Department of Mathematical Sciences
Annual Report for 2004

December 20, 2004

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1. Overview

First, here are some highlights of the personnel developments. In 2004 Gregory Allison and Roger Beck joined the Department as College Instructor and College Assistant Professor, respectively. Among tenure-track faculty, Drs. Bruce Olberding and Theodore Stanford earned tenure and were promoted to associate professor in Spring 2004, and Dr. Jerry Lodder was promoted to professor. Among college-track faculty, Barbara Sallach was promoted to college professor, and Suzanne Hill was promoted to college assistant professor. On the other hand, Dr. Nhu Nguyen resigned from his tenure-track assistant professorship. Our graduate student and AGEP fellow Scott Izu won one of approximately 60 Ford Foundation Pre-doctoral Diversity Fellowships in a competition administered by the National Research Council, which provides him with three years of support. Graduating senior Matej Danter was named "outstanding international graduating senior" by the College of Arts and Sciences in May 2004.

Highlights of developments in the area of curricular activities are as follows. In spring 2004 the Department offered its first on-line mathematics course, and in fall 2004 the Department is offering four on-line mathematics courses. The headcount of students enrolled in mathematics and statistics courses at all levels rose from 3900 in October, 2003, to 4065 in October, 2004, showing approximately 3% growth in the student population. In March, 2004, under the leadership of Drs. David Pengelley and Bruce Olberding, members of the Department assembled a proposal to the NMSU Library for $112,000 in General Obligation Bond money for mathematics books and for filling gaps in the Library's collection of mathematics journals. Then, in April, 2004, the Library awarded $75,000 toward our proposal. Drs. Caroline Sweezy participated in the "Writing Across the Curriculum" program in May, 2004. The departmental Teaching Committee has started a series of colloquia that will explore issues of teaching suggested by members of the faculty through the spring of 2005. The level of energy devoted to teaching by the faculty remains high.

Twenty-two faculty members reported 39 refereed publications appearing in 2004. Many more faculty were active presenters at conferences and universities world-wide. In particular, members of the Department have won funding for a three-year extension of the activities of the New Mexico Analysis Seminar, an activity conducted jointly with mathematicians from the University of New Mexico since 1997, and funding to host a Conference Board of the Mathematical Sciences Lecture Series here at New Mexico State University in June, 2005. Twenty six

faculty members were associated with more than 50 grants and proposals for support in 2004.

The number of students declaring themselves to be math majors or candidates for the supplementary major in applied mathematics reached remained about the same as last year. Many members of the department are participating in elements of curriculum review and development. Interest in improving the content knowledge of middle-school and high-school teachers is spreading to more members of the department.

Members of the faculty 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 and in service to the local community.

More details on these highlights are provided below.

2. Personnel Developments

In spring 2004 Drs. Theodore Stanford and Bruce Olberding were awarded tenure and were promoted to associate professor, and Dr. Jerry Lodder was promoted to professor. Among the college-track faculty, Barbara Sallach was promoted to college professor, Suzanne Hill was promoted to college assistant professor. Alyne Fulte and Gary Hartshorn left their positions on the college faculty; new college track faculty are Gregory Allison and Dr. Roger Beck. Dr. Nhu Nguyen resigned his assistant professorship in May, in part for health reasons and in part to pursue a project to develop a private university in Vietnam. Dr. Josefina Alvarez and Dr. Patrick Morandi were on sabbatical leave and traveling extensively, and they returned in fall 2004. The ADVANCE program has provided course releases to Dr. Mary Ballyk for spring 2004.

This fall Dr. John Harding and Dr. Irena Swanson are candidates for promotion to full professor and Dr. Elizabeth Gasparim is a candidate for tenure and for promotion to associate professor. The Department conducted comprehensive third year reviews for Dr. Jens Funke, Dr. Tiziana Giorgi, Dr. Maria Cristina Mariani, and Dr. Robert Smits.

3. Curricular Activities

The most striking feature of 2004 is that members of the Department got into distance education. In spring 2004 Dr. Kurtz offered the Department's first distance

course, a pilot version of a course in linear algebra for in-service middle school teachers. In fall 2004 Dr. Finston offered another distance course, a pilot version of a course in applied abstract algebra for in-service middle school teachers, Dr. Mostafa offered a section of Math 230–Matrices and Linear Programming, a course for majors in the College of Business Administration and Economics, and Dr. Krupa offered on-line sections of Math 392–Ordinary Differential Equations and Math 480–Linear Algebra, courses for science and engineering majors. The courses taught by Dr. Kurtz and Dr. Finston are pilot versions of two of an eventual seven mathematics courses in support of the Master of Arts in Teaching Mathematics (MATM) degree administered by the College of Education. A third course in support of the MATM program will be offered by Dr. Linda Zimmerman in spring 2005, and a fourth course will be offered by Dr. Tony Wang in fall 2005. At the Education Council meeting of December 2, 2004, the participation of Department of Mathematical Sciences faculty in the MATM program was hailed as exemplary by Dean Morehead and offered up as a model to other science departments in the College of Arts and Sciences who would like to improve content knowledge of in-service middle school teachers.

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 Math 112 in 2004, demonstrating the interest of tenure-track faculty in the training of elementary school teachers. Dr. Patricia Baggett continues to offer partnership courses for elementary school teachers. Part of the instructional technique is to partner the pre-service teachers with in-service teachers to develop, try out, and evaluate instructional materials. Members of the Department also formed an ad hoc committee to review the mathematics courses required of secondary mathematics education majors and to consult with the College of Education about ways to improve the program. At the Education Council meeting of December 2, 2004, we received a report on results of the New Mexico Teachers' Assessment content knowledge test in mathematics, as of April 24, 2004 and July 17, 2004. For April, 2004, there had been 31 test takers since April, 2002, divided into 19 secondary mathematics education candidates and 12 "non-qualified" candidates. The "non-qualified" category included education students in other areas, non-degree students, and someone not even enrolled at NMSU. Of the 19 "qualified" test-takers, 15 passed for a 79% pass rate, which is close to the target rate of 80%. Of the 12 "non-qualified" test-takers only 4 passed. The overall pass rate was 61%. The report for July did not break down the latest group of test-takers into "qualified" and "un-qualified", and reported the overall pass rate rose to 63%.

The conclusion is that the mathematical training provided by the Department of Mathematical Sciences makes a significant difference in the performance of pre-service teachers on this examination. Nevertheless, there is room for improvement in the results even among the qualified test-takers. The ad hoc committee hopes to make a contribution here.

Concerning other courses, the following items are high points of the year's activities. Members of the college-track faculty have been working hard on re-design of the Math 115 and Math 185 courses to divide the material into three courses. When this is accomplished, the NMSU program of pre-calculus courses will align better with the pre-calculus courses of the other institutions of higher learning in New Mexico, facilitating transfer of credits between institutions while assuring that transfer students have actually meet prerequisite requirements for courses at their new institution. The redesign should also provide better options for NMSU students, by providing some separation between general mathematics material and material essential for the study of calculus. Along these lines, the College of Health and Human Services has made inquiries about alternatives to their current requirement of the general education course Math 210 for nursing students, that would provide both more rigorous and more practical mathematical training. The Department has discussed the calculus sequence in committee meetings and in general faculty meetings. Faculty annual reports identify a major problem as the need for students to spend more quality time with the material. We have explored the idea of 4-credit calculus courses, and in spring 2005 we will invite publishers of candidate calculus texts to present colloquia on the on-line supplementary material they offer along with their books. We might eventually be able to obtain on-line materials that generate "routine" problems and provide quick feedback to students. The goal is to raise the calculational skill level of students and to provide more opportunities to practice with the ideas at a basic level. In spring 2005 there will also be discussion of the role of projects, or more extended writing assignments, in calculus courses. Drs. Finston and Morandi have nearly completed a new book for the introductory abstract algebra class Math 331, draft versions of which have already been put into use. This course is currently required of secondary mathematics education majors. Reports are that students find this book an improvement over other material we have tried, and, perhaps, the improved instructional material will lead to better performance of the secondary mathematics education students on the NMTA content knowledge exams.

A collaborative effort between the department and the Computer Science

department has resulted in a new course CS/Math 278 on discrete structures that serves as an alternative mathematics requirement for the CS degree, replacing two courses required previously. The initial runs of the course have not proved to be satisfactory, and a lot of effort is being invested to fix the problems. Collaborative development of other Math courses in areas of mathematics of interest to computer science students continues, using ideas that have grown from the NSF grant on teaching discrete mathematics via historical resources. (This project involves Drs. Guram Bezhanishvili, Jerry Lodder, and David Pengelley from Mathematical Sciences and Drs. Desh Ranjan and Hing Leung from Computer Science. The Liaison Committee will also be discussing the needs of the College of Business Administration and Economics about their needs and plans for Math 142 and Math 185.

One of the department's major curricular efforts has involved development of course materials using mathematical software and the internet to improve courses taken by mathematics, science, engineering, and education majors. With NASA support, Professor Staffeldt developed materials that incorporate advanced software in our course in third semester calculus. The software enables students to investigate fine details of surfaces in three dimensional space and also to apply calculus to more realistic problems. These innovations have made their way now into nearly all sections of that course and into our undergraduate course in ordinary differential equations. Dr. Mary Ballyk and our Ph.D. candidate Mr. Hubert Noussi continue working to transfer some of the material for the differential equations course from the Maple platform to the Matlab platform. When this work is completed, students will be able to compare results of the two software packages and they will have a choice of tools for their course. The choice of platforms should make it easier for non-math majors to transfer what they learn in our course to courses in their own departments.

How to improve our introductory courses in modern algebra and analysis is being discussed by a few faculty. In 2003 Professor Morandi had NASA support to redesign our introductory course in modern algebra, Math 331, required of math and secondary math education majors. The result is that he and Professor Finston have written a new book for the course, which was tested by Professor Swanson this fall. The redesign introduces abstract concepts through familiar applications and uses software to effect calculations structures that generalize our familiar number systems. Dr. Kurtz is working on a text to better address the needs of our students in the introductory course in analysis, Math 332.

Coincidentally, the Committee on the Undergraduate Program in Mathematics

of the Mathematical Association of America has published its latest curriculum guide, which contains much potentially useful material, such as model self-study questionnaires, clearly stated suggestions for program goals, statistical reports on the undergraduate student body, and lists of resources to help with course design and revision.

Faculty are using technology for teaching purposes in many ways. In addition to using the internet for posting class materials and communicating with students, computer demonstrations have become integral to teaching at all levels. The old portable PC/overhead projector combination has proved to be unwieldy for effective classroom demonstrations. We have equipped some of our classrooms with permanently installed overhead projectors and have acquired sufficiently many laptop computers to enable many more faculty members to integrate computer use in their teaching. Future planning calls for the purchase of portable projectors because of concerns for the security of the ceiling mounted projectors. Funding for this process is provided by Instructional Equipment funds and grants from NASA and the Department of Education.

The department participates actively in the Honors and General Education programs. Faculty members routinely teach the Honors courses "Spirit and Evolution of Mathematics" and "Great Theorems: The Art of Mathematics." An honors course on mathematics appreciation was offered in Spring 2004.

3.1. Teaching Improvement

In both spring and fall 2004 the department's Teaching Committee conducted an extensive program of peer review of teaching. Members of the Teaching Committee also provide advice to candidates for promotion and tenure in 2005 on the preparation of their teaching statements. In fall 2004 the Teaching Committee has started a series of teaching colloquia, which take the form of panel discussions with faculty on various issues.

Individual members of the faculty have participated in the Gaining Retention and Achievement for Students Program, which is coordinated by Dr. Judy McShannon of the NMSU Space Grant Consortium. In spring 2004 Dr. Ernie Barany participated, and in fall 2004, participants were Dr. Jens Funke, Dr. Tiziana Giorgi, and Mr. Hamed Obeidat. Mr. Obeidat is preparing his dissertation, and is the first Ph.D. candidate to participate in the program. Eventually, we would like to extend the opportunity to all advanced Ph.D. students. The GRASP program aims to make faculty aware of various student learning styles and to provide

suggestions and guidance while faculty attempt and practice alternative teaching strategies. The reports of the GRASP evaluators also provide independent assessments of the quality of the teaching of the participants. Drs. David Finston, Amal Mostafa, and Linda Zimmerman also participated in the ITAL program sponsored by ICT. Dr. Martin Krupa also completed some of the modules that introduce faculty to techniques of web-based instruction.

Individuals also took the initiative to work on their teaching as well. Dr. Caroline Sweezy participated in the Writing across the Curriculum program in May 2004. Throughout the academic year 2003-2004 many individuals attended activities sponsored by the Teaching Academy.

Faculty members are using advanced technology, including mathematical software and the internet, in significant ways in their teaching. With NASA, NSF, and Department of Education support, Professor Baggett is offering a new course on the use of technology in elementary science classes.

A major strength of the department's educational program is the participation of graduate students and talented undergraduates as tutors and graders in the Mathematics Learning Center. This provides a history of experience with the peer-tutoring aspect of learning, which is inherent in the cooperative learning projects now taking place in many other classes. It creates a valuable training program for new graduate assistants, introducing them to educational issues while they are under close supervision by experienced educators. The Math Learning Center also administers the Deborah Louise Thomas award for outstanding undergraduate tutors, which is an endowed award the recognizes the efforts of a novice tutor, a senior tutor, and a graduate student annually.

College track faculty members also invest time and effort in teaching improvement activities. Many are members of the American Mathematical Association of Two-Year Colleges (AMATYC), the New Mexico Mathematical Association of Two-Year Colleges (NMMATYC), and the National Council of Teachers of Mathematics (NCTCM), the Mathematical Association of America (MAA), and the Society for Industrial and Applied Mathematics (SIAM). College-track faculty members are also involved in professional development activities at the national level. Suzanne Hill attended the national meeting of the American Mathematical Association of Two-Year Colleges (AMATYC) in Florida in November, Sue Schibel attended the AMATYC summer institute in Hawaii, Linda Zimmerman attended the International Conference on Technology in Collegiate Mathematics in New Orleans in October, and Kitty Berver attended a Math Media Symposium in Austin in October. College track faculty members participate in advising ac-

tivities in the Colleges of Arts and Sciences, Business, and Engineering, and also serve on the department's two liaison committees, one for the Dona Ana Branch and another for other units of NMSU.

Mathematics Learning Center staff and graduate assistants also participated in a second trial of "math boot camp" sponsored by the College of Engineering, which brought together a number of engineering freshman for a week-long concentrated review and practice of pre-calculus mathematics. The goal is to see if participation in the boot camp would improve the scores of the students on the Mathematics Placement Exam enough for them to gain entry to mathematics courses they really wanted to take.

Dr. Susana Salamanca Riba, Dr. Lisa Snow (College of Education) and Ms Kathe Kanim (College of Engineering) were awarded a grant from the Institute for Advanced Study/Park City Mathematics Institute to establish a Professional Development and Outreach group for high school and middle school teachers in New Mexico. The nucleus of the group was established in summer 2004, when a group of area high school teachers accompanied the three to a workshop in Park City, Utah, where the group was introduced to the Japanese Lesson Study plan. The program concept also calls for interaction between NMSU faculty and teachers.

3.2. Student Advising

Student advising is handled by special department committees, except for 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.

The department is sponsoring 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. The Undergraduate Curriculum Committee coordinates the update of our course offerings, syllabi, and information provided to instructors.

Outside of advising for regular classes, Professor Caroline Sweezy and Emeritus Professor Richard Bagby provide coaching for 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 exam sequence. As the national actuarial societies are interested in reaching out to minorities underrepresented in the profession, he sees great potential in a program at NMSU to support preparation of students for actuarial careers.

Advising of graduate students is coordinated by the Graduate Studies Committee, which also makes recommendations for graduate assistant appointments, coordinates comprehensive exam preparation and grading, and updates our graduate course offerings. The Graduate Studies Committee is fine-tuning a significant overhaul of our requirements for the doctorate. Last year the Department instituted course requirements in addition to successful completion of the comprehensive exam and the dissertation. One of the goals of our program that was found in need of improvement by our outcomes assessment process is that Ph.D. students should acquire significant breadth in mathematics beyond the area of the thesis. The course requirement will enable us to better meet that goal. More active advising on the part of faculty is required in order to make sure the course requirements are met.

Members of the department advise for the Advising Center and the Honors program and many advise secondary mathematics education majors. From August 2003 to August 2004, members of the department contributed 144 hours to the Arts and Sciences Advising Center and Elaine Cohen earned half graduate assistant support by working in the Advising Center. The department rigorously enforces prerequisites for our courses. Professor Sweezy handles most of the advising for Supplementary Majors in Applied Mathematics.

Jane Els is assigned as Special Students Program Coordinator to monitor students who are handicapped, have learning disabilities, or are experiencing great difficulties in their classes. She is also the MLC liaison to Student Services and American Indian programs and the department ADA coordinator.

3.3. Graduate Studies

Graduate enrollment in the department held at 38 mathematics graduate students enrolled in Masters and doctoral programs by the end of Fall 2004, far below the record of 48 in 2001. Eight Mathematical Sciences graduate students were awarded master's degrees and three were awarded doctorates during the year. Thirty two graduate students hold graduate assistantships and one more is supported on a college instructorship. Four graduate students were partially supported from grants as research assistants in 2004. Ten of our graduate stu-

dents are female, and three are members of minority groups. The department is home to 2 AGEP fellows, one of whom is also a recipient of a Ford Foundation Diversity Pre-doctoral Scholarship. Since 2001 we have witnessed the practically complete disappearance of applications for graduate study from the Middle East. In 2002 we had six graduate students from the Middle East, two finished their doctorates in 2002, a third finished a doctorate in 2003, and a fourth finished his doctorate in 2004. One found a tenure track position in the United States, and the other three were obligated to return to the Middle Eastern universities where they had been teaching and which had partially supported their studies in the United States. These students had been well-prepared, with substantial Master's programs behind them, and highly motivated; it is unfortunate that a new generation has not reappeared to replace them. However, contacts Professors Hung Nguyen and Tony Wang have developed with universities in Thailand brought one new graduate student to NMSU who started in the spring of 2004. This student has proved to be very capable. Recruiting quality American students will be a priority and competition with other universities for these students will be considerable. Our recruiting efforts in the minority community and in area colleges and universities continue. As incentives, the department can appeal to the Sloan Foundation for additional support of minority students, as soon as the number of minority graduate students reaches a higher level, and the National Science Foundation awarded NMSU the AGEP grant for similar purposes in a broader spectrum of scientific disciplines. In the department one continuing student had support from the AGEP program, and a first-year student has also been named an AGEP fellow. This student was recruited with the help of the AGEP program and with the help of the NMSU Mathematics Association Fund. In spring snd fall 2004, the department brought promising applicants for graduate study to campus. The AGEP program and the NMSU Math Alumni Association Fund helped cover expenses of the visits. We plan to continue to use campus visits as a recruiting tool, and appreciate the support the graduate school is offering for candidate visits. At advanced levels, the faculty support seminars in analysis, statistics, applied mathematics, topology, algebra, lattice theory, and functional analysis. Most faculty strongly recommend that pre-oral comprehensive Ph.D. candidates present in appropriate seminars and require dissertation level Ph.D. candidates to present. In 2002 the department approved a plan to broaden the areas on which doctoral students can be examined for the written portion of the comprehensive exam. The motivation for this is to enable them to progress more rapidly to thesis work in a broader array of mathematical areas (e.g. statistics, applied

mathematics, logic, and mathematics education). Along with this change, new two semester doctoral level course sequences were developed in logic/universal algebra and ordinary/partial differential equations. Doctoral course sequences in mathematics education remain in development. To ensure that our doctoral students will have the breadth of mathematical knowledge necessary for successful careers course requirements were also instituted in 2002.

3.4. Undergraduate Program

At the end of 2004, Institutional Research and Planning reported 44 mathematics majors (36 first majors and 8 second majors) and 15 students enrolled in the supplementary major in applied mathematics. Fourteen of the fifteen students declaring the supplementary major have a major other than mathematics. In fact, thirteen of them have a major in the College of Engineering, making the supplementary major an interdisciplinary activity.

In 2004 there were five graduates in spring and summer and eight applications for degrees in fall. We have partial information about May 2004 graduates. Math major Will DiCharry graduated in May 2004, and was recruited by the University of Connecticutt for its graduate program, following a 2003 graduate Lance Miller to Connecticutt. Matej Danter was outstanding international graduating senior, graduating with majors in mathematics and computer science, and an honors thesis. He continues in the program for a master's degree in mathematics at NMSU.

Concerning earlier graduates, we have the following partial information. Vakhid Masagutova entered graduate study in mathematics at Purdue University in Fall 2003. Year 2002 graduates Sarah Ellis, Richard Eric Moreno, and Charles Mundy-Castle continued the study of mathematics here at NMSU and completed requirements for the master's degree in Fall 2004.

In 2004 the undergraduate majors and minors committee was able to increase the diversity and the number of students receiving scholarship money from the department's scholarship resources. We have sent departmental representatives, both students and faculty, to both meetings of the Arizona Mathematics Undergraduate Conference (AMUC). Our first goals were to recruit new graduate students from participating schools and to inspire our own majors. We have discovered that Mesa Community College has an active mathematics club and a faculty sponsor who is trying to place his talented students in effective undergraduate programs. We will arrange a winter visit to Mesa, Arizona, to try to recruit

some transfer students to NMSU. To better track recent graduates is another item on which we haven't made much progress. Looking into the longer term, the committee would like the department to devote space for a lounge for undergraduate majors and to redesign some existing courses for mathematics majors to make them more attractive to potential new majors. At the moment it is difficult to imagine where the space for the lounge might be found.

3.5. 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 contact mathematics departments at branch campuses for their feedback concerning the content of mathematics courses. We have been working with the Computer Science department to update the course requirements that we have in common. A grant awarded by the National Science Foundation to faculty in the two departments will result in new course materials based on classic mathematics papers that laid the foundations for computer science. The Undergraduate Curriculum Committee is developing proposals to alter our scientific calculus sequence. Since the College of Engineering provides the majority of students in these courses, modifications will be done in consultation with their faculty.

Educational outreach activities included visits to area public, elementary, middle, and high schools to speak to students and the development of an online high school mathematics contest. Professor Baggett teaches a series of partnership courses in which NMSU students are matched with active Las Cruces area high school teachers. The contest was held in Spring 2004 with 50 teams from four Las Cruces area high schools participating. An awards ceremony was held, with prizes supplied by MacKichan Software and the department. The contest will again be held in spring 2005, but the date is still open.

The recently funded Health Careers Opportunity Program (HCOP) grant also provides academic and nonacademic support to middle and high school students from a wide area of southern New Mexico and aims to encourage them to consider health careers. The Department provided HCOP with online mentoring and tutoring and instruction in the summer enrichment program held at NMSU in summers 2003.

A considerable amount of effort continues to be devoted to the Mathematics Placement Exam (MPE). An an online version of the MPE became available in

Spring 2003. At the math teachers request, the MPE was administered on site at Las Cruces High School, Mayfield High School, and Oñate High School in April 2004. This service was very well received at the high school campuses, and seems to be a good public relations move. Professor Ted Stanford is also working with Las Cruces High School teachers on a course for college-bound seniors who would otherwise not take a mathematics course during their senior year in high school.

The department participated in many recruiting activities for the university. A faculty member is designated as the coordinator of Visitor's day activities. We participated in all Aggie Experiences, and in Visitor's Day and the Majors Fair as fully as possible. Members of the undergraduate majors and minors committee conduct interviews and tours of the department for prospective students visiting the campus.

We are preparing a 2004 edition of a departmental newsletter, that will complement the activities of the NMSU Mathematics Alumni Association. The Association has a web page, and posts news items occasionally. Also, the Association and the department sponsor a reception at the annual winter joint meeting of the American Mathematical Society and the Mathematical Association of America. Generally, about 25 faculty, emeriti, friends, and former students attend the reception. The newsletter will reach all alumni for whom we have postal addresses, which is, of course, a much larger group. In time we hope the newsletter contribute to the formation of a larger community with an interest in the activities of the department. We are also sending 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.

4. Research and Other Scholarly Activities

Members of the department were productive researchers. Twenty-two of the tenure-track faculty members reported thirty-nine papers appearing in print in 2004. Two faculty members also had two new books appear in 2004, and one faculty member saw two earlier books reappear in new editions. Faculty members delivered many talks on their research at conferences and at other universities.

Members of the department conduct joint research with mathematicians at other institutions. Members of the Department collaborate with other mathematicians in Europe, South America, Asia, and Australia. Some highlights of this type of activity include: Dr. Morandi made extended visits to Ireland, Belgium,

and Germany while on sabbatical leave in spring 2004. Dr. Elizabeth Gasparim was on leave to visit the Max Planck Institute in Bonn, Germany. Adam Sikora was on leave to visit the Australian National University in Canberra.

The department sponsors a weekly colloquium and several weekly seminars. The colloquium series included 27 lectures during the year, many of them presented by visitors to NMSU. Special colloquiua were offered by Dr. Rekha Thomas, who was a distinguished visiting professor supported by ADVANCE. In addition to her colloquiua, which were very well received, she met with school teachers and undergraduate and graduate students during her week-long visit. She also offered more specialized seminar talks. Speakers from other institutions visit the department to collaborate with our faculty on their research. A few of the talks were presented by members of the department, explaining work accomplished while on leave or on sabbatical. Also, Professor Susana Salamanca Riba and Ms. Kathe Kanim presented a colloquium on the Japanese Lesson Study method practiced by school teacers. Professors Baggett, Pengelley, and Stanford led the first of the teaching colloquia, on the topic of teaching styles. The weekly seminars specialize in algebra, analysis, lattice theory, statistics, topology, and fuzzy mathematics. The New Mexico Analysis seminar is a joint venture between the mathematics faculty of NMSU and UNM. The Spring 2003 session was held at NMSU and featured talks by NMSU graduate students as well as talks by distinguished established mathematicians. A proposal for continued support of the seminar by the NSF was accepted, assuring the seminar will continue into 2006.

Faculty members participate in interdisciplinary research. Professor Sikora has been conducting joint research with Professor Ray Lyman of Electrical Engineering; they published a paper together in 2004. Professor Lakey collaborates with staff at PSL and statisticians Hung Nguyen, Nhu Nguyen, and Tony Wang consult with researchers around campus. Professors Ballyk and Barany published a paper representing joint research with a Ph.D. candidate in biology.

Facutly members participate in interdisciplinary scholarship as well. An NSF education grant awarded in 2002 supports Drs. Bezhanshvili, Lodder, and Pengelley and Drs. Leung and Ranjan from computer science while they develop material for teaching discrete mathematics using original historical sources. Their work will be piloted in courses like Math 279, Math 330, Math 430, and Math 454/504. It has the potential to be a very influential development in mathematical pedagogy.

Twenty six faculty were associated with more than fifty grants and proposals for external funding in 2004. In 2004 there were six new grants awarded:

a grant from the NSA to Bruce Olberding for summer research, an NSA Young Investigator's Grant award to Robert Smits for his research, an NSF individual investigator's grant to Martin Krupa for his research, a grant from the Defense Threat Reduction Agency to Hung Nguyen for research related to decision problems associated with bio defense, and an NSF/Park City Mathematics Institute grant to Susana Salamanca Riba for professional development outreach groups to improve teaching, and an NSF/Conference Board in the Mathematical Sciences grant to support a lecture series in June 2005. There are several proposals pending for grants to support individual and group research and educational projects.

5. 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 (AMS) , the Mathematical Association of America (MAA) the Society for Industrial and Applied Mathematics (SIAM), the American Mathematical Association of Two-year Colleges (AMATYC) and the Association for Women in Mathematics (AWM) It is an institutional sponsor of the *Pacific Journal of Mathematics* and a member of the Rocky Mountain Mathematics Consortium. Many members of the department served as referees for journals and books, reviewers for the two major mathematical abstract journals, and referees for grant proposals to the National Science Foundation and other organizations. Faculty members took part on conference organizing committees and organized special sessions at national and international conferences sponsored by professional societies. Lolina Alvarez, Hung Nguyen, Nhu Nguyen, John Harding, David Pengelley, and Irena Swanson served on editorial boards of professional journals. Professor Robert Smits is the department's representative to the Rocky Mountain Mathematics Consortium. Professor David Pengelley is a member of a committee of the MAA. Professor Smits serves as the department's representative to the Mathematical Association of America (MAA). Doug Kurtz is a member of a committee of the American Mathematical Society and two committees of the Mathematical Assocation of America. He also was a member of a panel that reviewed curriculum changes at the Australia National University in Canberra in summer 2004.

The department plays a major role in the university's service mission. Professor Ted Stanford is a member of the University Senate, and Professor Irena

Swanson is a member of the University Graduate Council. Professor Lolina Alvarez is also a member of a committee of the NM AGEP program and serves on the College Academic Affairs Committee. The department provided advice and assistance to the College of Arts and Sciences with representatives on the Curriculum and Educational Policies Committee, the Planning and Budget Committee, and on the Improvement in Instruction and Student Relations Committee. Mathematical Sciences faculty served as outside members on tenure and promotion committees for the Departments of Biology, Computer Science, Languages and Linguistics, and Physics. Faculty members also served as advisors in the College of Arts and Sciences Advising Center, advisors to several student organizations, and Dean's representative on many graduate student exam committees external to the department. Nearly all department faculty members participated in committee work within the department.

6. Community Service and Relations

Working with groups and agencies outside the university is important to the department. Several faculty members worked with Las Cruces Public School students and teachers.

The department has been involved in the New Mexico Commission on Higher Education Mathematics Articulation Task Force, which coordinates the transfer of credits for mathematics courses among the institutions of higher learning in the state. Currently, Professor Kitty Berver is cochair of the task force, which meets periodically to update information. She is responsible for maintaining the internet-accessible database that articulates transfer credits.

The department has increased and improved its interactions with local public schools. Patricia Baggett continues to run her Math 111 (Fundamentals of Elementary Mathematics I) and Math 112 G (Fundamentals of Elementary Mathematics II) classes concurrently with special topics Math 301 and Math 501 courses for pre and in-service teachers. Elementary education majors in these courses are paired with practicing teachers enrolled in the concurrent graduate course, who act as mentors to the pre-service teachers, allowing them to observe, co-teach, and finally teach alone, in their classrooms. The in-service teachers received free tuition with funds provided by a grant from the New Mexico Commission on Higher Education and from NASA. This grant closes in December 2003. The administration of the Las Cruces Public Schools and, in particular, the Teachers' Center have been highly supportive of this initiative. Dr. Baggett is also a member of

the board of directors of the Science Education Alliance, which promotes contact between faculty at NMSU and teachers in Las Cruces Public Schools.

Professor Baggett continues her practice of teaching a class a week in elementary and middle schools. Several other faculty members are frequent visitors to area schools. Professor Ted Stanford obtained a course release to work several times a week with middle school teachers in Las Cruces; he is also consulting with Las Cruces High School teachers on a new course for college-bound seniors who would not otherwise take a mathematics course in their last year of high school .

The department maintains several display cases in public areas in Science Hall, in the classroom wing and near the department office. These help to introduce visitors to the members of the department and to give timely information about mathematical topics of current interest.

Three faculty members serve on a joint committee with members of the Doña Ana Branch Community College mathematics faculty. Their activities include working to develop a smooth transition from branch college to main campus mathematics courses, arranging mini-conferences involving members of both faculties at the beginning of each semester

The department supports university and state activities by providing space for organizations on campus. It continues to house the university's Women's Studies Program, and a seminar room has been converted into an office for the southern coordinator for the New Mexico MESA (Mathematics Science Engineering Achievement) program.

7. Outcomes Assessment Activities

7.1. 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 survey was devised by Richard Bagby in collaboration with the Undergraduate Majors/Minors Committee. 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? Often /Seldom

2. Does the student display the ability to complete explicit calculations and derivations? Often /Seldom

3. Can the student clearly express a written mathematical argument? Often/ Seldom

4. Does the student display the ability to apply theoretical knowledge to solve problems? Often /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.) Often /Seldom

Faculty are also asked to justify their responses, indicating the methods by which they arrived at the assessment.

In spring 2004 and fall 2004 we attempted to schedule exit interviews with graduating seniors, with limited success.

The report of the department on outcomes assessment activities for 2003 received a 2 rating, a rise from a 0 rating the year before. A meeting of the head, members of the department, Dean Brown, and Professor Mike Johnson representing the Outcomes Assessment Committee of the University had been held in fall 2003 to identify actions to put the department's undergraduate outcomes assessment activity back on track.

Results of Assessment Activities Outcomes assessment and assessment of student learning is taking place and is having effects. Instructors of the two "theoretical " courses Math 331 and Math 332 required of all mathematical sciences majors and all secondary math education majors agreed that these courses need serious revision. David Finston and Patrick Morandi have revised the content of Math 331 and are collaborating on a text with the revised content. Dr. Douglas Kurtz is working on a book for Math 332 that he expects will address some of the problems of the students in this course. Although outcomes assessment is conducted only for majors, the faculty has identified improving the skills of hand and mental computation of all students in the calculus sequence as a goal to be addressed in 2005.

7.2. Graduate Outcomes Assessment Activities

The assessment of our graduate program includes a survey of graduates with advanced degrees and evaluation of the performance of our graduate students

on master's and doctoral examinations. In 1999 we instituted a questionnaire administered to the chairs of graduate examining committees for the oral comprehensive exams and final orals for the master's and doctorate. The intent is to assess whether the examinee demonstrates mathematical breadth and content specific knowledge appropriate to his or her level. At the discussion of the report on outcomes assessment for 2003, faculty members indicated dissatisfaction with the questionnaires to assess graduate outcomes. Another method, perhaps, calling a faculty meeting to discuss the graduate students' performances, is under consideration. In 2004 about eight students passed final oral exams, and other students passed oral comprehensive exams, where data is also collected, so we will have a report to file in January 2005.

Results of Assessment Activities The information we had received from our established assessment activities, along with the new breadth of research interests in the department, led to a proposal to expand the subject areas on which students can be examined for the written part of the doctoral comprehensive and to impose course requirements for our doctoral students. It was voted on and passed in Fall, 2001. The revision enables students to progress more rapidly into research leading to a doctoral dissertation. It necessitated course revisions since the written portion of the comprehensive exam is based on year long course sequences at the 500 level. Therefore an area can considered as an examination area only if there is a year long sequence of 500 level courses upon which to base the examination. New areas that were included in 2002 are statistics, applied mathematics, and logic/universal algebra. The revision includes course requirements to ensure that our Ph.D.s have appropriate breadth in several mathematical areas. How the new requirements are affecting our graduate student program is the question we will study this year and next.

8. Computing Facilities

The department made a significant advance in oversight of its computing facilities in 2003, when our second permanent full-time staff member, Min Li, joined the staff. John Pierce and Min Li are to be commended for their work in attempting to protect our network from possible damage due to hackers and viruses. The department currently has 20 *Unix* computers, including two *Sun* servers, 139 *IBM* compatible PC's and 20 printers. In addition, the mobile wireless mathematics education laboratory has 29 laptops. Thus, when the lab is in use, the department

can have as many as 183 machines on the network at one time. Additionally, there are two PC/overhead projector combinations, fixed projectors in two classrooms, and 4 laptops that can be checked out by teaching staff for instructional purposes. These machines are used by faculty members and graduate students for research and for the preparation of teaching materials. The department purchased the fixed overheads and laptops through funds provided by external grants. In 2004 we obtained funds to improve the machines in the undergraduate computer laboratory in SH 118. The undergraduate lab houses thirty five networked personal computers, equipped with the mathematics word processing and computing software, *Scientific WorkPlace,* and the symbolic computing software, *Maple.* This lab has been used for students in calculus, linear algebra and several graduate-level courses. We attempted to move the older computers out to graduate student offices in Walden Hall, but we have reached the switch capacity in Walden Hall. Until the problem is rectified, it is not possible to link any more computers in Walden Hall to the Department's network.

The department maintains two more computer labs for graduate students in Science Hall; this year's priority is to upgrade the machines in these laboratories, as well as to improve the switching capacity between the buildings. The graduate students' lab is equipped with 9 ancient UNIX machines and three personal computers.

The department has ongoing needs for renewal of computing equipment and for advanced software for educational uses just to maintain current programs. The Mathematics Learning Center is experimenting with computer-based courses, and we have learned that the use of these programs pushes our older laboratory machines to their limits. Looking toward the future, the contemplated revisions to the calculus curriculum could possibly include computer-assisted learning, which would increase our needs for equipment and permanent staff to maintain it even more.

The machines used by the main department office are obsolescent, and we have also requested funding to replace these machines before they start to fail and to make sure they can accomodate BANNER-related software.

9. Advanced Degrees Awarded in 2004

Name	Degree
Ding Feng	Ph.D.
Advisor: Hung Nguyen	
Ibrahim Al-Ayyoub	Ph.D.
Advisor: Irena Swanson	
Rebecca Pablo	Ph.D.
Advisor: Irena Swanson	

Dr. Feng accepted a post-doctoral appointment in the Department of Statistics at the University of Virginia. Dr. Al-Ayyoub accepted a position at the Jordan University of Science and Technology in Irbid. Dr. Pablo accepted a tenure-track appointment at Sam Houston State University in Huntsville, Texas.

Master's degrees were earned by Zhonghui Liang, Youngchan (Andrew) To, Hubert Noussi, Hien Tran, Lloyd Moyo, Sarah Ellis, Eric Moreno, and Charles Mundy-Castle. Mr. Liang returned to a teaching postion in China, Mr. To works at White Sands Missile Range, Mssrs. Noussi, Tran and Moyo continue in the Ph.D. program at NMSU, Ms. Ellis and Mr. Moreno continue to be employed as part time instructors here at NMSU and at the DABCC, and Mr. Mundy-Castle's plans were not yet fixed for spring.

10. International Activities 2004

10.1. Colloquia

January 15, 2004. Speaker: John Millson, University of Maryland. Title: The Generalized Triangle Inequalities in Symmetry Spaces and Buildings With Applications to Algebra.

January 22, 2004. Speaker: Professor Seamus Curran, NMSU Department of Physics. Title: Spectroscopic Analysis of Defects Formed on Carbon Nanotubes and Subsequent Self-Assembly.

February 19, 2004. Speaker: Martin Wechselberger, Ohio State University Title: Relaxation Oscillators $\frac{3}{4}$ Invariant Structures, Canards and Turning Points.

February 24, 2004. Speaker: Pablo Amster, Universidad de Buenos Aires. Title: Fixed Point Methods for Two Nonlinear Black-Scholes.

February 26, 2004. Speaker: Pedro Mendez, University of Utah. Title: Spectrum of the Fractional Laplacian and Symmetric Stable Processes.

March 11, 2004. Speaker: Stefan Schmidt, Physical Science Laboratory, NMSU. Title: Ring Geometry and Geometry of Data Tables.

March 18, 2004. Speaker: Hala Jadallah, Purdue University. Title: Existence of classical solution of time-dependent Ginzburg-Landau equations is a bounded domain imbedded in vacuum.

April 1, 2004. Speaker: Goetz Pfander, University of Maryland. Title: Two Results in Harmonic Analysis Motivated by Communications Engineering.

April 15, 2004. Speaker: Darel Hardy, Colorado State University. Title: Teaching Calculus With Technology.

April 29, 2004. Speaker: David Pengelley, NMSU Mathematical Sciences. Title: Pascal's Treatise on the Arithmetical Triangle.

May 6, 2004. Speaker: Micheal J. Field, University of Houston. Title: Combinatorial Dynamics

August 26, 2004. Speaker: Sergei Artemov, CUNY Graduate Center. Title: Goedel's provability calculus and the intended semantics for intuitionistic logic.

September 9, 2004. Speaker: Fabio Antonelli, University of L'Aquila, Italy. Title: Backword SDE's and Applications.

September 16, 2004. Speaker: Ludmil Kazarkov, University of California at Irvine. Title: Homological Mirror Symmetry

September 23, 2004. Speaker: Pat Morandi, New Mexico State University. Title: Division Algebras With an Anti-Automorphism but no Involution.

September 30, 2004. Speaker: Ted Stanford, New Mexico State University. Title: Knots Modulo Braids

October 7, 2004. Speaker: David Pengelley, New Mexico State University. Title: Did Euclid need the Euclidean algorithm to prove unique factorization?

October 14, 2004. Speaker: Jerry Bona, University of Illinois at Chicago. Title: A Model for Monetary Shocks

October 19, 2004. Speaker: Jim Conant. Title: Invariants of Classical Knots Through Homotopy Theory.

October 21, 2004. Speaker: Pablo Amster. Title: Topological degree methods for some nonlinear elliptic problems.

October 25, 2004. Speaker: Kevin O'Meara. Title: Gromov Translation Algebras.

October 28, 2004. Speaker: Susana Salamanca-Riba and Katherine Kanim. Title: NMSU Professional Development and Japanese Lesson Study

November 1, 2004. Speaker: Rekha Thomas, University of Washington. Title: The Traveling Salesman Problem

November 2, 2004. Speaker: Rekha Thomas, University of Washington. Title: Polynomial Systems: Applications and Solutions.

November 11, 2004. Speaker: Leslie Saper, Duke University. Title: Cohomology of Locally Symmetric Spaces.

November 16, 2004. Speaker: Pat Baggett, David Pengelley, and Ted Stanford of New Mexico State University. Title: Discussion of Teaching Styles.

November 18, 2004. Speaker: Peter Trapa, University of Utah. Title: Shimura correspondences for split real groups.

10.2. Department Visitors

- Dr. Fabio Antonelli, University of L'Aquila, Italy. Organized by Tiziana Giorgi.

10.3. International Research Collaborations

- Mary Ballyk collaborates with Dr. Wolkowicz and Dr. C. Connell McCluskey, at Mc Master University, Hamilton, Canada.

- Josefina Alvarez is collaborating with Carlos Cabrelli, University of Buenos Aires, and Maria Amelia Muschietti, Universidad de La Plata, both in Argentina.

- Josefina Alvarez with Martha Guzmán-Partida, Universidad de Senora, and Salvador Pérez-Esteva, Instituto de Matemáticas de Cuernavaca, both in México.
- Josefina Alvarez with Cristina Varsavsky, Monash University, Australia.
- Elizabeth Gasparim was on leave during the Spring 2004 at the Max Planck Institut für Mathematik in Bonn, Germany to collaborate with R. J. Milgram; and Cambridge University in Cambridge (England) with C. Teleman.
- Elizabeth Gasparim, Summer 2004, with Christophe Eyral from Tokyo Metropolitan University, Japan.
- Elizabeth Gasparim with Ruxandra Moraru of the University of Toronto, Canada.
- Elizabeth Gasparim with E. Ballico from the University of Trento, Italy.
- Adam Sikora collaborated with Derek Robinson at Australian National University, Australia; Tom ter Elst from Technische Universiteit Eindhoven, Netherlands; and Zhu Yueping, Nantong University, China. Adam also visited with Michael Cowling from the University of South Wales, and Thinh Duong, Macquarie University, Australia.
- Adam Sikora worked with Coulhon Thierry from the University of Cergy-Pontoise, France.
- Irena Swanson, co-principal investigator, NSF grant to support participants for the US-India Workshop: Commutative Algebra, Algebraic Geometry and Combinatorics, Bangalore, India.
- Irena Swanson collaborates with three colleagues from other countries: Anna Guerrieri from Italy; Reinhold Hübl from Germany; and Ngo Viet Trung from Vietnam.
- Maria Mariani has been working with Professor M. Ferraro, and S. Jaroszewicz from the Physics Department of the University of Buenos Aires in Econophysics, and applications to Biology.
- Jens Funke, University of Cologne, June/July 2004 (two months)

- Jens Funke, International Graduate College, Humboldt University, Berlin/Germany, June 2004 (one week).

- Jens Funke, University of Cologne, December 2004 (one week).

- Susana Salamanca-Riba with William Casselman, from University of British Columbia, Canada; Fokko du Cloux, from Universite de Lyon, France; Wai-Ling Lee, University of Toronto, Canada; and Marc van Leeuwen, Universite de Poitiers, France.

- Jerry Lodder continues to work on Leibniz cohomology with Director of Research Jean-Louis Loday of the Pasteur Institute in Strasbourg, France, and am now expanding the theory to Hamiltonian vector field and contact homology.

- Robert Smits is working on a project in mathematical finance with Professor Fabio Antonelli of the University of L'Aquila in Italy. The project deals with the modeling of short term interest rates whose moments have finite recurrence times for any moment. The commonly used model has the drawback that the time to recurrence has a power law tail and is thus not representative of available data.

- Guram Bezhanishvili is invited to write a chapter for the Handbook of Logics of Space in collaboration with Marco Aiello of Trento University, Italy. The handbook will be published by Kluwer Academic Publishers.

- Guram Bezhanishvili is also invited to be the second reader of the chapter by Steven Vickers of The Open University, United Kingdom, for the same handbook mentioned in the preceding item.

- Guram Bezhanishvili has been collaborating with Silvio Ghilardi of Milan University, Italy; Ramon Jansana of the University of Barcelona, Spain; Johan van Benthem, Dick de Jongh, Nick Bezhanishvili, and Balder ten Cate of the University of Amsterdam, The Netherlands.

- Guram Bezhanishvili has been collaborating with Leo Esakia, Revaz Grigolia, and David Gabelaia of the Georgian Academy of Sciences, Georgia.

10.4. International Service

- David Pengelley continually updates and expands the web site, Teaching with Original Historical Sources in Mathematics. A google search for the words "teaching", "mathematics", "history" brings up his website first in the world list of 1,666,000 entries.
- Josefina Alvarez organized a Special Session on Functional and Harmonic Analysis with Carlos Bosch, Instituto Tecnológico Autónomo de México, and Salvador Pérez-Esteva, Instituto de Matemáticas de Cuernavaca, México.
- Josefina Alvarez is a member of the Advisory Board and Contributing Editor, *Matematicalia*, electronic journal in preparation, sponsored by the Spanish Royal Mathematical Society.
- Josefina Alvarez reviewed research proposal on U.S.-Russian Scientific cooperation in mathematics for the Cooperative Grants Program of the U.S. Civilian Research and Development Foundation.
- Josefina Alvarez reviewed papers for Zentralblatt für Mathematik (European Mathematical Society), Mathematische Nachrichten (Switzerland) and Colloquium Mathematicum (Polish Academy of Sciences).
- Josefina Alvarez is a member and Liaison of the Argentinian Mathematical Union.
- Josefina Alvarez is an associate editor of *The Rocky Mountain Journal of Mathematics*, frequently in contact with authors and referees from foreign institutions.
- Tiziana Giorgi is a member of the Canadian Mathematical Society and of the Canadian Applied and Industrial Mathematics Society.
- Hung Nguyen co-organized the Joint Thai-US Conference on Intelligent Technologies, University of Houston-Downtown, Houston, Texas (December 2004); and the Fourth International Conference on Information and Management Sciences, Kumming, China (July 2005).
- John Harding was on the organizing committee of the International Quantum Structures Association meeting, summer 2004 in Denver. This organization has about 200 members and friends from numerous countries around the world.

- John Harding co-organized, with Sonja Smets, a conference titled "Philosophical Logic Meets Mathematical Logic: From Classical to Quantum" at the Free University of Brussels (VUB) Feb 4-7, 2004.

- Doug Kurtz spent six weeks in residence at the Australian National University in Canberra to review recent changes to their undergraduate program by evaluating these changes and making suggestions for improvement.

- Guram Bezhanishvili is an associate editor of Studia Logica, an International Journal of Symbolic Logic.

10.5. International Lectures/ Talks

- Mary Ballyk traveled to McMaster University, Hamilton, Canada presented a colloquium talk in the Department of Mathematics and Statistics, March 19, 2004. Mary also attended the International Conference on Nonlinear Dynamics Evolution Equations at Memorial University of Newfoundland, Canada, and have a talk entitled "Competition in the chemostat for two perfectly substitutable resources."

- Josefina Alvarez, *El matemático accidental* (The Accidental Mathematician), two-hour workshop in the course *Sociedad, Matemáticas y Tecnología*, Universidad de La Laguna, Tenerife, Spain, March 23, 2004.

- Josefina Alvarez, *De funciones a distribuciones* (From Functions to Distributions), talk at the Special Semester in Mathematical Analysis and Applied Mathematics, Escuela de Matemática, Universidad de La Laguna, Tenerife, Spain, March 25, 2004.

- Tiziana Giorgi co-organized the Special Session of The New Mexico Analysis Seminar, Fall 2004, which hosted speakers from abroad.

- Caroline Sweezy gave a 20 minute presentation on "Weighted inequalities for caloric functions on classical domains," (joint work with J. M. Wilson) WSEAS Conference in Corfu, Greece, August 17-19, 2004.

- Elizabeth Gasparim, "Moduli of bundles on surfaces," Tokyo Metropolitan University, Algebraic Geometry Seminar, invited by M. Oka, July 2004.

- Elizabeth Gasparim, "The Atiyah-Jones conjecture for rational surfaces," Algebraic Geometry seminar, Oxford University, England, invited by N. Hitchin and B. Totaro, January/May 2004; University of Zurich, Switzerland, invited by C. Okonek, May 2004; Séminaire de Géométrie e Singularités, Université de Marseille Province, France, invited by A. Teleman, April 2004; MPIM-Bonn, Germany, invited by E. Materov, March 2004.

- Elizabeth Gasparim, "Symmetries of instanton moduli and applications," Oberseminar, MPIM-Bonn, Germany, invited by D. Zagier, April 2004.

- Elizabeth Gasparim attended the Workshop on Fourier-Mukai, Essen, Germany, March 2004.

- Elizabeth Gasparim attended the Seminar on Holomorphic Bundles conducted at Tokyo Metropolitan University, June 2004.

- Pat Morandi, "Valuations on tensor powers of division algebras," 27 May 2004, and "A Springer theorem for higher degree forms," 3 June, 2004, Oberseminar zur Algebrentheorie, Universität Regensburg, Regensburg, Germany.

- Hung Nguyen, gave lectures on Statistics and Random Sets at National Chengchi University, Taipei, Taiwan (May 2004), University of Paris VI, France (June 2004), University of Ghent, Belgium (July 2004), University of Torino, Italy (July 2004).

- Hung Nguyen gave a keynote address at the Fifth National Conference of the Thai Statistical Association, Chaingmai University, Chianmai, Thailand (May 2004).

- Bruce Olberding gave a plenary talk at the conference, Commutative rings and their modules, Cortona, Italy, May 2004.

- Irena Swanson, main speaker and co-organizer of the International Conference on Commutative Algebra and Combinatories, 8-13 December 2003, Bangalore, India.

- Irena Swanson gave a talk "Associated primes of local cohomology modules and of Frobenius powers" at the School on Commutative Algebra and Interactions with Algebraic Geometry and Combinatorics, Trieste, Italy, June 2004.

- Maria Mariani invited to Mainz University, Germany, for teaching the course "Optimization - Math Finance" (about 13 lectures, 90min. each) during Summer 2004. She postponed the invitation. The founds for this visit were provided by the German Science Foundation.

- Jens Funke, Arithmetic Geometry Seminar, Humboldt University, Berlin, Germany, June 2004.

- Jens Funke, Automorphic Forms Seminar, Heidelberg University, Germany, July 2004.

- Jens Funke, Automorphic Forms Seminar, Aachen-Cologne-Lille-Siegen, Cologne, Germany, July 2004.

- Jens Funke, Number Theory Seminar, Max Planck Institut für Mathematik, Bonn, Germany, December 2004.

- Jens Funke was asked to be the Invited Speaker at the International workshop on modular forms and related topics at the Korean Institute for Advanced Studies (KIAS), Seoul, Korea, December 2004: two lectures. Since the workshop is during the last two weeks of instruction at NMSU, Jens had to decline the invitation.

- Patricia Baggett and Andrzej Ehrenfeucht participated in the eight-day Tenth International Congress of Mathematics Education in Copenhagen, Denmark, July 2004 . They presented a paper, Math and science, which is online at http://www.icme-10.dk/.

- Guram Bezhanishvili will attend a conference dedicated to the handbook of Logics and Space in Freiburg, Germany, November 27-28, 2004.

- Guram Bezhanishvili has been invited to give a seminar at Bonn University, Bonn, Germany on December 7, 2004.

- Guram Bezhanishvili has been invited to give a seminar at University of Amsterdam, The Netherlands, on December 17, 2004.

Refereed Publications and Books Appearing in 2004.

Josefina Alvarez

- *Los matemáticos accidentales* (The Accidental Mathematicians), refereed summary and bibliography, published in paper and CD to publicize in Europe the course *Sociedad, Matemáticas y Tecnología*, offered by the Universidad de La Laguna, Tenerife, Spain, March-October, 2004.

Patricia Baggett

- Baggett, P. & Ehrenfeucht, A. (2004). Breaking away from the math and science book: Physics and other Projects for Grades 3-12. Lanham, MD: Scarecrow Education. A review of this book by James N. Boyd is in Mathematics Teacher, October 2004, pp. 206-7. The book and the review are attached.

- Two of our earlier books, originally published in 1995 and 1998, have been republished with new dates (October 2004), and are featured on the first page of our publisher's website, ScarecrowEducation. Attached is a printout of the page, together with a printout listing our four books. The books have new covers and higher prices.

- Baggett, P. & Ehrenfeucht, A. Breaking away from the math book: Creative projects for grades K-6, Lanham, MD: Scarecrow Education, October 2004.

- Baggett, P. & Ehrenfeucht, A. Breaking away from the math book II: More creative projects for grades K-8. Lanham, MD: Scarecrow Education, October 2004.

Ernest Barany

- Barany, E., Schaffer, S., Wedeward, K., and Ball, S., "Nonlinear control of singularly perturbed models of power and flow networks," *Proceedings of 2004 IEEE conf. on Decision and Control*, Paradise Island, Bahamas, December 2004, In press.

Guram Bezhanishvili

- John Harding and Guram Bezhanishvili, "McaNeille completions of Heyting algebras," *Houston Journal of Mathematics*, **30** (2004), 937-952.

- Marco Aiello, Johan van Benthem, Guram Bezhanishvili, "Reasoning about space: the modal way," *Journal of Logic and Computation*, **13** (2003), 889-920.

David Finston

- Finston, D., Deveney, J. K. and van Rossum, P. "Triangular G_a Actions on $\mathbb{C}^4$." *Proc. AMS* **132** (2004) 2841-2848.

Jens Funke

- J. Bruinier, J. Funke, "On two geometric theta lifts," *Duke Mathematical Journal*, 125 (2004), 45-90.

Elizabeth Gasparim

- Milgram, R. James, and Gasparim, E., "The Atiyah Jones Conjecture for Blown-Up Surfaces," *Max Planck Institute für Mathematik Preprint Series* (2004) **n. 14**.

Tiziana Giorgi

- Giorgi, T., O'Leary, M., "On the Local Integrability and Boundedness of Solutions to Quasilinear Parabolic Systems," *E. J. Qualitative Theory of Diff. Equa.*, No. **14** (2004), pp. 1-14.

- Giorgi, T., Smits, R., "From Hot Spots to High School Geometry and Calculus," *Proceedings of the Bridges International Conference*, 2004 (Refereed publication).

John Harding

- Bezhanishvili, G. and Harding, J., "Mac Neille Completions of Heyting Algebras," *The Houston J. of Math.*, **30(4)** (2004), 937-952.

- Harding, J. and Roddy, M. "Obituary: Gunter Bruns," *Order* **20** (2004), 329-332.

Douglas Kurtz

- *Theories of Integration: the Integrals of Riemann, Lebesgue, Henstock-Kurzweil, and McShane*, with C. Swartz. World Scientific Publishing Co., Singapore, 2004. (Upper division text book)

Joe Lakey

- Efromovich, S., Lakey, J., Pereyra, M., and Tymes, N., "Data-driven and optimaldenoising of a signal and recovery of its derivative using multiwavelets," *IEEE Trans. Signal Proc.*, **52** (2004), 628-635.

- Gilbert, J. E., and Lakey, J. D., *On a characterization of the local Hardy space by Gabor frames*, "Wavelets, Frames, and Operator Theory," *AMS Contemp. Math.* Vol. **345**, C. Heil, P. Jorgensen, and D. Larson eds., (2004), 153-162.

Jerry Lodder

- J. Lodder, "Leibniz Cohomology and the Calculus of Variations," *Differential Geometry and its Applications*, **21** (2004), 113-126.

- J. Lodder, "Teaching Discrete Mathematics via Original Historical Sources," *exhibit for NSF-funded projects*, Joint Mathematics Meeting, Pheonix, Arizona, January 2004.

Maria Mariani

- P. De Nápoli, M.C. Mariani. "Mountain Pass Solutions to Equations of p-Laplacian type." *Nonlinear Analysis*, **54** (2003) 1205-1219. This paper was ranked #12 in Nonlinear analysis – Most downloaded articles January – August 2003.

- P.Amster, C. Averbuj, M.C. Mariani. "Stationary solutions for two nonlinear Black-Scholes type equations," *Applied Numerical Mathematics* **47** (2003) 275-280.

- P. Amster, J.P. Borgna, M.C. Mariani, D.F. Rial. "Existence and multiplicity results for the nonlinear Klein - Gordon equation." *To appear in Applicable Analysis.* Accepted in 2003.

- P. Amster, M.C. Mariani. "Periodic solutions of the forced pendulum equation with friction." *Bulletin de la Classe des Sciences* (2003) 7-12.

- P. Amster, P. De Napoli and M. C. Mariani. "Existence of solutions to n-dimensional pendulum-like equations." *Electronic Journal of Differential Equations* **125** (2004) 1-8.

Patrick Morandi

- Morandi, P., "Computing the Symmetry Groups of the Platonic Solids With the Help of Maple, *Resonance* **9** (2004), 18-26.

Hung Nguyen

- Choquet weak convergence of capacity functionals of random sets. In *Soft Methodology and Random Information Systems* (Miguel Lopez-Diaz et al, Editors), Springer-Verlag (2004), **19-31**.

- On statistical inference with random sets (coauthored with Ding Feng) . In *Soft Methodology and Random Information Systems* (Miguel Lopez-Diaz et al, Editors), Springer-Verlag (2004),77-84.

- Dirty pages of logarithm tables, lifetime of the universe, and probabilities on finite and infinite intervals (coauthored with Vladik Kreinovich, Luc Longpre). *Reliable Computing* (2004), Vol. **10**, 83-106.

- Deduction from conditional knowledge (coauthored with D. Bamber and I.R. Goodman). *Soft Computing* (2004), Vol. **8(4)**, 247-254.

- Group-theoretic approach as a general framework for sensors, neural networks, fuzzy control and genetic boolean networks (coauthored with V. Kreinovich, C. Barl and V. Mazin). *10th IMKO TC7 International Symposium* (June 30-July 2, 2004), Saint-Petersburg, Russia, 65-70.

Bruce Olberding

- Fuchs, L., Heinzer, W., & Olberding, B., *Maximal prime divisors in arithmetical rings*, "Rings, modules, algebras, and abelian groups," 189-203, *Lecture Notes in Pure and Appl. Math.*, **236,** Dekker, New York, 2004.

David Pengelley

- Global structure of the mod two symmetric algebra, $H^*(BO; F_2)$, over the Steenrod Algebra (with F. Williams), *Algebraic and Geometric Topology* **3** (2003), 1119-1138.

- The global structure of odd-primary Dickson algebras as algebras over the Steenrod algebra (with F. Williams), *Mathematical Proceedings of the Cambridge Philosophical Society* **136** (2004), 67–73.

- *Excerpt from a letter of Monsieur Lame to Monsieur Liouville on the question: Given a convex polygon, in how many ways can one partition it into triangles by mean of diagonals?*, translation of an article from *Journal de Mathématiques Pures et Appliquées* (1838), 2 pages, published at `http://math.nmsu.edu/~davidp`

Adam Sikora

- Sikora, A., "The Riesz transform, Gaussian bounds and the method of wave equation," *Math. Z.* **247 (3)** (2004), 643-662.

- Sikora, A., Tao. T., "Bochner-Riesz summability for analytic functions on the m-complex unit sphere and for cylindrically symmetric functions on $R^{n-1} \times R$." *Comm. Anal. Geom.* **12(1)** (2004), 43-57.

Robert Smits

- With T. Giorgi "From Hot Spots to High School Geometry and Calculus" refereed conference proceeding of the Bridges Conference 2004.

- Book Review for "Fundamentals of Probability, 3rd Edition" by Saeed Ghahramani, quoted by the publisher on the reverse cover.

Ted Stanford

- *Some Computational results on mod 2 finite-type invariants of knots and string links.* Invariants of knots and 3-manifolds (Kyoto, 2001), 363-376 (electronic), Geometry and Topology Monographs 4, Geometry and Topology Publications, Coventry, 2002. (Note: my paper appeared in 2004, even though the official publication date is 2002.)

Irena Swanson

- Delfino, D., and Swanson, I., "Erratum to 'Integral Closure Ideals in Excellent Local Rings'," *J. Algebra* **274** (2004), 422-428.

- Singh, A., and Swanson, I., "Associated Primes of Local Cohomology Modules and of Frobenius Powers," *International Mathematics Research Notices* **30** (2004), 1703-1733.

- Swanson, I., "On the Embedded Primes of the Mayr-Meyer Ideals, *J. Alg.* **275** (2004), 143-190.

Caroline Sweezy

- "Elliptic functions, area integrals and the exponential square class on $B_1(0) \subseteq \mathbb{R}^n, n > 2$", *Studia Mathematica* **164 (1)** (2004), 1-28.

- "Weighted inequalities for caloric functions on classical domains" joint work with J. M. Wilson, *WSEAS Transactions on Mathematics*, Issue 3, Volume **3**, July (2004), 578-583.

- "Subspaces of $L^1(\mathbb{R}^d)$", *Proceedings of the American Mathematical Society* **132**, No. 12, September (2004), 3599-3606

Tony Wang

- "Inferences in growth curve models under elliptical settings" (with B. Li), *Proceedings of Fourth International Conference on Intelligent Technologies*, Thailand, (2003), pp. 499 - 506.

Summary of Grants and Grant Proposals in 2004.

JOSEFINA ALVAREZ	**Date**				
Title/Co-PI's	**Submitted**	**Agency**	**Amount**	**Duration**	**Status**
Two Writing Projects in Mathematics Research and Education		NSF funded program ADVANCE subcontract 1-4-25466	$21,420	2004	funded.
PI: Alvarez					
Mathematics for All Students, ED05-0018	Sept. 3, 2004	NSF	$1.5 million	2005 – 2010	pending
Coprincipal Investigator with Karin Wiburg (Associate Dean and Director of the Research Center College of Education); and Luis Vazquez (Head of the Department of Counseling and Educational Psychology					
Travel grants		MAA/ Universidad de la Laguna Tenerife, Spain/ and NMSU Math			

PATRICIA BAGGETT	**Date**				
Title/Co-PI's	**Submitted**	**Agency**	**Amount**	**Duration**	**Status**
NMSU Title V Developing Hispanic-Serving Institutions Program	2000	US Dept of Education	$1,019,702	5 years	Funded
(with Nassersharif, Morandi, Finston, et al.)					
Expanding a program of partnership mathematics courses through web development and grant preparation	2002	ADVANCE/NSF	~$27,000	continuing	Funded
Designing and testing materials for a high school calculus course	October 2004	Calculus Consortiumfor Higher Education	$21,644	1 ½ years	just being submitted

MARY BALLYK

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Ecologica Dynamics of Chemostats	June 30, 2004	NSF	$403,967	3 years	Pending
Co-PI: Dr. Ernest Barany					
Center for Research Excellence in Computational Biology Research and Education.	January 2004	NSF	$4,997,241	5 years	Current
P.I. Dr. Desh Ranjan					
ADVANCE Startup Grant	n/a	NSF	$30,666	01/03-12/05	Current
UBM: An Interdisciplinary Program in Mathematical Biology at New Mexico State University.	June 2, 2003	NSF	$100,311	2 years	Current
PI: Dr. W.J. Boecklen					

ERNEST BARANY

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Ecological Dynamics of Chemostats	June 30, 2004	NSF Special Program onMathematical Biology	$403,967	3 years	Pending

GURAM BEZHANISHVILI

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Applications of Topology and Universal Algebra to Modal Logic	May 2002	GRDF/CRDF	$35,000	2 years	Funded
Co-PIs: M. Gehrke, P. Morandi, J. Harding					
Teaching Discrete Mathematics via Original Historical Sources	June 2002	NSF	$74,432	2 years	Funded
Co-PIs: G. Lodder, D. Pengelley, H. Leung, D. Ranjan					

MARCUS COHEN

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Axial Jets in Nonlinear, Multispinor Fields	12/04	AFOSR	$156,000	2 years	Submitted

DAVID FINSTON

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Strengthening Hispanic Institutions (Title V)/	1999	Dept. of Ed.	$175,000 ($18,000 in 2005)	2000-05	Active
PI Rudi Schoenmackers					
Mathematically Connected Communities/	2004	Dept. of Ed.	$530,000	2004	Active
Wiburg, Scott, Kurtz					
Mathematically Connected Communities	2004	Dept. of Ed	$11,500,000		Declined
Wiburg, Scott, Kurtz					
English Language Learners and Algebra/	2004	NSF	$2,200,000		Submitted
Finston, Remmenga, Scott					
Sloan Scholars	1999	Sloan Foundation		Indefinite	Active

JENS FUNKE

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Cycles in locally symmetric spaces of orthogonal and unitary type and modular forms	October 2002	NSF	$88,190	July 2003 - July 2006	Funded

ELIZABETH GASPARIM

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Associate fellow of the International Center for Theoretical Physics Trieste, Italy	5/200	ICTP Italy	Supports visits, graduate students and collaborators	6 years	Active
Hypersurface Singularities Visit to Tokyo Metropolitan University, Japan	11/2003	NMSU Arts and Sciences Reserach Center	$1,242		received
Summer Research Award Mathematics Department	3/2004	NMSU	$5,000		received
Instanton Moduli Spaces	10/2003	NSF	$261,515		pending

TIZIANA GIORGI

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Workshop: Singularities in materials	October 2004	IMA - Institute for Math and its Applications	Travel & living expenses	1 week	Awarded
CBMS- Conference Board in Mathematical Sciences	April 2004	NSF	$31,329	1 year	We have received informal communication of funding
PI: J. D. Lakey. Co-PI's: T. Giorgi, M. C. Pereyra, A. Sikora, R. Smits					
Visitor	August 2004	Purdue Univ.	Travel & lodging	1 week	Awarded

TIZIANA GIORGI

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Nonlinear Partial Differential Equations with Applications to Finance and Physics	Nov. 3, 2003	NSF	$700,000	3 years	Not funded
PI: M. C. Mariani. Co-PIs: T. Giorgi, R. G. Smits, O. Mendez					
Surface Nucleation in Superconductors Surrounded by Normal Materials	Oct. 28, 2003	NSF-ADVANCE INST TRA	$9,347	1 year	Awarded
New Mexico AnalysisSeminar	March 9 2004	NSF	$15,000	2 years	Awarded
PI: M. C. Pereyra. Co-PIs: T. Giorgi,J. D. Lakey, A. Sikora, R. Smits					
Start-Up Funding	Jan. 1, 2002	NSF/Advance INST TRA and CS	$8,000	4 years	Active

JOHN HARDING

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Applications of Topology and Universal Algebra to Modal Logic	May 2002	CRDF/CRDF	$35,000	2 years	Funded
Co-PI's: Bezhanishvili, Gehrke, Morandi (NMSU)					
Philosophical Logic Meets Mathematical Logic: From Classical to Quantum	July 2003	Flemish Fund for Scientific Research	4000 Euros	Funds for a conference, Feb 4-7, 2004	Funded
Co-PI Smets (VUB)					

DOUG KURTZ

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Mathematically Connected Communities	January, 2004	NM Public Education Department	$1,600,000	3 years	Funded
Kurtz, Scott, Wiburg					
Mathematically Connected Communities	December 2003	National Science Foundation	$11,568,655	5 years	Not funded
Gladden, Kurtz, McCarthy, Scott, Wiburg					
Noyce Scholarships	May 2004	National Science Foundation	$499,980	3 years	Not funded
Kanim, Kurtz, Scott					

JOSEPH LAKEY

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
New Mexico Analysis Seminars	July 2003	NSF	$15,000	2 years	current
(PI)Pereyra (Co-PIs) Giorgi, Lakey, Sikora, Smits					
On Models for Coordination of Activity and its Disruption	April 2002	ARO	$208,704	3 years	current
Lakey					
CBMS/NSF Regional Conference: Nonlinear and Dispersive Equations	June 2004	NSF	$31,329	1 year	pending
Lakey (PI), Giorgi, Smits, Sikora, Pereyra (Co-PIs)					
Increasing Speed and Flexibility of Brain-Machine Interfaces with Multiple Cognitions and Wavelet Analysis	April 2004	AFRL	$55,107	14 months starting	current
Kroger (PI) /Lakey (Co-PI)					

JOSEPH LAKEY

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
The Functional Role of Frontpolar Cortez: the Dynamics of Frontpolar Recruitment	Sept. 2004	NIH	$392,545	3 years	pending
Kroger (PI) / Lakey (Co-PI)					

JERRY LODDER

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Teaching Discrete Mathematics via Original Historical Sources	June 2002	NSF	$74,432		Funded through 5/31/2006
Lodder, Leung, Bezhanishvili, Pengelley, Ranjan					

MARIA MARIANI

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Regularity of Differential Equations Arising in Physics	October 2004	NSF Analysis Program	$436,466	3 years	Pending
Nonlinear Problems Arising in Physics and Finance		NSF Advance	$10,000	Fall 2004 - Spring 2005	Awarded
Nonlinear Problems Arising in Finance and Physics	November 2004	NSF Applied Mathematics Program	$436,466	3 years	Pending

PATRICK MORANDI

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Georgian-U.S. Bilateral Grants Program	May 2002	GRDF/CRDF	$35,000	2 years	Funded
Gehrke, Bezhanishvili, Harding					
Title V - Developing Hispanic Serving Institutions Program	March 1999	Dept. of Ed.	$2,5000,000	5 years	Funded
Mathematically Connected Communities	January 2004	NM Pub. Ed Department	$530,000	1 Year	Funded
Wiburg, Scott, Kurtz					
Mathematically Connected Communities	December 2003	NSF	$11,568,655	5 Years	Rejected
Scott, Kurtz, Gladden					

HUNG NGUYEN

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Consulting contract for SPAWAR. PI	January 2004	SDSU/DOD	8,696	2/27/04-12/31/04	funded
Expert decision-support systems. Co-PI	September 2004	DTRA	414,376	10/1/04-9/30/05	funded
Capstone Design Course for soft computing and robotics. Co-PI	September 2004	US Army WSMR	75,000	10/1/04-9/30/05	funded

BRUCE OLBERDING

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Prüfer rings in function fields	Summer 2004	NSA	$6,817		funded
Intersections of valuations rings	Fall 2004	NSA	$30,000		submitted

DAVID PENGELLEY

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Teaching Discrete Mathematics via Original Historical Sources	June 6, 2002	NSF	$74,432	06/01/03--05/31/05	Funded

PIs: G. Lodder, G. Bezhanishvili, D. Pengelley, H. Leung, D. Ranjan

SUSANA SALAMANCA-RIBA

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Unitary dual of real groups	10/03/01	National Science Foundation	$ 87,002.00	06/01/02 to 05/31/05	Granted 05/22/02
Professional Development Outreach*	10/01/04	National Science Foundation (sub award Park City Institute for Advanced Study)	$20,000.00	07/01/04 to 06/30/05	Granted 05/30/04
Sloan Minority Ph. D program in Mathematical Sciences **	08/25/00	Alfred P. Sloan Foundation	per Sloan formula	Indefinite	Granted 12/11/00
Atlas of LieGroups and Representations Focus Research Group***	9/17/03	American Institute of Mathematics National Science Foundation	$19,962.00		Pending
Professional Development Outreach*	Deadline: 12/15//04	Institute for Advanced Study/Park City Mathematics Institute	$20,000.00	07/01/05 to06/30/06	In prep.
Enhancing Math.Sciences Workplace in21st Century****	Deadline09/16/05	National Science Foundation	$400,000.00 to $1,000,000.00	07/01/06 to 06/30/09	In prep.

ADAM SIKORA	**Date**				
Title/Co-PI's	**Submitted**	**Agency**	**Amount**	**Duration**	**Status**
New Mexico Analysis Seminars	July 31, 2003	NSF	$15,000	36 months	Current
PI: Maria Pereyra, Co-PI: Tiziana Giorgi, Robert Smits, Joseph Lakey, Adam Sikora					
NSF/CBMS Regional Conference in Mathematical Sciences: Nonlinear Dispersive and Wave Equations.	April 5, 2004	NSF	$31,329	12 months	Current
PI: Joseph Lakey, Co-PI: Maria Pereyra, Tiziana Giorgi, Robert Smits, Adam Sikora					
Method of wave equation, Phragmen Lindelöf method and spectral properties of differential operators	October 9, 2003	NSF	$156,000		Declined
PI: Adam Sikora					
Second-order differential operators and related topics	October 14, 2004	NSF	$161,658	36 months	Pending
PI: Adam Sikora					

ROBERT SMITS	**Date**				
Title/Co-PI's	**Submitted**	**Agency**	**Amount**	**Duration**	**Status**
New Mexico Analysis Seminar	February2004	NSF	15000	2 years	Funded
Cristina Pereya PI, Joe Lakey, Tiziana Giorgi, Adam Sikora, Robert Smits Co-PIs					
CBMS- Conference Board in Mathematical Sciences	April 2004	NSF	31,329	1 year	Funded
Joe Lakey, Cristina Pereya ,Tiziana Giorgi, Adam Sikora, Robert Smits Co-PIs					
Singular Stochastic Differential Equations	October 2003	NSA	25,367	2 years	Funded
Minigrant --Interest Rate Models	Spring 2004	Arts & Science Research Center	1000	6 months	Funded

ROBERT SMITS Continued.

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Nonlinear PDE's	October 2003	NSF	749,250	3 Years	Unfunded
Tiziana Giorgi and Maria C. Mariani PIs, Osvaldo Mendez and Robert Smits Co-PIs					
Heat Kernels, Conditioned Diffusions and Interest Rate	November 2003	NSF	175,306	3 Years	Unfunded

TED STANFORD

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
MCC PROJECT		New Mexico Department of Education			

IRENA SWANSON

Title/Co-PI's	Date Submitted	Agency	Amount	Duration	Status
Decompositions of ideals	October 2001	NSF	$97,263		Active till May 05
US-India Workshop: Commutative Algebra, Algebraic Geometry and Combinatorics,	April 2003	NSF	$30,000		Ended in Spring 04
Visiting Professor Proposal	May 2004	NMSU Advance	$3,600		Funded.

CO-PI's: Ross Staffeldt

CAROLINE SWEEZY	**Date**				
Title/Co-PI's	**Submitted**	**Agency**	**Amount**	**Duration**	**Status**
Weights and Parabolic Gradients	11/08/04	ADVANCE	$15,000	1 semester	pending

TONY WANG	**Date**				
Title/Co-PI's	**Submitted**	**Agency**	**Amount**	**Duration**	**Status**
Mathematically Connected Communities	Jan. 2004	New Mexico Public Education Department	$1,600,000	3 years	Funded
Co-PIs: Kurtz, Scott, Wiburg					
Mathematically Connected Communities	Dec. 2003	National Science Foundation	$11,568,655	5 years	Not funded
Co-Pis: Gladden, Kurtz, McCarthy, Scott, Wiburg.					