ECSU's Computational Science - Scientific Visualization Center

http://cssvc.ecsu.edu

2006 - 2007 Newsletter, Volume I: September 2006 - February 2007

Computational Science - Scientific Visualization

Algorithms
(Computational Modeling)

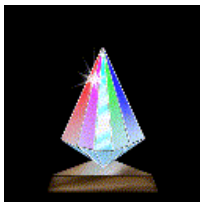
(Numerical Methods

Applications
(Science / Technology)

Architecture
(Computer Programming)
(Computer Visualization)

"A Scientific Resource Center for the School of Mathematics, Science & Technology"

The CSSV Center is a Center specializing in "an interdisciplinary approach to research, problem solving and visually displaying of data in the mathematical sciences, natural sciences and technological applications." The Center provides user friendly support services for students and faculty who are pursing research or educational endeavors which make significant uses of computational mathematics-numerical methods, mathematical modeling, high performance computer programming, using specialized computer application packages, and/or computer visualization tools and techniques.



"The mind is not a vessel to be filled but rather a flame to be ignited; when permitted to reach its potential, it is like a polished diamond radiating magnificent light"

(ECSU's CSSV CENTER)
The School of Mathematics, Science and Technology
Elizabeth City State University
Elizabeth City, North Carolina 27909; USA
URL: http://cssvc.ecsu.edu;

Johnny L. Houston, Ph.D.; Director
jlhouston@mail.ecsu.edu
Senior Research Professor, Dept. of Mathematics and Computer Science
Randolph Harris, Technology Specialist
Voice: (252) 335-3272/335-3361; FAX: (252) 335-3651

Weekly Schedule

for

ECSU's Computational Science - Scientific Visualization Center [ECSU's CSSV Center]

"A Scientific Resource Center for ECSU's School of Mathematics, Science and Technology"

Located in Rooms 122/209, Lester Hall, ECSU

Monday - Thursday:	**9:00 am - 9:00 pm**
Friday:	**9:00 am - 5:00 pm**
Weekends:	**By Appointments Only**

ECSU's COMPUTATIONAL SCIENCE-SCIENTIFIC VISUALIZATION CENTER

Johnny L. Houston, Ph. D., Director
Senior Research Professor, Dept. of Mathematics and Computer Science
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What is Computational Science - Scientific Visualization?

Computational Science-Scientific Visualization is an approach to the study of scientific and real world phenomena by extensive use of Computational/ mathematical modeling, numerical methods and simulation; as well as computer programming and computer visualization techniques. Computational Science-Scientific visualization is not an academic area of study itself. Instead it is a methodology used to study any number of academic discipline areas; especially those that encounter situations involving large or complex data or phenomena which needs to be analyzed, interpreted or visually displayed. Computational Science-Scientific Visualization works well in four major areas of investigations; those involving phenomena or data items considered to be:

(A) Too Small/ Too Large **(B) Too Fast/ Too Slow,**

(C) Too Complex **(D) What if?**

**Today's high-performance computers, combined with better understanding of computing environments as well as advances in computer graphics- computer visualization, have permitted the emergence of Computational Science -
Scientific Visualization (CSSV), which has put the solving of many formally intractable problems/investigations within our reach.**

YEAR-ROUND RESEARCH ACTIVITIES OCCURING IN ECSU's CSSV CENTER

A. Academic Year Faculty Research
A Research Project in Computational Science is pursued by one or more Faculty members each academic year in the CSSV Center.

B. Academic Year Student Research Teams
One or more different student teams pursue research activities in the CSSV Center each year.

C. Academic Year CSSV Center Visiting Scientists Seminar - Colloquium Series
During the Academic Year approximately eight (8) visiting scientists are invited to ECSU's School of Mathematics, Science & Technology to make a scholarly seminar or colloquium presentation involving Computational Science - Scientific Visualization activities; while visiting they relate to faculty and students interested in research in their area of expertise.

D. Academic Year Faculty Education/Training Workshops
During the Academic Year, the CSSV Center provides structured research and educational training for ECSU faculty in CSSV (upon request). In the Spring of the year Faculty Work-shops in CSSV are provided for approximately twenty-five (25) faculty participants during a Regional Conference.

E. Summer Research Institute in Computational Science - Scientific Visualization
An Institute is held during the last two weeks in May each year in the CSSV Center. Four teams, consisting of three - five students and one - two faculty mentors develop research projects during the Institute after intense training in CSSV.

F. Summer Session Faculty/Student Research Projects
A Research Project in Computational Science is pursued by one or more faculty members each summer at the CSSV Center. Moreover, one or more students develop research projects with a faculty member each summer in the CSSV Center.

G. Extramural Summer Faculty/Student Research Projects
One or more faculty members related to the CSSV Center are involved in extramural research projects each summer. Moreover, at least three students are involved in extramural research summer projects each summer.

H. Monthly, Technical and Research Support
The CSSV Center provides Technical and Research Support for ECSU faculty and students in the School of Mathematics, Science & Technology as well as for Science and Mathematics Faculty at NAM Institutions, upon request.

ACTIVE RESEARCH TEAMS IN THE CSSV CENTER

Research Team A: Computational Modeling of Optimization Problems

Faculty Leaders: J. L. Houston and J. W. Alexander

- Using Computational Techniques to model and solve optimization problems in one variable.
- Using Computational Techniques to model and solve optimization problems in several variables.

Research Team B: Computational Modeling and Analysis of Dynamical Systems

Faculty Leaders: J. L. Houston and J. W. Alexander

- Using Computational Techniques to model and analyze dynamical systems.
- Using Computational Techniques to visualize and simulate dynamical systems.

Research Team C: Computational Modeling of Probabilistic and Statistical Data

Faculty Leaders: J. L. Houston, A. Lawrence, and F. Chandler

- Using Computational Techniques to model and analyze probabilistic behavior.
- Using Computational Techniques to model and analyze statistical data.

Research Team D: Numerical Modeling of Data Using Searching and Sorting Techniques

Faculty Leaders: J. L. Houston and A. Lawrence

- Using Computational Techniques to model, search and organize data.
- Using Computational Techniques to model, sort and display data.

Research Team E: Data Mining and Visualization of Data

Faculty Leaders: J. L. Houston, A. Lawrence, F. Chandler, and C. Bland

- Using Computational Science Techniques to analyze data for association and influences.
- Using Computational Science Techniques to guide what to visualize and how to visualize it.

Research Team F: Combinatorial Mathematics and Spatial Geometry

Faculty Leaders: J. L. Houston, A. Lawrence, and F. Chandler

- Using Computational Science Techniques for modeling, analyzing and solving combinatorial problems.
- Using Computational Science Techniques for modeling and solving the No-Three-In-Line Problem.

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ELIZABETH CITY STATE UNIVERSITY
SCHOOL OF MATHEMATICS, SCIENCE AND TECHNOLOGY

Announces

Research Week 2007

February 12 – 16, 2007

Theme: Enhancing Academic Instruction Through Research

All units in the school of MST will be participating in one or more of the following ways……

- A motivating look at ECSU faculty research & scholarly activities
- Colloquium presentations by well-known scientists and researchers
- Displays and posters from various departments and agencies
- Pre-College & Community College session
- Student Science Bowl Competition
- Student research poster session
- Panel presentations
- Research fair

For more information or to learn how to participate please contact:
Dr. Ronald Blackmon, Vice Chancellor for Academic Affairs, (252) 335-3710, rhblackmon2@mail.ecsu.edu
Dr. Cynthia Warrick, Dean of the School of Mathematics, Science and Technology, (252) 335-3189, cawarrick@mail.ecsu.edu
Dr. Linda Bailey Hayden, Associate Dean of the School of Mathematics, Science and Technology, (252) 335-3696, haydenl@mindspring.com

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Announcing Applications Available for

ECSU - NAM's 2007 Computational Science Workshop Mini-Grants to attend Computational Science Workshops at NAM's 2007 Regional Faculty Conference on Research and Teaching Excellence; March, 30 – 31, 2007

Hosted by Tennessee State University; Nashville, TN

Faculty Education / Research Training Workshops will be conducted in Computational Science—Scientific Visualization

For application for Mini-Grant, see page 8.

ECSU - NAM 2007 SUMMER RESEARCH INSTITUTE IN COMPUTATIONAL SCIENCE-SCIENTIFIC VISUALIZATION

May 14 – 26, 2007

This Institute is an intense two-weeks program where participants learn research skills by tutorials, presentations by experts and by actual research experiences.

The Institute's focus is:

"To Explore and Engage in Research Activities that are of interest to DoE and To Enhance Increased Involvement and Productivity in future DoE Related Research."

The Institute is designed to enhance the research skills of students for summer internships and graduate study.

Sponsored by Elizabeth City State University's CSSV Center and the National Association of Mathematicians, Inc. (NAM) and with funding support from the Dept. of Energy (DoE).

Conference participants will receive lodging, a food allowance for meals and a $500 stipend (students).
A stipend will also be provided to faculty participants.
(A maximum of $300 is provided for travel to and from the Institute.)

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A. Length of Time: **Two (2) Weeks**
B. Institute Dates: **May 14 - 26, 2007**

C. Generic Institute Structure: Tutorials -Lab Assignments-Presentations-Project Dev.
D. Participants: Twenty (20) Student Mathematics/Computer Science Majors,
Four (4) Mathematical Sciences Faculty Mentors - Team Leaders,
{Four (4) Research Teams; 5 students - 1 faculty, per team}

For application/information, contact Johnny L. Houston at (252) 335-3361, Fax: (252) 335-3280
(email: jlhouston@mail.ecsu.edu or visit the CSSV Center Website http://cssvc.ecsu.edu

NAM's 2007 Regional Faculty Conference On Research and Teaching Excellence

Hosted by Tennessee State University; Nashville, TN; March 30 - 31, 2007

Application - Registration for Conference/Mini - Grant Support

For Mini-Grant Support Consideration, Please Return By March 2, 2007

Please Print in Ink or Type the Following Information:
Name (Dr.__ Prof. __ Mr. __ Mrs.__ Ms.__) _____

Position _____ Institution_____

(Please use address where you would like Conference information to be mailed)

Mailing Address _____

City_____ State_____ Zip Code _____

Telephone: Day ( )_____ Evening ( )_____

E-Mail _____ Fax Number ( )_____

Application for ECSU – NAM Computational Science Workshop Mini-Grant Support ($500.00 per applicant)

Please complete the section below **only** if you are requesting a Mini Grant for Conference Support.

Conference Grant Support is designed to cover travel, lodging, food and registration.
Persons requesting grant support should include a one page letter/application stating how this conference would enhance them professionally.

For selected participant, NAM will receive a check for $100.00 for Registration and Meals.

For selected participant, the Participant will receive a check for $400.00 for travel and lodging.

Travel Support

Travel support covers a maximum of $300 for an economical round-trip airfare, a rental car or for the use of a personal car up to this amount at a rate of $.40 per mile.

I will travel (check one): ____ by car _____ by air ___other

My airport and city of departure _____

Lodging Support - Local Travel

Lodging support – local travel covers a maximum cost of $100.00. Colleagues who desire to share a room are encouraged to submit both applications together and should arrange your reservations accordingly.

Signature _____ (Required for funding)

SSN _____(Required for funding)

ECSU-NAM 2007 STUDENT RESEARCH INSTITUTE IN COMPUTATIONAL SCIENCE-SCIENTIFIC VISUALIZATION

May 14, 2007 - May 26, 2007
(Extended Deadline: April 30, 2007 with limitations)

STUDENT APPLICATION

NOTE: Funding guidelines require participants to be U.S. citizens or permanent residents. This Institute is designed for rising seniors and graduating seniors who plan to do an internship during the summer of 2007 and who plan to attend graduate school after graduation.

To apply, you should be at least a junior (2006-2007 Academic year) with a GPA of 3.0 or higher:

(a) complete this form
(b) briefly describe (on the back) your mathematics/computer science interests and career goals,
(c) send a copy of your current college transcript (unofficial copy is acceptable),
(d) include one (1) letter of reference (from a mathematics / science professor) with your application.

The complete application, along with required materials, should be sent by **April 9, 2007** to:

The CSSV Center
Elizabeth City State University
Campus Box 959
Elizabeth City, North Carolina 27909
Fax - (252) 335-3651 Alt. Fax - (252) 335-3487

Name _____

Social Security Number _____ Birth Date _____

Expected date of graduation _____ Current / Expected GPA _____

Name of your Institution _____

College Phone Number _____ Home Phone Number _____

College Address _____ City _____ State _____ Zip _____

Home Address _____ City _____ State _____ Zip _____

Email Address _____

2007-2008 Fall Semester Classification: # of hours earned by May 2007 _____

Name, address and phone number of person writing reference (should be a college mathematics/science professor who has taught you).

Name _____ Phone Number _____

Institution _____

Address _____

Please provide the following information (applicant):

Gender: ☐ Male ☐ Female

Race: ☐ African American ☐ Hispanic American ☐ Native American ☐ Asian American ☐ Caucasian ☐ Other

Deadline: April 9, 2007 (Extended Deadline: April 30, 2007)
Page 2, Student Application

I. Classes Completed: Give titles of college mathematics/computer science courses completed by 5/15/07

II. Career Goals: Briefly describe your mathematics / science interests and career goals.

III. 2007 Summer Plans: What are your plans for the summer of 2007 between 6/1/07 & 8/15/07?

IV. Do you plan to do a 2007-2008 academic year project?

V. What discipline area do you plan to study in graduate school?

Signature _____ Date _____

The CSSV Center's Visiting Scientist Seminar—Colloquium Series

The School of Mathematics, Science, and Technology

As a method to heighten awareness of different kinds of scientific knowledge, to stimulate research interest in different knowledge areas, to provide experts to dialogue with ECSU/NAM's institutions researchers, and to permit students to relate to external role models in different areas of mathematics, science, and technology, there is a monthly Visiting Scientists / Seminar-Colloquium Series. For four months during the fall semester (August – November) and four months during the spring semester (January – April), plans and arrangements are made to have a visiting scientist to come to the campus of Elizabeth City State University to make a seminar presentation for a large and varied audience and possibly one or two specialized lectures for a smaller audience. As often as feasible, the visit is one that a professional, a researcher, group of researchers (at ECSU or at some NAM institution) or a discipline area (at ECSU) would be interested in having a dialogue. The monthly seminar-colloquium presentations are scheduled for Thursday afternoons so that the Visiting Scientists may arrange to spend 1-3 days during a visit. During the summer months visiting scientists are invited to present to the Summer Institute participants. On the website **http://cssvc.ecsu.edu**, one may learn additional details by selecting Colloquium Series link from the menu and then selecting the desired year. .

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Elizabeth City State University

Dr. Cynthia Warrick, Dean of the School of Mathematics, Science and Technology

On behalf of the Students, Faculty & Staff in the School of Mathematics, Science and Technology, I would like to thank all participants of Research Week 2007 at Elizabeth City State University. This year's theme, "Enhancing Academic Instruction through Research," recognized that Knowledge is acquired through Teaching and Research. Research Week provided our community of Teacher-Scholars and Students the opportunity to learn and demonstrate the link between knowledge and creativity.

Podium and Poster presentations celebrated the research and academic accomplishments of our faculty and students in the School of Mathematics, Science & Technology (Mathematics & Computer Science, Aviation Science, Biology, Chemistry, Marine Environmental Science, Geology, Pharmacy, Physics, and Technology) and across the ECSU campus (Business, Education and the Social Sciences). The first annual Research Fair brought representatives from State and Federal Agencies, Graduate Programs and Professional Schools to present information about student internships, graduate programs and research collaboration.

"RESEARCH WEEK 2007" also celebrated the accomplishments of African Americans, HBCU's, and others in Math, Science and Technology. We hope that the displays, panel discussions, seminars, and poster presentations have sparked your interest and imagination to create new knowledge, the science to transform our world.

Research Week - Schedule of Events

Monday, February 12, 3 - 5:00 pm

Departments, Faculty, and Student Displays
Rooms 216 - 218, Student Union Center
Presiding - Dr. Mehran Elahi
Welcome - Dr. Ronald Blackmon

Departments and major funded centers/programs will have displays set up showcasing their research efforts. These displays will remain in the lobby for the entire week.

Tuesday, February 13, 3 - 5:00 pm

MST Panel Presentation, Major African American Contributors in Mathematics, Science and Technology
Room 206 Student Union Center
Presiding - Dr. Gary Harmon
Welcome - Dr. Cynthia Warrick

Wednesday, February 14, 3:30 - 5:00 pm

Guest Speaker - Dr. Bernard Harris
An Astronaut's View: The Power of a Dream
Room 206 Student Union Center
Presiding - Dr. Ephraim Gwebu
Welcome - Dr. Willie Gilchrist, Chancellor
Introduction of Speaker - Dr. Cynthia Warrick

Thursday, February 15

Research Fair
Rooms 216 - 218 Student Union Center
Presiding - Dr. Francisco San Juan
2:00 - 3:00 pm - Science Bowl Competition
1st Floor, Student Union Center
11:00 am - 4:00 pm - Research Fair/Science Bowl Awards

Friday, February 16

Student Poster Presentations
11:00 am - 1:00 pm, Student Union Center
Presiding - Dr. Darnell Johnson

Department Representatives

- **Biology** - Dr. Margaret Young
- **Chemistry & Physics** - Dr. Ephraim Gwebu
- **Geological, Environmental & Marine Sciences** - Dr. Francisco San Juan
- **Mathematics & Computer Science** - Dr. Darnell Johnson
- **Pharmacy** - Dr. Huyla G. Coker
- **Technology** - Dr. Mehran Elahi, Dr. Orestes Gooden
- **CERSER** - Dr. Linda Hayden
- **CSSV Center** - Dr. Johnny L. Houston