# Year-End Report for

# **ADVANCE Institutional Transformation Project**

# **University of Michigan**

Year 5: December 2006

# FOR PUBLIC RELEASE

Data are aggregated by college (Engineering; Literature, Science, and the Arts; and Medical School) or across the six additional schools/divisions (Dentistry, Information, Kinesiology, Natural Resources and Environment, Pharmacy, and Public Health), in this version for public release, in order to protect individual identities.

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### SECTION I: PERSONNEL AND FINANCIAL REPORT

# A. BUDGET EXPLANATIONS BY AREAS AND MAJOR FUNCTIONS

(for the reporting year and the proposed no-cost time extension period)

#### SENIOR PERSONNEL

Dr. Abigail J. Stewart, the principal investigator, is responsible for ADVANCE project oversight. In the fifth project year, 50% of Dr. Stewart's salary is cost shared. Her work has included the management and oversight of the project implementation and evaluation advisory and steering committees and the facilitation of departmental initiative implementations.

Salary is cost shared in this fifth project year at 5% for each of the four co-PIs (the Deans of Engineering, Medicine, LSA and a representative of the Provost's Office). The co-PIs facilitate project activities within their home schools and campus-wide. They serve on the project's Steering Committee, which makes decisions about program initiatives, and the three deans chair the Gender, Science and Engineering (GSE) subcommittees.

#### **OTHER PROFESSIONALS**

Dr. Janet Malley, Associate Director of the Institute for Research on Women and Gender, has served as evaluation manager for the project and has provided oversight of the quantitative research evaluation effort (data collection, analysis and reporting) of the initiative (survey and inventory) at 30% effort.

Carol Hollenshead and Jean Waltman from the Center for the Education of Women (CEW) conducted qualitative evaluations of the departments with substantial Departmental Transformation Grants, as well as comparison departments. Carol Hollenshead continued this work in the fifth project year at 20% effort (includes 10% cost share) and Jean Waltman continued at 50% effort in the fifth project year.

Senior faculty served on the *Science and Technology Recruiting to Improve Diversity and Excellence* (STRIDE) Committee and assisted the project this year by providing consultation with individual departments on recruitment and on hiring and retention practices. Each committee member received \$20,000 in release time for this work, and funds in the amount of \$160,000 were allocated for this purpose in the fifth year. All funds associated with the STRIDE committee were cost shared this year.

#### **STUDENTS**

This year research assistants worked on the project by assisting with programming activity and the climate survey data collection and data entry. Salary costs in the amount of \$25,475 were incurred for student assistance.

#### **OTHER PERSONNEL**

Cynthia Hudgins serves as Program Manager for the project (100% effort). Ms. Hudgins provides staff support for data collection efforts, all project initiatives, advisory, steering and selection committees, and production and dissemination of reports and presentations. She also serves as the focus group facilitator.

Keith Rainwater serves as Program Evaluation Manger (100% effort). Mr. Rainwater provides staff support for data analyses and evaluation. Mr. Rainwater's salary is paid partially by cost shared funds.

In the fifth project year, salary funds were originally budgeted for a postdoctoral associate and a half-time graduate student research assistant. These allocations were, instead, used to fund the program manager's salary and partially fund the program evaluation manager's salary.

Lisa Parker, research administrator at the Institute for Research on Women and Gender, allocates 10% of her time to manage the budget for the ADVANCE grant (including all sub-accounts) and process financial and administrative paperwork.

Salary funds for transcription of interviews and focus group meetings totaled \$2,550 in the fifth project year.

### FRINGE BENEFITS

Fringe benefit expenses are calculated at 30% for all faculty, professional and administrative staff and at 8% for all students, facilitators and transcribers.

### TRAVEL/DOMESTIC

Travel expenses in year five have totaled \$6,670 for advisory meetings, University of Michigan Women Scientist Network event speakers, and consultants.

### **OTHER DIRECT COSTS – MATERIALS AND SUPPLIES**

In year five, funds in the amount of \$27,325 were used for program and event publicity as well as consumable supplies and duplication. This total amount was comprised of \$5,445 direct funds and \$21,880 cost shared funds.

### **OTHER DIRECT COSTS – PUBLICATION COSTS**

In the fifth project year, \$5,000 was budgeted for printing costs associated with the dissemination of project findings.

#### **OTHER DIRECT COSTS – CONSULTANT SERVICES**

Expenditures for consultant activity totaled \$11,000 in year five.

#### **OTHER DIRECT COSTS – OTHER**

The Center for Research on Learning and Teaching's (CRLT) Climate Theater continued to perform scripts developed by CRLT that are of specific relevance to the ADVANCE project. Although no NSF funds were provided to CRLT in the fifth project year, cost shared funds in the amount of \$25,000 were allocated to continue their work. Additionally, a supplemental award of \$107,847 (direct costs) was used to fund a summer institute program developed by CRLT.

In the fifth project year, funds in the amount of \$23,898 were used by the UM Network of Women Scientists to support events, including visiting speakers. Expenses in the fifth year included invited speakers and social events.

The Elizabeth Crosby Research Fund (formerly the Gender Equity Resource Fund) is budgeted at \$100,000 each year (includes \$10,000 cost share) to provide awards of \$20,000 each to five applicants. This fund is used to support women faculty in ways best suited to their particular needs (special laboratory equipment, graduate student or post-doctoral support, conference travel, support for a visiting scientist, release time, etc.). Funds are awarded as a result of a call for applications and a selection process. Beginning in the second project year, the University of Michigan cost shared additional funds in the amount of \$240,000 to increase the number of awards throughout the project period. This year, seven awards were made in the total amount of \$103,805. This amount was comprised of both direct and cost shared funds.

Although no new Departmental Transformation Grants were awarded in the fifth project year, expenditures related to previously allocated awards continued. Seventeen awards have been distributed (selected through a review process) to carry out specific activities aimed at producing significant transformation of the climate for women faculty. The University of Michigan allocated additional funds to increase the overall funding available for Departmental Transformation Grants. In total, \$873,800 (\$611,000 direct cost, \$262,800 cost shared and additional funds) were allocated to departments over the entire project period.

## **INDIRECT COSTS**

Indirect costs are calculated at 51%.

### **COST SHARING**

In the original project budget, cost sharing was committed in the amount of \$155,034 for the fifth project year. The percentage of Dr. Abigail Stewart's salary to be cost shared, however, increased from 15% to 50%. As a result, the cost sharing commitment increased to \$234,045 in the fifth project year. As of November 30, 2006 (the most recent monthly account statement available to us), the University of Michigan has cost shared \$1,844,659.89 over the five-year project period.

### **PROPOSED NO-COST TIME EXTENSION**

The request for a one-year, no-cost time extension was submitted to NSF on November 15, 2006. Funds to be used during this extension are targeted for qualitative and quantitative studies of the University of Michigan campus climate to assess the impact of UM's NSF ADVANCE Program and change over the five years of the award. The no-cost time extension request explains the use of these funds in detail, but the main budget categories are described below.

#### Climate Study (quantitative)

In fall 2001, prior to the NSF ADVANCE award, the project team conducted a climate survey of science and engineering faculty as well as a comparison group of female social science faculty. To assess the impact of UM's project five years later, a follow-up survey is being conducted. It is anticipated that data collection and cleaning will be completed by the end of the calendar year. Data programming and analyses will commence early in the new year and are expected to be completed by the end of March. Final reports are expected to be completed by July 1, 2007.

Costs for completing this survey assessment include staff time (\$53,806) to oversee data collection and cleaning, program and analyze the data and write the reports. In addition,

temporary staff have been hired to program the web survey and retrieve data from the web survey, and for data entry (\$9,000). Printing costs are also being incurred for the survey and reports (\$3,000). Total direct costs for the climate survey are budgeted for \$65,806.

### *Climate Study (qualitative)*

In addition to the quantitative survey, a qualitative study of science and engineering faculty will be conducted to help contextualize findings from the survey and provide additional insight into the experiences of the faculty. The focus of interviews will be 25 female faculty. A smaller sample (15) of men faculty will also be included. Costs associated with this phase of the climate assessment include interviewing, transcription and checking of transcripts and data coding (\$6,800). Staff time to oversee the data collection, analyze the data and write the report is also included (\$32,156). Total costs for this phase of the project are budgeted at \$38,956.

### DTG Qualitative Evaluation

Finally, the qualitative evaluation component of the Department Transformation Grant (DTG) program assessment will be completed during the no-cost time extension period. Work will entail interviews with faculty from three departments that received large DTGs over the course of the project period and comparison departments that did not receive these large grants. Interviews will be completed by the end of December. Transcriptions, checking transcripts and coding the interviews will take place beginning in January. The final report will be completed by July1. Total cost for this project is estimated at \$75,954.

#### Miscellaneous

Supplies and miscellaneous materials to support these efforts are budgeted at \$1,098.

#### Supplemental Awards

The remaining balances for two supplemental awards associated with the ADVANCE Institutional Transformation award are \$28,250 (NSF Think Tank) and \$6,357 (Mitigating Evaluation Bias). These funds will be fully expended by the end of the no-cost time extension period.

# **B. ESTIMATED UNOBLIGATED FUNDS**

(at the end of the fifth project year)

We anticipate no unobligated funds at the end of the period (January 1, 2006 – December 31, 2006) for which NSF currently is providing support to Abigail J. Stewart's NSF grant SBE 0123571, "ADVANCE Institutional Transformation Award." The budget allocation for the fifth project year was \$749,948 (\$496,654 direct costs; \$253,294 indirect costs). While a balance of direct cost funding will remain at the end of the fifth project period, all of these funds have been assigned to specific allocations or have been otherwise committed and a no-cost time extension has been requested. Funds remaining at December 31, 2006 will be fully expended by costs associated with activities performed during the no-cost time extension period. As a result, we expect the ADVANCE project to fully expend the total amount of \$3,748,785 (\$2,482,639 direct costs; \$1,266,146 indirect costs) awarded for the entire project period, as well as all supplement award funds.

### COST SHARING STATUS AT THE END OF THE FIFTH PROJECT YEAR

As indicated previously in this report, as of November 30, 2006 (the most recent monthly account statement available to us), the University of Michigan has cost shared \$1,844,659.89 over the five-year project period. A cost sharing report will be provided to NSF from the University of Michigan's Office of Financial Operations. Financial Operations is unable to produce an accurate cost sharing report for the entire five-year project period (January 1, 2002 – December 31, 2006) until the close of December business occurs in early January. The University will submit this report as soon as possible after December 31, 2006.

# C. PROPOSED BUDGET FOR NO-COST TIME EXTENSION PERIOD (in accordance with NSF form 1030)

Please Note: The current reporting year (January 1 – December 31, 2006) was the final year for which new funds were allocated to this project. A request for a one-year, no-cost time extension has been submitted, however, and this request contains a detailed explanation of planned expenditures during the no-cost time extension period. Below is an outline of this usage, although the funds listed here represent previously allocated funds rather than a request for an additional allocation. In total, we expect to expend all funds allocated to this project over the five-year funding period, as well as all funds associated with supplemental awards, by the end of the no-cost time extension period.

#### **No-Cost Time Extension Period (NSF - ADVANCE)**

B. (	Other Personnel	
B.2	Other Professionals	67,046
B.3	Graduate Students	9,882
B.6	Other	4000
	Total Other Personnel	80,928
	Total Salaries and Wages	80,928
C.	Fringe Benefits	20,834
	Total Fringe Benefits	20,834
	Total Salaries, Wages and Fringe Benefits	101,762
G. (	Other Direct Costs	
G.1	Other Dir. Costs - Materials & Supp	4,098
G.6	Other	110,561
	Total Other Direct Costs	114,659
H.	TOTAL DIRECT COSTS no-cost time extension period	216,421
I.	Total Indirect Costs Rate: 51%	110,375
J.	TOTAL DIRECT AND INDIRECT COSTS	326,796

# D. CURRENT OTHER SUPPORT INFORMATION FOR KEY PERSONNEL

#### Stewart, Abigail (Current) Principal Investigator: Abigail Stewart Title: Narratives and Numbers: Integrating Quantitative and Qualitative Methods in the Study of Gender University of Michigan/Rackham Graduate School Sponsor: Amount of Award: \$32.000 Duration of Award: 09/01/00 - 6/30/07 Time Devoted to Project: 1% Principal Investigator: Abigail Stewart Co-PI: Terrence McDonald, David Munson, Pamela Raymond, James Woolliscroft Title: ADVANCE Institutional Transformation Award National Science Foundation Sponsor: Amount of Award: \$3.748.785 Duration of Award: 01/01/02 - 12/31/06Time Devoted to Project: 50% (cost shared) **Principal Investigator:** Abigail Stewart Title: Global Feminisms: Comparative Case Studies of Women's Activism and *Scholarship* University of Michigan/Rackham Graduate School Sponsor: Amount of Award: \$250,000 07/1/02 - 06/30/07 Duration of Award: Time Devoted to Project: 5% Principal Investigator: Abigail Stewart Title: Supplemental Request for ADVANCE Institutional Transformation Award: CRLT Summer Institute National Science Foundation Sponsor: Amount of Award: \$159.441 Duration of Award: 01/01/05 - 12/31/06 Principal Investigator: **Timothy Johnson BIRCWH** Career Development Title: Sponsor: NIH/BIRCWH (Building Interdisciplinary Research Careers in Women's Health) Career Development Program \$2,499,797 Amount of Award: Duration of Award: 09/01/05 - 07/31/10Time Devoted to Project: 3% as advisory board member Principal Investigator: Abigail Stewart Title: Putting ADVANCE Institutional Transformation Models to Work Serving National Needs

Sponsor: National Science Foundation Amount of Award: \$28,250 Duration of Award: 01/01/06 - 12/31/06Principal Investigator: Abigail Stewart Title: Supplemental Request: ADVANCE Institutional Transformation Award: Mitigating Evaluation Bias Sponsor: National Science Foundation Amount of Award: \$10.032 Duration of Award: 01/01/06 - 12/31/06Principal Investigator: Abigail Stewart Title: Supplemental Request for ADVANCE Institutional Transformation Award: NSF Think Tank National Science Foundation Sponsor: Amount of Award: \$28.250 01/01/06 - 12/31/06 Duration of Award: Principal Investigator: Abigail Stewart Title: ADVANCE Partnerships for Adaptation, Implementation, and Dissemination (PAID): Creating Faculty Change Agents to Transform Academic Science and Engineering Sponsor: National Science Foundation Amount of Award: \$499,906 Duration of Award: 09/01/06 - 08/31/09 Time Devoted to Project: 5% (cost shared) Principal Investigator: Abigail Stewart Title: A GVSU-UM Partnership for Advancing Women in Science and Engineering Sponsor: National Science Foundation (Subcontract of award issued to Grand Valley State University) Amount of Award: \$54.918 Duration of Award: 10/01/06 - 09/30/08 Time Devoted to Project: advisory/consulting Principal Investigator: Abigail Stewart Title: *Mizzou ADVANCE in Science, Technology, Engineering and Math:* Gender and Institutional Transformation at the University of Missouri-Columbia National Science Foundation (Subcontract of award issued to the Sponsor: University of Missouri-Columbia) Amount of Award: \$34.904 01/01/07 - 12/31/09 Duration of Award: Time Devoted to Project: advisory/consulting Malley, Janet (Current) Principal Investigator: Abigail Stewart Co-PI: Terrence McDonald, David Munson, Pamela Raymond, James Woolliscroft

Title: ADVANCE Institutional Transformation Award Sponsor: National Science Foundation Amount of Award: \$3,748,785 01/01/02 - 12/31/06 Duration of Award: Time Devoted to Project: 30% (cost shared) Principal Investigator: Abigail Stewart Co-PI: Janet Malley Title: ADVANCE Partnerships for Adaptation, Implementation, and Dissemination (PAID): Creating Faculty Change Agents To Transform Academic Science and Engineering National Science Foundation Sponsor: Amount of Award: \$499.906 09/01/06 - 08/31/09 Duration of Award: Time Devoted to Project: 5% (cost shared) Principal Investigator: Abigail Stewart Co-PI: Janet Malley Title: Mizzou ADVANCE in Science, Technology, Engineering and Math: Gender and Institutional Transformation at the University of Missouri-Columbia Sponsor: National Science Foundation (Subcontract) Amount of Award: \$34,904 01/01/07 - 12/31/09 Duration of Award: Time Devoted to Project: advisory/consulting **McDonald**, Terrence (Current) Principal Investigator: Abigail Stewart Terrence McDonald, David Munson, Pamela Raymond, James Co-PI: Woolliscroft ADVANCE Institutional Transformation Award Title: Sponsor: National Science Foundation Amount of Award: \$3,748,785 01/01/02 - 12/31/06 Duration of Award: Time Devoted to Project: 5% (cost shared) Munson, David (Current) Principal Investigator: Abigail Stewart Co-PI: Terrence McDonald, David Munson, Pamela Raymond, James Woolliscroft Title: ADVANCE Institutional Transformation Award Sponsor: National Science Foundation Amount of Award: \$3,748,785 01/01/02 - 12/31/06 Duration of Award: Time Devoted to Project: 5% (cost shared) Principal Investigator: David Munson Title: Collaborative Research: A Modern Autofocus Methodology with Applications to Radar Imaging

Sponsor: Amount of Award: Duration of Award: Time Devoted to Project:

#### **Raymond**, Pamela

(Current) Principal Investigator: Title: Sponsor: Amount of Award: Duration of Award: Time Devoted to Project:

Principal Investigator: Title: Sponsor: Amount of Award: Duration of Award: Time Devoted to Project:

Principal Investigator: Title: Sponsor: Proposed Amount of Award: Proposed Duration of Award: Time Devoted to Project:

Principal Investigator: Co-PI:

Title: Sponsor: Amount of Award: Duration of Award: Time Devoted to Project:

Principal Investigator: Title: Sponsor: Amount of Award: Duration of Award: Time Devoted to Project:

#### Woolliscroft, James

(Current)	
Principal Investigator:	Abigail Stewart
Co-PI:	Terrence McDonald, David Munson, Pamela Raymond, James
	Woolliscroft
Title:	ADVANCE Institutional Transformation Award
Sponsor:	National Science Foundation

National Science Foundation

50% for one summer month

Wnt Signaling in Retinal Stem Cells

0% (sponsor for Postdoctoral Fellow Jason Meyers)

Genetic Analysis of Cone Photoreceptor Determination

Terrence McDonald, David Munson, Pamela Raymond, James

ADVANCE Institutional Transformation Award

09/15/04 - 08/31/07

Pamela Raymond

07/01/06 - 06/30/08

Pamela Raymond

07/01/03 - 06/30/07

Pamela Raymond

10/01/04 - 11/30/07

National Science Foundation

Core Center for Vision Research

Abigail Stewart

Woolliscroft

\$3,748,785

B. Hughes

\$3.019.879

NIH

0%

01/01/02 - 12/31/06

05/01/02 - 04/30/07

5% (cost shared)

New Neurons in the Retina

\$274,673

NIH

NIH

20%

NIH

20%

\$923,709

\$974.605

\$94,772

I-10

Amount of Award: Duration of Award: Time Devoted to Project: \$3,748,785 01/01/02 - 12/31/06 5% (cost shared)

# SECTION II: SUMMARY OF PROJECT ACTIVITIES, JANUARY-DECEMBER 2006 A. SUMMARY OVERVIEW

The most important activity of UM ADVANCE during this past year was preparation for the end of grant funding. (Our formal end date is December 31, 2006, though we have requested a no-cost extension through December 31, 2007. This extension is primarily aimed at permitting the full assessment of the impact of the five-year project.] Discussions about how best to continue to sustain effort on the project after the funding ends took place within the Steering Committee, the Gender in Science and Engineering Committee, and in discussions with the Provost and Executive Vice President for Academic Affairs, and the Associate Provost for Academic and Faculty Affairs.

At the end of our fifth full year of grant-supported activity (and halfway through our fifth full academic year, since we publicly launched our project in September 2002), we believe that campus awareness about the importance of the climate for recruitment and retention of women faculty in the sciences and engineering has increased and remains high. We will, however, be able to make stronger and clearer statements along these lines after we have completed the 2006 climate survey data analysis, and have completed the other steps in our own assessment of the impact of the first five years. One factor that has complicated the landscape for our efforts is the passage of Proposition 2 or the "Michigan Civil Rights Initiative." This initiative, which is aimed at banning many affirmative action efforts has absorbed considerable institutional attention and resources, inevitably diverting time and discussion from the issues of subtle discrimination and the operation of bias in recruitment, career development, leadership, retention, and other important institutional processes.

An important positive change agent within the ADVANCE Institutional Transformation program on campus has been the CRLT Players' performances on campus, including their recent launch of a third program focused on the tenure review process (called "The Fence"). In addition to their on-campus performances, CRLT Players has been much-sought-after nationally, and offered a second, successful three-day summer institute.

In addition, as a direct result of the policy review launched by the President and Provost to consider the impact of University policies on women scientists and engineers, the Provost appointed a committee to consider a more flexible tenure probationary period. This committee's report is under discussion on campus, and real changes in the tenure probationary period policies are being considered.

We are pleased to note that during the immediate "pre-ADVANCE" years, about five women scientists and engineers were hired each year in the three largest colleges. During the three "post-ADVANCE" years, about 15 women scientists were hired each year. While overall change in the demographic structure of the institution is slow, this level of change in hiring is significant in the short and the longer term.

For the second year, the *Science and Technology Recruiting to Improve Diversity and Excellence* (STRIDE) Committee presented an expanded workshop to all chairs of search committees in all fields. The deans asked all such chairs to attend and there was excellent participation in three

II-1

separate workshops involving faculty from all three schools. Both informal and formal feedback indicate that these workshops were even more successful than the shorter presentations made in departments in the past.

An interesting new development has been increased attention to issues for graduate students and postdocs in science and engineering. More and more departments have noted that this is an issue, and the ADVANCE staff agreed to undertake a survey of the climate for graduate students shortly before the new dean of the Rackham Graduate School was appointed, in the hope that she would find it useful in working with science and engineering departments. The report has been disseminated throughout the campus, and the Rackham Graduate School has worked with ADVANCE to identify important points of intervention that might address the issues identified.

The UM ADVANCE project hosted the annual meeting of the "MIT 9" institutions during the Summer of 2006. This was one of the meetings of the faculty and administrative representatives, but not the Presidents. The program included evaluation of faculty hiring and retention progress over a ten-year period, in comparison with graduate student pool data. In addition, the representatives discussed the importance of expanding the group's focus to include underrepresented minorities. In April 2007, the MIT 9 Presidents will meet (along with other delegates) in Washington, D.C.

An important focus of 2006-2007 activities has been collaboration with the National Center for Institutional Diversity (recently established at Michigan) on planning of a conference on "Advancing Science and Diversity in Science and Engineering." This conference, to take place in January 2007, focuses on both women and underrepresented minority faculty and students in STEM disciplines. The conference is aimed at encouraging small groups of faculty and administrators to develop proposals for programs (of research and especially of interventions) to address issues of underrepresentation. These groups will compete for funds totaling \$250,000.

A second important focus of 2006-2007 activities is our own PAID grant supporting new concentrated summer activities educating faculty both in the operation of bias and organizational change. The first three-day summer program is aimed at small teams of UM faculty who agree to develop and implement a change effort within their own department. We are in the middle of development of the summer program and recruitment of faculty teams.

As a result of the institutional commitment to support the infrastructure for the ADVANCE program through June 30, 2011, ADVANCE director Abigail Stewart was appointed Senior Counselor to the Provost. She has a direct reporting line to the Provost, with this title. During this academic year, she is working with Associate Provost Lori Pierce on clarifying the elements of the program that will be changing and those that will be continuing unchanged.

Below, in detail, is a full accounting of activities of UM ADVANCE in 2006.

# **A. PARTICIPANTS**

### **PROJECT STAFF**

**Abigail Stewart**, Principal Investigator, is responsible for ADVANCE Project oversight. She represents the project to the larger University of Michigan community, offering presentations about the program, and consultation on mentoring, recruitment and retention strategies to units and administrators across campus and in other settings. She directs all project interventions and consults on all ADVANCE-related activities involving the project's collaborators.

**Pamela Raymond**, ADVANCE Co-PI, offers consultation on mentoring, recruitment, and retention strategies to units and administrators across campus and in other settings. She consults on ADVANCE-related activities involving the project's collaborators.

**Janet Malley** directs all project evaluations. She directs the ongoing collection of data to be used to evaluate the project's progress in nine different UM colleges. She oversees the design and administration of web surveys to evaluate the effectiveness of the activities and initiatives of ADVANCE and prepares reports. She also directed the collection, analysis, and writeup of data on the climate for graduate students, and the climate survey assessment of faculty that took place in Fall 2006.

**Cynthia Hudgins** manages and coordinates activities including committee meetings, presentations, and intervention activities. She develops draft reports and publications, including materials for University publications. She coordinates plans for ADVANCE-sponsored activities, schedules ADVANCE meetings and discussions, provides administrative support to the STRIDE recruitment committee and other project committees and collaborators (e.g., CRLT). She assists with climate studies and develops text for the project website. She maintains the mailing lists and individual contacts with ADVANCE constituencies.

**Keith Rainwater** manages and coordinates ongoing project evaluation and data collection activities under the supervision of Janet Malley. He collects and analyzes data used in evaluating the project's initiatives. He develops instruments for collecting college-level data, ensures the accuracy of the data, and represents results in charts and graphs designed to illustrate change over time. He provides liaison with the nine target schools and colleges within the university to collect data and information. He designs web surveys and writes draft reports on ADVANCE activities and initiatives. He maintains the project website.

**Lisa Parker** keeps financial records, writes budget reports, and manages ongoing account activities for the ADVANCE grant.

**Patricia Smith** reviews ADVANCE account activities and, along with Lisa Parker, negotiates with administrators in units cooperating with the Institute for Research on Women and Gender in administering the grant.

Allison Schwartz worked with the project from November 2005 through April 2006. During that time, she provided programming support and worked on the archives and the electronic database of resources and articles.

**Patricia Mullally** worked with the project from May through August 2006. She provided programming support and worked on the archives and the electronic database of resources and

articles.

Alixandra Burns joined the project in September 2006. She provides programming support.

**Marie Schaeffer** joined the project on a half-time basis for November 2006, to provide administrative assistance during Cynthia Hudgins' one-month leave from the project.

**Cindy Torges** joined the project in May 2006 to work on the preparation of the web-based climate survey to be administered in Fall 2006. She played a major role in the development of the survey and the data collection process.

**Laura Hirshfield** joined the project in May 2006 to collect interview data from graduate students, as a follow-up to the graduate student climate survey.

**Janice Habarth** joined the project in May 2006; she completed analyses of the graduate student climate study, focusing on graduate students who are sexual minorities.

**Becca Rueble** joined the project in May 2006; she provides support to several different evaluation projects, checking and analyzing data and preparing reports.

**Lily Axelrod** rejoined the project for June through August 2006. She provided programming support and assisted with resource and database development. She developed the *UM ADVANCE Project Grant Programs* publication.

**Danielle LaVaque-Manty** is co-editing the volume about ADVANCE, entitled *Transforming Science and Engineering: Advancing Academic Women* with Abigail Stewart and Janet Malley. As of July, she became the program manager for the recently funded program on Advancing Diversity and Excellence in Science and Engineering conducted in collaboration with the National Center for Institutional Diversity at the University of Michigan, as well as the NSF PAID project, Science and Technology Excellence Program (STEP). She also provided general administrative assistance during Cynthia Hudgins' leave.

**Ellen Meader**, a research associate in the Dean's Office of the College of Literature, Science and the Arts, was hired in part to institutionalize data collection and organization of indicators for NSF and ADVANCE, as well as for internal LSA institutional research. She participates in ADVANCE staff meetings to ensure effective coordination between LSA and the project; as a result, she also participates in many ADVANCE activities.

# PARTNERS

**Jeffrey Steiger** and other staff at the Center for Research on Learning and Teaching (CRLT), directed by **Connie Cook**, have developed three interactive theater sketches for ADVANCE. The first, called the *Faculty Meeting Sketch*, illustrates experiences of female faculty and the negative climate issues that sometimes emerge in the context of faculty recruitment. The second, *Faculty Advising Faculty Sketch*, illustrates some good and poor mentoring techniques. The third sketch, called *Tenure: The Fence* focuses on a tenure committee discussion of a candidate. This group

also offered a second three-day Summer Institute (June 19-21) on "Setting the Stage for Change," with support from a supplemental award, in collaboration with the ADVANCE staff. Appendix A includes the article, entitled *Using Theatre to Stage Instructional and Organizational Transformation*, published in Change (May/Jun 2006). This article discusses the interactive theatre efforts CRLT has developed with UM ADVANCE.

### PARTNERS

**Jean Waltman** and **Carol Hollenshead** from the Center for the Education of Women (CEW) are conducting qualitative evaluations of the departments with substantial Departmental Transformation Grants, as well as comparison departments (a total of five). They are also conducting exit interviews with faculty who have left those departments during this period and in recent years past.

# OTHER COLLABORATORS OR CONTACTS

Strategies and Tactics for Recruiting to Improve Diversity and Excellence (formerly The Science and Technology Recruiting to Increase Diversity and Excellence—STRIDE) Committee was formed in 2002 and provides information and advice about practices that will maximize the likelihood that well-qualified female and minority candidates for faculty positions will be identified, and, if selected for offers, recruited, retained, and promoted at the University of Michigan. The committee works with departments by meeting with chairs, faculty search committees, and other departmental leaders involved with recruitment and retention. They advise chairs on search committee composition and search practices, work with search committees throughout the search process, and offer recruitment presentations to departments, search committees, and other groups. The membership is comprised of senior faculty in sciences and engineering and is chaired by the PI. In May, Anthony England, Associate Dean for Academic Affairs, College of Engineering transitioned from the STRIDE Committee to the STRIDE Advisory Board. Additionally, two new members joined STRIDE in May: Katherine Spindler, Microbiology and Immunology, and Charles Brown, Economics and Institute for Social Research. Mark Chesler, Emeritus Professor of Sociology, has worked with STRIDE as a consultant for one year, to help the committee include issues of race more effectively.

**Gender in Science and Engineering Committee.** The President and Provost co-chair the Gender in Science and Engineering Committee. The committee members include Abigail Stewart, Pamela Raymond, and the three deans who are co-PIs on ADVANCE. The committee meets annually to discuss the policy issues associated with ADVANCE university-wide, and to ensure coordination of ADVANCE efforts in all affected schools and colleges.

**Flexible Tenure Committee.** In January 2005 the Provost charged a committee co-chaired by Dean Terrence McDonald and (then) Associate Provost Janet Weiss (now Dean of the Rackham Graduate School) to recommend specific policy changes including a more flexible tenure clock. Abigail Stewart served on this committee. During 2005-2006 an extensive process of consultation with the faculty was undertaken, and in the Summer of 2006 the committee restated its proposed recommendations in light of faculty feedback. These recommendations are under review by the Provost.

**Pamela Smock**, Professor of Sociology and Women's Studies, has provided expert consultation about mentoring to junior female faculty in the natural sciences in the Colleges of Literature, Science, and the Arts and Engineering. Based on this experience, Dr. Smock, along with Robin Stephenson, formerly the Program Manager for ADVANCE, developed a draft handbook on *Giving and getting career advice: A guide for junior and senior faculty*. The handbook is distributed widely to faculty and department chairs.

**Lorna Hurl**, Staff Counselor at UM's Faculty & Staff Assistance Program (FASAP), developed a series of programs with her staff, the Office of Institutional Equity (OIE), and the Human Resource Development (HRD) office to offer coaching sessions about topics identified by the Network of Women Scientists and Engineers.

**Janet Weiss**, Dean of the Horace H. Rackham School of Graduate Studies, provides expert consultation to the UM ADVANCE Project about implementation of programs. Abigail Stewart meets regularly with Dr. Weiss, and they are working together on devising follow-up from the graduate climate study.

**Diana Kardia**, President of Diversity By Design and Leadership Consulting, Coaching, and Training for Diverse Environments, offers both coaching services to science chairs in LSA, and workshops specifically designed for new full professors in LSA, Engineering, and Medicine. She is also consulting on aspects of the NCID-ADVANCE conference, and on the planned STEP program for next summer.

**Mark Chesler**, Emeritus Professor of Sociology and a member of the Evaluation Advisory Committee, conducted interviews with male assistant professors and chairs of the eight natural science departments in LSA. Dr. Chesler is working with the PI and the Dean of LSA to discuss the results of those projects and their implications for departmental activities. Dr. Chesler is also serving in a consulting role to the STRIDE Committee.

# **B. ACTIVITIES AND FINDINGS**

### **RESEARCH AND EDUCATION ACTIVITIES**

**Graduate Student Experience**. A campus-wide, confidential, on-line survey about the graduate school climate was developed, funded by the Rackham Graduate School and the Office of the Provost and Executive Vice President for Academic Affairs. The survey was designed to identify aspects of the graduate school experience students find problematic and those that contribute to satisfaction and success. Some measures were designed to be parallel to the faculty climate survey, and others were specially designed to assess graduate school issues. The findings reveal that students' experiences of the climate, as well as their relationship with their advisors (and other UM faculty), play a powerful role in the students' confidence that they can be successful academics and their interest in pursuing a faculty career at a top research university. The provision of opportunities for the broad range of experiences normally open to students is also important. These relationships do vary in important ways for different demographic groups. Students with less positive experiences of the climate (women and U.S. students of color) and

less positive relationships with advisors (women) appear to be at the highest risk for lower morale and career aspirations, while international students—who report the largest number of areas of "insufficient opportunities"—seem particularly to benefit from the broadest range of opportunities. Finally, across many different areas (advising, goals, etc.), the issue of managing a personal and professional life was identified as one that students find problematic. It is, then, in these four areas that it seems most important to attempt to create changes in students' graduate school experience. As a supplement to the survey, and to further enrich our understanding of graduate school climate, we conducted one-on-one interviews with graduate students about their experiences in graduate school. A random sample of Rackham students, controlling for diversity in ethnicity, gender, and field of study, was interviewed. Interview topics include: peer and advisor relationships, department climate and student morale, and social life outside of the department. These data will be analyzed in 2007.

**Survey of the Climate for Women Scientists and Engineers.** In October 2006 a web survey, paper copy, and PDF link of the Climate Survey were sent to 2,471 faculty. This study replicates the baseline study, conducted in 2001 to assess whether the ADVANCE Project has improved the working conditions for women scientists and where more attention to the work-related issues of women scientists needs to be placed. It will also identify problems for scientists and engineers in general, as well as for faculty of color. The current survey is very similar to the original 2001 survey. Findings from the survey will be summarized in a written report, which will be released to the entire campus in 2007. It will be posted on the University of Michigan's ADVANCE website and will also be distributed to any department's individual faculty members by request.

**Abigail Stewart** interviewed LGBT science and engineering faculty about the climate for gay and lesbian faculty in their departments. She is discussing these findings with faculty groups in an effort to identify ways to provide better support to gay and lesbian science and engineering faculty. In addition, a meeting of interested members of the Network of Women Scientists and Engineers was held.

**Mark Chesler** and **Keith Rainwater** conducted focus groups with male assistant professors in science departments to discuss their perspective on departmental climate issues generally, and gender and other diversity issues more specifically. They produced a report and executive summary discussing faculty perspectives on departmental climate issues generally, and gender and other diversity issues more specifically. The report and executive summary have been shared with participants and the Dean of LSA. The executive summary was shared with chairs of natural science departments in LSA. Mark Chesler also conducted one-hour interviews with department chairs of natural science departments in LSA and produced a report based on these discussions. He and the PI will meet with the Dean and chairs of natural science departments in LSA in January to discuss the findings.

### **OPPORTUNITIES FOR TRAINING AND DEVELOPMENT**

### Strategies and Tactics for Recruiting to Improve Diversity and Excellence (STRIDE)

conducted formal presentations during the past six months to groups across campus to educate them about bias and disadvantage.

**Abigail Stewart** gave two presentations about ADVANCE, with special focus on the STRIDE Committee's efforts, at the University of Kentucky in Lexington.

**Abigail Stewart** made a presentation about effective recruitment to the members of the Graham Institute Search Committee, the School of Information Dean Search Committee at the University of Michigan.

**Sam Mukasa** and **John Vandermeer** gave a presentation about ADVANCE and faculty recruiting at the University of Texas at Austin.

**Martha Pollack** gave a presentation about the STRIDE Committee's efforts and best practices in recruiting, retaining, and professional development of female faculty in the STEM fields at the Committee for Institutional Cooperation—Women in Science and Engineering (CIC-WISE) in Chicago.

Mark Chesler, Carol Fierke, Mel Hochster, Wayne Jones, Sam Mukasa, Pamela Raymond, and Kathy Spindler participated in dinner discussions with the representatives at the Meeting of the Nine Universities (MIT9).

**Gary Huffnagle** and **Pamela Raymond** made a presentation about effective recruitment to the members of the School of Public Health Environmental Health Sciences Faculty Search Committee.

**Sam Mukasa** made a presentation about effective recruitment to the members of the search committee on geomicrobiology in the Department of Geological Sciences.

**Martha Pollack** and **Wayne Jones** made a presentation about effective recruitment to the members of the search committee in the School of Natural Resources and Environment.

**Wayne Jones** made a presentation about effective recruitment to the members of the search committee in the Department of Mechanical Engineering,

In May, the STRIDE Committee held a two-day **FASTER** (Friends and Allies of STRIDE Toward Equity in Recruiting) workshop. The two workshop sessions were attended by 14 senior faculty. Because of the ADVANCE staff's agreement with the Provost that institutionalization of STRIDE would result from expansion of the committee to include all fields, these workshops included social science faculty for the second time. Faculty from the following three natural science departments in LSA participated (Chemistry, Mathematics, and Statistics), as well as one social science department (History). In addition, faculty from two departments in Engineering participated (Mechanical Engineering and Civil & Environmental Engineering), as did faculty from the Medical School departments of Cell & Developmental Biology and Microbiology & Immunology. Science faculty from the Schools of Natural Resources and Environment (1), Public Health (1), and Pharmacy (1) also participated.

In May, September, and October, 57 faculty participated in STRIDE Faculty Recruitment

Workshops. Participants from the College of Engineering, Dentistry, LSA, Medical School, and Public Health attended. In addition, two of our collaborators on our NSF PAID grant from Grand Valley State University attended the October workshop.

STRIDE was asked by the Associate Dean for Academic Programs and Initiatives at the Rackham School of Graduate Studies to assist in developing a presentation that would address graduate student recruiting. A STRIDE sub-committee (including Mel Hochster, Gary Huffnagle, Wayne Jones, Katherine Spindler, and Abigail Stewart) has interviewed graduate chairs in the Natural Science Division of LSA, the Medical School, and the College of Engineering, as part of the process of developing two presentations for January that will focus on the role of bias in admissions practices.

**STRIDE** held a reunion of participants of previous STRIDE workshops (Faculty Recruitment Workshops and FASTER). Sixteen faculty attended the session, which focused on recruitment strategies that have work and those that have not been as successful.

The **Departmental Transformation Grant Program**, funded by the University of Michigan's NSF ADVANCE award and funds from both the Provost's and the President's offices, provided grants to selected departments to support activities leading to significant transformation in the environment for women faculty. Specific objectives included improving departmental climate and mentoring and increasing the number of women faculty recruited, retained, and/or promoted. Executive summaries of Departmental Transformation Grant Year-end Reports were included in the June Interim Report. As of November 2005, the Departmental Transformation Grant program was supplemented by the **UM ADVANCE Program of Visiting Scientists and Engineers**, a new program to support visits to campus by scientists and engineers whose presence on campus will improve our success at recruiting and retaining women scientists and engineers on the faculty, as well as in the student body. The Program requires departments to share in the costs of these visits. Grants were awarded to the Department of Statistics; Department of Microbiology & Immunology; Department of Atmospheric, Oceanic and Space Sciences; Department of Mathematics, Electrical Engineering and Computer Science (EECS) Department.

A Departmental Transformation Grant was made to Diana Kardia to develop and facilitate two cross-departmental programs. The first is a Pilot Coaching Program for the LS&A Natural Science Division Department Chairs. The second is development of a workshop for new or recently appointed full professors, called Leading Excellence: The Role of Full Professors. The aim of this program is to encourage leadership activities, and facilitate a shift in career focus from personal accomplishment toward community development among younger full professors. In May, Dr. Kardia conducted a two-day workshop for 22 faculty from seven departments in the College of Engineering (Atmospheric, Oceanic, & Space Sciences, Biomedical Engineering, Chemical Engineering, Civil and Environmental Engineering, EECS, Mechanical Engineering, and Naval Architecture and Marine Engineering) and from 10 departments in the College of Literature, Science and the Arts (American Culture, Astronomy, EEB, Geology, History, Linguistics, Mathematics, Near Eastern Studies, Physics, and Women's Studies. An additional one-day workshop was held for 42 faculty members from the following Medical School departments (Anesthesiology, Biological Chemistry, Cell & Developmental Biology, Dermatology, Emergency, Medicine, Family Medicine, Human Genetics, Internal Medicine,

Molecular and Integrative Physiology, Neurology, Neurosurgery, Nuclear Medicine, Obstetrics & Gynecology, Ophthalmology, Otolaryngology, Pathology, Pediatrics, Pharmacology, Psychiatry, Radiation Oncology, Radiology, and Surgery).

# **OUTREACH ACTIVITIES**

### **CRLT** performances of ADVANCE Faculty Sketches:

The CRLT Players presented the tenure sketch *The Fence* in January at the College of Pharmacy, in April in the Astronomy Department. In May, they presented it to two audiences of faculty who will serve on tenure committees during the upcoming year. The events were convened by the Dean of College of Literature, Science, and the Arts (LSA). In June, they presented it to representatives at the Meeting of Nine Universities, hosted by the University of Michigan. Three events were held in the month of October for 46 faculty who are serving on their departmental tenure and promotion committees. In addition, three of our collaborators on our NSF PAID grant from Grand Valley State University attended one of the October performances.

In March, the CRLT Players presented *The Faculty Meeting* in the Department of Mathematics and in April for participants of the CIC Academic Leadership Program.

In October, the CRLT Players presented *Faculty Advising Faculty* to the UM Alumnae Council.

In addition, the CRLT Players presented ADVANCE sketches to several audiences at the National Science Foundation and the NSF ADVANCE PI Annual Meeting; Michigan State University; the University of Washington; the University of Maryland, Baltimore Campus; Harvard University; MIT; University of California at Irvine; Stanford University; Michigan Technological University; University of Virginia; and Barnard College.

Abigail Stewart, Danielle LaVaque-Manty, and Cynthia Hudgins participated in material development meetings for future CRLT Players sexual harassment vignettes.

**Summer Institute 2006.** In collaboration with the University of Michigan Center for Research on Learning and Teaching (CRLT), in June we hosted the second annual three-day workshop, entitled *Setting the Stage for Change: Using Theatre to Improve Institutional Climate.* The Summer Institute provided participants with an opportunity to learn more about how to develop and use interactive theatre programs focused on hiring, retention, and climate for women faculty in the sciences and engineering. The 34 participants attending the Institute came from 14 colleges and universities, including:

Bowling Green State University Dartmouth Grand Valley State University Harvard University Michigan State University

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New Mexico State University Stanford University The New School University of California Irvine University of Delaware University of Hawaii at Manoa University of Notre Dame Utah State University Virginia Tech

**Abigail Stewart** attended Stony Brook University's "Women in Academia: 21st-Century Challenges". Dr. Stewart and Evelyn Hammonds of Harvard University were invited to speak at the Stony Brook Provost's Lecture Series.

**Abigail Stewart** provided advice about ADVANCE and related matters to Lynne Wolf, Advocacy Coordinator for the Center for Social Inclusion. Dr. Wolf is developing materials on "Changing the public discussion on race and diversity."

**Cynthia Hudgins** provided advice about ADVANCE and related matters to Jammie Benton-Speyer, LEAP Advance Program at Colorado University, Boulder.

**Abigail Stewart** and **Cynthia Hudgins** coordinated two dinners for the Dean of the College of Literature, Science, and the Arts (LSA). These dinner provided opportunities for LSA faculty who will be serving on upcoming tenure committees to view the CRLT Players tenure sketch, *The Fence* and discuss the critical applications this sketch has for their own tenure committee experiences. Twenty faculty attended the first dinner, and 21 attended the second dinner.

**UM ADVANCE** was invited by the College of Engineering to host lunches for its female faculty. The 20 faculty who attended the April lunch discussed scheduling similar lunch opportunities to allow them to network with one another. Participants also discussed developing a leadership program for May 2007. An additional lunch was held in September and 20 faculty attended.

**Janet Malley** represented UM ADVANCE at the 5<sup>th</sup> Annual ADVANCE Principal Investigators meeting. A document entitled "Lessons Learned at the University of Michigan by the ADVANCE Project" was provided at the pre-session (Lessons Learned from prior IT Projects). Dr. Malley presented at the session entitled "Institutionalization—Cross site findings of institutionalization workgroup." Additionally, she presented the poster entitled, "The University of Michigan ADVANCE Institutional Transformation" and "Faculty Talking to Faculty about Recruitment" at the session entitled "What Works and How do we know?—Recruitment."

The UM ADVANCE **Steering Committee** met in January to discuss the timing and process of expanding ADVANCE's focus to more disciplines and to a more central focus on race-ethnicity as well as gender, in the context of institutionalization of the program. The Steering Committee met again in May to discuss the graduate student study and how these data can be useful to the three Deans and their school/college. The Steering Committee met in July and discussed the

turnover quotient for women and faculty of color and the data produced for the Meeting of the Nine Universities (MIT9). The Steering Committee met in November to discuss the transition from NSF support to UM support, the impact of Proposition 2 on campus climate, and the continuing progress of ADVANCE.

A proposal submitted by UM ADVANCE to the National Center for Institutional Diversity at UM entitled "Advancing diversity and excellence in science and engineering" was funded. The first step was to establish an advisory committee of faculty and students, and to carry out a qualitative study of the experience of male and female faculty of color in science and engineering, and to plan the conference planned for January, 2007. This will be a two-day conference that will begin with the presentation of national data, and evidence drawn from the quantitative studies of the climate for U-M faculty and graduate students of color conducted by ADVANCE, as well as the new qualitative study of the climate for UM faculty of color. In addition, social science theory and evidence about the enabling conditions for successful recruitment, retention, and thriving for faculty of color will be presented by a series of ten nationally recognized speakers. All conference participants will be invited to compete for funds to support a significant transformation in the environment for diversity in science and engineering, including improvement of climate and mentoring, and an increase in the number of diverse faculty or students recruited, retained and/or promoted. Funded by contributions from the Provost's Office; the Horace H. Rackham School of Graduate Studies; ADVANCE; the College of Literature, Science and the Arts; the College of Engineering; and the School of Medicine, Advancing Diversity and Excellence in Science and Engineering Grants for up to \$50,000 (to be used within twelve months of the award) will be awarded on a competitive basis to support proposals to improve the campus climate for diversity in science and engineering.

A proposal for a Science and Technology Excellence Program (STEP) was funded by NSF PAID. A ten-member Advisory Committee for STEP has met three times and contacted all UM deans and department chairs to recruit participants. STEP will engage groups of male and female STEM faculty in a program of self-education and commitment to becoming active change agents within their academic institutions. It will bring together several successful activities developed in the course of the UM ADVANCE Institutional Transformation project. The project is guided by social science literature on unconscious bias, accumulation of disadvantage, critical mass, demographic and career issues facing women scientists and engineers, and the dynamics of effective cross-gender alliances. STEP will contribute a new model for institutional change by engaging senior faculty in an intensive process of becoming change agents within a network of faculty committed to the same goals, and supported over time. The central focus of the program will be a three-day set of activities offered in the format of an intensive seminar/workshop outside of the regular term. In the first year UM faculty participants will be recruited to participate in teams from all science and engineering departments; subsequent cohorts will be drawn from Midwest institutions in year two and nationally in year three. Ideally, two to four senior faculty (both men and women) will participate from a particular unit, and will agree to engage as a team with others in their department or school in (1) a series of preparatory activities over a couple of months before the program, (2) the intensive program in May, and (3) follow-up activities over the subsequent academic year (and, for UM faculty, following years).

### The Gender in Science and Engineering Committee was convened in December. The

committee reviewed ADVANCE's progress, compared it with the progress of other institutions, and discussed the challenges of both sustaining and improving changes in the next period.

**Abigail Stewart** participated in two workshops on mentoring organized by the College of Literature, Science and the Arts. The UM ADVANCE handbooks *Giving and Getting Career Advice: A Guide for Junior and Senior Faculty*, were distributed to all faculty in attendance.

**Abigail Stewart** served as a member of the planning committee for the June meeting of representatives of the nine universities initially convened by MIT President Vest. Nineteen representatives from the following institutions attended the two-day meeting held on the University of Michigan campus: California Institute of Technology, Harvard University, Princeton University, Massachusetts Institute of Technology, Stanford University, University of California, Berkeley, University of Michigan, University of Pennsylvania, and Yale University. A formal report will be developed based upon the presentations and discussions. The April 2007 meeting will include the presidents of these institutions.

**Kristen Moore**, Assistant Professor of Mathematics, presented "Advancing Women in Science at the University of Michigan" at the Models that Work: Building Diversity in Advanced Mathematics Conference of the Annual National Joint Meetings of the American Mathematical Society and the Mathematical Association of America.

**Abigail Stewart** attended "Building Strong Academic Chemistry Departments through Gender Equity" in Arlington, Virginia.

**Mark Chesler and Keith Rainwater** continued conducting focus groups of male assistant professors in the science departments. The general purposes of these sessions were several fold: to gain an understanding of male junior faculty colleagues' perceptions and experiences with climate related issues in their departments and in the college; to assess their perceptions and understandings of gender-related issues in their departments; and to solicit their views and suggestions regarding the ADVANCE program.

**Mark Chesler** presented at the session entitled Faculty of the Future: Transforming Universities at the CIC Academic Leadership Program.

**Abigail Stewart** met with Londa Schiebinger, John L. Hinds Professor in the History of Science, and Barbara D. Finberg Director of the Institute for Research on Women and Gender at Stanford University.

The **Evaluation Advisory Committee** was convened in March to provide advice about the Survey of Academic Climate and Activities.

Abigail Stewart participated in the meeting of Diversity Provosts, held at Columbia University.

**Abigail Stewart** made a presentation about ADVANCE at the National Council for Research on Women Summit Meeting on the Role of Leadership in Fostering and Sustaining Diversity in Institutions of Higher Education, held in New York.

In March, with co-sponsorship from the **UM ADVANCE**, Rackham School of Graduate Studies, Office of Academic Multicultural Initiatives, and Cellular and Molecular Biology Program, the Association of Multicultural Scientists (AMS) invited Dr. Lydia Villa-Komaroff, a distinguished cell biologist and Chief Scientific Officer at Cytonome, Inc, a biotech company. Approximately 70 people attended the presentation.

**Abigail Stewart** and **John Vandermeer** developed and offered a graduate interdisciplinary course entitled, "Gender, Women, and Science." The course was offered in Fall 2006, to 11 enrolled students, and 3 auditors. The course description is presented in Appendix B. Special funding from the Graduate School enabled the course to sponsor visits from distinguished women scientists Vera Rubin (astronomy) and Victoria Sork (biology). Their visits included both meetings with the seminar, public lectures, and informal meetings with faculty and students in the relevant departments.

**Cynthia Hudgins** planned and moderated a panel discussion entitled "Dual Career Issues and Faculty Work-life Balance." This panel was part of the *Getting Ready for an Academic Career: Preparing Future Faculty (PFF) Conference*, sponsored by the Center for Research on Learning and Teaching (CRLT), Rackham Graduate School, and The Career Center.

**UM ADVANCE** coordinated a visit by Dr. Anne Pépin, a senior research scientist in the fields of physics and nanotechnology at the French National Scientific Research Center (CNRS) about the development of her study for the Mission for the Place of Women at CNRS ("Mission pour la place des femmes au CNRS"). Dr. Pépin met with the UM ADVANCE staff; the STRIDE Committee; The Center for the Education of Women; Anthony England, Associate Dean for Academic Affairs at the College of Engineering; and Women in Science and Engineering.

Abigail Stewart participated in the UM Diversity Summit in October.

**Abigail Stewart** serves on the Advisory Committee on Chair Orientation (ACCO) at the University of Michigan.

Abigail Stewart serves on the UM National Center for Institutional Diversity Steering Committee.

**Abigail Stewart** is collaborating with the University of Michigan Development Office to develop a corporate training program that, if funded, would help to provide ongoing funding for the Elizabeth Caroline Crosby Awards.

**Abigail Stewart** and **Janet Malley** made a presentation to the NSF Chemistry Program Officers to discuss how to incorporate attention to evaluation bias in panel reviews. A pilot program began in September in the Chemistry Division.

**Abigail Stewart** has continued to have individual meetings with all new female faculty who joined UM science and engineering departments in the academic year 2005-2006. She has developed a document outlining common issues and problems arising in these meetings, for

distribution to department chairs through the deans.

**Pamela Raymond** provided advice about ADVANCE and related matters to individuals at Pennsylvania State University, University of Chicago, Washington State University, Michigan State University, University of Minnesota, Virginia Tech, Texas A&M University, and Columbia University.

**Abigail Stewart** provided advice about ADVANCE and related matters to individuals at the University of Chicago, University of Illinois-Chicago, Princeton University, MIT, Harvard University, and the University of Nebraska-Lincoln.

Abigail Stewart and Pamela Raymond met with a number of individual women in private consultation about counter-offers, accepting committee assignments, appointments to be chairs, and other related issues.

**Pamela Raymond** serves on the external Advisory Board for the ADVANCE Program at the University of Maryland, Baltimore County.

**Abigail Stewart** serves on the external Advisory Board for the ADVANCE Program at Case Western Reserve University.

# **C. PUBLICATIONS AND PRODUCTS**

A booklet entitled *University of Michigan ADVANCE Project Grant Programs* was published. This booklet, which highlights and summarizes some of the supported projects, is presented in Appendix C.

Following changes made to the architecture and improved navigation, development of the website has continued. In an average month, our site had 32 "unique visitors" per day. The web address is: http://sitemaker.umich.edu/advance.

A piece published by the Institute for Research on Women and Gender, which spotlighted UM ADVANCE, is presented in Appendix D.

*Transforming Science and Engineering: Advancing Academic Women*, edited by **Abigail Stewart, Janet Malley** and **Danielle LaVaque-Manty**, is in press and scheduled to become available in Fall 2007. The book will be promoted by a panel at ACE on Sunday, February 11, 2007. Panelists will include Abigail Stewart, Alice Hogan, Susan Sturm, Vita Rabinowitz, and Diana Bilimoria. The schedule of National Panels and Programs is included in Appendix E. The Table of Contents for the volume is included in Appendix F.

# **D. CONTRIBUTIONS**

*The Elizabeth Caroline Crosby Fund*—Two competitions took place this year. Of the 29 proposals received from STEM faculty, seven from the following departments received awards

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in January:

Molecular, Cellular, and Developmental Biology Ecology and Evolutionary Biology Internal Medicine and Health Management and Policy Pharmacology Industrial and Operations Engineering Internal Medicine Oral Medicine, Pathology and Oncology

Of the 35 proposals received in October, seven faculty from the following departments received awards:

Ecology & Evolutionary Biology Electrical Engineering & Computer Science Geological Sciences Human Genetics Microbiology and Immunology Physics Statistics

*The Network of Women Scientists and Engineers* is composed of tenured and tenure-track women faculty in science and engineering across the entire campus. The Network meets several times each year to socialize, to talk about issues the members have in common, and to develop plans for the future. The Network provides women faculty in science and engineering with opportunities to define collective goals and to support one another. The *Network* held the following events:

#### <u>January</u>

Barbara Butterfield (former UM Associate Vice President for Human Resources and Affirmative Action and Chief Human Resource Officer) and Jane Tucker (Duke University Administrative Systems Management) facilitated one workshop for faculty entitled, "Effective Negotiation: A Seminar for Faculty." Twenty-one faculty attended. With co-sponsorship from the Rackham School of Graduate Studies, Drs. Butterfield and Tucker also facilitated two workshops, entitled "Effective Negotiation: A Seminar for Post-doctoral Fellows." Forty-three post-doctoral fellows attended these sessions.

#### **February**

Dr. Kristie Keeton, University of Michigan Maternal Fetal Medicine Fellow, presented "Physician Work-Life Balance and Career Satisfaction." Fourteen people attended the presentation.

### March

With co-sponsorship from UM ADVANCE, UM Faculty and Staff Assistance Program (FASAP), and the Office of Institutional Equity, Dr. Loraleigh Keashly, Associate Professor of Communication at Wayne State University, presented "Gender, Civility and Negotiating Faculty

Relations." Twenty-four female faculty attended the presentation.

Several members of the Network also participated in Dr. Loraleigh Keashly's session entitled "Workplace bullying: What it is and what we can do about it?"

## April

We hosted the Network of Women Scientists and Engineers Spring Dinner. This social evening provided an opportunity for the participants to network and to provide important feedback about the climate in their departments and how ADVANCE can be most helpful. Sixty-one women faculty attended. Janet Weiss, Dean of the Graduate School, and Abigail Stewart presented findings from the recent graduate study with a specific focus on the insight provided by the findings about future women faculty in science and engineering.

### May

Suzanna Rose, Director, Women's Studies Center, and Chairperson and Professor of Psychology at Florida International University facilitated a workshop entitled "Strategic Career Planning for Women in Science and Engineering." Dr. Rose has broad and deep experience providing career advice to women faculty, particularly to academic women scientists and engineers, and the workshop was largely aimed at developing strategies to promote research careers. Fourteen female faculty attended the workshop. Additionally, Dr. Rose held individualized meetings with 19 female faculty to discuss their careers.

Abigail Stewart convened a discussion about issues facing lesbian faculty in science and engineering departments.

A lunch discussion was held with female faculty of color in science and engineering departments.

### September 199

We hosted a fall welcome dinner for the Network of Women Scientists and Engineers. Nearly 100 faculty attended. Provost Teresa Sullivan and Abigail Stewart presented information about the past five years of the ADVANCE Project at UM and discussed future efforts as we move toward institutionalization.

### November

Victoria Sork, Professor in the Department of Ecology and Evolutionary Biology and Institute of the Environment at the University of California, Los Angeles, presented a public lecture, entitled "Gender and Race in the Science Professions: Strategies for Remedying Leaky and Dry Pipelines." The flyer is included in Appendix G.

Vera Rubin, Senior Fellow in the Department of Terrestrial Magnetism at the Carnegie Institution of Washington presented a public lecture, entitled "Women Scientists in the U.S., 1840-1960." The flyer is included in Appendix H.

### December

An End-of-Term luncheon was held, and 60 faculty attended.

# E. INTEGRATION OF ADVANCE ISSUES IN UNIVERSITY POLICY AND ADMINISTRATION

The **ADVANCE Steering Committee** is composed of co-PIs **Abigail Stewart**, **Pamela Raymond**, **Terrence McDonald**, Dean of Literature, Science, and the Arts, **David Munson**, Dean of the College of Engineering, and **James Woolliscroft**, Dean of the Medical School. The Committee meets quarterly. The newly named Dean of the College of Engineering (David Munson) will attend the next scheduled meeting of the Steering Committee. **Abigail Stewart** met with Dean Munson and James Woolliscroft to discuss ADVANCE and their roles on the Steering Committee. Lori Pierce, Associate Provost for Academic and Faculty Affairs, and Janet Weiss, Dean of the Rackham School of Graduate Studies joined the Steering Committee and began to attend meetings in November.

**Abigail Stewart** and **Pamela Raymond** met with the incoming Provost, Theresa Sullivan, to discuss UM ADVANCE. Provost Sullivan opened the meeting of the MIT9 at UM on June 1.

**Abigail Stewart** met with the UM Provost and Executive Vice President for Academic Affairs, Theresa Sullivan, to discuss the institutionalization of UM ADVANCE with internal funding. Issues of focus and range were addressed, as were issues of internal leadership.

**Abigail Stewart** met with the Associate Provost for Academic and Faculty Affairs, Lori Pierce, to discuss UM ADVANCE. A schedule of regular monthly meetings was established to troubleshoot issues that arise through ADVANCE or the Provost's office.

**Abigail Stewart** met with the newly named interim Dean of the UM Medical School, James Woolliscroft; a plan for addressing some work-family balance issues in the Medical School was developed.

**Abigail Stewart** and **Pamela Raymond** met with the new Vice President of Research, Stephen Forrest, to discuss UM ADVANCE.

**Abigail Stewart** met with Sally Schmall, the newly named Coordinator for the Dual Academic Career Program in the College of Language, Science and the Arts.

**Abigail Stewart** met with Deborah Carter, Associate Professor and Chair of the Center for the Study of Higher and Postsecondary Education, and newest member of the Evaluation Advisory Committee.

**Abigail Stewart** and **Cynthia Hudgins** met with Lorelle Meadows, Coordinator for Academic Affairs in the College of Engineering to discuss UM ADVANCE programming.

**Abigail Stewart** participated in the Faculty Student Relationship Policy meeting, the University of Michigan Salary Equity Study Committee, the Flexible Tenure Committee, and the Office of the Vice President for Research's Research Award Committee.

**Abigail Stewart** has continued to serve on the Steering Committee of the National Center for Institutional Diversity (NCID) at UM.

Abigail Stewart coordinated and participated in the Climate Review of the Department of Geological Sciences.

**Abigail Stewart** met with Peter Green, the newly named chair of Materials Science and Engineering, to discuss ADVANCE.

**Abigail Stewart** holds regular meetings about ADVANCE issues with Terry McDonald, Dean of LSA, and Anthony England, Associate Dean for Academic Affairs in College of Engineering.

UM ADVANCE collaborated with a number of institutions on the development of NSF Partnerships for Adaptation, Implementation, and Dissemination (PAID) proposals, which were submitted in January. We have begun to work with our colleagues on the following projects:

Grand Valley State University (subcontract with University of Michigan), "A GVSU-UM Partnership for Advancing Women in Science and Engineering"

University of Missouri (consulting relationship with University of Michigan), "Mizzou ADVANCE in Science, Technology, Engineering and Math: Gender and Institutional Transformation at the University of Missouri-Columbia"

Wayne State University (consulting relationship with University of Michigan), "ESCALATE: Engineering and Science Careers in Academia: Learning from ADVANCE and Translating Effectively"

### SECTION III: REPORT ON NSF INDICATORS AND PROGRAM EVALUATION Fifth Year of UM ADVANCE (AY2006) & Baseline Year (AY2001)

# A. INTRODUCTION

The UM ADVANCE indicator data reported here are for the 2005-2006 academic year (hereby referred to as AY2006); the fifth year of ADVANCE funding began midway through the academic year of interest (i.e., January 2006). In this report, we discuss the state of women scientists and engineers at the University of Michigan for AY2006 via a review of the changes in gender composition from the baseline year (AY2001).

We are reporting on all science and engineering faculty (instructional, research, and clinical tracks) with budgeted appointments (i.e., greater than 0% time equivalence) in science and engineering departments in the College of Engineering<sup>1</sup> (ENG), the College of Literature, Science, and the Arts' Division of Natural Sciences<sup>2</sup> (LSA), and the Medical School's Basic Science departments<sup>3</sup> (MED). In addition, we are reporting on science faculty members in six additional schools that house science faculty at the University of Michigan, including the School of Dentistry, School of Information, Division of Kinesiology, School of Natural Resources and Environment, College of Pharmacy, and School of Public Health. Faculty members in these schools were determined to be scientists by assessing the field of study in which they received their highest degree (see Appendix I for a listing of which fields of study were included). For those highest degrees that might comprise research in both science and non-science areas, we evaluated the individual cases and included faculty based on their research foci.

For each College or School, we included faculty from the instructional (tenure), primary research, and clinical tracks. These tracks generally refer to the titles of assistant, associate, and full professor; assistant, associate, and research scientist/professor<sup>4</sup>; and assistant, associate, and clinical professor, respectively. Instructors, research investigators, and supplemental faculty were not included. Faculty with joint appointments (i.e., greater than 0% time equivalence) are counted in each unit of appointment.

Following this section of the report are tables presenting all of the indicators required by the National Science Foundation (NSF). A list of the tables is included in the table of contents. In extracting data from the University's databases, the effective date of March 1, 2006 was used. We have taken this to reflect conditions in effect during AY2006. These data were verified by the individual Colleges and Schools to ensure we did not exclude any faculty who may have been present in Fall 2005 and not in

<sup>&</sup>lt;sup>1</sup> Engineering (ENG): Aerospace Engineering; Atmospheric, Oceanic & Space Sciences; Biomedical Engineering; Chemical Engineering; Civil & Environmental Engineering; Electrical Engineering & Computer Science; Industrial & Operations Engineering; Materials Science & Engineering; Mechanical Engineering; Naval Architecture & Marine Engineering; Nuclear Engineering & Radiological Sciences.

<sup>&</sup>lt;sup>2</sup> Literature, Science, and the Arts Division of Natural Sciences (LSA): Astronomy; Chemistry; Ecology & Evolutionary Biology; Geological Sciences; Mathematics; Molecular, Cellular & Developmental Biology; Physics; Statistics.

<sup>&</sup>lt;sup>3</sup> Medical School Basic Science departments (MED): Biological Chemistry; Cell & Developmental Biology; Human Genetics; Microbiology & Immunology; Pharmacology; Molecular & Integrative Physiology.

<sup>&</sup>lt;sup>4</sup>On the research track, faculty may be appointed to two different paths: research scientist classifications include research scientist, associate research scientist, and assistant research scientist; and research professor classifications include research professor, research associate professor, and research assistant professor. For our purposes, faculty members at each rank are considered together (regardless of title).

Winter 2006; the data liaisons in each academic unit also ensured that we included all additional positions (e.g., administrative positions) held during either semester.

For changes in status such as new hires and terminations/retirements, the effective dates used were between March 1, 2005, and March 1, 2006. That is, we report on faculty members who started their instructional tenure track position or who left their position between the given dates. While this means that the data for new hires and terminations/retirements do not match exactly with the academic year, the date parameters were selected to facilitate the reconciliation of changes in the number of faculty from AY2005 to AY2006. In the case of offers of employment and new hires, however, we also report on faculty members who received and responded (i.e., accepted or declined) to offers of employment within the academic year of September 1 to August 31 (see page III-8). This timeframe recognizes the fact that academic hiring season extends well beyond the effective date of March 1, 2006. Lastly, in regard to faculty promotions, we report faculty whose promotions were effective in AY2006 (and thus were reviewed in the previous academic year, AY2005).

# **B. ASSESSING THE IMPACT OF ADVANCE OVER FIVE YEARS**

The ADVANCE Project at the University of Michigan identified recruitment, retention through climate improvement, and promotion of women faculty as its foci, and has made efforts to engage discussion, stimulate new efforts, and create real change related to these efforts throughout the campus. Now that we have accumulated 5 years of data we are turning our attention to assessing the impact of ADVANCE on these efforts. Fuller statistical analyses will be completed over the coming month; here we present some preliminary findings.

### RECRUITMENT

Analysis of UM science and engineering faculty data reveal overall significant progress in the representation of women over the course of the NSF ADVANCE award period. The percentage of the science and engineering faculty that are female increased overall from 15% in AY2001 to 19% in AY2006; see Figure A for percentages by College/School. These gains are due in large part to increased hiring of female faculty. In AY2002 16% of new faculty hires were female; in AY2006 that number had more than doubled to 34% (see Figure B). Looking at the proportion of men and women hired in each of the three colleges that employ the largest number of scientists and engineers at the University of Michigan from the two pre-ADVANCE years (AY2001 and AY2002) compared to the next four years (AY2003 – AY2006), we find a statistically significant increase in the proportion of women hired over this time period (chi square=10.54, p=.01).

Moreover, while each of the three divisions in the College of Literature, Science, and the Arts (natural sciences, social sciences, and humanities) reported gains in percent female faculty over two five-year periods before and during the ADVANCE Project (1996-2001 and 2001-2006, respectively), the Division of Natural Sciences was the only division to report a larger percent increase during the latter five-year period (i.e., during ADVANCE) when compared to the earlier period (see Figure C).

# **RETENTION AND PROMOTION**

The evidence concerning retention and promotion is more mixed, signaling some successes as well as areas still needing work. A cohort analysis of science and engineering assistant professors hired between 1990 and 1997 reveals no statistically significant different outcomes by gender in terms of promotion and leaving UM prior to promotion as of 2006. Moreover, we find that the percent of female science and engineering faculty at the associate and full ranks has increased from AY2001 to AY2006 (from 23% to 27% in the case of associate professors and from 7% to 11% in the case of full


professors). However, the percent female science and engineering faculty at the assistant rank has remained steady at 26% during this same time period.

In addition, an assessment of the turnover quotient<sup>5</sup> for the period 2001-2005 reveals that, overall, 62% of the female hires for this time period went to replacing women who had left, ranging from 36% in the Medical School (Basic Science departments) to 80% in the College of Engineering; see Figure D. These data suggest that retention at the assistant professor level may be a continuing problem. However, the turnover quotient for male faculty during the same period is 85%, suggesting that the net addition of new female faculty is actually higher than the net addition of new male faculty. More



recent cohort analyses, once data are available, will help determine whether the retention rate continues to be the same for junior male and female faculty.

#### LEADERSHIP

Other measures of efforts to promote female faculty, particularly at the senior levels, demonstrate some success. The number of female chairs of all science and engineering departments has increased

substantially during the award period from one to seven (see Figure E). Assessment of those who serve on department and school tenure and promotion committees reveal that women science and engineering faculty do not participate consistently at the same rate as their male colleagues. The problem is most pronounced in Engineering where the proportion of women on department and college level tenure and promotion committees is lower than that for their male colleagues. Most recent data reveal that in LSA women do participate at the same rate as men at the department



level but not at the college level; women's participation in Medicine is at or above the rate for men. While these data suggest some improvement, efforts need to continue to facilitate leadership training for women faculty and make chairs and deans aware of the need to appoint women faculty to these important decision-making bodies.

<sup>&</sup>lt;sup>5</sup> To understand the extent to which new hires are simply replacing faculty who have left Mareno *et al.* (2006) devised the Turnover Quotient. It is derived by dividing the net change in core faculty from time 1 to time 2 by the total number of news hires during the period time 1 to time 2. The formula is: TQ=[1-(Time 2 faculty count - Time 1 faculty count/N of new hires)] X 100.

#### C. INSTRUCTIONAL (TENURE) TRACK FACULTY

#### **OVERVIEW**

In this section we discuss the numbers of male and female science and engineering instructional (tenure) track faculty in each College and School. The percentages reported here are based on the number of men and women in each department (i.e., appointment count), and not based on time equivalents (FTE). Head counts are easier to conceptualize, and in most cases do not differ significantly from the FTE allocation (see Table 1 for percentages based on head count and FTE). Where the percentages based on head counts and those based on FTE allocation differ by more than two percentage points, the percentage based on FTE will be reported in brackets [].

#### **COLLEGE OF ENGINEERING**

In AY2006, the College of Engineering<sup>6</sup> was 87% male (N = 270) and 13% female (N = 39)<sup>7</sup> (see Figure 1a for aggregate data by rank comparing AY2006 to AY2001 and Table 1 for breakdown by department); the percentage of women was slightly higher than the percentage in AY2001, when the comparable figures were 89% male (N = 261) and 11% female (N = 31). In AY2006, the small proportion of female faculty is particularly apparent at the professor level, where only 12 out of 183 (7%) of the faculty were women; however, even this is higher than in AY2001 when the percent of female faculty at the professor level was less than 5%. At the associate professor level, women comprised 24% (N = 16) of the faculty, and at the assistant professor level, they comprised 19% (N = 11); again, these percentages represent slight increases from AY2001 figures.



Compared to the baseline year of AY2001, ENG has experienced a net increase of 9 male faculty and 8 female faculty across all three ranks (see Figure 1b). Of the new hires in Engineering for AY2006, 8 were men (67%) and 4 were women (33%); see Table  $2^8$ . At the same time, Engineering lost 13 men

<sup>&</sup>lt;sup>6</sup> Faculty with joint appointments (i.e., greater than 0% time equivalence) are counted in each unit of appointment. In AY2006, 7 faculty members (6 men and 1 woman) had joint appointments across departments within the College of Engineering; the 7 faculty members were counted in both departments in which they had budgeted appointments. With the exception of one male research professor, these faculty members were on the instructional (tenure) track. Therefore, the data contained in the table slightly overestimate the total number of male faculty members with budgeted appointments in ENG. In addition, 9 men and 1 woman on the instructional (tenure) track had joint appointments including a unit outside of ENG.

<sup>&</sup>lt;sup>7</sup> All percentages are rounded to the nearest whole number. Also, while percentages are used throughout this report for ease of comparison across colleges and sub-populations that vary widely in number, the reader must keep in mind that due to the small number of female faculty, an addition/loss of one female will result in a larger corresponding percentage change than if that addition/loss had been one male. Please refer to the tables and figures for raw numbers.

<sup>&</sup>lt;sup>8</sup> We report on faculty members who started their instructional tenure track position between March 1, 2005, and March 1, 2006.

and no women to retirements and other terminations (see Table 3). In terms of faculty promotions, 20 faculty were evaluated for promotion: 14 men and 5 women were promoted, and 1 woman was denied promotion from assistant to associate professor (see Table 4).

#### **COLLEGE OF LSA (Natural Sciences)**

The overall composition of faculty in the Division of Natural Sciences<sup>9</sup> for AY2006 was 83% male (N = 230) and 17% female (N = 46); the AY2006 data reveal an increase in the percentage of women faculty from AY2001, when the Division was 89% male (N = 223) and 11% female (N = 28). The gender disparity in AY2006 was the greatest at the highest rank: only 10% (N = 17) of the full professors were women; however, this is double the percent female full professors in AY2001. At the associate professor level, 23% (N = 9) of the faculty were women (similar to the percent in AY2001), and at the assistant professor level, 31% (N = 20) of the faculty were women (compared to 24% in AY2001); see Table 1. Figure 2a depicts the aggregate number of faculty in each rank across the eight natural science departments by gender.



In relation to AY2001, LSA has seen a net increase of 7 male faculty and 18 female faculty across all instructional ranks (see Figure 2b). Of the new hires in LSA (Natural Sciences) for AY2006, 17 were men (71%) and 7 were women (29%); see Table 2. In the same year, the natural science departments lost 12 male faculty and 1 female faculty (see Table 3). Of the 14 faculty who were considered for promotion, 13 men and 1 woman were promoted; no faculty were denied tenure (see Table 4).

#### MEDICAL SCHOOL (Basic Sciences)

The basic science departments in the Medical School<sup>10</sup> were comprised of 70% men (N = 80) and 30% women (N = 34) in AY2006. In AY2001, the faculty in the basic science departments were 74% male [71% of FTE] (N = 77) and 26% female [29% of FTE] (N = 27), which reflects an increase from AY2001 to AY2006 in the percent and number of women faculty in the basic science departments. At all ranks, women were in the minority: they comprised 24% of professors (N = 15), 45% [49% of FTE] (N = 9) of associate professors, and 31% [35% of FTE] (N = 10) of assistant professors. These figures represent an increase over AY2001 percentages for full (18%) and associate (37%) professors; and a

<sup>&</sup>lt;sup>9</sup> Faculty with joint appointments (i.e., greater than 0% time equivalence) are counted in each unit of appointment. In AY2006, no faculty members in the natural science departments had joint appointments (budgeted) in more than one natural science department within the College of LSA; 6 male instructional (tenure) track faculty members and 1 male research track faculty member had joint appointments including a unit outside of LSA. No female faculty members had joint appointments including a unit outside of LSA.

<sup>&</sup>lt;sup>10</sup> Faculty with joint appointments (i.e., greater than 0% time equivalence) are counted in each unit of appointment. No faculty members in the basic science departments had joint appointments (budgeted) in more than one basic science department within the Medical School in AY2006; 2 men and 1 woman on the instructional (tenure) track had joint appointments including a unit outside of MED.

decrease in the percentage of assistant professors (39%). Figure 3a shows the actual number of men and women at each rank in AY2001 as well as AY2006; see Table 1 for percentages based on head count and FTE.



The Medical School basic science departments saw a net gain of 3 male and 7 female faculty members since AY2001 (see Figure 3b). In AY2006, 3 men (75% of hires) and 1 woman (25% of hires) joined the faculty in the basic science departments; see Table 2. At the same time, 3 men (75%) and 1 woman (25%) left the faculty in AY2006 (see Table 3). With regard to promotions, all 6 faculty (4 men and 2 women) who were evaluated for promotion received it (see Table 4), and no faculty were denied tenure.

#### SIX ADDITIONAL SCHOOLS (Science Faculty)

In AY2006, the overall composition of science<sup>11</sup> faculty across the six additional Schools<sup>12</sup> was 73% male (N = 140) and 27% female (N = 51); this reflects a slight increase from AY2001 when men comprised 76% (N = 131) and women comprised 24% (N = 42) of tenure track faculty in these six Schools. In AY2006, this proportion ranged from 13% female in the School of Information to 50% female [45% of FTE] in the Division of Kinesiology (see Table 1 for breakdown by School). Looking at all six Schools by rank, we see that the proportion of women at each rank drops as we ascend the academic ladder: 43% (N = 21) of assistant professors, 30% (N = 15) of associate professors, and 16% (N = 15) of professors were women (see Figure 4a on next page). These figures represent an increase in the percentage of women faculty at the full and associate professor ranks from AY2001 when the figures were 13% and 24%, respectively, and a decrease at the assistant professor rank when the percentage in AY2001 was 49%.

Considering all six schools together, there was a net gain of 9 male faculty members and 9 female faculty members since AY2001 (see Figure 4b on next page). Of the new hires across all six Schools, 12 were men (71%) and 5 were women (29%); see Table 2. In the same year, the six schools lost 7 male science faculty (78%) and 2 female science faculty (22%); see Table 3. Of the 7 faculty who were considered for promotion, 6 men were promoted; one female scientist was denied tenure, and no female scientists were promoted (see Table 4).

<sup>&</sup>lt;sup>11</sup> Only scientists in each department are included; non-scientists (based on highest degree or research foci) are not reported.

<sup>&</sup>lt;sup>12</sup> Faculty with joint appointments (i.e., greater than 0% time equivalence) are counted in each unit of appointment. In AY2006, 3 male and 1 female faculty members had joint appointments within the School of Dentistry: 2 male and 1 female faculty members had instructional and research track appointments; and 1 male faculty member had research and clinical track appointments. In addition, 7 male instructional (tenure) track and 1 male research track faculty members had joint appointments (budgeted) including a unit outside of the six additional schools. No female faculty members had joint appointments including a unit outside of the six additional schools.



#### SUMMARY OF CHANGES FOR ALL SCHOOLS/COLLEGES

Each of the Colleges and Schools reported slight increases in the percentage of female instructional (tenure) track faculty as well as the absolute number of women appointed to tenure track positions from AY2001 to AY2006. Looking across the Colleges and Schools, the most striking fact is the continued lower numbers of female faculty in all ranks in comparison to their male colleagues. In a pattern unchanged from that previously reported, the majority of instructional track science and

engineering male faculty were found to hold the highest rank of professor, while the female faculty were relatively evenly distributed across all ranks. Generally, women faculty increased from AY2006 at all ranks; however, in some Schools the percentage of women faculty at the assistant professor level was lower than that reported for AY2001. Overall the proportion of female instructional (tenure) track scientists and engineers on campus increased from 16% in AY2001 to 19% in AY2006; in absolute numbers they increased from 128 to 170. These increases, though modest, were consistent and reflect significant and sustained success in hiring and promotion across the schools and colleges.

#### OFFERS & HIRES, INSTRUCTIONAL (TENURE) TRACK FACULTY

One way to significantly change the gender composition of the faculty is through balanced hiring. UM ADVANCE is able to report substantial progress regarding the number women *hired* as a proportion of all science and engineering instructional track hires: 13% of new hires were women in AY2001 compared to 32% in AY2006 (i.e., September 1, 2005 to August 31, 2006). Furthermore, as a proportion of all science and engineering tenure track *offers*, 15% of offers were to women in AY2001 and 30% in AY2006. It is important to note that these data report the number of faculty members who received and responded to offers of employment within the academic year of September 1 to August 31 (i.e., the data are not as of







Section III: Report on NSF Indicators and Program Evaluation (For Public Release)

the effective date of March 1, 2006, which are reported in Table 2).

In ENG, while the total number of new hires decreased from AY2001 to AY2006 (N = 27 and N = 20, respectively), the percentage of new hires that were women increased over four-fold from 7% in AY2001 to 30% in AY2006 (see Figure 5a). LSA (Natural Sciences) hired a total of 18 instructional track faculty in AY2001 and 9 in AY2006; the



percentage of new hires that were women doubled from 17% in AY2001 to 33% in AY2006 (see Figure 5b). In MED, the total number of new hires increased from 2 in AY2001 to 5 in AY2006. The percentage of new hires that were women, however, decreased from 50% in AY2001 to 40% in AY2006 (see Figure 5c). Lastly, in the six additional Schools, the number of newly hired science faculty decreased from a total of 18 in AY2001 to 10 in AY2006, and the percentage of hires that were women remained unchanged (see Figure 5d).

Generally, more women accepted offers in AY2006 than in AY2001. The percentage increased from 25% to 86% in ENG, 50% to 100% in MED, and 82% to 83% in the six additional Schools. In one school, LSA, the percentage decreased from 75% to 38%.

Following the useful model of the Commission on the Status of Women at Columbia University ("Advancement of Women through the Academic Ranks of the Columbia University Graduate School of Arts and Sciences," November 2001), we also compared the gender balance of new hires (assistant professors) against the gender balance of existing *tenure-eligible faculty* (assistant professors) for each of the Colleges/Schools. ENG reported a greater percentage of women among new hires (33%) than among tenure-eligible faculty (19%), improving the gender balance of the instructional track faculty for AY2006. LSA reported the same percentage for both groups (31%). MED and the six additional Schools reported a lesser percentage among new hires than among tenure-eligible faculty in AY2006 (25% of new hires and 31% [35% of FTE] of tenure-eligible faculty in MED; and 38% of new hires and 43% in the six additional Schools).

#### ASSOCIATE PROFESSORS, AVERAGE NUMBER OF YEARS IN RANK BY GENDER

Chart 6a reports the average number of years in rank by gender for associate professors, and Chart 6b reports the range of years (i.e., minimum and maximum values) by gender for each of the academic years; moreover, Figures 6a-c present the average number of years in rank (by gender) for associate professors (instructional track) in ENG, LSA, and MED.

Chart 6a: Average Number of Years in Rank by
Gender for Associate Professors,

-	A	Y2	2001	- AY2	200	6			
	E	ENC	3	L	_S/	ł	Ν	ЛЕС	)
	m		f	m		f	m		f
AY2001	6.3	>	3.7	5.1	>	4.5	3.1	<	5.6
AY2002	5.9	>	3.0	5.0	>	4.8	3.6	<	4.5
AY2003	6.2	>	3.5	4.1	<	6.1	5.2	>	4.8
AY2004	6.6	>	3.0	4.7	<	5.8	5.5	>	4.4
AY2005	6.7	>	3.6	4.6	<	5.5	6.0	>	4.5
AY2006	6.4	>	3.9	3.2	<	6.1	6.0	>	4.7



	AY	2001	- AY20	106		
	E١	١G	LS	SA	M	ED
	m	f	m	f	m	f
AY2001	1-28	0-11	0-31	2-16	1-20	3-11
AY2002	0-29	1-8	0-31	0-16	1-21	1-12
AY2003	0-30	0-9	1-33	2-18	0-22	1-13
AY2004	1-31	0-10	0-34	1-19	1-23	1-14
AY2005	1-29	1-11	1-35	1-20	1-24	2-10
AY2006	1-29	1-12	0-24	1-21	1-25	1-11

In ENG the average number of years in rank for male associate professors was consistently greater than the average for female associate professors during each of the six academic years (see Figure 6a); the average number of years for male and female faculty was similar in AY2001 and AY2006.

In contrast, the data for LSA and MED reveal fluctuations in whether men or women, in the aggregate, experienced the higher average number of years in the associate professor rank from AY2001 to AY2006. In LSA, between AY2001 and AY2006 the average number of years in rank decreased for male faculty and increased for female faculty; by AY2006, the average number of years in rank for female associate professors was greater than the average for male associate professors (see Figure 6b). The data for MED reveal the opposite pattern: the average number of years in rank for female associate professors was greater than the average for male associate professors in AY2001 and AY2002 and less than the average for male associate professors in AY2003 – AY2006 (see Figure 6c).

The sources of these mean difference are likely varied and complex, including the fact that some men have held the rank of associate professor for at least twice as long as the most senior woman. The average number of years in rank is also sensitive to the percentage (by gender) of new hires, promotions, and terminations.



We will explore some alternative ways of analyzing these data (e.g., disaggregating by ranges of years in rank by gender, etc.) in order to represent the underlying issues better. In addition, we will encourage each college to consider within-college evidence carefully, and to disaggregate their own data further to draw meaningful conclusions.

#### OVER TIME CHANGE ON THE TENURE TRACK BY GENDER

Following Lisa Frehill's suggestion (Georgia Tech Conference panel presentation, "Measuring the Status of Women: Toward Cross-Institutional Analysis to Understand Institutional Transformation," April, 2004), we assessed the sex ratio of the departments in each of the Colleges and Schools for AY1996, AY2001, and AY2006<sup>13</sup>. (Note: AY1996 data were not available for the six additional schools.) The sex ratio categories used by Frehill are female token, female minority, sex balance, male minority, and male token. We defined the categories as follows: female token (0-17% female); female minority (18-35% female); sex balance (36-64% female); male minority (65-82% female); and male token (83-100% female). These percentages are based on percentages of males and females in the

<sup>&</sup>lt;sup>13</sup> The reader should keep in mind that due to the small number of female faculty, an addition/loss of one female will result in a larger corresponding percentage change than if that addition/loss had been one male.

overall population. Consideration may need to be taken of the specific availability of women in the pipeline when assessing the "success" of particular departments.

#### **COLLEGE OF ENGINEERING**

Looking first at ENG, we found that all of the 11 departments reflected a female token sex ratio in AY1996. By AY2001 the situation had improved, with 8 departments classified as female token and 3 as female minority. The number of departments in each category remained the same in AY2006. The graph (Figure 7a) depicts the number of departments in each category in each of the three academic years.

#### **COLLEGE OF LSA (Natural Sciences)**

The departments in the Division of Natural Sciences demonstrated a pattern of improvement. The number of female minority departments increased from zero in AY1996 to one in AY2001, and then to five in AY2006. The remaining departments were classified as female token. It should be noted that the total number of departments also increased between AY2001 and AY2006 because the biology department split into two separate departments in AY2002. Figure 7b depicts the number of departments in each sex ratio category for the three academic years.

#### MEDICAL SCHOOL (Basic Sciences)

In the Medical School we found an increase in the number of departments with female minority sex ratios and those with sex balanced ratios and a corresponding decline in the number of departments with a female token sex ratio between AY1996 and AY2006 (see Figure 7c).

#### SIX ADDITIONAL SCHOOLS (Science Faculty)

In AY2001, we found that science faculty in four Schools reflected a female minority sex ratio. The science faculty in the remaining two academic units were coded as female token and sex balanced. By AY2006, the situation had worsened slightly: one



School, which was coded as female minority in AY2001, reflected a female token sex ratio in AY2006 (see Figure 7d). These analyses indicate the sex ratios for the science faculty only in the six additional Schools, and do not necessarily reflect the ratios of the full faculty rosters for the Schools.

#### OVER TIME CHANGE ON THE TENURE TRACK BY RACE/ETHNICITY

We conducted a similar set of analyses looking at the racial/ethnic breakdown by department in each of the science and engineering departments for AY1996, AY2001, and AY2006. (Note: AY1996 data

were not available for the six additional schools.) In the University database faculty ethnicity is coded using five mutually exclusive categories (American Indian/Alaskan Native; Asian/Pacific Islander; Black/African American; Hispanic/Latino; and white). We looked specifically at the percentage of faculty who were identified as a member of an underrepresented minority group (American Indian/Alaskan Native, Black/African American, and Hispanic/Latino) compared to all faculty in the department.

It is not completely straightforward to select cutoffs for "representativeness" of racial/ethnic minorities. However, using U.S. census data as our guide, we employed 25% as an estimate of "full representation" rather than 50% or "balance" as used in the gender analyses. The basis for this figure was the 2000 U.S. Census, which reported that African Americans constituted 12% of the U.S. population, Hispanics 12%, and American Indians 1%, for a total of 25% in these underrepresented groups. Accordingly, we designated 0-9% as underrepresented ethnic/racial group token; 10-19% as underrepresented ethnic/racial group full representation.

In ENG, 2 departments (out of 10 in AY1996 and 11 in AY2001) were coded as minority, and the remaining departments were coded as token. The situation had worsened slightly by AY2006, when only one department was coded as minority, and the remaining 10 departments were coded as token. In LSA, 1 of 7 departments in AY1996 and AY2001 was coded as minority, and the remaining departments were coded as token. By AY2006, 2 of 8 departments were coded as minority, with the remaining departments coded as token (in AY2002 the biology department split, creating one additional department in LSA's Division of Natural Sciences). In MED, though 1 of 5 departments was coded as minority in AY2001, all six departments were coded as token in AY1996 and AY2006. Lastly, science faculty in 2 of the six additional Schools were coded as minority, and the remaining 4 were coded as token in AY2001 and AY2006.

These data suggest that the University has not been successful either in recruiting or retaining underrepresented minority faculty in the sciences and engineering. We are hopeful that the policies and procedures being institutionalized at the University of Michigan through the NSF ADVANCE grant project will also help to address the serious problems of under representation of ethnic/racial minorities on this campus.

#### D. PRIMARY RESEARCH TRACK FACULTY

#### **OVERVIEW**

In this section we discuss faculty on the research track at the University. While there are actually two (not entirely distinct) research tracks, we do not distinguish between the tracks for this report. Thus, the ranks we consider are assistant research scientist (including assistant research professor), associate research scientist (including senior associate research scientist and associate research professor), and research scientist (including senior research scientist and research professor).

#### **COLLEGE OF ENGINEERING**

In AY2006, of the 53 faculty on the research track, 6 (or 11%) were female, of whom half were at the lowest rank of assistant research scientists; the 47 men were distributed across all ranks (see Figure 8a), although the majority were at the assistant rank (see also Table 1). In comparison to the baseline year (AY2001), the percentage of women on the research track increased slightly from 9% (N = 5) in AY2001 to 11% (N = 6) in AY2006.



Since AY2001, ENG has seen a net decrease of 6 male and a net increase of 1 female research faculty members (see Figure 8b).

#### **COLLEGE OF LSA (Natural Sciences)**

In AY2006, 16% of the research track faculty in the LSA Division of Natural Sciences were women (N = 5; see Figure 9a and Table 1), and 3 out of 5 of these women were at the lowest rank—that of assistant research scientist. Similar to the pattern observed for ENG, the male faculty (N = 27) were distributed across the ranks, with the highest concentration at the assistant rank. In comparison to AY2001, the percentage of women on the research track decreased from 20% [17% of FTE] (N = 6) in AY2001 to 16% (N = 5) in AY2006.



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The college gained 3 male faculty and lost 1 female faculty since AY2001 (see Figure 9b).

#### MEDICAL SCHOOL (Basic Sciences)

In the Medical School's basic science departments, 50% [44% of FTE] of the research track faculty were women in AY2006 (N = 6; see Figure 10a and Table 1); this reflects an increase from AY2001 when 29% [24% of FTE] (N = 5) of the research track faculty in the basic science departments were women. As observed in the other Colleges, the distribution of research scientists in the Medical School basic science departments was bottom-heavy, with the greatest proportion of faculty at the lowest rank, assistant research scientist, for both men and women.



Since AY2001 MED has experienced a net decrease of 6 men and a net increase of 1 woman on the research track (see Figure 10b).

#### SIX ADDITIONAL SCHOOLS (Science Faculty)

Women research scientists comprised 33% [30% of FTE] of the research track faculty in the six additional Schools in AY2006 (N = 13; see Figure 11a and Table 1), which is comparable to the 33% [29% of FTE] (N = 6) in AY2001, though the actual number of women on the research track more than doubled. In AY2006, all but one of the female research track faculty held the rank of assistant research scientist. While the majority of male research track faculty also held the rank of assistant research scientist, there were several holding the higher ranks of associate and research scientist.



In the past five years (i.e., since AY2001), the six additional Schools have experienced a net gain of 15 male and 7 female research science faculty (see Figure 11b).

#### SUMMARY OF RESEARCH TRACK FACULTY

Overall, the proportion of women scientists on the research track in AY2006 did not change much from AY2001. In ENG women comprised only 11% of the research faculty, which is slightly lower than the proportion of women on the tenure track (13%); in LSA women comprised 16% of the research faculty, which is comparable to the proportion of women on the tenure track (17%). In MED and the six additional Schools, women are better represented, comprising 50% [44% of FTE] and 33% [30% of FTE], respectively, of the research track, as compared to 30% and 27%, respectively, on the instructional (tenure) track.

The distribution of faculty across the ranks (for both men and women) remained similar to that observed in previous years: the majority of research faculty were at the lowest rank, assistant research scientist. This pattern is opposite to that observed for male tenure track faculty. Also, in contrast to the tenure track, the number of faculty on the research track has been decreasing over the last few years.

#### **E. CLINICAL TRACK FACULTY**

Here we report on the Colleges and Schools that have faculty on the clinical instructional track. In AY2006, MED (basic science departments) had one faculty member on this track; only the six additional Schools had a group of faculty members on this track.

#### SIX ADDITIONAL SCHOOLS (Science Faculty)

In AY2006, there were 33 female clinical track faculty, representing 51% of the clinical track faculty (see Figure 12a and Table 1) in the six additional Schools; this reflects an increase from AY2001, when women comprised 46% (N = 22) of the clinical track faculty. Similar to the research track faculty, the clinical track science faculty members, both men and women, were concentrated at the lowest rank of clinical assistant professor (62%) and had the smallest proportion of faculty at the highest rank of clinical professor (8%).



Relative to AY2001, the clinical track in these schools experienced overall growth—a net gain of 6 male and 11 female faculty members (see Figure 12b).

#### F. ADDITIONAL APPOINTMENTS AND HONORS

In this section we discuss additional appointments of interest held by instructional (tenure) track faculty members. These appointments fall under two broad categories: named professorships and administrative service in leadership positions. Under named professorships, we considered the following four categories of honor (see Tables 8a-d): Distinguished University Professor (to recognize exceptional scholarly achievement, national and international reputation, and superior teaching skills; a lifetime award), Collegiate Professor (for outstanding scholarship, teaching, and service), Endowed Chair, and Thurnau Professor (for excellence in teaching). Since these appointments are generally limited to professors, we only considered faculty at this highest rank.

For administrative service, we considered membership on tenure/promotion committees (see Tables 9a-d) and administrative appointments (see Tables 10a-d). These appointments were largely held by professors, but also by associate professors, so we considered both associate professors and professors who held these positions. We included faculty who served on either college or department level tenure/promotion committees. For administrative positions, we included those who held these positions at the university, college, or department levels.

For each type of appointment we assessed the change (or the lack thereof) in the number of women holding these positions from AY2001 to AY2006, and whether or not the rate of appointment for women was equal to that for men. For this last question, given the very small numbers (in some cases) of both women faculty and available administrative appointments, we only considered categories in which the expected rate of appointment for women was equal to or greater than one woman.<sup>14</sup>

#### NAMED PROFESSORSHIPS COLLEGE OF ENGINEERING

Compared to AY2001, the number of male faculty with named professorships increased in all four categories: an increase of 2 Distinguished University Professors, 5 Collegiate Professors, 2 Endowed Chairs, and 10 Thurnau Professors. The number of female professors holding a named professorship increased by one from AY2001; see Figure 13a. In the category in which there is the largest number of positions, Endowed Chairs, the rate of appointment for men was 14% (24 out of 171); see Figure 13b. One woman held this honor in AY2006 (see Table 8a), representing 8% of women full professors. This is the number we would expect to have if women held these titles at the same rate as men, given that two female Endowed Chairs would represent 17% of women full professors, which exceeds the rate of appointment for men.



<sup>&</sup>lt;sup>14</sup> Expected rates can be calculated for each level/category by taking the rates at which male faculty are awarded these positions.

#### **COLLEGE OF LSA (Natural Sciences)**

In relation to AY2001, LSA reported the following changes in named professorships: a net increase of 2 male Distinguished University Professors, 7 male and 2 female Collegiate Professors, 2 female Endowed Chairs, 1 male Thurnau Professor, and a net decrease of 6 male Endowed Chairs (see Figure 14a).

In LSA, the largest number of appointments was to Collegiate Professorships. Approximately 15% of all male professors (23 out of 154) held a Collegiate Professorship. Two female professors held this title, representing 12% of all female professors. This is the number we would expect if women held these titles at the same rate as men, since three female professors (an increase of one) would represent 18% of female professors, which exceeds the rate of appointment for men; see Figure 14b and Table 8b.



#### MEDICAL SCHOOL (Basic Sciences)

Compared to ENG and LSA (Natural Sciences), MED had a much smaller number of faculty who held named professorships. MED reported the following changes in named professorships from AY2001 to AY2006: a net increase of 1 female Distinguished University Professor and 3 male and 1 female Collegiate Professors as well as a net decrease of 2 male Distinguished University Professors and 1 male Endowed Chair (see Figure 15a). In MED, the largest number of appointments was to Collegiate Professors (9% and 7%, respectively). Overall, though, female professors held named professorships at nearly twice the rate of men (20% of female full professors compared to 11% of male full professors); see Figure 15b and Table 8c.



#### SIX ADDITIONAL SCHOOLS (Science Faculty)

Similar to MED, very few male and female science professors in the six additional schools held named professorships in AY2006; therefore, we are unable to look at gender differences for any particular

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category. Overall, male and female professors held named professorships at comparable rates (12% of male and 13% of female professors); see Figures 16a and 16b and Table 8d. Data from earlier academic years were not compiled; therefore, we are unable to compare change over time. The figures and percentages are based on the number of male and female professors who were classified as scientists in each of the six additional Schools (based on study field and/or research foci); the gender composition of the science faculty in the six additional schools with named professorships is not necessarily representative of the full faculty rosters for the Schools.



**SUMMARY FOR NAMED PROFESSORSHIPS.** The number of female faculty holding named professorships from AY2001 to AY2006 increased by one in ENG, increased by four in LSA, and increased by two in MED. For male faculty, ENG saw 19 new male named professors, LSA gained 4, and the number was unchanged in MED. The differences between new appointments to named professorships of female and male faculty, while striking, must be considered in the context of the fact that women represent only 7%, 10%, and 24% of the full professor population in ENG, LSA, and MED, respectively. In the six additional schools, male and female professors (scientists) held named professorships (based on the rate at which men are appointed) are so small that it is difficult to determine if women are being appointed at rates similar to that of men.

## ADMINISTRATIVE SERVICE: TENURE/PROMOTION COMMITTEES COLLEGE OF ENGINEERING

Overall, in the College of Engineering, the number of men serving on all tenure/promotion committees at both the department and college levels increased by 15 from AY2001 to AY2006, and the number of women serving on these committees increased by 5 during the same period (see Figure 17a on next page). The percentage of college-level committee members who were women increased from 20% (N = 1) in AY2001 to 25% (N = 1) in AY2006; at the department-level, the percentage of committee members who were women increased from 2% (N = 1) in AY2001 to 8% (N = 6) in AY2006.

At the department-level in AY2006, 30% (N = 67) of male associate and full professors in ENG served on tenure/promotion committees (see Table 9a). The six female professors who served on a department-level tenure/promotion committee represent 21% of all female associate and full professors; see Figure 17b. If women held these titles at the same rate as men, we would expect to have 8 women associate or full professors serving on these committees. At the college-level in AY2006, 1% (N = 3) of male associate and full professors and 4% (N = 1) of women associate and full professors served on a tenure/promotion committee. Female associate and full professors, therefore, served on college-level tenure/promotion committees at a slightly higher rate than male associate and full professors.



#### **COLLEGE OF LSA (Natural Sciences)**

The number of men serving on all tenure/promotion committees in the College of LSA decreased by 15 from AY2002<sup>15</sup> to AY2006, and the number of women increased by 6 during the same period (see Figure 18a). The percentage of college-level committee members who were women decreased from 50% (N = 1) in AY2002 to 0% in AY2006; at the department-level, the percentage of committee members who were women increased from 3% (N = 2) in AY2002 to 15% (N = 9) in AY2006.



The proportion of women (N = 9) serving on department-level tenure/promotion committees in AY2006 was 35% (see Table 9b and Figure 18b). This is greater than the 29% (N = 53) of male associate and full professors serving on such committees; therefore, female associate and full professors served on department-level tenure/promotion committees at a slightly higher rate than male associate and full professors in AY2006. However, it is also important to recognize that only 15% (N = 9) of department-level committee members were women. At the college-level, two men (1% of male associate and full professors) from the natural sciences departments served on this committee; no women served in AY2006.

#### MEDICAL SCHOOL (Basic Sciences)

In relation to AY2001, there was an overall increase of 3 male professors serving on all tenure/promotion committees (college and department-level combined). The number of women serving on all tenure/promotion committees remained unchanged (see Figure 19a). The percentage of college-level committee members from basic science departments who were women decreased from 100% (N = 2) in AY2001 to 40% (N = 2) in AY2006; moreover, at the department-level, the percentage of committee members who were women remained unchanged from AY2001 to AY2006 (26%; N = 9).

<sup>&</sup>lt;sup>15</sup> Comparable data were not available for AY2001, due to a change in LSA's reporting procedure. Section III: Report on NSF Indicators and Program Evaluation (For Public Release)

Overall, in AY2006, 43% (N = 25) of male associate and full professors served on department-level tenure/promotion committees, which is higher than the 38% (N = 9) of women associate and full professors who served on these committees; see Figure 19b. If women held department-level appointments at the same rate as men, it is expected that 10 women would hold such appointments (42% of female associate and full professors). At the college level, 5% (N = 3) of male associate and full professors and 8% (N = 2) of women associate and full professors served on college-level tenure/promotion committees; therefore, female associate and full professors served on college-level tenure/promotion committees at a slightly higher rate than male associate and full professors in AY2006 (see Table 9c).



#### SIX ADDITIONAL SCHOOLS (Science Faculty)

In the six additional Schools, male associate and full professors (scientists) served on tenure/promotion committees (both college and department levels) at a slightly higher rate than female associate and full professors (9% and 7%, respectively) in AY2006; see Figures 20a and 20b and Table 9d. Data from earlier academic years was not available for comparing change over time.



**SUMMARY FOR TENURE/PROMOTION COMMITTEES.** Given the small number of women at the senior ranks, it is difficult to determine if women are being appointed at rates similar to that of men. At the college-level, female associate and full professors held administrative positions at a greater rate than male associate and full professors in ENG and MED; however, women remained underrepresented in LSA. At the department-level, women were underrepresented in ENG and MED, but held appointments at a slightly higher rate than men in LSA. In regard to tenure/promotion committees in AY2006, the percentages of committee members who were women reveal that female faculty were underrepresented, relative to their male counterparts, on college and department-level tenure/promotion committees in each of the three College/Schools.

## ADMINISTRATIVE SERVICE: ADMINISTRATIVE POSITIONS COLLEGE OF ENGINEERING

In ENG the total number of male faculty with administrative appointments dropped in AY2006: twelve fewer men held administrative positions in AY2006 than AY2001. The total number of female faculty with administrative positions was unchanged from AY2001 to AY2006 (see Figure 21a).



In AY2006, less than 1% (N = 1) of male associate and full professors and no female associate or full professors held university-level appointments (see Figure 21b). In addition, 2% (N = 4) of male associate and full professors held college-level administrative appointments and a slightly higher 4% (N = 1) of female associate and full professors held appointments at the college-level. At the department-level, while 8% (N = 18) of male associate and full professors held administrative appointments, only one woman (4%) held these positions (Table 10a). If women held positions at the same rate as men, it is expected that approximately two women (7% of female associate and full professors) would hold department-level administrative appointments.

#### **COLLEGE OF LSA (Natural Sciences)**

In LSA, there were seven more men and five more women holding administrative positions (university, college, and department levels) in AY2006 than AY2001 (see Figure 22a).



At the university level, 2% (N = 3) of male associate and full professors and 4% (N = 1) of female associate and full professors held administrative appointments in AY2006 (see Figure 22b). While only 1% (N = 2) of male associate and full professors held college-level appointments, 4% (N = 1) of women associate and full professors held appointments at this level. In AY2006, five women held department-level administrative positions (19% of female associate and full professors). This is slightly higher than the rate at which male faculty held department-level administrative positions (17%; N = 32); see Table 10b.

#### MEDICAL SCHOOL (Basic Sciences)

In AY2006, three new female professors held administrative appointment (Figure 23a and Table 10c); the number of male faculty holding administrative appointments remained unchanged from AY2001 to AY2006.



In AY2006, 8% (N = 2) of female associate and full professors in the basic science departments held university-level administrative appointments; 2% (N = 1) of male associate and full professors in the basic science departments held such appointments (see Figure 23b). At the college-level, 5% (N = 3) of male and 4% (N = 1) of female associate and full professors held college-level administrative positions. Women, therefore, held university and college-level appointments at a comparable rate to male associate and full professors. Lastly, at the department-level, while 10% (N = 6) of male associate and full professors held administrative appointments, only 4% (N = 1) female associate and full professors served in AY2006. If women held appointments at the same rate as men, at least two women (8% of female associate and full professors) would hold department-level administrative appointments.

#### SIX ADDITIONAL SCHOOLS (Science Faculty)

In the six additional Schools, female associate and full professors (scientists) held college and department-level administrative appointments at slightly higher rates than male associate and full professors; see Figures 24a and 24b and Table 10d. No male or female associate and full professors (scientists) held university-level appointments in AY2006. Data from earlier academic years was not available for comparing change over time.



**SUMMARY FOR ADMINISTRATIVE POSITIONS.** The findings here are similar to those observed for membership on tenure/promotion committees: given the small number of faculty appointed to university and college-level administrative positions as well as the small number of

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women at the senior ranks, it is very difficult to determine if women and men were appointed to these positions at about the same rates. In the case of department-level administrative positions, women were not represented at the same rates as men in ENG and MED. That is, female faculty were less likely to hold department-level administrative positions than were male faculty. This is particularly important as the largest numbers of positions in these colleges are at this level. In LSA and the six additional Schools, female associate and full professors held administrative positions at slightly higher rate than male associate and full professors.

#### SUMMARY FOR NAMED PROFESSORSHIPS & ADMINISTRATIVE SERVICE: ALL SCHOOLS/COLLEGES

The discussion of equitable representation of women in these additional appointments is complicated by the low rates of appointment (for both men and women) to these positions, and further, by the low numbers of female faculty eligible (i.e., associate professors and/or full professors) to hold such positions. Though the findings must be considered within this context, it is nonetheless important to note any discernable gender disparities.

#### **G. OTHER INDICATORS**

Here we discuss additional indicators that were collected for AY2006. In the case of three variables: years in rank, years at the University, and salary, we collected data for all three tracks: instructional, research, and clinical. For the fourth variable—startup packages—we only collected data for instructional track faculty from ENG, LSA, and MED.

#### YEARS IN RANK and YEARS AT UM

The raw numbers are reported in Tables 5-6, respectively, and have been broken down by College/School, department, rank, and gender. These data are used for salary equity analyses.

#### SALARY

Table 7 report raw average salary by department, rank, and gender for each school. Based on Lisa Frehill's recommendation (Georgia Tech Conference panel presentation, "Measuring the Status of Women: Toward Cross-Institutional Analysis to Understand Institutional Transformation," April, 2004), the salary ratios reported in Chart 25a may be interpreted as the amount the average female faculty member earns for every dollar the average male faculty member

Chart 25a: Tra	Salary ck Fac	Ratios ulty, AY	for Ins 2001 a	truction	nal (Tei 2006	nure)
	E١	١G	LS	SA	M	ED
	2001	2006	2001	2006	2001	2006
Professor	0.93	1.01	0.83	1.02	0.93	0.98
Associate	0.94	1.00	1.00	0.97	1.00	0.94
Assistant	1.00	1.02	1.00	1.01	0.94	1.04
Note: College Medical Scho	of Engi ol (MED	neering )	(ENG);	College	of LSA	(LSA);

earns. Because neither of these approaches includes any statistical controls we cannot draw any conclusions from these data.

Former Provost Paul N. Courant charged a university committee with conducting a university-wide salary equity study every five years. The last university-wide salary study was done in 2001, assessing 1999 salary data. The next university-wide salary study is expected to be released in early 2007.

Though the ADVANCE Project intended to include a report of the results of a study of AY2006 salaries of science and engineering instructional (tenure) track faculty members, we decided to postpone that report until after release of the University-wide study. In this way, we will be able to identify analyses that might be particularly useful to University administrators and faculty. During the no-cost extension period, the ADVANCE Project will continue to work on salary analyses, and will particularly focus on assessing whether salary equity has actually improved during the period of the project.

#### **STARTUP PACKAGES**

Startup packages for new incoming instructional track faculty for the three large Colleges/Schools have been compiled, but for reasons of confidentiality are not included in this report. These numbers, like those for salary, are raw numbers and do not take into account the field or type of research for individual new faculty. Therefore, no conclusions can be drawn about gender. Now that we have five years of data, the ADVANCE Project evaluation team will conduct an overtime statistical analysis of startup data during the no-cost extension period.

#### SPACE

We are collecting data on space allocation as part of our survey of faculty in natural science, engineering, and social science departments at the University of Michigan. In 2001 an initial

"baseline" survey was conducted. The current survey is intended to assess the work environment five years later. Respondents were asked to indicate their level of satisfaction with their current allocation of specified resources (including office and research space), to estimate the overall square footage allocated to them and their postdoctoral fellows and graduate students, and to indicate whether or not they think the overall square footage allocated to them is adequate. Findings from these data are expected to be available by June 2007.

### **H. EVALUATION AND ASSESSMENT**

Evaluation efforts have proceeded in three areas during this period: assessment of UM ADVANCE initiatives; compilation of institutional indicators; and climate assessments (within specific departments as well as campus-wide).

#### **PROGRAM ASSESSMENTS**

A variety of evaluation efforts were undertaken during this period, including an assessment of the following UM ADVANCE-supported initiatives:

- CRLT Players performances for:
  - senior faculty members on search committees;
  - faculty and students in the College of Pharmacy, Department of Mathematics, and Department of Astronomy; and
  - representatives participating in a meeting of the "MIT9" (California Institute of Technology, Harvard University, Massachusetts Institute of Technology, Princeton University, Stanford University, University of California, Berkeley, University of Michigan, University of Pennsylvania, and Yale University)
- Departmental Transformation Grants;
- Faculty and Staff Assistance Program (FASAP) workshop facilitated by Dr. Loraleigh Keashly entitled, "Gender, (in)civility, and negotiating faculty relations";
- Friends and Allies of STRIDE Toward Equity in Recruiting (FASTER) workshop;
- Leading Excellence seminars presented by Dr. Diana Kardia;
- Negotiation seminars facilitated by Drs. Barbara Butterfield and Jane Tucker for instructional, tenure track faculty and postdoctoral fellows in the sciences and engineering;
- Strategic and Career Planning Workshop and individualized career advising sessions facilitated by Dr. Suzanna Rose;
- STRIDE Committee Faculty Recruitment Workshops for faculty members serving on search committees (including invited presentations in the School of Public Health, School of Natural Resources and Environment, and the School of Business); and
- Summer Institute 2006.

The evaluation team also produced a poster for the NSF ADVANCE PI meeting in May, 2006. The poster outlined four distinctive components of the UM ADVANCE Project, presented detailed information about the STRIDE (Strategies and Tactics for Recruiting to Improve Diversity and Excellence) committee, and described several measures of success.

#### INSTITUTIONAL INDICATORS

In addition to collecting, cleaning, and analyzing data on the institutional indicators for this report, the evaluation team also compiled data on faculty recruitment, appointment counts, and salaries as well as data on student attrition and degrees conferred/graduation rates for use by University administrators, department leadership, and UM ADVANCE committees.

Furthermore, in preparation for a meeting of the "MIT9", the evaluation team compiled data on new hires (instructional, tenure track faculty), PhD recipients, and faculty appointment snapshots (instructional, tenure-track faculty) in science and engineering fields from each of the nine participating institutions.

In May 2006, the UM ADVANCE evaluation team met with data contacts in the nine academic units with science and engineering faculty at the University who provide and/or verify institutional indicator data for UM ADVANCE. The purpose of this meeting was to thank the data contacts for their excellent work, to discuss the ADVANCE Project's activities and initiatives, to share some of what we have learned from analyzing institutional indicators over time, and to discuss future data collection efforts.

#### **CLIMATE ASSESSMENTS**

The UM ADVANCE evaluation team collaborated with three academic units to conduct climate selfstudies during this period: Department of Ecology and Evolutionary Biology, Department of Geological Sciences, and the School of Dentistry. Dr. Janet Malley, Director of Evaluation for UM ADVANCE, prepared reports for the Departments of Ecology and Evolutionary Biology and Geological Sciences. Drs. Abigail Stewart and Janet Malley met with faculty, students, and staff in both departments to discuss the findings outlined in the reports. The evaluation team also collaborated with the School of Dentistry to produce and administer climate assessments for recent graduates, current students, faculty, and staff. The surveys closed in December, 2006; the data will be analyzed and the report completed by the end of winter term, 2007.

The UM ADVANCE Project staff also developed a faculty climate follow-up survey, which opened in September, 2006. The survey was sent to all women scientists and social scientists on the instructional, research, and clinical tracks and comparable subsamples of male faculty in the same groups. The survey replicates the baseline survey completed in September, 2001 and covers faculty members' service responsibilities and teaching loads, as well as their research activities, resources, and perceptions of the department and university climate. In addition, specific questions were added about quality of and satisfaction with research space so that we may report on faculty experiences in this area. The survey closed in mid-November, 2006. Findings from the survey will be summarized in a written report, which will be released to the entire campus in AY2006-2007. It will be posted on the UM ADVANCE Project's Web site and will also be distributed to any department's individual faculty members by request.

## I. INSTITUTIONAL TRANSFORMATION INDICATORS

#### Table 1: Instructional, Research, and Clinical Track Faculty by Gender 2005 - 2006<sup>a</sup>

			FUI	LL PROF	ESSC	DR					ASSO	CIATE	PROF	ESSO	R				ASS	STANT I	PROF	ESSO	R					тоти	AL			
		m	ales			fe	males			n	nales			fe	males			r	nales			fe	males			I	males			fe	males	
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ENGINEERING <sup>b</sup>	171	93%	152.74	94%	12	7%	9.67	6%	51	76%	48.65	76%	16	24%	15.50	24%	48	81%	44.50	82%	11	19%	10.10	18%	270	87%	245.89	87%	39	13%	35.27	13%
LSA (Natural Sciences) <sup>c</sup>	154	90%	136.64	90%	17	10%	15.25	10%	31	78%	29.50	78%	9	23%	8.50	22%	45	69%	39.40	67%	20	31%	19.00	33%	230	83%	205.54	83%	46	17%	42.75	17%
MEDICAL SCHOOL (Basic Sciences) <sup>d</sup>	47	76%	38.15	77%	15	24%	11.62	23%	11	55%	7.90	51%	9	45%	7.60	49%	22	69%	17.78	65%	10	31%	9.67	35%	80	70%	63.83	69%	34	30%	28.89	31%
SIX ADDITIONAL SCHOOLS (Scientists) <sup>e</sup>	77	84%	67.15	84%	15	16%	13.20	16%	35	70%	32.60	70%	15	30%	13.68	30%	28	57%	26.50	58%	21	43%	19.08	42%	140	73%	126.25	73%	51	27%	45.96	27%

			RES	EARCH S	CIEN	ITIST					ASSOC	RESEA	RCH	SCIEN	TIST				ASST	RESEAR	сн s	CIENT	IST					тот	AL			
		n	nales			fe	males			n	nales			fe	males			I	nales			fe	males			1	males			fe	males	
	Ν	% N	FTE	% FTE	Ν	% N	FTE	% FTE	Ν	% N	FTE	% FTE	N	% N	FTE	% FTE	N	% N	FTE	% FTE	Ν	% N	FTE	% FTE	Ν	% N	FTE	% FTE	N	% N	FTE	% FTE
ENGINEERING	13	93%	9.35	90%	1	7%	1.00	10%	12	86%	10.70	88%	2	14%	1.40	12%	22	88%	19.95	88%	3	12%	2.75	12%	47	89%	40.00	89%	6	11%	5.15	11%
LSA (Natural Sciences)	4	80%	4.00	86%	1	20%	0.63	14%	9	90%	5.32	84%	1	10%	1.00	16%	14	82%	13.00	87%	3	18%	1.90	13%	27	84%	22.32	86%	5	16%	3.53	14%
MEDICAL SCHOOL (Basic Sciences)	0	0%	0.00	0%	1	100%	0.80	100%	0	0%	0	0%	0	0%	0.00	0%	6	55%	6.00	60%	5	45%	4.00	40%	6	50%	6.00	56%	6	50%	4.80	44%
SIX ADDITIONAL SCHOOLS (Scientists)	5	100%	4.02	100%	0	0%	0.00	0%	2	67%	2.00	74%	1	33%	0.70	26%	20	63%	17.30	65%	12	38%	9.46	35%	27	68%	23.32	70%	13	33%	10.16	30%

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SIX ADDITIONAL SCHOOLS (Scientists)	5	100%	5.00	100%	0	0%	0.00	0%	8	40%	8.00	44%	12	60%	10.21	56%	19	48%	16.35	44%	21	53%	20.70	56%	32	49%	29.35	49%	33	51%	30.91	51%

<sup>a</sup> Ns do not include faculty with only dry appointments in the department; "% N" based on number of appointments within rank; "% FTE" based on FTE within rank

<sup>b</sup>Faculty with joint appointments (i.e., greater than 0% time equivalence) are counted in each unit of appointment. In AY2006, 7 faculty members (6 men and 1 woman) had joint appointments across departments within the College of Engineering; the 7 faculty members were counted in both departments in which they had budgeted appointments. With the exception of one male research professor, these faculty members were on the instructional (tenure) track. Therefore, the data contained in the table slightly overestimate the total number of male faculty members with budgeted appointments in CoE. In addition, 9 men and 1 woman on the instructional (tenure) track had joint appointments including a unit outside of CoE.

<sup>c</sup>Faculty with joint appointments (i.e., greater than 0% time equivalence) are counted in each unit of appointment. In AY2006, no faculty members in the natural science departments had joint appointments (budgeted) in more than one natural science department within the College of LSA; 6 male instructional (tenure) track faculty members and 1 male research track faculty member had joint appointments including a unit outside of LSA. No female faculty members had joint appointments including a unit outside of LSA.

<sup>d</sup>Faculty with joint appointments (i.e., greater than 0% time equivalence) are counted in each unit of appointment. No faculty members in the basic science departments had joint appointments (budgeted) in more than one basic science department within the Medical School in AY2006; 2 men and 1 woman on the instructional (tenure) track had joint appointments including a unit outside of MED.

<sup>e</sup>Faculty with joint appointments (i.e., greater than 0% time equivalence) are counted in each unit of appointment. In AY2006, 3 male and 1 female faculty members had joint appointments within the School of Dentistry: 2 male and 1 female faculty members had instructional and research track appointments; and 1 male faculty members had joint appointments (budgeted) including a unit outside of the six smaller schools. No female faculty members had joint appointments including a unit outside of the six smaller schools. No female faculty members had joint appointments including a unit outside of the six smaller schools.

#### Table 2: Hires to the Instructional (Tenure) Track (between 3/1/2005 and 3/1/2006)

	FULL PR	OFESSOR	ASSOC PF	ROFESSOR	ASST PR	OFESSOR	TO	TAL
	males	females	males	females	males	females	males	females
TOTAL ENGINEERING	3	1	1	1	4	2	8	4
Percent of Hires	75%	25%	50%	50%	67%	33%	67%	33%
TOTAL LSA (Natural Sciences)	5	2	1	0	11	5	17	7
Percent of Hires	71%	29%	100%	0%	69%	31%	71%	29%
TOTAL MEDICAL SCHOOL (Basic Sciences)	0	0	0	0	3	1	3	1
Percent of Hires					75%	25%	75%	25%
TOTAL SIX ADDITIONAL SCHOOLS (Scientists)	2	0	2	0	8	5	12	5
Percent of Hires	100%	0%	100%	0%	62%	38%	71%	29%

#### Table 3: Retirements and Terminations from the Instructional (Tenure) Track (between 3/1/2005 and 3/1/2006)

	FULL PR	OFESSOR	ASSOC PF	ROFESSOR	ASST PR	OFESSOR	TO	TAL
	males	females	males	females	males	females	males	females
TOTAL ENGINEERING	8	0	1	0	4	0	13	0
Percent of Terminations	100%	0%	100%	0%	100%	0%	100%	0%
TOTAL LSA (Natural Sciences)	9	1	2	0	1	0	12	1
Percent of Terminations	90%	10%	100%	0%	100%	0%	92%	8%
TOTAL MEDICAL SCHOOL (Basic Sciences)	3	1	0	0	0	0	3	1
Percent of Terminations	75%	25%					75%	25%
TOTAL SIX ADDITIONAL SCHOOLS (Scientists)	5	1	2	0	0	1	7	2
Percent of Terminations	83%	17%	100%	0%	0%	100%	78%	22%

#### Table 4: Promotions effective AY2006 (Reviewed in AY2005)

	Asst → A	Associate	Associa	te → Full
	males	females	males	females
TOTAL ENGINEERING APPROVED	5	1	9	4
Promotions Denied	0	1	0	0
TOTAL LSA (Natural Sciences) APPROVED	8	0	5	1
Promotions Denied	0	0	0	0
TOTAL MEDICAL SCHOOL (Basic Sciences) APPROVED	2	1	2	1
Promotions Denied	0	0	0	0
TOTAL SIX ADDITIONAL SCHOOLS (Scientists) APPROVED	4	0	2	0
Promotions Denied	0	1	0	0

#### Table 5: Average Time (in Years) in Rank 2005 - 2006

	FULL PR	OFESSOR	ASSO	C PROF	ASST	PROF	RESEA	RCH SCI	ASSOC	RES SCI	ASST	RES SCI	CLINIC	C PROF	CLINIC	ASSOC P	CLINIC	ASST P
	males	females	males	females	males	females	males	females	males	females	males	females	males	females	males	females	males	females
ENGINEERING	11.77	4.38	6.42	3.87	3.32	3.86	8.49	0.58	3.83	0.50	2.15	1.15						
LSA (Natural Sciences)	14.30	4.97	3.19	6.05	2.68	3.01	6.25	20.50	4.32	0.50	2.90	3.02						
MEDICAL SCHOOL (Basic Sciences)	14.02	9.62	6.04	4.72	2.51	2.55		8.50			2.69	5.91						3.63
SIX ADDITIONAL SCHOOLS (Scientists)	10.57	8.50	6.22	7.21	2.93	6.47	6.09		2.45	0.50	3.50	2.26	5.19		4.68	4.18	3.77	3.82

\*includes all at FTE > 0%

#### Table 6: Average Time (in Years) at UM 2005 - 2006

	FULL PR	OFESSOR	ASSO	C PROF	ASST	PROF	RESEAF	RCH SCI	ASSOC	RES SCI	ASST F	RES SCI	CLINIC	PROF	CLINIC A	ASSOC P	CLINIC	ASST P
	males	females	males	females	males	females	males	females	males	females	males	females	males	females	males	females	males	females
ENGINEERING	20.27	9.79	10.73	7.09	3.43	4.32	19.40	0.58	12.33	14.83	6.15	3.79						
LSA (Natural Sciences)	22.02	12.79	7.47	11.26	3.01	3.40	20.31	30.00	14.91	9.81	7.99	5.72						
MEDICAL SCHOOL (Basic Sciences)	23.17	23.23	12.36	12.06	2.99	2.88		30.50			12.65	10.85						8.00
SIX ADDITIONAL SCHOOLS (Scientists)	20.46	22.15	14.22	13.04	3.95	7.82	18.39		8.01	2.41	9.32	7.25	15.88		14.58	13.81	5.84	8.32

\*includes all at FTE > 0%

#### Table 7: Mean Salary FTE\* by Rank and Gender 2005 - 2006

	FULL PRO	DFESSOR	ASSOC	PROF	ASST	PROF	RESEAF	RCH SCI	ASSOC	RES SCI	ASST R	RES SCI	CLINIC	PROF	CLINIC A	SSOC P	CLINIC	ASST P
	males	females	males	females	males	females	males	females	males	females	males	females	males	females	males	females	males	females
ENGINEERING	\$136,886	\$124,652	\$100,159	\$97,354	\$82,350	\$81,390	\$105,000	\$81,818	\$77,596	\$67,582	\$60,061	\$55,200						
LSA (Natural Sciences)	\$108,551	\$110,402	\$79,504	\$78,031	\$69,652	\$69,626	\$59,862	\$65,230	\$50,564	\$54,377	\$43,830	\$30,916						
MEDICAL SCHOOL (Basic Sciences)	\$117,612	\$117,468	\$87,904	\$87,779	\$72,841	\$74,028		\$91,654			\$55,249	\$53,052						\$61,975
SIX ADDITIONAL SCHOOLS (Scientists)	\$126,473	\$118,165	\$92,715	\$89,384	\$73,965	\$67,454	\$65,016		\$52,148	\$89,325	\$60,564	\$56,011	\$120,801		\$89,909	\$81,720	\$74,543	\$70,022

\*Salary FTE based on 9-month academic year; salaries paid on 12 month year were divided by 11 and multiplied by 9.

#### Named Professorships 2005-2006

#### Table 8a: ENGINEERING

	Males	% of male Profs*	% of all positions	Females	% of female Profs*	% of all positions
Distinguished University Professor	4	2.3%	7.8%	0	0.0%	0.0%
Collegiate	7	4.1%	13.7%	1	8.3%	2.0%
Endowed	24	14.0%	47.1%	1	8.3%	2.0%
Thurnau (for teaching)	14	8.2%	27.5%	0	0.0%	0.0%
TOTAL	49	28.7%	96.1%	2	16.7%	3.9%

#### Table 8b: LSA (Natural Sciences)

	Males	% of male Profs*	% of all positions	Females	% of female Profs*	% of all positions
Distinguished University Professor	4	2.6%	11.4%	0	0.0%	0.0%
Collegiate	23	14.9%	65.7%	2	11.8%	5.7%
Endowed	2	1.3%	5.7%	2	11.8%	5.7%
Thurnau (for teaching)	2	1.3%	5.7%	0	0.0%	0.0%
TOTAL	31	20.1%	88.6%	4	23.5%	11.4%

#### Table 8c: MEDICAL SCHOOL (Basic Sciences)

	Males	% of male Profs*	% of all positions	Females	% of female Profs*	% of all positions
Distinguished University Professor	0	0.0%	0.0%	2	13.3%	25.0%
Collegiate	4	8.5%	50.0%	1	6.7%	12.5%
Endowed	1	2.1%	12.5%	0	0.0%	0.0%
Thurnau (for teaching)	0	0.0%	0.0%	0	0.0%	0.0%
TOTAL	5	10.6%	62.5%	3	20.0%	37.5%

#### Table 8d: SIX ADDITIONAL SCHOOLS (Scientists)

	Males	% of male Profs*	% of all positions	Females	% of female Profs*	% of all positions
Distinguished University Professor	4	5.2%	36.4%	2	13.3%	18.2%
Collegiate	2	2.6%	18.2%	0	0.0%	0.0%
Endowed	3	3.9%	27.3%	0	0.0%	0.0%
Thurnau (for teaching)	0	0.0%	0.0%	0	0.0%	0.0%
TOTAL	9	11.7%	81.8%	2	13.3%	18.2%

\*Calculated as a proportion of full professors (with greater that 0 FTE) within gender

Some Professors may hold more than one title, and thus are counted once in each category.

#### **Tenure/Promotion Committees 2005-2006**

#### Table 9a: ENGINEERING

	Males	% of male Assoc/Profs*	% of all positions	Females	% of female Assoc/Profs*	% of all positions
College	3	1.4%	3.9%	1	3.6%	1.3%
Department	67	30.2%	87.0%	6	21.4%	7.8%
TOTAL	70	31.5%	90.9%	7	25.0%	9.1%

#### Table 9b: LSA (Natural Sciences)

	Males	% of male Assoc/Profs*	% of all positions	Females	% of female Assoc/Profs*	% of all positions
College	2	1.1%	3.1%	0	0.0%	0.0%
Department	53	28.6%	82.8%	9	34.6%	14.1%
TOTAL	55	29.7%	85.9%	9	34.6%	14.1%

#### Table 9c: MEDICAL SCHOOL (Basic Sciences)

	Males	% of male Assoc/Profs*	% of all positions	Females	% of female Assoc/Profs*	% of all positions
College	3	5.2%	7.7%	2	8.3%	5.1%
Department	25	43.1%	64.1%	9	37.5%	23.1%
TOTAL	28	48.3%	71.8%	11	45.8%	28.2%

#### Table 9d: SIX ADDITIONAL SCHOOLS (Scientists)

	Males	% of male Assoc/Profs*	% of all positions	Females	% of female Assoc/Profs*	% of all positions
College	8	7.1%	66.7%	1	3.3%	8.3%
Department	2	1.8%	16.7%	1	3.3%	8.3%
TOTAL	10	8.9%	83.3%	2	6.7%	16.7%

\*Calculated as a proportion of full and associate professors (greater than 0 FTE) within gender

Some Assoc/Profs serve on both college and department committees, and thus are counted once in each category.

#### Administrative Positions 2005-2006

#### Table 10a: ENGINEERING

	Males	% of male Assoc/Profs*	% of all positions	Females	% of female Assoc/Profs*	% of all positions
University	1	0.5%	4.0%	0	0.0%	0.0%
College	4	1.8%	16.0%	1	3.6%	4.0%
Department	18	8.1%	72.0%	1	3.6%	4.0%
TOTAL	23	10.4%	92.0%	2	7.1%	8.0%

#### Table 10b: LSA (Natural Sciences)

	Males	% of male Assoc/Profs*	% of all positions	Females	% of female Assoc/Profs*	% of all positions
University	3	1.6%	6.8%	1	3.8%	2.3%
College	2	1.1%	4.5%	1	3.8%	2.3%
Department	32	17.3%	72.7%	5	19.2%	11.4%
TOTAL	37	20.0%	84.1%	7	26.9%	15.9%

#### Table 10c: MEDICAL SCHOOL (Basic Sciences)

	Males	% of male Assoc/Profs*	% of all positions	Females	% of female Assoc/Profs*	% of all positions
University	1	1.7%	7.1%	2	8.3%	14.3%
College	3	5.2%	21.4%	1	4.2%	7.1%
Department	6	10.3%	42.9%	1	4.2%	7.1%
TOTAL	10	17.2%	71.4%	4	16.7%	28.6%

#### Table 10d: SIX ADDITIONAL SCHOOLS (Scientists)

	Males	% of male Assoc/Profs*	% of all positions	Females	% of female Assoc/Profs*	% of all positions
University	0	0.0%	0.0%	0	0.0%	0.0%
College	8	7.1%	33.3%	4	13.3%	16.7%
Department	9	8.0%	37.5%	3	10.0%	12.5%
TOTAL	17	15.2%	70.8%	7	23.3%	29.2%

\*Calculated as a proportion of full and associate professors (greater than 0 FTE) within gender

## Appendix A: Using Theatre to Stage Instructional and Organizational Transformation

**Using Theatre to Stage Instructional and Organizational Transformation** Matthew Kaplan; Constance E Cook; Jeffrey Steiger *Change;* May/Jun 2006; 38, 3; Research Library pg. 32



# Using Theatre to Stage Instructional and Organizational Transformation

BY MATTHEW KAPLAN, Constance E. Cook, and Jeffrey Steiger

*Editor's Note:* The CRLT Theatre Program won the 2006 TIAA-CREF Theodore M. Hesburgh Certificate of Excellence.

#### SCENE I: CONFLICT IN THE STATISTICS CLASSROOM

We coefficients. But when you and the students discussed the graph on infant mortality and mothers' income levels, your plans went awry. Within seconds, an interesting classroom conversation escalated into a heated argument among the students about the parenting abilities of low-income mothers—culminating in harsh words that left one student in tears. Disconcerted, you raised your voice to bring the group back to order, thereby eliciting stony silence from the students for the remainder of the

Matthew Kaplan is associate director of the Center for Research on Learning and Teaching (CRLT) at the University of Michigan. His work with the Theatre Program includes grant writing, sketch facilitation, publicity, and evaluation. Constance E. Cook is director of CRLT as well as associate professor in the Center for the Study of Higher and Postsecondary Education. She brought the Theatre Program to CRLT, oversees its administration, and has institutionalized the use of theatre for faculty development. Jeffrey Steiger is the director of the CRLT Theatre Program. He writes original scripts, recruits and develops actors, consults with faculty and graduate students on voice and communication issues, and works with academic units to apply theatre to their facultydevelopment needs.

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class. Now you dread the next class meeting, and you know that your students do too.

But magically, you get a chance to replay the conflict and handle it differently, and you can ask your colleagues for advice before the class begins. Now you can look into the minds of your students to discern their thoughts, concerns, and perceptions. You become deeply aware of the subtleties and nuances of the classroom dynamics, and you begin to understand the ways that gender, social class, and race are playing out



in the exchanges between you, the students, and their peers. With these new insights, you collaborate with your colleagues to develop productive responses to the students in the very moment of the heated argument. Essentially, you have the opportunity to transform the classroom conflict into an opportunity for learning.

## SCENE II: A TENURE DISCUSSION IN A FACULTY MEETING

You attended the departmental executive committee meeting to participate in a tenure review. But as the meeting unfolded, you felt as if the conversation was getting off track. The candidate's credentials were questioned in ways that seem biased. The discussion shifted from her qualifications to a contentious airing of views about whether good teaching matters, the value of interdisciplinarity, and the future direction of the department. The discussion seemed to be about everything but this candidate. You have the sense that the whole conversation was being influenced by gender. You tried to intervene, but your attempts were rebuffed.

But then you have the opportunity we all long for: the chance to revisit the conversation, think carefully about what was said, decide how and when to intervene effectively, and replay the scene. But it gets better: not only do you have a second chance, you also have a group of colleagues with whom to compare notes and strategize about the most effective interventions. You get to see the impact of your choices as selected parts of the conversation get replayed, this time incorporating the interventions you and your colleagues have devised. In the process, you develop an awareness of what are more and less effective approaches to raising sensitive issues; the unintended consequences of various strategies; and how power, status, and gender can affect one's ability to create change.

#### INTERACTIVE THEATRE AS FACULTY DEVELOPMENT

Since 2000, the Center for Research on Learning and Teaching (CRLT) at the University of Michigan (UM) has presented an educational theatre program for the professional development of faculty and graduate student instructors. Through the medium of interactive theatre, faculty can experience the sort of "second chance" described in these scenarios. As they engage with the sketch, the characters, and each other, faculty are drawn into making sense of the issues portrayed, relating them to personal experience and strategizing about how to transform a difficult situation. We have found that the results can have a profound effect on faculty attitudes and behaviors.

Most people think of theatre as a form of entertainment—a diversion from our daily lives that inspires, amuses, or provokes us and that engages our creative imagination. But theatre has long served as a powerful educational tool as well. At colleges and universities, theatre is often used to facilitate student affairs training: sketches on topics like date rape and substance abuse are common now at orientation sessions. The marvel is that we faculty and consultants engaged in professional development have come so late to the idea of theatre as an effective teaching tool.

Faculty development workshops usually present research on teaching improvement focused on problems instructors typically face; consultants then work with faculty to figure out

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how to apply the material to their own settings. These days, our theatrical productions often replace those kinds of workshops at UM. We have found that interactive sketches can accomplish the same objectives, only better. Consequently, the CRLT Theatre Program is in demand, performing not only at our own programs, but also at the university's departmental retreats and faculty meetings and at other universities and national conferences.

Jeffrey Steiger, the director of the CRLT Theatre Program,

has adapted his use of theater from the pioneering work of Augusto Boal, a Brazilian theatre director and politician and the originator in the 1950s of the Theatre of the Oppressed. In developing this methodology, called Forum Theatre, Boal drew on the work of another Brazilian, Paulo Freire, the educational theorist and author of Pedagogy of the Oppressed. A key Freirian thesis is that people learn through doing. Boal's methodology involves engaging the audience by presenting a problem in theatrical form (usually a political problem involving some sort of oppression) and then inviting the audience to advance and discuss solutions to the problem, often with individuals from the audience acting out those solutions on stage.

The CRLT Theatre Program sketches typically focus on diversity issues. While all faculty development workshops can seem didactic if done poorly, faculty often approach multicultural programs with special suspicion. Those who identify multiculturalism as a recognizable and worthy goal generally benefit from these programs. But those who need greater awareness, knowledge, and skill develop-

ment may not participate in them or, when they do, react defensively or have difficulty seeing the relevance of the sketches to their own situations. This can be particularly problematic in the sciences and engineering, where the subject matter appears "objective" and discussions of identity (gender, race, and disability) or power dynamics can seem irrelevant to faculty and graduate students.

The diversity-related topics in the CRLT sketches typically fall into one of two categories. The first is teaching and learning improvement, especially the ways an instructor can serve underrepresented students and teach better by creating a classroom environment where all students feel safe and can achieve their full potential. The second topic is the transformation of the faculty work world—for instance, faculty meetings, hiring, mentoring, and the tenure and promotion process—so that women and faculty of color, who may be marginalized in their departments, are more likely to succeed. The latter topic has developed out of a collaboration between CRLT and the AD-VANCE project at UM, funded by the National Science Foundation, to improve recruitment and retention of women faculty in the sciences. Thus, the Theatre Program is working on both multicultural instructional development and multicultural orga-

Faculty ..... are drawn ..... into making •••••••••••••••• sense of the issues ..... portrayed, . . . . . . . . . . . . . . . . . . . relating them to personal ..... experience and strategizing about how to . . . . . . . . . . . . . . . . . transform a ..... difficult situation.

nizational development—with the ambitious objective of both personal and institutional transformation.

The CRLT Theatre Program currently presents 15 sketches. They have a variety of formats, all of which include some degree of interactivity. For example, some sketches are followed by a workshop at which the audience members discuss the issues in the sketch and may also address questions to the actors (still in their roles) in order to get a better understanding of the personal experiences of each character (for

example, the Conflict sketch described at the outset). Another format involves a sketch followed by an invitation to some audience members to join the actors on stage and redirect the sketch outcome (for instance, the Tenure sketch, also described above). A third format starts with a sketch, then has audience discussion with the actors in their roles, including audience suggestions to the actors for improving their interactions. The actors then replay the scenario, incorporating the audience feedback and demonstrating better outcomes than the original (the sketch called Gender in the Classroom, on the chilly climate for women students in the sciences, for example).

All of the CRLT Theatre sketches are based on research done at UM, a synthesis of the literature on a topic, or a combination of the two. Before a sketch begins, a CRLT facilitator briefly presents the research findings on which the sketch is based. After the sketch, the facilitator guides the exchange among the audience and the actors—noting implicit assumptions and helping the audience uncover the subtext behind the characters' comments. At the end, the facilitator underlines key points for the audience and

finishes with additional research findings and strategies for using the information presented.

#### How Do WE KNOW IT WORKS?

As with any professional development activity for faculty, the primary purpose of the theatrical performances is transformation at both a personal or institutional level. There are a number of models for how such change occurs, but they share several common steps: gaining an awareness of the need for change, devising strategies, changing behavior, and making the change permanent.

We have evaluated our effectiveness by administering surveys directly following performances, following up with additional surveys and focus groups three months to a year after the performances, and interviewing key administrators who use the Theatre Program to effect change at the University of Michigan. Results from these multiple sources indicate that on an individual level, participation in theatre performances affects audience members' awareness and their behavior. On an institutional level, theatre makes a significant contribution as well.

To illustrate: We have collected over 2,000 evaluations of our most commonly performed sketches, *Gender in the Classroom* and *(dis)Ability in the Classroom*. In order to raise

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awareness, audience members must see the sketches as useful and relevant. Over 75 percent of the *Gender* audience members and over 90 percent of the *(dis)Ability* audiences thought that the issues raised in the sketch were useful for them as teachers. In addition, nearly three-quarters of the *Gender* audiences and almost 90 percent of the *(dis)Ability* audiences agreed that the interactive discussion enhanced their understanding of difficult issues.

Qualitative comments also consistently indicate an increase in audience awareness of key issues and a gain in instructors' knowledge and sense of self-confidence as teachers, as the following comments from *Gender in the Classroom* reflect:

• "The performance...reminded me how subtle gender discrimination can be. [It] encouraged me to make sure that my [TAs] were very clear on my preferences for classroom conduct and was a good organizer/reminder for me in talking with them before the start of classes."

• "I was amazed [at] how intensely some other people in the audience were moved by the presentation, as if they had never seen represented what they (mostly women in the audience) had experienced."

Similarly, among department chairs who saw the *Tenure* sketch, over 90 percent agreed or strongly agreed that the issues raised by the sketch made them think about familiar interactions and situations in new ways, and over three-quarters agreed or strongly agreed that the interactive discussion enhanced their understanding of difficult issues. Again, the chairs' comments are revealing:

• "Poor leadership leads to confusion and injustice. Not news, but people always think it is the other chair who is doing it. Self-recognition is the most valuable product of the sketches."

• "My main observation was to realize how difficult it is to handle these kinds of situations and how important it is for the chair to be prepared, anticipate issues before the meeting, come to the meeting with all of the information, and not leave it to other faculty."

When instructors' capacities and awareness increase, they can begin to make changes in the classroom. Our follow-up surveys indicate that instructors who attend the Theatre Program presentations pay more attention to the effect of their actions on students

and design assignments and make classroom management choices that work more uniformly for the student body. For example, attendees at several TA orientation programs saw the (dis)Ability sketch. In surveys three months or more after the performance, close to 80 percent said that seeing the sketch had affected their teaching or their interaction with students in some way. Some typical comments:

• "[I developed an] understanding of what 'sensitivity' to disabilities is really about: it is not feeling compassionate or sorry for disabled students, but treating them as equals and understanding the nature of their disabilities and how they are able to handle them. Based on that, the teacher proceeds to interact with the student."

• "I remembered to ask [students] to let me know of any special needs they had when they filled out index cards for me."

• "I became aware of the possibility that I would need to consider a student's disability when arranging the room/office hours."

TAs in the sciences and engineering were surveyed three to 12 months after seeing the *Gender* sketch. Almost 90 percent agreed that the sketch made them aware of classroom experiences of women and minority students; over 80 percent said it led them to reflect on how their actions in the classroom affected students; and about three-quarters said the sketch led them to consider the issues as more important than before, made them proactive about creating a positive climate, and gave them strategies to address classroom dynamics that negatively affect women and minority students. Moreover, close to 40 percent said they changed their behavior as a result of the sketch, a particularly notable number in the sciences and engineering, where many TAs have had no prior teaching

The dialogue sparked by the performances was not always easy or comfortable, often leading to heated discussion and disagreement, but it was productive in the long run. experience. Some of their reactions:

• "I attended the CRLT Theatre performance last year before I actually started teaching. When I started, I found out that the class was more difficult for students than I expected. I had more women in the class than men. After a couple of labs, I realized that the men were more enthusiastic, and I kept paying more attention to their answers. *Gender in the Classroom* showed me the real issue. So I decided to pay attention equally to both genders, and also I answered more questions referring to all my students, sometimes using 'random call.""

• "I teach a lab course. Often I see women being the note-taker in the lab, rather than actively participating in the experiments. In those cases, I now intervene immediately to remind my students that they will all need individual lab skills."

Given the power of the Theatre Program, it can also help create change on an institutional level. CRLT has collaborated since 2002 with the ADVANCE Program at UM on its efforts to improve institutional culture for women faculty in the sciences and engineering. Each ADVANCE sketch is developed with input from key faculty and administrators in the relevant depart-

ments—including initial interviews that provide the basis for the script—and then previewed by faculty opinion leaders. In addition to strengthening the sketches, the process also creates an investment in them. Administrators and faculty who have contributed to their creation want to bring them to their departments and use them as tools for making difficult conversations go better. One dean told us that the dialogue sparked by the performances was not always easy or comfortable, often leading to heated discussion and disagreement, but it was productive in the long run: "We were dealing with tough topics, like gender equity," the dean said. "These were difficult topics, very difficult to move the School forward....[Theatre] raised the level of consciousness so that people were aware of their behaviors. They became aware of themselves and others making comments that make you cringe, behaviors they want to change. Even if it did get some faculty angry, that discussion alone caused other faculty to say, 'Well, wait a second, why is that faculty reacting that way?' and [realize] that there really was a problem. As we hired a more diverse faculty, we did not get the pushback we used to get. The interview process that we were putting faculty through went a lot better."

#### WHY DOES THEATRE WORK?

Theatre works because it combines the best elements of reflection and exchange characteristic of professional development workshops with the power and creativity of theatre. And the sketches use a set of strategies that allow faculty to open up regarding issues that they would normally resist dealing with. The following section describes four such strategies.

1) Serious issues are presented with humor. The topics dealt with in the sketches are serious and sometimes controversial: gender dynamics and how they play out in departments and classrooms, ways that race and class can surface in discussions, the challenges of disabled students. While the sketches do not shy away from the issues they usually contain some humor, which allows the audience to relax and enjoy the sketch and which can come as a welcome release when the sketch focuses on problematic dynamics and tense situations.

As one participant in the Tenure Sketch observed, "Humor is a great way to open people's minds to new ideas."

2) Sketches are emotionally engaging but allow participants to maintain distance. The importance of emotional connections in learning has been explored in brain research (see Leamonson in the November/December 2000 issue of *Change*), has been discussed as part of good practice in multicultural pedagogy, and is the subject of current work in the Carnegie Campus Program that is investigating cognitive-affective learning (see the Journal of Cognitive Affective Learning, http:// www.jcal.emory.edu/).

Instructors who are able to create in students an emotional connection with the content they are teaching are able to engage students' imaginations and inspire their interest. Emotional engagement stimulates the learning process.

Theatre condenses the experiences of instructors and the research on those experiences, and it features actors who act like familiar colleagues and students—people with whom faculty identify or for whom they feel empathy. As they act out the scenes and during the interactive discussion, actors experience pain or discomfort, and the audience explores the reasons for it.

The scenarios often call up emotions from previous events in faculty lives, and the interactions with the actors—asking questions and offering suggestions—lead to faculty awareness of the toll that these situations can have on others. Faculty remember the sketches precisely long after the performance because of their emotional impact.

A faculty participant in *Classroom Conflict* recalls, "I vaguely remember being frustrated at the TA. Like I thought it was interesting what was happening between the students, and I just wanted to shake this TA and say, 'are you missing all of



this?' Thinking to myself, it made me frustrated. Do I miss all of this when I'm doing it, or is this guy just bad? Is it me? I mean, why am I so upset?"

At the same time, the sketches do not implicate faculty participants: it is the actors who experience the problems. Audience members are invited to identify the problems and then discuss strategies for solving them without having to reveal whether they experience similar difficulties.

The post-performance activities and interactive components enable the audience to step back and think critically about the scenario and to evaluate their own responses based on what

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they hear from others in the audience. Seeing the issues enacted on stage, separate from their own experience, provides a distance from them that lowers audience defenses so they can engage with the subject matter more freely.

According to a participant in the *Tenure Sketch*, "Putting a difficult subject in the context of a dramatic sketch distances the subject from the audience enough to help them take a fresh look."

3) Sketches have credibility but take advantage of a willing suspension of disbelief. CRLT Theatre sketches seem credible and relevant because they are built on a strong foundation of research concerning the experiences of underrepresented faculty and students. For example, *Classroom Conflict* grows out of the considerable literature on the role of race in classroom dynamics, as well as interviews with students of



color about the impact race has had on their learning experiences and interactions with UM faculty and TAs. The *Tenure Discussion* is based on a series of interviews and focus groups with faculty at UM, as well as the literature concerning how gender informs tenure and other personnel decisions in the academy and the workplace.

The realism and power of the sketches is enhanced by the rigorous process of actor training. For sketches on institutional transformation, the actors must learn about the details of faculty life, everything from what a provost does to what tenure means and how decisions get made in departments. Actors read the research on the sketch's topic and prepare for the types of questions that might arise in interactions with the audience. Then, when the sketch is over, they contribute their own experiences to some of the audience discussions, such as how they have experienced and thought about identity (race, gender, ability) and power dynamics.

"I think they are good actors, and you believe for the moments that you're watching that they are actual students. It's a realistic enough scenario that you get caught up, like when you watch a play, you forget that they're actors," a faculty participant in *Classroom Conflict* remarks.

"You folks must do an incredible amount of research. The sketch was right on the money," says another faculty participant in a customized sketch for a professional school.

While the sketches need to be credible and realistic, the theatrical setting requires some willing suspension of disbelief. Sketches must compress a range of problematic behaviors into a short performance. In the sketch on (*dis*)Ability in the Classroom, for example, two of the five students have disabilities, and in a 10-minute performance the TA makes a whole series of gaffes that are representative of the behaviors with which disabled students must contend.

For example, when the TA finds out about one student's learning disability, he starts a conversation about accommodations in front of the whole class, despite the student's obvious desire to keep it private. The TA also resists giving extra time for a test. While we occasionally get comments from audience members that sketches are overdrawn, theatre's distillation of a problem helps audience members remember what they see and focus on change.

"It seemed a little contrived, at the time. Once we finished the whole discussion, it was obvious that he was playing a bad [TA] so that we could talk about what would make him better. But that works well," concludes a faculty audience member in *Classroom Conflict*.

4) Meaning is created through presentation and active learning. The literature tells us that if students learn actively, they typically learn more and retain information longer. Active learning, as its name implies, engages students with the instructor and with their fellow students (often in pairs or groups) so that they are sharing perspectives, generating their own ideas, and teaching each other.

The role of the teacher is to facilitate student involvement with the subject matter, to serve as a guide rather than the sole source of knowledge. The challenge that many instructors face is how to balance the presentation of content with interactivity.

Interactive theatre by its nature balances these two approaches. Theatre audiences are often unfamiliar with the research behind sketch topics, and the performance itself functions as the research presentation. Because theatre works best by "showing" rather than "telling," the research comes through in the characters' actions, interactions, and dialogue, and by means of brief comments by the facilitator. As a result, the sketches are openended (there is no single solution to the problem presented) and based on constructivist principles: rather than being told "the answer," audience members are asked to make meaning from what they have seen.

The active learning that follows the sketch continues and

deepens the sense-making process. When a sketch ends, the audience interacts with the actors in their roles and then with each other (often in pairs or small groups). They question the actors, brainstorm suggestions to improve the outcome of the sketch, or find ways that an audience member can enter the scene and redirect the action. Discussion usually consumes two-thirds of the program. Through these conversations, each learner takes away understandings that are meaningful in her own context.

"I think that the faculty, just as our students, get more out of experiential learning than the more passive style of learning. And it causes a dialogue to occur, which I think is fruitful," says one dean.

#### INTERACTIVE THEATRE AND FACULTY CAREER STAGES

Faculty go through distinct career stages, and what is appealing and helpful at one stage may not necessarily be so at another. Nonetheless, interactive theatre is a powerful educational medium at all stages of the faculty career.

• Graduate Students. New TAs come

to the classroom with their own theories about learning based on their many years as students. In their early years, TAs are likely to personalize relationships with their students, and it is not until they have had some time in the classroom that most learn to distance themselves from the relationships and become more analytical, eventually learning to think of students as professional clients.

The interactive theatre experience provides TAs the chance to be more analytical about their relationship with students and see that the challenges they encounter are ones common to the teaching experience and faced by every instructor. Interactive theatre provides them with a practice session, a rehearsal for their classes. It lets them take risks during the discussion and consider solutions and teaching strategies in a safe environment.

• Junior Faculty. Junior faculty need to learn the behavioral norms of the institution they have joined. Pre-tenure faculty have many questions about how to behave both in and outside the classroom, but there is a perceived cost to asking too many questions. Though many institutions have mentoring systems to facilitate the candid exchange of institutional information, junior faculty know that the people who are mentoring them, or the colleagues who could answer their questions, are often also those who will judge them when it comes time to make a tenure

decision. The simple act of asking questions might create a negative impression (why doesn't she know these things?), new faculty may think, so it is easy to understand why they may be reluctant to air their confusions.

Interactive theatre bypasses the need for junior faculty to initiate inquiries because questions are incorporated into the discussion of the sketches. Faculty can have their challenges addressed without admitting that they face the same ones as the instructor or administrator in the sketch or that they do not

> understand institutional policies. When there is a mix of junior and senior faculty in an audience, junior faculty find that their more experienced peers share their concerns and have similar questions, and they have an opportunity to listen in as senior colleagues do problem-solving about the challenges they face. It is an ideal way to learn about institutional norms and expectations.

> • Senior Faculty. Senior faculty become less likely to engage in professional development activities over time. They may not attend teaching improvement programs, for example, because they already consider themselves good teachers. But the playful nature of a theatrical experience can draw them to an event on a topic they would not otherwise address in a public setting. That theatre is typically regarded as entertainment, not education, makes attendance more acceptable-it does not indicate that one is facing a problem or needs assistance. Consequently, a theatre program is less likely than other faculty development programs to be preaching to the converted. Moreover, theatre models the experimentation and creativity that faculty should be bringing to their classroom, giving them

ideas for role-playing and other innovative pedagogy.

#### CONCLUSION

In June 2005, an NSF-funded summer institute at the University of Michigan brought together theatre professors, faculty developers, and academic administrators from 17 institutions to learn how to create interactive theatre programs on their own campuses. We believe that it will not be long before educational theatre is as common for faculty as it currently is for students. That would bode well for efforts across the country to transform campuses so that faculty and students of all backgrounds can succeed and flourish.

Parker Palmer has written eloquently about how knowledge and the learning process are communal acts; interactive theatre is so useful in part because it creates community among faculty audiences. As they share dismay at the challenges presented by the theatre scenarios, faculty recognize the barriers to being inclusive. As they engage in the group problem-solving sessions that follow the sketch, faculty learn from each other about ways they can transform the climate in their own classrooms and departments. The academy has long wanted to transform our campuses into inclusive learning communities, and interactive theatre is one important step toward that end.

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## Appendix B: Gender, Women, and Science

## Gender, Women, and Science

Rackham 575 / Women's Studies 698-005 / Psychology 591-002 Fall 2006 • Wednesday, 1:00 - 4:00pm

Professors Abby Stewart (Psychology and Women's Studies) and John Vandermeer (Ecology and Evolutionary Biology and Center for Theoretical Physics)

This course explores the relationship between gender and science from a theoretical and practical point of view.

The course reviews the historical development of science and the ways in which gender issues have always been implicated, even if not normally highlighted, in traditional narratives. In addition the seminar will carry out case studies of several notable women scientists from various periods, including at least 19th century mathematician Sofia Kovalevskaya, 20th century biologist Rosalind Franklin, and contemporary astronomer Jocelyn Bell Burnell. Finally, literature documenting and explicating the current status of women in science will be critically reviewed.

The course will meet once per week for three hours. Texts will include *Unbending Gender* by Joan Williams and *Why So Slow ?* by Virginia Valian.

For more information about this course, please contact Abby Stewart (<u>abbystew@umich.edu</u>) or John Vandermeer (jvander@umich.edu).



Sofia Kovalevskaya



Rosalind Franklin



Jocelyn Bell Burnell

## Appendix C: ADVANCE Project Grant Programs

## university of Michigan, ADVANCE Project GRANT PROGRAMS





### About UM ADVANCE

The UM ADVANCE Project promotes institutional transformation in science and engineering fields. The goals of this project are to improve recruitment and retention of women faculty in science and engineering and to improve the institutional climate. The program began with a 5-year grant from the National Science Foundation; as of 2007, the project is institutionalized and funded internally by the University of Michigan.

> For more information, please visit our website: www.umich.edu/~advproj

Please contact us with comments, questions, or concerns: advanceproject@umich.edu

> Institute for Research on Women and Gender 1136 Lane Hall 204 South State Street Ann Arbor, MI 48109-1290

## Reflections from Grant Recipients

"The DeWitt Award gives women scientists not only monetary, but also moral support and recognition." DeWitt winner

"Our department is finding the program very beneficial, as it leads to a better understanding as to what it means to be a woman scientist." Departmental Transformation Grant winner

"I cannot overstate how beneficial this award has been in jumpstarting my career." Crosby winner

"I believe it will make me more likely to address problems that I see developing rather than letting them persist." Attendee at a Departmental Transformation Grant seminar

"The Crosby Award has resulted in the most productive collaboration of my career." Crosby winner

#### Dr. Margaret McFall-Ngaí

Dr. Margaret McFall-Ngai, Professor of Medical Microbiology & Immunology at the University of Wisconsin-Madison, will visit UM's Department of Microbiology & Immunology in the Fall of 2006 to discuss her work on host-symbiont interactions and to meet with women faculty, graduate students, and post-doctoral fellows.



"It will aid in retention of women to have high caliber scientists interact with our faculty, postdocs, and students."

Dr Katherine Spindler, Professor of Microbiology & Immunology

#### Dr. Sílvía Vídal

Dr. Silvia Vidal, Associate Professor of Medicine, Microbiology and Immunology, and Human Genetics at McGill University, will visit UM's Department of Microbiology & Immunology in the Fall of 2006 to discuss her unique interdisciplinary work on immune responses to cytomegalovirus infections. She will meet with women scientists of all career levels from several different departments.

"We will benefit from learning about their outstanding science and career experiences." Dr Katherine Spindler,

Professor of Microbiology & Immunology

The Program of Visiting Scientists and Engineers is the newest UM ADVANCE grant program, initiated in 2006. The PVSE supports visits to the University of Michigan by scientists and engineers whose presence on campus will improve our success at recruiting and retaining women scientists and engineers on the faculty, as well as in the student body.

Program of Vísítíng Scientísts & Engineers

# Elízabeth Carolíne Crosby Research Fund For instructional-track faculty

Research Award. The fund has directly supported the careers of approximately 70 other women scientists, and has provided indirect support to countless more. The Crosby Award has encouraged recipients to collaborate with fellow women scientists and engineers, improved recipients' chances of attaining tenure or promotion, engendered opportunities to increase the visibility of the contributions of women scientists and engineers, and afforded recipients opportunities to direct graduate research and mentor graduate and undergraduate women scientists.

Individua

World-renowned neuroanatomist Elizabeth Caroline Crosby began her career at the University of Michigan in 1920 and eventually became the first woman professor of the medical school. A dedicated researcher and teacher, Dr. Crosby published extensively in comparative anatomy, and received several prestigious awards. She remained active in scientific work until the

Individual faculty grants are availa needs of faculty that, if met, will inc advancement of women faculty in University of Michigan. The funds, ADVANCE grant, support a range scholarly work in science and engi grants have funded seed m

- teaching release
- child care
- summer salary
- support for post docs, graduate s

end of her life in 1983, at the age of ninety-four.

#### "The funds have been absolutely instrumental in my career.

Created a research team focusing on the application of geostatistical inverse modeling methods for constraining the

#### Dr. Anna M. Michalak

Department of Civil & **Environmental Engineering** Department of Atmospheric, Oceanic, & Space Sciences

**Crosby Recipient 2005** 

atmospheric budgets of greenhouse gases. Crosby funds provided summer salary for Dr. Michalak and two female graduate students, allowing the group to use

> preliminary results in support of a large, successful grant proposal. "This proposal would never have come about without the Crosby award, so I can say without hesitation that the Crosby Award got a 40-to-1 return on their initial investment," says Dr. Michalak.



purchas

field res



Tested protocols for extraction of DNA from museum samples. The DeWitt Award enabled Dr. Cortés-Ortiz to purchase supplies for her research, hire and train a woman undergraduate to participate in the project, and participate in the annual congress of the American Society of Primatologists. "The results of

Dr. Lílíana Cortés-Ortíz

Museum of Zoology Department of Ecology & Evolutionary Biology DeWitt Recipient 2005

the research that I am currently conducting under this award will assure the continuity of my research," says Dr. Cortés-Ortiz.

"This award has been extremely useful for me to launch my research at the University of Michigan."

## ole to help meet career-relevant A pathologist and research so

crease the participation and science and engineering at the initially seeded by the NSF of activities necessary for neering fields. Crosby and DeWitt

oney for larger grant proposals se of equipment and supplies search

students, and research assistants

A pathologist and research scientist known for her contributions to the anatomy of the pancreas and heart and for pioneering work in the chemotherapy of tuberculosis, Lydia Adams DeWitt was also the founder of the Women's Research Club at the University of Michigan and was elected to the

Association of American Anatomists. After many years as a research scientist at the U of M, Dr. DeWitt served as

Lydía Adams DeWítt

an instructor of pathology at Washington University in St. Louis and assistant city pathologist and bacteriologist in the St. Louis Department of Health. She later took a position at the University of Chicago, where she was eventually awarded tenure. She also served as president of the Chicago Pathological Society.

As of June 2006, 7 UM faculty had won the Lydia Adams DeWitt Research Award. The fund has directly supported the careers of 14 other women scientists, and provided indirect support to many more. For primary research-track faculty

DeWitt Research Fund

#### Indívidual Departmental Transformation Grants These grants have funded teaching release, travel grants, research

These grants have funded teaching release, travel grants, research grants, and summer salary for women faculty, as well as activities such as seminar series, networking groups, mentoring activities, departmental climate evaluation studies, and recruitment efforts, within individual science, engineering, and medicine departments.

## DepartmentalT



The Departmental Transformation Initiative departments to compete for funds to sup environment for women faculty, including mentoring, and an increase in the number and/or promoted. Eleven individual depart have been awarded Departmental Transf

Dr. Carol Fierke Chair, Department of Chemistry

"No doubt ADVANCE contributed to our success in recruitment; the percentage of women assistant professors increased from 10% to 41% over the course of the grant."

The Department of Chemistry used their Departmental Transformation Grant to enhance the size and quality of their applicant pool for faculty positions; to enhance recruitment, mentoring, and success of women faculty; and to evaluate and enhance

Department of Chemistry College of Literature, Science, and the Arts

success of women faculty; and to evaluate and enhance departmental climate. To accomplish these goals, the department invited women faculty to deliver seminar talks, awarded travel funds to female faculty members and graduate students, organized forums for junior and women faculty, supported summer salary for female faculty, and administered a survey to evaluate departmental climate. "Leading Excellence: The Role of Full Profes-\_eadíno sors at UM" provides senior faculty with an 1P. R opportunity to examine the structure of the -essors university and develop problem-solving skills as mentors, initiative leaders, and senior members of the university community. This seminar, developed by Dr. Diana Kardia, has been presented in the Colleges of LSA and Engineering, and in the Medical School. "AN EUE-OPENING EXPERIENCE."

attendee at a 2005 seminar

ransformation

ve invited departments or groups of port a significant transformation in the improvement of department climate and er of women faculty recruited, retained artments and two groups of departments formation Grants since 2002.



Dr Diana Kardia Diversity by Design

Coachína Program for SA Natúral Science Chairs

Executive coaching services, provided by Dr. Diana Kardia, were offered to LSA Natural Science Division department chairs to foster (1) identification of barriers to effective department functioning and to the success of individuals within the department; (2) improved communication and transparency; and (3) attainment of the chair's professional and

administrative goals. Chairs utilized these services to support longterm planning efforts and achieve organizational change goals that related to the goals of the ADVANCE Project.

Group Departmental Transformation Grants

## Complete List of Grant Winner

Program of Visiting Scientists and Engineers Department of Microbiology and Immunology

#### Crosby Fund -

Kate Barald (Cell & Developmental Biology, **Biomedical Engineering**) Laura Beretta (Microbiology & Immunology) Rebecca Bernstein (Astronomy) Katarina Borer (Kinesiology) Susan Brown (Kinesiology) Robyn Burnham (Ecology & Evolutionary Biology, Geological Sciences) Maria Clara Castro (Geological Sciences) Amy Cohn (Industrial & Operations Engineering) Kathleen Collins (Internal Medicine, Microbiology & Immunology) Aline Cotel (Civil & Environmental Engineering) Duyen Dang (Internal Medicine) Julie Douglas (Human Genetics) Nisha D'Silva (Dentistry, Pathology) Betsy Foxman (Epidemiology) Anna Gilbert (Mathematics) Deborah Goldberg (Ecology & Evolutionary Biology) Rachel Goldman (Materials Science & Engineering) Susan Dorr Goold (Internal Medicine) M. Melissa Gross (Kinesiology) Kristina Hakansson (Chemistry) Ingrid Hendy (Geological Sciences) Trachette Jackson (Mathematics) Jionghua Jin (Industrial & Operations Engineering) Smadar Karni (Mathematics) Kim Kearfott (Nuclear Engineering, Biomedical Engineering, Radiology) L. Lacey Knowles (Ecology & Evolutionary Biology) Elizaveta Levina (Statistics) Carolina Lithgow-Bertelloni (Geological Sciences)

#### DeWitt Fund-

Catherine Badgley (Geological Sciences, Paleontology) Susan Brooks (Biomedical Engineering, Molecular & Integrative Physiology) Liliana Cortés-Ortiz (Ecology & Evolutionary Biology)

#### Departmental Transformation Grants-Atmospheric, Oceanic, & Space Sciences Electrical

Biomedical Sciences Chemical Engineering Chemistry Civil & Environmental Engineering Ecology & Evolutionary Biology Mingyan Liu (Electrical Engineering & Computer Science) Rita Loch-Caruso (Environmental Health Sciences) Laura MacLatchy (Anthropology) Janine Maddock (Molecular, Cellular, & Developmental Biology) Anna M. Michalak (Civil & Environmental Engineering. Atmospheric, Oceanic & Space Sciences) Joanna Mirecki Millunchick (Materials Science & Engineering) Kristen Moore (Mathematics) Sayoko Moroi (Ophthalmology & Visual Sciences) Susan Murray (Biostatistics) Laura Olsen (Molecular, Cellular, & Developmental Biology) Geneva Omann (Surgery, Biological Chemistry) Mathilde Peters (Dentistry) Elizabeth Petty (Internal Medicine, Human Genetics) Mary Putman (Astronomy) Rosemary Rochford (Epidemiology) Gabrielle Rudenko (Pharmacology) Melanie Sanford (Chemistry) Donna Shewach (Pharmacology) Ana Sirviente (Naval Architecture & Marine Engineering) Jing Sun (Naval Architecture & Marine Engineering, Electrical Engineering & Computer Science) Michele Swanson (Microbiology & Immunology) Mimi Takami (Internal Medicine) Debra Thompson (Ophthalmology & Visual Sciences, Biological Chemistry) Katsuvo Thornton (Materials Science & Engineering)

Priscilla Tucker (Ecology & Evolutionary Biology) Margaret Wooldridge (Mechanical Engineering)

Julie Kafkalidis (Atmospheric, Oceanic, & Space Sciences) Margaret Liu (Ecology & Evolutionary Biology) Cynthia Marcelo (Surgery) Susan Shore (Molecular & Integrative Physiology, Otolaryngology)

Electrical Engineering & Computer Science Materials Science & Engineering Microbiology & Immunology Molecular, Cellular, & Developmental Biology Naval Architecture Physics Diversity By Design

The University of Michigan, as an equal opportunity/affirmative action employer, complies with all applicable federal and state laws regarding nondiscrimination and affirmative action, including Title IX of the Education Amendments of 1972 and Section 504 of the Rehabilitation Act of 1973. The University of Michigan is committed to a policy of nondiscrimination and equal opportunity for all persons regardless of race, sex\*, color, religion, creed, national origin or ancestry, age, marital status, sexual orientation, disability, or Vietnam-era veteran status in employment, educational programs and activities, and admissions. Inquiries or complaints may be addressed to the Senior Director for Institutional Equity and Title IX/Section 504 Coordinator, Office of Institutional Equity, 2072 Administrative Services Building, Ann Arbor, Michigan 48109-1432, 734-763-0235, TTY 734-647-1388. For other University of Michigan information call T34-764-1817. "Includes gender identity and gender expression

The Regents of the University of Michigan: David A Brandon, Ann Arbor; Laurence B. Deitch, Bingham Farms; Olivia P. Maynard, Goodrich; Rebecca McGowan, Ann Arbor; Andrea Fischer Newman, Ann Arbor; Andrew C. Richner, Grosse Pointe Farms; Katherine E. White, Ann Arbor; Mary Sue Coleman, ex officio.

## Appendix D: Through STRIDE, UM ADVANCE Promotes Gender-Equitable Faculty Recruitment and Assessment

Winter 2006 Newsletter

#### Through STRIDE, U-M ADVANCE Promotes Gender-Equitable Faculty Recruitment and Assessment

**Housed** in IRWG, the University of Michigan's ADVANCE Project (U-M ADVANCE) is dedicated to promoting gender equity in the science and engineering fields. In order to bring about this institutional change, U-M ADVANCE advocates for increased recruitment and retention of women science and engineering faculty.

One of the ways that U-M ADVANCE promotes the recruitment of women faculty in science and engineering at the University of Michigan is through the Strategies and Tactics for Recruiting to Improve Diversity and Excellence (STRIDE) Committee. Established by U-M ADVANCE in 2002, STRIDE is comprised of male and female senior faculty in science and engineering fields. STRIDE members offer peer-to-peer workshops designed to educate and advise faculty and search committees about the need for gender diversity, as



**STRIDE Committee Members** Pamela Raymond, Senior Counselor to the Provost, MCDB Abigail Stewart, Psychology, Women's Samuel Mukasa, Geological Sciences Carol Fierke, Chemistry Anthony England, Electrical Engineering & Computer Science Martha E. Pollack, Electrical Engineering & Computer Science John Vandermeer, Ecology & Evolutionary Mel Hochster, Mathematics Not pictured: Gary Huffnagle, Internal Medicine, Microbiology & Immunology Wayne Jones, Materials Science and

well as strategies to achieve it. Among the strategies that STRIDE espouses is composing search committees that use gender-equitable recruitment and hiring practices. STRIDE members are available to consult with search committee chairs about the formation of search committees. During this process, STRIDE encourages chairs to consider committee members' demonstrated commitment to diversity and excellence, as well as the diversity of potential committee members in terms of gender, race, and sexual orientation.

Another strategy that STRIDE supports is developing an awareness of, and working to eradicate, non-conscious biases against women applicants and faculty. To illustrate how nonconscious biases can manifest in the hiring process, one STRIDE presentation notes that female applicants for orchestral jobs are hired at an increased rate of 25-46% when all applicants, both men and women, audition behind a screen and out of sight of those making hiring decisions. Additionally, the presentation documents non-conscious biases in letters of recommendation; references for women are typically shorter and contain more "doubt-raisers" such as faint praise ("It's amazing how much she's accomplished.") and irrelevant details ("She is close to my wife.").

The pervasiveness of non-conscious bias and the need to address it led to the creation of FASTER: Friends and Allies of STRIDE Toward Equity in Recruiting. Established in 2003, FASTER is comprised of STRIDEtrained senior faculty who focus on eliminating non-conscious bias in both faculty recruitment and assessment. FASTER members engage in critiquing literature on the phenomenon of nonconscious bias, as well as developing STRIDE materials on the topic.

For additional information about STRIDE, including a faculty recruitment handbook, candidate evaluation tools, and pertinent reading lists, see <u>http://</u>sitemaker.umich.edu/advance/STRIDE. Related information about FASTER is available at <u>http://sitemaker.umich.edu/advance/FASTER</u>.



## **U-M ADVANCE Receives**

**U-M ADVANCE** is able to report significant progress in the area of female recruitment in each of the three colleges that employ the largest number of scientists and engineers at the University: Engineering, LSA, and Medicine.

In the three academic years 2003-2005, as a proportion of all science and engineering tenuretrack hires, 34% of all new hires were

U-M ADVANCE a significant institutional

women as compared to 14% in the two academic years 2001–2002, when the ADVANCE project began its work.

These and other data confirm that U-M ADVANCE plays a significant role in the University of Michigan's institutional transformation. This critical role in improving the climate for all faculty is well recognized

U-M

News from

## ADVANCE

## Michigan project gender gap in engineering

### **Funding Through 2011**

by the administration which has pledged to fund U-M ADVANCE through 2011. Currently funded by a five-year NSF grant that ends in 2006, U-M ADVANCE now enjoys the ability to extend and grow its influential programs. To this end,

#### plays role in U-M's transformation.

**U-M ADVANCE** has already begun to cultivate relationships with other educational institutions within Michigan, such as Grand Valley

State University, in order to foster the exchange and development of pedagogical and research resources.

Over the next five years, U-M ADVANCE will continue to work to enrich diversity within the University's science and engineering communities and beyond.

#### Winter 2006 Newsletter

#### **U-M ADVANCE Takes Dramatic Approach** to Recruitment and **Retention of Women Scientists and** Engineers

For three days in June 2005, more than thirty scholars from across the country gathered at the University of Michigan to attend a Summer Institute called "Setting the Stage for Change: Using Theatre to Improve Institutional Climate." The institute was co-sponsored by U-M ADVANCE and the Center for Research on Learning and Teaching (CRLT). Established in 1962, CRLT is dedicated to developing an institutional environment that values teaching as well as diverse learning styles. To further this mission, CRLT created the CRLT Players, an interactive theatre troupe in 2000. In collaboration with U-M ADVANCE, the **CRLT** Players developed three sketches focused on mentoring, faculty hiring, and the tenure review process, based on faculty interviews and focus groups conducted



Director of the CRLT Players, Jeffrey Steiger

at the University of Michigan. The sketches demonstrate the challenges female faculty may encounter in interactions with students or with other faculty and provide a foundation for dialogue about climate and collegiality.

For the 2005 Summer Institute, CRLT Players facilitated discussions for the audience to exchange ideas about the issues raised in the performance. Audience members then participated



Summer Institute Participants

in workshops to learn how to develop this kind of interactive theatre program at their own institutions.

Praised by participants as "more effective than any statistics/graphs," and a rare example of a "forum that would

make it possible for people to speak freely" about gender-related issues in a university setting, the CRLT/U-M ADVANCE co-sponsored Summer Institute was so successful that it will recur in 2006. For additional information, please see http://sitemaker.umich. edu/advance/Summer Institute 2005.

## Appendix E: Transforming Science and Engineering: Advancing Academic Women

#### **Transforming Science and Engineering: Advancing Academic Women**

Abigail J. Stewart, Janet E. Malley, and Danielle LaVaque-Manty, editors University of Michigan Press Forthcoming, 2007

#### Part one: Context

- Analyzing the problem of women in science and engineering: Why do we need institutional transformation? Abigail J. Stewart, Janet E. Malley, and Danielle LaVaque-Manty (University of Michigan
- 2. Transforming the scientific enterprise: An interview with Alice Hogan Danielle LaVaque-Manty (University of Michigan)

#### Part two: Providing institutional support to women scientists and engineers

- Weak links, hot networks, and tacit knowledge Why advancing women requires networking Patricia Rankin, Joyce Nielsen, and Dawn M. Stanley (University of Colorado)
- 4. An institutional approach to establishing professional connections Ruth A. Dyer and Beth A. Montelone (Kansas State University)
- Inter-connected networks for advancement in science and engineering: Theory, practices, and implementation Mary Lynn Realff, Carol Colatrella, and Mary Frank Fox (Georgia Institute of Technology)
- A faculty mentoring program for women: Building collective responsibility for a highly qualified faculty Evelyn Posey, Christine Reimers, and Kelly Andronicos (University of Texas – El Paso)
- 7. Beyond mentoring: A sponsorship program to improve women's success Vita C. Rabinowitz and Virginia Valian (Hunter College and the CUNY Graduate Center)

 Supporting faculty during life transitions Eve A. Riskin, Sheila Edwards Lange, Kate Quinn, Joyce W. Yen, and Suzanne G. Brainard (University of Washington)

#### Part three: Transforming institutional practices

- Faculty recruitment: Mobilizing science and engineering faculty Abigail J. Stewart, Janet E. Malley, and Danielle LaVaque-Manty (University of Michigan)
- 10. Scaling the wall: Helping female faculty in economics achieve tenure Rachel Croson (University of Pennsylvania) and KimMarie McGoldrick (University of Richmond)
- Equity in tenure and promotion: An integrated institutional approach Mary Frank Fox, Carol Colatrella, David McDowell, and Mary Lynn Realff (Georgia Institute of Technology)
- 12. Executive coaching: An effective strategy for faculty development Diana Bilimoria, Margaret M. Hopkins, Deborah A. O'Neil, and Susan R. Perry (Case Western Reserve University)
- Interactive theater: Raising issues about the climate with science faculty Danielle LaVaque-Manty, Jeffrey Steiger, and Abigail J. Stewart (University of Michigan)

#### Part four: Learning from change

- 14. Creating a productive and inclusive academic work environmentC. Greer Jordan and Diana Bilimoria (Case Western Reserve University)
- 15. Advancing women science faculty in a small Hispanic undergraduate institution Idalia Ramos and Sara Benítez (University of Puerto Rico – Humacao)
- 16. Gender equity as institutional transformation: the pivotal role of "organizational catalysts" Susan Sturm (Columbia University)

- Institutionalization, sustainability, and repeatability of ADVANCE for institutional transformation Sue V. Rosser and Jean-Lou Chameau (Georgia Tech)
- 18. Measuring outcomes: Intermediate indicators of institutional transformation Lisa M. Frehill (New Mexico State University), Cecily Jeser-Cannavale (New Mexico State University), and Janet E. Malley (University of Michigan)
- 19. Maximizing Impact: Low Cost Transformations Lee Harle (National Science Foundation)

Appendix: Online resources

## Appendix F: Schedule of National Panels and Programs

Schedule of National Panels and Programs Winter 2007

1. American Council on Education (ACE) – Feb. 11, 2007 Washington, D.C.

Transforming Academic Science and Engineering, Advancing Women Faculty<br/>Panelists:Abigail J. Stewart (University of Michigan)<br/>Alice Hogan (National Science Foundation)<br/>Susan Sturm (Columbia)<br/>Diana Bilimoria (Case Western Reserve University)<br/>Vita Rabinowitz (Hunter College)

2. American Association for the Advancement of Science (AAAS) – Feb. 17, 2007 San Francisco

Sustaining Institutional Change Without External Funding: Is It Possible?Panelists:Suzanne Gage Brainard (University of Washington)Ana Mari Cauce(University of Washington)Sue Rosser(Georgia Institute of Technology)Abigail J. Stewart(University of Michigan)Wanda E. Ward(National Science Foundation)

 American Educational Research Association (AERA) – April 9-13 Chicago

Advancing Women in Science and Engineering

Panelists:

Abigail J. Stewart	(University of Michigan)	
Ruth Dyer	(Kansas State University)	
Beth Montelone	(Kansas State University)	
Diana Bilimoria	(Case Western Reserve University)	
Danielle LaVaque-Manty (University of Michigan)		
Janet E. Malley	(University of Michigan)	

4. American Philosophical Association (APA) – April 21 Chicago

Why Are Women Only 21% of Philosophy? Chair: Rosemarie Tong (UNC, Charlotte) Sharon Crasnow (Riverside Community College) Sally Haslanger (MIT) Elizabeth Minnich (AAC&I) Abigail Stewart (University of Michigan) Appendix G: "Gender and Race in the Science Professions: Strategies for Remedying Leaky and Dry Pipelines" Victoria Sork

## "Gender and Race in the Science Professions: Strategies for Remedying Leaky and Dry Pipelines"

## **Victoria Sork**

Professor Department of Ecology and Evolutionary Biology and Institute of the Environment University of California, Los Angeles



#### Wednesday, November 8, 2006 1:00 – 2:00 PM Rackham Assembly Hall

Dr. Sork's research examines contemporary and historical gene flow in plant populations from both an evolutionary and conservation perspective. Using molecular markers and novel statistical approaches, she has shown contemporary gene movement results in a much more restricted local neighborhood than previously thought. Recently, she has been funded by the National Science Foundation to study pollen movement and seed movement in California valley oak (*Quercus lobata*), a species threatened by human disturbance and population decline. In collaboration with Peter Smouse from Rugters, the have developed a new approach to the study of

contemporary gene movement that can be applied to many study systems. A separate thrust of her work is landscape and geographical genetics. Her laboratory includes projects on California oaks and a parallel study of the epiphytic lace lichen, *Ramalina menziesiii*, which uses oaks as host trees. Dr. Sork has applied her work to a range of conservation topics, including landscape fragmentation and design of reserve networks.

Throughout her career, Dr. Sork has been involved in issues of gender and race equity in academe. While a graduate student at Michigan and as a faculty member, she has participated in Women's Studies and has been engaged in activities related to the recruitment, retention, and climate of faculty in under-represented groups in the sciences.

Dr. Sork received her Ph.D. from the University of Michigan and her B.S. from the University of California, Irvine.

#### For more information, call (734) 647-9359.

NSF ADVANCE at the University of Michigan Institute for Research on Women and Gender University of Michigan, Ann Arbor, MI 48109-1290 <u>http://www.umich.edu/~advproj</u>

Co-sponsored by the Cantor Seminar jointly sponsored by the Rackham School of Graduate Studies and the Provost's Office; Ecology and Evolutionary Biology; and the UM ADVANCE Project

### Appendix H: "Women Scientists in the U.S., 1840-1960" Vera Rubin

## "Women Scientists in the U.S., 1840-1960"

## Vera Rubin

Senior Fellow, Department of Terrestrial Magnetism Carnegie Institution of Washington



#### Tuesday, November 14, 2006 4:00 PM Michigan League—Michigan Room (Second Floor)

Vera Rubin is preeminent in studying the motions of galaxies. Her pioneering studies of deviations of galaxy motions from classic Hubble theory demonstrated that large scale structure existed in the universe. Her discovery that most of the universe is unseen dark matter derived from her exploration of the rotation of spiral galaxies. By example and gentle voice she has championed equal rights and revealed the incredible beauty of the universe.

Dr. Rubin received her Ph.D. from Georgetown University, her M.S. from Cornell University and her B.S. from Vassar College. She also carries honorary Doctors of Science degrees from numerous universities, including Harvard, Yale, Smith and Grinnell.

#### For more information, call (734) 647-9359.

NSF ADVANCE at the University of Michigan Institute for Research on Women and Gender University of Michigan, Ann Arbor, MI 48109-1290 <u>http://www.umich.edu/~advproj</u>

Co-sponsored by the Cantor Seminar jointly sponsored by the Rackham School of Graduate Studies and the Provost's Office; Department of Astronomy; Women in Science and Engineering (WISE) Program; and the UM ADVANCE Project

## Appendix I: List of Degrees Considered Science Degrees

#### List of Degrees of Faculty Included/Excluded as Scientists for the 6 Additional Schools.

The following tables list all fields of degrees of instructional (tenure), research and clinical track faculty with budgeted appointments in these schools. Faculty holding degrees listed in the "Include" column were deemed scientists; those holding degrees in the "exclude" column were deemed non-scientists for our purposes (and not included in any tables or figures). Those holding degrees in the "individualized" column were looked at on an individual level: their current field of research, as reflected by recent publications and website descriptions, determined their status as scientists or nonscientists.

Include	Exclude	Individualized
Anatomy	Anthropology	Public Health
Biochemistry	Business Administration	
Bioengineering & Biomedical	Education	
Engineering	Medical Record Librarianship	
Biology	Psychology	
Biometrics And Biostatistics		
Chemical Engineering		
Dental Hygiene		
Dental Specialties		
Dentistry Dds Or Dmd Degree		
Genetics		
Materials Engineering		
Medicine Md Degree		
Microbiology		
Neurosciences		
Pathology		
Physical Sciences		
Physiology		

#### School of Information:

School of Dentistry:

Include	Exclude	Individualized
Computer & Information	Economics	Information
Science	Business Administration & Law	Sciences &
Computer And Data Processing	Business Management	Systems
Elect & Communication Eng	Communications	
	History	
	Library Science	
	Philosophy	
	Political Science & Government	
	Psychology	
	Social Sciences	

#### Division of Kinesiology:

Include	Exclude	Individualized
Bioengrg & Biomedical Eng	Business Administration	Physical
Engineering	Economics	Education
Neurosciences	Education	
Physiology	Experimental Psychology	
Stats, Math & Theory	Marketing And Purchasing	

School of Natural Resources:

Include	Exclude	Individualized
Agriculture & Natural Resource	Agricultural Economics	
Biology	Anthropology	
<b>Biometrics And Biostatistics</b>	Business Management	
Chemical Engineering	City, Community & Regional Planning	
Ecology	Economics	
Environmental Science	Educational Psychology	
Forestry	Fine Arts	
Marine Biology	Fish, Game & Wildlife Management	
Natural Resources	Geography	
Oceanography	International Business	
Plant Physiology	Landscape Architecture	
Zoology	Law	
	Political Science & Government	
	Public Administration & Management	
	Sociology	

#### College of Pharmacy:

Include	Exclude	Individualized
Biochemistry	Education	Health Serv &
Biophysics		Paramedical Tech
Cell Biology		
Chemistry		
Pharmaceutical Chemistry		
Pharmacy		
Physical Chemistry		
Physical Therapy		

#### School of Public Health:

Include	Exclude	Individualized
Analytical Chemistry	Anthropology	Environmental
Atmospheric Sci	Business Administration	Health
& Meteorology	Clinical Psychology	Health
Biochemistry	Developmental Psychology	Professions
Biological Sciences	Economics	Public Health
<b>Biometrics And Biostatistics</b>	Educational Psychology	
Cell Biology	Geography	
Chemistry	Health Education	
Civil & Construction Engineering	Hospital & Health Care Admin	
Dentistry Dds Or Dmd Degree	Law	
Ecology	Political Science &	
Foods, Nutrition And Dietetics	Government	
Genetics	Psychology	
Geochemistry	Social Psychology	
Medical Specialties	Sociology	
Medicine Md Degree	Urban Studies	
Microbiology		
Molecular Biology		
Nutrition		
Physics		
Physiology		
Stats, Math & Theory		

Toxicology	
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