FROM THE DEPARTMENT HEAD

by Charles L. Vinsonhaler

The important thing is this:
To be able at any moment
to sacrifice what we are
for what we could become.
—Charles DuBois

It is a pleasure to begin by thanking Jim Hurley and Manny Lerman for getting this newsletter under way. Their efforts typify the spirit of community that I see gaining momentum in the Department. The rest of the newsletter provides testimony to that momentum, but let me cite a few examples here.

- Yung-Sze Choi is participating in the Virtual Cell project, spearheaded by the UConn Medical School.
- Jim Hurley and Vince Giambulvo are working with Ed Pollock in Physics to implement a two-semester Calculus and Physics course for Pharmacy majors.
- Izzy Koltracht, Miki Neumann and Reo Gonzalez are working with George Rawitscher in Physics on research on the Schroedinger equation.
- Bill Abikoff has been appointed a Sigma Xi lecturer.
- The Aetna, through Jay Vadiveloo’s efforts, is establishing $30,000 worth of annual fellowships to support the graduate Actuarial Science Program. Internships tied to the fellowships will provide practical experience along with research opportunities for grad students.
- Walt Lowrie is working with Pat Neafsey in Nursing on survival models.
- Ed Tomastik is working with Ron Cotterill in Agricultural Economics on supply and demand equations in oligopoly models.
- Andy Haas is reviewing the math majors with the goal of providing a major that will attract and serve the large body of students who will become users of mathematics rather than mathematicians.

Continued on Page 2.
Continued from Page 1: FROM THE DEPARTMENT HEAD —

DEPARTMENTAL REVIEW:

In preparation for our External Review that will be conducted in Fall, 1999, the Department is beginning an Internal Review in the fall of 1998, to be completed by May, 1999. Ed Tomastik has agreed to coordinate the collection of data and compilation of the various reports. The process should provide an excellent opportunity for us to examine what we are doing and where we want to go. Two key components of our undergraduate program - calculus and differential equations - are already under investigation.

CALCULUS and DIFFERENTIAL EQUATIONS REVIEW:

Intrepid volunteers have agreed to review our calculus and differential equations offerings, with the following goals in mind:

1. A clear set of objectives for each course, including techniques and important ideas. (Course Portfolio)
2. A syllabus that allows the flexibility to pursue important topics in depth, thereby improving understanding and retention.
3. Intelligent use of technology — graphing calculators, computer lab, standard software.
4. Some emphasis on the reading and writing of mathematics.
5. Regular use of collaborative learning, especially in problem solving. Compilation of stimulating problems.
6. Assessment (testing) of concept understanding as well as computational skills.
7. Ways to ensure the commitment of all faculty and TAs involved.
8. Methods of evaluation to “measure” our success.

The courses and corresponding coordinators are:

112-113-114 : Tollefson, Tomastik
115-116 : Blei, Sidney
210 : Hurley, Giambalvo
211 : Haas, Hansell, Hernandez, Hurley, McKenna

Meetings and discussions have included the School of Engineering and other client schools and departments. A grant from the Hewlett Foundation will provide some financial support for our reform efforts.

THE FIRST NINE MONTHS

At the end of my first nine months as Department Head, I am most gratified by three aspects of the job:

(1) the exciting opportunities open to our Department;
(2) the willingness of faculty, staff and students to work toward common goals;
(3) the spirit of honesty that has dominated discussion (Yes, this includes complaining).

My hope for the future is that these positives will be augmented by a growing vision of the potential of our mathematical community, a reservoir of talent, ideas and energy.

WELCOME!

... to the inaugural edition of Math CONNections, the newsletter of the University of Connecticut Mathematics Department. Our hope is that you will enjoy reading about our progress and learning about some of the people you recall interacting with during your time here. This first issue aims to highlight current departmental projects, recent events that we thought you would enjoy reading about, and some of the faculty and students who have contributed to them. You will find details of some significant educational and curricular initiatives in both the undergraduate and graduate programs, some important research achievements of our colleagues, and updates on the comings and goings of Department members. Our modest experience in producing (much smaller-scale) newsletters leaves us with some trepidation as we embark on this new undertaking. Please give us your feedback about our hits and misses: what you like, what you wish we had thought to include, and what you would find interesting for future issues.

It is a great pleasure to acknowledge the cheerful assistance of so many people who have helped us bring this new publication into being. In particular, we want to thank Joan Seliger Sidney for her superb editorial assistance and Kevin Marinelli for his energetic work on the newsletter’s design and layout. Special thanks to Murray Wachman for sharing his unique perspective on the nature of mathematics — and its place in our world, nation and university — over the course of his professional career. We are sure you will enjoy reading his insights, which so eloquently illustrate our discipline’s human dimension. Finally, it is a pleasure to thank Dean Ross MacKinnon of our college for his support.

In future editions, we would very much like to include a column with information about you and fellow alumni/ae. Please send us news about yourself, and encourage others — especially any you may know of who aren’t on our mailing list for this first issue — to do the same. For now, we hope you will enjoy catching up on the Department’s doings!

Jim Hurley and Manny Lerman
gathering of probabilists and statisticians. At this meeting, the most important advances during the preceding four years receive recognition. The committee that Evarist chairs makes most of the invitations to participate. Such a responsibility comes only to people whose work is deemed high quality, and whose professional integrity and judgment are well-trusted.

The Bernoulli Society is an international professional organization for probability and statistics, affiliated with the International Statistical Institute. It seeks to develop and improve statistical and stochastic methods and their application through the promotion of international activity and collaboration. The older Institute of Mathematical Statistics, although international in scope, has traditionally been associated with the development of probability and mathematical statistics in the U.S., and publishes two of the most prestigious journals in the areas, *Annals of Probability* and *Annals of Statistics*.

Evarist came to UConn in 1990 as Professor of Mathematics and Statistics, having taught at Instituto Venezolano de Investigaciones Científicas, Universitat Autonoma de Barcelona, and Texas A&M University, among other institutions. He received his Ph.D. from the Massachusetts Institute of Technology in 1973. Among his other accomplishments, Evarist is a Fellow of the IMS, an elected member of the ISI, and a corresponding member of the Institut d’Estudis Catalans.

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**ABIKOFF APPOINTED SIGMA XI LECTURER**

Sigma Xi is a scientific research society that provides opportunities for the exchange of information among scientists in different fields. Each year, Sigma Xi names about twenty-five “outstanding individuals who are at the leading edge of science” to its College of Distinguished Lecturers for a term of two years. These scientists are invited to lecture to various groups, and to “communicate their insights and excitement to a broad range of scholars and to the community at large.”

Sigma Xi has honored William Abikoff, one of our faculty members, whose two-year lecturership began July, 1997. His lectures, *Geometry and Christmas Ornaments, Computers and Geometry*, and *Symmetry in Geometry and Physics* cover the interactions between geometry and other disciplines. In his lectures on *Symmetry in Geometry and Physics*, for example, he demonstrates the interplay between the aesthetic, geometric, and physical notions of symmetry. The lectures provide many examples of symmetries in the real world, and discuss how the existence of symmetries are postulated and how scientists search for physical objects that realize those symmetries.

In addition to this honor, Bill has been an Alfred B. Sloan Fellow, as well as holder of several grants from the National Science Foundation and the Swedish Royal Academy of Sciences. His invitations have included year-long visits to the Institute Mittag-Leffler in Sweden, the Institute for Advanced Study, and the Technion where he was a Lady Davis Senior Fellow and Visiting Professor, along with professorships or lectureships at the Universities of Paris, Perugia, and Firenze, and the Summer Research Institute of CINVESTAV in Taxco, Mexico. He has also delivered invited addresses to the Swedish Mathematical Society, the Danish Mathematical Society, and the American Mathematical Society.

Bill’s mathematical interests have centered on the interaction of classical geometry and complex analysis. In addition to numerous journal articles, he has written three books. His early interest in physics was rekindled by inquiries from physicists trying to understand the mathematics behind string theory and, later, knot theory and, in Edward Witten’s formulation, the Chern-Simons theory; his book on Teichmüller Theory is the standard reference for physicists working in that field.

Bill has extensive training in electrical engineering as well as mathematics. He received B.S. and M.S. degrees in electrical engineering from the Polytechnic University, and worked as a member of the technical staff at Bell Telephone Laboratories before returning to the Polytechnic University to pursue a Ph.D. degree in mathematics, which he received in 1970. He has served as a Joseph Fels Kitt Assistant Professor of Mathematics at Columbia University and an Associate Professor of Mathematics at the University of Illinois before coming to the University of Connecticut in 1981 as a Professor of Mathematics.
MCKENNA'S RESEARCH ON SUSPENSION BRIDGES CONTINUES TO RECEIVE RECOGNITION

One of the most widely watched films on modern mathematics has been “The Proof,” about Andrew Wiles’ solution of Fermat’s last theorem. Simon Singh, the well-known scientific journalist who directed this film, was at the UConn Co-op recently for a book-signing. Afterwards, he visited the Mathematics Department to talk to Joe McKenna about his work on suspension bridges. Joe showed him computer-generated movies, which match the famous films of the Tacoma Narrows collapse and will be part of Kristen Moore’s thesis.

It was natural for Singh to drop in on the Mathematics Department to check on recent progress since, some years ago, he had interviewed Joe for the BBC’s science program, “Tomorrow’s World”. This was part of a widespread response to Joe’s paper, published in 1990 in the flagship journal of the Society of Industrial and Applied Mathematics, The SIAM Review. Paul Davis, the chief editor, called that one of the two most commented upon papers of the decade. Stories about this article appeared in Science News, Discover, American Scientist, and the front page of the San Francisco Chronicle.

In collaboration with the Department’s differential equations and applications group, Joe has continued to work on the nonlinear partial differential equations that arise in the study of suspension bridges. Working with Yung-Sze Choi, whose undergraduate and doctoral degrees are in engineering, Joe’s research in the nineties has led to eight Ph.D. dissertations, many Master’s and undergraduate honors dissertations, as well as approximately forty research papers. His most recent paper, “Large torsional oscillations in suspension bridges revisited: fixing an old approximation,” will appear shortly in the American Mathematical Monthly. He believes it will become the definitive explanation of the torsional motions of the Tacoma Narrows Bridge.

Joe’s work is already finding its way into the mainstream of the undergraduate canon. At least five elementary differential equation textbooks list “McKenna” in their index. The most recent, by Blanchard, Devaney, and Hall, of Boston University, devotes about ten pages to the Lazer-McKenna suspension bridge model, and includes both a picture and brief biography. Joe likes the attention. “Most of us become mathematicians, hoping that we will end up in textbooks. Usually, you have to wait a couple of hundred years. I got lucky.”

Graduate Student News

by David Molnar

Last winter I attended the Joint Mathematics Meetings in Baltimore. It was good to see recent graduates Dave Pinchbeck, Sharon Hill, and Lisa Humphreys. They all seem to be fitting in well with their new surroundings. Lisa reiterated that she is still a young mathematician. Jay Caggiano was down with me interviewing; he has since accepted a position at Arkansas State University. I picked up some tips for next year — wear comfortable shoes.

Jay, Sharon and I had the opportunity last spring to speak in a “Future Colleagues” session at the MAA Northeast sectional meeting. Besides the valuable experience speaking, it was nice to make the acquaintance of Donna Beers and many others who welcomed us into the mathematical community. I recommend that grad students not think they have to wait until they get a job to go to their first conference.

Jay and Slaven Stricevic jetted out to Berkeley for a week with their advisor, Ron Blei. Jay says they were there for a Seminar on Malliavin Calculus at MSRI, but I don’t know why he feels a need to make up excuses. Burkhard Englert and his advisor, Manny Lerman, went to Leeds for the European meeting of the Association for Symbolic Logic.

Last summer, Kristen Moore was invited to an AWM Workshop in conjunction with the SIAM Meeting at Stanford; she participated in a poster session detailing her research on PDEs modeling bridge oscillations. Eun-heui Kim attended a meeting at the Santa Fe Institute on Complex Systems. Those of us who stuck around all summer took a feisty softball team into the playoffs, but were eliminated in an epic extra-inning battle. However, after a couple of hours at Willington Pizza, we completely forgot about it. We will miss Jay’s bat in the cleanup slot — if anyone has any advisees who can hit, send them our way!

Continued on page 5...
ACTUARIAL SCIENCE AT UCONN
by Chuck Vissenshauer and Walt Lawrie

Actuarial Science Rates Interest

Our nationally recognized Actuarial Science Program is making vigorous strides toward the 21st century, moving through major changes on the actuarial landscape. The most dramatic of these is an unprecedented employer demand for our majors. This year over a dozen companies have made presentations and recruited on campus, while many more have called to request resumes and to send job postings — the new first-floor bulletin board is packed with opportunities. Fortunately UConn has already taken steps to meet the demand.

Recruiting of Majors

Fall of 1997 brought in the first group of actuarial majors under an intensified recruiting program. We sent out information letters to all UConn applicants with exceptional mathematics ability, informing them about the actuarial profession and the program at UConn. In the meantime, CIGNA representatives, under the direction of Stephen Keene, were visiting high schools, illustrating actuarial concepts with their innovative Wacko Pricing Game, and telling students about the advantages of a UConn actuarial education. The result was a stellar class of 13 entering freshman actuarial majors, three of them class valedictorians. It has been exciting to watch these students brighten our calculus courses. Increased donations from ACTEX, Aetna, Arthur Andersen, Benefit Concepts, CIGNA, Guardian Life, Hartford Life, Mass Mutual, D.W. Simpson, and Travelers enabled us to support the freshman class and other actuarial majors with a record total of scholarships. We were especially gratified by two permanent endowments: The $60,000 Gordon Ashton Scholarship fund, established by Benefit Concepts Incorporated to honor a former partner; and a scholarship for female actuarial majors established through bequest by alumna Louise Cirelli O’Brien. For the first time, we asked all scholarship recipients to perform some type of voluntary community service as an appropriate way to express gratitude for their financial support.

Graduate Internships

Another exciting development will have long-term impact on our graduate program. For the 1997-98 academic year Aetna awarded two internships to Ph.D. candidates Yvonne Chueh and Frank Kang. Each internship includes a $5,000 fellowship to support graduate study. In addition, Frank and Yvonne work part time at Aetna, helping to implement
new pricing and reserving software. They are meeting regularly with Corporate Actuary Alastair Longley-Cook and Valuation Actuary (and invaluable adjunct Professor) Jay Vadiveloo to discuss the theoretical aspects of their work. We expect that two doctoral dissertations will evolve from this experience. The experiment has been so successful that plans are under way to establish six such internships annually. This partnership will give UConn a unique status among the nation’s graduate actuarial programs, while Aetna

benefits from a ready supply of bright students with actuarial skills.

Dick London to Teach

Dick London, of ACTEX Publications, will be joining us as an adjunct Professor in the fall of 1998. Dick will fill in for Director Walter Lowrie, who will be on sabbatical. Dick’s expertise on the new Society of Actuaries’ exam syllabus will help us redesign our curriculum to complement the changing actuarial education requirements.

TEACHING INITIATIVES

by Jim Hurley

The Department’s long-standing commitment to educational innovation has continued apace in recent years, and has attracted significant local, state and national recognition and support.

In 1993, the University’s Teaching and Learning Institute began to honor faculty nominated and selected by their colleagues as outstanding teachers. Chuck Vinsonhaler was among the second group of four faculty to be named University Teaching Fellows, and Jim Hurley was one of the next year’s group. Only two other departments have yet had two honorees, and Mathematics is the only one with Teaching Fellows in consecutive years.

Last year marked the end of a long period of continuous National Science Foundation support of our calculus-improvement project. An NSF Instrumentation and Laboratory Improvement grant in 1988 and a State Department of Higher Education High-Technology Award in 1989, to Jim, funded the creation of the Computing Lab in MSB 203. In 1994, Jim, Chuck, Bill Abikoff, and Jerry Neuworth attracted another State grant to update the equipment to Power Macintosh computers, and to outfit a small technology lab for the Math Center.

The major NSF support came from two grants through its Curriculum Improvement in Calculus Program. The first, covering the period 1991-93, was awarded to Jim and faculty associates Roger Hansell and Chuck, to support integration of computing activity in the main-track calculus sequence. Jim and Chuck also introduced group projects, study groups, and cooperative learning as standard features. The second grant, which encompassed 1992-97, came to Jim, co-PI Chuck, and faculty associates Roger, Bill Wickless, and Alan Stein of the Waterbury Campus. Its thrust was implementation of a technology-central modern calculus course for UConn’s High-School Cooperative Program. Teachers from 32 schools throughout the State worked with the UConn mathematicians to develop,

test, and then implement an ambitious new approach to high-school calculus. Annual August workshops provided stimulating exchange of ideas, as well as transmission of the new approach and the newly created materials by the UConn/high-school teacher collaborative.

Somehow, Chuck found time not only to continue to teach existing courses superlatively and to design, develop and test major innovations for the calculus project, but also to develop and implement a new freshman-level course (Math 102) in problem solving. This very successful course provides prospective non-technical majors experience in using quantitative methods to solve problems that confront them in their daily lives.

At present, Chuck has appointed an implementation group for both our large calculus sequences, as well as introductory differential equations (Math 211). This spring, Jim is following a trail previously blazed by Andy Haas and Yung-Sze Choi (using pre-publication manuscripts) in Math 221 (enhanced differential equations), from an innovative new text by Paul Blanchard, Bob Devaney, and Glen Hall of Boston University. This new approach spreads to Math 211 starting Fall, 1998.

Finally, Jim and Vince Giambalvo have been working with two physicists and two colleagues from the School of Pharmacy to develop a new integrated math-physics sequence for pre-pharmacy students, a project ready for classroom testing next fall.
Schmerl Receives Prize

Paul Erdős, who died at the age of 86 on September 26, 1996, was one of the preeminent mathematicians of the twentieth century. He was actively engaged in mathematics from the time he was a child prodigy in his native Hungary up to his very last hours. Not only was he a highly respected mathematician, but he was unique in his advocacy for the popularization and promotion of mathematics. He was famous for offering cash prizes for solutions to unsolved problems that he considered important and challenging. Just a few months prior to Erdős’s death, James Schmerl received one of his cash prizes for solving a problem that Erdős had proposed 30 years earlier.

To understand the problem that Jim solved, consider the following simple case. Imagine that you have colored each point on a line with one of two colors, say red and blue. All points may be colored red, for example, or all points may be colored blue, or, more interestingly, there may be infinitely many points that are colored with each of the colors. No matter how you color the points, you can always find three of them, say A, B, and C, all having the same color, with B the midpoint of A and C. (This can be seen with a little ingenuity: try it.) Now, instead of coloring a line, imagine coloring all the points in a plane with two colors. You will then be able to find three similarly-colored points A, B, and C, which are the vertices of an equilateral triangle. (If you figured out the problem on the line, try this one; it’s just a little harder.) Such an equilateral triangle can be referred to as “monochromatic”: Monochromatic equilateral triangles can also be found if the number of available colors increases to 3, 4, 5, or even to any number, as long as it’s finite. If you were to use 100 colors, it would be difficult to think of 100 different names for the colors (unless you worked for Revlon or Crayola), so you could instead designate them \( c_1, c_2, c_3, \ldots, c_{100} \). Now suppose that you had infinitely many colors available, say \( c_1, c_2, c_3, \ldots \), and so on. Erdős asked if, under these conditions, you could still expect to find a monochromatic equilateral triangle. He suspected not, but could not prove it. He even suspected that there would not always be a monochromatic isosceles triangle. Prior to 1996, there were a dozen or so published papers on this question, giving various partial answers. In a paper published in the Mathematical Proceedings of the Cambridge Philosophical Society in 1996, Jim proved that you can color the points in a plane, using the infinitely many colors \( c_1, c_2, c_3, \ldots \), in such a way that there are no monochromatic isosceles triangles. Moreover, the proof shows that you could also color the points in 3-dimensional space, or even in 4-dimensional, 5-dimensional, and all higher dimensional spaces, so that there are no monochromatic isosceles triangles.

The Erdős legacy includes other problems, some of which are unlikely to be solved in our lifetime.

Jim received both his B.S. and Ph.D. degrees from the University of California at Berkeley, and joined the UConn faculty in 1972, after spending two years at Yale University as a Gibbs Instructor. His area of research is mathematical logic, and he has received several research grants from the National Science Foundation.

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STU'S PUZZLE CORNER

For what positive integers \( a, b \) and \( n \), if any, is it the case that the sum

\[
S(a,b,n)=\sum_{k=0}^{n} \frac{1}{a+kb}
\]

is an integer?
MATHEMATICS DEPARTMENT RECEIVES GRANT TO DEVELOP PEDAGOGY COURSE

The Mathematics Department has received a grant of $2000 from the Institute of Teaching and Learning to develop a course in pedagogy for new Teaching Assistants. The course was offered for the first time in Fall 1997 on an experimental basis, and will be revised and offered again next year. We aim to have it become a permanent component of the training of Teaching Assistants in mathematics, and the grant was awarded with the expectation that the course will serve as a model for similar courses in other departments within the University.

In the past, most graduate departments have not taken the time to train TAs before placing them in front of a class. (Training programs for UConn TAs have existed for nearly two decades, but they haven't been universal.) This trend is now being reversed nationwide, and the UConn Mathematics Department is at the forefront of training-program development.

Students receive preliminary training during the week before classes start, and then continue with a six week training course. The course begins with theoretical discussions about the different modes of learning, and of techniques for reaching students with different learning modes. These techniques stress interactive models of learning, and how to implement them. TAs keep journals that describe the techniques they have tried, and the level of success they have encountered. Their classes are also videotaped. They then meet with master teachers to discuss the tapes and journal, and to interactively discusses how to make more effective use of the class time. Our faculty members working on this project are David Gross, Jim Hurley, Chuck Vinsonhaler, and Bill Wickless, along with Tom DeFranco at the School of Education.

Students who took the course in Fall 1997 had the following comments about their experiences: "I am more willing to experiment in class. I am more comfortable. It made me more open-minded about my teaching." "I thought it was really helpful. There was a lot of peer support." "I thought the seminar showed me alternatives for instruction. If you don't have seminars like this, how are people ever going to change?"

The Mathematics Department has approximately 45 TAs who teach lower division courses, under close faculty supervision. Most receive very good evaluations of their teaching, both from faculty and students. Each year, approximately 10 new TAs are appointed, most of whom are pursuing a Ph.D degree. Our Department has an excellent record of placing students who have completed their Ph.D degrees. Many are appointed to positions in colleges and universities that place a heavy emphasis on teaching, and their UConn training provides excellent preparation for such positions. TAs gain experience both in teaching in group learning settings, and in the use of technology to teach mathematics. The addition of this pedagogy course will further enhance their training.

UCONN INITIATES MATHEMATICS SCHOLAR PROGRAM

by Stu Sidney

The Mathematics Scholar Program is an effort by the Mathematics Department to provide an enriching experience for especially promising undergraduate mathematics students (not necessarily mathematics majors) by offering courses that help develop their talents and are commensurate with their abilities. The Program was introduced by UConn faculty members Manny Lerman, Gene Spiegel, and Stu Sidney, who serve as its directoring board, with Stu as Chair. With the Mathematics Scholar Program, the Mathematics Department hopes to accomplish at least four things:

- Offer talented mathematics students superior courses that will interest, stimulate, and challenge them.
- Help these students to sharpen their analytical skills; this
- will serve them well in their futures, no matter what interests they pursue.
- Give our best mathematics students an academic setting in which they can interact productively.
- Develop a programatic option that will attract mathematically gifted high-school students to UConn.

The first course designed for the Program was Combinatorics, taught by Jim Schmerl during the Fall 1996 semester. This was followed, in Spring 1997, by a Seminar on Numerical Analysis from Miki Neumann, and in Fall 1997, Elements of Topology offered by Jeff Tollefson. Last spring, Stu taught Problems and Their Role in Mathematics, while a course in probability with Evarist Giné is being offered in Fall 1998.

Students taking "post-calculus" mathematics courses are selected for the Program on the basis of academic record, faculty nomination, and other indications of distinction. They are offered at least one specially designed course.

Continued on page 9...
Continued from page 8: Mathematics Scholar

Each semester during their junior and senior years. These courses explore mathematics in greater depth than more conventional courses, and they demand considerable active participation on the part of their students. Small classes allow instructors to give individual students the attention they deserve. Students who complete three of these courses and perform satisfactorily on a suitably challenging national or internal competition (e.g., the William Lowell Putnam Mathematical Competition or the UConn Calculus Competition) earn the Mathematics Scholar designation.

The Honors Program and the Degree with Distinction Program, both University-wide, are well served by the Mathematics Scholar Program, inasmuch as its courses automatically qualify for Honors credit. In most cases, the Mathematics Scholar Program courses provide an option superior to conversion of a conventional course to Honors status.

Pavel Okunev, scheduled to graduate in May 1999, took the Math Scholar Course, Numerical Analysis with Miki in Spring 1997, then Problems and Their Role in Mathematics with Stu, and expects to take more. He has found the program courses “more challenging” and the content “interesting”. On a more personal level, he says that one reason he has enjoyed the courses is that “I like the idea of complete proofs”.

RETIREMENTS

Three members of the Department retired in 1997: Professors Soon-Kyu Kim, Jerome H. Neuwirth, and Murray Wachman. Each served the University with distinction, and moved into retirement with the gratitude and best wishes of their colleagues and students.

Soon-Kyu came to Storrs in 1969 after three years of teaching at the University of Illinois, where he went after completing his Ph.D. at the University of Michigan. His research areas include Hurewicz fibering, group actions on manifolds, Nielsen fixed point theory, and Morse-Conley index theory. While at UConn, Soon-Kyu supervised four Ph.D. students and was the advisor for many Masters students. From 1985 through 1988, he served as Associate Department Head for Graduate Programs, and became Head of the Department in 1988. He held that position until his retirement last August 1. His twelve-year period of leadership was a major factor in the growth of our graduate program. Beyond the University, he has served as a member of the editorial board of two Korean mathematical journals and as President of the Korean-American Association of Scientists and Engineers. He continues to maintain an active schedule as Professor Emeritus: throughout the year he is teaching a course, and supervising his doctoral student’s research.

Apart from sabbaticals at the Mittag-Leffler Institute, Orsay, and Delft, Jerry Neuwirth has been a member of the Department since 1967. After obtaining his Ph.D. from MIT in hyperbolic equations and singular integrals under the direction of A. P. Calderon, Jerry taught at Rutgers and Hunter College before coming to UConn. Although “retired,” he continues his research in dynamics of inner functions and general Benford laws for continued fractions. Like Soon-Kyu, he also teaches one course for the Department each semester, and continues to be an active analysis seminar participant and speaker. He relishes the freedom from mundane duties that retirement brings, and welcomes the additional time it makes available for research. His irrepressible presence still enlivens the lounge at colloquium teas, lunch, and other impromptu gatherings.

Murray Wachman joined the Department the same year as Jerry. Your editors have prevailed upon Murray to write an account of his career that personalizes his long and dedicated service to us, and supplies prior background, far better than anything we could add here. However, his modesty does lead to some understatement of his many substantial contributions. One small example: besides the customary faculty gathering on the occasion of his retirement, the graduate students organized their own farewell/thank you party in his honor. The sincere expressions of appreciation to him by both colleagues and students for his dedicated and distinguished work as Associate Head for Graduate Programs spoke eloquently of the success he achieved in that office.

Soon-Kyu Kim

Jerome Neuwirth

Murray Wachman
RECOLLECTIONS
FROM A CAREER IN MATHEMATICS

by Murray Wachman

After graduating from Brooklyn College with an undergraduate degree in mathematics in Fall 1952, I enrolled at the Courant Institute for my graduate work. At that time, there were very few employment opportunities for mathematicians, and still fewer for Jewish mathematicians. An uncle of mine told me that I was doing something very foolish by going for graduate studies in mathematics. In fact, he himself had gone through graduate studies at Columbia University in economics and ended up a jewelry manufacturer. But I loved mathematics, and decided to go on to graduate work anyway.

I did not even get a chance to complete my first semester at the Courant Institute, however. Because we were in the middle of the Korean War, I was drafted into the Army. Although local draft boards would allow students to finish college, only students pursuing degrees in essential disciplines were allowed to go on to graduate school. So I spent one year in Alabama, and another in Germany. In those days, Germany was a very tense place. Due to the Cold War, the U.S. was trying to build some sort of a German army, largely composed of the same soldiers who had served Hitler. Only a fence separated this German army camp from our camp, and I was very uncomfortable with their presence.

After my Army service, I continued my graduate studies at Courant. My Master’s Degree was in algebra, and I did my thesis with Professor Wilhelm Magnus on the theory of valuations. Then I decided to switch to partial differential equations for my Ph.D., and I worked with Professor Fritz John. My thesis was on Fundamental Solutions of Elliptic Partial Differential Equations with Analytic Coefficients.

My initial decision was to work in industry. It is difficult now to imagine what the competition between the U.S. and the Soviet Union was like during those intense times of the Cold War. There was a constant fear that this conflict would escalate to atomic war. Our country was urgently trying to build its military-industrial complex. After the USSR launched Sputnik in 1959, we responded with a massive program to enlarge our technical capacity, as well as to educate and interest American youth in the scientific disciplines. To understand the magnitude of this task: when I graduated from the Courant in 1961, one of the most prestigious graduate departments of mathematics in the country, there was only one other Ph.D. student in mathematics graduating that year.

My first position was with Republic Aviation in Farmingdale, Long Island. They were building the F-105, the plane that performed a special maneuver in releasing its bombs, and I worked on computing trajectories for those bombs. Later, I also worked at Republic on computing reactions in nuclear reactors, and as the space race intensified, I started work on computation of initial conditions necessary to launch satellites into Earth orbit. With my increased interest in the space program, I decided in 1960 to join the General Electric Space Sciences Department in Valley Forge, PA. After Sputnik, President Kennedy set a goal for a manned lunar landing in 1969, which became a major project for my department at G.E. At first, I worked in a mathematical group to study and design the computation of the moving two-point boundary value problem that defines a trajectory from the Earth to a lunar orbit. Later, since a spacecraft spends much time in a rarefied gas environment, there was much interest in the spacecraft’s interaction with such an environment. I soon became manager of a mathematical group with two subgroups: one of mathematicians, and the other, of programmers.

Increasingly, however, I came to feel that I was becoming isolated mathematically, that the work was mathematically very narrow, and there was no mathematical culture in the laboratory. At considerable financial sacrifice, I moved my family to Storrs, in 1967, to join the UConn Mathematics Department. At that time, both the University and the Department were experiencing rapid growth and expansion. When I arrived, the Mathematics Department was located in the Humanities Building. We moved to Beach Hall shortly afterwards, and to the Mathematical Sciences Building in 1974. Those were exciting times. With our large number of newly-hired faculty, we developed a richer and more rigorous curriculum. Among our most important tasks was to build a solid graduate program. For several years, while we were in Beach Hall, I headed the graduate program. The projections, as we were planning the Mathematical Sciences Building, were for the Department to more than double the size of its graduate program. A large space was reserved for graduate students on the ground floor of this building, but due to a shortage caused by the University’s expansion, this space was instead allocated to the Computer Science Department when the building was finished. Finally, today, UConn 2000 is addressing our space problem.
In the Beach Hall period, in addition to the departmental duties, I maintained my research on partial differential equations, and consulting to G.E. on the Boltzmann Equation. After the move to the Mathematical Sciences Building, I continued with my research on mathematical modeling of biological processes. I also became a consultant to the Naval Underwater Systems Center in New London. My work there involved the partial differential equations governing Hydro-Acoustics, to study how to make submarines as quiet as possible in their travel through water. The numerical computations eventually became so extensive, that the Cray supercomputer was necessary to carry them out. Obtaining these solutions was challenging, both mathematically and numerically.

For many years, Professors Shelley, Tomastik, and I worked towards establishing a significant applied mathematics presence in the Department. As faculty with interests in applied mathematics joined the Department, they also joined in this effort.

During the last years of my career at UConn, I became the Associate Department Head for the Graduate Program. The graduate program had already begun to grow substantially. I worked to make the graduate administration office efficient, and to systematize data collection. Efforts were made to improve communications between the faculty and the graduate students, and to obtain input from the graduate students about various aspects of the program. The Graduate Committee worked hard to keep developing the program's academic and social structure. Special efforts were made to create an atmosphere in the Department that would be friendly and nurturing for the students. We expanded the recruitment of our graduate students both domestically and internationally, during my tenure as Associate Head. Throughout this period of time, I was privileged to work with some very talented Graduate Committee Heads, and with a Department Head who deeply cared about the graduate program and its students.

**CHANGES ON CAMPUS**

UConn 2000 continues to change the face of campus near the Mathematics Department.


The new Chemistry building viewed from the Mathematics Department. The Central Warehouse (center right) is dwarfed by Chemistry.

Construction has started on the new Biology/Physics wing of the Gann Science Complex.

Work underway for the new centralized Heating/Cooling plant next to Engineering.
Mathematics
PLEASE LET US HEAR FROM YOU!

Your editors hope you found this inaugural issue informative and interesting. Among the raft of items that come to our mailboxes (both real and virtual), some are actually welcome. We would like our newsletter to earn a place in that category, but can succeed in that goal only with your feedback. Please let us know what you liked, what you wish we had included, and what we can consider reducing or removing.

One feature we are planning is news about former colleagues and students, for which we will rely on your input. Please use the form below to tell us about your accomplishments, report any errors in the address label, and tell us your reaction to this publication. You can mail it to the Department, or if more convenient FAX it to (860) 486-4238 to the attention of the Newsletter. Many thanks for your help!

Name: ______________________ Years at UConn: __________

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Faculty/Staff _____

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Is your address correct on the label? _______ (If not, please include it with corrections.)

Best feature(s) of this newsletter: __________________________________________

What would you like to see more of? _______________________________________

What could we reduce or eliminate? _________________________________________

What did we forget to include? _____________________________________________

News about yourself for next issue's "Alumni Items":

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