UK
- Proteomics  UK
## Collaborative Research Development Grant Awardees

<table>
<thead>
<tr>
<th>Type</th>
<th>First</th>
<th>Last</th>
<th>Org</th>
<th>Title</th>
<th>Start</th>
<th>End</th>
<th>KY EP</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRDG</td>
<td>Mahendra</td>
<td>Sunkara</td>
<td>UofL</td>
<td>Toward University/Industry Collaborative Research Center in <strong>Materials Nanotechnology</strong></td>
<td>8/1/03</td>
<td>7/30/05</td>
<td>$40,000</td>
</tr>
<tr>
<td>CRDG</td>
<td>I.S.</td>
<td>Jawahir</td>
<td>UK</td>
<td>Engineering Research center (ERC) for <strong>Sustainable Products</strong>, Processes and Systems</td>
<td>1/4/04</td>
<td>12/31/04</td>
<td>$20,000</td>
</tr>
<tr>
<td>CRDG</td>
<td>Kozo</td>
<td>Saito</td>
<td>UK</td>
<td>Engineering Research center (ERC) in <strong>Surface Coatings</strong> Research and Applications</td>
<td>4/1/04</td>
<td>12/31/08</td>
<td>$19,987</td>
</tr>
<tr>
<td>CRDG</td>
<td>Michael</td>
<td>Jay</td>
<td>UK</td>
<td>Lowering <strong>Drug</strong> Costs through a New <strong>Manufacturing Paradigm</strong></td>
<td>11/1/04</td>
<td>12/31/05</td>
<td>$20,000</td>
</tr>
<tr>
<td>CRDG</td>
<td>Suzanne</td>
<td>Smith</td>
<td>UK</td>
<td>Establishing an Engineering Research Center (ERC) for <strong>Unmanned Aerial Vehicles</strong> at the University of Kentucky</td>
<td>11/1/04</td>
<td>10/31/06</td>
<td>$20,000</td>
</tr>
<tr>
<td>CRDG</td>
<td>Stephen</td>
<td>Winters</td>
<td>UofL</td>
<td>Pursuit of a Center for the Study of Neuroendocrine and Testicular Mechanisms in <strong>Male Infertility</strong></td>
<td>6/1/05</td>
<td>5/31/07</td>
<td>$29,574</td>
</tr>
<tr>
<td>CRDG</td>
<td>Bert</td>
<td>Lynn</td>
<td>UK</td>
<td>Collaborative <strong>Proteomics</strong> Research for Kentucky: A Standard Bioinformatics Infrastructure for Proteomics Data at UK and Uof L</td>
<td>6/1/06</td>
<td>5/31/08</td>
<td>$28,971</td>
</tr>
<tr>
<td>CRDG</td>
<td>Gang</td>
<td>Cao</td>
<td>UK</td>
<td>Formation of a Center for <strong>Advanced Materials</strong> - Novel Electronic Materials and their Applications in Epitaxial Thin Films and Device Structures</td>
<td>5/1/07</td>
<td>6/30/08</td>
<td>$30,000</td>
</tr>
<tr>
<td>CRDG</td>
<td>Patrick</td>
<td>Kitzman</td>
<td>UK</td>
<td>Health and quality of life challenges for individuals with <strong>spinal cord injury</strong>, living in medically underserved areas of Kentucky, receiving <strong>rehabilitation</strong> services.</td>
<td>6/15/08</td>
<td>6/14/10</td>
<td>$16,706</td>
</tr>
<tr>
<td>CRDG</td>
<td>Jinze</td>
<td>Liu</td>
<td>UK</td>
<td>The Development of a Model of Molecular Events Leading to <strong>Seed Germination</strong></td>
<td>6/15/08</td>
<td>6/14/09</td>
<td>$19,002</td>
</tr>
<tr>
<td>CRDG</td>
<td>Dave</td>
<td>McNear</td>
<td>UK</td>
<td>Integrated Research, Education, and Extension to Enable <strong>Sustainable Biofuel Production</strong> – A Workshop to Organize Research Efforts in the Southeast U.S.</td>
<td>4/5/10</td>
<td>4/8/11</td>
<td>$27,335</td>
</tr>
</tbody>
</table>

**Results:** 7 of the 11 CRDG awardees (64%) secured federal/major funding subsequent to their award.
KY EPSCoR Infrastructure Seeding Program

National Laboratories Visited

- Kitt Peak National Observatory
- US Army Research Laboratory
- Los Alamos National Laboratory
- Marshall Space Flight Center
- Argonne National Laboratory
- Pacific Northwest National Laboratory
- AFRL (Air Force Research Laboratory)
- Oak Ridge National Laboratory
Suzanne Weaver Smith, PhD, PE, Director
Janet K. Lumpp, PhD, Associate Director
Jacob Owen, Assistant Director

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@NASAKentucky
### NASA KY Space Grant – Funding Available

<table>
<thead>
<tr>
<th>Award Program</th>
<th>Program Abbreviation</th>
<th>Program Description</th>
<th>US Citizen Required</th>
<th>Maximum Award</th>
<th>Indirect Costs Allowed</th>
<th>Required Cost-Share $CS:$Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate Fellowships</td>
<td>GF</td>
<td>Salary or stipend, tuition, materials and travel for MS and PhD students to conduct NASA aligned research</td>
<td>YES</td>
<td>$30,000</td>
<td>No</td>
<td>1:1 including 12.5% faculty FTE</td>
</tr>
<tr>
<td>Undergraduate Scholarships</td>
<td>US</td>
<td>Salary or stipend, materials and travel for undergraduate students to conduct NASA aligned research</td>
<td>YES</td>
<td>$6,000</td>
<td>No</td>
<td>None¹</td>
</tr>
<tr>
<td>Team Projects</td>
<td>TP</td>
<td>Materials and travel for student teams participating in NASA related competitions</td>
<td>YES</td>
<td>$10,000</td>
<td>No</td>
<td>0.5:1</td>
</tr>
<tr>
<td>Research Initiation Awards</td>
<td>RIA</td>
<td>Faculty directed research to explore NASA collaborations and NASA aligned research topics</td>
<td>YES</td>
<td>$15,000</td>
<td>Yes</td>
<td>1:1</td>
</tr>
<tr>
<td>Course Development/Revision</td>
<td>CDR</td>
<td>Higher education curriculum development and revision of aerospace courses</td>
<td>YES</td>
<td>$3,000</td>
<td>Yes</td>
<td>1:1</td>
</tr>
<tr>
<td>Mini-Grants</td>
<td>MG</td>
<td>Precollege and science center outreach activities, targeted recruiting and teacher PD</td>
<td>YES</td>
<td>$5,000</td>
<td>Yes</td>
<td>None¹</td>
</tr>
</tbody>
</table>

**Call for proposals in August 2014**
Undergraduate Student Travel Scholarship

- $500
- students at Affiliate Institutions
- travel to:
  - conferences
  - NASA Centers or
  - other relevant scientific sites and events

Available until funds run out
NASA KENTUCKY<br>Space Grant Consortium and EPSCoR Programs

Kentucky Space Grant Academic Affiliates

Bellarmine University<br>Berea College<br>Bluegrass CTC<br>Centre College<br>Eastern Kentucky University<br>Kentucky State University<br>Morehead State University<br>Murray State University<br>Northern Kentucky University<br>Owensboro CTC<br>Thomas More College<br>University of Kentucky<br>University of Louisville

Western Kentucky University

Kentucky Space Grant Non-Academic Affiliates

Aviation Museum of Kentucky<br>Innovator, LLC<br>Institute for Aerospace Education<br>Kentucky Science and Technology Corporation<br>Kentucky Space, LLC<br>Tribo Flow Separations, LLC

Space Grant opportunities open to U.S. citizens at affiliate institutions. EPSCoR opportunities open to all Kentucky higher education institutions without restriction of participant citizenship status.

nasa.engr.uky.edu
“Aerospace is now the leading Kentucky export, increasing over the last three years and expected to continue to increase”

- Louisville Business First article:
  Kentucky’s aerospace products and parts exports exceeded $5 billion through November of last year, making it the highest export total for any individual industry sector in Kentucky’s history.

- Lexington Herald-Leader article:
  Leading Kentucky’s export growth is aerospace products ($5.6 billion), followed by motor vehicles and parts ($5.5 billion) and synthetic rubber and resin ($1.4 billion).
  [Link](http://www.kentucky.com/2014/02/15/3089780/ky-sets-exports-record-for-third.html)
University Level

Kentucky College Students Interning at NASA Centers in 2011-2012:

Alec Lewis, Georgetown College, Isolator Dynamics Research Lab (IDRL), Langley Research Center (left)

Megan Fuldner, NKU, Wind Tunnel Testing, NASA Ames Research Center (right)

Ishita Jain, UofL, Prototype Space Suit Design and Testing, Johnson Space Center (left)

Barrett Tirey, UK, Advanced Propulsion Technologies - Designed Most Promising System to Power the Team’s ERA Aircraft, NASA Langley Aeronautics Academy (right)

Timothy Hennig, WKU, Construction Projects, Operations Directorate, Johnson Space Center (left)

Carolina Rojas Ramirez, Hopkinsville Community College, Nanocomposites, Langley Research Center (right)
Robot Design Competition

Autonomous Robot Design Competition

Autonomous robots will play a crucial role in the success of future NASA missions due to the fact that the robots are out of contact with mission control for long periods of time. Murray State University’s Robot Team (with three returning members from the 2001 team) designed and built an autonomous robot that competed in the IEEE Southeast Conference 2012 Student Hardware Competition in March 2012 in Orlando, FL.

The objective of the 2012 competition was for the robot to traverse a maze-like course, analyzing electrical signals and other information along the way in order to point the robot in the right direction. The competition required team members with expertise in electrical and mechanical engineering, and computer programming with knowledge of circuit analysis, Fourier series, sensors, circuit building, model simulation software packages, and troubleshooting.
Airplane Design Competition

BLUE CAT: A Student Design Challenge – UAV’s

NASA KY Space Grant funding supported the 2011-2012 Boundary Layer UAV for Experimental Characterization of Turbulence (BLUE CAT) design challenge. This project provided undergraduate seniors with hands-on experience applying analytical principles, problem solving ability and design skills towards designing, building and flying an unmanned aerial vehicle (UAV) capable of meeting specific set of requirements.

The mission objective for 2011-2012 was to produce an autonomous platform capable of conducting scientific measurements of atmospheric turbulence.

Design/Build/Fly (DBF) Competition

The University of Kentucky’s “Blue Dawn” team competed against nearly 100 student teams from around the world in the 2011 Cessna Aircraft Company/Raytheon Missile Systems Design/Build/Fly Competition at TIMPA Field in Tucson, AZ April 15-17, 2011. Each year, teams must design a lightweight aircraft to successfully complete three action specific flights.

The contest theme was a Soldier Portable Unmanned Aerial Vehicle (UAV). The airplane had to fit in a commercially available suitcase meeting airline carry-on requirements. UK’s DBF team competed well, despite some mid-flight difficulties and recorded their best overall finish tied for 49th place with The Ohio State University.

“Many teams crashed and only 30 or so actually completed all three missions,” said team member Austin Loyal. “Regardless, [the competition] was an excellent opportunity for each team member to apply concepts from the classroom into designing, building and flying a complex system.”

University of Kentucky student test their plane prior to flight

University of Kentucky DBF team member sends the "Blue Dawn" in flight.
Rocket Design Competition

USLI Rocket Launch Competition

NASA University Student Launch Initiative, or USLI, is a competition that challenges college students to design, build and launch a reusable rocket. Students vie to see whose rocket can come closest to the 1-mile altitude goal and safely return its onboard science payload to Earth.

The project engages students in scientific research and real-world engineering processes with NASA engineers.

In the 2012 competition, held at Bragg Farm in Toney, Ala, students from the University of Louisville received the Best Rookie Team Award placing 14th out of 51 teams.

Specially crafted rockets soared high into the skies April 22 at the 2011-12 NASA Student Launch Projects challenge.

Fifty-one teams of college students from around the country took part in the event.

Image credits: NASA/MSFC/Fred Deaton
Airplane Wing Design Competition

2012 Wing Design Competition, Nicholasville, KY, May 14, 2012

Planes designed and built by nine Kentucky high schools took to the air Monday, May 14, in the second Kentucky Institute for Aerospace Education (KIAE) Wing Design Competition, held at Lucas Field in Nicholasville, Ky. The event was again hosted by R.J. Corman Aviation Services and coordinated by the UK College of Engineering and NASA Kentucky.

More than 125 students, faculty and volunteers from across Kentucky participated. The students assembled a remote-controlled airplane from kits and were challenged to design and construct a wing for their aircraft in place of the one provided. The winning design was based on the amount of weight the aircraft could carry with respect to the weight of its wing and a new “speed round” required teams to build for speed and strength. Teaching modules on aerodynamics and stability were provided by UK mechanical engineering professors Sean Bailey and Jesse Hoag.

KIAE’s CEO Tim Smith commented last year on students reaction to the event saying, “The level of engagement was through the roof...with STEM learning demonstrated in great depth.” NASA KY Director Suzanne Smith added this year that, “[The] competition inspires students with flight, but gives them a great hands-on opportunity to apply math, science and problem solving in ways they don’t get in a classroom.”
Space Science Education
- cubesat build

Robinson Scholars Program - Space Sciences Academy

The Robinson Scholars Program completed year two of its Space Science Camp for high school student enrichment in astronomy and space sciences. The intent of the program is twofold: 1) improve math and science outcomes and college preparation and 2) increase the number of students from Eastern Kentucky pursuing careers in STEM disciplines.

Thirty-two high school students attended the program which was held at Morehead State University, June 24-29, 2012. Year one students participated in activities such as basic circuit building, laboratory techniques, programming, optical and radio telescope usage, applied math, and astronomy. Year two students participated in activities in applied math, planetary sciences, and mechatronics.

SPACE SCIENCE CAMP - (top) Prof. Benjamin Malphrus, director of the Morehead State University Space Science Center, delivers a lecture on extra-solar planetary systems to eastern KY high school students.

Prof. Robert Twiggs led advanced circuitry activities with seven advanced students who constructed CubeSats, including, (left) Alex Mendoza, Pike County and (right) Willa Daniels, Owsley County.
Rocket Design Competition

Hart County’s Cave Area Rocket Scientists enter the Team America Rocketry Challenge (TARC)

TARC is the world’s largest annual rocket contest, where student teams aged 11-18yrs design, build and fly a model rocket that meets a specified set of mission and performance requirements. The top 100 teams from across the US, based on local qualification flights, are invited to Washington, DC in May for the national finals. Prizes include $60,000 in cash and scholarships split between the top 10 finishers who are then eligible to compete in international competition.

Kentucky students have excelled in the TARC challenge sending four teams from Butler and Hart County in 2011 and five teams including LaRue County in 2012 to the national finals. In 2011, Butler County students placed 14th out of the top 100.

Space Grant funds were used to purchase materials and supplies for the two Hart County 4-H teams (The Cave Area Rocket Scientists), pictured below, to build rockets for the competition. A recent survey of TARC alumni indicated that 81% of students who have participated in the rocket competitions plan to pursue careers in STEM.
# NASA KY EPSCoR Grants

<table>
<thead>
<tr>
<th>Award Program</th>
<th>Program Abbreviation</th>
<th>Program Description</th>
<th>US Citizen Required</th>
<th>Maximum Award</th>
<th>Indirect Costs Allowed</th>
<th>Required Cost-Share $CS:$Award</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Infrastructure Development Grants</td>
<td>RIDG</td>
<td>Faculty directed research to enhance existing collaborations with NASA collaborators</td>
<td>NO</td>
<td>$40,000</td>
<td>Yes</td>
<td>0.5:1</td>
</tr>
<tr>
<td>Workshop/Conference/Seminar</td>
<td>WCS</td>
<td>Researchers meeting to explore aerospace topics and joint funding opportunities</td>
<td>NO</td>
<td>$3,000</td>
<td>Yes</td>
<td>None</td>
</tr>
</tbody>
</table>

Call for proposals in August 2014
NASA KY EPSCoR
Research Area Awards

- Topic Specific projects that address a high priority NASA research and technology development need.

- $250 k Federal + $100k KY EPSCoR + $150 alt match/year

- Project term -> 3 years

- Total Funding -> $1.5 million

Call for proposals in September 2014
1. Efficacy of Countermeasures to **Cardiovascular Deconditioning** in Men and Women During Simulated Moon and Mars Explorations - Joyce Evans, UK

2. Versatile Biosensing Platform for Monitoring **Bone Markers for Space Medicine** - David Puleo, UK

3. The **CubeLab** Standard for Improved Access to the International Space Station for Scientific Payloads - James Lumpp, UK

4. **Shape Memory Alloys** for High Temperature and Surface Morphing Applications in Aerospace Industry - Dr. Haluk Karaca and Dr. Y.T. Cheng, UK

5. A Paradigm-Shifting Therapy for **Mitigating Cellular and Tissue Damage** in Humans Exposed to Radiation - Dr. Patricia Soucy and Dr. Robert Keynton, UofL

6. Improving **Heat Shields for Atmospheric Entry**: Numerical and Experimental Investigations for Modeling Ablative Thermal Protection System Surface Degradation Effects on Near-Wall Flow - Dr. Alexandre Martin, Dr. Sean Bailey, Dr. Michael Winter, Dr. Chi Shen, UK
Faculty Travel Grants

- $1,500/ea
- Eligibility **not limited** to NASA Kentucky Space Grant Consortium Affiliate Institutions. US Citizenship is **not required**
- travel to:

<table>
<thead>
<tr>
<th>Ames Research Center</th>
<th>Dryden Flight Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glenn Research Center</td>
<td>Goddard Research Center</td>
</tr>
<tr>
<td>Goddard Space Flight Center</td>
<td>Jet Propulsion Laboratory</td>
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<td>Johnson Space Center</td>
<td>Kennedy Space Center</td>
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<tr>
<td>Langley Research Center</td>
<td>Marshall Space Flight Center</td>
</tr>
<tr>
<td>NASA Headquarters</td>
<td>Stennis Space Center</td>
</tr>
<tr>
<td>Wallops Flight Facility</td>
<td>White Sands Test Facility</td>
</tr>
</tbody>
</table>

- Apply 1 month prior to travel

**Funds available until May 15, 2014 – Travel Complete by June 30, 2014**
• Rodney Andrews, Director

• Jeff Mossey, Program Administrator

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KyNSFEPSCoR
KY NSF EPSCoR (Pending Available Funding)

Research Infrastructure Initiative (RII) Track-1

“Powering the Kentucky Bioeconomy for a Sustainable Future”
- $20M Federal + $4M state match -> $24M over 5 years

1) Bio-Inspired Membrane Technologies
   - water purification, biomass conversion and bioproduct separation

2) Chemical Biology for Advanced Materials
   - Engineering of biomass systems with tractable lignin

3) Electrochemical Energy Storage
   - Self-healing electrodes and bio-based battery materials
REG – Research Enhancement Grant

Eligibility -> non-UK/non-UofL participants and institutions. -> submit an NSF research proposal within 1 year

**Track1:** Faculty Research Seed Funding for Kentucky’s regional faculty to establish their research programs and enable competitive follow-on applications to NSF. ($25,000).
- Equipment purchases allowed (existing faculty)

**Track2:** Startup packages for newly hired STEM faculty recruited from outside of Kentucky to a (non-UK/non-UofL) Kentucky institution. ($50,000).
KY NSF EPSCoR – Potential funding in Summer/Fall 2014

- **RSP** – Research Scholars Program – (no $ limit)
  - mentored research projects for undergraduate and graduate students
  - underrepresented students in STEM majors,
  - a minimum of a 3.0 GPA in related course work

- **ROC** – Research Outreach and Communication – ($15,000)
  - communicate and distribute meaningful results of STEM research projects with the public. (Examples: STEM teacher training programs or highlight/instructional video)
## KY NSF EPSCoR – Examples of Previous Awardees (FY12-13)

<table>
<thead>
<tr>
<th>PI</th>
<th>Institution</th>
<th>Amount</th>
<th>Yes</th>
<th>No</th>
<th>REG T1 ($25K)</th>
<th>REG T2 ($50K)</th>
<th>RSP</th>
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<td>1 Horne, Lloyd</td>
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<td>2 Gupta, Sanju</td>
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<td>7 Trzepacz, Chris</td>
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<td>39 Dakshinamurthy/Waghwani</td>
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<td>40 Melanie Bentley (Otieno)</td>
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$1,069,502  23  20  23  6  13  1
Progress in the development of new functional organic materials has accelerated in recent years, leading to a host of design rules for a variety of applications that are not necessarily enumerated in current chemical literature. This Symposium is designed to introduce researchers from EPSCoR states to the latest in organic electronics materials design and characterization, as well as present the current state-of-the-art in...
• Eric Grulke, Director
• Monica Mehanna, Program Manager

www.kydoeepscor.org
DOE EPSCoR Implementation Grant

- Award Term: 3 years,
- Award Amount: $2.5 M / yr ($7.5 Million total)
- # of awards expected: 2-3
- No cost share required
- Proposal submitted to DOE 4-15-14
Center for self-sustaining electronics

Selected project
Core competencies

- Energy harvesting
- Energy storage
- Low-power devices

Cover page supplement for collaborations

Table 1: Senior / key personnel on the application and institutional affiliations

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>Title</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alphenaar</td>
<td>Bruce</td>
<td>Professor</td>
<td>University of Louisville</td>
</tr>
<tr>
<td>Brill</td>
<td>Joe</td>
<td>Professor</td>
<td>University of Kentucky</td>
</tr>
<tr>
<td>Graham</td>
<td>Kenneth</td>
<td>Asst. Professor</td>
<td>University of Kentucky</td>
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<tr>
<td>Liu</td>
<td>Jinjun</td>
<td>Asst. Professor</td>
<td>University of Louisville</td>
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<tr>
<td>McNamara</td>
<td>Shamus</td>
<td>Assoc. Professor</td>
<td>University of Louisville</td>
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<tr>
<td>Naber</td>
<td>John</td>
<td>Professor</td>
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<tr>
<td>Odom</td>
<td>Susan</td>
<td>Asst. Professor</td>
<td>University of Kentucky</td>
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<tr>
<td>Russel</td>
<td>KC</td>
<td>Professor</td>
<td>Northern Kentucky U.</td>
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<tr>
<td>Walsh</td>
<td>Kevin</td>
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<td>University of Louisville</td>
</tr>
<tr>
<td>Weisenberger</td>
<td>Matt</td>
<td>Assoc. Director</td>
<td>Center for Applied Energy Research</td>
</tr>
</tbody>
</table>
Demonstration project: helps focus the team on an integrated, problem-solving product

- **Figure 1.** Schematic of the integrated sensor module that is the end-goal of CSSE’s 3-year DOE EPSCoR project. Initial demonstrator devices will have dimensions of roughly 9cm x 9cm x 2cm, but our end goal are 3cm x 3cm x 0.5cm products.
Vision for CCSE...

(UK), the Center for Applied Energy Research (CAER), and Northern Kentucky University (NKU). The project will bring together Kentucky’s experts in energy harvesting and storage, along with researchers experienced in low-power sensors and the fabrication of electronics by low-cost methods using flexible substrates. Our budget request is not simply asking for the traditional support for a collection of individual researchers – rather, in the true spirit of the EPSCoR program, this project is strongly focused on building infrastructure, in terms of both equipment and personnel, to fill in existing gaps in capacity that have precluded Kentucky researchers from pursuing center-type funding opportunities from traditional funding sources. While we will describe the key physical deliverables from this project over the course of this proposal, the most significant outcome will be the completion of a cohesive group of Kentucky-based researchers with the capability to translate fundamental discoveries in the areas of materials and electronic phenomena into functional devices for the benefit of society.
For More Information contact:

KY Statewide EPSCOR Program

- Nancy Martin, Chair  *(position open - retiring October 2014)*
- Rick Kurzynske, Director
- Liz Knapp, Assistant Director

www.kyepsco.org

@ KY_EPSCoR

KYEPSCoR
Questions ?
IDeA – NIH
Centers of Biomedical Research Excellence (COBRE)

Centers at the University of Louisville:

<table>
<thead>
<tr>
<th>Research Focus</th>
<th>Award Total</th>
<th>Yrs in Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal Cord Injury</td>
<td>$18.5 Million</td>
<td>2000 – 2010</td>
</tr>
<tr>
<td>Cancer Targets</td>
<td>$21.0 Million</td>
<td>2003 – 2013</td>
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<tr>
<td>Birth Defects</td>
<td>$11.6 Million</td>
<td>2002 – 2013</td>
</tr>
<tr>
<td>Diabetes &amp; Obesity</td>
<td>$ 8.1 Million</td>
<td>2008 – 2013</td>
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</table>

Centers at the University of Kentucky:

<table>
<thead>
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<tr>
<td>Oral Health</td>
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<td>Human Disease</td>
<td>$21.8 Million</td>
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<tr>
<td>Women’s Health</td>
<td>$21.1 Million</td>
<td>2000 – 2011</td>
</tr>
<tr>
<td>Obesity &amp; Heart Disease</td>
<td>$ 6.5 Million</td>
<td>2008 – 2013</td>
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IDeA Networks of Biomedical Research Excellence (INBRE)

Expand & connect biomedical research across the state at primarily undergraduate universities:

- Student training & career development
- Build bioinformatics infrastructure

$41.6 Million  2001 – 2014
Track 2 Participating Institutions:

1. Alabama A&M University
2. Auburn University
3. Kentucky State University
4. Murray State University
5. Northern Kentucky University
6. Tuskegee University
7. University of Alabama
8. University of Alabama at Birmingham
9. University of Alabama in Huntsville
10. University of Kentucky
11. University of South Alabama
12. SmartStart Educational Consulting Services (program evaluation)