

Department of Mathematical Sciences

Annual Report for 2000

November 17, 2000

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1. Overview

This has been an excellent year for research, outreach, teaching improvement, and graduate recruitment in the Department of Mathematical Sciences. The achievements of two Professors, Hung Nguyen and Lolina Alvarez, were recognized by the university and college with the awards to Professor Nguyen of the Westhafer Award for research, and to Professor Alvarez of the first Manasse Chair for Research. External funding in support of departmental projects in research and education increased by more than 20% over the previous year. The department matched its Fall, 1999 record of 14 new graduate students in Fall, 2000, and four more will join us in Spring, 2001. We were again successful in recruiting graduate students from the minority community. An outstanding young topologist, Ted Stanford, joined our faculty as a tenure track Assistant Professor. Gary Hartshorn and Suzanne Hill joined the College Faculty, and several more College Faculty were hired in regular positions.

Research in the department continues to be strong. Even though only 80% of our tenure track positions are filled, our research productivity, measured in terms of numbers of refereed publications, is 90% of the 1999 total. On the other hand, research and training funding in 1999-2000 was up by 50% over 1998-99. Research opportunities for graduate students saw a dramatic increase largely through the efforts of Ernie Barany, Joe Lakey, and Reinhard Laubenbacher via their work on funded projects at the Physical Sciences Laboratory, Los Alamos National Laboratory, and New Mexico Tech.

The department conducts many outreach programs, most of which have attracted external funding. Alyne Fulte continued to direct the Proyecto Access Las Cruces PREP program with funding from the National Aeronautics and Space Administration, Intel, and others. Sandy Geiger and Chris Weaver continued to direct the Mathematics Accessible to the Visually Impaired Student (MAVIS) program, taking a leadership role on campus initiating work on a program to braille mathematics text for visually impaired students. Patricia Baggett and David Finston, together with faculty in the College of Education were awarded a grant from NASA to improve instruction for future teachers of mathematics. A university-wide effort resulted in a successful proposal to the Department of Education for funding to enhance our capabilities for instruction with technology. Professors Baggett and Morandi played a central role in that effort. A multi-institutional effort, with NMSU as lead institution, resulted in funding from the National Science Foundation for a program to increase the presence of members

of minority groups in the professoriate in science, mathematics, and engineering fields. Lolina Alvarez serves as the primary departmental representative in that effort. A team of mathematics and engineering faculty led by David Finston and Caroline Sweezy obtained NSF funding for a program to provide academic and nonacademic support for economically disadvantaged students. The Supplementary Major in Applied Mathematics received final approval and recruited its first group of students.

The department played an important role in service to the mathematics community, the state of New Mexico, and the university. Faculty members served on professional society committees, journal editorial boards, and organizing committees for national and international conferences. Kitty Berver co-chairs the New Mexico Higher Education Mathematics Articulation Task Force. Many faculty interacted with the Las Cruces Public Schools. Faculty members participated on sensitive university and college committees and in the faculty senate.

The most serious problems faced by the department continue to be a shortage of tenure track faculty. We experienced the resignations of three assistant professors and one associate professor in Spring, 2000. One Professor retired in 2000 and two more will retire after the Spring, 2001 semester. We were able to hire one new tenure track faculty member to begin in Fall, 2000, but our offers to three others were turned down largely because of the intransigence of the Executive Vice President on the issue of credit for prior service. It should be noted that Robert Wisner and Joaquin Loustaunau, who retired in 1999 and 1998, did not have active research programs and therefore were assigned to three courses per semester. Since the increased use of new mathematics in many fields of study compels us to consider only faculty active in research for tenure track positions, these retirements result in a net loss to the department of three teaching positions rather than two.

2. Personnel Changes

One tenure track faculty member, Tony Wang, was awarded tenure and promoted to Associate Professor. Irena Swanson and Joe Lakey were promoted to Associate Professor, and Mai Gehrke and Pat Morandi were promoted to Professor. Kathryn Engebos was promoted to College Associate Professor. Frank Williams retired after more than 30 years of distinguished service to NMSU. Ray Mines and Westhafer Awardee Joe Zund announced their retirements at the end of 2001. Both have served the university with distinction for many years. Gerry Dunn,

Susan Hermiller, James Pommersheim, and Arkady Vaintrob resigned. In anticipation of this turnover, the department developed a long term hiring plan in 1999-2000 and we are implementing it now. The plan called for algebraic topology as an area of priority for new tenure track hiring. As noted above we were extremely fortunate to have Ted Stanford join our faculty in Fall, 2000.

Mathematics Education is another hiring priority since the department is committed to offering mathematics education as an area for doctoral study. Our 1999-2000 search in this area was unsuccessful due to great demand for individuals with this expertise. Hiring in this specialization operates on a different timetable than for the traditional areas in mathematics, and we missed the top candidates. We have accelerated our process and as of today (November 17) are voting on a short list of applicants for interviews.

The department was pleased to have Drs. Raghavan, Guram Bezhanishvili, Martha Guzman Partida, Stefan Schmid, and George Voutsadakis as visiting faculty. The first three are teach teaching two courses each semester in 2000-01 and are actively engaged in collaborative research with NMSU faculty members. The latter two are the first in what is expected to be a continuing series of joint visitors to the department and the Physical Sciences Laboratory. They also are engaged in collaborative research with Mathematical Sciences faculty members and will teach one course each in Spring, 2001. With our crisis in tenure track staffing, it is only with the services of these visitors that we are able to meet our teaching obligations.

3. Curricular Activities

The department designed new programs to enable students in other disciplines to acquire a mathematics major and conducted outreach to better serve students in client departments. The department's proposal for a Supplementary Major in Applied Mathematics was finalized and approved at all levels. Faculty members worked with representatives of the College of Engineering, College of Business Administration, Computer Science Department, Biology Department, and Physics Department in developing programs of study for the supplementary major. Faculty worked with members of the Department of Psychology on statistics courses. Teaching exchanges were conducted with the Physics Department, and joint mathematics and physics courses were offered by Joe Zund. The MAVIS program in the department took a leadership role in addressing the needs of visually impaired students.

One of the department's major curricular efforts involved development of course materials using mathematical software and the internet to improve courses taken by mathematics, science, engineering, and education majors. Our undergraduate course in differential equations was redesigned to emphasize mathematical modeling and dynamical systems. Sophisticated software enables students to attack applied problems that are more realistic than those accessible with traditional methods. A new text emphasizing the use of mathematical software is used in this courses, and Bill Julian has been energetic in developing programs for the graphing calculator that perform much of the tedious numerical work that arises in applications. The faculty have expanded their use of the computer in the classroom. The old portable PC/overhead projector combination has proved to be unwieldy. We have therefore embarked on a program to equip our classrooms with permanently installed overhead projectors and acquire sufficiently many laptop computers to enable many more faculty members to integrate computer use in their teaching. Funding for this process is provided by grants from NASA and the Department of Education.

Developing new programs and courses is an important activity in the department in order to introduce students to new mathematics and to better meet their programmatic needs. Mathematical Sciences faculty and faculty from the Department of Electrical Engineering continue work on the design of a five-year program on communications science, leading to both bachelor's and master's degrees. A group within the department designed a new one year sequence integrating differential equations and linear algebra. Joe Lakey is piloting this course in 2000-01. Students who complete the sequence will learn the content of Math 392 and Math 480, but integrated in a natural context that will enhance the two subjects both for engineering undergraduates and mathematics students. Students will receive 300 and 400 level credit. Faculty members have funding from the National Science Foundation to write a textbook of annotated original historical sources for a capstone course based on the Hon/Math 411G course, "Great Theorems: the Art of Mathematics." As always, faculty offered special topics undergraduate and graduate-level courses on recent developments in pure mathematics and on the use of advanced technology in the elementary and middle school classroom. A member of this department taught special topics courses on relativistic astrophysics and black holes for the Department of Physics. A teaching seminar on applied logic, organized by Mai Gehrke, draws on faculty and graduate students from a number of departments and from PSL.

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.” Honors courses on mathematics appreciation and number theory have been developed. Gabriel Lampert developed an Honors course on Jewish literature. In addition to the Honors courses, the department offers an array of courses approved for General Education, including courses on mathematics for elementary education, business calculus, and mathematics appreciation. An alternate means of meeting the General Education requirement in mathematics is to take six credits of mathematics that require Math 115.

3.1. Student Advising

Student advising is handled by special departmental committees. Undergraduate mathematics majors are advised by members of the Undergraduate Majors/Minors Committee. This committee nominates mathematics majors for scholarships and awards and informs them about study and career opportunities. The Undergraduate Curriculum Committee coordinates the update of our course offerings, syllabi, and information provided to instructors. The committee assisted the College of Engineering with the ABET accreditation visit that took place in Fall, 2000. 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. Members of the department advise for both the Advising Center and the Honors program.

Sandy Geiger 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 monitors students repeating a Mathematics Learning Center class more than one time and Native American students, and she acts as liaison with the American Indian Program Office and Student Support Services. She is also the departmental Americans with Disabilities Act (ADA) contact.

3.2. Graduate Studies

Graduate enrollment in the department was at a record high in 2000 with 42 mathematics graduate students enrolled in Masters and doctoral programs. Five Mathematical Sciences graduate students were awarded master’s degrees during the year. The department continues to attract relatively large numbers of students

from groups traditionally under-represented in mathematics (42% are women or US citizen members of ethnic minority groups). A multi-faceted recruiting effort in 2000 led to the enrollment of a record number (18) first year graduate students in 2000-01, five of them members of ethnic minority groups. Our recruiting efforts in the minority community and in area colleges and universities continue. A combination of departmental, College, Graduate School, and central administration funds enabled eight graduate students to attend the SACNAS annual meeting. Four of these students participated in graduate recruitment activities organized by the Graduate School at the conference. A proposal to the Sloan Foundation to increase the presence of minority graduate students was submitted. A proposal to the National Science Foundation in their AGEP program was submitted and funded in 2000. This is a multi-university grant, NMSU the lead institution and UNM and New Mexico Tech as partners. It will provide enhanced stipends and mentoring to graduate students from groups traditionally under-represented in the sciences.

The department offers a seminar designed specifically for graduate students, introducing them to areas of contemporary mathematics suitable for thesis topics. We have been developing a doctoral program in mathematics education. Requirements for comprehensive examinations and course work have been drafted, and they are now being discussed and revised. Among our first year students, there are several who have expressed interest in this option. We were unsuccessful in our 1999-2000 search for a new faculty member in mathematics education to support this program, but we have renewed our search.

The mathematical areas represented in the department offers doctoral students a broad array of thesis directions. On the other hand, our written comprehensive exam is structured to ensure mathematical breadth in the areas of algebra, topology, and analysis. While these are certainly core areas of contemporary mathematics, faculty recognized this year that the present design forces students with thesis interests in other areas strongly represented among the faculty to defer course work in these areas for an undue period of time. The department is restructuring its comprehensive exam and courses so that we may expand the areas on which students can be examined and thereby enable them to proceed more rapidly to thesis research .

Cooperative and research opportunities for our graduate students have expanded. A cooperative arrangement with Mackichan software has been underway for a year and is expected to continue. Several graduate students were supported during the academic year and summer by research grants made to PSL. The de-

partment and PSL have designed a new program to offer research assistantships to up to 6 new graduate students who are US citizens. Recruitment for this program has just begun.

3.3. Teaching Improvement

The Teaching Committee oversees the coordination of multi-section courses and classroom observations of faculty members and graduate student teaching assistants. The committee drafted plans for a longitudinal study of student performance, to assess the efficacy of current mathematics preparation for courses with mathematics prerequisites. We are seeking funds for release time for Gabriel Lampert to collect and analyze the appropriate data.

Faculty members are using advanced technology, including mathematical software and the internet, in significant ways in their teaching. With NASA support, Pat Baggett is offering a new course on the use of technology in elementary science and mathematics classes. Ross Staffeldt has developed programs used by several faculty to aid students in visualization of various structures of geometric significance in calculus and differential equations courses; NASA funds secured in 2000 will provide him release time to make these materials accessible to all of our faculty. Pat Morandi has developed programs for use in graduate modern algebra courses and uses internet sites in courses for prospective teachers. The same NASA funding will provide him with a course release to revamp the introductory course in modern algebra required of mathematical sciences and secondary mathematics education majors. Bill Julian uses the graphing calculator in innovative ways in graduate and undergraduate courses.

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 under close supervision by experienced educators.

Several faculty members developed a new interest in the mathematical education of prospective teachers. Their work was presented at the national meeting of the Mathematical Association of America in January, 2000. Two faculty members worked on updating the mathematics competencies for the teacher preparation program, and two faculty members attended the New Mexico Roundtable

discussions on the preparation of future teachers.

Other work with undergraduate students includes coaching and other preparation of students for the prestigious Putnam and COMAP competitions. Caroline Sweezy and Marcus Cohen conducted these activities.

3.4. 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. In 1999 we worked with Psychology faculty members to improve the new statistics course the department developed to support their major.

The department continues its teaching exchange with the Department of Physics. Joe Zund offered an advanced graduate-level course on relativity in the Department of Physics, while Thomas Hearn taught mathematics courses in exchange. Mathematics Learning Center faculty members work closely with faculty at the Doña Ana Branch Community College.

One highlight of 1999 was the final approval of the Supplementary Major in Applied Mathematics. Mathematical Sciences faculty members, in collaboration with colleagues from Engineering, Business Administration and Economics, Physics, and Computer Science designed this new degree program. Five students have declared their intent to take advantage of this opportunity.

Educational outreach activities included visits to area public, elementary, middle, and high schools to speak to students, externally funded programs to improve mathematics teaching at these levels, and an enrichment program for talented high school mathematics students. The department has hosted the Diné College Science Honors program in Summers 1998 -2000. The department submitted a proposal to the Fulbright Foundation to support the visit of a mathematics educator from sub-Saharan Africa. The proposed program for the visiting scholar has community involvement through activities in the Las Cruces Public Schools as a central activity. We are hoping to attract someone with expertise in ethnomathematics. If we are successful, Diné College has expressed interest in collaborative work.

A highlight of our outreach to public schools is the PREP program. The program encourages disadvantaged middle school and high school students to study mathematics and science through an intensive summer program of enrichment

activities and is conducted with support of federal, state, and private agencies. The department will again conduct a Mathematics Education Institute in Spring, 2001 and will also host a conference for teachers of the visually impaired that semester. External funding for these activities was secured this year.

4. Research Activities

The productivity of our research program continued a growth trend begun in 1992, as did the number of faculty members supported by outside funds. Faculty members spoke at numerous conferences and universities. Interdisciplinary research remained an important part of our research effort. The Mathematical Sciences Summer Research Awards, funded by an anonymous donation to the NMSU Foundation, enabled Martin Krupa, Tony Wang, and John Harding to further their research efforts. Tony Wang spent part of his sabbatical year at Duke University and obtained funds from Taiwan to visit that country to deliver a series of lectures and conduct collaborative research.

Members of the department were productive researchers. Twenty of the tenure-track faculty members had a total of forty six papers appear in print in 2000. Richard Bagby's text on introductory analysis was published, and the book co-authored by Reinhard Laubenbacher and David Pengelley on educational uses of original mathematical sources went into its second edition. Joe Zund continued his work on mathematics history including writing mathematical biographies. Faculty members delivered dozens of talks on their research at conferences and at other universities.

Faculty members continued to receive external funding to support their research. Nine faculty members conducted mathematics research with funding from the National Science Foundation, the National Security Agency, Sandia National Laboratory, Los Alamos National Laboratory, the Army Research Office, and the Astrophysics Research Lab (through PSL). Eight faculty members conducted funded educational research work on nine projects during the past year; some of these projects involved joint work with the high schools in Las Cruces. Support came from the National Science Foundation, the National Aeronautics and Space Administration, the New Mexico State Department of Education, the New Mexico Commission on Higher Education, the New Mexico Eisenhower Foundation, and the Intel Corporation.

Members of the department conduct joint research with mathematicians at other institutions. Some highlights of this type of activity include: Irena Swan-

son's POWRE grant, a special NSF award, to conduct research and write an advanced text with collaborators at the University of Kansas; Hung Nguyen's service as a Senior Research Fellow of the ASEE/NAVY Summer Faculty Research Program in San Diego, California; Joe Lakey's ongoing activities with faculty at Macquarie University in Australia; Joe Zund was a visiting researcher at the California Institute of Technology. Susana Salamanca Riba spent her 1999-2000 sabbatical leave at the University of Maryland. Reinhard Laubenbacher conducts joint research with staff at Los Alamos National Laboratory and Arizona State University, Ernie Barany with faculty at New Mexico Tech, Bill Julian conducts research with Astronomy faculty at the University of Arizona, and Lolina Alvarez with faculty at Mexican institutions in Cuernavaca and Sonora.

The department sponsors a weekly colloquium and several weekly seminars. The colloquium series included 41 lectures during the year, presented by 27 visitors and 14 speakers from NMSU. Most of the speakers from other institutions visit the department to collaborate with our faculty on their research. Seven of the talks were presented by members of other departments on campus, explaining how they use mathematics in their research. The seminars specialize in algebra, analysis, cryptography, historical sources, lattice theory, statistics, and topology. The "Basic Notions" is a more informal, general interest seminar. The New Mexico Analysis seminar is a joint venture between the mathematics faculty of NMSU and UNM. The Spring, 2000 session was held at NMSU and featured a series of talks by Kate Okiokolu, a distinguished young mathematician at UC San Diego. Together with their counterparts at UNM, Lolina Alvarez and Joe Lakey secured NSF funding for the next series of seminars.

Faculty members participate in interdisciplinary research. Ernie Barany is conducting joint research with faculty members in the College of Engineering and staff of PSL on externally funded projects. Statisticians Hung Nguyen, Nhu Nguyen, and Tony Wang consult with researchers around campus.

5. Professional Service Contributions

The department provided service for the mathematical community and the university. We are an institutional member of several professional organizations, and a sponsor of one journal. Department members worked on committees and conferences for these organizations. They served as journal editors and referees of research articles and grant proposals. For the university, faculty members were members of sensitive university and college committees, and were outside rep-

representatives on tenure and promotions committees for nine departments. The department is represented in the faculty senate by Doug Kurtz.

Members of the department play an important service role in the mathematical community. The department is an institutional member of the American Mathematical Society, the Mathematical Association of America, the Society for Industrial and Applied Mathematics, the American Mathematical Association of Two-year Colleges and the Association for Women in Mathematics. It is an institutional sponsor of the *Pacific Journal of Mathematics* and a member of the Rocky Mountain Mathematics Consortium. Twenty 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 the National Security Agency. Faculty members took part on conference organizing committees and organized special sessions at national and international conferences sponsored by professional societies. Richard Bagby, Pat Baggett, Kitty Berver, Hung Nguyen, David Pengelley, and Joe Zund served on editorial boards of professional journals. Reinhard Laubenbacher was the department's representative to the Rocky Mountain Mathematics Consortium and co-edited a special issue of the *Journal of Symbolic Computation*. Ray Mines served as the department's representative to the Mathematical Association of America and as a member of the board of directors of the *Pacific Journal of Mathematics*. Hung Nguyen was a member of the International Program Committee for the IEEE Conference on Fuzzy Systems. David Pengelley was a member of two MAA committees, and Lolina Alvarez was a member of the American Mathematical Society Committee on Committees. Doug Kurtz serves on two committees of the American Mathematical Society and one of the Mathematical Association of America. Joe Zund was a member of one Special Commission and two Special Committees of the International Association of Geodesy, and the chair of one Special Subcommission. He served on one committee of the American Geophysical Union.

The department plays a major role in the university's service mission. Members of the department served on the Disability Resource Advisory Board, the Educational Diagnostician Advisory Council, the Faculty Senate and its Library Committee, an ad hoc Committee on Admissions, two General Education Committees, two Outcomes Assessment Committees, and the Westhafer Award Committee. One faculty member serves on the Publications Board for the ASNMSU. The department provided advice and assistance to the College of Arts and Sciences with representatives on the Curriculum and Educational Policies, Faculty Affairs,

and Research Affairs Committees, and on the College Council. Mathematical Sciences faculty served as outside members on tenure and promotions committees for the Departments of Astronomy, Chemistry, Computer Science, Government, History, Physics, Philosophy, and Psychology. 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. . All department faculty members participated in committee work within the department.

6. Community 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, Kitty Berver is cochair of the task force. She is responsible for maintaining the internet-accessible database that articulates transfer credits. She was also external evaluator of the lower division mathematics program at Eastern New Mexico University.

The department has increased and improved its interactions with local public schools. Pat Baggett reorganized her Math 111 (Fundamentals of Elementary Mathematics I) and Math 112 G(Fundamentals of Elementary Mathematics II) classes to run concurrently with special topics Math 301 and Math 501 courses for pre and in-service teachers. She created a new course on teaching mathematics and science with technology and offered it in Fall, 2000. 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. Several other Math 111 and Math 112G instructors had their students observe public school classes. The in-service teachers received free tuition with funds provided by a grant from the New Mexico Commission on Higher Education and from NASA. The administration of the Las Cruces Public Schools and, in particular, the Teachers' Center have been highly supportive of this initiative, which has led to several joint interactions involving the department, the public schools, and the College of Education.

Patricia Baggett continues her practice of teaching a class a week in elementary and middle schools, presenting workshops, and addressing the LCPS School Cabinet. Several other faculty members are frequent visitors to area schools.

Alyne Fulte's PREP program continues to grow. It had financial support from National Aeronautics and Space Administration, Intel, and local companies. The year 2000 program brought nearly 200 sixth through tenth grade students to NMSU over the summer to learn mathematics, science and engineering. It seeks to intervene with minority students early in their public school careers, give them the encouragement and educational background necessary to keep them in school, and affords them exposure to scientific and technological careers.

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, and sponsoring the "After Math" contest in the student newspaper.

The department supports university and state activities by providing space for organizations on campus. It has housed the university's Women's Studies Program for ten years, as the university refuses to provide space for this recognized program. It converted a seminar room into the office of the southern coordinator for the New Mexico MESA (Mathematics Science Engineering Achievement) program and provides office space for the PREP director and secretary.

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.

Complementing the survey, all students with senior status will be invited for a discussion with the department head every semester until graduation. The discussion will enable the department head to assess the satisfaction students have with their program of study, assess their preparation for their future mathematical life (graduate school or career), and supplement the standard advising that students receive. Five such interviews were conducted in Fall, 2000. The department will institute a senior seminar course as a requirement for the major. The course will be offered in Spring, 2001.

Results of Assessment Activities Our previous assessment activities included exit interviews and post graduation surveys. Neither elicited much response from students. However, instructors of the two "theoretical" courses required of all mathematical sciences majors agreed that these courses need serious revision. Richard Bagby's new text *Introductory Analysis, A Second Look at Calculus*, published this year by Academic Press, is a step in this direction. David Finston and Patrick Morandi have revised the content of the algebra course and are collaborating on a text with the revised content. We continue to encourage our majors to participate in national competitions, such as the Putnam Examination and the COMAP Modelling Contest.

General Education Assessment Activities The goals of General Education Assessment are not completely clear at the present time. The Department Head met with Vice President Franco to discuss Gen Ed Assessment. We agreed to assist the Vice President in developing an assessment strategy. It should be noted that coordinators of the General Education mathematics courses 112G, 142G, and 210G have been collecting samples of student work as well as instructor guidelines and syllabi.

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. Five of our students passed their master's examinations in 2000 and the questionnaires were administered at these exams.

Results of Assessment Activities The information we have 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 doctoral comprehensive. The proposed revision enables students to progress more rapidly into research leading to a doctoral dissertation. It will necessitate course revision as well. The written portion of the comprehensive exam is based on four year long course sequences at the 500 level. The Graduate Studies Committee has proposed revisions that standardize the syllabus for designated 500 level course sequences proposed as new areas for examination.

7.3. Research Outcomes Assessment Activities

The proposal to assess the research program incorporated the university's mission with proposals from the American Mathematical Society, and involved the research production of faculty members and participation of graduate and undergraduate students in research and creative activities. The research production of the faculty is assessed by the percentage of the tenure-track faculty members who

publish research results during each three-year period. This percentage should be at or above the average for Carnegie I Research Universities, which was 84% for the fall of 1994.

Results of our Assessment Activities Just over 80% of the tenure-track faculty members currently on our staff published research results during the past three years. It should be noted that four faculty members resigned in the year, all of whom had active research programs. During 2000, faculty members offered special-topics courses in pure and applied mathematics and mathematics education to both undergraduate and graduate students, introducing them to ideas at the cutting edge of these fields. The department offered special topics courses in the spring, summer, and fall, including advanced courses in mathematical physics and mathematics applied to signal analysis.. The majority of the faculty use problem-solving and writing assignments in their classes. Our students continue to participate in national mathematics competitions, and are often acknowledged for their performances. They competed in the Putnam Examination and the Mathematics Modeling Contest. Graduate and undergraduate students are involved in mathematical research in faculty research projects funded by the NSF, Los Alamos National Lab externally funded programs in mathematics education, and on a research projects funded by the Physical Sciences Laboratory.

8. Department Self-Study

Part of the university's review process is university-wide self-studies, which began in spring, 1995. The department volunteered to be one of the first in the College of Arts and Sciences to perform a self-study. As the follow-up to the self-study, we proposed the following three activities:

1. Develop a research program in mathematics education.
2. Receive permission to hire visiting faculty members beginning in March for the following academic year.
3. Increase the number of minority students in our graduate program.

Over the past four years our success on items 1 and 3 are significant. The program in mathematics education is clearly defined and active. We are presently conducting a search for our second faculty member with primary research interest

in mathematics education. Our graduate recruiting efforts resulted in a total of 9 students of minority heritage, and we have developed a program to funnel talented minority mathematics majors nationwide to our graduate program. Funding to sustain this effort is pending from the Sloan Foundation. Item 2 remains a problem. Faculty will continue to request leave without pay, and the temporary vacancies these leaves create give us an opportunity to get talented mathematicians as visitors. Early approval for visiting faculty will enable us to get the best fit for the department in terms of teaching needs and research compatibility.

9. Computing Facilities

The department made several significant advances in its computing facilities this year. The operating systems for the servers and computers in the SH 118 computer laboratory were upgraded to Windows 2000. This lab is the first on campus to be so upgraded. The subnetwork for the faculty and staff servers were also upgraded to Windows 2000. Graduate student offices were all networked. Math-Cog's preparations for Y2K were successful, the department's operations saw no effects. John Pierce is to be commended for his work in protecting our network from possible damage. The department currently has twenty five *Sun* computers, including one *Sun* servers, 125 *IBM* compatible PC's, three of which run *Linux/NT*, 18 printers. Additionally, there are two PC/overhead projector combinations, a fixed projector in one classroom, and a laptop used for instructional purposes. These machines are used by faculty members and graduate students for research and for the preparation of teaching materials. The department is now purchasing more such fixed overheads and laptops through funds provided by external grants. We have requested funds to upgrade the graduate student computing laboratory. Departmental funds were used to purchase two new suns and one PC for that facility.

The department maintains three computer labs incorporating state-of-the-art equipment and software. The undergraduate lab houses twenty two networked personal computers, equipped with the mathematics word processing and computing software, *Scientific WorkPlace*, designed by Adjunct Professor Roger Hunter, and the symbolic computing software, *Maple*. This lab has been used for students in calculus, linear algebra and several graduate-level courses. The graduate students' lab is equipped with 9 UNIX machines and three personal computers. The mathematics education computer lab had been used for a variety of teacher education activities, but it was inadequately equipped. Internal BRR funds and external

funds (NASA) were secured to upgrade the equipment and create a laboratory classroom environment. The computing equipment available to faculty and students in the Mathematics Learning Center will soon be upgraded with funding from the department's portion of new Title V funding from the Department of Education. The department has an ongoing need for computing equipment and advanced software for educational uses.

The Computer Operations Group has one full time staff member. The other staff consists of student workers. This is inadequate staffing for an operation as large as ours. In comparison, Computer Science has a smaller operation with three full time staff members. Dean Casillas has agreed to fund one half of a second staff member provided the department can come up with the remaining funds. We are working on this.

10. Advanced Degrees Awarded in 2000

Name	Degree
MacErastus Amokwaw Advisor: Hung Nguyen	Master's
Murat Basaran Advisor: Hung Nguyen	Master's
Michael Carroll Advisor: John Harding	Master's
Daniela Hobst Advisor: Reinhard Laubenbacher	Master's
Huili Wang Advisor: Hung Nguyen	

11. Department Colloquia for 2000

Maria Evelina Rossi, University of Genoa, Italy. *The Hilbert Function of a Local Cohen-Macaulay Ring*. January 13, 2000.

- Ross Staffeldt, New Mexico State University. *Teaching With Maple*. January 27, 2000.
- Melanie Martin, Jennifer Oesterling and Bob Zavala, New Mexico State University. *The Graduate Student Council and the Graduate Student Organizations at NMSU*. February 10, 2000.
- Kate Okikiolu, University of California at San Diego. *Spectral Zeta Functions in Riemannian Geometry*. February 24, 2000.
- Alex Solano, Florida State University. *Building Images for the Learning of Mathematics Through Visualization*. February 25, 2000.
- Dan Christensen, Institute for Advanced Study, Princeton and Johns Hopkins University. *Efficient Constructions of Spaces and Chain Complexes*. February 28, 2000.
- David Foulis, University of Massachusetts, Amherst. *Unigroups*. March 2, 2000.
- Charles Rezk, Northwestern University. *Modular Forms and Homotopy Groups*. March 3, 2000.
- Shoumei Li, SAGA University, Japan. *Convergence Theorems for Set Valued Martingales*. March 6, 2000.
- Alberto Corso, Michigan State University. *Closing an Ideal With Integral Equations*. March 7, 2000.
- Joe Buhler, MSRI and Reed College. *Fast and Fourier Transforms Using Algebraic Integers*. March 16, 2000.
- Robin Wilson, Open University, England. *The Mathematics of Lewis Carroll*. March 21, 2000.

- Chris Moyer, Math Computer Operations Group, NMSU. *Presenting the Capabilities of Science Hall 118 When Used as a Teaching Tool*. March 23, 2000.
- Ted Stanford, United States Naval Academy. *Undoing Knots and Undoing Other Things*. April 6, 2000.
- Martin Krupa, New Mexico State University. *Math Spans Fractional Dimensions*. April 25, 2000.
- Jay Gogue, President, New Mexico State University. *Meet the Prez*. September 14, 2000.
- Hilary Priestley, Oxford University, England. *Priestly Spaces of Lattice-ordered Algebras*. September 28, 2000.
- Patrick Scott, New Mexico State University. *A Look at the New NCTM Principles and Standards*. October 5, 2000.
- K. N. Raghavan, Chennai Mathematical Institute, India and New Mexico State University. *On the Combinatorics of Representation Theory at $q = 0$* . October 19, 2000.
- Tim Cochran, Rice University. *Non-Commutative Knot Theory*. October 26, 2000.
- David Pengelley, New Mexico State University. *Dances Between Continuous and Discrete: Euler's Summation Formula*. November 2, 2000.
- Jacob Mostovoy, Universidad Nacional Autonoma de Mexico, Cuernavaca. *Spaces of Continuous Rational Maps*. November 16, 2000.
- Ian Melbourne, University of Houston. *Title TBA*. December 7, 2000.

12. International Activities 2000

12.1. Colloquia

- Maria Evelina Rossi, University of Genoa, Italy. *The Hilbert Function of a Local Cohen-Macaulay Ring*. January 13, 2000.

- Shoumei Li, SAGA University, Japan. *Convergence Theorems for Set Valued Martingales*. March 6, 2000.
- Robin Wilson, Open University, England. *The Mathematics of Lewis Carroll*. March 21, 2000.
- Hilary Priestley, Oxford University, England. *Priestly Spaces of Lattice-ordered Algebras*. September 28, 2000.
- K. N. Raghavan, Chennai Mathematical Institute, India and New Mexico State University. *On the Combinatorics of Representation Theory at $q = 0$* . October 19, 2000.
- Jacob Mostovoy, Universidad Nacional Autonoma de Mexico, Cuernavaca. *Spaces of Continuous Rational Maps*. November 16, 2000.

12.2. Department Visitors

- Guram Bezhanishvili, Tbilisi, Georgia, 2000-2001
- Martha Guzman Partida, University of Sonora, 2000-2001
- George Voutsadakis, Greece, 2000=2001
- Stefan Schmidt, Germany, 2000-2001
- Raghavan, Chennai Mathematical Institute, India, 2000-2001
- Maria Alicia Aviño Diaz, National Autonomous University of Mexico, 1999-2000.

12.3. Collaborative Research

- Ross Staffeldt conducts joint research with faculty at Univerty of Bielefeld, Germany.
- Irena Swanson conducts joint research projects with faculty in Italy and Germany, among others.
- John Harding conducts research with colleagues in the Czech Republic and Canada.

- Pat Morandi does collaborative research with Susanne Pumpluen, University of Regensburg.
- Joe Lakey did collaborative work in Sydney, Australia.

12.4. International Service

- Joe Zund was a member of one Special Commission and two Special Committees of the International Association of Geodesy, and the chair of one Special Subcommission.
- Lolina Alvarez is US Liaison of the Argentine Mathematical Union
- John Harding is an officer of the International Quantum Structures Society.

12.5. International Conferences and Lectures

- Lolina Alvarez lectured at the Technological University in Ciudad Juárez.
- Mai Gehrke lectured at universities Austria, Denmark, Portugal, and Japan, and Great Britain.
- Patricia Baggett lectured at an international conference in Japan.
- Marcus Cohen lectured at an international conference and colloquium in Switzerland.
- John Harding was an invited speaker at the conference Current Research in Operational Quantum Logic II in Brussels, Belgium.
- Martin Krupa gave a minisymposium in Portugal.
- Pat Morandi spoke at the Catholic University of Louvain, Belgium, and attended a minicourse in Artois, France.
- Nhu Nguyen lectured at the Chinese University of Hong Kong.
- Tony Wang lectured at international conferences in Taiwan, Hong Kong, and Thailand.
- Hung Nguyen spoke at international conferences in Thailand and Taiwan.

- Irena Swanson lectured at the University of Ljubljana, Slovenia.
- David Finston spoke at an international conference in Hong Kong.
- Jerry Lodder lectured at a conference in France.
- Susana Salamanca-Riba lectured at an international conference in Trieste, Italy.

13. Refereed Faculty Publications and Books Appearing in 2000

Josefina Alvarez

- “Spaces of bounded λ -central mean oscillation, Morrey spaces, and λ -central Carleson measures,” (with M. Guzmán-Partida, J. Lakey): *Collectanea Mathematica* 51 (2000), 1-47.

Richard Bagby

- *Introductory Analysis*, Academic Press, 2000, 201 p.
- *Instructor’s manual for Introductory Analysis*, Academic Press, 2000, 91 p.

Ernest Barany

- “Tuning nonlinear identifiers: Networks of coupled oscillators,” *Proc. 2000 Amer. Cont. Conf.*, June, 2000, Chicago, IL.

Marcus Cohen

- “A Nonlinear Twist on Inertia gives Unified Electroweak-Gravitation”. In *“Fragments in Science - a Festschrift for Mendel Sachs”*. Ed., M. Ram, World Scientific, 1999. pp. 134-164. (Conference Proceedings)
- “Cosmological Determination of the Weinberg Angle”. In: *The Photon; Old Problems in the Light of New Ideas*. Ed., Valerie Dvoeglazov, Nova, 2000, pp. 157-163. (Refereed)

- “Mass and Interaction from Eight-Spinor Nonlinearity” in ‘*Lorentz Group, CPT, and Neutrinos*’ Eds. A. E. Chuby Ralo, et. al., pp. 232-242 (Conference Proceedings).

David Finston

- Deveney, J. K., and Finston, D. R., “Free G_a actions on \mathbf{C}_3 .” *Proceedings of the American Mathematical Society* 128 (2000) 31-38.
- Deveney, J. K. and Finston, D.R., “Twin triangular derivations.” *Osaka Journal of Mathematics* 37 (2000) 15-21.

Mai Gehrke

- (with B. Jónsson), “Monotone Distributive Lattice Expansions”, *Math. Japonica* 52, No.2 (2000), 197-213.
- Averaging Operators on the Unit Interval, with C. Walker and E. Walker, *International Journal of Intelligent Systems, (Special Issue: The Mathematics of Fuzzy Sets)* 14 (9), (1999), 883-898
- Fuzzy normal forms and truth tables, *Proceedings of JCIS 2000*, Atlantic City, New Jersey, February 17-March 2, 2000.
- Some comments on fuzzy normal forms, *Proceedings of the ninth IEEE International Conference on Fuzzy Systems: FUZZ-IEEE 2000*, San Antonio, Texas, May 7-10, 2000.

John Harding

- Harding, J. & Pogel, A., “Every Lattice with 1 and 0 is Embeddable in the Lattice of Topologies of some Set by an Embedding which Preserves the 1 and 0”, *Topology and Its Applications*, 105: 99-101, 2000.

William Julian

- Julian, W.H., Samarasinha, N.H., and M.J.S. Belton. Thermal Structure of Cometary Active Regions: Comet 1P Halley. *Icarus*, **144**, 160-171 (2000).

Martin Krupa

- B. Katzenbruger, M. Krupa, P. Szmolyan. Bifurcation of traveling waves in extrinsic semiconductors. *Physica D* 144 p. 1-19 (2000).
- S. A. van Gils, M. Krupa and V. Tchistiakov. Homoclinic twist bifurcation in a system of two coupled oscillators. *JDDE* 12 (2000).
- M. Krupa and P. Szmolyan. Geometric analysis of the singularly perturbed planar fold. *Multiple Time-Scale Dynamical Systems*, IMA Volume 122 Editors: Christopher K. R. T. Jones and Alexander Khibnik. In press.

Joseph Lakey

- Alvarez, J., Guzmán-Partida, M., & Lakey, J., “Spaces of bounded λ -central mean oscillation, Morrey spaces, and λ -central Carleson measures” *Collect. Math.*, **51** (2000), 1–47.
- Gilbert, J., Hogan, J., & Lakey, J., “Characterization of Hardy spaces by singular integrals and divergence-free wavelets”, *Pacific J. Math.*, **193** (2000), 79–105.
- Lakey, J., and Pereyra, M., “Divergence-free multiwavelets on rectangular domains” in , *Wavelet Analysis and Multiresolution Methods* 203–240, Marcel-Dekker, 2000.
- Lakey, J., and Pereyra, M., “Multiwavelets on the interval and divergence-free wavelets” in *Wavelet Applications in Signal and Image Processing VII*, Proc SPIE 3813, (1999), 162–173.
- Gilbert, J., Hogan, J., & Lakey, J., “Fourier and wavelet characterizations of massless Hardy spaces” in “Dirac Operators in Analysis,” 25–40, Longman, 1998. (not previously recorded as in print)

Reinhard Laubenbacher

- A New Algorithm for the Quillen-Suslin Theorem, with C. Woodburn, *Contributions to Algebra and Geometry* 41, 2000, 23-32.
- An Algorithm for the Quillen-Suslin Theorem for Quotients of Polynomial Rings by Monomial Ideals, with K. Schlauch, *Journal of Symbolic Computation*

- Permanent Ideals, with Irena Swanson, *Journal of Symbolic Computation*
- *Paskutinė Fermat teorema [Fermat's Last Theorem]* (with R. Laubenbacher), *Alpha Plius Omega* **8**, #2 (1999), 4–18.
- *Mathematical Expeditions: Chronicles by the Explorers* (with Reinhard Laubenbacher), revised second printing, book in Undergraduate Texts in Mathematics / Readings in Mathematics series, Springer-Verlag, New York, 2000.

Jerry Lodder

- Rigidity of Secondary Characteristic Classes, “*Differential Geometry and its Applications*, 12, (2000), p. 207–218.

Pat Morandi

- Morandi, P., Sethuraman, B.A., “Generalized Cocycles with Values in One-Units of Henselian Valued Division Algebras”, *Journal of Algebra* **224**, 123-139, (2000).
- Morandi, P., Sethuraman, B.A., “Decomposition of involutions on inertially split division algebras”, *Mathematische Zeitschrift* **235** (No. 1), 195-212, (2000).

Hung Nguyen

- Some mathematical structures for computational information. *International Journal of Information Sciences* (128), 67-89, 2000.
- On Chu spaces in uncertainty analysis (with Nhu Nguyen). *International Journal of Intelligent Systems* (15), 425-440, 2000.
- Fuzzy systems are universal approximators for a smooth function and its derivative (with V. Kreinovich and Y. Yam). *International Journal of Intelligent Systems* (15), 565-574, 2000.
- Probability updating using second order probabilities and conditional event algebra (with I.R. Goodman). *International Journal of Information Sciences* (121), 295-347, Dec. 1999.

- *Fuzzy Mathematics and Statistical Applications* (with Berlin Wu). Textbook published by Hua-Tai Publishing Company, Taiwan, 2000.
- Extracting fuzzy sparse rule base by cartesian representation and clustering (with Yeung Yam, Vladik Kreinovich). *Proceedings of the 2000 IEEE Conference on Systems, Man, and Cybernetics SMC '2000*, Nashville, TN, October 8-10, pp. 3778-3783.

Nhu Nguyen

- Chu spaces in uncertainty analysis, (with H.T. Nguyen), *Journal of Intelligent Systems*, 15(2000), pp. 425-440.
- The AR-property in linear metric spaces, (with M. Khamsi and L. Valdez-Sanchez), *Topology Appl.* (galley proofs were corrected in February, 2000. It should appear before December 31, 2000).

David Pengelley

- “Sheared algebra maps and operation bialgebras for mod 2 homology and cohomology” (with Frank Williams), *Transactions of the American Mathematical Society* 352 (2000), 1453–1492.
- A global structure theorem for the mod 2 Dickson algebras, and unstable cyclic modules over the Steenrod and Kudo-Araki-May algebras (with Franklin P. Peterson and Frank Williams), *Mathematical Proceedings of the Cambridge Philosophical Society* 129 (2000), 263–275.
- *Paskutinė Fermat teorema [Fermat’s Last Theorem]* (with R. Laubenbacher), *Alpha Plius Omega* 8, #2 (1999), 4–18.
- *Mathematical Expeditions: Chronicles by the Explorers* (with Reinhard Laubenbacher), revised second printing, book in Undergraduate Texts in Mathematics / Readings in Mathematics series, Springer-Verlag, New York, 2000.

Ross Staffeldt

- The NMSU Department of Mathematical Sciences Maple Computing Laboratory”, ASEE Gulf-Southwest 2000 Conference Proceedings, 87C3, 2000. (Published on CD-ROM.)

Theodore Stanford

- Four observations on n-triviality and Brunnian links, *Journal of Knot Theory and its Ramifications*, volume 9 (2000), 213-219

Irena Swanson

- Zeros of differentials along ideals, appendix to R. Hübl's Derivations and the integral closure of ideals, *Proceedings of the American Mathematical Society*, 127 (1999), 3503-3511.
- (with Guerrierie, A.), "Jacobian ideals of trilinear forms: an application of 1-genericity," *Journal of Algebra*, 226 (2000), 410-435.

Joseph Zund

- "Hotine's Transformation Formulas Revisited," *Bolletino di Geodesia e Scienze Affini*, anno LVIII, (1999), 275-288.
- "An Essay on the Foundations of Gaussian Differential Geometry-IV: Parametric Systems," *Bolletino di Geodesia e Scienze Affini*, anno LVIII, (1999), 325-352.
- "A Note on the Existence of a Canonical Form for the Curvature Tensor in Riemannian Geometry," (with J. M. Wilkes), *Tensor N.S.* (August 1998).
- "Areas of the Event Horizon and the Stationary Limit Surface for a Kerr Black Hole," (with C. A. Pickett), *American Journal of Physics* 68, 746-748, (2000).

14. Summary of Grants and Grant Proposals in 2000

Josefina Alvarez

Grant title	Date of Submission	Agency	Amount	Status
New Mexico Alliance for Graduate Education and the Professoriate (NM-AGEP)	May 2000 awarded Sept.	NSF	\$ 2.5 million	active
New Mexico Analysis Seminar	June 2000 awarded Sept.	NSF	\$ 20,941	active

Pat Baggett

Grant title	Date of Submission	Agency	Amount	Status
Math and Science Educators for the Future	Oct. 1999	NASA	\$590,788	active
Strengthening Hispanic Serving Institutions Program	March, 2000	US Dept of Education	\$2,500,000	active
Collaborative for Excellence in Teacher Preparation	1999	NSF	\$8,500	active
A Program in Mathematics, Science, and Technology for Prospective and Practicing K-8 Teachers	2000	Oracle	\$10,000	pending

Ernie Barany

Grant title	Date of Submission	Agency	Amount	Status
Complex Systems Modeling, Analysis Simulation	March 2000	New Mexico Tech	\$3,200,000	active
Complex Systems Modeling, Analysis Simulation	July 2000	New Mexico Tech	\$81,968	active
Singular Perturbation Theory for Nonhyperbolic Points	Nov. 2000	NSF	\$250,000	pending

Marcus Cohen

Grant title	Date of Submission	Agency	Amount	Status
New Physics predicted Spinor Grand Unification	December 2000	AFOSR	\$300,000	Proposed

David Finston

Grant title	Date of Submission	Agency	Amount	Status
Math and Science Educators foor the Future	October, 1999	NASA	\$598,000	Active
MAVIS	March, 2000	New Mexico Eisenhower Foundation	20,000	Active
Strengthening Hispanic Serving Institutions	March, 2000	Dept. of Education	\$2,500,000	Active
Math/Engineering Scholarships	Aug. 1999	NSF	\$220,000	Active
MAVIS	Aug. 2000	NSF	\$100,000	Pending
Sloan Scholars	Dec. 1999	Sloan Foundation	\$180,000	Pending
Visiting Scholar	Nov. 2000	Fulbright Foundation	\$25,000	Pending

Alyne Fulte

Grant title	Date of Submission	Agency	Amount	Status
New Mexico PREP	June 1999	Commission for Higher Ed.	\$200,000	Tabled March 2000
New Mexico PREP	Oct. 1999	Intel Found.	\$33,000	Accepted Nov. 1999
New Mexico PREP	Nov. 1999	GTE Focus Grant	\$30,000	Rejected Dec. 1999
New Mexico PREP	March 2000	New Mexico Summer Food Service Program	\$10,783.50	Accepted May 2000
New Mexico PREP	March 2000	Doña Ana Workforce Action Council	\$6,250	Accepted April 2000
New Mexico PREP	April 2000	Cross Timbers Oil Company	\$2,500	Accepted May 2000
New Mexico PREP	Feb. 2000	Commission for Higher Education	\$200,000	Pending
New Mexico PREP	Oct. 2000	Intel	\$27,000	to be submitted
New Mexico PREP	Oct. 2000	Honeywell	\$6,500	to be submitted
New Mexico PREP	Oct. 2000	Verizon Focus Grant	\$30,000	to be submitted

Mai Gehrke

Grant title	Date of Submission	Agency	Amount	Status
Minigrant	Fall 1999	AS, NMSU	\$1500	funded
PSL funding		PSL		

Sandy Geiger

Grant title	Date of Submission	Agency	Amount	Status
Mavis	Spring 1998	NSF	\$600,000	active
Mavis: New Mexico Eisenhower Foundation grant	July 2000	NMEF	\$19,999	awarded 2001

Maciej Krupa

Grant title	Date of Submission	Agency	Amount	Status
Mathematical Sciences Summer Research Grant	Summer 2000	NMSU Foundation	\$2,000	funded
Singular perturbation theory for non-hyperbolic points	November 2000	NSF	\$250,000	pending

Joseph Lakey

Grant title	Date of Submission	Agency	Amount	Status
CAREER Times Frequency Method	July 1999	NSF	\$247, 488	not funded
New Mexico Analysis Seminar	April 2000	NSF	\$20,941	active
Toward Scientific Computing	May 2000	NSF	\$60,000	pending
Uncertainty principles in analysis	Oct. 2000	NSF	\$150,000	pending

Reinhard Laubenbacher

Grant title	Date of Submission	Agency	Amount	Status
Mathematical Foundations of Computer Simulation	10/13/99	LANL	\$44,000	active
Biocomplexity - Incubation Activity	4/25/00	NSF	\$98,000	active
Mathematical tools for the Analysis of Dynamical....		ARO	\$379,000	Pending
Sloan Scholars		Sloan Foundation	\$180,000	Pending

Jerry Lodder

Grant title	Date of Submission	Agency	Amount	Status
A Capstone Course: Learning Mathematics Through Original Sources	June 1996	NSF	\$53,000	active to May 2000

Patrick Morandi

Grant title	Date of Submission	Agency	Amount	Status
Strengthening Hispanic Serving Institutions	9 March 1999	Dept of Ed.	\$2,500,000	active
Mathematics & Science Educators for the Future	3 December 1999	NASA	\$598,000	active

Hung T. Nguyen

Grant title	Date of Submission	Agency	Amount	Status
Density Estimation Using Random Sets (co-PI)	September 28, 2000	NSF	\$ 165,195	pending

Nhu Nguyen

Grant title	Date of Submission	Agency	Amount	Status
Density Estimation Using Random Sets	September 28, 2000	NSF	\$165,195	Pending
Non-Uniform Fast Fourier Tranforms	October 18, 2000	NSF	\$255,794	Pending

David Pengelley

Grant title	Date of Submission	Agency	Amount	Status
A Capstone Course: Learning Mathematics Through Original Sources (with J. Lodder, R. Laubenbacher, A. Knoebel)	May 20, 1996	NSF NMSU #960957	\$190,100	Funded for \$52,797 6/1/97– 5/31/00

Susana Salamanca-Riba

Grant title	Date of Submission	Agency	Amount	Status
Unitary Representations and Zuckerman modules	December, 1996	National Science Foundation	7\$6,336	active

Ross Staffeldt

Grant title	Date of Submission	Agency	Amount	Status
Algebraic K-theory of Spaces	Nov. 2000	NSF	\$70,000	pending
Math and Science Educators for the Future	Oct, 1999	NASA	\$598,000	active

Irena Swanson

Grant title	Date of Submission	Agency	Amount	Status
Power of ideals	October 1998	NSF	\$90,000	active
Integral closures	December 1999	NSF - POWRE	\$75,000	active

Caroline Sweezy

Grant title	Date of Submission	Agency	Amount	Status
Parabolic Functions	October 2000	NSF	\$62,000	pending
Math/Engineering Scholarships	August 1999	NSF/CEMS	\$220,000	active

Tony Wang

Grant title	Date of Submission	Agency	Amount	Status
Random Sets Statistics for Data Mining	Sept. 1999	NSF	\$160427	not funded
Students Investigators in the Middle School Classroom	May 2000	NSF		pending
Random Sets Statistics and Fractal Probability	April 2000	Summer Research Award	\$5000	funded
Multivariate Linear Models under Elliptical Settings	May 2000	NSC of Taiwan	\$42,000	funded