ADVANCE: Institutional Transformation

Year End Report
January 1, 2004 - December 31, 2004

Lisa M. Frehill, PI
Waded Cruzado-Salas, Co-PI (as of 8/15/04)
Leroy Daugherty, Co-PI
Josephine DeLeon, Co-PI (as of 8/15/04)
Christine Marlow, Co-PI (until 8/15/04)
Kenneth Paap, Co-PI (until 8/15/04)
Rudi Schoenmackers, Co-PI

Pamela Hunt, Program Coordinator
Rebecca Zaldo, Records Specialist
Cecily Jeser-Cannavale, Research Analyst
Jammie Benton-Speyer, Graduate Assistant (1/1/04-8/15/04)
Lauren Ketcham, Graduate Assistant (6/15/04-12/31/04)

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I. PARTICIPANTS

Program Personnel

Lisa M. Frehill, PI/PD, Associate Professor, Department of Sociology and Anthropology
Principal Investigator is also the Program Director, responsible for all aspects of ADVANCE. The PI/PD oversees all program activity, participates in and supports programs of all ADVANCE committees, conducts institutional self-study, and supervises program coordinator, research analyst and graduate students. The PI/PD serves as chair of the Committee on the Status of Women in STEM.

Pamela Hunt, Program Coordinator
Program Coordinator facilitates and coordinates work of the Committee on the Status of Women in Science, Mathematics and Engineering and its subcommittees by: gathering institutional data and other information and providing logistical support; organizing workshops for faculty and students; coordinating with other relevant programs on campus on annual events; facilitating communication among faculty, staff, and administrators; maintaining website; producing program brochure/flyers; monitoring budget; writing annual reports.

Jammie Benton-Speyer (1/04-8/04) and Lauren Ketcham (6/04-12/04) Graduate Assistants
Assist with on-going internal data collection and analysis, including workshop evaluation and reporting. Assist with production of publications to disseminate results.

Rebecca Zaldo, Administrative Assistant
Provides programmatic support to the Program Coordinator including: meeting facilitation, financial records processing, and financial records database maintenance.

Cecily Jesser-Cannavale, Research Analyst
Assists with on-going internal data collection and analysis, including workshop evaluation and reporting.

Kenneth Paap, Co-PI, Associate Dean, College of Arts and Sciences (1/1/04-8/15/04)
Administration of program. Serves on the Committee on the Status of Women in STEM and the Research Subcommittee. Replaced by Dr. Waded Cruzado-Salas, Dean, College of Arts and Sciences 8/15/04.

Leroy Daugherty, Co-PI, Associate Dean, College of Agriculture and Director, Agricultural Experiment Station
Administration of program. Serves on the Committee on the Status of Women in STEM, the Recruitment Subcommittee and the ADVANCING Leaders Committee.

Christine Marlow, Co-PI, Program Director, NM-Alliance for Graduate Educationa nd the Professoriate (1/1/04-8/15/04)
Administration of program. Replaced by Dr. Joesphine DeLeon, Associate Provost for Academic Affairs, 8/15/04.

Members, Committee of the Status of Women in STEM

In addition to the above listed program personnel, participants served on the Committee on the Status of Women in STEM. Each Committee member attends meetings of the committee and serves on one of the five subcommittees.

- Laurie Churchill, Program Coordinator, New Mexico Alliance for Graduate Education and the Professoriate (NM-AGEP)
- Sonya Cooper, Associate Professor, Engineering Technology
- Champa Gopalan, Professor, Agronomy and Horticulture
- Roger Hartley, Department Head (through 7/1/04), Computer Science
- Patricia Hynes, Project Director, NM Space Grant
- Ricardo Jacquez, Professor, Civil and Geological Engineering and Program Director, New Mexico Alliance for Minority Participation
- Steven Loring, Administrative Analyst, Agricultural Experiment Station
- Linda Riley, Associate Academic Department Head, Industrial Engineering (Left NMSU 2/1/04)
- Jill Schroeder, Professor, Entomology, Plant Pathology and Weed Science
- Tracy Sterling, Professor, Entomology, Plant Pathology and Weed Science
- Ann Vail, Department Head, Family and Consumer Sciences

Subcommittees

Recruitment

- Chair, Linda Riley, Associate Academic Department Head, Industrial Engineering through 2/1/04
- Josefina Alvarez, Professor, Mathematical Science (appointed 8/15/04)
- Leroy Daugherty, Associate Dean, College of Agriculture and Home Economics and Director, Agricultural Experiment Station
- Roger Hartley, Department Head, Computer Science – Committee Chair starting 2/1/04
- Jill Schroeder, Professor, Entomology, Plant Pathology and Weed Science (appointed 8/15/04)

Research

- Chair, Patricia Hynes, Project Director, NM Space Grant
- Sonya Cooper, Associate Professor, Engineering Technology
- Tiziana Giorgi, Assistant Professor, Mathematical Sciences
- Champa Gopalan, Professor, Agronomy and Horticulture
- Kenneth Paap, Associate Dean and Director, Arts and Sciences (through 8/04)
- Rudi Schoenmackers, Associate Dean of Research, College of Engineering
- Mark Wise, Department Head, Animal and Range Sciences

Distinguished Visiting Professor

- Chair, Ann Vail, Department Head, Family and Consumer Sciences
- Steven Loring, Administrative Analyst, Agricultural Experiment Station
- Stuart Munson-McGee, Professor, Chemical Engineering
- Tracy Sterling, Professor, Entomology, Plant Pathology and Weed Science

Faculty Development

- Christine Marlow, Professor of Social Work and Program Director New Mexico Alliance for Graduate Education and the Professoriate (Chair through 8/04)
- Sonya Cooper, Associate Professor, Engineering Technology (Chair: 8/04)
- Maria Luisa Gonzales, Department Head, Educational Management and Development
- Tara Gray, Director, New Mexico State University Teaching Academy
- Steven Kanim, Associate Professor of Physics
- Nirmala Khandan, Professor of Civil and Geological Engineering
- April Ulery, Assistant Professor, Agronomy and Horticulture

ADVANCING Leaders Committee

A new committee to oversee a leadership development program for faculty at NMSU was formed. The members planned an academic year of monthly luncheons, a two-day off-campus retreat, and the application and selection procedures for participants. Committee members:

- Cynda Clary, NMSU Provost's Office, Chair
- Bonnie Daily, Associate Professor, Department of Management
- LeRoy Daugherty, Associate Dean, College of Agriculture and Home Economics and Director, Agricultural Experiment Station
- Patricia Hynes, Program Director, New Mexico Space Grant Consortium
- Michael Morehead, Associate Dean, College of Education
- Diane Michelle Prindeville, Director, Women's Studies Program

ADVANCING Leaders Participants

- Brenda Benefit, Department Head and Professor, Sociology and Anthropology
- Janice Black, Associate Professor, Management
- Carolyn Chavez, Assistant Professor, Management
- Steven Franks, Department Head and Associate Professor, Survey Engineering
- Ricardo Jacquez, Professor, Civil and Geological Engineering and Director, New Mexico Alliance for Minority Participation
- Desh Ranjan, Department Head and Associate Professor, Computer Science
- Allison Mann, Assistant Professor, Nursing
- Gary Roemer, Assistant Professor, Fishery and Wildlife Sciences
- Tracy Sterling, Entomology, Plant Pathology and Weed Science
- Cynthia Pierard, Department Head, Research and Reference Services, NMSU Library
- Connie Stout, Associate Professor, Special Education/Communication Disorders

Other Specific People Not Listed:

- Dr. Miriam Meyer, Director, Institutional Research and Planning provided most of the institutional data required for this report.
- Judy Bosland, Institutional Research and Planning, provided data upon request and participated in a study (not yet published) of Gender Equity in Pay at NMSU.
- Paul Gayle-Smith, Director of Institutional Equity: Paul joined NMSU in October, 2004 as a result of two searches to replace the EEO Director. The ADVANCE Program Director meets with Mr. Gayle-Smith twice each month and it is anticipated that he will become more involved in ADVANCE activities.
- Dr. William Quintana, Associate Professor, Department of Chemistry and Biochemistry, Chair, NMSU Hispanic Faculty/Staff Caucus-Collaboration on diversity issues.

- Dr. Elizabeth Titus, Dean NMSU Library, Chair, President's Commission on the Status of Women. The Commission grew from an effort begun by ADVANCE, but now has a stronger institutional basis and broader focus. Dean Titus' leadership is essential. Dean Titus works with the program on various leadership and development efforts.
- Dr. Irena Swanson, Associate Professor, Mathematical Sciences, Hosted Distinguished Visiting Professor Dr. Rekha Thomas.
- Dr. Phillip Alkon, Adjunct Professor, Fishery and Wildlife Sciences, hosted Distinguished Visiting Professor Anne LaBastille.

Participants' Summary

- 99 (37 female, 62 male) STEM faculty from 18 of the 19 target STEM departments attended at least one ADVANCE event.
- 60 faculty and department heads from 25 of the 36 non-STEM NMSU departments participated in an ADVANCE event.
- 80 faculty and administrators—mostly from STEM fields—participated in the mentoring program (half men, half women).
- 30 department heads from 26 academic departments (including 11 STEM departments) attended at least one ADVANCE-sponsored department head training event.
- Deans and/or associate deans from all eight of NMSU's colleges attended at least one ADVANCE event.
- The President, two Vice Presidents and all three members of the Provost's Office participated in at least one ADVANCE event.

Almost all female STEM faculty members were involved in some aspect of the ADVANCE program during the past year. Many department heads--from STEM and non-STEM departments--participated in ADVANCE-Sponsored programming that was part of a series of department head workshops. The evaluator (Dr. Ann Austin) met with numerous people, most of whom were from non-STEM departments at NMSU to discuss ADVANCE. Dr. Austin's evaluation followed up on previous evaluations (one by Dr. Austin and two by Dr. Laura Kramer) to provide the NMSU ADVANCE team with guidance on how best to expand the program to involve faculty throughout the institution. Because the goal of ADVANCE is institutional transformation, involvement of faculty and administrators from across campus will be essential in changing the institution and for garnering support for the continuation of ADVANCE programs after the end of the award period.

Several deans attended the ADVANCE PI meeting and conference hosted by Georgia Tech this year: Dean Waded Cruzado-Salas (College of Arts and Sciences); Associate Dean Jeffrey Brown (College of Arts and Sciences); Dean LeRoy Daugherty (College of Agriculture and Home Economics and Director of the Agricultural Experiment Station); and Associate Dean Rudi Schoenmackers (College of Engineering). In addition, the newly appointed Dean of the College of Engineering, Dr. Steven Castillo, attended the two-day ADVANCE/NSF Engineering Directorate workshop in Arlington, VA on December 13-14, 2004.

II. ACTIVITIES & FINDINGS

Overview

ADVANCE activities are administrated through a Committee on the Status of Women in STEM at NMSU. The PI, Co-PI's, faculty from each of the three colleges involved in ADVANCE (Agriculture and Home Economics, Arts and Sciences, and Engineering) and program directors from related NMSU programs work on this Committee and its five subcommittees. The five subcommittees manage the various programmatic elements and include several faculty members beyond those who work on the main Committee on the Status of Women in STEM.

The *Committee on the Status of Women in STEM* (CSW-STEM) engages in outreach activities and is responsible for coordinating the annual research report on the status of women in STEM at NMSU. The report forms the basis for subsequent programming to address gender disparities in STEM at NMSU. An office staff consisting of a Program Coordinator, Records Specialist, Research Analyst and Graduate Assistants provide necessary administrative, data collection and analysis, and logistical support for the CSW-STEM's, five subcommittees' and the ADVANCING Leaders Committee's activities.

The *Recruitment Subcommittee* is involved with outreach (meetings with job candidates), research (surveys about search processes, startup, etc.) and training and development (work with departmental search committees) activities. The *Faculty Development Subcommittee* is involved with educational and training and development activities. The *Research Subcommittee* meets to administer a program of grants to existing female STEM faculty for research and travel within their disciplines. The *Distinguished Visiting Professor Subcommittee* administers another research-related activity that involved a strong outreach component and makes women scientists more visible. The ADVANCING Leaders Subcommittee oversees a leadership development program for faculty at NMSU, which included an academic year of monthly luncheons, a two-day off-campus retreat, and development of the application and selection procedures for participants. And an ad-hoc *Exit Interviews Subcommittee* developed the interview protocols and conducted face-to-face and phone interviews to understand why STEM faculty left NMSU. A new *ADVANCING Leaders Committee* developed a leadership development program, application procedures, and secured financial support from all six NMSU academic colleges and the library for the program.

Research and Education

The ADVANCE Program at NMSU supports institutional and faculty development research projects, conducted largely by ADVANCE Program personnel (Frehill, Jeser-Cannavale, Ketcham, and Benton-Speyers) and research and travel for female STEM faculty in the 19 target STEM departments.

All reports and data are posted to the ADVANCE program webpage. We routinely bring copies of reports to key administrators (e.g., the President, Provost, Vice Provost for Research, Deans, Director of the Teaching Academy, etc.) to discuss findings and seek assistance in solving problems.

ADVANCE Program Staff Research

- **Space Allocation**: Research Analyst Cecily Jeser Cannavale worked closely with Ron Washburn on his annual space audit. She has interviewed all 25 STEM and SBS (social and behavioral science) department heads conducted brief phone interviews with STEM and SBS faculty members. Jeser-Cannavale will present her findings on the space allocation study at the Pacific Sociological Association Annual Meetings in Portland, OR, in April 2005.

- **Institutional Data**: We compiled data for the 12 required indicators (except start-up packages) for the 19 STEM and 6 SBS departments as in the past (findings reported in the attached file) and we compiled many of these indicators for the non-STEM departments. In addition, this year we compiled more trend data to make meaningful presentations about the trends in women's involvement in STEM and academic administration for the three-year period prior to ADVANCE (i.e., 1999-2001) and for the first three years of the ADVANCE Program.

    - **Attrition data** for the entire campus were analyzed and presented to: Roles and Rewards Taskforce (and included in the Taskforce's second report to the Provost on Promotion and Tenure); the Associate Provost; the Vice Provost for Research.

    - **Toolkit**: Frehill and Jeser-Cannavale produced a toolkit for other ADVANCE institutions to use in collecting, compiling and reporting the data for the 12 required indicators. The toolkit forms the basis for the supplemental funding award ($60,000) to bring together data analysts from several ADVANCE institutions to craft a uniform approach to the data reporting tasks. Two presentations titled "Measuring the Status of Women: Towards Cross-Institutional Analysis to Understand Institutional Transformation" were made as follows:

        - Annual Meetings of the Eastern Sociological Society, New York, NY, February 2004.
        - ADVANCE National Conference, Atlanta, GA, April 2004.

    Manuscripts in preparation are:
        - Frehill and Jeser-Cannavale: "Transforming Gendered Organizations: A Mentoring Program Based on Feminist Organizational Theory" (for the Academy of Management conference, August 2005)
        - Frehill and Jeser-Cannavale: "Mentoring and Institutional Transformation: Formalized Mentoring of Men and Women STEM Faculty" for the International Conference for Women Engineers and Scientists, August 2005.

    Publications under preparation are:
        - Frehill, Lisa M. paper under preparation for the Journal of Technology Transfer: "Using the Index of Dissimilarity to Understand the Sex Segregation of Academic Science and Engineering."

- Frehill, Lisa M. and Cecily Jeser-Cannavale "Measuring the Status of Women: Towards Cross-Institutional Analysis to Understand Institutional Transformation" for a volume to be edited by Abigail Stewart.

- **Dual Career Couples**: ADVANCE personnel have worked with four couples at NMSU to make accommodations, which has resulted in recruitment/retention of six STEM faculty (including two college track females) and two social and behavioral science faculty (both college track). We are working with Elizabeth Creamer of Virginia Tech on a study of institutional accommodation of dual career couples. An IRB application to the NMSU review board was approved and interviews are in process. Future publications and presentations will be prepared based on these data.
  - Frehill, Lisa M. "Dual Career Couples at NMSU" presented at the Pacific Division of the American Association for the Advancement of Science Annual Meetings, Logan, UT, June 2004.

- **Exit Interviews**: NMSU Institutional Review Board approval for this year's interviews was sought (and awarded). Cynda Clary (Special Assistant to the Provost), Sonya Cooper (Associate Professor of Engineering Technology), and Lisa Frehill are conducting interviews. ADVANCE Graduate Assistant Jammie Benton-Speyers made initial contacts with department heads and faculty who left to make arrangements for interviews. Interviews are progressing and will be completed in the Spring 2005 semester, with a report by the end of the Spring 2005 semester. Frehill will present a paper about conducting exit interviews at the Pacific Sociological Association Annual Meetings in Portland, OR in April 2005.

- **Diversity in engineering**: PI Frehill has continued her work, now supported by the ADVANCE grant, on racial/ethnic and gender diversity in engineering. Several presentations and papers are based upon this work, with several more in preparation. Diversity as it relates to recruitment has been and will continue to be a theme in this research strand.

  - Frehill, Lisa M. "Women of Color in the Engineering Pipeline" published in the Proceedings of the Women in Engineering Programs Advocates Network annual conference, June 2004.

  - Frehill, Lisa M. "Women of Color in the Engineering Pipeline" presented at the Women in Engineering Programs Advocates Network annual conference, Albuquerque, NM, June 2004.

  - Hunt, Pamela and Cecily Jeser-Cannavale "Recruitment Best Practices" presentation at the Conference on Women Faculty in STEM Fields at Historically Black Colleges and Universities, Atlanta, GA, August 2004.

  - Frehill, Lisa M. and Eng, Patricia "Diversity: A Buzzword." presented at the Society of Women Engineers National Conference, Milwaukee, WI, October 13-16, 2004. (Article for SWE Magazine currently under preparation.)

  - **SWE Literature Review**: for the past two years, the ADVANCE Program research group at NMSU has prepared a comprehensive review of the literature on women in

engineering for publication in the Society of Women Engineers' annual yearbook. The literature review has become an essential and well-respected resource for engineers, engineering faculty and academic administrators, and for people involved in efforts to increase women's participation in engineering. In the coming year, the ADVANCE Graduate Research Assistant, Lauren Ketcham, will make a presentation about the literature review at the joint Women in Engineering Programs and Advocates Network/National Association of Minority Engineering Program Administrators (WEPAN/NAMEPA) conference in Las Vegas, Nevada.

- Frehill, Lisa M., Cecily Jeser Cannavale and Jammie Benton-Speyer. Literature Review of Women in Engineering, 2003. **SWE Magazine**, April-May, 2004.

- In preparation: Frehill: "The NSF-ADVANCE Program and the Recruitment and Retention of Women Engineering Faculty" for the American Society of Engineering Education conference, June 2005.

Research and Travel Awards to Female Faculty in STEM

In 2004, 16 women submitted 19 proposals for ADVANCE funding for a total of $210,880 in requests. Twelve of the women were from the College of Arts and Sciences, three were from the College of Agriculture and Home Economics and one applicant was from the College of Engineering. A total of $119,757 was awarded to 12 women. The awardees are (funds to be spent in 2005-06):

- *Mary Ballyk*, Assistant Professor of Mathematical Sciences, received a Research award, "Competition in an Unstirred Chemostat", for $7,030.

- *Martha Desmond*, Assistant Professor of Fishery and Wildlife Sciences, received a Research award, "Burrowing Owl Nest-Site Selection and Reproductive Success in an Urban-Agricultural Interface in Southern New Mexico and Grasslands in Janos, Chihuahua, Mexico", for $7,000.

- *Nancy Flores*, Assistant Professor of Food Sciences, received a Research award, "Effects of Slats on Pectin Esterase Activity in Red Pepper Mash Fermentation", for $14,000.

- *Elizabeth Gasparim*, Assistant Professor of Mathematical Sciences, received a Research award, "Collaborative Research in Algebraic Geometry and Topology", for $14,713.

- *Kathryn Hanley*, Assistant Professor of Biology, received a Research award, "Genetic Determinants of Transmission of Transmission Mode in Flavaviruses", for $8,485.

- *M. Cristina Mariani*, Assistant Professor of Mathematical Sciences, received a Travel award, "Numerical Solutions to Nonlinear Problems Arising in Finance and Physics", for $2,500.

- *Nancy McMillan*, Professor of Geological Sciences, received a Research award, "Trace Element Signatures of Gem Beryls: Tracing Geologic Processes and Terrorist Trading", for $13,144.

- *Inna Pivkina*, Assistant Professor of Computer Science, received a Research award, "Revision Programming with Cardinality Atoms", for $12,504.

- *Erin Silva*, Assistant Professor of Agronomy and Horticulture, received a Travel award, "Travel to Eco-Conference in Monterey, CA for Curriculum and Professional Development", for $1,025.

- *Irena Swanson*, Associate Professor of Mathematical Sciences, received a Research award, "Integral Closure of Ideals", for $9,635.

- *Caroline Sweezy*, Associate Professor of Mathematical Sciences, received a Research award, "Weights and Parabolic Gradients", for $14,721.

- *Julieta Valles-Rosales*, Assistant Professor of Industrial Engineering, received a Research award, "Human Performance Modeling to Improve the Decision Making Process in Manufacturing Cells", for $15,000.

Findings

Indicators and Reports

See attached file for the tables reporting the twelve required indicators. The attached file includes our Space Allocation report as well as Ann Austin's 2004 Evaluator's Report.

In addition, all recipients of start-up funds (distributed by the Recruitment Subcommittee), research and travel awards (distributed by the Research Subcommittee), and Faculty Development funds (distributed by the Faculty Development Subcommittee) report their findings from work supported by ADVANCE funds. Project dates vary, but the following findings were reported in 2004 by the recipients of ADVANCE funds.

Recruitment Subcommittee: Start-Up Funds

PI – Jing He (Computer Science)
Type of Project – Start-Up Funds

He's start-up funds were used to partially support a graduate student to help with research and for traveling to three conferences, one of which He presented a paper at. He has worked on the development of a computational method to derive a 3-dimensional structure of proteins using constraints from a protein density map. Recent research on this topic has involved constraints extraction from the intermediate resolution structure, generation of a mapping library for secondary structure elements using constraints, and analysis of the individual accuracy of the secondary structure prediction method. Additionally, He succeeded in establishing a weekly Keck seminar broadcast at NMSU, which includes topics such as computational biology, biochemistry, and genetics. Moreover, He is working on a subproject in the "Center for Research Excellence in Bioinformatics and Computational

Biology" called "Bridging the resolution gap: automatic sequence mapping for intermediate resolution macro-molecular structures from electron cryomicroscopy".

PI- Maria Mariani (Mathematical Sciences)
Type of Project- Start-Up Funds

During the summer, Mariani visited Dr. Paul Glasserman, Associate Dean of the Graduate School of Business at Columbia University using her funding. The visit allowed for the continuation of research work in the analysis of asset-price dynamics in models that capture the possibility of sudden, large changes in asset prices. As a result of the visit, Mariani developed a course in financial mathematics at NMSU, which will be taught for the first time in spring 2005. In addition, Mariani organized a special session in the Financial Mathematics in the American Mathematical Society's fall Western Sectional Meeting in October 2004. Currently, Mariani is working with a graduate student on numerical simulations and data fitting. A publication on the subject is being prepared for submission.

PI – Erin M. Silva (Agronomy and Horticulture)
Type of Project – Start-Up Funds

Silva has used the start-up funds to pay a laboratory technician's salary, not provided by the department, who helps gather data for research and publishing, which is necessary to Silva's academic development. Additional start-up funds went to equipment purchasing (a freezedryer, equipment for field experiments, computer and software equipment) necessary for research and teaching. Several research projects are underway involving viral diseases of chili peppers, carbohydrate partitioning in onion plants, analysis of the nutritional composition of onion and chili peppers, root growth of chili plants, and viral disease resistance in tomatoes.

PI- Tiziana Giorgi (Mathematical Sciences)
Type of Project- Start-Up Funds

Giorgi's start-up funds supported personal research, course releases to provide the time for research, moving expenses, travel to professional conferences, and equipment necessary for research in her subject of interest.

PI – Julieta Valles-Rosales
Type of Project – Start-Up Funds

Dr. Valles hired a research assistant, purchased fixtures related to her research on injection molding and traveled to visit manufacturing labs and conferences. She visited Penn State and California Polytechnic at Pomona to observe their manufacturing laboratories and presented papers at conferences in Cancun and Houston. In addition, she was able to attend three NSF workshops in St. Louis, Atlanta and Albuquerque and to meet with NSF program officers in Arlington, VA, as a result, Dr. Valles-Rosales will seek an NSF Career Award for Young Faculty in 2005. She also visited Sandia National Labs in Albuquerque to meet with potential research partners. ADVANCE funding and connections have enabled Valles-Rosales to secure a research award with two other NMSU faculty (from the Department of Management) SCERP 2004 ($62,192) and to prepare another proposal for the same agency 2005 ($63,000). Her ADVANCE funding also enabled Dr. Valles-Rosales

to seek funds from other NMSU organizations to support her research, specifically: College of Engineering ($10,000); support from AMP to hire undergraduate students to help in her research and also to benefit them from it; in spring 2005 she will hire a graduate assistant with funds from WERC to prepare a proposal to submit it to an appropriate agency that involves her research and environmental issues.

Research Subcommittee: Research and Travel Minigrants

PI – Josefina Alvarez (Mathematical Sciences)
Type of Project – Research
Title of Project – Two Writing Projects in Mathematics, Research and Education

Alvarez, with coeditors Carlos Cabrelli and Maria Amelia Muschietti, coedited three monographs written by Alberto P. Calderon, professor emeritus at the University of Chicago to be published by Walter de Gruyter, Berlin. Additionally, Alvarez completed a book proposal submitted by invitation to Princeton University Press which has received very good reviews. Alvarez has also presented at numerous events for the Mathematical Association of America, the University of La Laguna, Spain, and at the Joint Meeting of the Southwestern Section of the Mathematical Association of America. Because of one of these presentations, Alvarez was invited to submit a Prospectus to the Mathematical Association of America to write a collection for teaching activities.

PI – Paola Bandini (Civil and Geological Engineering)
Type of Project – Research
Title of Project – Purchase, Installation, and Calibration of Triaxial Equipment and Accessories for Soil Testing with Automatic Data Acquisition System

Bandini used funds to purchase licenses for specialized software and computers and to start the first phase of an experimental program to determine the shear strength and liquefaction resistance of silty sands. Following approval of the ADVANCE grant, Bandini's department agreed to significantly increase its initial contribution so that more and better laboratory equipment can be acquired for the project. Bandini also traveled to meet collaborators at Purdue University, which resulted in two paper submissions and a new project idea for 2005.

PI – Nancy Chanover (Astronomy)
Type of Project – Travel
Title of Project – Vertical Structure of Haze in Titan's Atmosphere

Chanover used funding to acquire telescopic data in January 2004 of Saturn's largest moon, Titan, using the Air Force Advanced Electro-Optic System telescope on Maui. An NMSU-built camera that incorporates a tunable filter, enabling observations in many different colors, was successfully used to image Titan at colors corresponding to different altitudes in the atmosphere. The travel award paid for Chanover's observing trip, which allowed her to use existing grant funds to pay for travel for an Astronomy Ph.D. graduate student working on the project. It also provided support for travel for one graduate student to attend a meeting to present results from the project. Additionally, the project provided Chanover the opportunity for cross-college collaboration and this, in conjunction with new opportunities for

publication, may increase her chances for securing a tenure-track position within the Astronomy department.

PI – Martha Desmond (Fishery and Wildlife Sciences)
Type of Project – Travel
Title of Project – Influence of Seed Production and Habitat Associations on a Chihuahuan Desert Avifauna

Desmond used the travel award to support travel to two research projects. One location traveled to was Gray Ranch in southwest New Mexico to conduct a pilot study to examine winter avian diet and seed selection in relation to availability. The other location was in Janos, Chihuahua to work on locating and mapping burrowing owl nest site selection in relation to local and landscape scale factors in 26 prairie dog colonies. Four manuscripts related to both research projects are in progress. Based on this research, Desmond plans on applying for a research sabbatical to continue this work with collaborators in the U.S., Canada, and Mexico which will be funded by a USDA National Research Initiative (NRI) grant.

PI – Jing He (Computer Science)
Type of Project – Research
Title of Project – Improving Protein Secondary Structure Prediction Using 3-Dimensional Spatial Constraints of the Protein

He and her research assistants have developed a computational method to identify the bad secondary structure predictions of proteins using the length distribution of helices. This method has been tested on two sources of datasets for the PHD method, a commonly used secondary structure prediction method. He is in the process of applying the detection method to improve the secondary structure prediction. He's award supported a course release and partial salary for two graduate students, which allowed her to write and conduct research more vigorously. Four published conference proceeding papers resulted.

PI – Mai Gehrke (Mathematical Sciences)
Type of Project – Research
Title of Project – Lattice-Ordered Algebras and Applications

Gehrke has spent the past year doing extensive traveling, writing, and research. The travel has resulted in networking and collaborative relationships as well as benefited Gehrke as a researcher and academic. These collaborations have resulted in at least three accepted papers, one in the prestigious *Transactions of the American Mathematical Society*. Additionally, Gehrke presented plenary talks at the International Summer Topology Conference in South Africa and signed a contract with collaborator, Hilary Priestley, with Oxford University Press for a book on the subject. Several other articles are also being prepared for submission. Gehrke is currently on sabbatical conducting research and writing.

PI – Tiziana Giorgi (Mathematical Sciences)
Type of Project – Research-Related Travel
Title of Project – Surface Nucleation in Superconductors Surrounded by Normal Materials

In 2004, Giorgi was the recipient of an award, which supported both personal research and the hosting of a visiting female researcher, Dr. Jadallah, for the project "Surface Nucleation in Superconductors Surrounded by Normal Materials". As a result, Dr. Jadallah invited Giorgi to Purdue University in June. This visit gave Giorgi and Jadallah time to work on their research and they obtained preliminary results that are the basis of a paper, which is currently in preparation. In addition, Giorgi used funds to attend a workshop, "Singularities in Materials" held at the Institute for Mathematics and its Applications (IMA) in October where Giorgi presented a poster, "Superconductors Surrounded by Normal Materials", related to the project research. The conference provided an excellent opportunity for constructive feedback and collaboration.

PI – Maria Mariani (Mathematical Sciences)
Type of Project – Research
Title of Project – Nonlinear Problems Arising in Physics and Finance

During the summer, Mariani visited Dr. Paul Glasserman, Associate Dean of the Graduate School of Business at Columbia University using her funding. The visit allowed for the continuation of research work in the analysis of asset-price dynamics in models that capture the possibility of sudden, large changes in asset prices. As a result of the visit and encouragement from Dr. Glasserman, Mariani developed a course in financial mathematics at NMSU, which will be taught for the first time in spring 2005. In addition, Mariani organized a special session in Financial Mathematics in the American Mathematical Society's fall Western Sectional Meeting in October 2004. Currently, Mariani is working with a graduate student on numerical simulations and data fitting. A publication on the subject is being prepared for submission.

PI – Martha C. Mitchell (Chemical Engineering)
Type of Project – Travel
Title of Project – Travel to attend the International Adsorption Society's 8th International Conference on Fundamentals of Adsorption in Sedona, AZ from May 23-28, 2004

Mitchell attended the International Conference on Fundamentals of Adsorption, which brought in representatives from the U.S., Europe, and Asia. She was able to network with other experimentalists and researchers interested in adsorption modeling and presented a poster, "Evaluating Possible Materials for Light Gas Separations Using Computer Simulations". The results presented in the poster were published as a journal article.

PI – Tracy Sterling (Entomology, Plant Pathology and Weed Science)
Type of Project – Research
Title of Project- Oxidative Stress Tolerance Mechanisms in Plants

Sterling was able to use research funding to continue research on ecophysiological and biochemical responses to plant stress in a model system using herbicide-tolerant cotton. Sterling completed the analytical work for greenhouse experiments (nutrient and herbicide stress) and for a field study (spurred anoda competition in cotton). Two research papers and two abstracts were submitted based on this research. In addition, the work funded through this grant has helped capitalize on unique technical expertise, positioning Sterling's program for approaching larger, more prestigious funding sources. The research funding also

provided Sterling with the opportunity to develop a novel area of expertise and transform her career achievements into a new research area.

PI – Nicole Vogt (Astronomy)
Type of Project – Research
Title of Project- The Formation of Disk Galleries

Vogt is conducting a long-term observational and modeling program using the Keck Observatory of 10-meter telescopes and the Hubble Space Telescope to quantify the degree and the form of evolution in the spiral galaxy population. The research grant allowed Vogt, peers at the California Institute for Technology and the University of California, Santa Cruz, and three students to spend the summer doing data reduction and data analysis of local and distant galaxy images and spectra. The research gave way to five manuscripts. Additionally, the collaborations with peers in California are important given their leadership in the field and access to large private telescopes, which NMSU cannot access. Vogt is the winner of an NSF Career Award for Young Faculty.

Opportunities for Training and Development

ADVANCE Program Staff

ADVANCE Program Staff attended a number of conferences in the past year. At most of these conferences, papers were presented or sessions organized, often by multiple members of the NMSU ADVANCE team. In addition to these opportunities, detailed elsewhere, ADVANCE program staff attended:

- May 2004, Women in Engineering Leadership Institute (WELI) in Storrs, Connecticut (Research Analyst Cecily Jeser-Cannavale).
- August 2004, two-day grant writing workshop in El Paso, TX (Research Assistant Lauren Ketcham).
- October 2004 Grace Hopper Celebration of Women in Computing, Chicago, IL (PI Frehill).
- October 2004 NASA Administrator's Fellowship Program Regional Awareness Day at California State University, Fullerton (Research Analyst Cecily Jeser-Cannavale).

Other Faculty and Administrators

The ADVANCE Program provided training programs that reached many faculty and administrators from almost every NMSU academic department and a limited number of students (graduate and undergraduate). In addition to ADVANCE events on campus, the ADVANCE Program provides support to the NMSU Teaching Academy and enables STEM faculty, administrators, and students to attend important off-campus workshops and conferences related to gender in the STEM fields.

On Campus Events

The ADVANCE Program features a number of training events associated with mentoring, department head training and ADVANCING Leaders programs. Attendance at these events averages about 26 people.

While the mentoring program focuses predominantly upon faculty in the STEM fields, several participants are from departments outside these target disciplines and several key NMSU administrators outside of STEM participate in this program. A new cohort of social and behavioral sciences participants will be recruited in the coming year and the program will expand to include college-track STEM faculty.

The ADVANCE department head trainings were the only training opportunities for department heads at NMSU this year. Thirty heads from 26 departments (including 11 of the 19 STEM fields) participated in these sessions.

The new ADVANCING Leaders Program also reaches across campus in important ways. Not only are the participants from all six academic colleges plus the NMSU Library, but the invited speakers include important administrators at NMSU, including: Provost William Flores; Vice President Ben Woods (Facilities and Human Resources); and Vice President Gladys DeNecochea (Student Affairs). Associate deans from several colleges are involved as mentors or are on the planning committee for the program including: Kathleen Brooks (College of Business Administration and Economics); LeRoy Daugherty and Wes Holley (College of Agriculture and Home Economics); and Michael Morehead (College of Education).

Date	Attendees	Event
1/28/04	30	Department Head Training: Mentoring and the Role of the Department Head
2/21/04	36	Promotion and Tenure Working Session: Preparing for Spring Review
3/11/04	22	Mentoring Workshop: Effective Use of Service Time
5/12/04	24	End-of-year mentoring program event. Invited speakers: Dr. Christina Lohn, Vice President White Sands Research Developers and Debbie Potter, New Mexico Network for Women in Science and Engineering.
8/25/04	60	Luncheon: Women's Studies and Programming at NMSU (Co-sponsors: Women's Studies Program and Teaching Academy)
9/11/04	14	Mentor Training Workshop, Speaker: Dr. Elba Serrano, Associate Professor of Biology
9/17/04	20	ADVANCING Leaders Luncheon (Presentations by Dr. William Flores, Provost, and Mr. Ben Woods, Vice President of Facilities and Support Services) and Training Session on the Myers-Briggs Inventory (Presentation by Patricia McCoy, NMSU Counseling Center)
9/23/04	36	Mentor/Mentee Orientation, Speaker: Dr. Linda Lacey, Dean NMSU Graduate School

9/30/04	25	"Building Community with Traditional Adobe Construction" talks by Dr. Sonya Cooper (Associate Professor, Engineering Technology), Jean Fulton, Assistant Coordinator of Cornerstones Partnership, and Nancy Binneweg, Licensed General Contractor and member, City of Las Cruces Planning and Zoning Commission (Co-sponsor: Women's Studies Program)
10/2/04	34	Promotion and Tenure Workshop (co-sponsors: Hispanic Faculty/Staff Caucus, Office of the Provost and the NMSU Teaching Academy)
10/8-10/9/04	19	ADVANCING Leaders Retreat, Facilitator: Mary Ancker
10/22/04	15	Distinguished Visiting Professor (DVP) Lecture: Women in Wilderness by Anne LaBastille
11/1/04	70	DVP Lecture: The Traveling Salesman Problem by Rekha Thomas
11/2/04	62	DVP Lecture: Polynomial Systems: Applications and Solutions by Rekha Thomas
11/3/04	20	DVP Lecture: Mathematics Colloquium by Rekha Thomas
11/4/04	11	DVP Specialists' Lecture: Polyhedral Geometry by Rekha Thomas
11/4/04	23	Pi Mu Epsilon/Society of Women Engineers Luncheon with DVP Rekha Thomas
11/12/04	20	ADVANCING Leaders Mentoring Luncheon
12/03/04	13	ADVANCING Leaders Luncheon: Dr. Gladys DeNecochea on Leadership Paths

All ADVANCE workshops are evaluated, with a report prepared by the Research Analyst for use by the Faculty Development Subcommittee in planning future workshops.

Four faculty received partial funding (remainder provided by departments and colleges) to participate in the Space Grant's GRASP (Gaining Retention and Achievement for Students Program). April Ulery and Champa Gopalan of Agronomy and Horticulture and Tiziana Giorgi and Caroline Sweezey of Mathematical Sciences participated in GRASP in 2004 supported by ADVANCE and their departments.

NMSU Teaching Academy Programs

The NMSU ADVANCE Program supports and promotes events at the NMSU Teaching Academy, which provides a range of professional development activities for all NMSU faculty. The Teaching Academy provides the ADVANCE Program with names of STEM faculty who attend so that we can determine topics of interest to STEM faculty in particular. A total of 20

STEM faculty (tenure-track and tenured) and 11 STEM non-tenure-track faculty members attended at least one of the following events at the Teaching Academy during the Spring, 2004 semester. The ADVANCE Program has not yet received attendance reports from the Teaching Academy for the Fall, 2004 events, which are also listed here.

Date	Event
1/23/04	Team Mentoring for Graduate Instructors
1/29/04	Educating the NetGen: Strategies that Work
1/30/04	Peer Coaching for Classroom and Distance Educators
2/03/04	Spring Writing Group
2/12/04	Toward Dismounting a Dead Horse: Avoiding Overload
2/13/04	Making Change I: Why We Don't Change
2/13/04	Making Time: Efficiencies & Boundaries/Time & Values
2/20/04	Tips for New Teachers
2/26/04	The Real Cost of Online Courses
2/26/04	When Will We Ever Learn (to use what we know)
2/27/04	Harnessing CATs and CoTLs
2/27/04	Making Real the Scholarship of Teaching
3/3/04	Boot Camp for Profs: A Panel Report
3/6/04	The Sun Conference on Teaching and Learning
3/17/04	Moderating Online Discussions, Wednesday Section
3/18/04	Moderating Online Discussions, Thursday Session
4/1/04	Writing to Learn
4/2/04	Learning to Write
4/7/04	What You Ask for is What You Get
8/20/04	Funded Research and Diversity: Get a Competitive Edge
8/27/04	Be All You Can Be-Teach! Twelve Steps to Help Teachers Flourish
9/23/04	Time Managements Tips for the Organizationally Impaired
10/08/04	Team Mentoring for Graduate Students Who Teach a Class or Lab
10/14/04	Visual Communication for Effective Teaching and Learning
10/14/04	Paradigm Busters: Instructional Design Strategies for Online Learning
10/14/04	Writing for the Web
10/29/04	Discussion as a Way of Teaching
11/10/04	Be All You Can Be-Teach! Twelve Steps to Help Teachers Flourish
11/10/04	Publish and Flourish: Become More Prolific
11/12/04	Cheating: Causes, Prevention, and Turning It Into a Teachable Moment
12/1/04	How Cultural Differences Can Be an Asset in the Classroom
12/13/04	Backwards Course Design
12/14/04	Team-Based Learning: How Small Groups Can Transform a Class

Conferences and Off-Campus Development Opportunities

- March 2004: ADVANCE provided partial funds to enable the student chapter of the Society of Women Engineers to leverage funds from the College of Engineering Dean's office to send seven students and two faculty advisors to the regional conference in Phoenix, AZ.

- April 2004: ADVANCE PI Meeting and Conference, Atlanta, Georgia: NMSU ADVANCE supported attendance by: Dean Waded Cruzado-Salas and Associate Dean Jeffrey Brown (College of Arts and Sciences); Associate Dean LeRoy Daugherty (College of Agriculture and Home Economics); Associate Dean Rudi Schoenmakers (College of Engineering); Christine Marlow (New Mexico Alliance for Graduate Education and the Professoriate Program Director); and Melanie Martin (Computer Science Doctoral student and Member, President's Commission on the Status of Women). Program Director Frehill, Coordinator Hunt and Research Analyst Jeser-Cannavale also attended the conference.
- Michelle Shuster, College Assistant Professor in Biology attended an educational symposium.
- May 2004 Delia Julieta Valles-Rosales (Assistant Professor, Industrial Engineering) was supported to attend the second annual FORWARD to the Professorship workshop at Gauladet University in Washington, DC.
- June 2004: A number of faculty members were supported to attend the Women in Engineering Programs and Advocates Network conference in Albuquerque:
  - Paola Bandini (Assistant Professor, Civil and Geological Engineering)
  - Jeanine Cooke (Assistant Professor, Electrical and Computer Engineering)
  - Jing He (Assistant Professor, Computer Science)
  - Sheila Horan (College Professor, Electrical and Computer Engineering)
  - Inna Pivkina (Assistant Professor, Computer Science)
- July 2004 Edward Pines (Industrial Engineering Department Head) was supported to attend the Department Chairs workshop at the University of Washington.
- October 2004: two Industrial Engineering faculty (Tim Matis and Julieta Valles) received matching funds to attend the INFORMS (Institute for Operations Research and the Management Sciences) Conference in Denver, Colorado to recruit new faculty to NMSU.
- October 2004: Grace Hopper Celebration of Women in Computing, Chicago, IL: Support was provided to enable attendance by five graduate students and three faculty in the Department of Computer Science. The faculty members included:
  - Inna Pivkina (Assistant Professor of Computer Science)
  - Roger Hartley (Professor of Computer Science and member of the ADVANCE Committee on the Status of Women in STEM at NMSU and the Recruitment Subcommittee)
  - Karen Villaverde (College Assistant Professor of Computer Science).
  - Students were: Iris Chavez, Nina Javaher, Melanie Martin, Cameron Mott, and Rajaa Shindi. The conference involved technical sessions and numerous events and sessions relating to the advancement and status of women in computer science.
- December 2004: Dean Steven Castillo (College of Engineering) and PI Frehill attended the NSF Engineering Directorate/ADVANCE Workshop in Arlington, VA.

Outreach

Jeser-Cannavale, Cecily. "ADVANCE at New Mexico State University" poster presented at the Women in Engineering Programs Advocates Network annual conference, Albuquerque, NM, June 2004.

Frehill attended and made presentations as follows:

- ADVANCE Leadership Development Program at the University of Washington (2/12)

- ADVANCE Mini-PI Meeting at the University of Washington (2/12) with a status report-style presentation.

- American Association for the Advancement of Science, Feb. 12-16, Frehill, Lisa M. "ADVANCE at New Mexico State University: Sustainability, Adaptability, and Replication" Presented at the American Association for the Advancement of Science Annual Meetings, February 2004.

- Frehill, Lisa M. "ADVANCE: Institutional Transformation at New Mexico State University: Successes and Challenges" presented at the ADVANCE National Conference, Atlanta, GA, April 2004.

- Frehill, Lisa M. "Mentoring: Some Observations" presented at the BRIN Conference, Las Cruces, NM, May 2004.

- Frehill, Lisa M. "Mentoring and Institutional Transformation at New Mexico State University" presented at the Society of Women Engineers National Conference, Milwaukee, WI, October 2004.

New brochure: produced in collaboration with the ADVANCE Program a the University of Texas at El Paso: "Dual Career Opportunities." Brochure was sent with a cover letter and a copy of a dual career couples report (written by Frehill, Fall 2002) to the new President, Provost, Vice Provost and ADVANCE Co-PIs. Copies will be distributed to department heads and search committee chairs at a workshop in January 2005 in conjunction with a workshop that will be conducted by Virginia Valian.

<u>Miscellaneous Visits and Meetings</u>
Visit: provided technical support to the ADVANCE Program at the University of Rhode Island (Frehill, September 2005).
Regular meetings with Tara Gray (Director, Teaching Academy) and Paul Gayle-Smith, Director of Institutional Equity (the new EEO director, hired in October, 2004) (Frehill).
Met with NMSU alumna Patricia Lopez (Hunt and Frehill).
Met with Richard Meyers, NMSU's Washington Representative (Frehill).
Met with WEPAN Conference Planning Committee in Albuquerque (Hunt).
Met with the New Mexico Women in Science and Engineering Network (Hunt)
Presentation about ADVANCE and Dual Career Couples made to the College of Arts and Sciences Department Heads' Retreat (Frehill, August 2004).

<u>Committee Memberships</u>
The PI is involved in several committees:

- Provost's Taskforce on Roles and Rewards
- Two Search Committees for the EEO/ADA
- President's Commission on the Status of Women

- Monitoring Policies Subcommittee of the President's Commission on the Status of Women
- Gender Equity in Pay Committee
- Employee Climate Survey Committee
- Women's Studies Steering Committee
- WEPAN Conference Program Co-Chair (2004)
- Search Committee: Department of Computer Science, Bioinformatics

PI Frehill also serves as a member of the ADVANCE Advisory Board for the University of Texas at EL Paso.

The Program Coordinator is also doing committee work:
- Children's Village Planning Committee (on-site daycare)
- WEPAN Conference Program Co-Chair (2004)
- WEPAN Conference Program Committee (2005)

The Research Analyst serves on:
- Monitoring Policies Subcommittee of the President's Commission on the Status of Women
- Gender Equity in Pay Committee

Sessions Organized/Moderated at Conferences
- ADVANCE: Best Practices in Recruitment and Retention. Session organized by L. Frehill for the ADVANCE Conference, Atlanta, GA, April 2004.
- Career Trajectories in Engineering. Session moderated by L. Frehill at the WEPAN Conference, June 2004.

Distinguished Visiting Professor: Anne LaBastille, renowned author and ecologist, hosted by Dr. Philip Alkon, Adjunct Professor of Fishery and Wildlife Science with various events October 16-22, 2004 (14 total, including K-12, public, multiple campus audiences). Schedule:

Date/Time	Event	Location	Target Group
10/16 (Saturday)	**Bookstore Signing and Radio Interview**		
10:00 AM – 12:00 PM	Book Signing	COAS: My Bookstore, Las Cruces Downtown Mall	Las Cruces Community
5:30 PM - 6:00 PM	Radio Interview	KRWG Radio, NMSU Campus	Las Cruces Community
10/18 (Monday)	**Presentations to Local School Children and Las Cruces Community**		
10:00 AM – 11:00 AM	*Living Alone in the Wilderness*	Vista Middle School Assembly	Las Cruces Middle School Children
2:00 - 4:00 PM	*Wilderness Writing* and *Wilderness Guiding in the Adirondacks*	Branigan Cultural Center, Shannon Room	Las Cruces Community, local conservationists and writers
10/19 (Tuesday)	**Presentations to Fishery and Wildlife Sciences Department**		
8:30 - 9:30 AM	Informal meeting with faculty	Knox 116	FWS faculty and female faculty from Ag College
10:30 – 11:30 AM	Meeting with undergraduate students	Knox 116	FWS undergrads
11:30 AM – 12:30 PM	Lunch with graduate students: Pizza	Knox 116	FWS grad students
4:00 - 5:00 PM	Seminar: "Acid Rain Impacts on the Adirondack Park and Selected Critical Ecosystems around the World	GT 200	FWS and NMSU faculty and students

10/20, Wednesday	**Presentations to English Department and Center for Latin American and Border Studies (CLAB)**		
10:00 – 11:15 AM	*Inside Nature Writing*	Tba	English Dept. -- Creative writing students and faculty
2:00 - 4:000 PM	*Researching the Ecology of Lake Atitlan*	Nason House	CLAB, NMSU community
10/21, Thursday	**Activities with CLAB, SWEC and Biology Presentation**		
7:00 - 8:30 AM	Breakfast at with students and CLAB members	Old Mesilla Pastry Café/ The Shed, 810 S. Valley Drive	Students and CLAB members
9:00 - 11:00 AM	Field trip	Mesilla Valley Bosque Reserve, led by SWEC Director	CLAB, students, SWEC members
4:00 - 5:00	Seminar: *Ecology and Politics at Lake Atitlan, Guatemala: A Dangerous Case Study*	Foster Hall Room 201	Biology Dept., NMSU faculty and students
October 22, Friday	**Women's Studies/ADVANCE Program**		
2:00 -4:00 PM	Lecture/Booksigning *Women and Wilderness*	Isabel M. Crouch Reader's Theatre	General Audience -- NMSU and Las Cruces

Distinguished Visiting Professor: Dr. Rekha Thomas (University of Washington) was hosted by Ross Staffeldt (Department Head, Mathematical Sciences) and Irena Swanson (Associate Professor, Mathematical Sciences). Six events November 1-4, 2004 were very well attended by faculty, students, members of the Las Cruces community, and K-12 students. Schedule:

Date/Time	Event	Location	Target Group
Monday, November 1			
4:00 PM	Public Lecture - The **Traveling Salesman Problem**	Science Hall 102	General public and NMSU students and faculty
Tuesday, November 2			
4:00 PM	Lecture - **Polynomial Systems: Applications and Solutions**	Science Hall 107	Scientists and engineers
Wednesday, November 3			
4:00 PM	Mathematics. Colloquium - **Lattice Point Free Polytopes in Integer Programming**	Science Hall 106	Mathematics department faculty and students
Thursday, November 4, 2004			
10:30 AM	K-12 Talk - **The traveling Salesman Problem**	Lynn Middle School	7th grad honors math
1:10 PM	Specialist's Talk - **Polyhedral Geometry in McKay Correspondence**	Science Hall 107	
Friday, November 5, 2004			
12:00 PM	Luncheon - Pi Mu Epsilon and Society of Women Engineers (SWE) Please register -- click **here** for form	Otero Room, Corbett Ctr.	Pi Mu Epsilon and

III. PRODUCTS

The ADVANCE program at NMSU has produced an impressive array of products in a large number of STEM disciplines via the minigrants program that provides research and travel funds to women faculty in 19 departments at NMSU.

Journal Publications

Abazajian, K., N.P. Vogt, et al. 2004. "The Second Data Release of the Sloan Digital Sky Survey". *Astronomical Journal* 128 (1): 502-514.

Alvarez, J. and C. Varsavsky. 2005. "Impossible Tilings". *Function*. Accepted.

Amster, P., C.G. Averbuj, M.C. Mariani and D. Rial. 2005. "A Black-Scholes Option Pricing Model for Transaction Costs". *Journal of Mathematical Analysis and Applications*. Accepted.

Amster, P., M.C. Mariani, C. Rogers and C. Tiddell. 2005. "On two-point boundary value problems in multi-ion electrodiffusion". *Journal of Mathematical Analysis and Applications*. Accepted.

Amster, P., P. DeNapoli and M.C. Mariani. 2005. "Periodic Solutions of a Resonant Third-Order Equation". *Nonlinear Analysis*. Accepted.

Amster, P, P. DeNapoli and M.C. Mariani. 2005. "Periodic solutions of a resonant higher order equation". *Portugaliae Matemática*. Accepted.

Amster, P, P. DeNapoli and M.C. Mariani. 2005. "An n-dimensional pendulum-like equation via topological methods". *Nonlinear Analysis*. Accepted.

Amster, P., P. DeNapoli and M.C. Mariani. 2005. "An n-dimensional pendulum-like equation". *Electronic Journal of Differential Equations*. Accepted.

Amster, P., P. DeNapoli and M.C. Mariani. 2005. "Boundary nonlinearities for a one dimensional p-Laplacian-like equation". *Revista de la Unión Matemática Argentina*. Accepted.

Anderson, C.M., N.J. Chanover, D.G. Voelz, M.E. Deramo, C.P. McKay and D.M. Kuehn. 2004. "Titan's haze structure in 1999 and 2004 from spatially-resolved narrowband imaging between 700 and 1000 nm". *Bulletin of the American Astronomical Society* (36): 1115.

Bezhanishvili, G. and M. Gehrke. 2005. "Completeness of S4 with respect to the real line: revisited". *Annals of Pure and Applied Logic* 131 (1-3): 287-301.

Desmond, M.J. 2004. "Effects of grazing practices and fossorial rodents on a winter avian community in Chihuahua, Mexico". *Biological Conservation* 116 (2): 235-242.

Desmond, M.J. 2004. "Habitat associations and Co-occurrence of Chihuahuan Desert Hares: *Lepus californicus* and *L. callotis* in Chihuahua, Mexico". *American Midland Naturalist* 151: 414-419.

Desmond, M.J. and S.A. Niemela. 2005. “Influence of seed abundance, diversity, and biomass on wintering Chihuahuan Desert avifauna”. *Journal of Arid Environments*. Accepted.

Frehill, L.M. 2004. “The Gendered Construction of the Engineering Profession in the United States, 1893-1920”. *Men and Masculinities* 6 (4): 383-403.

Frehill, L.M., C. Jeser Cannavale and J. Benton-Speyer. 2004. “Women in Engineering: A Review of the 2003 Literature”. *SWE Magazine* 50(3): 20-36.

Gasparim, E.T. and E. Ballico. 2005. “Vector bundles on a three dimensional neighborhood of a ruled surface”. *Journal of Pure and Applied Algebra* 195 (1): 7-19.

Gasparim, E.T. and R.J. Milgram. 2004. “The Atiyah-Jones conjecture for rational surfaces”. http://xxx.lanl.gov, math.AG/0403138.

Gehrke, M. and B. Jonsson. 2004. “Bounded Distributive Lattice Expansions”. *Matemática Scandinavica* 94:13-45.

Gehrke, M., J. Harding and Y. Venema. 2004. “MacNeille completions and canonical extensions”. *Transactions of the American Mathematical Society*. Accepted.

Gehrke, M., H. Nagahashi and Y. Venema. 2005. “A Sahlqvist Theorem for distributive modal logics”. *Annals of Pure and Applied Logic* 131 (1-3): 65-102.

Gehrke, M., C. Walker and E. Walker. 2004. “Varieties generated by t-norms”. *Soft Computing* 8 (4): 264-267.

Gibbs, L.A. and T. Sterling. 2004. “Seasonal variation of picloram metabolism in broom (*Gutierrezia sarothrae*) and threadleaf (*Gutierrezia microcephala*) snakeweed populations in a common garden”. *Weed Science* 52 (2): 206-212.

Ginter, D., and M.J. Desmond. 2004. “Avian mortality during fall migration at communication towers along the Rio Grande corridor in southern New Mexico”. *Southwest Naturalist* 49 (3): 414-417.

Ginter, D.L. and M.J. Desmond. 2005. “Influence of foraging and roosting behavior on home range size and movement patterns of wintering Savannah Sparrows in south Texas”. *Wilson Bulletin*. Accepted.

Giorgi, T. and M. O’Leary. 2004. “On the Local Integrability and Boundedness of Solutions to Quasilinear Parabolic Systems”. *Electronic Journal of Qualitative Theory of Differential Equations* 14: 1-14.

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Jaroszewicz, S, M.C. Mariani and M. Ferraro. 2005. “Long Correlations and Truncated Levy Walks Applied to the Study of Latin American Market Indices”. *Physica A*. Accepted.

Kulshreshtha, S., R. Creamer and T. Sterling. 2004. “Phylogenetic relationships among New Mexico *Astragalus mollissimus* varieties and *Oxytropis* species by restriction fragment analysis”. *Weed Science* 52 (6): 984-988.

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Mitchell, M. C., M. Gallo and T.M. Nenoff. 2004. “Computer Simulations of Adsorption and Diffusion for Binary Mixtures of Methane and Hydrogen in Titanosilicates”. *Journal of Chemical Physics* 121 (4): 1910-1916.

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Vogt, N.P. M.P. Haynes, T. Herter and R. Giovanelli. 2004. “M/L, H α Rotation Curves, and HI Measurements for 329 Nearby Cluster and Field Spirals: I. The Data”. *Astronomical Journal* 127(6): 3273-3299.

Vogt, N.P., M.P. Haynes, R. Giovanelli and T. Herter. 2004. “M/L, H α Rotation Curves, and HI Measurements for 329 Nearby Cluster and Field Spirals: II. Evidence for Galaxy Infall”. *Astronomical Journal* 127(6): 3300-3324.

Vogt, N.P., M.P. Haynes, R. Giovanelli and T. Herter. 2004. “M/L, H α Rotation Curves, and HI Measurements for 329 Nearby Cluster and Field Spirals: III. Evolution in Fundamental Galaxy Parameters”. *Astronomical Journal* 127(6): 3325-3337.

Weiner, B.J., A.C. Phillips, D.C. Koo, N.P. Vogt, S.M. Faver, G.D. Illingworth et al. 2005. “The DEEP Groth Strip Survey. III. Spectroscopic Data and Redshifts”. *Astrophysical Journal*. Accepted.

Books or other non-periodical, one time publications

Books

Desmond, M.J., K. Young, B. Thompson, R. Valdez and A. Lafon-Terrazas. 2004. “Habitat associations and conservation of grassland birds in the Chihuahuan Desert Region: two case studies in Chihuahua Mexico”. Chapter 22 in L. E. Carton, G. E. Ceballos and R.S. Felger, eds. *Biodiversity, Ecosystems and Conservation in Northern Mexico*. Oxford University Press, New York.

Proceedings

Alvarez, Josefina. 2005. “Bordando imágenes”. *Proceedings of the course Sociedad, Matemáticas y Tecnología*, Universidad de La Laguna, Tenerife, Spain, March-October 2004. Accepted.

Amster, P., P. DeNapoli and M.C. Mariani. 2005. “Resonant Problems for Ordinary Differential Equations”. *Proceedings of the VII Monteiro Conference*. Accepted.

Amster, P., P. DeNapoli and M.C. Mariani. 2005. “An n-dimensional forced pendulum equation with friction”. *Proceedings of the VII Monteiro Conference*. Accepted.

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Bandini, P., D. Loukidis and R. Salgado. 2005. “Limit Analysis of Seismically Loaded Slopes”. *Proceedings of the 11th Annual IACMAG Conference, International Association for Computer Methods and Advances in Geomechanics*, Torino, Italy. Accepted.

Carraro, J.A.H., P. Bandini and R. Salgado. 2005. “Liquefaction Resistance of Clean and Silty Sands from Cone Penetration Resistance”. *Proceedings of the Geo-Frontiers Conference*, Austin, Texas. Accepted.

Conselice, C.J., K. Bundy, R.S. Ellis, J. Brinchmann and N. P. Vogt. 2004. “The Relationship between Stellar and Halo Masses of Disk Galaxies at z=0.2-1.2”. *IAU Symposium 220, Dark Matter in Galaxies*, Sydney, Australia: 399.

Frehill, L.M. 2004. “Women of Color in the Engineering Pipeline”. *Proceedings of the Women in Engineering Program Advocates Network Annual Conference, Albuquerque, NM*. In Press.

Giorgi, T. 2004. “Superconductors Surrounded by Normal Materials”. *Proceedings of the Royal Society of Edinburgh*. Accepted.

Giorgi, T. and R. Smits. 2004. “From Hot Spots to High School Geometry and Calculus”. *Proceedings of the Bridges International Conference*, Alberta, California: 79-86.

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IV. Contributions

Within PI Discipline

The PI is preparing a number of manuscripts within the field of sociology. To some extent, the data related to the institution and the question of how to make meaningful and appropriate cross-institutional comparisons among the original nine ADVANCE institutions has formed the basis of one thread of work, measuring the status of women, which was presented at the Eastern Sociological Society meetings and the ADVANCE conference in spring, 2004. This work will continue, with additional presentations and publications in the coming year.

Other related research uses in-depth qualitative interviews and other programmatic records maintained by the ADVANCE program to understand how institutional forces affect faculty work lives. The PI works with collaborators at other ADVANCE institutions on several projects related to exit interviews and dual career couples accommodations. The PI and the research analyst, also a sociologist, are working on several projects that will be presented at sociology and educational management conferences in the coming year. These projects examine the impact of the mentoring program and the study of space allocation that we have completed at NMSU.

The PI and the ADVANCE research staff produced an in-depth review of literature for the Society of Women Engineers' annual "Yearbook" edition in 2004 and are doing this service again for 2005. The Graduate Research Assistant will make a presentation at the joint WEPAN/NAMEPA conference (April 2005 in Las Vegas, NV) about the SWE Literature Review.

The PI is involved is writing a textbook on social inequality that integrates class, ethnicity, gender and sexuality. She is also completing several research papers related to program evaluation and teen sexuality education programs.

Contributions to Other Disciplines

ADVANCE funds assisted in the preparation of scholarly work in nine STEM disciplines: astronomy, agricultural sciences, geology, wildlife science, mathematics, biological science, civil engineering, weed science, electrical engineering, industrial engineering, food science, computer science and science education. Wide-reaching contributions across the STEM fields have been and will continue to be made as a result of this grant:

- 37 articles
- 14 proceedings papers
- 7 funded grant proposals (over $3.15 million)
- 4 abstracts
- 2 websites
- 1 book
- 25 products currently under review and in preparation.

ADVANCE Awardees were able to successfully win grants from NASA, NSF, SCERP, and the New Mexico Department of Transportation and to publish in the most prestigious journals in their fields.

Development of Human Resources

The ADVANCE faculty development, research and travel grants were essential to scholars' professional development. First, four awardees (Dr. Gopalan, Dr, Ulery, Dr. Giorgi, and Dr.

Sweezey) used their funds to improve their teaching via the Gaining Retention and Achievement for Students (GRASP) program. Michelle Schuster used funds to attend an educational symposium. The heavy teaching loads and institutional emphasis on teaching excellence mean that such development opportunities are essential to faculty success at NMSU.

Second, the travel awards provided funding for faculty women to attend conferences in their fields to strengthen professional networks. As can be seen by the impressive list of publications (in Section III of this report), collaborative activity is key to women's success in academic STEM fields.

Third, faculty like Tiziana Giorgi, Elizabeth Gasparim, Mai Gehrke (all of Mathematical Sciences) and Nicole Vogt (Astronomy) were able to gain release from teaching duties to strengthen their research publications records. Dr. Gasparim applied for tenure this year, therefore, the course release was quite timely for her. Nicole Vogt won a prestigious NSF Career Award for Young Faculty as a result of her course release.

Fourth, Julieta Valles-Rosales of Industrial Engineering and Paola Bandini of Civil and Geological Engineering were able to use ADVANCE awards to leverage resources—additional funds or equipment--from the college and their departments. Both have also successfully competed for external research funding, with Valles-Rosales winning a $62,192 grant from SCERP (with two co-PIs from the Department of Management, including her mentor Bonnie Daily) and Bandini receiving $50,000 from the New Mexico Department of Transportation. As the ability to generate external funds has become more vital within the promotion and tenure process at NMSU, these early successes bode well for both of these faculty members within the College of Engineering.

Fifth, the program engaged in activities to develop women who are currently ranked as "college track" at NMSU to enable them to compete successfully for future tenure track openings. All five women in this case are part of "dual career couples". Funds were provided to Dr. Michele Shuster in Biology and Dr. Nancy Chanover in Astronomy for this purpose. Dr. Chanover was the Co-PI on three separate grants and subcontracts, including a $2.7 million NASA grant with the noted Rete Beebe as the PI. This track record and the publications Dr. Chanover is producing will equip her well to compete for an open tenure-track position. Dr. Catherine Zhang was recently accommodated as part of a dual career couple. The ADVANCE program pledged one third of her support for two years as a College Track Researcher in the Department of Physics (currently, there are o female faculty in this department). The program also made modest pledges of $1,500 annually for two years to two social science women, also related to dual career accommodations. In both cases, part-time teaching positions were secured (as requested by the women, both of whom have young children). The travel funds were pledged to ensure that these scholars are able to attend at least one professional conference in their field to maintain their research productivity and scholarly networks.

Sixth, the ADVANCING Leaders Program as well as the individual efforts that target assistance to new department heads develops the managerial capabilities of women in science. A majority of the ADVANCING Leaders participants are women. Two new interim department heads, appointed within the past five months, are Martha Mitchell (Chemical Engineering) and Sonya Cooper (Engineering Technology). Both are associate professors and both are the first women department heads within the College of Engineering. Discussions between the ADVANCE program, the Dean of the College of Engineering, and the two new department heads are

underway to develop plans to improve their skills as department heads and to ensure they maintain research productivity essential for promotion to full professor.

Finally, this past year Dr. Linda Riley left NMSU to become the Associate Dean of the School of Engineering at Roger Williams University in Rhode Island. Within the larger perspective of ADVANCE's intended effects on higher education, the movement of a STEM woman from an associate department head position to one of academic leadership as a dean is important to note.

Physical, institutional, or information resources that form the infrastructure for research and education.

The ADVANCE program was instrumental in providing significant support for increased information resources at NMSU for STEM and non-STEM fields. Working with the Office of the Provost, the Hispanic Faculty/Staff Caucus, the Teaching Academy and Faculty Senate the program provided support for broad-based institutional training. ADVANCE program funds have been essential to the launch of the NMSU Teaching Academy.

In addition, the program, in collaboration with the University of Texas at EL Paso ADVANCE Program, has produced a brochure on "Dual Career Couples" for use by the institutions in solving dual career dilemmas. The program has brought department heads together on two occasions in the past year to discuss managerial issues such as conflict management and evaluating faculty members' teaching, research and service activities. The program has established a reputation among department heads of providing quality, value-added programming that is truly relevant to their administrative roles.

The ADVANCE program website, and the vital connections maintained with the other eight ADVANCE institutions have been essential in making information about institutional change easily accessible to a wide audience. The PI, Research Analyst, and Program Coordinator made numerous presentations about women's status in STEM fields and the ADVANCE Program to various NMSU and national audiences.

Program personnel participation in other institutional efforts-notably a campus-wide Provost's Taskforce on Roles and Rewards, the President's Commission on the Status of Women, and the Employee Climate Survey Committee are important in disseminating the information learned via the many data collection efforts of the program across campus. Such involvement insures that issues related to the status of women at the institution are kept at the forefront of these other institutional efforts.

Other Aspects of Public Welfare

Nancy McMillan's newly-funded research titled "Trace element signatures of gem beryls: Tracing geologic processes and terrorist trading" has obvious implications for public welfare. In addition, this research provides funding "down the pipeline" to a female undergraduate and a female graduate student. Dr. Jing He's funded research enabled her to develop a weekly seminar program that brings together faculty across many disciplines spread across several colleges at NMSU with similar interests in bioinformatics. Dr. He is one of the Co-PIs on a newly funded (NSF) Center for Research Excellence in Science and Technology proposal to develop a bioinformatics center and program at NMSU. Even as a third-year assistant

professor, she has taken a lead role in the fundamental building blocks of this program, which has much potential to attract and retain women into the sciences.

The PIs research on diversity in engineering is important in determining how more women and under represented minorities can be recruited and retained at all levels of the engineering pipeline. Affecting the pipeline is also one important role of the Distinguished Visiting Professor program. Both of this year's Distinguished Visiting Professors, Dr. Ann LaBastille and Dr. Rekha Thomas, met with middle school classes as part of their visits. These women were an inspiration to the young girls in these classes, providing them with role models affirming that there are women in science.