Quaternion

Department of Mathematics Newsletter

Chairman's Comments

Of significance to the nation is the recently released report, entitled *Everybody Counts*, by the National Research Council on the future of mathematics education. The report is an informative analysis of the state of U.S. mathematics education and a bold challenge for educators, parents, students, legislators, community organizations, and others - virtually every segment of our society - to follow a bold agenda for change during the next two decades in mathematics education.

The need for change is evident. Numerous recent news reports have shown that U.S. students are falling behind their peers in other countries and the effectiveness of U.S. mathematical education is being questioned. National statistics show that there have been sharp declines in the number of students pursuing mathematics as a major and in the number of U.S. students receiving Ph.D.'s in mathematics. During a recent address in Phoenix, Arizona, the Director of the National Security Agency, Vice Admiral William O. Studeman, pointed out the irony of the fact "that the United States attracts the brightest minds from around the world to study mathematics at our universities, and yet we fail so miserably in providing a basic mathematics education to our own high school students." He went on to state his

resulting concern not only for national security but also for the future of American technological research and applications.

Everybody Counts opens with the following observations.

"Mathematics is the key to opportunity. No longer just the language of science, mathematics now contributes in direct and fundamental ways to business, finance, health, and defense. For students, it opens doors to careers. For citizens, it enables informed decision. For nations, it provides knowlege to compete in a technological economy. To participate fully in the world of the future, America must tap the power of mathematics.

"...Wake up, America! Your children are at risk. Three out of every four Americans stop studying mathematics before completing career or job prerequisites. Most students leave school without sufficient preparation in mathematics to cope either with on-the-job demands for problem-solving or with college requirements for mathematical literacy. Thus, industry, universities, and the armed forces are burdened by extensive and costly demands for remedial education. The report goes on to give a specific agenda for curing U.S. ills in mathematics

Special Year In Approximation Theory

The National Science Foundation has awarded $25,250 for a "Special Year in Approximaton Theory" to be hosted by the Department of Mathematics at USF. The principal investigators of the grant are E. B. Saff and M. Ismail. The theme will be highlighted by collaborative research among USF faculty and distinguished visitors from a variety of universities in the U.S. and abroad. The first half of the year will focus more on the theoretical aspects of certain problems dealing with nonlinear approximants (rational approximations, splines, fractal approximations), orthogonal expansions, and special functions. The second half of the year will emphasize applications (numerical (methods, image processing, computer-aided geometric design). As a unique feature of this year, USF will host the first joint U.S.-Soviet Conference in Approximation Theory. Historically the subject of Approximation Theory has many roots in the works of Russian mathematicians and today the Soviets have a very active and distinguished group in this field.

Center For Mathematical Services

Again this summer, the Center for Mathematical Services will sponsor five summer programs for gifted

secondary students on the Tampa and St. Petersubrg campuses. Last summer, one hundred thirteen students attended in Hillsborough County and sixty-six in Pinellas. They were joined by nine others from Pasco and Polk counties. This summer, a school bus will be provided to transport students from Pasco County to the Tampa campus. This will encourage more students to attend from Pasco.

The Lecture Program has gone very well this year. The program, sponsored by CMS and the Center for Excellence in Mathematics, Computers, Science and Technology, is designed to send teams of faculty members and representatives of local businesses into the schools to talk to students about the applications of Mathematics and the importance of studying it. So far this year, 28 schools have been visited in 9 counties, representing an increase of 50% over last year's totals. One hundred twenty six lectures have been presented to 4,158 students. If you are interested in participating in the program, either as a lecturer or by having a lecture given to your students, please contact Dr. Nagle at the Center.

Training Programs in Applied Mathematics are currently available through the offices of the Center. CMS arranges part-time employment with local businesses for undergraduate and graduate students at USF. These students receive invaluable experience that will help them secure more attractive full-time employment when they enter the job market. Sometimes these training programs lead to full-time employment with the same company. At the present time, Ms. Caroline Grybash, a senior majoring in Engineering Technology, is working for the Entrepreneurial Division of GTE

Data Services. She is involved in updating existing software for their clients. If you are in a company that is interested in employing a student part-time in a mathematics or computer related job, please contact Dr. Nagle at the Center.

Student News

The USF Student Chapter of the Mathematical Association of America affiliated with the National MAA in January when 15 students became charter members of the group. The sole criterion for membership in this organization is interest in mathematics. Presentations in the Spring Semester included Todd Piersall's discussion of his Mathematics Honors Project, "An Elementary Introduction to the P-Adic Numbers" and doctoral student Richard Ruedemann's talk on "The Prime Number Theorem." Officers for next year are President AnhVu Nguyen, Vice President Tina Tremmel, Sec'y-Tres. Michael Nadler, Natural Science Council Representative Misty Campbell.

The Florida Epsilon Chapter of Pi Mu Epsilon Fraternity inducted 12 new members at its annual Induction Banquet. Professor Arthur David Snider of the Electrical Engineering Department spoke on "What is Engineering Mathematics?" The Outstanding Scholar For 1989, Todd D. Piersall, was recognized at this banquet. Officers for next year are President Todd Piersall, Vice President William Wilder, Student Correspondent Robert Simonelli, Honors Council Representative Todd Piersall.

Department News

Dr. R. Darling gave an invited talk entitled "Products of Infinite Dimensional Random Matrices" at the University of Florida seminar on February 21, 1989. On January 8-10, Dr. Darling attended a conference in Los Angeles in honor of the 70th birthday of T. E. Harris, and on March 30 he attended the seminar on Stochastic Processes at the Univeristy of California, San Diego.

Dr. M. Ismail presented a paper at the American Mathematical Society annual meeting on January 10, 1989 at Phoenix. He was also invited to speak at colloquia at Arizona State University in September, at West Virgina University in November, and at Florida Atlantic University and Carleton University at Ottawa in March. Dr. Ismail was successrful in obtaining a three year NSF grant from the Classical Analysis program, joint with Dr. E. Saff. In addition, he obtained grants from the following: NATO Advanced Study Institute to organize an ASI on orthogonal polynomials, joint with P. Nevai and D. Stanton, an NSF conference grant as a supplement to the ASI on orthogonal polynomials, and a grant for collaborative research with J. Charris from the International Division of NSF for travel to Bogota, Columbia.

Dr. A. Mukherjea gave invited talks at the American Mathematical Society annual meeting on January 10, 1989 at Phoenix. The talks were at its short course on Matrix Theory. Dr. Mukherjea also was invited to speak at the Oberwolfach Conference on Analytical and Topological Semigroups in West Germany on February 3 and at the Indian Statistical Institute in India on February 13. On April 18, he gave an invited talk at the Mathematics Colloquium at the University of Florida.

Dr. J. Pedersen presented a paper entitled "Growth Series of Monoids and Free Algebras" at the Twentieth Southeastern International Conference on Combinatorics held at Boca Raton on March 20-24, 1989, and also presented a paper entitled "Morphocompletion for One-Relation Monoids" at the Third International Conference on Rewriting Techniques and Applications held at the University of North Carolina, April 3-5.

Dr. K. Ramachandran presented a paper entitled "Nearly Optimal Control of Queues in Heavy Traffic with Heterogeneous Servers" at the American Mathematical Society annual meeting at Phoenix in January, 1989.

Dr. C. Williams along with colleagues at the National Institute of Standards and Technology, recently completed for the U. S. Naval Observatory software for the computation of the position of the moon according to four of the lunar theories developed in the 20th century that have been used by the Nautical Almanac Office of the Naval Observatory. Dr. Williams also was recently awarded the Outstanding Faculty Research Award by the USF chapter of the Society of Sigma Xi, a professional scientific society that promotes scientific research.

Dr. F. Zerla was selected as a 1988 Outstanding Undergraduate Teacher at the University of South Florida Honors Convocation in October. On April 12, 1989, he was presented the "Student Affairs Outstanding Faculty Advisor Award" at the President's Honors Banquet. Last November, Dr. Zerla gave the induction talk for Mu Alpha Theta at Charlotte High School. Dr. Zerla continues to be active in campus and statewide organizations. This year he was secretary for the USF Faculty Senate, and for the Suncoast Region, Florida Section of the Mathematical Association of America, he was Corresponding Secretary, Coordinator of Student Chapters, and chaired the Nominating Committee.

Chairman's comments cont..

education during the next decades. There are agenda items for many segments of society from students and parents to business and industry and to Congress and the President. The report is a public preface to the efforts toward revitalizing America mathematics education. For reasons of continued U.S. international competitiveness and scientific leadership, the report should be taken seriously and its prescribed agenda discussed and pursued where appropriate. The report is available from National Academy Press, 2101 Constitution Avenue, Washington, DC 20418 for $7.95 a copy. The telephone number is (202) 334-3313.

MAA News

The Florida Section of the Mathematical Association of America held its annual meeting in Gainesville on March 3 & 4, 1989. Featured at this meeting were Alan Tucker, Vice President of the MAA, who spoke on the "Mathematics of Fair Representation;" Benno Artmann of the Technical University of Darmstadt, Germany, "Who Wrote Euclid's *Elements* ?"; and Michael Barnsley of Georgia Tech, "The Mathematics and Graphics of Fractals."

USF involvement in this meeting included Kenneth Pothoven's participation in the meeting of the Chairs of the Mathematics Departments of Universities and Colleges.

Fredric Zerla organized and presided at the "Undergraduate Paper Session." As Past-President, Professor Zerla served as Chair of the Nominating Committee. Professor Zerla continues to be the State Coordinator of Student Chapters for the Florida Section. Because the regional meetings lack continuity, a continuing officer is being selected for each region. Professor Zerla was selected as this officer for our Suncoast Region.

Zachariah Sinkala, a doctoral student at USF, presented a paper on "The Existence of Solutions to Boundary Value Problems for Non-Linear Ordinary Differential Equations at Resonance."

Don and Betty Lichtenberg of Mathematics Education joined a panel discussion on the Sixth International Congress on Mathematical Education.

Student Degrees

B.A. in Mathematics, December 1988: Leonard Emmick, Peter Foley, Cynthia McDonnell, Larry Short, Perry Vincent.
M.A. in Mathematics, December 1988: Mohamed Hassani, Roger Pupp, Jung-Fung Sun, Gongyuan Yao.
Ph.D. in Mathematics, April 1989: Chi-Chang Lo (Dissertation Title: *Weak Convergence in d by d Bistochastic Matrices and Other Semigroups;* Advisor Arunava Mukherjea).
Graduate Council Fellowships Awarded for 1989-1990: Richard Moscatello, James Bishop.

Alumni News

Ed Burck (B.A., 1980; M.A., 1982) Earned an M.S. (Computer Sciences) from John Hopkins University in 1985. He is now a member of the technical staff at the Space Applications Corp. VA. He is working on large space system simulation program from VAX to SUN workstation.

William A. Fink (B.A., 1973; M.A., 1977). After graduation he went to the University of Illinois for ayear of computer science courses. He worked for Fidelity Electronics specializing in chess programs including the voice chess challenger. He is currently working at Scientific System Services, Melbourne, Florida, where he is designing expert, network diagnostics for GE's medical imaging equipment. He is leading a busy life with his wife and two children and misses the days of pure mathematics.

Jack Maxwell (B.A., 1966; M.A., 1967). He went on to earn his Ph.D. in Mathematics at the University of Florida in 1970. He is currently Director of Division of Business and Information Technology at the Indian River Community College.

Barbara L. Vogler (M.A., 1981). Barbara and her husband, Dave, are still living in Tampa. She is progressed from a Programmer to Supervisor to Engineer for the GTE Data Services during the last five years.

Colloquium Speakers
1988-1989

Dr. R. S. Varga, Kent State University; Dr. David Styer, University of Cincinnati; Dr. John Cohn, University of Melbourne; Dr. Olav Kallenberg, Auburn University; Dr. W. J. Padgett, University of South Carolina; Dr. John R. Haddock, Memphis State University; Dr. Jacques Lewin, Syracuse University; Dr. Antonio Elipe, National Institute of Standards and Technology; Dr. Gary L. Mullen, Pennsylvania State University; Dr. John Chadam, McMasters University; Dr. George A. Baker, University of California - Los Alamos State Laboratory; Dr. H. N. Mhaskar, California State University at Los Angeles; Dr. Dallas Lankford, Louisiana Tech University; Dr. Harley Flanders, University of Michigan; Dr. H. L. Manocha, Auburn University; Dr. David R. Masson, University of Toronto; Dr. John McKay, Concordia University, Vermont; Dr. M. Zuhair Nashed, University of Delaware; and Dr. Richard Askey, University of Wisconsin - Madison.

Summer Course Offerings at USF Summer Session B: June 26 - August 11, 1989:
The USF Department of Mathematics will offer the following courses during the summer of 1989 that may be of special interest to high school mathematics teachers:

MAA 4211 Advanced Calculus I MTWR 10:00 - 11:50 a.m.
MAD 3100 Discrete Mathematics MWF 12:00 - 01:50 p.m.
MAE 5875 Abstract Algebra for Teachers MW 06:00 - 08:50 p.m.
MAD 5305 Intro. Graph Theory MWF 10:00 - 11:50 a.m.
MHF 5306 Elem. Math Logic MWF 04:00 - 05:50 p.m.
MHF 5404 History of Math TR 06:00 - 08:50 p.m.

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