I. CONTENTS

I. From the Director

II. Mission and Activities

III. Membership and Visitors

IV. Seminars and Workshops

V. CAMS Summer Research Program

VI. Externally Sponsored Research

VII. Proposed Research

VIII. Facilities

IX. Publications and Presentations

X. External Activities

I. FROM THE DIRECTOR

CAMS fulfills its mission to promote and sustain research in the mathematical sciences at NJIT largely through the creation and maintenance of essential infrastructure. This infrastructure includes support for preparation and submission of research papers and proposals, the CAMS/Math Seminar Series, the CAMS/Math Computation Laboratory, the CAMS Reading Room, the CAMS Reports, and the CAMS Summer Research Program. Thanks to the efforts of CAMS membership, infrastructure development continued at a rapid pace in 1995. An NSF SCREMS award, with a match from NJIT, has provided for a significant upgrade of our computational capabilities including the creation for a full-time systems administrator for the CAMS/Math Computational Laboratory. Undergraduate students, supported by NSF REU supplements, participated in the CAMS Summer Research Program for the first time. This positive experience with undergraduate research prompted submission of a proposal (funded in 1996) to the NSF ILI program for expanding our computational laboratory to allow all mathematics
majors to use these facilities for their senior projects. The best evidence of the effectiveness of CAMS in building infrastructure is the research accomplishments of the CAMS membership documented in this report.

Many challenges remain: improving and enlarging research facilities including common space, offices for visitors and research assistants, integrating both graduate and undergraduate students into research projects, creating a support environment for consulting efforts and interdisciplinary collaborations, creating and strengthening ties to industry both to improve faculty research work and to assist the Mathematics Department in the implementation of an "industrial strength" Ph.D. program, improving support for publication and editorial activities. The talent, energy, and dedication of the CAMS membership gives us great confidence that these challenges will be met in the years to come.

The accomplishments of CAMS are built on the efforts and support of many individuals. CAMS is deeply indebted to President Saul Fenster whose vision has created an environment in which the aspirations of CAMS are espoused and appreciated. CAMS is also deeply indebted to Provost Gary Thomas for his pivotal role in realizing this vision and in particular for his unflagging assistance and support. And finally, CAMS is very appreciative of the deep commitment of Gregory Kriegsmann, Chairman and Foundation Chair of Applied Mathematics, whose generous supply of resources, advice, and energy have been instrumental in our ongoing success.

Jonathan Luke—CAMS Acting Director (Spring 95)

Daljit S. Ahluwalia—CAMS Director

II. MISSION AND ACTIVITIES

The Center for Applied Mathematics and Statistics (CAMS) was established in 1986 to promote research in the mathematical sciences at the New Jersey Institute of Technology. Members of the Department of Mathematics naturally form the core of CAMS membership, but the importance of mathematics for science and technology has made CAMS an interdisciplinary organization. The formal structure of CAMS consists of the Director, the Committee on Research Facilities. But the essential nature of the organization is that of a voluntary
association of individual researchers joined in a collegial collaboration to enhance mathematical work at NJIT.

CAMS undertakes a wide range of activities in pursuing its mission. Since cutting edge research requires that its members be in steady contact with international scientific and engineering communities, CAMS brings researchers from academia, industry, and government to NJIT and other institutions by organizing inter-disciplinary workshops and by bringing together researchers whose strengths are complementary and whose goals are common. In some cases, CAMS secures the appointment of Research Professors to formalize this relationship so that grants can be jointly pursued.

CAMS activities also include support for the submission of research proposals which is done through dissemination of information, organization of group efforts, and administrative assistance to proposers. Senior members of CAMS commit a significant amount of time and effort in providing guidance and advice to young researchers in their efforts to obtain funding. Finally, CAMS fosters and encourages research among its members by arranging the acquisition of necessary resources.

In the future, CAMS hopes and expects to maintain its high standards of professionalism and scholarship and plans to extend its activities to include fostering student research and developing long-term relationships with industry.

MEMBERSHIP AND VISITORS

Department of Mathematics

Ahluwalia, Daljit S. - Director (IPA at NSF Spring 95)

Andrushkiw, Roman

Bechtold, John

Bhattacharjee, Manish (Sabbatical, Fall 95)

Blackmore, Denis

Booty, Michael
Bukiet, Bruce

Collins, Russell - (Special Lecturer, Spring 95)

Dhar, Sunil

Dios, Rose

Goldberg, Vladislav - (Sabbatical, Fall 95)

Hile, Cheryl

Huang, Xun-Cheng

Kriegsmann, Gregory

Lacker, Michael

Luke, Jonathan - (Acting Director Spring 95)

Sabbatical, Fall 95) Michalopoulou, Zoi Heleni (Research Asst. Professor Spring 95)

Milojevic, Petronije

Papageorgiou, Demetrios - Associate Director (Fall 95)

Perez, Manuel

Porter, Michael

Ray, Bonnie

Rosar, Madeleine - (Visiting Assistant Professor)

Siegel, Michael

Sran, Kewal

Stickler, David
Tavantzis, John

Tilley, Burt

Wagner, Barbara

Department of Mechanical & Industrial Engineering

Rosato, Anthony

Dave, Rajesh

Department of Civil & Environmental Engineering

Meegoda, Namunu

CAMS Research Professors & Post Doc

Chaudhry, Hans

Erneux, Thomas

Booker, Stuart (Post-Doctoral Fellow)

Long-Term Visitors

Orellana, Oscar Universidad Federico Santa Maria

Valparasiso, Chile

Jones, Douglas S. The University of Dundee

Scotland, United Kingdom

Short-Term Visitors

Nachbin, Andre Instituto de Matematica Pura

Aplicade (IMPA)
Rio de Janeiro, Brazil
Scandrett, Clyde Naval Post Graduate School
Monterey, California
Silberglitt, Richard FM Technologies, Inc.
Fairfax, Virginia
Schuenemeyer, John University of Delaware
Newark, Delaware

IV. SEMINARS AND WORKSHOPS

A. THE CAMS/MATH SEMINAR SERIES

Dale Lifson
AT&T, Basking Ridge, NJ
The Role of Quantitative Analysis in the Success of
AT&T Consumer Communications Services

Abraham Kadish
Los Alamos National Laboratory, New Mexico
Modelling the Effects of Mechanical Hysteresis on
Seismic Signal Propagation

Ernest L. Baker
Energetics and Warheads Division, US Army, Armament
Research, Development & Engineering Center, Picatinny
Arsenal

Modeling and Optimization of High Explosive Systems

Seth D. Potter

Applied Science Program, New York University, NY

Wireless Power Transmission for Terrestrial and Space Applications

Han Zhu

Research Associates, Inc., Tyndall AFB, Florida

Engineering Applications of the Integral Equation Method

Rodolfo Rosales

Department of Mathematics, MIT, Cambridge, MA

Standing Waves in Resonant Nonlinear Acoustics

Walter Willinger

Picatinny Arsenal, NJ

When Traffic Measurements Defy Traditional Traffic Models (and vice versa): Traffic Modeling for High-Speed Networks

Ralph Kleinman

Department of Mathematics, University of Delaware, Newark, DE
Modified Gradient Methods in Imaging and Inverse Scattering

Tom Marzetta
Nichols Research Corporation

Three-Dimensional Digital Filters for Motion Detection in Image Sequences

Thomas L. Jackson
ICASE, NASA Langley Research Center, Hampton, VA

Shock-Turbulence Interactions and the Initial-value Problem for Shear Flows

Jeffrey G. Blaschak
USAF Armstrong Laboratory, Brooks Air Force Base, Texas

Electromagnetic Wave Propagation in Dispersive Material

James F. Lynch
Department of Ocean Engineering, Woods Hole Oceanographic Institute, Woods Hole, MA

Scattering of Sound from Internal Gravity Waves in Shallow water—some Beginning Efforts at Understanding

John Starkenberg
US Army Research Laboratory, Aberdeen Proving Ground, MD
Modeling Shock Initiation of Heterogeneous Solid High Explosives

Lloyd N. Trefethen

Department of Computer Science, Cornell University, NY

Computing Eigenmodes of Isospectral Drums

Richard Meyer

Department of Mathematics, University of Wisconsin, WI

Mathematics of Physical Modeling

Stuart Antman

Department of Mathematics, University of Maryland, College Park, MD

Real and Fake PDE's of Nonlinear Viscoelasticity:

Asymptotics of Light Bodies

William E. Olmstead

Department of Mathematics, Northwestern University, Evanston, IL

Shear Localization Phenomena—An Overview

Richard Silberglitt

FM Technologies, Fairfax, VA

Microwave Processing and Joining of Ceramic Materials
Amitabha Bose
Department of Mathematics, Boston University, MA
Applications of Geometric Singular Perturbation Theory to Neurophysiology

Douglas A. Huntley
Institute for Mathematics and its Applications, University of Minnesota, MN
The Migration of a Liquid Droplet on a Non-uniformly Heated Surface

Michael Siegel
Department of Mathematics, Ohio State University, Ohio
The Dynamics of Complex Singularities in Hele-Shaw Flow

Burt Tilley
Department of Engineering Sciences & Applied Mathematics, Northwestern University, IL
Stability of Two-Layer Fluid Flows in Inclined Channels

Vittorio Castelli
IBM T.J. Watson Research Center
Progressive Classification of Satellite Images in a Wavelet Framework

Margaret Cheney
Inverse Problems for a Perturbed Dissipative Half-Space

Ian Fischer

Modern Applications of Quaternions

Lisa Fauci

Computational Modeling of Swimming Organisms

Peter Petropoulos

The Computation of Linear Dispersive Electromagnetic Waves

Douglas S. Jones

Scattering by a Cone

Louise Obergefell

Wright-Patterson Air Force Base, Dayton, OH
Human Biodynamics Modeling

Qiang Zhang

Department of Applied Mathematics & Statistics, SUNY at Stony Brook, NY

Quantitative Theory of Fluid Mixing Induced by Random Fields

David E. Tyler

Department of Statistics, Rutgers University, New Brunswick, NJ

Robust Statistics and Computer Vision

Joseph B. Keller

Stanford University, Stanford, CA

Mathematics of Games and Sports

J. Douglas Carroll

Graduate School of Management, Rutgers University, Newark, NJ

Multidimensional Scaling of Similarity, Dissimilarity, and Preference Data

Smadar Karni

Courant Institute, New York University, NY
Algorithms for Compressible Interface Motion

**Michael Miksis**

Department of Engineering Sciences & Applied Mathematics,
Northwestern University, Evanston, IL

The Dynamics of Free and Confined Thin Liquid Films

**Jun Hu**

Department of Mathematics, Rutgers University, Newark, NJ

Renormalization, Rigidity, and Universality in Bifurcation Theory

**B. CAMS WORKSHOP IN MATERIALS SCIENCE PROBLEMS AT NJIT**

The purpose of this workshop is to bring together researchers from NJIT working on materials science problems with particular emphasis on chemical vapor deposition (CVD). This will be an opportunity for exploring the possibility of modeling and analyzing such problems currently being investigated by groups in different departments at NJIT.

James Grow, Chemical Engineering & Environmental Sciences

Roland Levy, Physics

Norman Loney, Chemical Engineering & Environmental Sciences

Trevor Tyson, Physics

**C. NJIT & COURANT INSTITUTE/MATERIALS SCIENCE RESEARCH WORKSHOP**

Under the auspice of CAMS, members of the Courant Institute, Physics Department (NJIT), and CAMS collaborated to explore joint research interests.
D. NJIT & RUTGERS/NEWARK JOINT MATHEMATICAL SCIENCES COLLOQUIUM

Philip Holmes

Princeton University, Department of Mechanical and Aerospace Engineering and Program in Applied and Computational Mathematics

Low Dimensional Models of Turbulence

CAMS 1995 SUMMER RESEARCH PROGRAM FOR STUDENTS

The CAMS Summer Research Program for students provides administrative support for faculty working with students on research projects during the summer. This support includes the organization of the CAMS Graduate Research seminar where faculty and students present their research projects or other topics of interest. In 1995 undergraduate students were included in the summer research program.

A. PARTICIPANTS

Graduate Student Project Advisor

John Pelesko Gregory A. Kriegsmann

Shailesh Naire Bruce Bukiet

John Gilchrist Demetrios Papageorgiou

Helen Martynov Michael Porter

Xulun Jiang Michael Lacker

Piewen Hou Jonathan Luke

Zili Huang John Bechtold

Juan Gomez Michael Booty

Matthew Charlap Cheryl Hile
Yanping Wang Demetrios Papageorgiou

Undergraduate Student Project Advisor

Erik Gordon Demetrios Papageorgiou

Jennifer Garofalo Demetrios Papageorgiou

Robin Tanenbaum Michael Booty

B. CAMS GRADUATE RESEARCH SEMINAR

Organizer: Bruce Bukiet

Demetrios Papageorgiou

Some Mathematical Problems in Fluid Dynamics

Zoi-Heleni Michalopolou

Source Localization for the Gulf of Mexico Experiment

Bruce Bukiet

A Characteristic Based Numerical Method with Tracking for Nonlinear Wave Equations

John Pelesko

Microwave Heating of Low Loss Ceramics Through the use of a Lossy Susceptor: A One-dimensional Model

Shailesh Naire

Simulation of Jet Combustion with Swirl and Detailed Chemistry

John Gilchrist

Microwave Heating of a Fluid Layer
Helen Martynov

Inversion of Underwater Acoustic Fields Using Global Optimization Techniques

Xulun Jiang

2D Multi-Pendulum Tree Model and Its Application To Human Movement

Peiwen Hou

Numerical Computation of Stokes Flow Containing Rigid Plates

Zili Huang

Flame Response in Oscillating Stagnation Point Flow

Juan Gomez

Droplet Combustion

Matthew Charlap

A Comparison of Numerical Techniques for Solving the GNLS Equation

Yanping Wang

Control of Velocity and Wake Formation by Manipulation of Bulk Surfactant Concentration

C. UNDERGRADUATE STUDENT RESEARCH PROJECT

Erik Gordon

Dynamics of Multi-Fluid Flow and Interfaces

Jennifer Garofalo

Dynamics of Multi-Fluid Flow and Interfaces
Robin Tanenbaum

The Modulation of Flames of Various Types in a Premixed Reactive Atmosphere

VI. EXTERNALLY FUNDED RESEARCH

A. NEW PROJECTS (Beginning in 1995)

1. Applications of Sweep Differential Equations to Automated Manufacturing

National Science Foundation: September 1995-August 1998

Denis Blackmore

Ming Leu

2. Mathematical Modelling and Dynamics of Premixed Flames as Hydrodynamic Discontinuities

National Science Foundation: July 1995-June 1998

John Bechtold

3. Mathematical Studies of Wave Propagation

National Science Foundation: June 1995-November 1996

Cheryl Hile


Canadian Department of National Defense (DREA):

October 1995-October 1998
Michael Porter
Zoi Heleni Michalopolou

6. Statistical Analysis of NJIT I/M Study
Hazardous Substance Management Research Center: June, 1995 - June, 1996
Bonnie Ray
Manish Bhattacharjee
Sunil Dhar

7. Mathematical Sciences Computing Research Environments
Jonathan Luke
Gregory A. Kriegsmann
Madeleine Rosar
John Bechtold
Bruce Bukiet
Zoi Heleni Michalopoulou

8. Marine Mammal Localization
National Science Foundation: August 1995-July 1996
Zoi Heleni Michalopoulou
9. Consulting Services

Poulos Technical Services, Inc.: September 1995

Bruce Bukiet

B. Continuing Funded Projects (Beginning before 1995)

1. Applied Mathematical Problems in Microwave Processing of Ceramic Materials

   Department of Energy: June 1994-May 1997

   Gregory A. Kriegsmann

2. The Modulation of Flames of Various Types in a Premixed Preactive Atmosphere

   National Science Foundation: July 1994-June 1997

   Michael Booty

3. Data Driven Modeling and Forecasting of Nonlinear Time Series Systems

   National Science Foundation: July 1994-January 1996

   Bonnie Ray

4. Mathematical Sciences Computing Research Environments

   National Science Foundation: August 1994-July 1995

   Jonathan Luke

   Michael Booty
Cheryl Hile

Michael Lacker

Andre Nachbin

5. *Dynamics of Multi-Fluid Flows and Interfaces*

National Science Foundation: June 1994–May 1996

Demetrios Papageorgiou

6. *Mathematical Sciences Computing Research Environments*

National Science Foundation: September 1993–February 1995

Daljit Ahluwalia

Rose Dios

Bonnie Ray

Sunil Dhar

Manish Bhattacharjee

7. *Mathematical Problems in Modern Electromagnetics*


Gregory A. Kriegsmann

Cheryl Hile

Jonathan Luke

8. *Asymptotic and Singular Methods for Bifurcation Problems with Applications*
National Science Foundation: June 1993–May 1996

Thomas Erneux

9. Microwave Processing of Ceramic Materials

National Science Foundation: July, 1993–January 1996

Gregory A. Kriegsmann
Barbara Wagner

C: Non–CAMS FUNDED PROJECTS WITH CAMS PARTICIPATION

1. Mathematical Aspects of Hypersonic Boundary Layers and Jets


Demetrios Papageorgiou

2. Incineration of Plastics and Cellulose in the Presence of Chlorine Species


Joseph Bozzelli Dept. of Chemistry & Chemical Eng
Lev Krasnoperov Dept. of Chemistry & Chemical Eng
Michael Booty Dept. of Mathematics

3. Plastics Combustion Data


Richard Magee HSMRC
4. Particulate Technology in Manufacturing Processes

National Science Foundation: June 1994-December 1996

Robert Pfeffer Dept. of Chemical Engineering
Rajesh Dave Dept. of Mechanical Engineering
Anthony Rosato Dept. of Mechanical Engineering
Ian Fischer Dept. of Mechanical Engineering
Jonathan Luke Dept. of Mathematics

5. The Use of Surfactants in the Remobilization of Bubbles in Thermocapillary Migration

National Aeronautics & Space Administration: August 1994-September 1996

Demetrios Papageorgiou Dept. of Mathematics
Charles Maldarelli City College, New York

6. Equity and Efficiency Issues

NCTIP: May 1995-August 1995

John Tavantzis Dept. of Mathematics
Lou Pignataro Dept. of Transportation

7. Representation and Analysis of Swept Volumes with
Tolerances

Office of Naval Research: September 1992–October 1995
Denis Blackmore Dept. of Mathematics
Ming Leu Dept. of Manufacturing
Frank Shih Computer & Information Services

8. Reduction of Age Associated Vascular Stiffness
Hans Chaudhry

Kessler Institute for Rehabilitation: March 1994–March 1996
Michael Lacker

10. In Situ Bioremediation of Organic Compounds: Coupling of Mass-Transfer and Biodegradation
Sub-Contract with Chemical Engineering: June 1995–May 1996
Gordon Lewandowski
Demetrios Papageorgiou
Madeleine Rosar

VII. Proposed Research

1. Development of Qualitative Theory of Multivalued Infinite Dimensional Systems with Applications to Control Problems
National Science Foundation/National Research Council

Roman Andrushkiw

2. The Investigation of Nonlinear Phenomena in Dissipative Systems and their Mathematical Modeling

National Science Foundation/National Research Council

Roman Andrushkiw

3. New Differential Methods for Automation and Computation

Geometry

Army Research Office

Denis Blackmore

4. Application of Web Geometry to Differential Equations and Physical Structures

National Research Council

Vladislav Goldberg

5. Four-dimensional Conformal Structures and Their Applications to General Relativity

National Science Foundation

Vladislav Goldberg

6. Scattering by Large and Complex Structures

Subcontract with the University of Arizona:
Air Force Office of Scientific Research (MURI)

Gregory A. Kriegsmann

Cheryl Hile

Jonathan Luke

7. Fluid Flow in Elastic Tubes

National Science Foundation

Madeleine Rosar

8. Asymptotic and Singular Perturbation Methods for Bifurcation Problems with Application

National Science Foundation

Thomas Erneux

9. Scattering by Large and Complex Structures

Subcontract with University of Delaware

Air Force Office of Scientific Research (MURI)

Gregory A. Kriegsmann

Cheryl Hile

Jonathan Luke

10. Microwave Processing of Ceramic Materials

National Science Foundation

Gregory A. Kriegsmann
11. Bayesian and Nonparametric Methods for Time Series Analysis with Environmental Applications

National Science Foundation
Bonnie Ray

12. Mathematical Studies of Wave Propagation

National Science Foundation
Cheryl Hile

13. Capstone Courses and Projects in Applied Mathematics and Statistics

National Science Foundation
Daljit S. Ahluwalia
Bonnie Ray
Bruce Bukiet

VIII. FACILITIES

A. CAMS/MATH COMPUTATION LABORATORY

Committee on Computation:
Michael Porter, Chairperson
Zoi Heleni Michalopoulou
Michael Siegel

Laboratory Assistant:
Evangelos Tsimis
The CAMS computer laboratory has steadily grown in the last year with the addition of two new Silicon Graphics workstations. Significant additions to our high-end computational server (an SGI R8000) include a new 4 gigabyte hard drive along with a writeable magneto-optical CDROM drive and main memory was expanded to 128 mbytes. Also 3 Silicon Graphics workstations were purchased for new faculty. These machines have been fully integrated into the network and are running all the software and compiler programs, either locally or by accessing the servers. A number of users have expressed interest in facilities for computer production of videos. Sophisticated software for such work (Wavefront/Composer) was also installed in the computer laboratory.

B. CAMS READING ROOM

Committee on Research Facilities:
Bonnie Ray

The CAMS Reading Room, located in Cullimore 607, continues to serve as a depository for research texts, journals, preprints and reprints of articles by CAMS members, software manuals, and finding information. Several new books and software manuals were added to the Reading Room collection during the year.

Throughout the fall and spring semesters, bimonthly CAMS teas were held in the reading room to provide CAMS members with a place to research ideas in an informal setting.


IX. PUBLICATIONS AND PRESENTATIONS

A. PUBLICATIONS

Roman Andrushkiw

John Bechtold

*Counterflow Diffusion Flames with Unsteady Strain Rates*, (with H.G. Im and C.K. Law), Combustion Science Technology

Vol. 106, pp 345-361, 1995


Manish Bhattacharjee

*On the Kolmogorov-Smirnov Type tests for NB(W) UE Alternatives Under Some Censoring Schemes*, (with P.C. Sen),


Denis Blackmore


*Integrable Discrete Dynamics and Fibonacci Sequences*, (with J. Kappraff) ZAMM, pp. 402-406, 1995


Stuart Booker

*Calculation of the Characteristic Impedance of TEM Horn Antennas*


Transient Antenna Design Parameters for Optimizing Radiated Pulse, High Power Microwaves (HPM), (with A.P. Lambert, and P.D. Smith), AGARD CP 564, NATO, pp 8.1-8.12, 1995


Michael Booty

Analysis and Optimization of Chlorocarbon Incineration Through the Use of a Detailed Reaction Mechanism, (with W. Ho, R.S. Magee, and J.W. Bozzelli), Industrial and Engineering
Chemistry Research, Vol. 34 (12), pp 4185-4192, 1995

**Simulation of a Three-stage Chlorocarbon Incinerator Through the Use of a Detailed Reaction Mechanism: Chlorine to Hydrogen Mole Ratios Below 0.15**, (with J.W. Bozzelli, W. Ho, and R.S. Magee), Environmental Science and Technology, Vol. 29 (12), pp 3059-3063, 1995

**Bruce Bukiet**

*Understanding Curved Detonation Waves, Proceeding of the 10th International Detonation Symposium, ONR-33395-12, pp 19-26, 1995*

**Thomas Erneux**


*Understanding Propagation Failure as a Slow Capture Near a Limit Point, (with V. Booth), SIAM Journal on Applied Mathematics, Vol. 55 No. 5, 1995*

**Vladislav Goldberg**

*Three Dimensional Submanifolds Carrying a Net of Asymptotic Lines, (with M.A. Akivis), Webs and Quasigroups, Tver State University, Tver, pp 20-31, 1995*

*Conformal and Grassmann Structures, (with M.A. Akivis), Abstracts of papers presented to the American Mathematical Society, (International Joint USA-Israel Mathematics Meeting, Vol. 16 No. 16 p 576*


*Differential Geometry of Curves and Surfaces (Review of Book) by A. Gray, CRC Press, Boca Raton etc. 1993, xviii+644 pp Mathematical Reviews, Vol. 95d, #53013, April 1995*
Reviews Vol. 95g, 95g:53002 July 1995

**Gregory A. Kriegsmann**

*Control Region Approximation of Scattering by Two Dimensional Periodic Structures*, (with B.J. McCartin), Journal of Electromagnetic Waves and Applications, Vol. 9, No. 5, 1995


**Zoi Heleni Michalopoulou**


**Petronije Milojevic**


**Demetrios Papageorgiou**


Michael Porter


Madeleine Rosar

Modelling of In-Situ Bioremediation: Coupling of Non-equilibrium Sorption and Growth Inhibition, (with G.A. Lewandowski, and D.K. Mandal), Annual Meeting of the American Institute of Chemical Engineers, 1995

Michael Siegel

A Well-posed Numerical Method to Track Isolated Conformal Map Singularities in Hele-Shaw Flow, (with G. Baker, and S. Tanveer), Journal of Computational Physics, Vol. 120, 348

A Study of Singularity Formation in the Kelvin-Helmholtz
Instability with Surface Tension, SIAM Journal on Applied Mathematics, Vol. 55, No. 1

Singularities and Interfacial Patterns in Hele-Shaw Flow
(with G. Baker, and S. Tanveer), Proceedings of the Fifth International Conference on Hyperbolic Problems, 1995

Burt Tilley


B. PRESENTATIONS

John Bechtold

October 1995: SIAM Annual Meeting, Charlotte, NC

Microwave-Induced Ignition of Ceramics

Manish Bhattacharjee

January 1995: Third Triennial Symposium on Probability and Statistics, Calcutta University, India

Tests for a Property of Aging Under Renewals: Rationality and General Asymptotics

January 1995: Indian Statistical Institute, New Delhi, India

Models of Aging Under Repair and Repair Efficiency

November 1995: Indian Statistical Institute, New Delhi, India
Sharp Bounds on Renewal Process Shock Models and Applications

November 1995: National Symposium on Science and Technology Interface with Productivity, Quality and Reliability, Calcutta, India

Some Emerging Trends in Modeling and Analysis of Repairable Systems, an Overview

June 1995: Bell Labs/AT&T, Somerset, NJ

Modeling Customer Outages and Impact of Some Protection Measures in a Public Electric Utility Distribution System

Denis Blackmore

July, 1995: ICIAM '95, Hamburg, Germany

Integrable Discrete Dynamics and Fibonacci Sequences


A New Algorithm for Computing Swept Volume

Stuart Booker

May, 1995: URSI International Symposium on Electromagnetic Theory, St. Petersburg, Russia

A Numerical Calculation of Transient Antenna Impedance Exploiting a Near-Field Integration Approach

May, 1995 URSI International Symposium on Electromagnetic Theory, St. Petersburg, Russia

A Calculation of Surface Impedance Effects on Transient Antenna Radiation
May, 1995 Seminar, Department of Mathematical Sciences, University of Delaware, Newark, DE

A Numerical Integral Equation Approach to Transient Antenna Impedance

July, 1995 PIERS '95 Progress in Electromagnetics Research Symposium, University of Washington, Seattle, WA

Time-Domain Integral Equation Approach to the Broadband Calibration of Dihedral Reflectors

November, 1995 IEEE New Mexico Chapter Seminar, Kirkland AFB, Albuquerque, NM

An Integral Equation Approach to Transient Antenna Design

November, 1995: Seminar, Department of Mathematics, University of New Mexico, Albuquerque, NM

An Integral Equation Approach to Transient Antenna Design

Michael Booty

March, 1995: Northwestern University, Department of Engineering Science & Applied Mathematics, Evanston, IL

Time-dependent Deflagrations

October, 1995: 27th SIAM National Meeting, Charlotte, NC

Time-dependent Deflagrations

October, 1995: 27th SIAM National Meeting, Charlotte, NC

Microwave-induced Ignition of Ceramics

October, 1995: Eastern States Section of the Combustion Institute, Fall Meeting, Worcester, Vermont

Pyrolysis & Oxidation of Cellulose and Styrene: An Experimental Study of Reaction Products
November, 1995: 48th Meeting of the Fluid Dynamics Section of the American Physical Society, Irving, CA

*Time-dependent Deflagrations*

**Sunil Dhar**

August, 1995: ASA 155th Annual Meeting, Orlando, Florida

*Randomized Response Model Using a Binary Sequence*

**Vladislav Goldberg**

May, 1995: 1st Joint Meeting of the American Mathematical Society and the Israel Mathematical Union

*Conformal and Grassmann Structures*

June, 1995: University of Bordeaux, Bordeaux, France

*Web Geometry: Its Past, Present and Future*

June, 1995: LEcole Polytechnique, Palaiseau, France

*Conformal and Almost Grassmann Structures*

June, 1995: University Paul Sabatier, Toulouse, France

*Grassmann and Algebraic Webs*

**Cheryl Hile**

October, 1995: AFOSR Nonlinear Optics Workshop, University of Arizona, Tuscon, AZ

*Comparisons of Maxwell's Equations with an Extended Nonlinear Schrodinger Equation*

**Gregory A. Kriegsmann**
January, 1995: Air Force School of Aerospace Medicine, Brooks AFB, San Antonio, TX

*Hybrid Methods in E&M Scattering and Propagation: Cavity Problems*

February, 1995: Department of Energy Workshop, Albuquerque, NM

*Mathematical Problems in Microwave Processing*

March, 1995: American Physical Society, San Jose, CA

*Microwave Heating of Ceramics: Bistability and Thermal Runaway*


*Microwave Processing of Materials*

May, 1995: American Ceramics Society, Cincinnati, OH

*Microwave Heating of Ceramics: Bistability and Thermal Runaway*


*Mathematical Problems in Microwave Problems in Microwave Processing*


*Mathematical Problems in Microwave Processing*

**Zoi Heleni Michalopoulou**

March, 1995: Graduate College of Marine Studies, University of Delaware
Localizing a Broadband Source in the Ocean

June, 1995: 129th Meeting of the Acoustical Society of America, Washington, DC

Fourier and Direct Time-Marching Methods for Transient Signals


MLTA Broadband Passive Shallow Water Localization

October, 1995: IEEE Workshop on Underwater Acoustics Signal Processing, University of Rhode Island

Focalization in the Gulf of Mexico

October, 1995 IEEE Workshop on Underwater Acoustics Signal Processing, University of Rhode Island

Matched Field Processing Applied to the Hudson Canyon Data

November, 1995: 130th Meeting of the Acoustical Society of America, St. Louis, MO

Source Localization in the Gulf of Mexico

Demetrios Papageorgiou

April, 1995: Symposium on Approximation Theory and Numerical Analysis, University of Cyprus, Nicosia, Cyprus


October, 1995: SIAM Annual Meeting, Charlotte, NC
November, 1995: Annual Meeting of the Institute of Chemical Engineers, Miami, FL

**Michael Porter**

June, 1995: 129th Meeting of the Acoustical Society of America, Washington, DC

*Fourier and Direct Time-Marching Methods for Transient Signals*


MLTA Broadband Passive Shallow Water Localization

August, 1995: International Conference on Theoretical and Computational Acoustics, Hawaii

*Using Replica Correlograms and Spectrograms for Shallow Water Inverse Problems*

October, 1995: Underwater Acoustics Signal Processing Workshop, University of Rhode Island

*Broadband Matched-field Processing Applied to the Hudson Canyon Data*

October, 1995: Underwater Acoustics Signal Processing Workshop, University of Rhode Island

*Focalization in the Gulf of Mexico Experiment*

November, 1995: 130th Meeting of the Acoustical Society of America, St. Louis, MO

*Source Localization in the Gulf of Mexico*

**Madeleine Rosar**

December, 1995: Boundary Method Seminar Series, Courant Institute of
Mathematical Sciences, New York University, NY

The Immersed Boundary Method and Flow in Collapsible Tubes

Michael Siegel

January, 1995: Seminar, Department of Mathematics, University of Manchester, Manchester, England

The Effects of Complex Singularities on a Evolving Hele-Shaw Interface

February, 1995: Seminar, Department of Mathematics, Illinois Institute of Technology, Chicago, IL

The Effects of Complex Singularities on an Evolving Hele-Shaw Interface

May, 1995: Minisymposium on Complex Singularities, Society for Industrial & Applied Mathematics Dynamical Systems Meeting, Snowbird, UT

The Effects of Complex Singularities on an Evolving Hele-Shaw Interface

July, 1995: Fourth Workshop on Partial Differential Equations, Instituto de Matematica Pura e Aplicada, Rio de Janeiro, Brazil

The Effects of Small Surface Tension in Time Evolving Hele-Shaw Flow

November, 1995: American Physical Society, Division of Fluid Dynamics, Irving, CA

The Effects of Small Surface Tension on a Smoothly Evolving Hele-Shaw Interface

X. EXTERNAL ACTIVITIES

Bruce Bukiet
Associate Editor, SIAM Journal on Scientific & Statistical Computing

Vladislav Goldberg


Biography and List of publications: 1995 Journal Webs and Quasigroups in recognition of Dr. Goldberg's 60th birthday and 35 years of scientific activity.

Editor, Journal Webs and Quasigroups, Tver State University, Tver, Russia

Visiting Member: Mathematisches Forchungsinstitut Oberwolfach (MFO), Germany

Gregory A. Kriegsmann

Harlan J. Perlis Award, NJ Institute of Technology

Editorial Board, SIAM Journal on Applied Mathematics

Editorial Board, Journal of Engineering Mathematics

Michael Lacker

Editorial Board, Journal of Theoretical Biology

Petronije Milojevic

Editorial Board, Communications on Applied Nonlinear Analysis

Demetrios Papageorgiou


Michael Porter
Associate Editor, Journal of the Acoustical Society of America (Underwater Sound)

Madeleine Rosar

Sandra Bleistein Award, Courant Institute of Mathematical Sciences, NYU