

# ***Grants Awarded Report***

**From: 6/1/10 to 6/30/10**

**Project Title:** Upper Cumberland Middle Grades Science Partnership

**Activation Amount:** \$68,000.00

**Agency:** Tennessee Department of Education

**Personnel:**

PI - Susan Gore, Curriculum and Instruction  
Senior Personnel - Daniel Combs, Biology  
Senior Personnel - Evan Hart, Earth Sciences  
Senior Personnel - Jeremy Wendt, Curriculum and Instruction  
Senior Personnel - Julie Baker, Curriculum and Instruction  
Senior Personnel - Margaret Phelps, STEM Center  
Senior Personnel - Ray Jordan, Biology  
Senior Personnel - Wayne Leimer, Earth Sciences  
Support Personnel - Charles Long, Learning Resources Center  
Support Personnel - Deborah Peterman, Curriculum and Instruction  
Support Personnel - Ellen Wolfe, Office of Research and Graduate Studies  
Support Personnel - Janet Counce, Chemistry  
Support Personnel - Jason Beach, Curriculum and Instruction  
Support Personnel - Kathryn Rust, Chemistry  
Support Personnel - Lana Clauss, Curriculum and Instruction  
Support Personnel - Paula Engelhardt, Physics  
Support Personnel - Stephen Robinson, Physics  
Support Personnel - Wendy Smith, Mathematics

# *Grants Awarded Report*

**From: 6/1/10 to 6/30/10**

***Abstract:***

TTU Departments of Curriculum and Instruction, Biology, Physics, Earth Science, Chemistry, and the Oakley STEM Center propose a middle grades science research partnership. Lebanon Special School District, Overton, and DeKalb are partners identified as "High Need." Other partners include Warren, Putnam, Smith, White, Macon, and Hamilton Counties. Fifty science middle school and special education teachers in grades 5-8 will be randomly assigned to an intervention group and 50 will be assigned to a control group. The control group will participate in all the pre/post tests and classroom observations as the intervention group; however, only the intervention group will participate in 3 two-week summer institutes aligned with state science standards and 5 follow-up professional development days that are based on district, teacher, and student needs. Teachers in the intervention and the control groups will take project developed content tests and will be observed using the LPIFA Science Classroom Observation Instrument. These data and the pre/post science achievement of their students will be compared to measure project success. This project is a controlled replication of the Cohort IV Upper Cumberland Middle Grades Mathematics Partnership. Results from this Science Partnership will be compared to the results of the Math Partnership.

***Project Title:*** Developing K-5 Teachers' Mathematics Knowledge for Teaching (Math Partnership)

***Activation Amount:*** \$378,434.00

***Agency:*** Tennessee Department of Education

***Personnel:***

PI - Holly Anthony, Curriculum and Instruction

Senior Personnel - David D. Smith, Mathematics

Senior Personnel - Jane Baker, Curriculum and Instruction

Senior Personnel - Leslie Suters, Curriculum and Instruction

Senior Personnel - Margaret Phelps, STEM Center

***Abstract:***

Tennessee Tech University (TTU) is the primary provider of professional development for teachers in the rural Upper Cumberland region. The TTU academic community understands the relationship between the quality of K-12 teaching and the academic skills needed by the students from this region. Given the size of local school districts and the geographic isolation from urban resources, the Upper Cumberland educational leaders at TTU and local school districts have created and sustained an active structure for providing quality professional development (PD) for area teachers for over 30 years. For this proposal, the TTU College of Arts and Sciences, Department of Mathematics, and the College of Education Department of Curriculum and Instruction have collaborated with the TTU Oakley Center for the Teaching and Learning of Science, Technology, Engineering, and Mathematics (STEM Center) and the TTU Rural Education Consortium in accessing the existing Upper Cumberland PD network of rural counties and identifying partners for this project. The scope of the project content includes attention to 1) all five standards in the Tennessee Mathematics Curriculum Standards, 2) research-based strategies for PD and mathematics instruction, and 3) development of standards-based instructional materials-since most adopted textbooks are not well aligned with the new K-5 Mathematics Curriculum Standards. This MSP project also builds on an emergent regional approach where PD targets a particular group of teachers across LEA's.

# *Grants Awarded Report*

**From: 6/1/10 to 6/30/10**

**Project Title:** TTU Pre-Engineering Math Science Research Partnership

**Activation Amount:** \$68,000.00

**Agency:** Tennessee Department of Education

**Personnel:**

Co-PI - Margaret Phelps, STEM Center

Co-PI - Roy Loutzenheiser, Engineering Administration

PI - Kenneth Hunter, Basic Engineering

Senior Personnel - Ellen Wolfe, Office of Research and Graduate Studies

Senior Personnel - Holly Anthony, Curriculum and Instruction

Senior Personnel - Jeffrey Austen, Electrical and Computer Engineering

Senior Personnel - Jessica Matson, Industrial and Systems Manufacturing

Senior Personnel - Joseph Biernacki, Chemical Engineering

Senior Personnel - Sandra J. W. Smith, Curriculum and Instruction

Senior Personnel - Wendy Smith, Mathematics

Support Personnel - Kristine Craven, Basic Engineering

Support Personnel - Sally Pardue,

**Abstract:**

The Tennessee Pre-Engineering Math Science Partnership Program is a comprehensive, three-year, research and professional development program for math, science, and career-technical teachers. The program is administered by the Millard Oakley Center for Teaching and Learning in Science, Technology, Engineering and Mathematics at Tennessee Tech. The program goals are to: 1) create a statewide cadre of teacher leaders for a sustainable pre-engineering program of study in grades 7-12; 2) provide teachers with the training and technology resources needed to integrate engineering principles into curricular and co-curricular programs; and 3) increase the number of students graduating from high school who are interested in and ready to pursue an engineering education. The partnership includes Tennessee Tech, Northeast State Technical Community College, the University of Tennessee at Martin, and 15-20 local education associations across Tennessee. Each partner LEA will have a four-teacher intervention team, a four-teacher control team, and a designated liaison to coordinate student data collection, testing, and evaluation activities. Each four-teacher team will consist of one middle school math or science teacher, one high school math teacher, one high school science teacher, and one career-technical teacher. Intervention teachers will attend a seven-day summer institute and four Saturday follow-up sessions each year. Instructional content includes engineering principles, the use of technology in the classroom, and field trips to engineering research centers and businesses. Teachers will assist in the development of engineering curriculum modules aligned with Tennessee students and will be trained to implement a pre-engineering certificate program for their students. Summer institutes will be held on the Tennessee Tech campus in July. Follow-up sessions will be held at regional locations in the fall and spring.

# *Grants Awarded Report*

**From: 6/1/10 to 6/30/10**

**Project Title:** Advancing the Hydrologic Potential of NASA's TRMM-Based Satellite Rainfall Estimation System for Global Flood Monitoring

**Activation Amount:** \$51,465.00

**Agency:** NASA

**Personnel:**

PI - Faisal Hossain, Civil and Environmental Engineering

**Abstract:**

The main research objectives of this project are: 1) to devise a framework for hydrologically relevant assessment metrics for the data producer that can advance the hydrologic potential of NASA's TMPA rain estimation system for flood monitoring and be amendable to operational institutionalization in a GPM based rain estimation system; 2) to demonstrate the hydrological relevance of the framework of assessment metrics for the TMPA system for flood monitoring over large-scale river basins; 3) to raise awareness of NASA's current and proposed missions on hydrologic measurements and inspire future generations of scientists at the K-12 level to tackle water-related global hazards; and 4) to demonstrate a deeper value of learning stochastic theory concepts for modeling natural variability of satellite based rain estimation in the undergraduate classroom.

# *Grants Awarded Report*

**From:** 6/1/10 to 6/30/10

**Project Title:** DURIP: A Cognitive Radio Network Testbed

**Activation Amount:** \$396,000.00

**Agency:** Office of Naval Research

**Personnel:**

Co-PI - Joseph Ojo, Electrical and Computer Engineering

Co-PI - Nan Guo, Manufacturing Center

Co-PI - Wenzhong Gao, Energy Center

PI - Robert Qiu, Manufacturing Center

**Abstract:**

The objective of this project is to investigate a novel paradigm of integrating three ingredients: 1) machine learning for cognitive systems; 2) cross-layer issues for cognitive radio networking; 3) application of the proposed network testbed for smart-grid (land-based power network) and shipboard power network.

# *Grants Awarded Report*

**From: 6/1/10 to 6/30/10**

**Project Title:** Conduct Hydrologic Delineation Training for the Tennessee Department of Environment and Conservation

**Activation Amount:** \$21,484.00

**Agency:** Tennessee Department of Environment and Conservation

**Personnel:**

PI - Bradford Cook, Biology

**Abstract:**

Hydrologic Delineation Training is designed to address standard procedures for making jurisdictional stream and wet weather conveyance determinations. This will be accomplished by holding a series of three-day workshops across Tennessee (3-4 per year). Workshops will be geared towards professionals working in state government agencies, private consulting firms, and local stormwater management agencies that deal with identification of surface water features. Workshops will be a mix of classroom and field training. PI's portion of the training will focus on basic stream ecology. This will include discussion of the stream continuum concept, roles of headwater streams in watershed, effects of hydrology on observed ecology, and basic benthic macroinvertebrate field identification.

# *Grants Awarded Report*

**From: 6/1/10 to 6/30/10**

**Project Title:** RET: Research Experience for Teachers in Manufacturing for Competitiveness in the U.S.

**Activation Amount:** \$167,582.00

**Agency:** National Science Foundation

**Personnel:**

Co-PI - Holly Anthony, Curriculum and Instruction  
PI - Mohamed Abdelrahman, Electrical and Computer Engineering  
Senior Personnel - Cynthia Rice-York, Manufacturing Center  
Senior Personnel - Holly Stretz, Chemical Engineering  
Senior Personnel - Ismail Fidan, Manufacturing and Industrial Technology  
Senior Personnel - Joseph Biernacki, Chemical Engineering  
Senior Personnel - Mario Oyanader, Chemical Engineering  
Senior Personnel - Nan Guo, Manufacturing Center  
Senior Personnel - Sally Pardue,  
Senior Personnel - Satish Mahajan, Electrical and Computer Engineering  
Senior Personnel - Stephen Canfield, Mechanical Engineering  
Senior Personnel - Ying Zhang, Mechanical Engineering  
Support Personnel - Brian Bates, Manufacturing Center

**Abstract:**

The Center for Manufacturing Research of Tennessee Technological University proposes to provide 30 high school teachers with a six-week multi-disciplinary summer experience in manufacturing research with an academic year follow-up plan. This proposed program will contribute to retaining and advancing the manufacturing base in the U.S. through meaningful changes in the teachers' understanding of manufacturing and how it relates to the Math and Science Curriculum. The program aims at improving the teachers' comprehension of the research and development process through hands-on experience and real world problems that relate to: a) advancing the state of the art in conventional manufacturing processes such as metalcasting; b) new trends in manufacturing such as rapid prototyping; c) emerging technologies such as nanomaterials and manufacturing of fuel cells and special coating materials; and d) enabling technologies serving manufacturing processes in general such as intelligent optimization. Manufacturing is a field where boundaries between disciplines disappear opening opportunities for multidisciplinary research. The research projects and faculty members participating in the program represent five different disciplines in the college of engineering. This offers the teachers a multi-perspective view of how underlying mathematical and scientific concepts are integrated in engineering applications.

# *Grants Awarded Report*

**From: 6/1/10 to 6/30/10**

**Project Title:** STEP: Math Success for STEM Majors

**Activation Amount:** \$379,130.00

**Agency:** National Science Foundation

**Personnel:**

PI - Allan Mills, Mathematics

Senior Personnel - Andrew Hetzel, Mathematics

Senior Personnel - Barry Elliott, Mathematics

Senior Personnel - Charles Carnal, Electrical and Computer Engineering

Senior Personnel - Christopher Brown, Biology

Senior Personnel - Christopher Wilson, Mechanical Engineering

Senior Personnel - Daniel Badoe, Civil and Environmental Engineering

Senior Personnel - Darrell Hoy, Mechanical Engineering

Senior Personnel - David Hume, Computer Science

Senior Personnel - Donald Visco, Chemical Engineering

Senior Personnel - Holly Anthony, Curriculum and Instruction

Senior Personnel - Ismail Fidan, Manufacturing and Industrial Technology

Senior Personnel - Jeffrey Austen, Electrical and Computer Engineering

Senior Personnel - Jeffrey Boles, Chemistry

Senior Personnel - Jessica Matson, Industrial and Systems Manufacturing

Senior Personnel - Michael Allen, Mathematics

Senior Personnel - Michael Harrison, Earth Sciences

Senior Personnel - Paula Engelhardt, Physics

Senior Personnel - Richard Le Borne, Mathematics

Senior Personnel - Sally Pardue,

Senior Personnel - Stephen Robinson, Physics

Senior Personnel - Troy Brachey, Mathematics

# *Grants Awarded Report*

**From: 6/1/10 to 6/30/10**

***Abstract:***

Tennessee Tech graduates, on average, 350 - 400 students in STEM (Science, Technology, Engineering, and Mathematics) majors annually. The goal of the Math Success for STEM Majors (MSSM) grant is to increase the number of students who obtain a baccalaureate degree in a STEM discipline at TTU to about 560 per year by the end date of the grant (May 31, 2015). Previous surveys and investigations at TTU have identified success in mathematics classes as a key factor in retaining STEM students through graduation. The MSSM project has six goals. Specifically, those goals are: (1) incorporating active learning through the redesign of introductory STEM mathematics courses; (2) implementing just-in-time academic support for students enrolled in all introductory STEM mathematics courses, (3) integrating the STEM disciplines through context-driven math applications within a new introduction to university life course for entering STEM freshmen, (4) articulating mathematics skill-level expectations with selected high schools sending large numbers of STEM freshmen to TTU; (5) implementing a uniform TTU mathematics course placement policy, and (6) developing and implementing a data system that tracks individual student performance and status across the STEM disciplines. The MSSM proposal is a synergistic approach amongst faculty from the College of Arts and Sciences, the College of Education, and the College of Engineering that utilizes best practices in STEM education, adapted for TTU, to increase the number of STEM graduates at Tennessee Tech. The investigative team, having led and participated in a number of externally funded STEM initiatives, is well-qualified to lead this project. Moreover, addressing the issue at the pre-college level through articulation with regional feeder high-schools, at the math placement level, and inside and outside the initial mathematics classroom is a holistic and transformative approach. It is anticipated that over the course of the project more than 2300 students will be impacted directly by the six initiatives, including 1300 within the revised mathematics offerings. In addition, the creation of a Math Zone within the Learning Commons (a university initiative designed to consolidate learning assistance and information access with technology supports) will enhance the University's education infrastructure. As TTU serves many rural and economically-challenged counties in middle Tennessee, this proposal will result in a significantly increased number of STEM graduates from this underrepresented group. Improved performance of students in STEM math classes will lead to increases in retention and the total number of STEM graduates from TTU who pursue careers in STEM that will benefit society.

***Project Title:*** REU Supplement to NSF 0928539-Controlling the Properties and Performance of Concrete

***Activation Amount:*** \$12,000.00

***Agency:*** National Science Foundation

***Personnel:***

Co-PI - Donald Visco, Chemical Engineering

PI - Joseph Biernacki, Chemical Engineering

***Abstract:***

The objective of this supplement is to provide support for two REU students during the summer of 2010.

# *Grants Awarded Report*

**From: 6/1/10 to 6/30/10**

**Project Title:** Application of CADDIS to an Impaired Waters in Tennessee

**Activation Amount:** \$0.00

**Agency:** Tennessee Department of Environment and Conservation

**Personnel:**

PI - John Harwood, Chemistry

**Abstract:**

This project extends and completes our initial study of the usefulness of the EPA CADDIS process (Causal Analysis/Diagnosis Decision Information System) in identifying stressors causing impairment of waters of Tennessee. To the test case of the initial study, impairment of the lower Failing Water River and associated tributaries, are added two additional test cases. These cases together represent a range of technical challenges in stressor identification in Tennessee. The project objectives are to reveal advantages and difficulties in applying the CADDIS process, and to identify the sources of impairment of water quality in the waters studied. Additionally, an objective of this project is to evaluate the utility of full involvement of stakeholders in identifying stressors, and involvement of stakeholders primarily as sources of information in stressor identification. In addition to the experience gained by the research team, this evaluation will be based on comments and suggestions solicited from the stakeholders concerning implementation of CADDIS, and on comments and suggestions of TDEC staff assisting with the project. Deliverables of the project will include 1) CADDIS stressor identification of the sources of impairments for the test cases, 2) an evaluation of the stakeholder role in applying the CADDIS procedure, 3) a summary of information needed to apply the CADDIS procedure, and 4) guidelines as to what impairment scenarios might be successfully approached with the CADDIS process, and what scenarios might be better approached using alternative means of stressor identification.

# *Grants Awarded Report*

**From: 6/1/10 to 6/30/10**

**Project Title:** From Art to STEM - A Creative Journey of Discovery and Transformational Project for Nashville Middle School Students

**Activation Amount:** \$65,637.00

**Agency:** Alignment Nashville

**Personnel:**

PI - Ismail Fidan, Manufacturing and Industrial Technology

**Abstract:**

Tenth grade students in high schools in Nashville, Tennessee, choose among four to seven career academies. Despite a needs analysis that demonstrates the several occupations in Nashville require a STEM background, the results of a survey show that most students are choosing arts and communications career academies rather than STEM-related ones. A comprehensive set of partners led by Alignment Nashville, an organization that works out of the mayor's office to connect community organizations to schools, provides an ITEST strategies project to increase interest in STEM-related careers especially for 200 eighth grade girls from underrepresented and disadvantaged populations and their teachers. Using their existing knowledge and interest, student increase their understanding of how their skills can be used in STEM-related careers by creating 3D computer models, using tools such as AutoCAD and Alice. Students can watch the construction of the model using the rapid prototyping facilities of Tennessee Technological University via Internet. A four-week summer camp at Nashville State Community College, using the Ford PAS curriculum maintains the students' interest and prepares them for the career academy. The mathematics and science teachers of the targeted audience participate in professional development activities to increase their ability to 3D model and connect rapid prototyping to their content areas. Additionally, local college students serving as Girl Scout Leaders in underserved areas of Nashville work with students in the after school activities and summer camps and receive professional development. The evaluation identifies strategies and tactics that are effective in increasing the interest and understanding of the students and teachers in STEM-related careers.

# *Grants Awarded Report*

**From:** 6/1/10 to 6/30/10

**Project Title:** Development of a Wire Core Transformer

**Activation Amount:** \$74,999.00

**Agency:** Buswell Energy, LLC

**Personnel:**

PI - Satish Mahajan, Electrical and Computer Engineering

Senior Personnel - Jie Cui, Mechanical Engineering

**Abstract:**

Superior performance (efficiency, shielding, etc.) at reduced cost of a wire core distribution transformer will have the potential benefits in lowering overall energy consumption thereby reducing greenhouse gases. The concept of using a wire core in place of a laminated core and placing it outside rather than inside the winding is truly novel. Once committed to this concept, the technology coming out of it will change entire landscape for the manufacturers of distribution transformers. It is proposed to perform an electromagnetic and thermal modeling of the wire core 10 kVA rated designs. Laboratory tests will then be performed to validate these models so that hot spot temperature (HST) and top oil temperature (TOT) could be determined. Comparison with a conventionally designed transformer having identical rating can then be made. Conformance to existing IEEE standards for transformer loading and allowable temperature rise in the insulation can also be validated.

# *Grants Awarded Report*

**From: 6/1/10 to 6/30/10**

**Project Title:** Wideband Digital Nulling and NIMO Radar

**Activation Amount:** \$60,000.00

**Agency:** BerrieHill Research Corporation (via Wright Patterson AFB)

**Personnel:**

PI - Robert Qiu, Manufacturing Center

Senior Personnel - Nan Guo, Manufacturing Center

**Abstract:**

To counter increasingly complex threats under dynamic signal environment, the phased array based sensing system is required to cover multiple GHz (e.g., 1-8GHZ, or 2-18 GHz) with wide instantaneous bandwidth (e.g., 500 MHz), adaptive capability in both spatial and spectrum domains and in real time operation. Beamforming technology utilizing phase shifter is a narrow band approach, and it cannot meet the wideband requirement. The wideband digital beamforming (DBF) commonly applies time delay unit (TDU) to compensate the electrical length difference for each array element. Though it is a wideband approach, the approach becomes problematic if the channel imbalance is not taken into account. This imbalance problem is very common in phases array based sensing system, and it needs to be included in the TDU implementation for the efficient DBF gain. To counter multiple threats and interference sources, adaptive DBF is in development. The adaptivity includes the spatial and spectral flexibility. It can form multiple spatial beams tracking threats and multiple nulls denying interferences. At the same time, the adaptive forms opaque spectrum bands to reject harmful interference bands. It is essential for the DBF to be real time operational. The DBF algorithm is loaded in FPGA to achieve real time DBF function. The adaptive DBF is foreseen to be more complicated in its computation, mostly through convex optimization. The optimization algorithm is expected to be loaded in fast computation chip for near real time operation. The resulting FIR-like coefficients are then piped into FPGA's for real time computation to achieve adaptive DBNF function.

# *Grants Awarded Report*

**From:** 6/1/10 to 6/30/10

**Project Title:** Social Norms Media Campaign for Alcohol and Drugs Summer 2009 to Spring 2010

**Activation Amount:** \$5,014.00

**Agency:** Tennessee Independent Colleges and Universities Association

**Personnel:**

PI - Patricia Smith, Counseling Center

**Abstract:**

The purpose of this project is to conduct a social norms media campaign related to alcohol and other drug prevention.

# ***Grants Awarded Report***

**From: 6/1/10 to 6/30/10**

***Project Title:*** Incentives for 2010 Alcohol and Drug Core Survey

***Activation Amount:*** \$1,766.00

***Agency:*** Tennessee Independent Colleges and Universities Association

***Personnel:***

PI - Patricia Smith, Counseling Center

***Abstract:***

The purpose of this project is to provide incentives for the 2010 Spring CORE Alcohol and Drug survey in an effort to maximize participation and strengthen the return rate.

# ***Grants Awarded Report***

**From: 6/1/10 to 6/30/10**

***Project Title:*** Spring 2010 Alcohol Free Alternative Campus Programming

***Activation Amount:*** \$1,000.00

***Agency:*** Tennessee Independent Colleges and Universities Association

***Personnel:***

PI - Patricia Smith, Counseling Center

***Abstract:***

The purpose of this project is to provide late night, substance-free activities for students to reduce the amount of unstructured free time students have during traditional peak drinking hours.

# *Grants Awarded Report*

**From:** 6/1/10 to 6/30/10

**Project Title:** Water Center Analytical and Computer Services

**Activation Amount:** \$71,254.00

**Agency:** various

**Personnel:**

PI - Dennis George, Water Center

**Abstract:**

Water Center analytical and computer services account for 2009-10.

# *Grants Awarded Report*

**From: 6/1/10 to 6/30/10**

***Project Title:*** Power-Test-Service Account 2009-10

***Activation Amount:*** \$16,044.00

***Agency:*** various

***Personnel:***

Co-PI - L. K. Crouch, Civil and Environmental Engineering

Co-PI - Stephen Idem, Mechanical Engineering

PI - Sastry Munukutla, Energy Center

***Abstract:***

Energy Systems Center testing account for 2009-10.

# *Grants Awarded Report*

**From: 6/1/10 to 6/30/10**

**Project Title:** Tennessee 3-Star Industrial Assessment Center

**Activation Amount:** \$100,000.00

**Agency:** U. S. Department of Energy

**Personnel:**

Co-PI - Kenneth Currie, Manufacturing Center

PI - Glenn Cunningham, Mechanical Engineering

**Abstract:**

The proposed Industrial Assessment Center (IAC) represents a unified and collaborative approach to industrial assessments that will not only span the entire state of Tennessee but also cover some of the more IAC underrepresented areas of Kentucky, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Alabama, Mississippi, Arkansas, and Missouri--all within a 150 mile radius! By utilizing the strong institutional bond between three of the six four-year universities under the authority of the Tennessee Board of Regents, the Tennessee 3-Star IAC will draw upon the engineering and technology resources of Tennessee Technological University (lead), the University of Memphis (satellite), and East Tennessee State University (satellite). The proposed IAC is referred to as the Tennessee 3-Star IAC to signify the historical geographic/economic/political divisions within the state: West Tennessee (Memphis), Middle Tennessee (Cookeville), and East Tennessee (Johnson City). By encompassing lead/satellite centers within each division, the Tennessee 3-Star IAC will reach an estimated population base of approximately 10 million and a manufacturing employee base of 1.0 million--once again within a 150-mile radius. Within the state of Tennessee, there are approximately 750 manufacturing concerns with less than 500 but more than 100 employees, and the Tennessee Valley region has been virtually untouched by previous IAC assignments (within the last 10 years) due to excessive geographic distance.

# *Grants Awarded Report*

**From:** 6/1/10 to 6/30/10

*Project Title:* Testing & Design 2009-10

*Activation Amount:* \$35,684.00

*Agency:* various

*Personnel:*

PI - Kenneth Currie, Manufacturing Center

*Abstract:*

Manufacturing Center esting account for 2009-10.