Summary of Department

Activities–Mathematical Sciences

Overview

First, here are some highlights of personnel developments. Among tenure track faculty, Dr. Elizabeth Gasparim was awarded tenure and promoted to associate professor, and Drs. John Harding and Irena Swanson were promoted to full professor. Ms. Alyne Fulte was appointed director of the Mathematics Success Center.

Highlights of the developments in the area of curricular activities are as follows: In spring 2005 the Department offered three on-line mathematics classes, and in fall 2005 the department offered one on-line mathematics class. Members of the faculty continued to develop the curricula for summer academies for middle school teachers, which were offered in Las Cruces, Carlsbad, Ruidoso, and El Rito. The headcount of students enrolled in mathematics and statistics courses at all levels declined from 4065 in October 2004 to 3803 in October 2005. However, the headcount in graduate level courses rose from 137 in October 2004 to 187 in October 2005. This growth is largely due to the offerings of courses on mathematics for teachers pursuing the Master of Arts in Teaching degree administered by the College of Education. The Teaching Committee continued its series of teaching colloquia through the year.

Concerning research and creative activity, nineteen faculty members reported sixty-nine refereed publications appearing in 2005. Many more faculty members were active presenters at conferences and universities worldwide. Dr. Jens Funke was invited to participate in a special research semester at the Centre de Recerca Matematia in Spain for fall 2005, and Dr. Adam Sikora was invited to be a fully-supported research visitor at the Australian National University.

The number of students declaring the mathematics major or declaring the supplementary major in applied mathematics rose from 56 in Fall 2004 to 74 in Fall 2005. The number of majors rose by 5 and the number of supplemental majors rose by 13. The number of graduate students stayed roughly constant at 38.

More members of the faculty than before are participating in efforts to improve the content knowledge of mathematics among middle school and high school teachers. Faculty members provide quality service to the profession through editing, refereeing, and reviewing, as well as in the administrative activities of the professional organizations. Faculty members are also involved in on-campus service activities.

More details on these highlights are provided below.

Personnel Developments

In Spring 2005 Dr. Elizabeth Gasparim was awarded tenure and promoted to associate professor, and Drs. John Harding and Irena Swanson were promoted to professor. There were
no promotions among college-track faculty. Kitty Berver left her position as director of the Mathematics Learning Center for a position in the office of the vice provost for distance education Carmen Gonzales, and Alyne Fulte was named her successor. Dr. Mai Gehrke and Dr. Jerry Lodder were on sabbatical leave in the spring of 2005 and returned in the fall. Dr. Adam Sikora was on leave without pay in the spring of 2005 to be a visiting researcher at the Australian National University, and Dr. Jens Funke was on leave without pay to be a visiting researcher at the CRM in Bellaterra, Spain.

This fall Drs. Ernie Barany and Joe Lakey are candidates for promotion to full professor. Dr. Guram Bezhanishvili is a candidate for promotion to associate professor. Drs. Tiziana Giorgi, Maria Cristina Mariani and Robert Smits are candidates for promotion to associate professor and for tenure. The Department conducted a comprehensive third year review for Dr. Mary Ballyk.

**Curricular Activities**

In 2005 members of the Department continued experimenting with distance education. In spring 2005 Dr. Martin Krupa offered on-line sections of Math 392—Differential Equations and Math 480—Vector Spaces and Matrix Algebra, repeating courses he offered in fall 2004. Members of the Department taught two more courses directed at teachers pursuing the Master of Arts in Teaching degree program administered by the College of Education. In spring 2005 Dr. Linda Zimmerman offered a course on mathematical modeling using linear functions, and in fall 2005 Dr. Tony Wang offered a course on probability and statistics. Dr. Wang’s course attracted the largest enrollment of any course offered so far in support of the MAT degree. Math 480 is very popular with advanced undergraduate engineering students. Since many of these students go on cooperative arrangements, it should be advantageous to make an on-line section of Math 480 a permanent feature of the schedule. Dr. Mariani offered a pilot version of a course on portfolio management, which is one of two new courses planned to form the nucleus of a program in financial mathematics. Other courses in mathematics and statistics currently in the catalog are used to fill out the program.

Members of the Department are concerned about the preparation of teachers at all levels. Professors Baggett, Morandi, and Stanford taught sections of Math 111 or 112 in 2005, demonstrating the interest of tenure-track faculty in the training of elementary school teachers. Dr. Baggett continues to offer partnership courses for elementary school teachers. Part of the technique is to partner the pre-service teachers with in-service teachers to develop, try out, and evaluate instructional materials. Dr. Salamanca-Riba continues to co-lead a "Professional Development and Outreach" program (PDO) for high school teachers in the area. This is supported by the NSF through a subgrant administered by the Park City Mathematics Institute in Utah. In summer Dr. Salamanca-Riba and teachers attend a workshop in Utah. The main object of the program is to train a cadre of teachers in the use of an effective technique called the "Japanese Lesson Study" method. These teachers then train other teachers in their own schools. Throughout the year, workshops are held for the teachers to share ideas and experiences. We are concerned about our own preparation of students for the New Mexico Teachers’ Assessment content knowledge test in mathematics, where the results are not impressive. We believe that some mathematics majors attempt the test without specific knowledge of the test format and content, and their lack of preparation for the test hurts the results. There were Summer Academies for middle school teachers in Las Cruces, Carlsbad,
Ruidoso, and El Rito. Participating faculty members included Dr. Douglas Kurtz, Dr. Bruce Olberding, Dr. Ted Stanford, Dr. Tony Wang, and Dr. Linda Zimmerman.

This work was supported by the grant Mathematically Connected Communities administered by the College of Education. Members of the Department of Mathematical Sciences are on the advisory board. The grant mission is to improve student achievement and the teaching and learning of middle school mathematics by building a statewide learning community of mathematics educators, mathematicians, and public school leaders. More specifically, the purpose of our grant is to provide middle school teachers in New Mexico with quality options for meeting "highly qualified" status. Activities are funded through a grant from the Public Education Department (PED) and Math-Science Partnership (MSP) funds. The project is a partnership between the College of Education and the Departments of Mathematical Sciences at NMSU and WNMU. The current community includes partnerships with 26 school districts. Professor Baggett offered a pilot version of a course of hands-on activities to promote the teaching of calculus to high school students in fall 2005. This course proved to be of interest to regular mathematics graduate students, as well as to secondary mathematics education majors and in-service teachers. She has applied for grant support to develop the material further.

Concerning other courses, the following items are high points of the year’s activities. In the fall members of the tenure track faculty joined members of the college track faculty and worked hard on the redesign of the Math 115 and Math 185 courses. Answering a call for proposals from the Dean, the Department successfully competed for funds to introduce new ways of administering the courses and to train faculty members for the change over. Yet more work needs to be done, but the reorganization will enable us to meet the state requirements for general education and common core courses at the level of college algebra. The Liaison Committee has surveyed client departments and colleges of students who take Math 115 and Math 142, and will present the findings in Spring 2006.

The faculty reviewed textbooks for the main calculus sequence in the spring of 2005 and chose to continue with the new edition of the previous book. Then, in fall 2005, the Department introduced iLrn interactive tutoring software in the courses Math 191 and Math 192 as a matter of policy and in Math 291 and Math 391 by instructor choice. The software enables instructors to make online assignments which are completed by the students on line, as well. Answers are checked automatically and instantly, so students receive instantaneous feedback are challenged to keep at routine calculations until they do them perfectly. Math 191 instructors are very satisfied with the results, but Math 192 instructors reported students having problems working with the program. We believe this is related to the fact that the material in Math 192 is somewhat more complicated than that in Math 191, and that entering answers so iLrn can read them takes a bit more skill. We continue to explore introducing 4 credit versions of Math 191 and Math 192. Accompanying this is a plan for a new course Math 190 (Pre Calculus with Trigonometry, tentatively) that selects material currently found in Math 185 (College Algebra) and Math 180 (Trigonometry) and presents that which is absolutely essential for Calculus. Math 190 would meet 5 times a week and be for 4 credits. Thus students who now take Math 180, Math 185, Math 191, and Math 192 would take Math 190, Math 191, and Math 192, earning the same number of credits, but completing the sequence more quickly.

Discussions of ways to improve our introductory courses in modern algebra and analysis continued in 2005. For modern algebra, Drs. Morandi and Finston submitted to a publisher a draft of a new book to introduce abstract concepts through familiar applications and uses
software to perform calculations in structures that generalize the familiar number systems. For
analysis, Dr. Kurtz continues to work on a text to better address the needs of our students.

Members of the faculty interested in the sequence of algebra courses for graduate students
studied the outcomes assessment reports on the graduate program and decided to revamp the
current four courses into three by eliminating some specialized topics and shifting the
emphasis in the first courses to material that serves a wider audience of graduate students.

Faculty continue to use technology for teaching purposes in many ways. Computer
demonstrations using a portable PC or laptop and a projector remain one of most popular tools.
Although portable equipment is unwieldy, we have been forced to retreat from permanent
installations in regular classrooms, which are often unlocked when few people are around.
One installation was destroyed and the projector stolen last year. On the other hand, the
Departments of Computer Sciences, Mathematical Sciences, and Psychology shared in the
expense of installing a computer podium, projector, and sound in Science Hall 107, a room
which normally remains locked. Faculty who use the new equipment are pleased, but it
requires an investment of time and practice to use the devices efficiently. Thanks to the
introduction of the iLrn software in calculus, more students are visiting the laboratories. We
thank the Dean’s office for continued support by providing instructional equipment funding
that enables us to keep the machines up to date.

Members of the Department also participate in the Honors College and in the General
Education programs. Dr. Pat Baggett served on a state-wide committee charged with
developing new general education and common core requirements. Faculty members taught
the Honors courses "Spirit and Evolution of Mathematics" and "Great Theorems: The Art of
Mathematics".

**Teaching Improvement**

In both spring and fall 2005 the Department’s Teaching Committee conducted an extensive
program of peer reviews of instructors. Members of the Teaching Committee also provided
advice to candidates for promotion and tenure in 2006 on the preparation of the teaching part
of their portfolios. Throughout the year the Committee organized teaching colloquia,
averaging about one panel discussion per month.

Dr. Tony Wang participated in the ITAL program offered in summer 2005, using what he
learned to offer an online course in probability and statistics for middle school teachers that
attracted about 20 students. Throughout the year members of the Department participated in
Teaching Academy activities, with Dr. Amal Mostafa earning an award for the amount of
effort she has put into supporting the Academy by participation. Dr. Mostafa also attended the
boot camp for professors in Colorado in the summer of 2005.

Graduate students and talented undergraduates continue to serve as tutors and graders in
the Mathematics Success Center. Math 308 is designed to provide them with the necessary
training. Along with 4 credit calculus, members of the Department are discussing alternative
ways of utilizing the graduate assistants. The one-on-one experience enables foreign students
and students from other parts of the country to get to know the characteristics of
undergraduates here at NMSU. Then they are better equipped to deal with the students when
they are teaching a section of a regular course.

College track faculty also invest time and effort in teaching improvement activities. Many
are members of the American Mathematical Association of Two Year Colleges (AMATYC)
and the New Mexico Mathematical Association of Two Year Colleges (NMMATYC), the National Council of Teachers of Mathematics (NCTM), the Mathematical Association of America (MAA), and the Society for Industrial and Applied Mathematics (SIAM). Several college track faculty attended national and regional meetings, and a few presented at the regional meeting of the MAA held in El Paso in April, 2005. College track faculty members participate in the advising activities in the Colleges of Arts and Sciences, Business Administration and Economics, and Engineering. They also serve on the two liaison committees, one for the Dona Ana Branch and another for other units of NMSU. Mr. Greg Allison and Dr. Linda Zimmerman taught sections of Math 115 using "Math in Action" material, which is a problem-based learning curriculum for college algebra. Various modes of assessment of student learning, such as writing, presenting, and oral discussion, are built into the material and provide a more complete picture of student learning when combined with test results. The results for the students look very promising, even after one semester. This curriculum seems particularly well-aligned with standards for college algebra, expected to be published by the MAA in summer or fall 2006.

Mr. Allison and Ms. Fulte are also expected to contribute to the implementation of statewide placement testing for students going on to college in New Mexico. Properly placing students has been a problem for a number of years, and the three course sequence replacing Math 115 and Math 185 is expected to address a large part of the problem.

Dr. Susana Salamanca Riba, Dr. Lisa Snow, (College of Education) and Ms. Kathe Kanim (College of Engineering) continued their grant supported activities to develop Professional Development and Outreach groups for high school and middle school teachers in New Mexico. The project began in 2004, when a group of teachers accompanied the three to the Park City (Utah) Mathematics Institute for a workshop in summer 2004. They attended another workshop in summer 2005.

**Student Advising**

Student advising is handled by special department committees, except for the advising of dissertation students and honors undergraduate students. Undergraduate mathematics majors are advised by members of the Undergraduate Mathematics Majors and Minors Committee. This committee nominates mathematics majors for College of Arts and Sciences awards and reviews applications for scholarships from mathematics majors. Advising of graduate students is coordinated by the Graduate Studies Committee, which also makes recommendations for graduate assistant appointments, coordinates comprehensive examination preparation and grading, and updates our graduate course offerings. The Graduate Studies Committee has instituted a real system for tracking the programs of students. From the tracking we hope to make our scheduling of classes more efficient and to change the culture of the graduate students, so that they learn to register well before the beginning of the next semester. The committee also hopes to improve the mentoring of students, by obtaining early warning of a student having difficulty with a course, so that an appropriate intervention can be applied.

The Department sponsors a chapter of the undergraduate mathematical honor society Pi Mu Epsilon. Through meetings and activities of this organization, undergraduates get acquainted with faculty on a more informal basis and with graduate students. Dr. Caroline Sweezy and Dr. Adam Sikora coached students interested in the prestigious Putnam Examination, a national
competition sponsored by the Mathematical Association of America. Dr. Robert Smits is coaching and advising students interested in the actuarial examination sequence. Under his tutelage students successfully completed the third actuarial exam, which is regarded as the most mathematically challenging of all the examinations. Members of the department advise for the College of Arts and Sciences Advising Center, and advise some secondary mathematics education majors. Dr. Caroline Sweezy handles most of the advising for Supplementary Majors in Applied Mathematics (SMAM).

As mentioned in the overview, the number of students declaring the mathematics major or declaring the supplementary major in applied mathematics rose from 56 in Fall 2004 to 74 in Fall 2005. The number of majors rose by 5 and the number of supplemental majors rose by 13. The Department promotes vigorously the SMAM program, and we seek growth in the regular major as well. We have noticed that a bachelor’s degree or master’s degree in mathematics qualifies a student to apply for many positions titled "engineer", and we need to get the word out to more students at the beginning of their careers. The point is that majoring in mathematics and becoming a "universal problem solver" provides a student with a wider variety of career options than any particular branch of engineering. We hope to start a newsletter to make this point to students in our calculus classes. We are pursuing avenues toward a program in biomathematics jointly with members of the Department of Biology. Reconstructing the undergraduate program webpage and then the catalog entry to describe the mathematical sciences core, plus options in pure mathematics, applied mathematics, actuarial mathematics, probability and statistics, mathematics education, mathematical biology, and other options to take an undergraduate to the bachelor’s degree with the training they need for their careers after graduation.

**Graduate Studies**

Graduate enrollment in the department amounted to 39 mathematics graduate students enrolled in master’s and doctoral programs by the end of Fall 2005, far below the record of 48 students set in 2001. Twenty four of the students are mail and fifteen are female. Twenty are US citizens and fourteen are foreign. Four of the male American students and three of the female American students are from underrepresented minority groups. The Department is home to two AGEP fellows, one of whom is also a recipient of a Ford Foundation Diversity Pre-doctoral Scholarship. Between 2002 and 2004 applications for graduate study from the Middle East completely disappeared, but it is possible that they are returning. In any case two new students from the Middle East will be joining the program in the spring of 2006. One student returned home to Vietnam in summer 2005, where his application for a visa to return in fall 2005 was denied, and he now says he plans to return in fall 2006.

**Undergraduate Program**

Near the end of the fall 2005 term, Institutional Research, Planning, and Outcomes Assessment reported 74 majors, second majors, and supplementary majors in applied mathematics. This total is up from 56 at the corresponding time in fall 2004. The number of majors increased from 35 to 37, double majors from 7 to 10, and supplementary majors from 14 to 27.

In spring 2005 there were 3 bachelor’s students graduating with a major, 2 with a
supplementary major, and 5 master’s degrees. In fall 2005 there was 1 bachelor’s student graduating with a major. Six students from outside the College of Arts and Sciences had met the requirements for the supplementary major in applied mathematics, and were expected to graduate.

Concerning earlier graduating mathematics majors, Will DiCharry (May 2004) and Lance Miller (May 2003) are in the graduate program at the University of Connecticut. Miller is expecting to complete a Ph.D in Mathematics in 2007, and he is also pursuing a Ph.D. in computer science. Outstanding international graduating senior Matej Danter (May 2004) is expected to finish a master’s degree in 2006. Vakhid Masagutov (May 2003) continues as a graduate student at Purdue University, which he entered in Fall 2003. Year 2002 graduates Sarah Ellis, Richard Eric Moreno, and Charles Mundy-Castle continued the study of mathematics here at NMSU, completed requirements for master’s degrees in 2004, and are now employed by the Department of Mathematical Sciences.

In 2005 the Undergraduate Mathematics Majors and Minors Committee was able to sustain the diversity and number of students receiving scholarship money from the department’s scholarship resources. We sent 6 undergraduates, one graduate student, and a faculty advisor (Dr. Maria Cristina Mariani) to the third Arizona Mathematics Undergraduate Conference held at Northern Arizona University in October. Some students offered short presentations about undergraduate research projects in which they had been engaged, and the graduate student participated in a panel discussion on graduate study in mathematics. The trip provided an opportunity to renew the contact with Mesa Community College, which has an active mathematics club and a faculty sponsor who is trying to place students into effective undergraduate programs. Our attempt to arrange a winter visit in February, 2005, failed, but the Department expects to try again. We also learned of a Texas Undergraduate Mathematics Undergraduate Conference held at Sam Houston State University also in October. The Conference put out its invitation two weeks before the event, which was not enough time to organize students and a faculty advisor. We still need to track recent graduates better than we now do.

Outreach

The Department engages in outreach activities both within and external to the University. The Liaison Committee was established in 1997 to contact faculty members from client departments and from branch campuses for their feedback concerning the content of mathematics courses. In fall 2005 the liaison committee sent a survey to several departments in the Colleges of Business Administration and Economics and Health and Social Services. Results of the survey will be disseminated and discussed in spring 2006. Our recent effort with Computer Science to develop a new course CS/Math 278 on discrete mathematics for their majors continues to refine the course. Not all material that one would like to include in such a course actually fits, so we expect to begin discussions to bring about a 300-level sequel that can be profitably taken by both computer science and mathematics majors. A grant awarded by the National Science Foundation to Drs. Bezhanishvili, Lodder, and Pengelley in Mathematical Sciences and to Drs. Leung and Ranjan in Computer Science is closing out this year and has resulted in new course materials based on original historical sources in discrete mathematics of interest to computer scientists. In spring 2005 the Undergraduate Curriculum Committee involved faculty members from the College of Engineering in their discussions about the new
calculus book and accompanying iLrn software for the scientific and engineering calculus sequence Math 191, 192, and 291.

Educational outreach activities included visits to area schools and further development of an on-line high school mathematics contest, which takes place in the spring. Contest winners are invited to an award ceremony at NMSU in April, with prizes offered by MacKichan software and the Department. The spring 2005 contest involved teams from schools in Las Cruces and El Paso; interest in the spring 2006 contest appears to be running ahead of last year.

Statewide mathematics and English placement testing for New Mexico high school seniors bound for college in New Mexico is slowly becoming a reality. Mr. Greg Allison and Ms. Alyne Fulte made themselves available as technical consultants in the fall of 2005 and expect to continue in spring 2006.

The Department participated in many recruiting activities for the university. A faculty member is designated as coordinator of Visitors’ Day activities. We participated in all Aggie Experiences, and in Visitors’ Day and the Majors Fair as fully as possible. The Recruiting Committee has proposed getting the undergraduates who are involved in undergraduate research involved in the Spring 2006 Visitors’ Day activities. Their presence would complement that of members of the Undergraduate Mathematics Majors and Minors Committee, who conduct interviews and lead tours of the Department for visitors.

In 2004 we had a newsletter that complemented activities of the NMSU Mathematics Alumni Association. The Association has a web page and posts news items occasionally. The Association and the Department sponsored a reception at the Joint Mathematics Meetings of the American Mathematical Society and the Mathematical Association of America held in Atlanta, GA, in January 2005. Attendance at the event was surprisingly large, given the distance to the event from locations where one expects to find most NMSU alumni. In fall 2005 the Department formed a small development committee and charged the committee with collecting items for the newsletter and preparing copy, but a second newsletter has not yet appeared. A newsletter is essential to the formation of a larger community with an interest in the activities of the Department. We would also send copies of the newsletter to high schools throughout the state. The goal is to assist in recruitment and to reach some of the secondary mathematics education majors, most of whom have taken many courses in the Department of Mathematical Sciences.

Associate Vice President for Enrollment Management Brad Bankhead has said it is possible for us to obtain lists of students taking the ACT and indicating an interest in a mathematical science, whom we could then contact by mail or telephone. If this can be accomplished, then we can try to raise the number of students enrolling in NMSU with an initial major in mathematics.

Research and Other Scholarly Activities

Members of the Department were productive researchers. Included with this summary is a listing taken from faculty annual reports that shows nineteen members of the tenure track faculty reported sixty-nine works appearing in print in 2005. This list comprises papers appearing in refereed journals and conference proceedings, books, and some articles written as special assignments. Reviews are not customarily included on this list, although a long and thorough review requires a significant investment of effort to produce. Two faculty members
published books in 2005 (included on the list): Dr. Nguyen saw the third edition of one of his books appear, and Dr. Lakey saw a new research monograph appear. Faculty members delivered many talks at conferences and at other universities.

Members of the Department conduct joint research with mathematicians at other institutions in Europe, South America, Asia, and Australia. Some highlights of this activity include Dr. Gehrke’s visits to Oxford, England, and universities in Denmark while on sabbatical, and Dr. Lodder’s visit to the University of Southern California while he was on sabbatical. Dr. Gasparim visited research institutes in Germany and in Russia in summer 2005. In spring 2005 Dr. Adam Sikora was on leave without pay to visit the Australian National University in Canberra, and Dr. David Pengelley visited the University of Oregon.

The Department sponsors a weekly colloquium and several weekly seminars. The colloquium series included 23 lectures during the year, many of them presented by visitors to NMSU. Speakers from other institutions visit the department to collaborate with our faculty on their research. A few of the talks were also presented by members of the department, explaining work accomplished while on leave or on sabbatical. Two teachers from Las Cruces High School presented a colloquium on a new course offered in the school for seniors who would not otherwise take a mathematics course during the senior year.

Weekly seminars specialize in algebra, analysis, applied mathematics, lattice theory, fuzzy mathematics, statistics and topology. Graduate students and faculty members participate in these seminars. The New Mexico Analysis Seminar is a joint venture of mathematics faculty members of NMSU and UNM. The Eighth Seminar was held in Las Cruces from June 12 to June 17, 2005. This extended version was a Conference on Nonlinear Dispersive and Wave Equations with additional funding provided by the Conference Board of the Mathematical Sciences. The main speaker, who offered a short course of 10 lectures during the meeting, was Dr. Terence Tao. The next regular seminar meeting will take place in Albuquerque in spring 2006.

Faculty members participate in interdisciplinary research. Dr. Sikora has been conducting joint research with Dr. Raphael Lyman of Electrical Engineering; they published another paper together in 2005. Dr. Lakey collaborates with staff at PSL, at Los Alamos National Laboratory, and faculty members from the Departments of Psychology and the Department of Electrical and Computer Engineering. Statisticians Hung Nguyen, Robert Smits, and Tony Wang consult with researchers on and off campuses. Drs. Ballyk and Barany published a paper representing joint research with a Ph.D. candidate in biology. Drs. Ballyk and Giorgi were involved with research clusters, as were graduate students Jaclyn Jeschelnig and Marc Salas.

Faculty members participate in other forms of interdisciplinary scholarship as well. An NSF education grant supported Drs. Bezhanishvili, Lodder, and Pengelley from Mathematical Sciences and Drs. Leung and Ranjan from Computer Science while they developed material for teaching discrete mathematics for computer science using original historical sources. Their work has been piloted in courses like Math 279, CS/Math 278, Math 330, Math 430, and Math 454/504. As the grant ended, mathematics graduate student Joel Lucero-Bryan had become involved, as had Drs. Inna Pivkina and Karen Valverde from Computer Science. An extension is planned.

Faculty members participated in the grant Mathematically Connected Communities administered by the College of Education. Participating faculty members included Drs. Doug Kurtz, Bruce Olsberding, Ted Stanford, Tony Wang, and Linda Zimmerman. They prepared and offered online mathematics courses in support of the Master of Arts in Teaching (MAT) degree administered by the College of Education. Their activities were geared toward
improving the mathematical content knowledge among middle school teachers throughout New Mexico. Dr. Susana Salamanca-Riba administers a grant for professional development and outreach among high school teachers.

Education grants such as these appear to offer a way to increase the number of faculty members whose activities are supported by external sources. The traditional source of support for research in mathematics is the National Science Foundation, where the funding rate for mathematics has remained around 30% for a number of years. Nevertheless, some faculty members have individual investigator grants from the NSF, including Dr. Jens Funke, Dr. Martin Krupa, and Dr. Salamanca-Riba. Dr. Robert Smits and Dr. Bruce Olberding received some support from the National Security Agency as well. Dr. Nguyen is involved in a grant from the Defense Threat Reduction Agency, along with researchers from CRL and the University of New Mexico. Most faculty members submit proposals for grants to support individual and group research. Although the prospects for success are not high, comments of the reviewers provide an independent assessment of the quality of the proposed research. In general, the proposed research is rated quite highly and recommended for funding. Members of the Department submitted a large proposal to the NSF for support for activities aimed at improving retention among science, technology, engineering, and mathematics (STEM) students. Large proposals, such as this one and others aimed at helping students over critical transitions, may turn out to be a way to increase the number of faculty members whose activities are supported by grants even more.

**Professional Service Contributions**

Members of the Department play an important service role in the mathematical community. The Department is an institutional member of the Association for Symbolic Logic, the American Mathematical Society, the Mathematical Association of America (MAA), the Society for Industrial and Applied Mathematics, the American Mathematical Association of Two Year Colleges, and the Association for Women in Mathematics. The Department is an institutional sponsor of the Pacific Journal of Mathematics, and a member of the Rocky Mountain Mathematics Consortium. Lolina Alvarez, Guram Bezhanishvili, John Harding, Hung Nguyen, and Irena Swanson served on editorial boards of professional journals. Robert Smits serves as the Department’s representative to the MAA, and Jerry Lodder serves as representative to the Rocky Mountain Mathematics Consortium. Doug Kurtz is a member of a committee of the MAA.

The Department plays a role in service to the University. Dr. Ted Stanford ended his term on the Faculty Senate, and Dr. Maria Cristina Mariani was elected to replace him. Dr. Irena Swanson was a member of the Graduate Council in the spring, and she was replaced by Dr. John Harding. Dr. Lolina Alvarez serves on an NM AGEP steering committee and on the College of Arts and Sciences Faculty Affairs Committee. Dr. John Harding serves on the Curriculum and Educational Policies Committee, Dr. Douglas Kurtz serves on the Planning and Budget Committee, and Dr. Caroline Sweezy serves on the Improvement in Instruction and Student Relations Committee. Mathematical Sciences faculty members served as outside members on tenure and promotion committees for the Departments of Biology, Computer Science, Languages and Linguistics, Physics, and the Library. Faculty members also served as advisors in the College of Arts and Sciences Advising Center, advisors to several student organizations, and as Dean’s representatives on many graduate student committees external to
the Department. Nearly all faculty members participate in committee work within the Department.

**Outcomes Assessment Activities**

**Undergraduate Outcomes Assessment Activities**

The Department’s undergraduate program evaluation includes a survey to be completed by all Mathematical Sciences faculty teaching courses in which at least one mathematical sciences major is enrolled. The questions to be answered for each mathematical sciences major are:

1. Does the student display the ability to understand definitions and use them in appropriate situations? (Answer often or seldom.)
2. Does the student display the ability to complete explicit calculations and derivations? (Answer often or seldom.)
3. Can the student clearly express a written mathematical argument? (Answer often or seldom.)
4. Does the student display the ability to apply theoretical knowledge to solve problems? (Answer often or seldom.)
5. Does the student demonstrate a degree of mathematical maturity? (Indications of this are the ability to think of a problem in several ways, to anticipate developments in course material, to relate the subject material to other courses in meaningful ways.) (Answer often or seldom.)

Faculty members are also asked to justify their responses, indicating the means (homework, quizzes, tests, projects, presentations, visits to office hours, etc.) by which they arrived at the assessment. We also attempt to schedule exit interviews with graduating seniors, with limited success. The assessment committee evaluated our status for the undergraduate program as stage 2 "implementing assessment of learning".

Here are some of the results of assessment activities. In November 2005 the faculty approved a proposal by the Undergraduate Mathematics Majors and Minors Committee to add to outcomes assessment the evaluation of portfolios of student work prepared by the majors themselves. This addition promises to give us more information to help specific courses evolve. We also expect to see how well students are able to connect part of one course with part of another. Dr. Finston and Dr. Morandi have revised the content of Math 331 and have submitted a draft of new book for the class to a publisher. Although outcomes assessment is conducted only for majors, the faculty identified improving the skills of hand and mental calculation of all students in the calculus sequence Math 191-192-291 as a goal. In fall 2005 the Department introduced the iLrn interactive software package in these courses as a tool to help achieve this goal. Through the software students are assigned certain problems which the computer grades immediately. Students have the opportunity to submit revisions and most of them appear to rise to the challenge of solving these problems perfectly. However, instructors in the more advanced courses report that students had greater difficulty in adapting to the new system and too many did not make full use of the opportunity. We will study carefully how the system works in spring 2006.
Graduate Outcomes Assessment Activities

The assessment of our graduate program is done by evaluation of the performance of our graduate students on master’s and doctoral examinations. Since 1999 the chair of an examination committee distributes questionnaires to the other members of the committee for the Ph.D. oral comprehensive examination, the master’s final oral exam, or the Ph.D. final oral exam, as appropriate. The intent is to assess whether the examinee demonstrates mathematical breadth and content specific knowledge appropriate to his or her level.

Here are the highlights of the results of graduate outcomes assessment activities. Subsequent to the preparation of the report on activities for 2004, faculty members interested in the graduate algebra sequence reordered the material, cut specialized topics, and designed a three course sequence to replace the old four course sequence. The first course was piloted in Fall 2005 and the second and third courses will be offered for the first time in Fall 2006 and Spring 2007. The goal is to present the material in such a way that it is easier to relate to material in other graduate courses, thus promoting breadth of learning among the students. Another step toward improving the breadth of learning is the introduction of planning documents for the students, which will help us more accurately gauge the demand for advanced courses. This took place during the fall of 2005.

The Outcomes Assessment Committee report summary placed our activities for the graduate program at stage 3 "using results of student learning assessment measures".

Computing Facilities

John Pierce and Min Li are the two senior staff members who oversee the network of computers owned by the Department of Mathematical Sciences. When all machines are in use, including 29 wireless laptops, we can have as many as 183 machines on the network. Additionally, there are two PC/overhead projector combinations on carts, fixed projectors in two rooms, and four laptops that can be checked out by faculty members for instructional purposes or travel to meetings. In 2005 we obtained funding to upgrade all the machines used by the secretarial staff in Science Hall 236, as well as a number of machines in the Science Hall 118 laboratory (J. Mack Adams Computing Laboratory). We requested that ICT install additional switches in Walden Hall to make it possible to provide more graduate student offices with a computer connected to the network. Viruses and hackers continue to be a problem for the Department, and Mr. Pierce and Mr. Li work hard to ward them off. A virus infestation that was not easy to ward off with Sophos software lamed many computers on the University network, including critical office computers, in August 2005. Because machines had to be taken out for cleaning up, it was not possible to process several hiring requisitions in a timely manner, and paychecks were delayed for some employees. To prevent this from happening again, the Department invested in virus protection software from McAfee, paid for from our own resources. Thanks to this software and vigilance, Mr. Pierce reports that our machines stay off the lists of infected machines distributed by ICT and productivity is therefore not affected by viruses. For 2006 we plan to install a firewall around the department’s network, which should lead to improved security.

The department has ongoing needs for renewal of computing equipment and for advanced software for educational uses just to maintain current programs. The scientific calculus
sequence is now using iLrn interactive software for tutoring and routine homework problems. Unsuccessful computer mastery sections for courses taught by the Mathematics Success Center have been dropped for the time being, but some kind of computer laboratory for Mathematics Success Center classes will be necessary. These gateway courses should be taught in a manner that resembles the manner we teach subsequent courses, so we must plan for heavier use of our laboratory equipment. With the trend to lower and lower prices for adequate computers, the Department would like to see a revision of the policy on taggable equipment. Given present restrictions on the use of certain funds, we feel forced to buy machines with features that are nice, but not really needed. If computers became a special category, with a reduced minimum cost requirement, we could better serve students and the University’s need to understand what equipment it owns.

Advanced Degrees Awarded in 2005

One student completed a Ph.D. degree in 2005. The following table lists students who earned master’s degrees in 2005.

<table>
<thead>
<tr>
<th>Student</th>
<th>Degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Christopher Weaver</td>
<td>Ph.D.</td>
</tr>
<tr>
<td>Trung Dinh</td>
<td>Master’s</td>
</tr>
<tr>
<td>Sarah Ellis</td>
<td>Master’s</td>
</tr>
<tr>
<td>Christian Gaffney</td>
<td>Master’s</td>
</tr>
<tr>
<td>Suzanne Galayda</td>
<td>Master’s</td>
</tr>
<tr>
<td>Stephanie Glass</td>
<td>Master’s</td>
</tr>
<tr>
<td>Joel Lucero-Bryan</td>
<td>Master’s</td>
</tr>
<tr>
<td>Thomas Ngiatedema</td>
<td>Master’s</td>
</tr>
<tr>
<td>Delia Rueda</td>
<td>Master’s</td>
</tr>
</tbody>
</table>

Dr. Weaver is employed at the Physical Sciences Laboratory. Mr. Dinh has transferred to the Ph.D. program at the University of Utah. Ms. Ellis is employed in the Mathematics Success Center here at NMSU. Ms. Glass is employed in the vicinity of Washington, D.C. Ms. Galayda, Mr. Lucero-Bryan, and Ms. Rueda are continuing to work toward the Ph.D. degree here at NMSU. Mr. Ngiatedema transferred to a program in industrial engineering at Clemson University. Up-to-date information on Mr. Gaffney is not available; he may be returning as a Ph.D. student in the fall of 2006.


Josefina Alvarez

Bordando imágenes (Embroidering Images, the mathematics of font design), Matematicalia 1 (2005) (http://www.matematicalia.net).

¿Qué pasaría si...? (What if ...?) Three contributions to the column I have in Matematicalia, where I present the mathematics behind very simple minded questions. I also manage the design aspects of the column, that sometimes require graphics and photographs.


La Geometría de los Espacios de Hilbert, Material Didáctico No. 10, Departamento de Matemáticas, University of Sonora, México (2005) 39 pages.

Mary Ballyk


Ernest Barany


Guram Bezhanishvili


Elizabeth Gasparim


Vector bundles on a three dimensional neighborhood of a ruled surface, with E. Ballico, J. Pure Appl. Algebra 195 no.1, 7–19 (2005)

Mai Gehrke


Tiziana Giorgi


John Harding

Harding, J., “Remarks on Concrete Orthomodular Lattices”, The International J. of Theoretical Physics., Volume 43, Number 10, 2149 – 2168.

Douglas Kurtz


Joe Lakey


Maria Mariani


**Patrick Morandi**
- *Division algebras with an anti-automorphism but with no involution* (with B.A. Sethuraman and J.-P. Tignol), Advances in Geometry **5** (2005), 485-495.
- *Valuations on tensor powers of a division algebra* (with B.A. Sethuraman), Journal of Algebra **293** (2005), 385-394.

**Hung Nguyen**

**Bruce Olberding**
- “Projective presentations of finitely generated modules with large annihilators,” with S. Saydam, Communications in Algebra, 33 (2005), no. 1, 201-212.

**David Pengelley**

**Adam Sikora**

**Robert Smits**
- With R.D. DeBlassie “Brownian Motion in Twisted Domains” Transactions of the American Mathematical Society –2005
Caroline Sweezy

- "Higher order integrability for parabolic gradients on non smooth domains" WSEAS Conference Proceedings on Dynamical Systems and Control, Venice, 2005

Tony Wang

- On consistency of estimators based on random set observations (with B. Li), Proceedings of Fifth International Conference on Intelligent Technologies, Houston, 2004.

Interdisciplinary Activities 2005

Colloquia

- Patricia Baggett: Working with Prof. Ralph Preszler in Biology Education. We have submitted an NSF grant to initiate supplemental instruction courses to enhance student learning in the lecture and laboratory components of Biology 111 and 211.
- Guram Bezhanishville: •Our NSF grant “Teaching Discrete Mathematics via Original Historical Sources” with the Computer Science Department of New Mexico State University.
  •The chapter for the handbook of Logics of Space that I have been writing in collaboration with Johan van Benthem of the Institute of Logic, Language, and Information (ILLC) of University of Amsterdam and Philosophy Department of Stanford University, Palo Alto, California.
  •My collaboration with Silvio Ghilardi of the Computer Science Department of Milan University, Italy.
  •My collaboration with Ramon Jansana of the Philosophy Department of University of Barcelona, Spain.
  •My collaboration with Revaz Grigolia of the Institute of Cybernetics, Georgian Academy of Sciences, Georgia.
- Marcus Cohen: He has invited colleagues from the Physics Department to talks and conversations in the Math Dept, as well as attending Physics colloquia.
- Jens Funke: In the 2004, the director of the Dona Ana Waste Management Department contacted our department with a question about determining the volume of liquids in (tilted) cylindrical containers. Such kind of questions we cover in our MATH 192 (Calculus II) classes. In November 2004, we run a project in our class concerning this problem. In February 2005, he produced a chart accessible to non-mathematicians for the
Dona Ana Waste Management Department to address their question. We have sent the chart with instructions to the county.

- **Mai Gehrke**: Most of her activities are interdisciplinary.
- **Giorgi, Tiziana**:
- **John Harding**: Participated in a small (but quite high quality) workshop on the interface between quantum computing, quantum information and quantum logic at the Perimeter Institute for Theoretical Physics in Waterloo, Canada in July 2005.

**Research Collaborations**

- **Mary Ballyk**: I am participating in a grant entitled UBM: An Interdisciplinary Program in Mathematical Biology at New Mexico State University, with Dr. William Boecklen (PI, Biology), Dr. Ernest Barany (Mathematical Sciences), Dr. Amy Marion (Biology), and Dr. Ralph Preszler (Biology). We are working to intensify undergraduate education at the interface of the mathematical sciences and biology. Through this grant, senior students in both disciplines have the opportunity to study applied problems already appearing in the literature under the supervision of the authors themselves.
- **Mary Ballyk**: I wrote two-pages of input at the request of Dr. Dan Howard (Biology Department) as part of a two-million dollar grant proposal to the Howard Hughes Medical Institute. My contribution focused on the need to improve Mathematics skills among life-science majors, and the various approaches our two departments might take.
- **Mary Ballyk**: I organized a joint colloquium of the Mathematics and Biology Departments. The featured speakers were Dr. Sergey Gavrilets, Professor of Ecology and Evolutionary Biology and Mathematics at the University of Tennessee, and Dr. Christina Burch, Professor of Biology at the University of North Carolina at Chapel Hill.
- **Marcos Cohen**: Starting with my colloquium talk in the spring, I have invited colleagues from the Physics Department to talks and conversations in the Department of Mathematical Sciences. I also attend physics colloquia as I can. I have continued to nurture the dialogue between the two departments, not only discussing mathematical physics, but also attempting to unify our approach to teaching calculus and other “physical” mathematics.
- **David Finston**: Organized an interdisciplinary group of scientists and engineers to work on a proposal to NSF.
- **Tiziana Giorgi**: In early September, was asked by the Chair of the Information Sciences and Security Systems Cluster, Dr. Chris Fields, to organize a physical modeling/simulation subcluster, and to represent this area in the steering committee of the cluster.
- **Tiziana Giorgi**: She is studying from the mathematical point of view the situation of a thin film superconductor with a ferromagnetic dot. In particular, she would like to understand the problem by minimization of the associated free energy functional, for different geometries of the dot. To do so, she needs to start from the right form of the energy of the system. After reviewing the physical literature, she contacted and met with Dr. Igor Vasiliev of the Physics Department, who agreed to assist her in the set up of the problem. This project is at an early stage.
- **Douglas S. Kurtz**: The Master of Arts in Teaching, MC² program, and the Gadsden MAT program discussed above are interdisciplinary programs, designed for in-service
teachers.

- **Joseph Lakey:** The funded programs *Increasing Speed and Flexibility of Brain Machine Interfaces* with Kroger (Psychology), *Signal Detection via Adapted Filter Banks* with Creusere (ECE) and Birlsawn (Los Alamos), and *On Models for Coordination*...with Coombs (PSL) are all interdisciplinary, as are proposals with Black (Management) and Hacker (Comm. Studies).

- **Patrick Morandi:** is working with others in the Department of Mathematical Sciences in collaboration with members of the College of Education on the Master’s of Arts in Teaching Mathematics (MAT) and in running summer academies for practicing teachers. In addition, He will teach in Spring 2006 a course for a group of Gadsden teachers as part of a contract MAT program the College of Education and Mathematical Sciences have arranged with the Gadsden school district.

- **David Pengelley:** NSF teaching grant work is joint work with PIs from mathematics and computer science. The bridges we are building between mathematics and computer science by this joint work are very important.

- **Tonghui Wang:** Is an active member (together with Hung Nguyen and Robert Smits from Department of Mathematical Sciences) in the Center of Stochastic Modeling (CSM) at New Mexico State University. CSM at NMSU is a multidisciplinary organization of individuals from various multinational industrial, academic, and government institutions. Their objective is to promote the broad advancement of the theoretical and applied aspects of stochastic processes in a collaborative framework. They recognize the broad base of interest in this subject and the potential benefit to society of its continued expansion. The synergy generated through the center promotes the rapid evolution of key research and educational advancements that cut across traditional discipline specific bounds. Since the Spring of 04, Tony has been working together with Dr. Jinfia Zhang of Agronomy and Horticulture Department, College of Agriculture and Home Economics on “Cotton Breeding and Genetics Problems”, as a statistical consultant. As the result of this collaboration, a joint paper on the topic was accepted for publication. Now they are working on the topics in variance component estimation in a genetic designed model, using Monto Carlo simulations.

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**Service**

- **Hung Nguyen:** Co-supervising two Doctoral students in interdisciplinary programs: I. Chairez and Chris Weaver.

- **David Pengelley:** Much of my creative activity is interdisciplinary (see above), combining history with mathematics.

- **Marcus Cohen:** Has kept the dialog open between Math and Physics, discussion the topics of mathematical physics and unifying the departments approach to teaching calculus and other physical mathematics.

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**Lectures, Seminars, Workshops**

- **Tiziana Giorgi:** For the past four years, has participated in the Bridges Conference. This interdisciplinary conference intends to connect mathematicians and scientists in general, and teachers with artists. The conference is always an exciting event, which provides
interactions of people of very different backgrounds from where many original ideas in teaching, research and arts are born.

**Departmental Colloquia for the year 2005:**

- Josefina Alvarez, New Mexico State University, *Characterizing Harmonic Functions in the Upper Half Space*. February 17.
- Marcus Cohen, New Mexico State University, *Roadmap to Spin Space*. February 24th.
- Winfried Kohnen, University of Heidelberg, Germany, *On the Number of Representations of an Integer as a Sum of Integral Squares*, March 15.
- David Pengelley, New Mexico State University, *Quadratic forms a la Fermat, Euler, Lagrange, and Legendre. Part I: Did Fermat inspire Euler to discover the Quadratic Reciprocity Law for prime numbers?*, April 7.
- Charles Boyer, University of New Mexico, *Einstein Metrics on Spheres*, April 14.
- Connie Jaramillo and Chris Mathis of Las Cruces High School, *Regarding a New Class First Taught This Semester*. April 14.
- Mai Gehrke, New Mexico State University, *Algebraic methods in computer science logic*. September 8.
- Kristin Umland, University of New Mexico, *What does cognitive science have to say about mathematical knowledge?* September 12.
- Pedro Ontaneda, SUNY Binghamton *Ricci flow and negative curvature in higher dimension*, September 22.
- Gavril Farkas, University of Texas at Austin, *The global geometry of the moduli space of curves*, September 29.
- Stefan Maubach, University of Texas at Brownsville, *Cayley-Hamilton for Polynomial Maps*, October 6.
- Elaine Cohen, New Mexico State University, *Proportional Reasoning Ability (or Lack of it) and How it Affects Understanding of Physics Concepts*, October 20.
- Annie and John Selden, New Mexico State University, *Research on Student Proving and a Course to Improve It*, October 27.
- Sergey Gavrilets, University of Tennessee, *Mathematical Models of Speciation*, November
10.


**International Activities 2005**

**International Research Collaborations**

- **Josephina Alvarez:**
  - One-hour invited lecture at the Annual Meeting of the Sociedad Matemática Mexicana, October 2005.
  - Member of the Editorial Board of *Matematicalia* (http://www.matematicalia.net), electronic journal published by the Spanish Royal Mathematical Society with the support of the Spanish Department of Science and Technology.
  - In charge of the column "¿Qué pasaría si ...? ("What if ...?") that explains the mathematics behind the surprising answers to very simple minded questions.
  - I revised my monograph *Distributions and Fourier Transform*, for a second edition to be published in Argentina.
  - *Bordando imágenes* (Embroidering Images, the mathematics of font design), appeared in the Spanish electronic journal *Matematicalia*.
  - (with Cristina Varsavsky, Monash University, Australia), *Impossible Tilings*, 15 pages, appeared in *Function*, refereed journal for mathematics teachers and students, published by Monash University, Australia.
  - (with Martha Guzmán-Partida, Universidad de Sonora, and Salvador Pérez-Esteva, Instituto de Matemáticas de Cuernavaca, both in México) Harmonic Extensions of Distributions, accepted by *Mathematische Nachrichten*.
  - As Associate Editor of *The Rocky Mountain Journal of Mathematics*, I am in frequent contact with authors and referees who work in foreign institutions. Presently I am handling submissions and references from mathematicians working at institutions in 24 countries.
  - Reviewed five papers for *Zentralblatt für Mathematik*, edited by the European Mathematical Society.
  - Refereed three papers for *Mathematische Nachrichten*.
  - Refereed one paper for *Studia Mathematica*.
  - Refereed two papers for the *International Journal of Mathematics*.
  - Liaison, Argentinean Mathematical Union. I communicate regularly with the members residing in the U.S. and I collect the membership dues.

- **David Finston:** Conducted joint research with Stefan Mauback, a mathematician from the Netherlands.

**International Service**


Mary Ballyk: Given that the community of individuals working in her area is relatively small, she feels it is important for both her and the department that she maintain collaborative ties by attending conferences and meetings.

Mary Ballyk: Her main collaborator at this time is Dr. G.S.K. Wolkowicz of McMaster University, Hamilton, Canada. In May 2005 she traveled from a workshop at the University of Western Ontario to McMaster University for the purpose of collaborating with Dr. Wolkowicz.

Mary Ballyk: Attended the International Workshop on Differential Equations in Mathematical Biology, Le Havre, France, July 11-13, 2004 where she gave a talk entitled “Thresholds for Growth and Predation.”

Guram Bezhanishvili:
• An associate editor of Studia Logica, an International Journal for Symbolic Logic.
• A program committee member of the Advances in Modal Logic 2006, a premier conference in modal logic. So far I helped in selection of the invited speakers for the conference. In the future I will also be involved in refereeing several contributed papers.
• Is invited to write a chapter for the handbook of Logics of Space in collaboration with Johan van Benthem of University of Amsterdam, The Netherlands, and Stanford University, Palo Alto, California. The handbook will be published by Kluwer Academic Publishers.
• Is invited to be the second reader of the chapter by Steven Vickers of The Open University, United Kingdom, for the same handbook.
• Was invited to speak at the International Conference on Algebraic and Topological Methods in Non-Classical Logics II, Barcelona, Spain, 15-18 June, 2005.
• Collaborates with Silvio Ghilardi of Milan University, Italy.
• Collaborates with Ramon Jansana of University of Barcelona, Spain.
• Collaborates with Johan van Benthem, Dick de Jongh, Nick Bezhanishvili, and Balder ten Cate of University of Amsterdam, The Netherlands.
• Collaborates with Leo Esakia, Revaz Grigolia, and David Gabelaia of Georgian Academy of Sciences, Georgia.
• Mai Gehrke: Most of her activities are international.

Funke, Jens:
• International Graduate College, Humboldgt University, Berlin/Germany, June 2005 (one week). Discussion with Profs Kraer and Kühn.
• University of Cologne, June 2005 (two weeks). collaboration with Prof. Bruinier.
• Max Planck Institut für Mathematik, Bonn, Germany, June/July 2005 (two months). Research on various projects.
• Lectured at the Arithmetic Geometry Seminar, Humboldt University Berlin,) Germany, June 2005.
• Colloquium, Siegen University, Germany, July 2005.
• Number Theory Seminar, Max Planck Institut für Mathematik, Bonn/Germany, Aug. 2005.
Attended the Aachen-Cologne-Lilli-Siegen Seminar on Automorphic Forms, Cologne, Germany, June 2005.

Gauss-Dirichlet Conference, University of Gottingen, Germany, June 2005: attendance and lecture, title: Traces of CM values of modular functions.


Workshop on Modular Forms, Moduli Spaces and Related Topics, University of Rome I, Italy, Sept. 2005, attendance and lecture, title: A singular theta lift and the construction of Green currents and unitary groups.

Workshop on the Intersection of Arithmetic cycles and Automorphic Forms, Centre de recherches mathematiques, Montreal, Canada, Dec. 2005: attendance and lecture, title: A singular gtheta lift and the construction of Green currents of unitary groups.

Tiziana Giorgi: Attended and presented work at the Renaissance Banff Conference held in Banff, Canada. (July 31 - August 3, 2005)

In July 2005, conducted an invited seminar at the Department of Mathematics of the University of Rome 1 "La Sapienza", Italy.

Member of the Canadian Mathematical Society (CMS) and of the Canadian Applied and Industrial Mathematics Society (CAIMS).

John Harding: Is on the editorial board of Order, one of the main international journals for the field of ordered structures.

Douglas S. Kurtz: During summer 2004, consulted at the Australian National University about the mathematics education of ANU students. During the past year, he continued to consult with these Australian contacts.

Martin Krupa:

Hung Nguyen: Co-organizing the Sixth International Conference on Intelligent Technologies, Phuket Island, Assumption University, Thailand (December 2005).

Bruce Olberding: Gave a plenary address in the Special Session on Multiplicative Arithmetic of Integral Domains and their Monoids at the Joint Meeting of American Mathematical Society, DMS, OMS in Mainz, Germany, June 2005.

David Pengelley: My continually updated and expanding web site, Teaching with Original Historical Sources in Mathematics (see above), is the main international resource on this topic. A Google search for the words “teaching” “mathematics” “history” brings up my website first in the world list of 1,666,000 entries. So it seems to be having a lot of impact.

International Lectures/ Talks

Tiziana Giorgi: Attended and presented her work at the Renaissance Banff Conference held in Banff, Canada. (July 31 - August 3, 2005).


Hung Nguyen: Giving a keynote address at the Annual Meeting of the Applied Statistics and Intelligent Technologies Association of Taiwan, Taipei (June 2005).

Caroline Sweezy: Gave a talk on "Higher order integrability at the "WSEAS International Conference on Dynamical Systems and Control, Venice, Nov. 2 - 4, 2005."
Chaired the session on Advanced Simulation, Modelling and Systems Theory II.