Report from the Chair

by Krishnaswami Alladi

THE academic year 2004–05 was an outstanding success highlighted by the *Special Year in Number Theory and Combinatorics.* This Special Year had the maximum number of featured talks of wide appeal by eminent mathematicians because both number theory and combinatorics have a long history and also one can describe various important problems in the two areas without requiring too much of a background. The main events of the Special Year 2004–05 were four conferences, two in combinatorics and two in number theory spread evenly over the Fall 2004 and Spring 2005 semesters. The activities of the Special Year received external support from the National Science Foundation (NSF), the National Security Agency (NSA), and the Number Theory Foundation (NTF), and base internal support from the College of Liberal Arts and Sciences (CLAS) and the Office of Research and Graduate Programs (RGP) of the University of Florida. The main organizers of the *Special Year in Number Theory and Combinatorics* were . . .
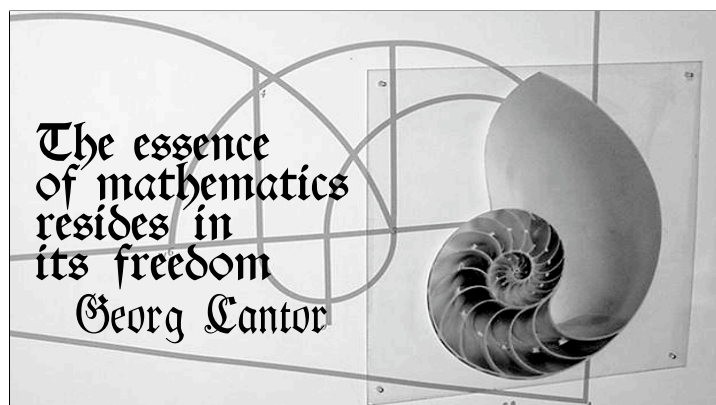
Special Year in Number Theory and Combinatorics

by Miklos Bona

THE Combinatorics and Number Theory Special Year got off to a stormy start. The *Fifth International Workshop on Automated Deduction in Geometry,* organized by **Neil White,** took place between September 16 and 18, between hurricanes Frances and Jean, while hurricane Ivan was attacking the Florida panhandle. It is quite remarkable that with all these threats, all but one participant showed up. The two invited speakers were Ileana Streinu, from Smith College, and New Jersey Board of Regents Professor Doron Zeilberger, from Rutgers University. Several speakers stayed in Gainesville for a few extra days, and gave talks at our seminars. The longest such stay was that of Dong-Ming Wang, from Paris and Beihang University in China, who gave a colloquium on *Automated Geometric Reasoning*. The main social event of the conference was a barbecue hosted by Neil and Mary White. The workshop is organized every two years, and the Gainesville workshop followed . . .

The essence
of mathematics
resides in
its freedom
Georg Cantor

In this issue:

Report from the Chair

by Krishnaswami Alladi

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. . . Professors Frank Garvan, Miklos Bona, Richard Crew and Neil White, with the assistance of Professors Alexander Berkovich, Norm Levin, and Kevin Keating.

The year's activities opened with a *Workshop on Automated Deduction in Geometry*, September 16–18, 2004, organized by Professor White in collaboration with Professor Mira Sitaram (Computer Science) and Hoon Hong (North Carolina State University). Professor Donming Wang (Beihang University, China and CNRS, Paris) gave a featured History Lecture during the conference. This was followed by an *International Conference on Additive Number Theory*, November 17–20, 2004, organized by Professors Garvan, Berkovich and me. For the first time, this conference brought together researchers in three areas of additive number theory, namely, the theory of partitions and q–series, Goldbach and Waring type problems, and bases and their asymptotics. The conference was inaugurated by associate Dean Jack Sabin of CLAS. The work of the Indian genius Śrinivasa Ramanujan dominated the discussions and so it was fitting that the conference featured a History Lecture by Ramanujan biographer Professor Bruce Berndt (University of Illinois, Urbana) on the topic *Ramanujan: his life, friends, notebooks, and identities for the Rogers–Ramanujan functions*.

Professor Richard Stanley of MIT, arguably the most eminent combinatorialist in the world, gave the *Seventh Ulam Colloquium* on October 11, 2004, on the topic *A survey of lattice points in polytopes* for which Dean Neil Sullivan of CLAS made the opening remarks. Fall 2004 had two other featured talks—a History Lecture by Professor Gyula Katona (Alfred Renyi Institute, Budapest) on *History of the extremal problems for set systems*, and another History Lecture by Professor David Bressoud (Macalester College) on *The alternating sign matrix conjecture*.

There were conferences of the Special Year in Spring 2005. The first was on *Arithmetic Algebraic Geometry* organized by Professors Crew, Keating, and Levin during February 28 to March 4, 2005. Dean Neil Sullivan inaugurated this conference. This was followed by an *International Conference on Pattern Avoiding Permutations*, March 7–11, 2005, organized by Professor Bona. This well known conference held at different locations each year, was brought to our department now because of our *Special Year in Number Theory and Combinatorics*. Regents Professor Doron Zeilberger of Rutgers University gave a History Lecture during the conference on the revolutionary *W-Z method*. Here W stands for Herb Wilf and Z for Zeilberger. It was fitting that Professor Wilf, who won the AMS Steele Prize with Zeilberger for this contribution, gave the opening remarks for this lecture.

One of the highlights of the Special Year 2004–05 was the two month visit of Evan Pugh Professor George Andrews of Pennsylvania State University, who gave a series of six lectures on *Ramanujan's Lost Notebook* during January–March, 2005 in the joint Combinatorics / Number Theory Seminar. In addition, Professor Andrews gave two general lectures on the joy of collaboration in interdisciplinary research, and on mathematics education. These general lectures were organized by the CLAS Dean's Math-Sci Committee.

Another distinguished speaker in the joint Combinatorics / Number Theory Seminar in Spring 2005 was Hershel Farkas of the Hebrew University, Jerusalem, who gave two talks on *The theta function in number theory and combinatorics*.

In collaboration with the France–Florida Research Institute (FFRI), the department arranged the visit of Professor Michel Waldschmidt (Paris), who recently finished his term as President of the French Mathematical Society. Professor Waldschmidt gave a History Lecture on the topic *Elliptic functions and transcendence*.

The week of March 7–11, 2005, was bursting with activity at the highest level. Fields Medallist Richard Borcherds of U.C. Berkeley gave the *Seventh Erdös Colloquium* on the topic *Feynman path integrals and the Bernstein polynomial*. It was fitting that Dean Sullivan, who is a physicist, gave the opening remarks for this lecture. On March 10, 2005, Professor Carl Pomerance of Dartmouth University, a world authority in the areas of primality testing, factoring large numbers, and cryptography, gave the *Second Center for Applied Mathematics* (CAM) *Colloquium* on the topic *A primal screen*. Vice-President of Research Dr Win Phillips gave the Opening Remarks for this lecture.

The activities of the *Special Year 2004–05* concluded with the visit of National Academy of Sciences Mem-

ber Professor Richard Askey of the University of Wisconsin who gave three lectures during March 21–22, 2005—a featured talk entitled *Some history of orthogonal polynomials,* a lecture on mathematics education, and a talk for Pi Mu Epsilon, our undergraduate mathematics club.

Not all major activities of 2004–05 were part of the *Special Year in Number Theory and Combinatorics.* A major event outside of the Special Year program was the *Eleventh Southeastern Logic Symposium,* organized by Professor Jindrich Zapletal. This well established conference series has now found a base in Gainesville thanks to the laudable efforts of Professor Zapletal and his contract with the National Science Foundation.

Our department has always maintained a healthy balance between research and teaching. Each year for the past several years, our department has been recognized with a CLAS Teaching Award and this year was no exception. Two time TIP award winner Professor Theral Moore was given the CLAS Teaching Award in Spring 2005.

In April 2005, at a College of Liberal Arts and Sciences ceremony, Computer Assistant Mr Brian Roberts and Administrative Assistant Ms Sharon Easter were recognized for completing ten and twenty years of service, respectively. In order for a large department like ours to function smoothly, we need to have a dedicated and competent staff, which we fortunately do. We are very thankful to Sharon, Brian, and other staff for their enthusiastic, efficient, and dedicated service.

As in previous years, the department was successful in its hiring efforts this year also. Hua Wang who is receiving his PhD from the University of South Carolina will be appointed a John G. Thompson Research Assistant Professor in Fall 2005. Also, Dr Michael Jury, an expert in functional analysis, will join the department in Fall 2005 as a tenure-track assistant professor. Dr Sergei Shabanov who has been an adjunct professor in our department for the past several years, and a visiting assistant professor during 2004–05, will also join the department as a tenure-track assistant professor in Fall 2005. In addition, the department will appoint Drs Larissa Williamson and Jason Kozinski as lecturers starting in Fall 2005.

Two of our colleagues, Professor Gerard Emch and Senior Lecturer Marvel Townsend retired at the end of the academic year 2004–05. Both of them have been awarded Emeritus status. We thank them for their

dedicated service and look forward to continued association in the years to come. As part of the *Annual Appreciation Day,* April 21, 2005, we had a ceremony in honor of Professor Emch and Ms Townsend. Professor Charles Radin of the University of Texas, Austin, a former student of Professor Emch, spoke about his contributions. Our colleague Professor Bruce Edwards spoke about the contributions of Ms Townsend.

On April 30, 2005, during the CLAS Commencement, Graduate Research Professor John Thompson was honored with the title of CLAS Distinguished Scholar. This was in recognition of his many significant contributions to mathematics in general and in appreciation of his role in enhancing the reputation of the mathematics department. On March 7, 2005, a reception jointly hosted by the Mathematics Department and the College of Liberal Arts and Sciences was held at the Keene Faculty Center in honor of Professors John Thompson and George Andrews. At this reception, Thompson was honored for the CLAS Distinguished Scholar title, and Andrews was thanked for his role in enhancing research in the UF mathematics department through collaborations and lectures. UF President Bernie Machen graced the occasion. The reception was held at this time in March to coincide with the peak period of distinguished visitors in the department.

Thus 2004–05 ended on a high note and 2005–06 which promises to be just as exciting, will be highlighted by the *Special Year in Probability and Analysis.* I look forward to working with our faculty, students, and the staff as well as with the university administration to continue raising the level of accomplishment of the mathematics department.

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Special Year in Number Theory and Combinatorics

by Miklos Bona

Continued from page 1.

. . . previous meetings in Toulouse, Beijing, Zurich, and Linz, and will be followed by a workshop in Spain in 2006.

The next major event for combinatorialists was the *Ulam Colloquium,* on October 11, given by Norman Levinson Professor of Applied Mathematics Richard

Stanley of MIT. Professor Stanley has many ties to our Department. He interviewed here (and received an offer) for a tenure-track position in his youth, was the graduate-school friend of Neil White, and the PhD advisor of Miklos Bona. The title of Richard Stanley's talk was *A Survey of Lattice Points in Polytopes*, and he gave a very enjoyable presentation starting with widely accessible examples and reaching cutting-edge research at the end. Professor Stanley's two-day visit concluded by a talk at the Combinatorics Seminar.

In early November, Gyula O.H. Katona, director of the Alfréd Rényi Institute of Mathematics of the Hungarian Academy of Sciences visited our Department for two days. He gave a history lecture on *Extremal set systems* on November 1, and a more specialized talk at the Combinatorics Seminar on the following day.

The next major event was a very well-attended *Conference on Additive Number Theory,* November 17-20, 2004, organized by **Krishnaswami Alladi, Alexander Berkovich** and **Frank Garvan.** The conference had more than 50 presentations, which were sometimes given in parallel sessions.

Plenary speakers were George Andrews, Pennsylvania State University; Jean-Marc Deshouillers, University of Bordeaux II; Basil Gordon, UCLA; James Lepowsky, Rutgers University; Melvyn Nathanson, Lehman College (CUNY); and Ken Ono, University of Wisconsin. The main social events were a party hosted by Mathura and Krishna Alladi, and a banquet at the Sovereign restaurant. In addition to participating in the conference, Evan Pugh Professor of Mathematics Andrews gave a program of eight lectures in the Number Theory / Combinatorics Seminar and also gave several lecturers for a more general audience at the Keene Faculty Center as part of a lecture series sponsored by the new interdisciplinary Mathematical Sciences Committee. On February 14, Andrews gave a particularly interesting presentation on *The joy of collaboration—why pure mathematical scientists should not mind their own business.* Also, Andrews gave an after dinner presentation in March at the Indian Educational and Cultural Center in which he told more about his early days in graduate school and how he came to discover the lost notebooks of Ramanujan while attending a conference in Cambridge University and browsing in the Wren Library. At the *Conference on Additive Number Theory,* UF faculty members Professor **Alex Berkovich** and the most recently appointed Thompson Assistant Professor **Hemza Yesilyurt** spoke at this meeting, both reporting on joint

research with fellow faculty member **Frank Garvan**. Berkovich spoke on *Infinite products with nonnegative coefficients* and Yesilyurt spoke on *Shifted and shiftless partition identities.*

The week following the number theory conference was marked by the visit of Robin Thomas of Georgia Tech, hosted by **Andrew Vince.** Professor Thomas gave a very accessible history lecture on the *Four-color theorem and related areas,* and a seminar talk the following day. Suzanne and Andrew Vince hosted a party in his honor.

As always, January and most of February was reserved for the talks and visits of candidates for tenure track positions. The special year then continued during Spring Break, with a *Conference on Arithmetic Geometry,* organized by **Richard Crew, Kevin Keating** and **Norman Levin.** The conference was opened by Neil Sullivan, and featured 15 one-hour talks. In particular, Crew spoke on *Arithmetic D–modules on the unit disk* and Levin spoke on *On the topological Hochschild cohomology of exact categories.* The main social event was an excursion to Ichetucknee Springs and organizer Crew was happy that nobody fell into the cool springs on this outing.

The week following the Spring Break, March 7–11, was perhaps the busiest week of the year. On one hand, we hosted the *Third International Conference on Pattern Avoiding Permutations.* The organizer was **Miklos Bona**. In the last two years, the conference took place in Dunedin, New Zealand, and Nanaimo, BC, Canada. This year, the conference enjoyed record participation (23 talks). Three talks were given by UF graduate students, **Rebecca Smith, Dan Warren** and **Micah Coleman.** We held a problem session, and an extra talk given by Michael Albert on a recent spectacular result he proved, along with four co-authors. The keynote speaker was Doron Zeilberger. Participants were invited to attend a noon CLAS and Mathematics Department Reception in honor of John Thompson and George Andrews at the Keene Faculty center (and most of them found the way there). The department was specially fortunate in having not only Dean Neil Sullivan of CLAS making remarks as part of the program, but also new University of Florida President Bernie Machen attended and made a brief presentation. During the *Conference on Pattern Avoiding Permutations,* it was decided that the next two conferences will take place in Reykjavik, Iceland, and in Saint-Andrews, Scotland. The best papers of this year's conference will be published in a special issue

of *Advances in Applied Mathematics.*

On the other hand, the same week featured three distinguished lectures that were not associated with the conference. On March 7, Fields Medalist Richard Borcherds (U.C. Berkeley) delivered this year's *Erdös Colloquium,* entitled *Feynman integrals and the Bernstein polynomial.* Two days later, Doron Zeilberger gave a history lecture on the *WZ*–method. Finally, on March 10, Carl Pomerance (Dartmouth) gave a talk on primality testing with the catchy title *A new primal screen,* rather than "scream". As this was the *Second Center for Applied Mathematics Colloquium,* an application was given to public key encryption and the world wide web.

The special year concluded by the visit of Richard Askey (Wisconsin), who gave not only a colloquium talk tracing the history of orthogonal polynomials from Legendre and Laplace, but also a talk at the Undergraduate Math Club.

While the events of the Special Year are now over, the activities are not. Krishna Alladi is working to put together a special volume containing the featured talks presented in our department during these very enjoyable and eventful nine months.   ✺

Pictures from the Special Year in Number Theory and Combinatorics

Participants of the *International Conference on Automated Deduction in Geometry* in the Math Dept Atrium on September 16, 2004. Seated in the front right is Professor Donming Wang who gave a featured History Lecture on *Automated Geometric Reasoning.* Seated behind with his UF Gator cap is Neil White, conference organizer.
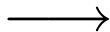
Professor Richard Stanley (MIT), one of the most eminent combinatorialists in the world, with Chair Krishna Alladi and faculty in our combinatorics group: David Drake, Neil White, Miklos Bona, and Andrew Vince.

Pictures from the Special Year in Number Theory and Combinatorics

Professor Richard Stanley delivering the *Seventh Ulam Colloquium* on *A survey of lattice points for polytopes* on October 11, 2004. Professor Neil White, a graduate school classmate, is in the front row taking notes.

Professor David Bressoud (Macalester College) delivering a History Lecture on the *Alternating Sign Matrix Conjecture* on October 29, 2004.
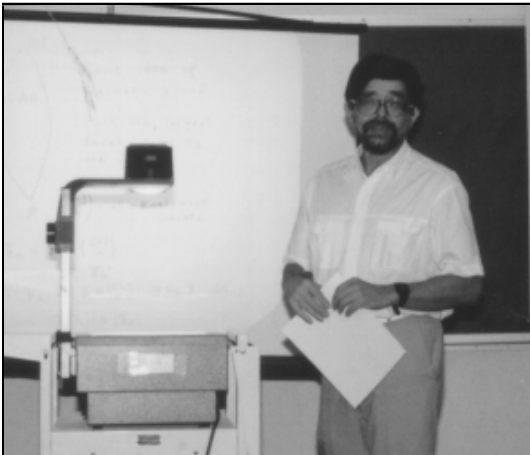

Professor Gyula Katonia (Hungarian Academy of Sciences) delivering a History Lecture on *Extremal Problems for Set Systems* on November 1, 2004.

Evan Pugh Professor George Andrews (foreground) introducing Professor Bruce Berndt (in the background) of the University of Illinois who gave a History Lecture on *Ramanujan, his Life, and Friends* on November 18, 2004.

Participants of the *International Conference on Additive Number Theory,* November 17, 2004. Seated in the front row is Dean Jack Sabin of CLAS who inaugurated the conference.
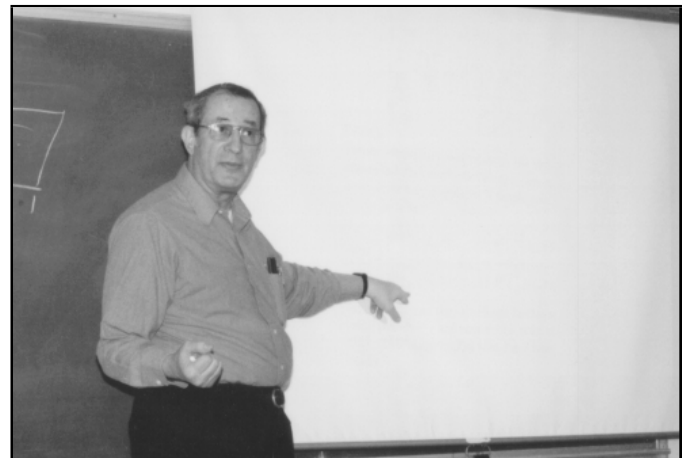
Professor Hershel Farkas (Hebrew University, Jerusalem) delivering the first of his two lectures on *The theta function in complex analysis and number theory* on January 25, 2005.

# Pictures from the Special Year in Number Theory and Combinatorics

Professor Michel Waldschmidt (Univ. Paris VI) delivering a History Lecture on *Elliptic functions and transcendence* on February 21, 2005. The lecture was co-sponsored by the France–Florida Research Institute.

Participants of the *Conference on Arithmetic Algebraic Geometry* held during February 28–March 4, 2005. Organizers Professors Kevin Keating, Richard Crew, and Norm Levin are seated in the first, second and third rows respectively.
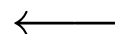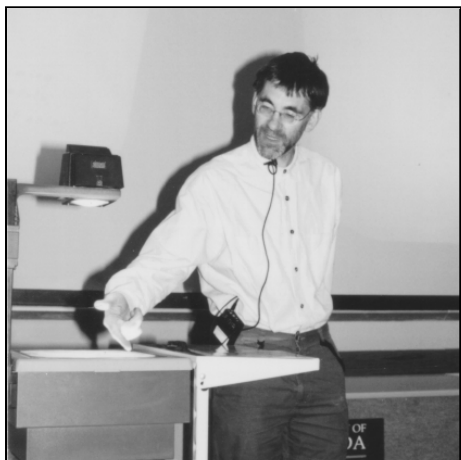
← Fields Medallist Richard Borcherds (U.C. Berkeley) delivered the *Seventh Erdös Colloquium* on March 7, 2005 on the topic *Feynman path integrals and the Bernstein polynomial.*
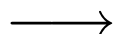
Distinguished Professor Doron Zeilberger (Rutgers) gave a History Lecture on the *W–Z algorithm* on March 8, 2005, introduced by the "W", Professor Herbert Wilf (U. of Pennsylvania). →
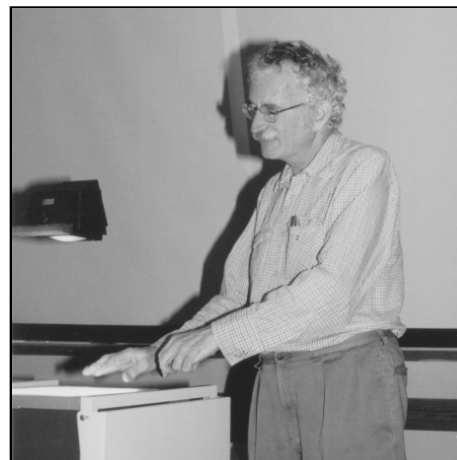
Distinguished Professor Carl Pomerance (Dartmouth) gave the *Second CAM Colloquium* on *The primal screen* on March 10, 2005.

Vice-President of Research, Dr Win Phillips, made the opening remarks for this 2nd *Center for Applied Mathematics Colloquium.*

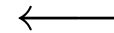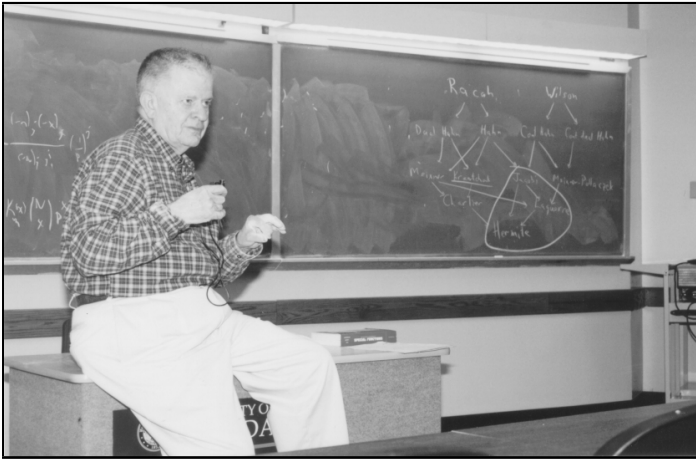## Pictures from the Special Year in Number Theory and Combinatorics

Professor Richard Askey (Wisconsin) delivered a History Lecture on *Orthogonal Polynomials* on March 21, 2005, as the formal events of the Special Year drew to a close.

Newsflash

Changes in the Mathematics Major

by Larry Wilson

FOLLOWING last year's changes to the calculus sequence, this year the department has made a change in the requirements for our undergraduate majors. Undergraduate Coordinator Professor **David Groisser** detailed these developments during an April faculty meeting. The most significant change is the end of the "package" system for advanced courses. Previously, a major took certain core courses and then four electives, two of which had to be from one of five packages (pure mathematics, applied mathematics, physics, computer science, and statistics and probability). Each package listed several courses from which the student could choose. Now, the students must just choose four courses from a list of approved electives. This change is viewed as a shift from forcing students to meet a package requirement to advising them on intelligent choices of electives.

The other most significant change comes in the awarding of degrees. Previously, a graduating student could choose to receive either a Bachelor of Arts or a Bachelor of Science degree. Under the new system, each degree has its own set of core courses associated. Both degrees require the core courses *Calculus 2* and *3*, *Dif-*

ferential equations, *Numbers and polynomials* or *Sets and logic*, *Abstract linear algebra*, and *Abstract algebra*. The BS degree requires *Advanced calculus 1* and *2* while the BA degree requires *Advanced calculus for engineers and physical scientists 1* and *2*. Students opting for a BA are required to have one of their electives be a 4000-level course in our department, while those pursuing a BS must take three such electives.

As you see, we no longer require any statistics or computer programming. Since this requirement had been in place, the curricular content of the course offered by Computer Science under the specified course number had changed so often that it was felt counterproductive to specify a particular requirement. The mathematical statistics course specified from the Statistics Department had morphed into a course in probability theory with no statistics taught during the first semester. Hence, it was felt better for the department to encourage students intending to work in an applied mathematics career to take such courses as their electives, based on what sort of things other departments are currently teaching in their courses. Students planning to teach at the secondary-school level are encouraged to take our *Geometry* course as one of their electives. We hope that these changes will allow our students the flexibility to get the most out of their time at UF while still ensuring that all of our majors have a solid background.

Newsflash

George Andrews Gives Eight Lectures during Two Months Visit

by Krishna Alladi

ONE of the highlights of the *Special Year in Number Theory and Combinatorics* was the two month visit of Evan Pugh Professor George Andrews of Pennsylvania State University between January 20 and March 20, 2005, during which he gave a series of eight lectures.

Andrews, a world authority on the work of the Indian mathematical genius Śrinivasa Ramanujan, gave six lectures on *Ramanujan's Lost Notebook* at the joint Combinatorics / Number Theory Seminar. The topics of the six lectures were: 1. *An overview: what did Ramanujan have up his sleeve?* 2. *Heine's transformation*, 3. *Partial fractions*, 4. *Partial theta functions*, 5. *Wild things*, and 6. *Entire functions*.
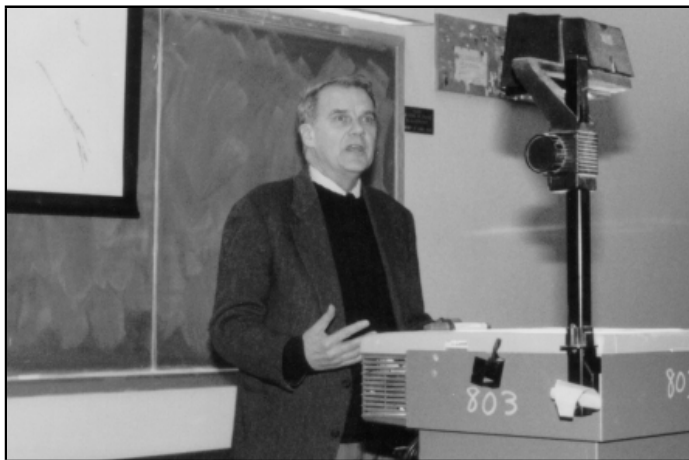
CLAS Dean Neil Sullivan making the opening remarks for Andrews' first lecture on *Ramanujan's Lost Notebook,* January 24, 2005.

It was Professor Andrews who in the year 1976 discovered Ramanujan's Lost Notebook at the Wren Library in Cambridge University, and wrote a series of important papers in the journal *Advances in Mathematics* in which he explained the significance of Ramanujan's results in the Lost Notebook and in that process made fundamental improvements as well. In 1987, during the Ramanujan Centennial, the printed form of Ramanujan's Lost Notebook by Springer-Narosa was released by Prime Minister Rajiv Gandhi of India who

presented the first copy to Mrs Ramanujan, and the second copy to Professor Andrews in recognition of his contributions.

Evan Pugh Professor George Andrews (Penn State University) delivering the first of his series of six lectures on *Ramanujan's Lost Notebook.*

Professor George Andrews delivered a lecture at the Keene Faculty Center on February 14, 2005 on *Mathematics and Interdisciplinary Research.*

The original two notebooks that Ramanujan maintained in India prior to his departure to England have been edited in detail by Professor Bruce Berndt of the University of Illinois and published in five volumes by Springer. Now, Professors Andrews and Berndt have undertaken the enormous task of editing Ramanujan's Lost Notebook, which too will appear as a series of volumes published by Springer. "There is still much to understand about the implications of many results in the Lost Notebook and their connections with current research which is one of the reasons to edit the Lost Notebook", said Professor Andrews. The first of these

Newsflash

volumes will appear in 2005 and at least two more volumes will be forthcoming. "The mathematical content of the Lost Notebook is so immense, that it is difficult to predict at this time how many volumes it will take to completely edit it", he added.

In addition to being a world class research mathematician, Professor Andrews is an outstanding teacher and has been actively involved at the national level on various issues relating to mathematics education. During this visit, at the invitation of the CLAS Dean's Mathematical Sciences Committee, he gave two lectures of wide appeal on the topics *The joy of collaboration—why pure mathematical scientists should not mind their own business,* and on *Research mathematical scientists and mathematics education.*   ✧

Braiding Mathematics with Life Sciences: Weaving Future Tapestry

by Paul Ehrlich

T has been widely written that as the latter half of the 20th century saw the ascendance of the silicon chip, that the 21st century is to be the century for the ascendance of biology. The January 10, 2005 issue of *Forbes* magazine, for instance, named the biotechnology company Amgen as the Company of the Year, noting it "is on the brink of a research renaissance that will target cancer, diabetes and more."

During the past few years, the Editor has personally seen several signs confirming the century of biology. First, on a trip back to the University of Missouri during May 2003 to participate in the BeemFest, he noticed that the parking lot of the Physics Building, well known to him from his 11 years at that institution and occasional classroom teaching in Physics, was now a vast construction site. The Missouri physicists were shorn of their gated parking lot, sacrificing to make way for the Life Sciences Center, which opened in May 2004, focusing immediately on plant responses to the environment and disease, behavioral and developmental neuroscience, and stress response and cellular transport in animal cells. Second, while leafing through *Science* magazine during November 2004 while giving a calculus 3 exam, the Editor noticed an advertisement of open positions in a think tank devoted to biomathematics and statistics surprisingly offered by the D.E. Shaw investment management firm of New York. This firm remains involved in trading financial instruments using quantitative techniques and

venture capital investments. However, the corporate web site revealed that now D.E. Shaw had decided that time was ripe for direct investment in advanced computational techniques that could impact on the way drug development was conducted, for one example, and that the think tank could aid the venture capital division of D.E. Shaw through expertise gained from in-house biomathematics research in the formation of new cutting edge technology companies in the bioscience area.

A third sign that somewhat surprised the Editor was the departure in 2001 of Professor Avner Friedman from the Institute for Mathematics and its Applications at the University of Minnesota (a pioneering institution which has seen current faculty members Professors **Jay Gopalakrishnan, Shari Moskow,** and **Maia Martcheva** participate in its postdoctoral program) for Ohio State and a Professorship of Mathematics and Physical Sciences. There Friedman participated in a successful grant application to the NSF's Division of Mathematical Sciences which led to the establishment of The Biomathematics Institute at Ohio State in 2002. With corporate members Pfizer, Eli Lilly, and Glaxo Smith Kline, the mission statement of this institution includes "to develop mathematical theories, statistical methods, and computational algorithms for the solutions of fundamental problems in the biosciences", and the web site also speaks of revolutionary advances in basic science and technology including medical imaging, nanoscale bioengineering

and gene expression arrays resulting in such a deluge of experimental data that scientists are challenged to produce mathematical solutions to analyzing and restructuring the data in a meaningful way. The title for this article is almost identical to that used by Dr Rita Caldwell, Director at the NSF, in a lecture she delivered at the gala opening ceremony for this new Ohio State center in October 2002. However, her title included "braiding mathematics and statistics"...

Fortunately for us, one of our own faculty members, Professor **Sergei Pilyugin** himself, specializes in biomathematics and spent April 2004–June 2004 as a Long Term Visitor at this Biomathematics Institute. Thus it seemed timely to interview him for an article in the Little Review on his views on the century of biology and biomathematics.

E: *Professor Pilyugin, let us begin by asking you to summarize the research areas which you investigated while a Long Term Visitor at the Ohio State Biomathematics Center last spring.*

P: Thank you for this opportunity to share my MBI experiences with our colleagues.

First, let me tell you a little bit about the Institute and its functions, and my role as a long term visitor. The MBI is a relatively small entity that consists of two permanent faculty members (director, A. Friedman, and an associate director, Tony Nance), 8–10 postdocs with 2–3 year long appointments, and typically 2–3 rotating visitors. The NSF grant given to the MBI totals $10 million for five years. These five years of the Institute are dedicated to various areas of biomedical research (somewhat similar to our own Special Years). The long term visitors who are experts in the corresponding area are invited for 1–2 quarter terms.

Their duties typically involve running the local MBI seminar, organizing the MBI workshops, inviting short-term visitors, and interacting with other MBI residents. For instance, the Spring 2004 Quarter at MBI was dedicated to immune models and host–pathogen interactions under the umbrella of a more general subject of cellular processes for the entire 2003–04 academic year.

During my visit, the Institute was in the process of transition to the next research area, and it just so happened that I was a lone long-term visitor at the time. Most of the postdocs were doing research in neural dynamics mentored by the OSU math professor David Terman, and two postdocs were working with Avner

Friedman on cancer models. So I did get a chance to learn a little bit about both areas, especially in neural models which is a truly fascinating subject. Hopefully, when I get tenure and the pressure to publish will diminish, I will have enough time to do some meaningful work in this area.

Anyways, I gave a series of seminars on both immune modeling and microbial growth kinetics that are really my areas of expertise. In addition, I co-organized two MBI workshops: *Workshop 5 on Immunological Models* and *Workshop 6 on Host–Pathogen Interactions*. I also gave talks in each of the workshops with titles *Quantifying the immune cell turnover: Existing approaches to the same problem,* and *Some remarks on backward bifurcations and the role of coinfection in multi-disease dynamics.* Finally, I participated in the tutorials for both of these workshops.

To bring more flavor to the program, I invited four short term visitors all of whom are in the beginning of their careers: Miriam Nuno (Cornell University and Arizona State University) who works with multistrain models of influenza; Irakli Loladze (University of Nebraska, Lincoln) who is an expert in environmental stoichiometry; Daniel Coombs (University of British Columbia) working with viral–host interactions; and finally, my collaborator Vitaly Ganusov (Emory University) who works with mathematical models of immunological memory.

Finally, since I had a three-month-long period free of teaching, it was a great opportunity to work on some individual research. I worked on seven papers, some of those are now published, and some are still in progress.

E: *Over the past several years, I have been seeing a lot of articles in the financial press on how computer and mathematical modeling is supplanting chemical experimentation in drug research by biotech companies and big pharmacology companies. I wrote in my introductory remarks that leading big pharma companies Eli Lilly, Pfizer, and Glaxo Smith Kline are institutional members of the Ohio State Biomathematics Institute. Did you see any evidence of this trend yourself from associates of these firms at the Institute?*

P: Oh, yes. The presence of Big Pharma (and the smell of big money) was certainly there. Once, I attended an MBI presentation given by Alexander Varshavsky who is a senior researcher at Eli Lilly. Accidentally, Mr Varshavsky is a mathematician and a former student of Boris Mityagin who is a distinguished func-

tional analyst from Russia presently at Ohio State. At that time, Alexander gave a complex talk on several research issues, but most importantly he wanted to establish a collaboration with people at MBI. In particular, he made it very clear that Eli Lilly (and, I guess, other big companies) are eager to commit resources to various kinds of biomathematical research, both analytical and computational.

Of course, one has to understand the rules of the game. For me personally, the most troublesome issue is the confidentiality. During my visit to MBI, they had a postdoc sponsored by Pfizer. The first thing he did was sign the confidentiality agreement essentially prohibiting him from sharing all sorts of research with other residents at MBI. The poor fellow explained this to me when I asked him to give a local seminar. I am not sure how this protocol fits into the idea of academic freedom, but the Big Pharma is certainly worried about improper dissemination of their big and small research secrets. They have the money and are willing to give it away, but they also write the playbook.

There were other interesting things at MBI. One day at lunch, Avner Friedman talked about a big modeling project involving a computer- based study of potential toxicity for new medicines. Just like modern chemists can rule out some theoretical compounds as poor reagents (these computer simulations save a lot of time and money), the pharmaceutical companies wish to have a software that would red flag the experimental medicines as potentially toxic before they go to the animal and human trials.

E: *Yes, those issues of confidentiality and secrecy can be vexing. Around 25 years ago, while visiting my parents in California, I got to hear a presentation from the head of Chiron at the small luncheon meeting of the Commonwealth Club of California. He revealed precisely nothing in a half hour.*

*Another big talking point on the part of university administrations, especially where new programs in the biosciences are concerned, is interdisciplinary cooperation. How have you and Professor **Maia Martcheva** personally found this aspect of the University of Florida ?*

P: From day one, it was my understanding that one of my responsibilities was to serve a liaison between the math department and other departments at UF. Since the university is huge, the opportunities for interdisciplinary research are plentiful. I was lucky in finding a collaborator in Chemical Engineering whose research interests were very close to my work on microbial growth. At this stage, we have outlined a large scale modeling project aiming at the comprehensive model(s) of adaptive responses in mixed microbial populations. We have several graduate students involved. Over the past 3–4 years, we published 7 papers in various journals.

As far as I know, Professor Martcheva has also started collaborating with the theoretical ecology group led by Professor Robert Holt, a prominent figure in the field.

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CLAS / Math Department Reception Honors Professors Thompson and Andrews

by Larry Wilson

O N March 7, 2005, a reception jointly sponsored by the Mathematics Department and the College of Liberal Arts and Sciences was held at the Keene Faculty Center. This was in honor of Graduate Research Professor **John Thompson** for the award of the CLAS Distinguished

Scholar title, and Evan Pugh Professor **George Andrews** of The Pennsylvania State University for his two month visit to the University of Florida.

UF President **Bernard Machen** graced the occasion and thanked Professor Thompson for his inspiring presence which has brought international recognition to the department, and appreciated Professor Andrews' influence in enhancing research in the Mathematics Department through his collaborations. Dean **Neil Sullivan** of CLAS described the purpose of creating the Distinguished Scholar Award to recognize truly outstanding contributions. He said that by awarding this title to Professor Thompson, the highest standards have been set. The Dean also expressed

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his appreciation to Professor Andrews for his inspiring set of eight lectures which were jointly sponsored by CLAS and the Mathematics Department.

Chair **Krishnaswami Alladi**, who referred to Professor Thompson as the crown jewel of the mathematics department, announced the publication of refereed proceedings of two conferences on Group Theory and Galois Theory held in 2002-03 during the *Special Year in Algebra* in honor of Thompson for his 70th birthday. The Group Theory proceedings were edited by Professors **Chat Ho, Peter Sin, Pham Tiep** and **Alex Turull**. The Galois Theory proceedings were edited by Professor **Helmut Voelklein** and his former UF PhD student **Tanush Shashka**. Alladi presented copies of the two proceedings to President Machen, Dean Sullivan, and Professor Thompson. Alladi expressed his appreciation to Professor Andrews for his two month visit and lectures which were among the main events of the *Special Year in Number Theory and Combinatorics* 2004–05.

Math Chair Krishna Alladi welcoming the chief guests (from left to right) CLAS Dean Neil Sullivan, UF President Bernie Machen, Prof. John Thompson, Prof. George Andrews and Mrs Joy Andrews.

The Reception was held at this time of the year to also coincide with the peak period of activity of the Special Year program. The reception was attended by mathematics department faculty and staff, participants of the *Conference on Pattern Avoiding Permutations,* and distinguished visitors including Steele Prize Winner Herb Wilf of the University of Pennsylvania, and Fields Medallist Richard Borcherds of U.C. Berkeley who delivered the *Seventh Erdös Colloquium* that same afternoon at 4:00pm.

Math Chair Alladi presenting Graduate Research Professor John Thompson with the two refereed proceedings of the conferences held in Thompson's honor during the Special Year in Algebra 2002–03.

UF President Bernie Machen speaks at the reception honoring Professors George Andrews and John Thompson.

1998 Fields Medalist Richard Borcherds (U.C. Berkeley) discussing with our distinguished colleague John Thompson, who won the Fields Medal in 1970.

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Retirees Emch and Townsend Honored

by Paul Ehrlich

On Thursday, April 21, 2005, prior to the annual Appreciation Tea in the Atrium, department members gathered in Little 113 during 6th period to enjoy tributes to two retirees for this academic year, Professor **Gerard Emch** and Senior Lecturer **Marvel Townsend**.

Professor Gerard Emch and his former student Professor Charles Radin, who summarized Gerard's scientific achievements.

Professor **Charles Radin** of the University of Texas at Austin, the second graduate student to receive the PhD with Emch as supervisor at the University of Rochester, accepted the task of summarizing Emch's scientific contributions and also delivered a Special Colloquium the prior Wednesday on *Hilbert's eighteenth problem on the densest packing of spheres, tetrahedra, and other shapes.* One aspect of Radin's Wednesday presentation was how, after treating mathematical aspects of the problem during the first part of the lecture, Radin then applied insights from the physics of phase transitions between solids, liquids and gasses back into the mathematical issues in his concluding remarks. Speaking Thursday noon *On the work of Professor Gerard Emch*, Radin took the approach of setting Emch's research in the context of his scientific ancestry, going back to Benjamin Pierce and Nathaniel Bowditch of Harvard in the early 1800's, see `http://www.ma.utexas.edu/users/radin/ancestry.html` for a complete table with dates and titles. Radin particularly commented that Emch's

having taken the Masters in experimental physics and then changed to theoretical physics under Professor Josef Jauch at the University of Geneva fit well into Emch's scientific ancestry.

In Emch's earlier education, prior to entering the University of Geneva, he studied at the College Calvin, an institution founded by the protestant theologian John Calvin in 1559 to educate the citizens of Geneva. Gerard graduated from this institution with the best grade point average of all four sections (Classique, Latine, Scientifique, and Moderne) and so was forced by his father to accept the honor of carrying the college flag at graduation. According to Radin, the group around Jauch at the University of Geneva was interested then in foundations of quantum theory. After receiving his PhD, Emch served as Chef de Travaux in Physics and Mathematics at Geneva, and in this role, as is customary in Europe, wrote up lectures from a course by Professor Jauch, and in so doing was involved in producing the first draft of Jauch's book on the *Foundations of Quantum Mechanics.* This appointment was followed by a year's postdoc at Princeton in 1964–1965 under Valery Bargmann and a second postdoc the next year at the Institute for Applied Mathematics at Maryland before Emch joined the University of Rochester Physics Department as an Assistant Professor in 1966. There Radin related that, in his second year as a graduate student at Rochester, he took a graduate course Emch was offering in quantum theory in his first year as a faculty member. These interests would lead to Emch's publication in 1972 of his first book on *Algebraic Methods in Statistical Mechanics and Quantum Field Theory* with Wiley Interscience; Radin characterized this work in his presentation as the first book to appear with a new approach to the foundations of quantum theory where Emch married quantum theory with the classical formalism of K–flows to obtain a new method of modelling dissipation in nonequilibrium statistical mechanics.

From Emch's beginnings in theoretical physics, Radin commented that Emch's interests have become so broad, spreading to geometry, then perhaps settling into an area of early interest, philosophical implications, that no one could possibly summarize all that Gerard had done. These broad interests are reflected in the publications of two further books, the first

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Mathematical and Conceptual Foundations of 20th Century Physics in 1984 in Elsevier North-Holland Mathematical Studies, and the second, written with a Professor of Philosophy at the University of Florida, Chuang Liu, on *The Logic of Thermostatistical Physics* in 2002 with Springer Verlag. Reflecting these broad interests Emch guided 12 PhD students graduating from Rochester and 2 PhD students graduating from the University of Florida in widely different thesis topics. Among Emch's many distinguished visiting appointments, Radin mentioned the Gauss Professorship at the Academy of Sciences in Göttingen, held during 1985, and more recently, Emch's election as a Visiting Fellow at All Souls College, University of Oxford in 2002, where Emch was also a visitor in the Department of Philosophy. Among his most current projects have been a study with his wife Professor Antoinette Emch-Deriaz on how faithful was Madame Emilie du Chatelet in translating Isaac Newton into French and a study on *From geometry to analysis : Newton, Clairaut and beyond.* Toward the end of 6th period, Chair Alladi read from several letters of tribute sent by former PhD students of Emch, and all, in addition to our speaker Charles Radin, recalled Emch's decisive influence in their scientific development as a mentor.

In the early 1980's, events led to an expansion plan for the department of mathematics at UF to add 20 new positions. As part of this campaign, an outside Chair was selected and Emch left Rochester for Florida in 1986 to assume this Chairmanship. At the Recognition Tea, both Graduate Coordinator Paul Robinson and Undergraduate Coordinator David Groisser spoke briefly of Emch's decisive impact in their recruitment to the University of Florida. Professor John Klauder also sent similar laudatory remarks to be read during the ceremony. The editor of this newsletter, who came during 1987–1988 in the first year of the expansion plan as the senior appointee in differential geometry and hence himself experienced Emch's recruitment methods, can also testify to the zeal and energy which Emch brought to the building program. In service outside the university setting, Emch served the International Association of Mathematical Physics during 1988–1999 as treasurer, US bursar, and board member. He was involved in the founding of the journal *Reviews in Mathematical Physics* and served as an editor during 1988–2001. He has also served on the Editorial Boards of *Reports on Mathematical Physics, Studies in History and Philosophy of Modern Physics,* and as an Associate Editor of the *Journal of Mathematical Physics.*

Following Radin's presentation on Emch, Chair Krisha Alladi introduced Professor **Bruce Edwards**, as a representative of the outstanding teaching in the department, to speak about Senior Lecturer **Marvel Townsend**'s contributions to the department and university. Edward's first comment was that "we all dread this moment—what will we do without Marvel?" Townsend received her BS in mathematics from Wake Forest and an MAT degree from Duke. She arrived in Gainesville in 1981 with her husband Frank, an engineering faculty member, and has served full time in the department since 1982. She has served as Coordinator of Precalculus since 1984, an assignment that in fall 2002 involved oversight of 2600 students. This role calls for making up the common exams, arranging for proctors, and supervising armies of TAs. She has also served in the very important role of TA Supervisor since 1986 and in recent years that role also involved conducting fall training workshops for the new TAs as well as making classroom visits during the semester as part of the training program. (A note was read from a former high school teacher who became one of our TAs relating on how helpful Townsend's comments from the classroom visits particularly, and teacher training program overall, had been to him.) The relatively high number of teaching awards that our nominated graduate students receive speaks to the effectiveness of this training program. Her own teaching has been recognized by the receipt of a CLAS Teaching Award during 1994–1995, a TIP Award in 1998, and being named as an Anderson Scholar Faculty Nominee in 1999 and finally by her promotion to the new rank of Senior Lecturer in 2004.

As UF evolved and a greater emphasis came to be placed at the institutional level on teaching during the presidency of John Lombardi, spearheaded by the TIP award program, the department instituted a Seminar on Teaching, as one aspect of the formation of the new Teaching Innovation Committee, and Marvel often served as Chair of these activities. In addition, Marvel has regularly served on the Undergraduate

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Committee of the department and was the first of our instructors to serve as Preview Advisor. One aspect of the Seminar on Teaching were sessions devoted to using technological aids such as the graphics calculator in the classroom. But beyond this departmental venue, Marvel was further active in this area in terms of grant activities. She was first a co-principal investigator on an NSF Succeed Grant involving engineering applications in mathematics courses. Then she was involved in an interdepartmental grant from the Mellon Foundation involving comparison of online lecture formats with live lectures. In this context, Marvel developed a distance education version of precalculus mathematics, online lectures for precalculus, and was also (along with Professor Martin Vala of Chemistry) one of the earliest users of WebCT on campus. Most recently, Marvel was involved from 2002–2004 in the PT3 Teaching and Technology Initiative with the College of Education.

As mentioned in the news of the Appreciation Day Ceremony and tea elsewhere in this issue, not only did both retirees receive a Commemorative UF Plaque, but as a special surprise, Interim Provost and Vice-President for Academic Affairs **Joseph Glover** sent a congratulatory e-mail to be read at the tea and also UF Medallions which were presented by Professor **Murali Rao** to both retirees.

Senior Lecturer Marvel Townsend with Professor Bruce Edwards, who spoke about Marvel's many contributions to the department.

## The Christmas Party and Annual Appreciation Day

As always, the staff prepared a bounteous spread for the Annual Christmas party. CLAS Dean Neil Sullivan and Undergraduate Coordinator David Groisser converse as everybody gathers for the feast.

CLAS Associate Deans Allen Burns, Yumiko Hulvey, and Jack Sabin join an enthusiastic group of graduate students plunging into the goodies.

The Christmas Party and Annual Appreciation Day
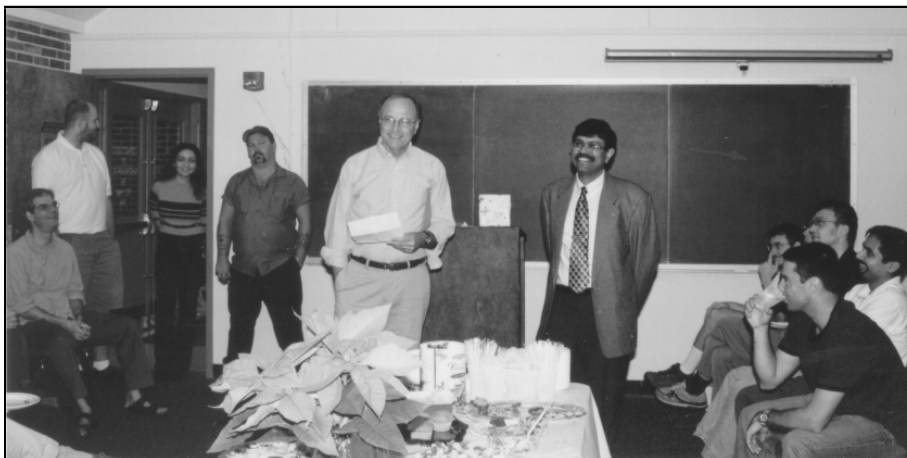
The audience delighted in Professor Rick Smith's annual roasting of the Chair Krishna Alladi with well chosen gifts.
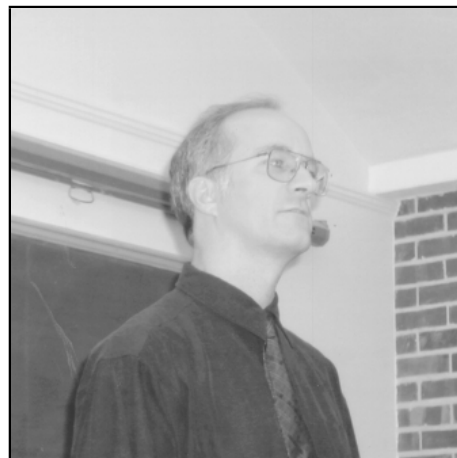
Graduate Coordinator Professor Paul Robinson was the Master of Ceremonies, for the Annual Appreciation Day, held on April 2, 2005

Faculty advisor Professor Kevin Keating presented Deniz Kazanci with a certificate recognizing her service as President of Pi Mu Epsilon.
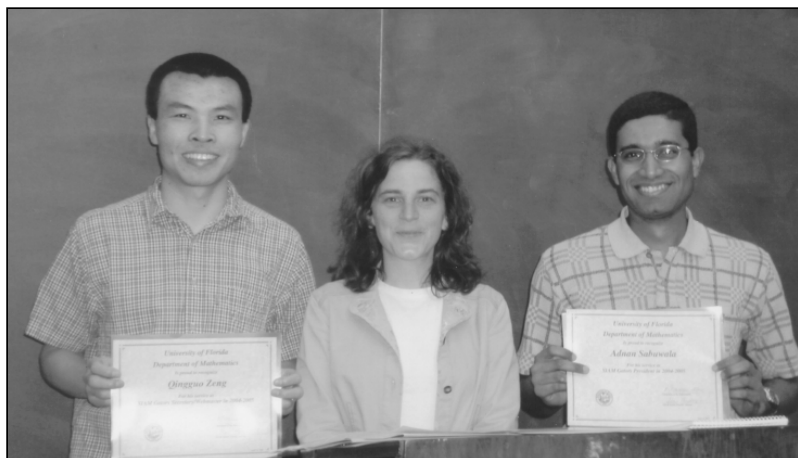
Faculty advisor Professor Shari Moskow recognized Qingguo Zeng (Secretary/Webmaster) and Adnan Subuwala (President) for their role in the SIAM Gators.
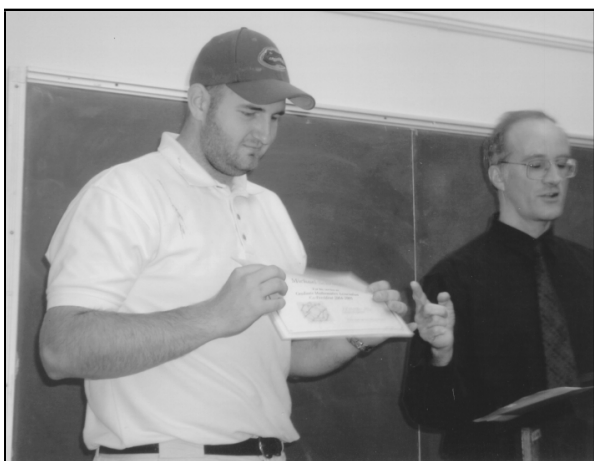
Michael Schroeder was recognized for his service as Co-President of the Graduate Mathematics Association.

Graduate students Jung-ha An, Timothy Bonner, and Nicole Krochak were presented with Certificates of Excellence in teaching by Marvel Townsend, representing the Selection Committee.

The Christmas Party and Annual Appreciation Day

As part of the buffet, a retirement cake for Emch and Townsend was enjoyed by all.

Staff members Administrative Assistant Sharon Easter and Computer Systems Manager Brian Roberts (not shown) were recognized for 20 and 10 years of service at UF respectively.
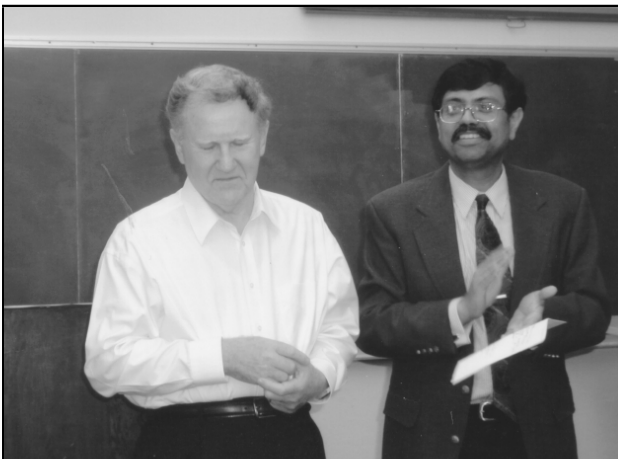
Professor Theral Moore was recognized for his receipt of a CLAS Teaching Award.

Retirees Emch and Townsend are shown with their University of Florida Medallions recognizing their decades of service at UF.

Chair Krishna Alladi accepts an award of $1,000 to the department from University Copy and More.

Graduate students, faculty, and staff filled the atrium to the seams, enjoying the afternoon.

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Faculty and Staff Notes

by Paul Ehrlich

N between hurricanes Frances and Jeanne, Professors **Jean Larson, William Mitchell** and **Jindrich Zapletal** traveled to the Centre Internationale de Rencontres Mathematiques in Marseille, France, to participate in the *Eighth Luminy Set Theory Workshop* held during September 20–24, 2004. Larson spoke on *A partition theorem for a large dense linear order* and Zapletal spoke on *Forcing with quotients*.

The University of Florida Office of Technology issued an announcement in October 2004 calling for an industrial partner to license algorithmic results obtained in joint research of Professor **William Hager** of our department and Professors **Yi Jiang** and **Jian Li** in the Department of Electrical and Computer Engineering. The journal article *The geometric mean decomposition* providing the mathematical basis for the algorithm has appeared in the journal *Linear Algebra and Its Applications*.

Professors **Krishna Alladi** and **Frank Garvan** traveled to India during December 2005 to participate in an *International Conference on Fourier Analysis and Number Theory* conducted by SASTRA University in Ramanujan's hometown of Kumbakonam in South India. Alladi delivered the *Ramanujan Memorial Lecture* on December 22, Ramanujan's birthday, on *Srinivasa Ramanujan and Probabilistic Number Theory* and also a plenary lecture at the conference on *How many prime factors does a number have?* Garvan spoke on *The combinatorics of Ramanujan's partition congruence* and on *Partitions and infinite products*. The second lecture represents joint work with Professor **Alexander Berkovich** and our newest Thompson Asssistant Professor, **Hamza Yesilyurt**. Berkovich was invited to speak, but was unable to make this trip.

In further strengthening ties between the UF mathematics department and the mathematical infrastructure in India, in 2004 Alladi was invited to set the question papers for two Mathematics Olympiads in India. The first of these was conducted in July 2004 by INFOSYS, the largest computer software company in India. This was for high school students all over India.

Alladi also delivered a set of eight lectures, (four at INFOSYS Madras and four at INFOSYS Bangalore) to the participants of the Olympiad on the significance of the Olympiad problems and their relevance to current research. Alladi was also invited to set the question paper for another Mathematics Olympiad conducted by SASTRA University, The Shanmuga Arts, Science, Technology Research Academy, (a private university formed about 15 years ago in Ramanujan's hometown Kumbakonam in the state of Tamil Nadu in South India). Over 3,500 students all over India took part in this Olympiad which was conducted on December 26, 2004. SASTRA announced that the First Prize Winner of the Olympiad will get an all expense paid trip to the University of Florida for one month in 2005 to receive training from our group here. The Olympiad winner's stay at the University of Florida will be covered by a grant from the Number Theory Foundation. SASTRA will provide the international airfare.

In further developments of interest to the world mathematics community, SASTRA has purchased the home of Śrinivasa Ramanujan in Kumbakonam, where he lived on his return from England to India just after World War I, in order to preserve it as a museum. Thus SASTRA is playing a crucial role in the preservation of Ramanujan's legacy for posterity. In a further recent development, SASTRA has instituted a Ramanujan Prize of $10,000 to be awarded annually to a mathematician not exceeding the age of 32 for outstanding contributions to an area of mathematics influenced by the late Indian mathematical genius Śrinivasa Ramanujan. Young mathematicians all over the world are eligible for this award. The age limit has been set at 32 because Ramanujan achieved so much in his brief life of 32 years, and also to encourage doctoral and post-doctoral research. Alladi has been invited to head a panel of experts who will select the 2005 winner from nominations received from around the world.

The 10th *SouthEastern Logic Symposium*, organized by Professors **Douglas Cenzer** and **Jindrich Zapletal** was held at UF during April 15–17, 2005. Invited speakers were from both the areas of set theory and of computability theory. As part of the conference, participants Professor Vladimir Pestov of the University of Ottawa, Professor Jeffrey Remmel of the

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University of California at San Diego, and Professor Slawek Solicki of the University of Illinois delivered colloquium lectures in the department, with respective titles *Geometry, dynamics, and combinatorics of infinite-dimensional groups of transformations*, *Permutation enumeration and symmetric functions*, and *Haar null sets and amenability in non-locally compact groups*. Partial support for the conference was provided by an NSF grant.

Faculty, graduate students and alumni again participated in the Joint Winter Mathematics Meeting held this academic year during January 5–8, 2005 in Atlanta. Professor **Douglas Cenzer** spoke in an *AMS–ASL Special Session on Reverse Mathematics* on *Proof-theoretic strength of the stable marriage theorem*. Professor **Shari Moskow** spoke in an *AMS–SIAM Special Session on Theoretical and Computational Aspects of Inverse Problems* on *Targeted grid approximations for geophysical inversion*. Professors **Pham Tiep** and **Peter Sin** participated in an *AMS Special Session on Algorithmic Algebraic and Analytic Geometry*, with Tiep lecturing on *The non-coprime $k(GV)$ problem* and Sin speaking on *Permutation modules and incidence matrices*. Thompson Assistant Professor **Larry Wilson** spoke in an *AMS Session on Algebra* on *Groups with fixed point free automorphisms of prime order*. Graduate students **Rebecca Smith** and **Sheshadri Thiruvenkadam** spoke at the meeting. Thiruvenkadam spoke in an *AMS–SIAM Special Session on Mathematical Imaging* on *Finding non-rigid correspondences between implicit curves*, research done with Professors **David Groisser** and **Yunmei Chen**. Smith spoke in an *AMS Session on Combinatorics* on *Algorithms generating restricted permutations*. Joint research of several faculty at Georgia State University in Atlanta, including Professor **Jean Bevis,** PhD 1965, on *Course redesign* was presented in a *MAA Session on the Teaching and Learning of Undergraduate Mathematics*. Professor **Tanush Shaska,** PhD 2001, co-organized the *AMS Special Session on Algorithmic Algebraic and Analytic Geometry* mentioned above, and also spoke in an AMS Session on Algebra on the topic *Genus 2 curves that admit a degree 5 map to an elliptic curve*.

Professors **David Drake, Chat Ho** and **Peter Sin** participated in a *Special Session on Designs, Codes and Geometries* at the 2005 *Spring Eastern Sectional Meeting of the American Mathematical Society* held at Newark, Delaware, in April 2005. Drake spoke on *Desarguesian nets without ovals*, Ho spoke on *Groups generated by affine perspectives*, and Sin spoke on *The p–rank of the symplectic generalized quadrangles*.

Professors **Steve Summers, Paul Ehrlich,** and frequent departmental visitor **Seon Bu Kim** from Chonnam National University, South Korea, authored sections for the Elsevier Publishers' *Encyclopedia of Mathematical Physics*. Summers contributed sections on *Tomita–Takesaki modular theory* and on *Scattering theory*. Ehrlich and Kim wrote the section on *Lorentzian geometry*. Summers, along with UF Physics Professor **Pierre Ramond,** is on the editorial board of this project. Professor Stephen Summers also gave an invited address at the symposium *Perspectives in Quantum Field Theory* held at the University of Göttingen in June 2004, as well as colloquia at the Universities of Braunschweig and Göttingen.

On April 1, 2004, Professor **Krishna Alladi** delivered one of four invited one-hour talks at a conference at Penn State University in honor of Professor George Andrews for his election to the National Academy of Sciences. The title of Alladi's talk was *Andrews, Ramanujan, and partitions*. In June 2005 Alladi gave an invited talk in Honolulu at the *Hawaii International Conference on Mathematics, Statistics and Allied Fields* on the topic *Sieve methods and probabilistic number theory*. He gave a colloquium on the same topic later in August at the Abdus Salam International Centre for Theoretical Physics in Trieste, Italy. In November 2004, Alladi addressed the joint Number Theory and Combinatorics Seminar at Ohio State University on the topic *New weighted Rogers–Ramanujan partition theorems and their analytic representations*. Later in December 2004, he gave a colloquium on the same topic at the Arizona State University. In January 2005, Alladi was invited to be one of four leaders for the Annual Mathematics Chairs Workshop held in conjunction with the Annual Meeting of the American Mathematical Society in Atlanta. This was in recognition of Alladi's accomplishments as Chair of the UF Mathematics Department. Alladi spoke and led a discussion on the topic *Strategic plan-*

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ning for improvement.

Professor **James Brooks** received an award from the London Mathematical Society, which included support for a fall 2004 lecture tour explaining his research on von Neumann algebras and stochastic processes. Brooks spoke at the University of London, Christ Church College, Warwick, and Reading University.

Professor **Richard Crew** was the recipient of a fellowship from the Japan Society for the Promotion of Science to visit Japan during May and June, 2004 and lecture on his research. Crew spoke in Hiroshima, Kyoto, Nagoya, Tokyo, and Chiba.

Professor **Bruce Edwards** gave a plenary presentation at the *Houghton Mifflin Spring 2005 Mathematics Conference* held at the Hilton Tampa Airport Hotel on February 10–11, 2005. The focus of the conference was incorporating web-based and calculator technologies in the classroom. Edwards also reported on this same topic a few weeks later in San Antonio.

Professor **Gerard Emch** presented a lecture entitled *Quantum statistical mechanics* at the *Foundations of Physics Handbook Workshop*, held at the Center for Philosophy of Science at the University of Pittsburg, during October 29–30, 2004. Then Emch traveled on to Princeton where he presented two Special Philosophy of Physics talks at the Department of Philosophy, Princeton University, under the titles *Not what models are but what models do,* and *Spontaneous symmetry breakdown in statistical mechanics.* Also, a volume, *Twenty Years of Bialowieza: Aspects of differential geometric methods in physics,* edited by Professors S.T. Ali, Emch, A. Odzijewicz, M. Schlichenmaier, and S.L. Woronowicz recently appeared in the World Scientific Monograph Series in Mathematics, Volume 8. Articles were contributed by past conference participants from Poland, Belarus, France, Belgium, Germany, Portugal as well as the US, including notably R.P. Langlands of the Institute for Advanced Study. On December 18–24, 2004, Professor Emch attended an *International Conference on Operator Theory, Quantum Probability, and Noncommutative Geometry,* held at the Indian Statistical Institute, Kolkata, India. This conference was in honor of the 60th birthday of the Director of this Institute, Professor Kalyan Sinha. In 1969, Sinha had completed his PhD dissertation under Emch's direction at the University of

Rochester. In November 2004, Sinha visited the Mathematics Department and the Institute of Fundamental Theory at the University of Florida, and presented three lectures on related aspects of non-commutative stochastic processes and differential geometry.

Reflecting recent developments since 2000, the April 1, 2005, issue of *Science Magazine* contained a short column with the title *"Cranky" proof reveals hidden regularities.* In this article, Professor George Andrews of Penn State and Professor **Frank Garvan** were singled out for joint work carried out in 1988 in finding patterns in successive partition numbers, generalizing Freeman Dyson's rank of a partition to the "crank" of a partition. The Dyson problem, which Andrews and Garvan solved, relates to Ramanujan's work on congruences and their solution grew out of results obtained by Garvan in his PhD thesis, for which Andrews was supervisor. Three of the mathematicians discussed in this article were participants in the November 2004 UF *Conference on Additive Number Theory*.

After serving as Associate Provost in Tigert Hall for several years, Professor **Joseph Glover** was chosen by new University President Bernard Machen to be the Interim Provost during the spring semester, 2005. In the spring 2005 CLAS commencement program, Glover was listed first among ten UF Vice Presidents with title Interim Provost and Senior Vice President for Academic Affairs.

Professor **Jonathan King** has been recently appointed as one of the judges for the Merton M. Hasse Prize of the American Mathematical Association. In 1997, King was the recipient of this prize for his article *Three problems in search of a measure* which appeared in the American Mathematical Monthly in 1994.

Professor **Bernard Mair**'s research on mathematical algorithms behind positron emission tomography and cardiology was profiled in the June/July 2005 issue of CLAS Notes with the title *Getting to the heart of medical imaging*. Mair and Professor David Gilland in the Department of Nuclear and Radiological Engineering have received an N.I.H grant of $600,000 to support the development of these algorithms which will help radiologists better detect abnormalities in motion produced by an ailing heart and understand the health of the heart wall from PET imagining.

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Professor **Maia Martcheva,** one of our newer faculty members in mathematical biology, has been awarded an NSF Interdisciplinary Grant to the Mathematical Sciences for the 2005–2006 academic year. Marcheva will spend this time period in the Department of Zoology at UF, working with theoretical biologists Ben Bolker and Robert Holt.

Professor **Scott McCullough** has been elected President pro-tempore of the College Assembly beginning fall 2005.

Professor **Theral Moore** was named as a CLAS Teacher of the Year for 2004–2005.

Professor **Sergei Pilyugin** participated in a conference held at the University of Florida Hilton and Conference Center during February 2–4, 2005 on the topic of *Systems Analysis, Data Mining and Optimization in Medicine.* Pilyugin lectured on *Rescaling methods for quantifying the turnover rate of lymphocytes using the CFSE assay.*

Professor **Yuli Rudyak** was a plenary speaker at the 42nd Annual Cornell Topology Festival held during May 7–10, 2004, lecturing on *On category weight and the Arnold conjecture on symplectic fixed points.* Rudyak's participation in this meeting led to Albert Einstein Professor Dennis Sullivan of CUNY visiting UF in December 2004 and delivering an inspiring colloquium on *An algebraic model in Zweibach form of Gromov–Witten theory using transversality and algebraic topology.*

In addition to the CLAS and Mathematics Department Reception in honor of Graduate Research Professor **John Thompson** held at the Keene Faculty Center on March 7, 2005, as reported in the article on the *Special Year in Combinatorics and Number Theory,* Professor Thompson was specially honored at the April 30th 2005 CLAS Graduate Commencement held at the Center for Performing Arts. At this ceremony, Dean Neil Sullivan presented Thompson with the first CLAS Distinguished Scholar Award. This is a new award created this year by Dean Sullivan to honor lifetime achievements of outstanding CLAS faculty members.

Professor **Pham Tiep** participated in an international conference on *Gitter und Anwendungen* held at the Mathematisches Forschungsinstitut Oberwolfach during January 2–7, 2005. Tiep spoke on *Clifford groups, Weil representations, and conjectures of Larsen and Katz* at this meeting.

Professor **Alexander Turull** traveled to Chicago in early October, 2004, first attending a meeting of the Publication Committee of the American Mathematical Society, then delivering a lecture on *A strengthening of the McKay conjecture by including local fields and the Schur index* at the Group Theory Seminar of the Department of Mathematics at the University of Chicago. A few weeks later, Turull attended a memorial ceremony at Yale University for the late Professor Walter Feit. Graduate Research Professor **John Thompson** was also at the memorial ceremony.

Professor **Jindrich Zapletal** delivered a Plenary Lecture at the ASL European Summer Meeting / Logic Colloquium 2005 held in Athens, Greece, July 28–August 3.

The Annual Appreciation Day, Thursday, April 21, 2005, fell on one of those beautiful April days in Florida, under warm and sunny blue skies. Elsewhere, we have reported on the program from 12:50–1:40 at which tributes were delivered to Professor **Gerard Emch** and Senior Lecturer **Marvel Townsend** on their retirements. At the 2:00pm continuation of this ceremony, after our enjoyment of a festive spread and retirement cake, beautifully arranged in the Atrium by our staff, Graduate Coordinator **Paul Robinson** served as Master of Ceremonies, donning a tie for the occasion and even quoting three lines from Shakespeare as an encouragement to the graduate students in the middle of the program. This year, the Kermit Sigmon scholarship went to **Erik Lundberg**, one of the three members of the Putnam Team. However, Undergraduate Coordinator **David Groisser** in announcing this award, mentioned that a second member of the Putnam Team, **Kevin Lawler,** had been a close runner up deserving honorable mention, and that the third member of the Putnam team, **Go Fujita,** had just been selected to participate in the Undergraduate Scholars Program. In the past, the department has generally received one or two CLAS Dissertation Fellowship Awards, but Robinson noted that this past academic year, that four of our PhD students had received such fellowships, **Diego Rojas-Rebolledo, Rebecca Smith, Sheshadri Thiruvenkadam,** and **Yuan-Chyuan Sheu.** During the Summer 2004, Fall 2004 and Spring 2005

People

terms, 15 Masters Degrees were awarded and 9 PhD degrees were awarded.

For a final time, **Marvel Townsend,** representing the Selection Committee presented the Certificates for Graduate Student Teaching. Here again, the department fared very well this past year, submitting three names to CLAS for the College level award and having all three, **Jung-ha An, Timothy Bonner** and **Nicole Kochak** receive Certificates of Excellence. Further, Jung-ha An and Timothy Bonner additionally received university-wide teaching awards, with Bonner being named one of three Calvin A. Vanderwerf Award recipients. The department awarded **Hariprasad Babu, Adnan Sabuwala** and **Michelle Taylor** with Certificates of Merit for their teaching.

Then Chair Krishna Alladi took over the program for the Faculty and Staff Recognition. First, Professor **Theral Moore,** a two time TIP teaching program award winner, was recognized for having received a CLAS Teaching Award. Our Computer Systems Manager **Brian Roberts** was recognized for 10 years service to the college and Administrative Assistant **Sharon Easter** was recognized for 20 years service to the department. Then Alladi presented Professor **Gerard Emch** and Senior Lecturer **Marvel Townsend** with plaques for their retirement. Further, Professor **Murali Rao** read an e-mail from Interim Provost and Senior Vice President for Academic Affairs, Professor **Joseph Glover,** thanking Emch and Townsend for their two decades of service to the department and university. As a further surprise, Rao then presented each of them with a University of Florida Medallion as a further testament to their years of service, this presentation being greeted by a sustained round of applause.

As a new element in the program this year, **Ron Quinn** of University Copy and More presented the department with an oversized check for $1,000. We learned that when students buy course materials from these copy centers, they have the opportunity to submit a slip with the instructor's name and course name for a drawing. To our good fortune, we were told that a student in one of Lecturer **Sherry Tornwall**'s classes had submitted the slip which resulted in the winning drawing for the department.   ❧

Alumni News

by Paul Ehrlich

PROFESSOR **William Hare**, PhD 1961, writes from Clemson University that "I retired August 2003 from Clemson's Department of Mathematical Sciences. Currently I teach one course per semester, primarily for inservice secondary math teachers. Besides **John Kenelly,** who is a Distinguished Alumni Professor Emeritus, we also have Dr **James Renke,** who received his BS and MS at Florida in the late 1950s." In his role as Treasurer of the MAA, Kenelly appeared in a photograph in the February 2005 issue of the *MAA Focus* while at a committee meeting of the MAA finance team during the Atlanta Joint Mathematics Meeting. Since 2002 the Clemson Mathematics Department website has included a historical link which reveals among other things how our PhD graduates Hare and Kenelly lured Professor Andrew Sobczyk, who had been at UF while they were graduate students here, to Clemson in 1965 with the creation of the Samuel Manor Martin Professor of Mathematics for Sobczyk, as part of their building up the graduate program in mathematics at Clemson. This material may be accessed at `http://www.math.clemson.edu/history/cover.html`

Also, Professor Kenelly served as one of the plenary speakers at the Joint Annual Meeting of the MAA Florida Section and FTYCMA at Manatee Community College near Sarasota. Kenelly spoke on February 25, 2005 on the topic *MAA highlights and what's happening in testing*.

Dr **Jungha An,** PhD 2005, has received a two year postdoctoral fellowship at the Institute for Mathematics and its Applications at the University of Minnesota. Her position is supported by the Siemens Corporation.

Dr **Rebecca Smith,** PhD 2005, has received an appointment as a tenure track assistant professor at SUNY at Brockport.

Dr **Sheshadri Thiruvenkadam,** PhD 2005, has received a two year postdoctoral position at UCLA, to work with Professor Tony Chan, last years' inaugural CAM Lecturer in the Department of Mathematics at UF.   ❧

A Note of Thanks

by Krishna Alladi

It is again a pleasure to warmly thank all of those who contributed to the support of our educational activities during the past year. For the Fiscal Year 2004–2005 we received a total of $6,964 in gifts to the various department foundation accounts. Non-anonymous donations included contributions from **Myron A. Bondelid, Clayton W. Commander, David A. Drake, Bruce H. Edwards, Karen Fagin, James E. Felt, Gary P. Gordon, William R. Hare, Patches L. Johnson, Philip B. Kane, Kevin P. Keating, John M. Kellett, John W. Kenelly, Shihai E. Li, Brandon C. Lord, Warren W. McGovern, Patrick J. Osborne, Robert S. Price, William D. Shiminske, Robert W. Shuford, Irvin L. Smith, Leah A. Susi, Lucinda F. Thomas, Dongxing Wang.**

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