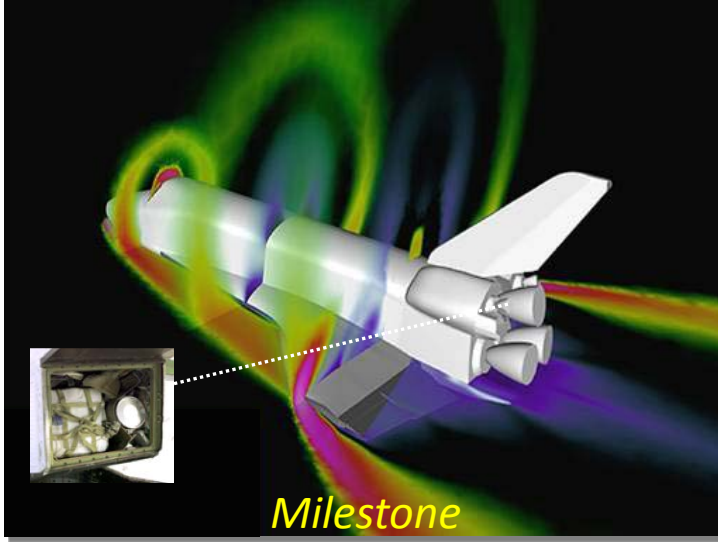
Mission

To foster interdisciplinary research in both the fundamental understanding of and application of all the natural sciences.

In particular, to model and develop integrated computational environments and crosscutting tools that allow a comprehensive, cross-disciplinary approach to problem-solving.

NSF Engineering Research Center (ERC) for Computational Field Simulation, 1990-2001

Mission: To reduce the time and cost of complex field simulations for engineering analysis and design.



During the 1998 STS-95 (John Glenn) Mission the drag chute door fell off at launch. A shuttle simulation, completed by the ERC allowed the ERC to reduce the solution time from 2 months to 2 days.

Cross-Disciplinary Research Team with a Common Focused Mission

Science & Engineering Faculty; ASE, CE, CS, ECE, MA, ME, PH

Mission Related Educational Programs

Computational Engineering MS & PhD Program
Related CME, ASE, CS, ECE, MA, ME courses
Undergraduate Outreach Programs

HPC^2 **High Performance Computing Collaboratory**

Definitions and Goals of the High Performance Computing Collaboratory

The High Performance Computing Collaboratory (HPC²) is a coalition of member centers and groups that share

- a common core objective of advancing the state-of-the-art in **computational science and engineering** using **high performance computing,**
- a common approach to research that embraces a **multi-disciplinary, team-oriented** concept,
- and a commitment to a full partnership between **education, research, and service.**

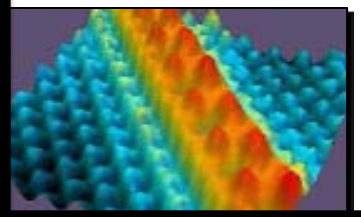
HPC² aims to become the nation's premier interdisciplinary high-performance computing research facility.

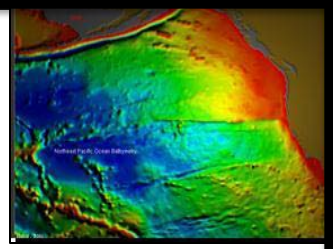
The Centers/Institutes of the High Performance Computing Collaboratory

CAVS is an interdisciplinary center providing engineering, research, development, and technology transfer teams focused on complex problems, such as those encountered in technologies designed to improve human mobility. Development efforts provide short-term solutions relevant to regional manufacturers while the core research builds longer-term knowledge needed for sustained economic development. Students gain valuable project experience that compliments their formal classroom learning.

Center for Advanced Vehicular Systems (CAVS)

Center for Computational Sciences (CCS)





Geosystems Research Institute (GRI)

GRI aims to be a world leader in advancing the state-of-the-art in spatial technologies and resource management. **The Institute's mission is** to understand Earth's natural and managed systems and provide comprehensive solutions for socioeconomic and environmental requirements, leading to an improved quality of life.

Northern Gulf Institute (NGI)

NGI aims to be a regional leader providing integrative research and education to improve the resiliency and conservation of the Northern Gulf of Mexico. **NGI** conducts high-impact research and education programs focused on integration of the land-coast-ocean-atmosphere continuum; integration of research to operations; and integration of individual organizational strengths into a holistic program. NGI will contribute to the recovery and future health, safety, resilience and productivity of the region, through sustained research and applications in a geospatial and ecosystem context.

Research Expenditures, Funding, Personnel of the High Performance Computing Collaboratory

Major External Funding Agencies

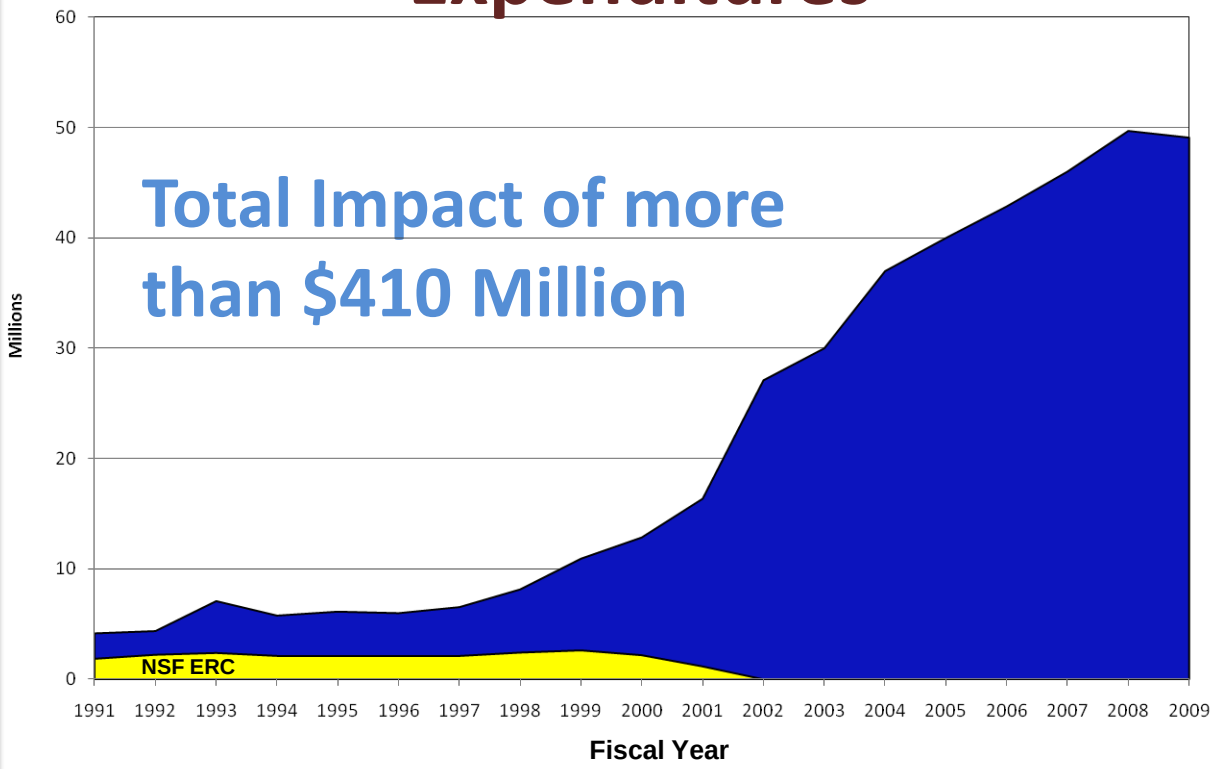
DoD, NASA, NOAA, USDA, NSF, DIA, DoE, USGS, USDOT, NIEHS, NIST, HUD, DoL, EPA, SBA, MS-DEQ, MS Space Commerce Initiative, MDA, Bell Helicopter, Boeing, Northrop Grumman, Sentel Corp., Miltec Corp., General Motors, ESI Group

Personnel

486 Total HPC² Personnel

70 Academic Faculty
38 Research Faculty
16 Postdoctoral
91 Research Associates
27 Staff
134 Graduate Students
110 Undergraduate Students

Expenditures



Academic Affiliations of the High Performance Computing Collaboratory

College of Agricultural and Life Sciences

Ag Econ, BioChem and Molecular Biology, Entomology and Plant Pathology, Plant & Soil Sciences

College of Arts & Sciences

Biological Sciences, Chemistry, Geosciences, Math and Statistics, Physics and Astronomy, Sociology Anthropology and Social Work, Psychology

College of Veterinary Medicine

College of Engineering

Aerospace, Ag & Bio, Civil, Chemical, Computer Science, Electrical & Computer, Industrial, Mechanical

College of Architecture, Art, & Design

Art

College of Business and Industry

Finance and Economics

College of Forest Resources

Forestry, Wildlife and Fisheries

Educational Program

M.S., more than 75 grads

Ph.D., more than 25 grads

Computational Mathematics

(numerical analysis, numerical solutions to PDEs, numerical linear algebra)

High-Performance Computing

(parallel algorithms, software engineering, computer architecture)

Application area from engineering or physical science

(computational fluid dynamics, electromagnetics, structural analysis, hydrodynamics, geospatial modeling)

Capabilities of the High Performance Computing Collaboratory

High-Performance Computing Systems

Talon: 3072 processors,
6 TB RAM
Raptor: 2048 processors,
4 TB RAM
Matador: 512 processors,
512 GB RAM
Maverick: 384 processors,
480 GB RAM

Talon Overview

- IBM iDataPlex
- 3072, 2.8-GHz 6-way Westmere
- 6 TB of RAM
- Quad-data rate Infiniband

Infrastructure and General Purpose Computing Systems

145 servers

Storage

250 TB of high-speed disk storage
2 PB of near-line storage

Desktops/Laptops

325+ Faculty/Staff desktops and laptops
250+ Student desktops

Networking

5300+ data ports

Capabilities of the High Performance Computing Collaboratory

Mississippi State University is now home to one of the world's greenest supercomputers, according to the Green500 List released this month (June 2010).

- **Ranked as the most energy efficient general-purpose supercomputer in the world**
- **7th most energy efficient system overall**
- **Can perform nearly 420 million calculations for every watt of electricity it uses**
- **18th fastest computer in any university in the United States**
- **331st most powerful computer in the world**

Mississippi State has been on 18 of the past 29 Top500 Lists dating back to June 1996.

Capabilities of the High Performance Computing Collaboratory

Facilities

HPC Building – Starkville

- 71,000 square feet

CAVS Building – Starkville

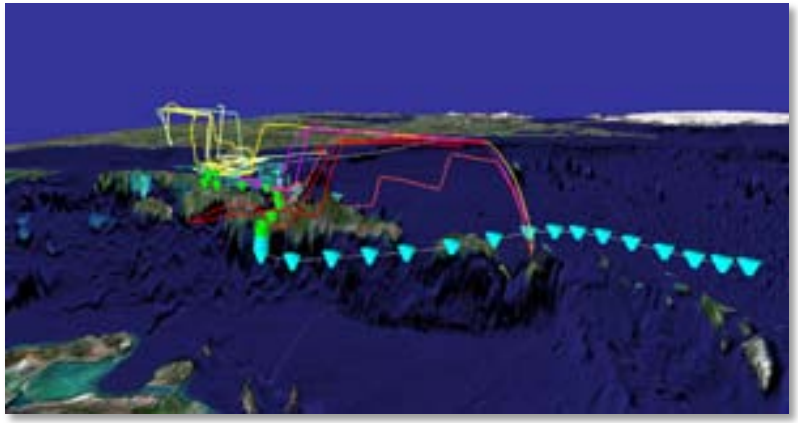
- 57,000 square feet

NASA Stennis Space Center – MS Gulf Coast

- 2 large suites in Bldg. 1103
- Construction of ~40,000 sq.ft. facility to begin in June 2010

Virtual Environment for RealTime EXploration

- Fakespace FLEX™ Virtual Reality Device
- Three projected walls plus floor
- Acoustic motion tracking
- Active and passive 3-D stereo viewing
- Reconfigurable into a Powerwall for large displays



Capabilities of the High Performance Computing Collaboratory

Publishing

- Brochures
- Annual Reports
- Posters
- Flyers/Handouts
- Business Cards/Stationary
- Web Design
- Photography
- Exhibits/Displays
- Logo Creation
- Video/Audio Production
- Copywriting/Editing

Center for Computational Sciences

MEMBERS

Mathematics

Ratnasingham Shivaji , Director, W.L. Giles Distinguished Professor

Hyeona Lim, Associate Professor

Seth Oppenheimer, Professor

Shantia Yarahmadian, Assistant Professor

Xingzhou Yang, Assistant Professor

Physics

Seong-Gon Kim, Associate Director, Associate Professor

Anatoli Afanasjev, Professor

Deepankgar Dutta, Assistant Professor

Gautam Rupak, Assistant Professor

Mark Novotny, Professor and Dept. Head

Matthew J. Berg, Assistant Professor

Torsten Clay, Associate Professor

Electrical & Computer Engineering

Sherif Abdelwahed, Assistant Professor

Biological Sciences

Christopher Brooks, Assistant Professor

Diana C. Outlaw, Assistant Professor

Lisa Wallace, Assistant Professor

Mark Welch, Assistant Professor

Vincent Klink, Assistant Professor

Chemistry

Edwin A. Lewis, Professor and Dept. Head

Steven Gwaltney, Associate Professor

Computer Science

Changhe Yuan, Assistant Professor

Ioana Banicescu, Professor

Song Zhang, Assistant Professor

Statistics

Haimeng Zhang, Associate Professor

Meng Zhao, Assistant Professor

QiQi Lu, Associate Professor

Industrial Engineering

Mingzhou Jin, Associate Professor

College of Veterinary Medicine, Basic Sciences

Henry X.-F. Wan, Assistant Professor

Affiliated faculty

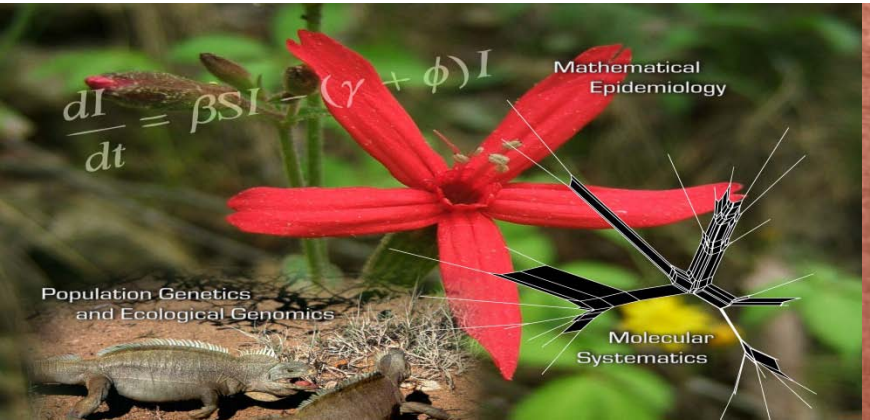
Jagadish P. Singh, Research Professor, Institute of Clean Energy and Technology.

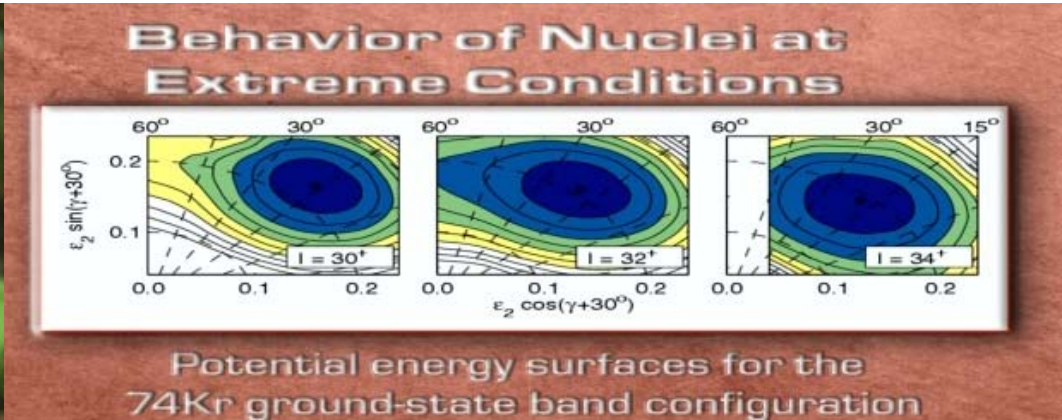
Yang Ki Hong, Professor & E.A.Larry Drummond Endowed Chair of Computer Engineering, Dept. of Electrical & Computer Engineering, University of Alabama, Tuscaloosa.

Center for Computational Sciences

Some Research Foci

- Computational Ecology and Evolutionary Biology
- Computational Physics
- Computational and Applied Mathematics
- Computational Statistics
- Modeling Visualization and Optimization

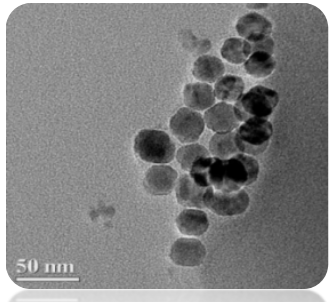


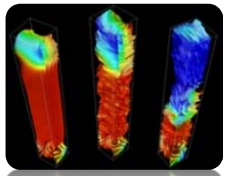


Recent Major Initiatives at CCS

FY 2011 Federal Initiative Proposal (request: $7 Million /3 years):
Advanced Materials Design for Nano Devices

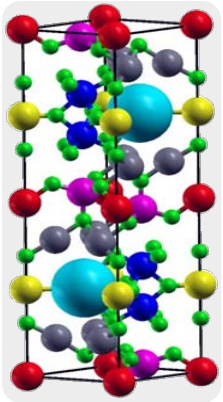
Mississippi State University proposes to conduct transformative research to develop unique and innovative materials and magnetic memory elements for high-density nanoscale memory devices and nanosensors for chemical warfare agents in support of the Nano Electronics Team of Sensor and Electron Devices Directorate (SEDD) at the U.S. Army Research Laboratory (ARL).





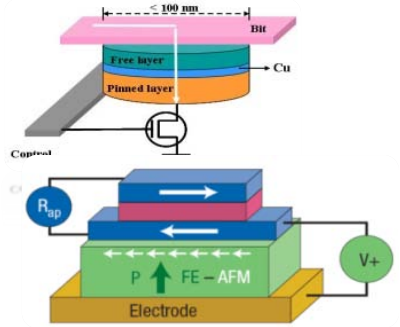
P.I. Seong-Gon Kim (MSU, Physics)

Administrator: R. Shivaji (MSU, CCS Director, Mathematics)



Interdisciplinary team: Computational Physics, Experimental Physics, Chemistry, Mathematics, Electrical and Computer Engineering, Materials Science

Education: 14 doctoral students and 7 postdocs will be involved in research each year



Overview

1.4 MB (moving parts)

X 1000

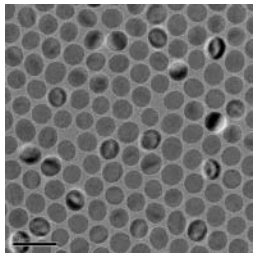
1 GB (no moving parts)

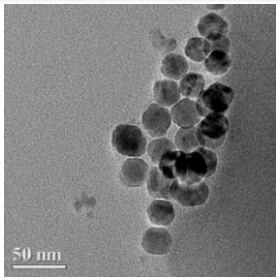
100 GB (moving parts)

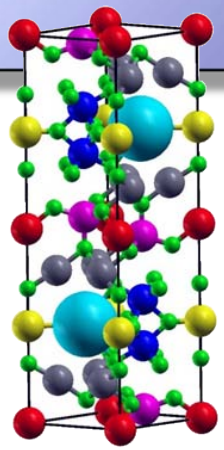
X 1000

100 TB (no moving parts)

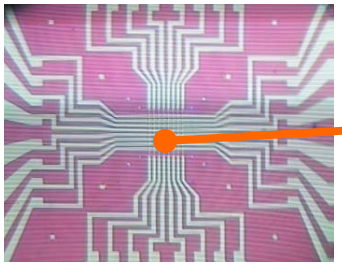
What do we need? New advanced magnetic materials

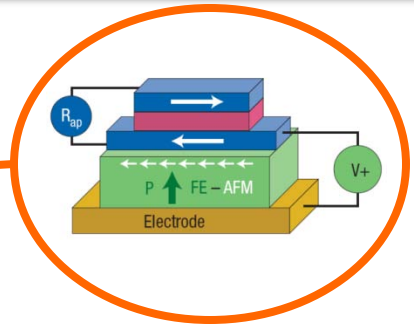






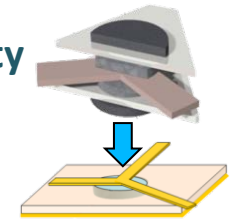
What will we have? Actual prototypes of high-density memory cells

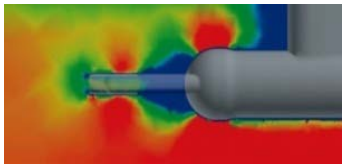


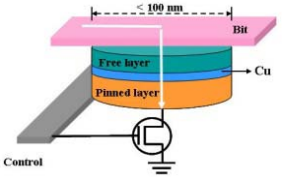


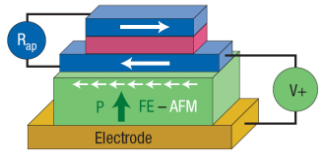
Economic Impact

- Will bring products to the market to be used for both **civilian and national security applications**.
- Will bring **research and manufacturing work for next generation of high-tech equipments/devices critical to national security** to the State of Mississippi.
  - Miniature GHz circulators and radars
  - Insect-sized micro air vehicles (MAV)
  - Lightweight communication systems
  - Biological and chemical sensor devices
- New **ultra-high-density memory devices** developed in the proposal will create a **multi-billion dollar market for the information storage industry and increase information security** significantly.









- **The success of this project has a strong potential to bring new high-tech manufacturing work to the State of Mississippi. Support letters:**
  - Seagate Technology, Fremont, CA;
  - Western Digital, San Jose, CA;
  - Custom Sensors & Technology, Frenton, MO.

Seagate

Western Digital

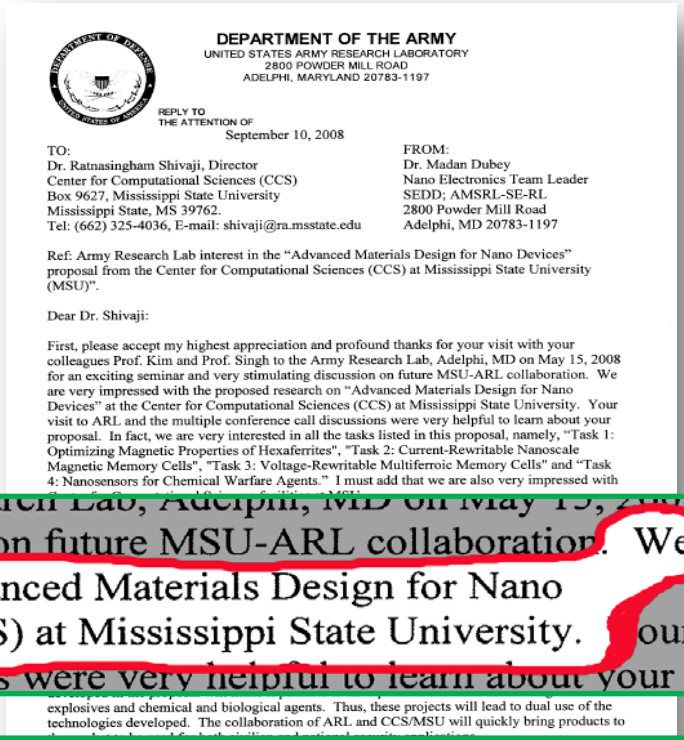
2011 FIP: Advanced Materials Design for Nano Devices

Federal Agency Collaboration

Federal Agency: Department of the Army
Program Officer: Dr. Madan Dubey
Nano Electronics Team Leader
Army Research Laboratory

Sensor and Electron Devices Directorate
Title: University and Industry Research Centers
Army PE/Project: 61104.J13 OSD
PE #: 0601104A

Support Letter



DEPARTMENT OF THE ARMY
UNITED STATES ARMY RESEARCH LABORATORY
2800 POWDER MILL ROAD
ADELPHI, MARYLAND 20783-1197

REPLY TO
THE ATTENTION OF
September 10, 2008

TO:
Dr. Ratnasingham Shivaji, Director
Center for Computational Sciences (CCS)
Box 9627, Mississippi State University
Mississippi State, MS 39762.
Tel: (662) 325-4036, E-mail: shivaji@ra.msstate.edu

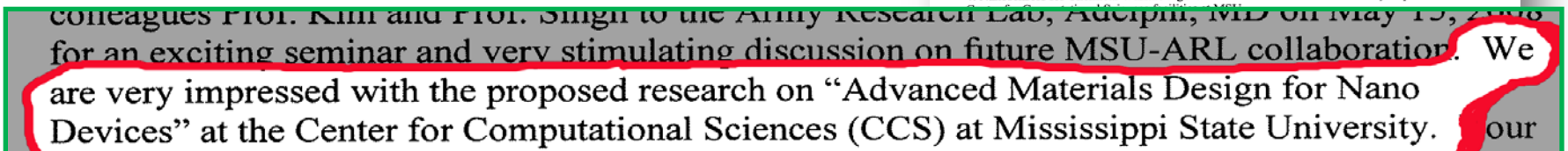
FROM:
Dr. Madan Dubey
Nano Electronics Team Leader
SEDD; AMSRL-SE-RL
2800 Powder Mill Road
Adelphi, MD 20783-1197

Ref: Army Research Lab interest in the "Advanced Materials Design for Nano Devices" proposal from the Center for Computational Sciences (CCS) at Mississippi State University (MSU)".

Dear Dr. Shivaji:

First, please accept my highest appreciation and profound thanks for your visit with your colleagues Prof. Kim and Prof. Singh to the Army Research Lab, Adelphi, MD on May 15, 2008 for an exciting seminar and very stimulating discussion on future MSU-ARL collaboration. We are very impressed with the proposed research on "Advanced Materials Design for Nano Devices" at the Center for Computational Sciences (CCS) at Mississippi State University. Your visit to ARL and the multiple conference call discussions were very helpful to learn about your proposal. In fact, we are very interested in all the tasks listed in this proposal, namely, "Task 1: Optimizing Magnetic Properties of Hexaferrites", "Task 2: Current-Rewritable Nanoscale Magnetic Memory Cells", "Task 3: Voltage-Rewritable Multiferroic Memory Cells" and "Task 4: Nanosensors for Chemical Warfare Agents." I must add that we are also very impressed with

explosives and chemical and biological agents. Thus, these projects will lead to dual use of the technologies developed. The collaboration of ARL and CCS/MSU will quickly bring products to



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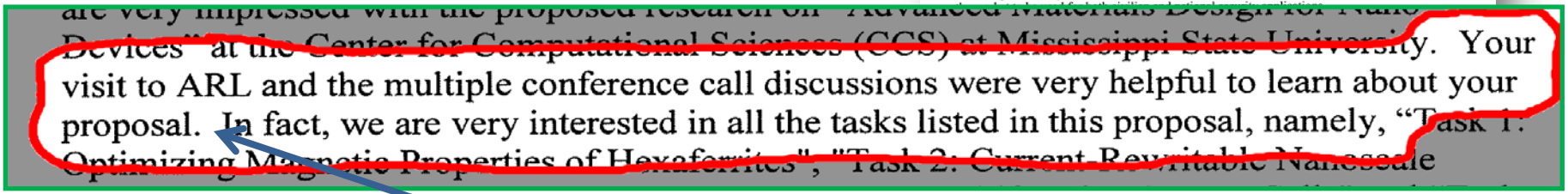

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May, 2008 – Kim, Singh, and Shivaji
$15,000 seed funding (2010)

Support from Industries

Vice Pres. of Seagate Technology

Vice Pres. of Western Digital Inc.

Pres. of Custom Sensors & Tech


Seagate

Professor Yang-Ki Hong
E. A. "Larry" Drummond Endowed Chair
Department of Electrical and Computer Engineering
The University of Alabama, Tuscaloosa, Alabama 35487

September 30, 2008

Ref: Proposal on "Advanced Materials Design for Nano Devices" to be submitted to The US Army Research Laboratory

Dear Professor Hong,

We would like to thank you for your visit with us at Seagate Technology, Fremont, California on Friday, September 19, 2008 for your invited seminar presentation regarding hexaferrites and spintronics including spin-polarized current and voltage rewritable non-volatile random access memory devices. The applications of your proposed advanced hexaferrites and multiferroic Y-type hexaferrites to microwave devices and non-volatile magnetic random access memory are highly innovative.

We would like to express our strong supports for your proposal in hexaferrites and spintronics including non-volatile magneto-electric random access memory (ME-RAM). Seagate Technology has prime interest in cutting-edge nano-related research and is culturing the people to implement the same, as we are a company that keeps continuous innovation and integration of advanced magnetic materials in our information storage devices. Currently, we have university research projects focusing on understanding of micromagnetic reversal mechanisms in innovative magnetic nanomaterials and development of high magnetic moment materials. As advanced magnetic materials and non-volatile magnetic memory devices are mainstreams for us, therefore, there is an imminent need for employees with the nanomagnetic and practical experiences to push the boundaries of this demanding, diverse nanoscale non-volatile random access memory.

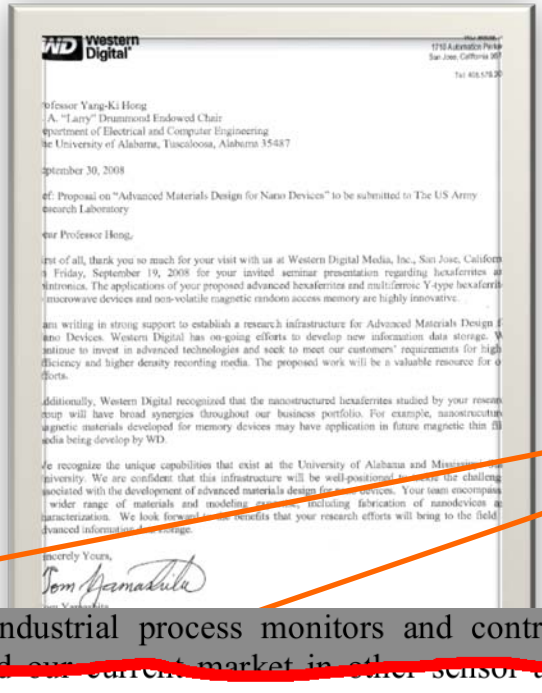
It is exciting to see this proposed program that focuses on a multi-prolong approach by a culturing more rounded experimental approach to science and engineering. Coupling this approach with more humanistic attention to scientific ethics and cultural diversity, this program should go far in helping provide a more innovative U.S. work force to compete in the fiercely expanding global economy.

We have great hope that Seagate Technology will directly benefit through implementation of this Army grant. Should the Army program succeed in its program form, we would anticipate a still higher level of research participation, as well as university research cooperation.

Sincerely Yours,

10/1/2008

Steve (K.H.) Hwing, Ph.D.
Vice President
Recording Media Operation
Seagate Technology


Western Digital

1710 Automation Parkway
San Jose, California 95131
Tel: 408.576.2000

Professor Yang-Ki Hong
E. A. "Larry" Drummond Endowed Chair
Department of Electrical and Computer Engineering
The University of Alabama, Tuscaloosa, Alabama 35487

September 30, 2008

Ref: Proposal on "Advanced Materials Design for Nano Devices" to be submitted to The US Army Research Laboratory

Dear Professor Hong,

First of all, thank you so much for your visit with us at Western Digital Media, Inc., San Jose, California on Friday, September 19, 2008 for your invited seminar presentation regarding hexaferrites and spintronics. The applications of your proposed advanced hexaferrites and multiferroic Y-type hexaferrites to microwave devices and non-volatile magnetic random access memory are highly innovative.

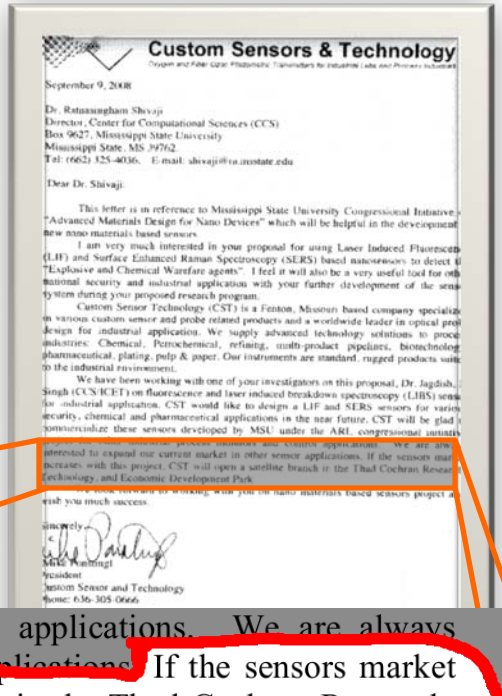
I am writing in strong support to establish a research infrastructure for Advanced Materials Design for Nano Devices. Western Digital has on-going efforts to develop new information data storage. We continue to invest in advanced technologies and seek to meet our customers' requirements for high efficiency and higher density recording media. The proposed work will be a valuable resource for our efforts.

Additionally, Western Digital recognized that the nanostructured hexaferrites studied by your research group will have broad synergies throughout our business portfolio. For example, nanostructured magnetic materials developed for memory devices may have application in future magnetic thin film media being develop by WD.

We recognize the unique capabilities that exist at the University of Alabama and Mississippi University. We are confident that this infrastructure will be well-positioned to meet the challenges associated with the development of advanced materials design for nano devices. Your team encompasses a wider range of materials and modeling capabilities including fabrication of nanodevices and characterization. We look forward to the benefits that your research efforts will bring to the field of advanced information storage.

Sincerely Yours,

Tom Ramakrishnan


Custom Sensors & Technology

Oxygen and Free Gas Photometric Transducers for Industrial Labs and Process Industries

September 9, 2008

Dr. Ramasingham Shivaji
Director, Center for Computational Sciences (CCS)
Box 9627, Mississippi State University
Mississippi State, MS 39762
Tel: (662) 325-4036, E-mail: shivaji@ra.msstate.edu

Dear Dr. Shivaji:

This letter is in reference to Mississippi State University Congressional Initiative "Advanced Materials Design for Nano Devices" which will be helpful in the development of new nano materials based sensors.

I am very much interested in your proposal for using Laser Induced Fluorescence (LIF) and Surface Enhanced Raman Spectroscopy (SERS) based nanosensors to detect "Explosive and Chemical Warefare agents". I feel it will also be a very useful tool for other national security and industrial application with your further development of the sensor system during your proposed research program.

Custom Sensor Technology (CST) is a Fenton, Missouri based company specializing in various custom sensor and probe related products and a worldwide leader in optical probe design for industrial application. We supply advanced technology solutions to process industries: Chemical, Petrochemical, refining, multi-product pipelines, biotechnology, pharmaceutical, plating, pulp & paper. Our instruments are standard, rugged products suitable to the industrial environment.

We have been working with one of your investigators on this proposal, Dr. Jagdish Singh (CCS/ICET) on fluorescence and laser induced breakdown spectroscopy (LIBS) sensors for industrial application. CST would like to design a LIF and SERs sensors for various security, chemical and pharmaceutical applications in the near future. CST will be glad to commercialize these sensors developed by MSU under the ARL congressional initiative.

We are also interested to expand our current market in other sensor applications. If the sensors market increases with this project, CST will open a satellite branch in the Thad Cochran Research, Technology, and Economic Development Park.

We look forward to working with you on nano materials based sensors project and wish you much success.

Sincerely,

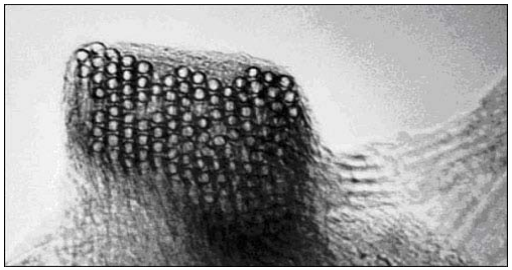
Mike Waldrup
President
Custom Sensor and Technology
Phone: 636-305-0666

project for other industrial process monitors and control applications. We are always interested to expand our current market in other sensor applications. If the sensors market increases with this project, CST will open a satellite branch in the Thad Cochran Research, Technology, and Economic Development Park.

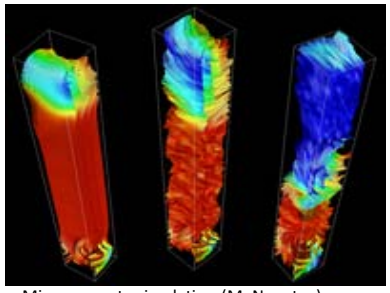
We look forward to working with you on nano materials based sensors project and

Expanding MSU Capabilities

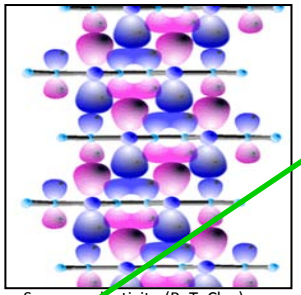
Research in materials science is one of the leading thrust areas of research at the CCS – Superconductivity, nanostructures, micromagnetic simulations.



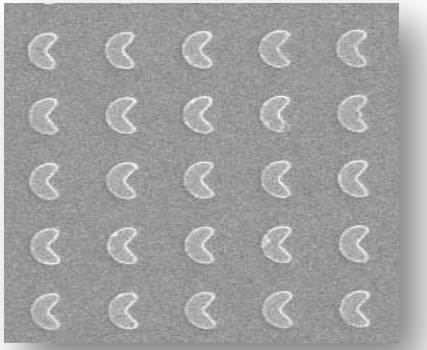
Science 273, 483 (1996) – Crystalline ropes of carbon nanotubes (S. Kim with Nobel laureate R. Smalley)

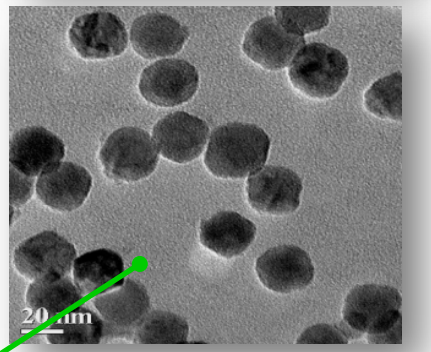


Micromagnetc simulation (M. Novotny)



Superconductivity (R. T. Clay)





The project provides MSU team an opportunity to expand its expertise to advanced magnetic materials.

Prof. Hong of UA is one of the highly recognized experts in magnetic nanoparticle synthesis and microcircuit fabrication.

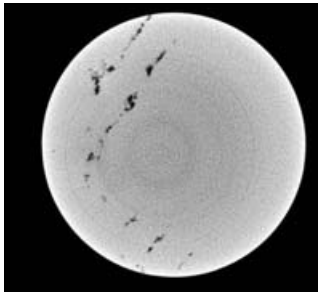
- **Inventor of "Pac-man" -shaped $Ni_{80}Fe_{20}$ thin film elements**
- **Recently synthesized world's smallest (< 20 nm) spherical Ba-hexaferrite nanoparticles.**

Dr. S. Erwin of NRL (Task 1 & 3) is one of the world's best experts in nanocrystal doping and theory of magnetism.

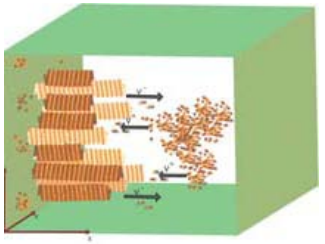
Erwin, et al., *"Doping Semiconductor Nanocrystals,"* **Nature 436**, 91 (2005)

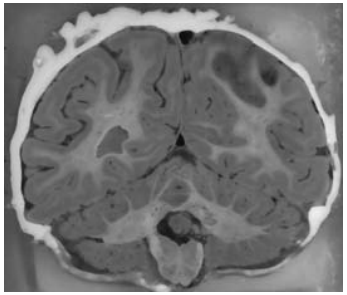
Recent Major Initiatives at CCS

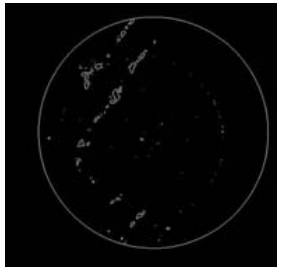
Recent National Science Foundation (NSF) Proposal (> $2 million) for a Research Training Group (RTG) Program at Mississippi State University

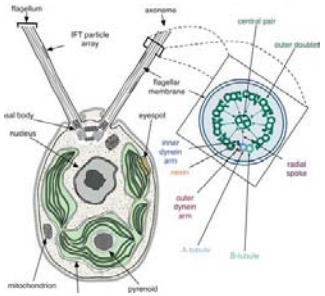


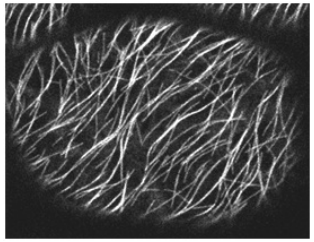
Goal: **To promote a research training environment in Partial Differential Equations with Applications in Biology and Materials Science at Mississippi State University by providing a variety of research and teaching activities designed to promote the professional development and education of trainees.**









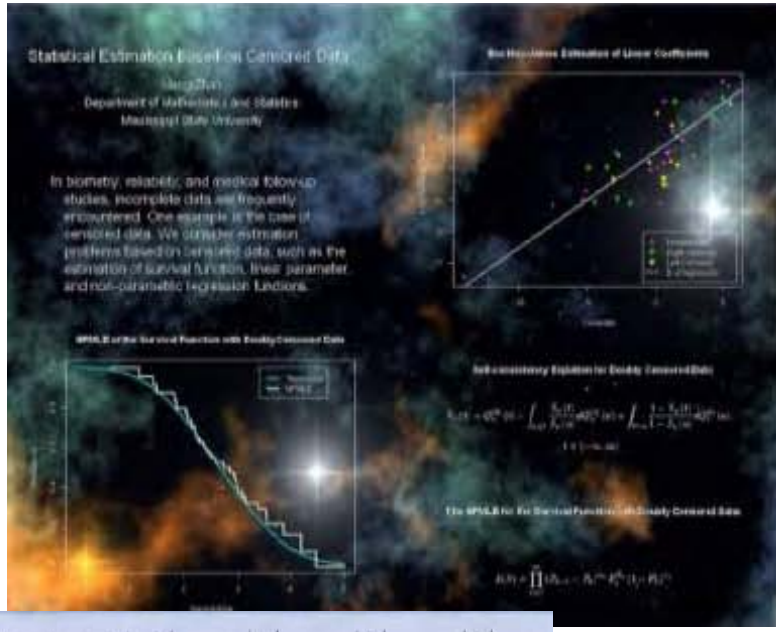


The RTG program will generate a better educated and trained workforce by supporting and training 2 postdoctoral associates, 14 graduate students and 10 undergraduates for strong skills in computers, modeling and applications of the scientific method.

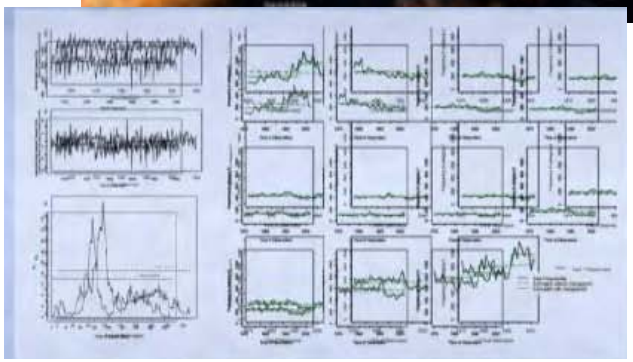
Recent Major Initiatives at CCS

Biologists, Computer Scientists, and Statisticians join to submit an NSF-UBM (National Science Foundation Interdisciplinary Training for Undergraduates in Biological and Mathematical sciences) proposal

Dr. Christopher Brooks led a team of members, Haimeng Zhang, Lisa Wallace, Huiping Xu and Changhe Yuan in the submission of UBM Group proposal **"The Landscape Genetics of Plant-Pollinator Interactions-Integrating Models and Data"**. This project aims at three year research experiences for MSU undergraduate participants.



Participants will receive a comprehensive educational exposure to mathematical biology while becoming involved in research projects that address important questions in landscape genetics. This initiative is expected to greatly enhance interaction between biologists and mathematicians at MSU.



Recent Major Initiatives at CCS

CCS received National Science Foundation funding to host a site for Research Experiences for Undergraduates (REU) program in Applied Mathematics and Biostatistics.

Dr. Hyeona Lim is the Principal Investigator of this project. Dr. Ratnasingham Shivaji is the Co-Principal Investigator and both Dr. Xingzhou Yang and Dr. Haimeng Zhang serve as senior personnel. This REU site project during the summers of 2010 and 2011 is aimed at involving undergraduate students each year in active research under the supervision of these four applied mathematicians and statisticians who are dedicated researchers and mentors. The major area of concentration will be applied mathematics and biostatistics. The cross-cutting themes of the project are image processing, population dynamics, computational mathematical biology, and highly stratified models in biostatistics.

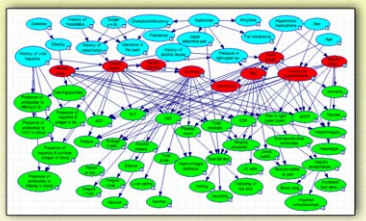
71 applications were received for the 2010 REU program and 7 students were selected among a pool of very strong applicants.

- John Corring, University of Southern Mississippi
- Helen Duke, Providence College
- Justin Hansen, University of Vermont
- Emily Poole, University of Arkansas
- Bonnie Roberson, Mississippi State University
- Britanny Stephenson, Mississippi State University
- Yicong Yong, University of Florida

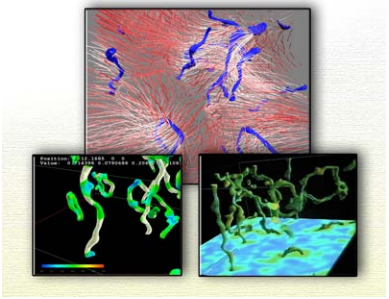
Recent Major Initiatives at CCS

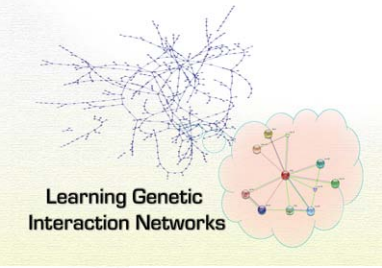
Computer Scientists and Engineers join to submit NSF proposal for research on Autonomic Computing

Dr. Ioana Banicescu (PI) and Dr. Sherif Abdelwahed (Co-PI) plan to initiate research on Autonomic Computing at CCS. They have received an NSF planning grant and have submitted a full proposal to NSF and also submitted a proposal for Federal Initiative funding.

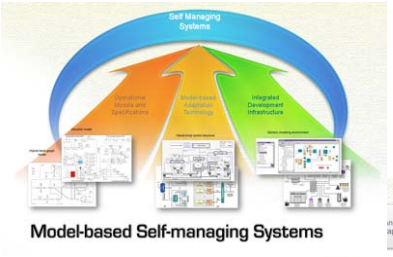


Multiple-fault Diagnosis
Using Bayesian Networks

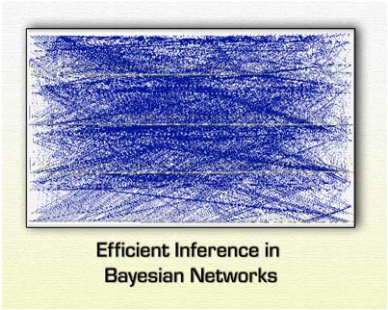




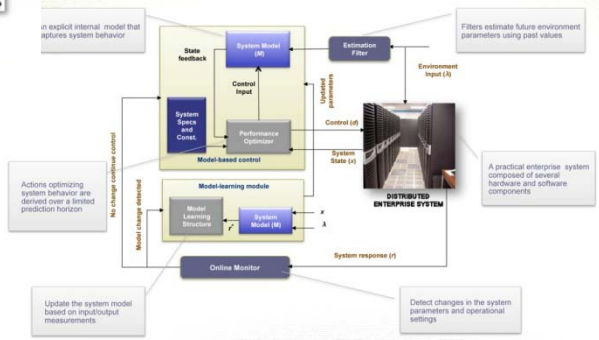
Learning Genetic
Interaction Networks



Model-based Self-managing Systems



Efficient Inference in
Bayesian Networks



Control-based Framework
for Self-managing Systems

Recent Major Initiatives at CCS

NSF Math Institute Proposal White Paper

Mississippi State University

DEPARTMENT OF MATHEMATICS AND STATISTICS

December 5th, 2008

Dr. Kirk Schulz,
Vice President, Office of Research and Economic Development

Dr. Sandra Harpole,
Associate Vice President, Office of Research and Economic Development

White Paper: Mathematical Sciences Research Institute Proposal

In response to your request to explore possibilities of submitting a Mathematical Sciences Research Institute Proposal in the near future, our group has developed the following recommendations:

A proposal in one of two general directions is definitely worth pursuit:

[A] An Institute for Discovery and Innovation in the Mathematical Sciences through Computation and Advanced Visualization

[B] An Institute for Mathematics of Materials and Its Applications.

Institute [A] would benefit MSU research in several disciplines, facilitating development of cutting edge multi-disciplinary research in physical systems, biological systems, and geo-systems, which involve applied and computational mathematics, advanced visualizations, and statistics in a significant way.

Institute [B] would considerably strengthen MSU's on-going research efforts in Materials Science. In particular, such an Institute would help MSU achieve expertise in the area of "*Integrated Computational Materials Engineering: A Transformational Discipline for Improved Competitiveness and National Security*", a field recently promoted by the Governing Board of the National Research Council.

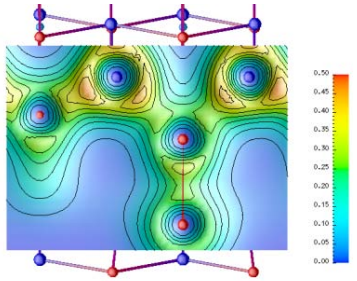
A proposal in one of two general directions is definitely worth pursuit:

A) An Institute for Discovery and Innovation in the Mathematical Sciences through Computation and Advanced Visualization

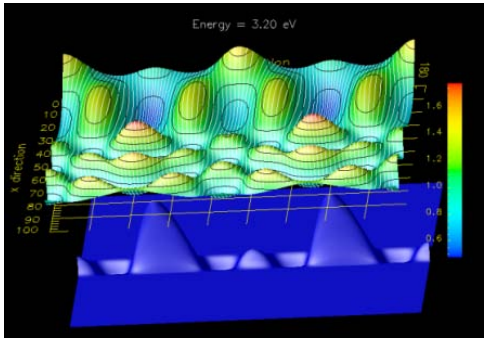
B) An Institute for Mathematics of Materials and Its Applications

Recent Proposals

Material Research Science and Engineering Center (MRSEC) Proposal



- Center for Multiscale Studies of Engineered Nanocomposites
- Purpose of the proposal is to develop accurate computational tools to predict material properties without actually manufacturing the new material.



Modeling and Experiments of Reforming Catalyst for Renewable Hydrogen Production from Glycerin

- DOE proposal.
- Project involves development of new nanoscale materials for Hydrogen production.
- Understanding of chemical reactions that occur on the catalyst surface during the reformation process.
- Would provide a new source for hydrogen production from low cost materials.

Recent Proposals

Computational Science Training for Undergraduates in the Mathematical Sciences (CSUMS) Proposal

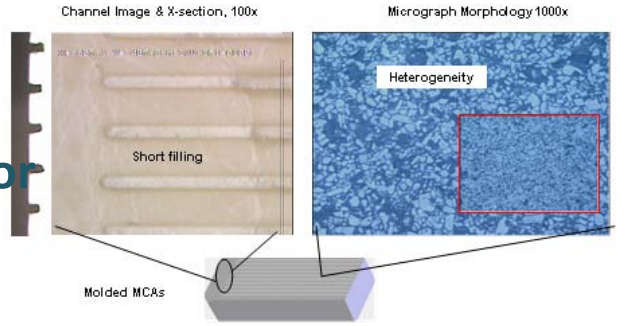
CSUMS: Undergraduate Research and Training in Differential Equations and their Applications

Project is aimed at involving 10 undergraduate students each year in active research under the supervision of applied mathematicians and engineers.

Focused Research Groups in the Mathematical Sciences (FRG) Proposal

FRG: Numerical Modeling and Industrial Applications in Powder Injection Molding for Nanoscale Powders

Develop robust and reliable numerical design tools for Particle Injection Molding with nanoscale powders



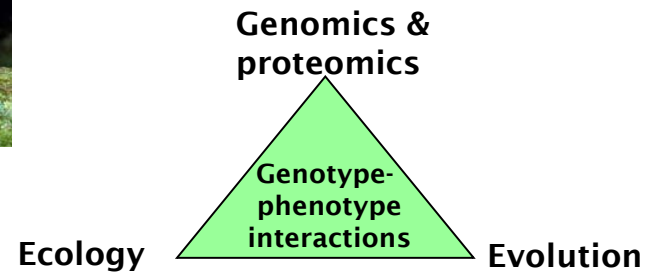
Recent Proposals

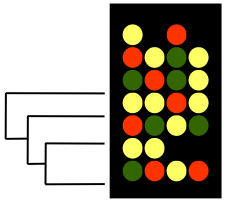
Major Research Instrumentation Proposal

NSF Proposal, Jointly with Life Sciences & Biotechnology Institute (LSBI), Institute of Digital Biology (IDB), CCS)

Requests 4 instruments integrated into a single system to support research and education activities in "system biology" at MSU:

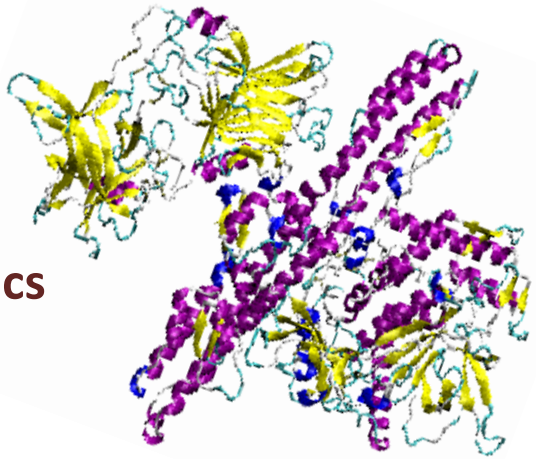
1. Illumina DNA Analyzer
2. LTQ XL electrospray ionization (ESI) linear ion trap mass spectrometry
3. LTQ Orbitrap XL ESI mass spectrometry system
4. IBM System P computer





Recent Proposals

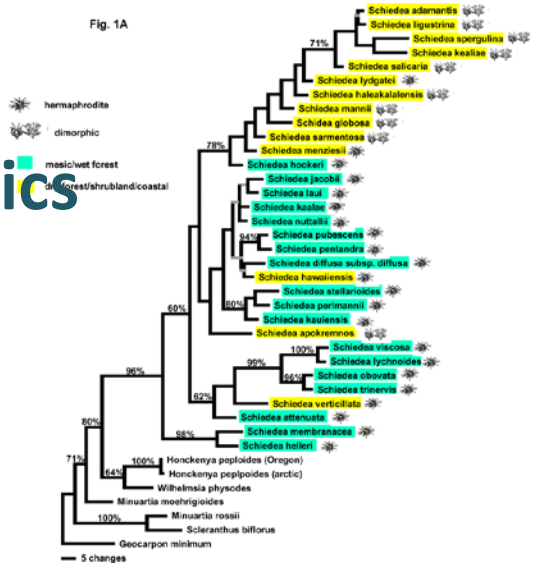
EPSCoR Research for Infrastructural Improvement Proposals



Title: MultiScale Atomistics Modeling of Biomolecules and Polymers

The three challenges of the research are:

1. predicting protein structure and dynamics
2. simulating synthetic polymers and their engineering properties
3. understanding the interfaces between polymers and nanoparticles



Title: Mississippi Consortium for Evolutionary Ecology CyberInformatics

The research focus area is to develop internet-based infrastructure to guide and facilitate informatics- based evolutionary ecology research.

Recent Proposals

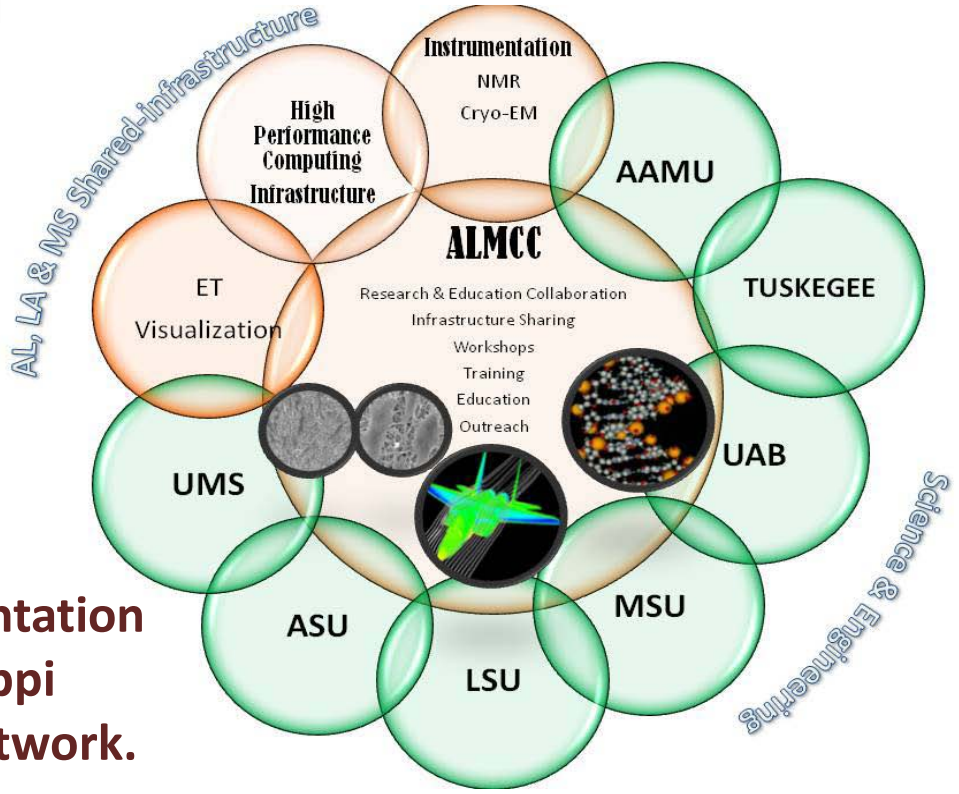
EPSCoR Research for Infrastructural Improvement Proposals

Title: NSF EPSCoR Track II White Paper

Key components:

Upgrading Computational Cyber Infrastructure

Network and incorporate current scientific and engineering instrumentation in Alabama, Louisiana, and Mississippi onto an advanced tri-state cyber network.



Selected Recent Activities at CCS

Computational Biology Group Meetings

Several research presentations through out the year

CAVS/CCS Joint Forum on Materials Science

Lectures by mathematicians, physicists, and engineers

DARPA – DOD Research Project Meetings

Nano materials modeling – thermal behavior of nanoparticle solutions subjected to RF excitation

Meetings with Dr. Gary Butler, Director of Tech Outreach, Office of Research

Joint Research with Institute for Clean Energy Technology (ICET)

Meetings with ICET and CCS members to discuss joint projects.

Scientific Computing Research Focus Group at MSU

Dr. Ioana Banicescu – Organizer

Several meetings throughout the year

CCS Workshops

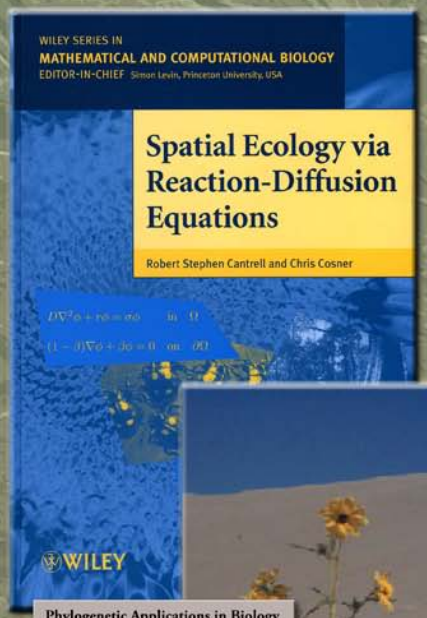
Computational Biology Workshop hosted by CCS at MSU

Ecology Workshop organized by CCS at MSU

Principal Speakers: Dr. Chris Cosner (University of Miami) and Dr. Junping Shi (The College of William & Mary)

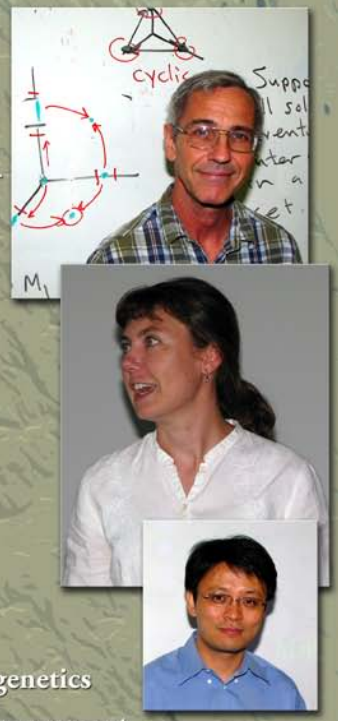
Mathematical Applications in Ecology and Evolution

A Workshop Hosted by the Center for Computational Sciences
Mississippi State University
August 4-6th 2008, HPC² Room 30
For more information contact
lisawallace@biology.msstate.edu



Speakers:

- Dr. Chris Cosner, Professor of Mathematics, University of Miami - Reaction Diffusion Models in Ecology
- Dr. Junping Shi, Associate Professor of Mathematics, College of William and Mary - Bifurcations in Reaction-Diffusion Systems
- Presentations by MSU faculty and graduate students
  - Dr. Jaffar Ali Shahul-Hameed - Modeling of species invasion
  - Dr. Chris Brooks - Network models of species invasion
  - Dr. Gary Ervin - Modeling the spread of invasive plants
  - Dr. Kevin Knudson - Topological analysis
  - Dr. Lisa Wallace - Phyloenetic applications in biology
  - Dr. Mark Welch - Likelihood and Bayesian models in population genetics
  - Dr. Xingzhou Yang - Biomechanical modeling of cilia and flagella movement



Support from: CCS · ORED Office of Research and Economic Development, Mississippi State University · College of Arts & Sciences · Mississippi State University

IMA Membership and CCS

Institute for Mathematics and its Applications (IMA) at University of Minnesota

The Primary Mission of the IMA is to increase the impact of Mathematics by fostering research of a truly interdisciplinary nature, linking mathematics of the highest caliber and important scientific and technological problems from other disciplines and industry.

Mississippi State University is a participating institution of the IMA.
Membership fee: $10,000 per year.

CCS Coordinates all of MSU's joint activities with the IMA.

Annual Program:

Mathematics and Chemistry, September 1, 2008, 2008-June30,2009
Complex Fluids and Complex Flows September 1, 2009-June30,2010
Simulating our complex world: Modelling Computation and Analysis September 1, 2010-June 30, 2011
Mathematics of Information, September 1, 2011–June 30, 2012

Website:
http://www.ima.umn.edu

IMA Membership and CCS

Participating Corporations

Boeing
Corning
ExxonMobil
Ford
General Motors
Honeywell
IBM
Lockheed Martin
Medtronic
Motorola
Microsoft
Schlumberger
Siemens
Telcordia

Participating Institutions

Air Force Research Laboratory
Arizona State University, Tempe
Georgia Institute of Technology
Indiana University
Iowa State University
Kent State University
Korea Advanced Institute of Science and Technology (KAIST)
Lawrence Livermore National Laboratory
Los Alamos National Laboratory (LANL)
Michigan State University
Michigan Technological University
Mississippi State University
Northern Illinois University
Ohio State University
Pennsylvania State University
Portland State University
Purdue University
Rice University
Rutgers University
Sandia National Laboratories
Seoul National University
Texas A & M University
University of Central Florida
University of Chicago
University of Delaware
University of Houston
University of Illinois
University of Iowa
University of Kentucky
University of Maryland
University of Michigan
University of Minnesota
University of Notre Dame
University of Pennsylvania
University of Pittsburgh
University of Tennessee
University of Wisconsin
University of Wyoming
Wayne State University
Worcester Polytechnic Institute

International Conference Series on Differential Equations and Computational Simulations

The primary objective of these conferences is to provide a joint forum where mathematicians, scientists, and engineers from industries, federal laboratories, and academia exchange research and development ideas.

An overall goal of these conferences is to promote research and education in mathematical and computational analysis of theoretical and applied differential equations.

The unique feature of these conferences is the interaction between mathematicians and engineers.

Researchers from Australia, Belgium, Brazil, Canada, China, Czechoslovakia, France, Germany, India, Indonesia, Japan, Korea, Mexico, Russia, Saudi Arabia, Spain, Thailand, the United Kingdom, and the United States have participated in these conferences.

The *Eighth* Mississippi State-UAB Conference on Differential Equations and Computational Simulations
May 7-9, 2009

The Eighth Mississippi State-UAB Conference on Differential Equations and Computational Simulations was held on May 7-9, 2009, at Mississippi State University, Starkville, Mississippi. There were 13 invited principal lectures presented by:

Douglas Arnold, University of Minnesota
Peter Bates, Michigan State University
Jack Benek, Wright-Patterson Air Force Base, (OH)
Alfonso Castro, Harvey Mudd College, (CA)
Pavel Drabek, University of West Bohemia, Czech Republic
Gisele Goldstein, University of Memphis, (TN)
Philip Maini, University of Oxford, United Kingdom
Scott Morton, Eglin Air Force Base, (FL)
Tinsley Oden, University of Texas at Austin
Stanley Osher, University of California at Los Angeles
Peter Polacik, University of Minnesota
Jere Segrest, University of Alabama at Birmingham
Theresa Windus, AMES LAB, U.S. Department of Energy, (IA)

A total of 147 participants and 20 international participants came from 12 different countries. The 2009 DE Conference was dedicated to Joe F. Thompson, W. L. Giles Distinguished Professor of Aerospace Engineering, for his outstanding and continuing contributions to Mississippi State University. 13 principal lectures and 89 contributed talks were delivered. We supported 50 graduate students/new Ph.D's using the NSF grant.

Atlas Conferences, Electronic Journal of Differential Equations (EJDE), Institute of Mathematics and its Applications (IMA) and National Science Foundation (NSF) were the co-sponsors for this conference.

The *Seventh* Mississippi State-UAB Conference on Differential Equations and Computational Simulations
November 1-3, 2007

The Seventh Mississippi State-UAB Conference on Differential Equations and Computational Simulations will be held on November 1-3, 2007, at Doubletree Hotel, Birmingham, Alabama. There were 12 invited principal lectures presented by:

Oscar Bruno, California Institute of Technology
Chris Cosner, University of Miami
Jeff Crandall, University of Virginia
Norman Dancer, University of Sydney, Australia
Joshua Epstein, The Brookings Institution
Lisa Fauci, Tulane University
YanYan Li, Rutgers University
Jean Mawhin, University of Catholique de Louvain, Belgium
Charles Nietubicz, Army research Laboratory
Jaime Peraire, Massachusetts Institute of Technology
John Rice, IBM TJ Watson Research Center
Peter Takac, University of Rostock, Germany

A total of 95 contributed papers were presented during the three-day conference. The conference was attended by 131 researchers, including those traveling from 7 different countries.

Atlas Conferences, Electronic Journal of Differential Equations (EJDE), Institute of Mathematics and its Applications (IMA) and National Science Foundation (NSF) were the co-sponsors for this conference.

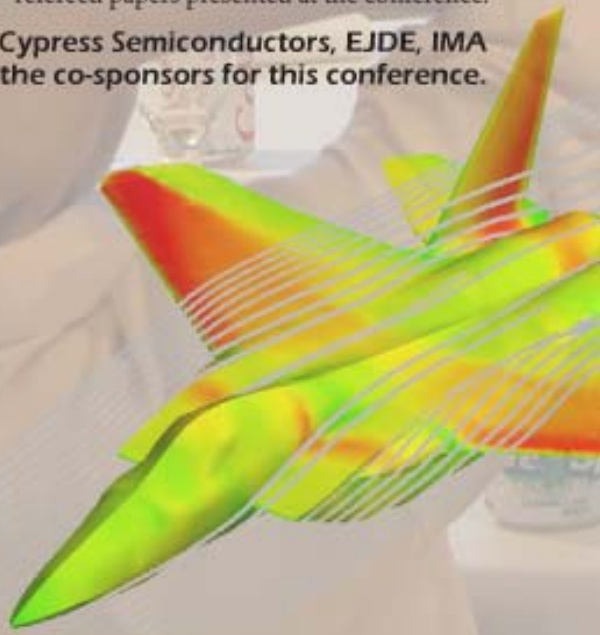
The *Sixth* Mississippi State-UAB Conference on Differential Equations and Computational Simulations
May 13-14, 2005

The Sixth Mississippi State-UAB Conference on Differential Equations and Computational Simulations was held on May 13-14, 2005, at Mississippi State University, Starkville, Mississippi. There were 8 invited principal lectures presented by:

Margaret Cheney, Rensselaer Polytechnic Institute
Lawrence DeLucas, University of Alabama at Birmingham
Thomas Yizhao Hou, California Institute of Technology
Mark Lewis, University of Alberta, Canada
Fang-Hua Lin, Courant Institute of Mathematical Sciences
Robert Meakin, U. S. Army, NASA Ames Research Center
Louis Nirenberg, Courant Institute of Mathematical Sciences
Klaus Schmitt, University of Utah

A total of 90 contributed papers were presented during the two-day conference. The conference was attended by 150 researchers, including those traveling from 9 different countries. This conference was dedicated to Louis Nirenberg in celebration of his 80th birthday, Klaus Schmitt in celebration of his 65th birthday, and their contributions to mathematics. As part of this celebration special sessions were organized. Also a banquet lecture titled "Louis Nirenberg and Klaus Schmitt: The Joy of Differential Equations" was delivered by Jean Mawhin, University of Catholique de Louvain-Belgium. The conference also featured a special lecture by Dr. Mary Ann Horn on the Funding Opportunities in the Mathematical Sciences at the NSF. The post-conference proceedings were published as a special issue of Electronic Journal of Differential Equations (http://ejde.math.txstate.edu/) Conference 15. It contains 25 refereed papers presented at the conference.

Atlas Conferences, Cypress Semiconductors, EJDE, IMA and NSF were the co-sponsors for this conference.



The *Fifth* Mississippi State Conference on Differential Equations and Computational Simulations
May 18-19, 2001

The Fifth Mississippi State Conference on Differential Equations and Computational Simulations was held on May 18- 19, 2001, at Mississippi State University, Starkville, Mississippi. There were 10 invited principal lectures presented by:

Peter Bates, Brigham Young University
Carlos Castillo-Chavez, Cornell University
Jerome Goldstein, University of Memphis
Anthony Ingraffea, Cornell University
James Keener, University of Utah
David Keyes, Old Dominion University
Hiroshi Matano, University of Tokyo, Japan
Suresh Menon, Georgia Institute of Technology
Wei-Ming Ni, University of Minnesota
George Papanicolaou, Stanford University

A total of 69 contributed papers were presented during the two-day conference. The conference was attended by 138 researchers, including those traveling from 7 different countries. The conference also featured a honoring ceremony for Professor Jack Hale, a special lecture by Dr. Henry Warchall on the Funding Opportunities in the Mathematical Sciences at the NSF, and the Banquet Lecture titled "Highway to Space" by Dr. Gary Lyles at NASA Marshall Space Flight Center. The post-conference proceedings were published as a special issue of Electronic Journal of Differential Equations (http://ejde.math.txstate.edu/) Conference 10. It contains 22 refereed papers presented at the conference.

EJDE, IMA and NSF were the primary co-sponsors for this conference.

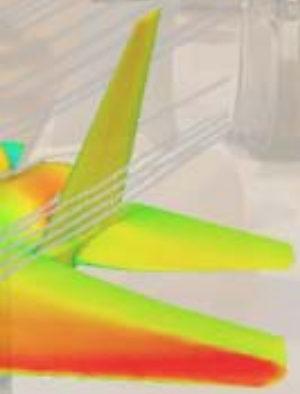
The *Fourth* Mississippi State Conference on Differential Equations and Computational Simulations
May 21-22, 1999

The Fourth Mississippi State Conference on Differential Equations and Computational Simulations was held on May 21- 22, 1999, at Mississippi State University, Starkville, Mississippi. There were 7 invited principal lectures presented by:

Lawrence C. Evans, University of California at Berkeley
Charbel Farhat, University of Colorado at Boulder
Irene Fonseca, Carnegie Mellon University
Ahmed Noor, University of Virginia
James Serrin, University of Minnesota
Paul Waltman, Emory University
Mary Wheeler, University of Texas at Austin

A total of 79 contributed papers were presented during the two-day conference. The conference was attended by more than 110 researchers. The post-conference proceedings were published as a special issue of Electronic Journal of Differential Equations (http://ejde.math.txstate.edu/) Conference 03. It contains 10 refereed papers presented at the conference.

EJDE and NSF were the primary co-sponsors for this conference.



The *Third* Mississippi State Conference on Differential Equations and Computational Simulations
May 16-17, 1997

The Third Mississippi State Conference on Differential Equations and Computational Simulations was held on May 16-17, 1997, at Mississippi State University, Starkville, Mississippi. There were 9 invited principal lectures presented by:

Walter Allegretto, University of Alberta, Canada
Jerry L. Bona, University of Texas
Djairo de Figueiredo, University of Campinas, Brazil
S.Godunov, Sobolev Institute of Mathematics, Russia
Antony Jameson, Princeton University
Jean Mawhin, University of Louvain, Belgium
Stanley Osher, University of California
Klaus Schmitt, University of Utah
Joseph Shang, Wright Patterson Air Force Base

A total of 75 contributed papers were presented during the two-day conference. The conference was attended by more than 130 researchers, including those traveling from 9 different countries. For those at the Engineering Research Center, it was a very special experience to have had the opportunity to speak with and hear a lecture by Professor Godunov, who is considered as the "grandfather" of computational fluid dynamics research. The post conference proceedings were published as a special issue of the Electronic Journal of Differential Equations (http://ejde.math.txstate.edu/) Conference 01. It contains 18 refereed papers presented at the conference.

EJDE and NSF were the primary co-sponsors for this conference.

The *Second* Mississippi State Conference on Differential Equations and Computational Simulations
April 7-8, 1995

The second Mississippi State Conference on Differential Equation and Computational Simulations was held on April 7-8, 1995 at Mississippi State University, Starkville, Mississippi. There were 9 invited principal lectures presented by:

Kenneth J. Brown, Heriot-Watt University, Edinburgh, United Kingdom
Luis Caffarelli, Institute of Advanced Study, Princeton University
David Caughey, Cornell University
Jerome Eisenfeld, University of Texas, Arlington
Jack Hale, Georgia Tech
Peter D. Lax, Courant Institute of Mathematical Sciences
Robert MacCormack, Stanford University
John Mallet-Paret, Brown University
Helen Yee, NASA Ames Research Center

A total of 79 contributed papers were presented during the two-day conference. The conference was attended by approximately 130 researchers, including those traveling from 7 different countries. The post-conference proceedings were published as a special issue of the journal of Applied Mathematics and Computation (89:1-3, 1998). It contains 23 refereed papers presented at the conference. NSF was a co-sponsor for this conference.

The *First* Mississippi State Conference on Differential Equations and Computational Simulations
March 19-20, 1993

The first Mississippi State Conference on Differential Equation and Computational Simulations was held on March 19-20, 1993 at Mississippi State University, Starkville, Mississippi. There were 7 invited principal lectures presented by:

Ramesh Agarwall, McDonnell Douglas Research & Development
Alfonso Castro, University of North Texas
Carlos Kenig, University of Chicago
Alan Lazer, University of Miami
Paul Rabinnowitz, University of Wisconsin, Madison
Phillip Roe, University of Michigan
Nigel Weatherill, University College of Swansea, United Kingdom

A total of 68 contributed papers were presented during the two-day conference. The conference was attended by approximately 115 researchers. The post-conference proceedings were published as a special issue of the journal of Applied Mathematics and Computation (65:1-3, 1994). It contains 30 refereed papers presented at the conference.

Plan for Computational Science Initiative

Interdisciplinary Graduate Certificate Program (M.S./Ph.D.)

Advanced research and education in Computational Science, including numerical algorithms, high performance computing, modeling and simulation with applications in Sciences, Engineering...

Available to graduate degree candidates in participating departments who have selected an independent research project in which there is a significant computational component.

M.S. Course requirements :

9 hours (> grades B or higher) of Computational Science Electives
including at least 3 hours outside home department
and must attain degree

Ph.D. Course requirements :

12 hours (> grades B or higher) of Computational Science Electives
including at least 6 hours outside home department
and must attain degree

Expanded Degree Programs

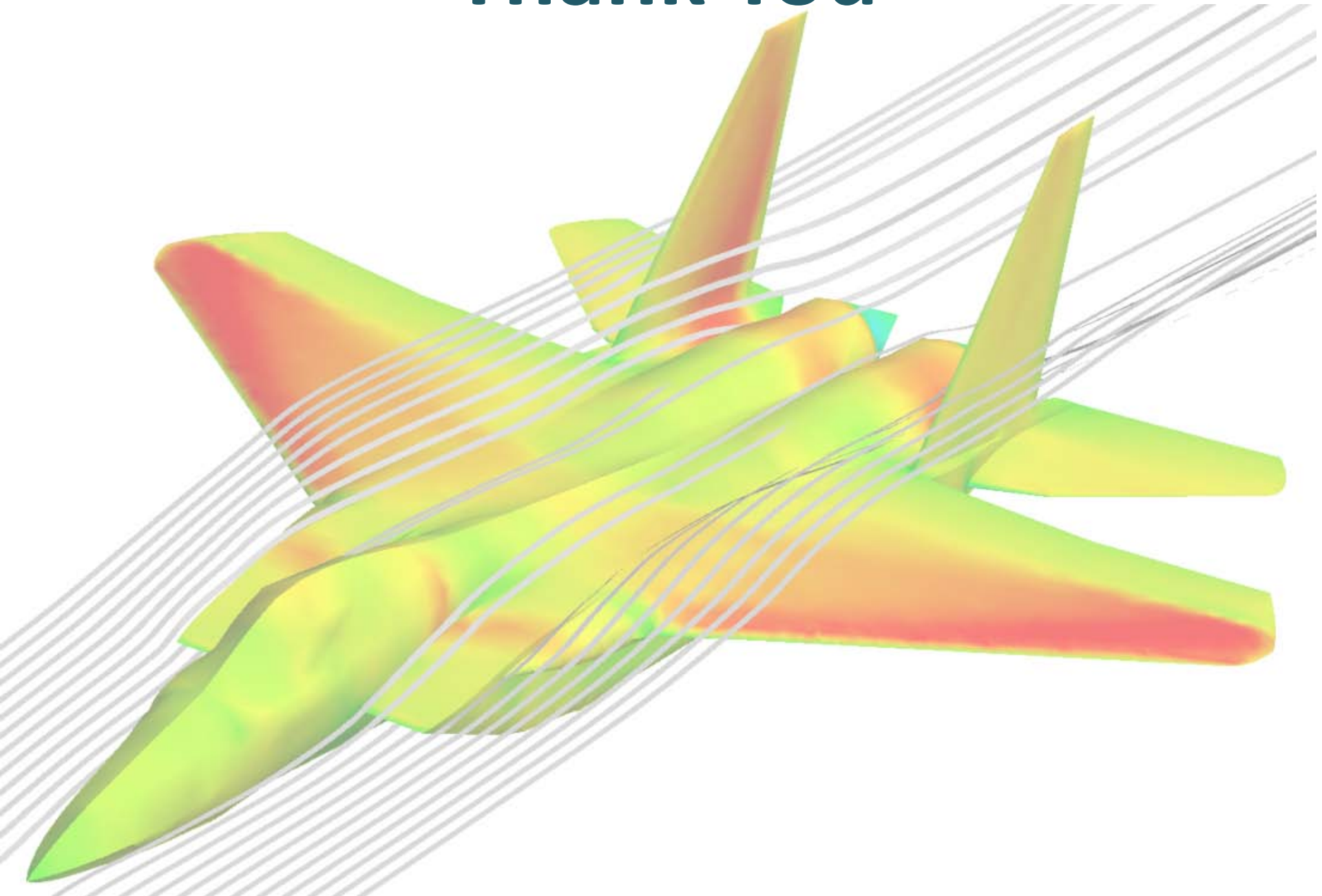
Expand degree programs centering on Computational Science

Currently, we have a Computational Engineering M.S. & Ph.D. Program.

Goals for the future:

- Computational Mathematics graduate programs
- Computational Biology / Bioinformatics graduate programs

Thank You



Recent funded and pending proposals

Sponsor	Title of Project	Amount	Personnel (PI)	Status
US Department of Army (ARMY) (DOD)	Molecular Packing Software for Ad-Initio Crystal Structure and Density Predictions	$17,474	Seong-Gon Kim	**Awarded** **(03/24/03-12/31/06)**
ABSL Power Solutions, Inc.	Portable Energy Divisions: Composites, Modeling, and Integration, Task 2	$209,990	Mark Novotny	**Awarded** **(04/11/06-04/10/07)**
Rensselaer Polytechnic Institute	Non equilibrium Growth Phenomena and Scalability in Synchronized Computing Networks	$274,970	Mark Novotny	**Awarded** **(09/01/04-08/31/08)**
National Science Foundation	The Seventh Mississippi State-UAB Conference on Differential Equations and Computational Simulations	$32,000	Hyeona Lim, Ratnasingham Shivaji	**Awarded** **(08/15/07-07/31/08)**
DOE	Nuclei at Extreme Conditions: A Relativistic Study (Ran through Physics with Overhead split between CCS and Physics)	$212,000	Anatolijs Afanasjevs	**Awarded** **(12/15/06-11/14/09)**
Environment Canada	Changepoint Estimation for Canadian Sky-Cloudiness Frequencies Using a Temporal Continuation-Ratio Logit Model	$20,000	Q. Lu	**Awarded** **(12/01/08-03/31/09)**
US Department of Defense (DOD)	Molecular Modeling to Develop Better Reactivators (Ran through Center for Environmental Health Sciences (CEHS) with Overhead split between CCS and CEHS)	$48,900.00	Steven Gwaltney	**Awarded** **(1/11/07 – 1/10/10)**
National Science Foundation	Collaborative Research : The role of isolation in species diversification : insights into disperal and evolution of endemics Lotus from the California	$99,777	Lisa E.Wallace	**Awarded** **(03/01/09 – 02/29/12)**
ERDC	Topological Features and Dynamics of Gene Flow Networks	$110,000	C. Brooks	**Awarded** **(03/02/09-09/30/2011)**
MAFES/MS Soybean Promotion Board	Development of a Rapid Genetic Field Race Test for Soybean Cyst Nematode (SCN) and Generation of SCN Resistance through Gene Inactivation	$54,850	V. Klink, G. Lawrence, T. Koger, T. Allen, C. Balbalian	**Awarded** **(04/01/09-03/31/2010)**
National Science Foundation	The Eighth Mississippi State- UAB Conference on Differential Equations & Computational Simulations	$35,000	Hyeona Lim, Ratnasingham Shivaji	**Awarded** **(06/15/09-05/31/2010)**
National Science Foundation	Planning of a Center for Autonomic Computing	$10,000	I. Banicescu, S, Abdelwahed	**Awarded** **(07/01/09-06/30/2010)**

Recent CCS Proposals

Sponsor	Title of Project	Amount	Personnel (PI)	Status
DOE	Theory of Coexisting Density Waves in Low Dimensional Quarter-Filled Band Molecular Solids	$507,111	Torsten Clay	**Awarded (09/01/08-08/31/2010)**
National Science Foundation	REU site Project: REU in Applied Mathematics and Biostatistics	$200,000	H.Lim, R. Shivaji,X. Yang, H. Zhang	**Awarded (09/15/09 - 08/31/11)**
DOE	Nuclei at Extreme Conditions: A Relativistic Study	$222,000	Anatolijs Afanasjevs	**Awarded (11/15/09 - 11/14/12)**
MS Soybean Promotion Board	Identifying Full-Length Open Reading Frames of Genes involved in Interactions between Soybean and Nematodes	$35,000	Vincent Klink	**Awarded (12/16/09 – 05/31/13)**
ORED (Mississippi State University) (RIP)	Ciliary Dynamics and the Motilities of the Single-Celled Algae Chlamydomonas	$10,000	Xingzhou Yang	**Awarded (1/1/10 - 12/31/10)**
ORED (Mississippi State University) (RIP)	Estimation of Latent Class Models with Conditional Dependence Using Multivariate Probit Analysis	$10,000	Huiping Xu	**Awarded (1/1/10 - 12/31/10)**
Federal Initiative for Funding (2009-2010) Department of Defense	**Advanced Materials Design for Nano Devices**	**$7.02M**	**R.T.Clay, S.Gwaltney, Seong Gon Kim, H.Lim,M.Novotny, P.C.Ray, R.Shivaji, J.P.Singh, Y.Ki.Hong.**	**Made it to Authorization bill but not in the Appropriation bill**
Federal Initiative for Funding (2010-2011) Department of Defense	**Advanced Materials Design for Nano Devices**	**$7.02M**	**R.T.Clay, S.Gwaltney, Seong Gon Kim, H.Lim,M.Novotny, P.C.Ray, R.Shivaji, J.P.Singh, Y.Ki.Hong.**	**Pending**
Federal Initiative for Funding(2010-2011) Department of Defense	**Towards Reliable and Green Computing Systems: An Automatic Management Approach**	**$2,599,651**	**Ioana Banicescu, Sherif Abdelwahed**	**Pending**

Recent CCS Proposals

Sponsor	Title of Project	Amount	Personnel (PI)	Status
US Department of Energy (12/01/08)	Few-and Many-Body Nuclear Theory from QCD	$383,461	G. Rupak	Pending
National Science Foundation (01/20/09)	GEPR: Identification of Gene Regulatory Networks Involved in Resistance as Identified by Laser Capture Microdissection and FLX-454 Sequencing of RNA Isolated from Nematode Feeding Sites	$869,986	V. Klink	Pending
DOE (09/01/09)	Universality, Nuclear Physics and QCD	$843,338	G. Rupak	Pending
National Science Foundation (12/15/09)	Efficient Numerical Methods for Variational Image Restoration and Segmentation	$217,702	Heyona Lim	Pending
National Science Foundation (09/30/09)	Composition Markov Chains of Multinomial Type	$33,165	Haimeng Zhang	Pending
National Science Foundation (07/24/09)	Collaborative Research: Magnolia grandiFLORA: A digital Herbarium of Collections in Mississippi(Proposal will run through GRI with O/H split 25%/25% between GRI and CCS)	$677,146	L. Wallace, C. Brooks, G. Ervin	Pending
NIH (09/24/09)	Early Detection of Myocardial Infraction: A3DDiffusion Tensor MRI Study on Heart Fiber Architecture	$418,476	Song Zhang	Pending
National Science Foundation (10/31/09)	Materials Inspired by Network Theory	$488,960	Mark Novotny	Pending
National Science Foundation (10/31/09)	Tailoring Magnetic Properties of Hexagonal Ferrites	$494,638	Seong – Gon Kim	Pending
National Science Foundation (01/13/10)	A Mechanical and Computational Model of the Unicellular Green Algae Chlamydomonas	$73,955	Xingzhou Yang	Pending
National Science Foundation (02/01/10)	Characterization of cpDNA SSR's in Lotus for inferring phylogeographic patterns on the Channel Islands	$14,401	Lisa Wallace	Pending
National Science Foundation (02/11/10)	UBM Group: The Landscape Genetics of Plant-Pollinator Interactions – Integrating Models and Data	$237,780	C. Brooks, H. Zhang, L. Wallace, H. Xu, C. Yuan	Pending
National Science Foundation (03/06/10)	**Center for Autonomic Computing at Mississippi State University**	$274,789	I. Banicescu, S. Abdelwahed	Pending
National Science Foundation (06/01/10)	EMSW21-RTG Research Training in Partial Differential Equations with applications in Biology and Material Science	$2,126,807	H. Lim, R. Shivaji, X.Yang and S. Yarahmadian	Pending