

---

**West Virginia University**  
**Program for Retaining Institutional Diversity and Equity**  
**(WVU PRIDE)**

---

**Project Summary:** West Virginia University (WVU) is strongly committed to diversity and gender equity, realizing that the development of a more diverse, and representative, STEM workforce benefits all the institution's stakeholders. As the only institution classified by the Carnegie Foundation as doctoral granting, Research High in WV, the university occupies a unique position within the state. Although WVU has had recent success in recruiting new female assistant professors, women are not being *retained* and *promoted* in the STEM fields. Therefore, this project aims to provide the policies and support to retain and promote women through the ranks at WVU, thus developing a strong network of female faculty and laying a foundation for further diversification of the faculty, in accordance with PI President Clements' stated vision for the institution. WVU seeks to transform the organization by developing a sense of interdependence and collective efficacy based on a social psychological approach. The approach retains flexibility, engages multiple parties as change agents, remains somewhat independent from university administration, fosters a sense of accountability toward constituent groups, and promotes a sense of urgency and teamwork toward attaining institutional transformation.

Specifically, the program's aims are to (1) *Make direct connections between individuals and the policies and practices of WVU.* (2) *Recruit, retain, and promote more women science and engineering faculty in the Eberly College of Arts & Sciences (ECAS) and the College of Engineering and Mineral Resources (CEMR) at WVU.* (3) *Engage faculty from departments and disciplines throughout the university in a dialogical change process that promotes collective engagement in institutional transformation and the achievement of gender-equity and diversity goals.* The *expected outcomes* are: (1) development of a replicable, cost effective, and efficient methodology to promote institution-wide change, (2) improvement of specific climate issues identified by male and female faculty, (3) significant increase in the percentage of women faculty at WVU compared to the national pool of women earning Ph.D.s in science and engineering, and (4) significant improvement in the advancement of female faculty to associate, full professors, and key administrative roles.

**Intellectual Merit:** Departmental interactions have been identified as a critical influence on women's job satisfaction and intention to quit and, therefore, as a key area for ADVANCE projects to focus their innovations and research. Overall, there is a critical need for effective mechanisms to assess where groups are in their engagement with diversity issues, apply the appropriate tools and motivation to help them move forward, and effectively connect department level processes with those at the administrative level. The WVU PRIDE project is therefore significant because it develops an approach to enable change agents to identify a group's readiness for transformation, facilitates group goal development, and provides a mechanism for implementing responsive institutional level policies.

**Broader Impacts:** The project adapts and implements a well-established method for *enhancing communication* to the academy--where change has been documented as slow and labor intensive. The *improved measure of consensus* can be used to accurately compare climate survey results across all ADVANCE institutions and also impact a variety of research studies in multiple fields. In addition to climate transformation at WVU, the department level research and improved measure of consensus will move forward fields concerned with group processes and organization change. The WVU PRIDE method for promoting institutional change is expected to be widely disseminated and applied to two-year, four-year, and research institutions that seek to adapt to the current academic environment, thus furthering the goals of the NSF ADVANCE program.

## TABLE OF CONTENTS

---

For font size and page formatting specifications, see GPG section II.B.2.

	<b>Total No. of Pages</b>	<b>Page No.* (Optional)*</b>
Cover Sheet for Proposal to the National Science Foundation		
Project Summary (not to exceed 1 page)	1	_____
Table of Contents	1	_____
Project Description (Including Results from Prior NSF Support) (not to exceed 15 pages) <b>(Exceed only if allowed by a specific program announcement/solicitation or if approved in advance by the appropriate NSF Assistant Director or designee)</b>	15	_____
References Cited	4	_____
Biographical Sketches (Not to exceed 2 pages each)	24	_____
Budget (Plus up to 3 pages of budget justification)	9	_____
Current and Pending Support	6	_____
Facilities, Equipment and Other Resources	1	_____
Special Information/Supplementary Documentation	25	_____
Appendix (List below. ) <b>(Include only if allowed by a specific program announcement/ solicitation or if approved in advance by the appropriate NSF Assistant Director or designee)</b>	_____	_____
Appendix Items:		

\*Proposers may select any numbering mechanism for the proposal. The entire proposal however, must be paginated. Complete both columns only if the proposal is numbered consecutively.

---

## **B. Project Description**

### **1. Introduction**

Effective recruitment, retention, and advancement of women faculty in science, technology, engineering, and mathematics (STEM) remains a challenge because of the complex set of barriers women still face. Although representation of women is improving in life sciences and a few other fields, they remain significantly underrepresented and primarily in the lower academic ranks. This is attributable to a combination of factors that include the institutional environment, an unconscious bias that prevents advancement of women, and the false perception that advancement for women comes at a cost for men. West Virginia University (WVU) is strongly committed to diversity and gender equity, realizing that the development of a more diverse and representative STEM workforce benefits all stakeholders. The institution also realizes that success in this endeavor requires a systemic approach to maintain, let alone increase, the representation and career advancement of women in the STEM academy. Despite our commitment and efforts to this end, comparing the percent of doctoral degrees awarded to women in the STEM fields with the percent employed in those fields at WVU reveals that we need to implement new strategies if we are to achieve our STEM diversity goals, particularly advancing women to upper ranks.

Based on 2006 data (the most recent national data available), we found that only 21.8% of STEM tenure-track faculty in the Eberly College of Arts and Sciences (ECAS) were female. This compares to 44.3% of the degrees awarded to women in these fields nationally. Further, only 5.3% of our College of Engineering and Mineral Resources (CEMR) tenure-track faculty were female compared to 20% of engineering doctoral degrees awarded to women nationally. Although improvements have been made since 2006, the WVU Program for Retaining Institutional Diversity and Equity (WVU PRIDE) is an *institution-wide concerted program* that must be implemented in order to realize our full potential and positively contribute to the diversification of academe in the United States.

Our *long term goal* is to ensure the success of all faculty members by creating a diverse scientific community within WVU that supports constructive interactions leading to professional and personal development. Our *specific goal* for this program is to transform the WVU organization by developing a sense of interdependence and collective efficacy based on a social psychological approach. Raising awareness of the nature of the problems facing women in STEM fields is a necessary but not sufficient condition for sustained organizational change. We are therefore implementing *a multi-level, time effective means to assess, engage, and support change efforts at the department level and integrate department identified needs into institutional level change*. Our approach retains flexibility, engages multiple parties as change agents, remains somewhat independent from university administration, fosters a sense of accountability toward constituent groups, and promotes a sense of urgency and teamwork toward attaining institutional transformation. Our strategy is based on: (1) a comprehensive analysis of the WVU climate, (2) innovative research in the field of social psychology, and (3) a review of successful programming at ADVANCE institutions and peer publications in the literature.

WVU recently selected our 23<sup>rd</sup> President, Dr. James P. Clements (PI), and a new Provost, Dr. Michele G. Wheatly (to begin 1/1/10), who have over 55 years of combined higher education experience. President Clements led transformative efforts to improve minority enrollments as Provost at Towson State University. As the Dean of Science, Provost Wheatly championed changes at Wright State University to strengthen representation from underrepresented and disabled individuals in her college and across the university. Both have publicly expressed their commitment to an aggressive strategic plan to transform WVU to better reflect the diversity of the global society in which we now live. This commitment, coupled with an ADVANCE award, places WVU in the strongest possible position for successful institutional transformation over the next five years. WVU PRIDE combines this strong leadership with faculty experts in such relevant fields as—social psychology, sociology, women’s studies, mathematics, biology, engineering, social work, and public administration to provide the necessary team to lead and implement a program of change. Research by this team has identified the norms and practices that tend to exclude women at WVU. Our *objectives* to overcome these barriers include:

(1) *We aim to make direct connections between individuals and the policies and practices of WVU.* Establish the WVU PRIDE center to promote, sustain, and assess institutional policies and practices that will enhance the environment for women faculty.

(2) *We aim to recruit, retain, and promote more women science and engineering faculty in the Eberly College of Arts & Sciences (ECAS) and the College of Engineering and Mineral Resources (CEMR) at WVU.* Implement recruitment strategies, mentoring models, training regarding promotion and tenure, and training in leadership to prepare junior faculty for advancement to administrative roles in their careers.

(3) *We aim to engage faculty from departments and disciplines throughout the university in a dialogical change process that promotes collective engagement in institutional transformation and the achievement of gender-equity and diversity goals.* Introduce, facilitate, and assess a dialogical process that promotes collective engagement at the department level.

Our *expected outcomes* are: (1) development of a replicable, cost effective, and efficient methodology to promote institution-wide change, (2) improvement of specific climate issues identified by male and female faculty through our climate and exit survey instruments, (3) significant increase in the percentage of women faculty at WVU compared to the national pool of women earning Ph.D.s in science and engineering, and (4) significant improvement in the advancement of assistant female faculty to associate, full professors, and key administrative roles on campus. In addition to climate transformation at WVU, our social psychological research and an improved measure of consensus will move forward any field concerned with group processes and organization change. Our method to promote institutional change is expected to be widely disseminated and applied to two-year, four-year, and research institutions that seek to adapt to the current academic environment, thus furthering the goals of the NSF ADVANCE program.

***Significance of Our Objectives.*** According to Sturm (2006), the ADVANCE project exemplifies an approach to achieving inclusive climates through institutional citizenship, organizational catalysts, and institutional intermediaries. Perceptions of climate are critically important determinants of women scientists' overall job satisfaction (Settles et al., 2006; Wachs and Nemiro, 2007). Unfortunately, departmental climate, particularly interactions with colleagues, remains an area wherein women continue to feel somewhat excluded (Committee on Gender Differences, CWSEM and NRC, 2009). This conclusion was echoed at a recent meeting of ADVANCE PIs where attendees identified the department as a key area for future interventions (June, 2009). Therefore, there is a critical need to develop strategies that can facilitate energy for change and promote respectful relationships among immediate colleagues, while providing an avenue for institution-wide impact. *Our project is significant because it develops an approach to enable change agents to identify a group's readiness for transformation, facilitates group goal development, and provides a mechanism for implementing responsive institutional level policies.* Similar to other ADVANCE programs, such as Utah State University, the University of Rhode Island, Iowa State University, and the University of Washington, our central approach is a *departmental level program* to promote faculty engagement.

*In an effort to contribute to the ADVANCE knowledge base, and not simply repeat what has already been accomplished, we address several challenges and recommendations from the aforementioned ADVANCE programs' final and annual reports, as well as peer reviewed publications.* We propose an *innovative five-year* departmental level program, which will sequentially target *all* nine ECAS STEM departments and *all* seven CEMR departments at a rate of *four per year*. We adapt and implement a well-established method for *enhancing communication* to serve a new population where change has been documented as slow and labor intensive – the academy. In addition, we develop an improved measure of consensus that can not only be used to accurately compare climate survey results across all ADVANCE institutions, but also impact a variety of research studies in multiple fields.

## 2. Institutional Context & Data

**Transformational Leadership.** On June 30, 2009, WVU welcomed James P. Clements as its 23rd president. President Clements has a record of leadership in successfully increasing the diversity of Towson State University, as its Provost. Two of President Clements' top five goals are to: 1) lower faculty workload by adding 100 new faculty lines by 2012 and 2) diversify the campus (Clements, 2009). Thus, the goals of the WVU PRIDE program support Clements' stated mission for the university (see LOC). In addition, WVU recently named Dr. Michele Wheatly as our new Provost, effective January 1, 2010. Provost Wheatly has a demonstrated record of commitment to social justice and diversity. As the Dean of Science at Wright State University, she was the PI for their successful ADVANCE award, and she has worked on multiple projects to enhance campus accessibility for persons with disabilities. President Clements and incoming Provost Wheatly recognize diversifying the campus and lowering faculty workload are essential to enable the institution to excel. Their leadership complements the expertise assembled in the working group that, with institutional support, has developed the WVU PRIDE program over the last two years.

**The WVU STEM Environment.** WVU was founded in 1867 and is the flagship land-grant, doctoral degree-granting research university in WV. Today, WVU consists of 15 colleges and schools offering 185 bachelors, masters, doctoral, and professional degree programs to approximately 30,000 students. As the only WV institution classified by the Carnegie Foundation as doctoral granting, Research High, the university occupies a unique position within the state. In 2008, WVU graduated 3,790 bachelors (51% female) and 204 doctoral students (48% female). The science and engineering departments at WVU are concentrated in two colleges: Eberly College of Arts and Sciences (ECAS), and College of Engineering and Mineral Resources (CEMR) (see Table 1). In 2008, 15% of ECAS and CEMR STEM bachelor degree recipients were female and 29% STEM doctoral degree recipients were female.

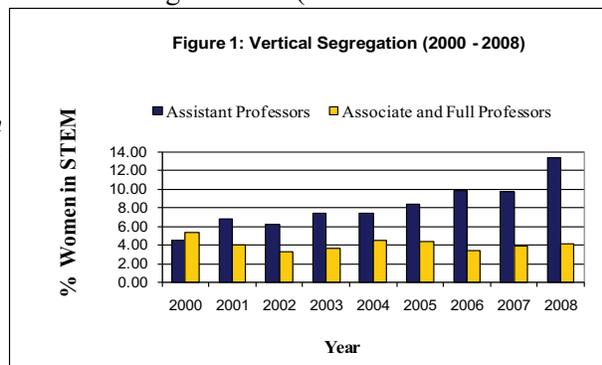
<b>CEMR</b>	Chemical Engineering, Civil & Environmental Engineering, Computer & Electrical Engineering, Industrial & Management Systems Engineering, Mechanical & Aerospace Engineering, Mining Engineering, Petroleum & Natural Gas Engineering
<b>ECAS</b>	Biology, Chemistry, Geology/Geography, Mathematics, Physics, Political Science, Psychology, Sociology, Statistics

As can be seen in Table 2, female faculty representation by rank is disproportionately greater at the assistant professor level. Based on an examination of women faculty by rank in STEM departments and the attrition rates of faculty by gender, it is apparent there is considerable variation in the success of recruiting and retaining women. Faculty search data from 2008 and 2009 (see Table 3) indicate that both CEMR and ECAS Stem departments are interviewing and gaining acceptances from female candidates in greater proportions than found in the applicant pools.

Academic Discipline	Women			Men			Women as % of Rank		
	Full	Assoc	Assist	Full	Assoc	Assist	Full	Assoc	Assist
Geology/Geography	1	2	1	11	5	3	8%	29%	25%
Engineering	0	4	5	59	19	21	0%	17%	19%
Biology	0	0	6	4	5	3	0%	0%	67%
Mathematics/Statistics	0	2	5	14	5	3	0%	29%	63%
Physics/Chemistry	1	1	3	16	6	7	6%	14%	30%
Psychology	2	2	7	7	1	1	22%	67%	88%
Sociology/Political Science	0	2	8	7	6	4	0%	25%	67%
<b>Total</b>	4	13	35	118	47	42	3%	22%	45%

<b>Table 3. Faculty Search Data (% Female)</b>					
<b>CEMR</b>	<b>2007/2008</b>	<b>2008/2009</b>	<b>ECAS</b>	<b>2007/2008</b>	<b>2008/2009</b>
Pool	10.2%	12.7%	Pool	20.3%	25.2%
Interviews	27.8%	35.3%	Interviews	43.1%	34.0%
Acceptance	40.0%	36.4%	Acceptance	35.7%	36.4%

The representation of women in the STEM departments is more segregated at WVU than nationally. Figure 1 exhibits the vertical segregation—the extent to which men and women are in different ranked occupational groupings (Frehill, 2006). It is apparent that although the percentage of women in STEM has increased, the percentage of women in the higher ranks (associate and full professor) has actually declined. Following discussion with the respective college chairs and deans, we have developed a strategy that will address a variety of departmental barriers. *Although we seek to recruit, retain, and promote more women science and engineering faculty overall, one of our highest priorities is to increase the advancement of assistant professors to the associate and full professoriate (see Aim 2).*



**Current & Past Activities Related to WVU PRIDE.** The WVU PRIDE program was developed

following a thorough analysis of WVU's institutional context, the WVU climate, an extensive review of all 37 previous ADVANCE awards, interviews with a subset of ADVANCE institutions, review of the published literature, and extensive discussions on the WVU campus between department chairs, faculty, college deans, and WVU administrators. Key details of our climate surveys and findings follow:

- 1) Collaborative on Academic Careers in Higher Education (COACHE) Survey:** Harvard Graduate School of Education developed *survey of tenure-track junior faculty* (administered to WVU faculty in Fall 2008). The overall WVU response rate was 55%, whereas our selected peer rate was 54%. The response rate for the ADVANCE colleges was 59.1% for CEMR and 60.4% for ECAS.
- 2) Internal Climate Survey:** Modified Jacobs, Bergen, and Korn (2000) survey of *pre-tenured, tenured, and non-tenure track faculty* (administered to WVU faculty in Spring 2009). The overall response rate was 44%. The response rate for the ADVANCE colleges was 28% for CEMR and 56% for ECAS.
- 3) Exit Survey:** Modified Yale University Women Faculty Forum survey (Kavathas, LaFrance, and Benhabib). The survey was administered in Summer 2009 and had an overall response rate of 41.3%.

Through these surveys, we identified the following *faculty concerns*: 1) female faculty are less positive about climate issues related to gender than male faculty, 2) high workload was cited as the number one problem by female faculty, 3) need for balance between work and personal lives, including parental leave and hiring assistance for dual career couples, 4) female faculty seek more informal networking opportunities and formal mentoring programs, and 5) faculty perceived a lack of leadership at WVU on climate issues. Additionally, faculty identified the following *institutional strengths*: 1) collegiality, 2) collaborating with colleagues, 3) academic freedom, 4) a sense of fit or belonging at WVU, and 5) clarity of the promotion and tenure process (P&T).

**Policies & Programs:**

**Institutional Initiatives to Mentor Faculty.** WVU has provided faculty with mentorship in the grant writing process via a one day workshop offered by the Grant Writers' Seminars and Workshops, LLC. (GWSW). Faculty can also apply to receive individual mentorship from GWSW regarding their specific grant proposals over a six month period. The WVU Research Corporation also offers external proposal review and mentorship from senior WVU faculty with a track record of grant writing success.

**Institutional Initiatives to Diversify the Faculty.** WVU has shown dedication to recruiting racial minorities through its “Special Initiative to Recruit Minority Faculty.” The program provides hiring incentives to ensure competitive start up packages. WVU has also recently started a Dual Career Office

to aid in finding jobs for new faculty spouses as a first step to address this significant recruitment challenge.

***Institutional Initiatives to Support Families.*** Several child care options are provided on the WVU campus, including: 1) a newly constructed WVU Child Learning Center, 2) Student Recreational Center, which offers limited, free drop-in childcare for members, and 3) the nursery school. In addition, WVU offers a Child Care Assistance Program to help offset the costs associated with child care and a pre-tax Dependent Care Flexible Spending Account. WVU also offers multiple programs for young children through its Community Arts and Motor Development Programs. At various locations across the campus lactation rooms have been provided to assist new mothers. Institutional groups, such as the Council for Women's Concerns and the Welfare Committee of the Faculty Senate, are working with the president's office, provost's office, and state legislators to provide paid parental leave for all faculty and a one-semester release from teaching responsibilities for faculty in tenure lines. Further, WVU provides flexible guidelines for extending the tenure clock wherein faculty may request a one year extension of her/his tenure clock within one year of a birth/adoption, with a maximum of three extensions for three qualifying events.

***Processes to Clarify P&T and Support Faculty.*** The WVU, ECAS, and CEMR administrations have sought to provide clear guidelines regarding the requirements and procedures for faculty tenure and promotion, which are shared annually with the faculty. The approach includes clear, detailed offer letters, a yearly rating review in research, teaching, and service, and an extensive fourth year review. This process facilitates and encourages communication between faculty and administrators regarding expectations and available support to address areas of concern.

***Existing social justice oriented offices.*** The President's Office for Social Justice sponsors several important groups, such as, the Council for Women's Concerns, the Social Justice Council, and the Council on Sexual Orientation. Additionally, WVU's Center for Women's Studies will celebrate its 30th anniversary in 2010. Co-PI Jackson was hired into a tenure track faculty position to strengthen connections between the Center and the STEM fields. Further, Dr. Debra Rolison, Section Head, Advanced Electrochemical Materials, Naval Research Laboratory, and Dr. Patricia Galloway, Chief Executive Officer and Principal, Pegasus Global Holdings, Inc., are two of the Center's recent Resident Scholars who delivered lectures and spoke to classes on issues facing women in STEM. In addition, the Center annually recognizes an outstanding female math student with the Showalter Award.

### **3. Institutional Commitment and Sustainability**

***Pre-Award Institutional Commitment.*** Faculty and administrators developed the WVU PRIDE program over an 18month period. The COACHE survey was supported at a cost of \$20,000. Further, with the assistance of a \$50,000 ECAS grant award, we conducted exit surveys of former tenure-track faculty, studied all 37 current ADVANCE awardees original proposals (including a subset of annual and final reports), and conducted multiple discussions across campus. We also conducted conference calls with Virginia Valian from Hunter College, Ronda Callister from Utah State, Sharon Bird and Bonnie Bowen from Iowa State University, and Barbara Silver from University of Rhode Island. Support was also provided to host Phoebe LeBoy, National President, Association for Women in Science (AWIS), and Geraldine Richmond, Richard M. and Patricia H. Noyes Professor of Chemistry, University of Oregon on campus for distinguished lectures on women in science, to network with women faculty, and to provide a COACH leadership workshop.

***Post-Award Institutional Commitment & Sustainability.*** In order to sustain our efforts, PI President Clements has agreed to support the following components of WVU PRIDE after the grant period: establish a permanent office for the Center for Faculty Equity, permanently fund the Executive Director for Faculty Diversity and Development, expand the WVU ADVANCE network regionally, institutionalize diversity data collection, institutionalize salary/resource, climate, and exit surveys, institutionalize gender policy review, and perform a state-wide gender policy impact study.

Second, WVU has developed a Women in Science and Engineering (WiSE) giving circle designed to bring together alumni who seek to make a difference in the STEM fields by encouraging and mentoring young women (e.g., Arizona State University, Iowa State University, Oregon State University,

Purdue University, and Wright State University). This collaborative effort will support faculty initiatives and student scholarships. Endowed funds from the giving circle will provide *Emerging Leader Associate awards* to female STEM faculty in order to finance a portion of their efforts.

#### 4. Transformational Activities

***Lessons Learned from the Literature and Prior ADVANCE Awards.*** The MIT report (1999) documented gender bias at one of the nation's top institutions. Women faculty were positive early in their careers, but their marginalization increased as they progressed in their careers, due in part to inequitable resource allocation, lower salaries, and lack of inclusion in positions of power, among other issues. Female faculty did not realize the systematic nature of this bias until they began to communicate about their experiences (MIT, 1999). ADVANCE was established to foster institutional level commitment to equity and diversity, and positively impact climate for both male and female faculty (LaVaque-Manty, 2007; Sturm, 2006). In 2005, the continued barriers facing women became apparent when Harvard president Lawrence Summers attributed the continued lack of women in high level positions in STEM fields in part to intrinsic difference in ability between the sexes. The National Academies commissioned the *Beyond Bias and Barriers* report (2007), whose authors thoroughly and systematically reviewed the extant literature on women in science and engineering. Their conclusions echoed the earlier MIT Report that women's careers were impeded by an accumulation of small disadvantages at each stage of their careers and that institutional level transformation efforts would be required.

A more recent survey of women at the nation's major research universities indicates positive impacts of the ADVANCE program and other interventions (i.e., major research universities are allocating resources evenly to recent hires) (Committee on Gender Differences et al., 2009). Yet, in some disciplines, women are less likely to apply to tenure track positions, have higher attrition before tenure, have difficulty forming effective networks and collaborations with colleagues (Committee on Gender Differences et al., 2009), are discouraged by negative climates (Settles et al., 2006; Wachs and Nemiro, 2007), and are not developing the entrepreneurship and patenting skills that are increasingly important (Ding, Murray, and Stuart et. al., 2006; Rosa and Dawson, 2006; Rosser 2008). Thus, it can be reasonably concluded that though women have progressed, this progress is at a critical stage and it is imperative to continue to engage male and female faculty and administrators with the relevant issues to continue to enhance women's gains.

Departmental interactions are a critical influence on women's job satisfaction and intention to quit. Callister (2006) found that the relationship between women faculty's greater dissatisfaction and higher intentions to quit was mediated by departmental climate, indicating women faculty place a high value on positive relationships and interactions with colleagues. Etzkowitz, Kemelgor and Uzzi (2000) found that women were more successful in "Relational Departments with a collegial and cooperative atmosphere that provide the safety to take the risks necessary for innovative work and the collaborations necessary for networking" (181). They linked personal transformation with organizational change, particularly when "[...] an individual male, with a key role in the power structure, acquires feminist values (181)." Further, high teaching and service workloads impede informal networking opportunities (Wachs and Nemiro, 2007). Tools to assess and mediate department level relationships are a critical component of the WVU PRIDE program.

Progress for women in STEM depends on male and female engagement from faculty and administrators. Developing trust and open communication is particularly important in addressing gender-based discrimination where advances for women might be perceived as a threat to men's status. According to Child (2005), people resist change when it threatens their interests and change often fails because people do not clearly communicate among themselves the type of desired change. Kalev, Dobbin, and Kelly (2006) found that organizational level change which involved establishing responsibility and administrative structures were most effective at meeting affirmative action goals and promoting diversity; these structures enhanced the effectiveness of other programming such as mentoring and training on gender bias in evaluations. Further, change efforts function most effectively through "[...] networks of people, not through the actions of one individual, and through the alteration of ongoing operations, rather than the introduction of different actors playing the same roles (Guinier and Minow, 2007:269)." Thus,

there is a critical need for effective mechanisms to assess where groups are in their engagement with diversity issues, apply the appropriate tools and motivation to help them move forward, and effectively connect department level processes with those at the administrative level.

Several ADVANCE programs have implemented programming to address these needs, including Utah State's Dual Agenda program, the University of Michigan's STRIDE program, the University of Rhode Island's Transtheoretical Model, the University of Washington's Cross Departmental Cultural Change Program (CDCCP), and Iowa State University's Collaborative Transformation (CT) project. The Transtheoretical Model focuses on assessing an individuals' readiness for change (e.g., self-efficacy), rather than group-level processes (e.g., collective efficacy and interdependence). It also uses survey instruments and the authors note that faculty not committed to advancing women are less likely to participate, but are among those who are most in need of assessment in order for change efforts to succeed (Prochaska et al., 2006). The Rhode Island project used Appreciative Inquiry to integrate individual's personal experiences with department level processes. The project team identified group dynamics and the interactional level of shared expectations as the focal point for change efforts (Silver et al., 2007). These elements are a focus of our departmental change effort.

Utah State's Dual Agenda Approach focuses on the department level with the aim of enhancing gender equity and work effectiveness by improving work/personal life integration (Feng et al., 2005). The program has been effective at encouraging department level change and avoiding backlash, but is time intensive (Utah State University, 2005; 2006). Callister's (2006) Utah State “[...] findings suggest an even stronger imperative for universities to focus on improving department climates if universities wish to retain female faculty in underrepresented fields such as science and engineering” because of the higher impact of climate on female retention.

Michigan's STRIDE program employs “organizational catalysts”—people who are generally upper level administrators and well-respected senior faculty who review the social science literature on gender and diversity issues and then advocate for women's progress at multiple levels across the university (Sturm, 2006; 2007). Though this is a promising change strategy, to be effective the programs must be flexible and responsive to faculty needs and avoid the risks of role substitution (relying on the position itself instead of researching the issues to develop an effective plan), over centralization (reliance on top down mandates and on a single individual), and bureaucratization (Sturm 2006; 2007).

The University of Washington's Program (CDCCP) provides a mechanism to bring together chairs and supportive or neutral, but non-resistant, faculty and to enhance personal awareness and relationships. The CDCCP's success highlights the need for tools to assess readiness for change and to tailor the message to a department's readiness level. The program avoids “blaming” those who are not ready for change and instead focuses on successful change agents who then attract other participants (Yen and Loving, 2005). The authors note that a long term investment is required for success: after one year, the department level projects were just beginning and the program was unfortunately terminated early (University of Washington, 2008).

Iowa State University's CT project involves social science researchers working with faculty from nine STEM departments to “mirror back” to faculty in each participating department positive and negative aspects of their own workplace climate and of their department's recruitment, retention and promotion practices. Ultimately, the program aims to develop assessment tools for university leaders, such as department chairs, to use in improving workplace climate and faculty recruitment, retention, and promotion (Bird and Hamrick, 2008). The researchers again note the time intensive nature of the intervention—although the social science researchers were prepared for this, the STEM faculty ADVANCE professors were not. Thus, developing clear protocols and expectations is vital for the success of these efforts (Iowa State University, 2007; 2008). *In conclusion, based on relevant research findings and building on existing research and practice, it is clear that to transform the culture, climate, and structures at WVU there is a critical need to establish a time effective means of fostering leadership at the top of the organization, as well as departmental engagement and participation.*

## **WVU PRIDE Specific Aims:**

***Specific Aim 1. Make Direct Connections between Individuals & the Policies and Practices of WVU: Establish the WVU Center for Faculty Equity to Promote, Assess, and Sustain Institutional Policies and Practices that will Enhance the Environment for Women Faculty.***

***Introduction.*** Transforming science and engineering in order to attract and advance women academics requires leadership (Burke, 2008) as well as a coordinated and comprehensive program (see Sturm 2006 and 2007 for the importance of organizational catalysts). Currently, WVU does not have a central office to coordinate recruiting, retaining, and promoting women and minority faculty. Therefore, our first objective is to establish the WVU Center for Faculty Equity. The Center personnel will coordinate our social science research, assist with the development and implementation of our programs, serve as a clearinghouse for our evaluation plans, coordinate dissemination activities, and facilitate examination and improvement of institutional policy. Establishment of the Center, under the auspice of the President and Provost, provides a visible indicator of the cultural change expected by the new administration.

***Planned Approach.*** Center personnel will facilitate the engagement of all faculty and administration in the transformation of the institution by providing a central location for all WVU PRIDE activities and communications. The Center will facilitate the following objectives in order to meet our aim of making direct connections between our faculty and the policies and practices of WVU: **(1) Promote WVU PRIDE**—bring together organizational resources and facilitate communication and initiatives with the President's Office of Social Justice, the Council for Women's Concerns, Council on Sexual Orientation, Center for Women's Studies, Center for Black Culture and Research, Office of Disability Services, and Faculty Senate Welfare Committee **(2) Assess WVU PRIDE**—undertake research on the applicability of our initial theoretical model and programs, provide formative and summative assessments of our initiatives, and modify programs and policies as necessary based on community feedback, and **(3) Sustain WVU PRIDE**—integrate results from our ADVANCE initiatives into the fabric of the WVU community by institutionalizing data collection (exit surveys, salary and resource surveys, climate surveys), continue to use programs to launch the success of our current and future women faculty and establish a community of female science role models that currently does not exist, and continue to monitor the progress of our departments as part of our method of transformational change.

***Expected Outcomes.*** We expect 1) greater collaboration of services across the university, 2) increased opportunities for networking among faculty, 3) improved policies and practices regarding the recruitment, promotion, and advancement of women faculty, 4) improved communication among stakeholders, 5) increased awareness of the barriers for women in the academic workplace, and 6) a central location for communicating and resolving such issues as a result of establishing the Center.

***Anticipated Problems & Alternative Strategies.*** Our team leaders are aware of the resistance to change inherent in the academy. Therefore, we have developed a transformational approach that includes stakeholders and key administrators and provides the academic community with program choices as well as financial incentives for their participation.

***Specific Aim (2) Recruit, Retain, and Promote more Women Science and Engineering Faculty in ECAS and CEMR.***

***Introduction:*** Although WVU has had recent success in recruiting new female assistant professors, women are not being *retained* and *promoted*. Therefore, the main goal of our programming is to provide the policies and support to retain and promote women through the ranks at WVU, thus developing a strong network of female faculty. We intend to lay the groundwork for further efforts to diversify our faculty. When the programming under this aim is in place, we expect to enhance climate for all faculty, and promote the success of women as well as initiate programs to further diversify the faculty. We selected best practices from ADVANCE institutions to address the issues and build on the strengths identified in our climate and exit surveys.

***Planned Activities: Develop a Supportive Climate that Values Diversity, Evaluates and Allocates Resources and Awards Fairly, and Attracts More Women and Minority Faculty.*** Our

institutional statistics reveal that our STEM departments are in different stages of diversifying and will thus require different strategies. The department level process will result in departments self identifying their stage of diversification while simultaneously identifying their respective challenges. A key strategy is to contextualize diversity in terms of *improving department effectiveness, excellence, and achieving WVU's mission*. One of the products of our department level process is a diversity and faculty development plan (with a discipline specific recruitment component), which will be integrated into President Clements' strategic plan. WVU PRIDE will provide up to \$3,000 to participating departments to enact a specific plan from their diversity document, ideally with a recruitment emphasis. Sample approaches include funding travel for faculty representatives to attend professional societies for underrepresented groups or developing a database of minority and women postdoctoral associates to be used in future recruitment efforts. Additionally, the Center for Faculty Equity will facilitate a Certification in Objective Evaluation for those responsible for faculty evaluation and faculty searches. This program will involve utilization of developed ADVANCE tools, such as the Georgia Tech ADVANCE ADEPT program and the online trainings developed by Hunter College's ADVANCE programs.

***Enhance Connections among Women and Provide Mentoring Opportunities.*** Our surveys indicate that female faculty value both formal mentoring programs and informal networking opportunities. Central to our programming is a mentoring approach based on Hunter College's Gender Equity Sponsorship Program (Rabinowitz and Valian, 2007). We selected this mechanism, which utilizes off campus faculty as Sponsors who mentor faculty in specific tasks, because of the small number of senior faculty at WVU and the fact that high workload has been identified as a significant problem by faculty. This strategy can have the added benefit of helping junior faculty develop professional networks useful for their scholarship, as well as the external review portion of their tenure process. This program *provides* financial incentives both for Associates, participants within the institution, and for Sponsors. Though most contact will be by phone or online, sponsors will be within driving distance to allow meetings. They will work with Associates on discipline specific strategies, such as providing grant writing assistance and feedback on publications.

The Center for Faculty Equity will recruit Sponsors and solicit feedback from both groups. Associates will apply and be selected through a competitive process. Associates can be at any rank, but their application should stress how they will use the program to move up to the next rank and to develop leadership skills. They will receive \$10,000 to be used for research related expenses. Collaborative projects and course reductions to work with industry partners are strongly encouraged. This approach will enable female faculty to gain entrepreneurship and patenting skills that are becoming increasingly important in many science and engineering fields (Ding et. al., 2006; Rosa and Dawson, 2006; Rosser 2008). In addition to working with a Sponsor, the Associates will attend monthly meetings. These meetings will enable us to provide peer mentoring and to build a cohort of female faculty across the campus. Some events will be open to all faculty and Associates will be encouraged to bring colleagues. Monthly events will include flash mentoring lunches wherein junior faculty or tenured faculty seeking advancement in rank receive feedback from faculty with extensive experience on promotion and tenure committees, a seminar for new hires which includes a one week boot camp to streamline tasks necessary to begin employment, and other topics including those used by previous ADVANCE awardees, such as practical strategies to develop a three minute opening for a talk, or lunches with administrators to foster communication and networking. Additionally, we plan to implement a Fall and Spring visiting speaker series with opportunities for the Associates to interact with the speakers.

***Balance Work and Personal Lives.*** Our surveys indicate that WVU faculty, particularly women, struggle to balance academic research, teaching, and service with their personal lives. Faculty mentioned the lack of a tuition remission program, hiring assistance for dual career couples, and the lack of parental leave. In addition to improving the lives of current faculty, implementation of these policies can enhance recruitment efforts. WVU PRIDE team members will work to further existing childcare and dual career hiring initiatives. First, we will collect data on the effectiveness of the current Dual Career Couple Program. A review of resources available on the ADVANCE Portal indicates that other institutions have developed application procedures for couples seeking assistance. Such processes ensure that these hiring

procedures are transparent, available to all, and equitable. Co-PI Towers and Center personnel will examine comparative approaches with the aim of developing a transparent and equitable procedure.

**Reduce Workload Pressures.** WVU's student faculty ratio of 27:1 is high for our Research High classification. President Clements has identified reducing the student faculty ratio as one of his top five goals (e.g., teaching loads in ECAS can be as high as 3:3). In addition to the policies and procedures to address work/personal life balance that are described above, we aim to target our department chair training activities toward helping chairs provide assistance to faculty around issues of workload. Co-PI Latimer is currently chair of Sociology and Anthropology, a department that serves over 800 majors, has a graduate program, and provides a high number of service courses for non-majors. She has identified a series of strategies based on previous experience at WVU, many of which also appear in various Chair Training materials on the ADVANCE portal. Most activities do not require additional funding (e.g., planning course offerings to minimize preps for new faculty). Others encourage chairs to try new approaches such as a mini-sabbatical with course reduction in the third year (which can also be used as a recruitment tool). We will spend the first year compiling these materials into a format that can be used in existing chair retreats and meetings and augmenting them with existing ADVANCE materials, particularly on topics such as implicit bias and gender equity. The trainings will begin in the second year and will be fully integrated into the existing chair events by the end of the grant period. *Trainings will include attrition planning to help chairs select and mentor their successors to ensure the sustainability of new practices.*

The ECAS and CEMR administrations have worked with chairs to develop formalized promotion and tenure documents with success in most areas as is indicated by our survey respondents' feelings of clarity about the P&T process and expectations. Further chair training will ensure that all new chairs are aware of these documents and how to work with their faculty on their implementation. WVU, like many institutions, has higher numbers of women than men in non-tenure track, teaching oriented faculty lines. In ECAS, these Teaching Assistant Professors (TAPs) are eligible for promotion to associate and full professor status and accorded raises. TAPs provide a potential source of new female hires and will be supported by all programming provided by WVU PRIDE. Teaching Assistant Professors have an important role in diversity efforts as they are the frontlines in terms of teaching and recruiting students to STEM.

**Expected Outcomes.** We expect 1) development of diversity plans and targeted recruitment efforts by departments, 2) implementation of programs and policies to address identified faculty concerns (e.g., Dual Career Couples, parental leave, etc.), 3) effective, engaged chairs who enhance their faculty's productivity, 4) a sustainable mentoring program and regular networking opportunities for tenure and non-tenure-track junior and senior faculty, 5) an increase in female full and associate professors, and 6) enhanced communication between faculty and administrators, particularly around diversity issues.

**Anticipated Problems & Alternative Strategies.** WVU faculty identify high workload as a barrier to research productivity and quality of life. Our programs have been developed to provide recognition and resources to faculty participants as well as leveraging resources outside the university. We will include gauges of the impact of our programming on faculty workload throughout the project in order to keep from further overloading faculty. For example, based on our formative assessments, we may need to implement a group mentoring format instead of individual sponsors or focus on informal lunches that encourage faculty interactions rather than formal training.

**Specific Aim 3. Engage Faculty from Departments and Disciplines throughout the University in a Dialogical Change Process that Promotes Collective Engagement in Institutional Transformation and the Achievement of Gender-Equity and Diversity Goals.**

**Introduction.** The current environment at West Virginia University, particularly in STEM departments, has limited success in recruiting, retaining, and promoting qualified female faculty members. There are many reasons for this, among them an organizational *culture* and *climate* that are at times not welcoming or supportive of women faculty. The depth and breadth of change needed to transform the culture, climate, and structures at WVU in order to adequately address this problem will require both leadership at the top of the organization **and** departmental engagement and participation.

While the focus of Specific Aims 1 and 2 are to establish the Center for Faculty Equity at the university level and to implement best practices to address gender equity and diversity issues, the focus of Specific Aim 3 is to provide a culture and climate conducive to change within the individual academic departments. Specifically, we will introduce a dialogical change process aimed at (1) engaging faculty, students, and staff in the creation of a *social atmosphere* that is supportive of women faculty and (2) facilitating the development of department-level *interdependence* and *collective efficacy* that will provide the motive force for these changes.

For our purposes we define interdependence as the *recognition* of and *acceptance* by department members that they compose parts of a whole (department), and that their role-specific cooperative engagement in the change process is necessary. Collective efficacy is the *shared belief* among department members that their actions and interactions will be effective in achieving the desired change. *Seeing* interdependence and *believing* in the efficacy of the collective are significant predictors of successful organizational functioning and transformation (Wheelen, 1994; Bandura, 2001).

In regard to the change itself, social psychologists have long argued that *collective habits* are very difficult to change; typically, only very small variations in the behaviors occur without some major intervention in the social field (Lewin, 1951; 1997). Consistent with the principles of field theory, the proposed interventions include 1) an unfreezing of ideas and behaviors (i.e., the “old way of doing things”), 2) a deliberate modification of forces for and against change—in the desired direction, and 3) a stabilizing of forces so as to continue the new attitudes and behaviors once they have been established (for example, Lewin, 1951; 1996) (see social science study). Within the social field of academia, there are specific forces that act on individuals, locking attitudes and behaviors in place. These forces include the autonomy and competitiveness of academia, the demands of the tenure and promotion process, the focus on *individual* (rather than collective) achievement, and disciplinary centrism. In addition, many people in academia may harbor both conscious and unconscious gender biases which inhibit change. Bias against women scholars in the sciences may be explained by some as resulting from the fact that women have not had the same success as men in terms of their overall academic achievement in the field. In other words, instead of seeing gender bias as the *cause* of unequal achievement, they blame women themselves for their lack of achievement and the resulting bias this causes. This faulty logic is referred to as a *benign prejudice view* in sociology and the *fundamental attribution error* in psychology (Levin and Nolan, forthcoming 2010; Zimbardo, 2004). It is often found to be a significant force against social and organizational change.

**The Proposed Change Process.** The theoretical foundation and methodology of our innovative departmental level process is provided in the social science study section of the proposal. Briefly, the institutional transformation process we are proposing moves forward in the following way:

**1) Thawing.** Nolan and members of the implementation team meet with faculty in the participating STEM departments to engage in a dialogue regarding current conditions for women faculty members (1-2 meetings). They provide data from the baseline departmental surveys. At this stage the goal is to prepare for change by helping faculty to recognize the need for change. Also, it is during this stage that they discuss the concepts of interdependence and collective efficacy and the need for everyone to participate in the process. **2) Moving in the Desired Direction.** Working with faculty members in the STEM departments, the team identifies forces for and against change. Together they develop and implement strategies for reducing the restraining forces (against change) and strengthening the driving forces (for change). This stage of the process involves whole-systems planning via recognized methods such as Future Search (Weisbord and Janoff, 1995). **3) Stabilizing.** Once the goals of the project have been achieved, the team works with faculty members from the STEM departments to identify ways to sustain the progress made during the project.

The rationale for this aim is that by identifying the contribution of the group-level characteristics *interdependence* and *collective efficacy* to goal achievement we expect to identify improved methods for modifying these variables to promote organizational transformation in a variety of conditions. Upon completion of Aim 3, we will better understand how to implement systematic organizational change. Such a finding is important because it allows us to achieve and sustain organizations that welcome

diversity and gender equity. In addition, by the end of the project we will have constructed and tested an improved tool for measuring consensus. This product builds on the work of Akiyama and Nolan (2000) and will produce a measurement that eliminates the problems inherent in other measures of consensus.

**Expected Outcomes.** We expect the WVU campus will have 1) an increased awareness of the barriers academic women experience in higher education, 2) improved communication within departments and among stakeholders, 3) increased opportunities for networking among faculty and learning from other departments, and 4) recognition and elimination of gender discrimination by both male and female faculty members. This will lead to a positive change in the culture and climate within academic departments. In addition, we will have produced an accurate, useful, standardized measure of consensus that can be generalized across research studies. Finally, the academic community will gain improved understanding regarding how institutional transformation occurs in higher education, including what obstacles and energies can be avoided or harnessed to be successful.

**Anticipated Problems and Alternative Strategies.** To encourage buy-in the department will have access to up to \$3,000 in order to institute the programs identified at the systems planning event. Although Nolan has particular expertise in bringing groups together who might have conflicting perceptions, goals, and expectations it is possible that some women may prefer to speak separately to a team member. Nolan will be available for individual interviews if necessary.

## **5. Dissemination**

In order to contribute to the national knowledge base about institutional transformation and organizational change, we have designed a three stage dissemination process. *First*, WVU will establish a WVU PRIDE webpage to communicate the mission, goals, and objectives of the program to the local community and to all stakeholders interested in improving the climate for women scientists. *Second*, outcomes from our institutional transformation experience will be shared through scholarly publications and conferences. Examples of such journals include: *American Sociological Review*, *Journal of Women and Minorities in Science and Engineering*, *Signs*, *Sex Roles*, *AFFILIA*, *Public Administration Review*, and *STATUS*. We intend to collaborate with our local chapters of the Association for Women in Science and the Society of Women Engineers to not only provide career tools for women in science, but also to explore how professional societies and programs such as WVU PRIDE can provide synergistic benefits to the community. *Third*, building on a 2008 state wide EPSCoR diversity conference, our research regarding theoretical models of interdependence and consensus will be disseminated to liberal arts colleges and universities across the central Appalachian Mountains at the annual meeting of the Appalachian College Association (ACA) (see LOC). WVU, Marshall University, and ACA plan to collaborate to identify best practices for faculty development and policy improvement.

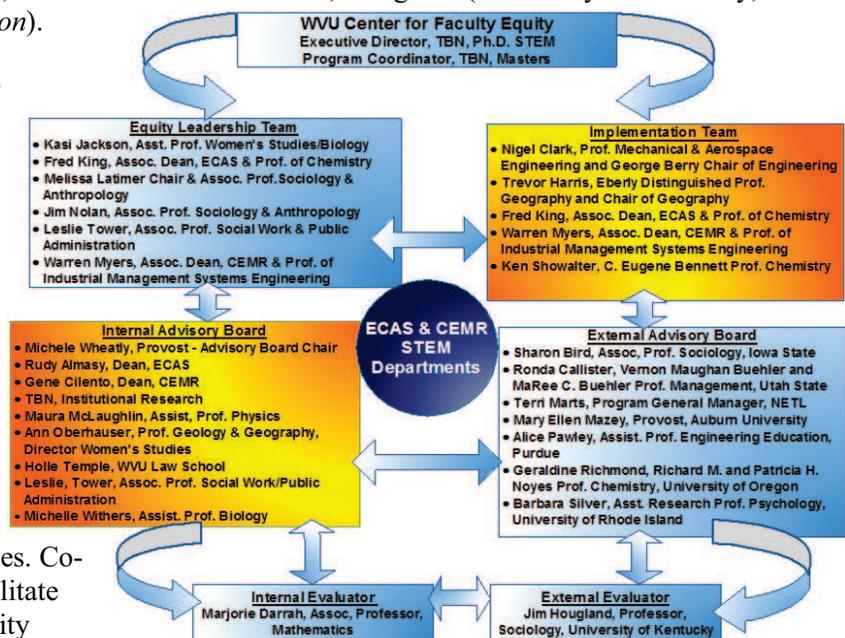
## **6. Project Management**

We have assembled our project management team and developed roles for both individuals as well as for component groups in accordance with best practices and recommendations from members of ADVANCE projects. *First*, the integration of WVU PRIDE activities with the upper administrative infrastructure will send a message that the aims and activities of WVU Pride are synergistic with the strategic mission for WVU, as developed by President Clements, and that efforts to diversify the WVU faculty have the full support of the administration. This ensures accountability on the part of departments and faculty. To accomplish this, the Center for Faculty Equity will be administered at the executive level under the auspice of the President and Provost and, specifically, the Executive Director for Faculty Diversity and Development will report directly to President Clements and incoming Provost Wheatly. PI President Clements will assist in catalyzing the mission of WVU PRIDE by ensuring institutional leadership of our stated goals and objectives. He will provide the strategic direction for the Center for Faculty Equity in consultation with the ADVANCE team (Co-PIs, Executive Director, Internal and External Advisory Teams). The Executive Director for Faculty Diversity and Development (ED) will integrate the functions of the Equity Leadership Team, the STEM Implementation Team, as well as the Internal and External Advisory Boards, coordinate the various activities and communications of the office, work with WVU faculty development personnel on University initiatives and policies, ensure timely collection and assessment of evaluation data, maintain regular and substantive communication

with the PI, and oversee and manage the project budget. The Program Coordinator will assist the ED in the coordination of activities, provide day to day continuity by promoting programs to the faculty and administrators, and build key relationships in departments and other units on campus. The center will include two graduate assistants (one from Mathematics and one from Sociology and Anthropology) to assist with implementing various components of the WVU PRIDE program, such as data collection, analysis, program evaluation, and research assistance. Evaluation will be coordinated by the Internal Evaluator, Darrah (Mathematics), and the External Evaluator, Hougland (University of Kentucky, Sociology) (see *Project Evaluation*).

*Second, to catalyze the establishment of the project, hire needed personnel, execute the social science research study, disseminate results and oversee the overall mission of WVU PRIDE, we have assembled an Equity Leadership Team with a strong background in social science and tools of gender analysis, as well as disciplinary experience in the STEM fields of biology and chemistry. The Leadership Team will convene on a monthly basis to discuss the status of key program activities. Co-PI Associate Dean King will facilitate communication between the Equity Leadership Team and the STEM Implementation Team. Co-PI Latimer of Sociology will lead the design and execution of the major research questions, guiding and directing all internal and external evaluation activities, including survey results, data analysis, and reports. Her work will include close collaboration with the External Advisory Board members with expertise in department level change. Co-PI Tower of Social Work will work on institutional policy change and serve as a liaison between the Leadership Team and the Internal Advisory Board, as well as gain input from faculty, and senior WVU administrators through mechanisms such as administering climate surveys and disseminating the results. Co-PI Jackson of Women's Studies and Biology will assist in the analysis of data gathered from the formative and summative assessments, organize the WVU PRIDE public presentations, design the Associate competitive application process in collaboration with the Leadership Team, and coordinate the on-campus speaker series. Associate Professor Nolan of Sociology will apply his unique background and experience with situational approaches to group change at the departmental level by facilitating workshops. He will assist department chairs and faculty in the resolution of conflicts. In addition, he will coordinate and facilitate (with an external consultant) the systems planning events.*

*Third, to facilitate buy-in and enhance WVU PRIDE's disciplinary credibility with faculty in science and engineering we have assembled a STEM Implementation Team representing key administrators, department chairs, and highly respected professors from the WVU STEM community who will serve as organizational catalyst. This committee will be co-chaired by Associate Deans in ECAS and CEMR (Co-PI King, Chemistry, ECAS, and Myers, Industrial and Management Systems Engineering, CEMR). The remaining committee members (Showalter, Chemistry; Harris, Geology and Geography; Clark, Mechanical and Aerospace Engineering) are endowed professors or chairs of their respective departments: These departments, along with Myers' department, Industrial and Management Systems Engineering, will form the first cohort in our departmental change efforts. In addition to encouraging the full participation of their own faculty, the Implementation Team will work with Nolan and the Executive Director of the Center for Faculty Equity to select and encourage participation by the*



remaining 12 STEM departments in subsequent years. To further enhance the project's credibility in the eyes of department faculty, we aim to hire a senior female scientist or engineer with an established research career for the Executive Director position.

*Fourth, to facilitate communication among WVU Pride and Center for Faculty Equity personnel, WVU, CEMR, and ECAS administration, and women faculty in the STEM fields at WVU, we have assembled an Internal Advisory Board with representations from all of these levels.* The Internal Advisory Board will meet every other month to review project outcomes and to advise on the development of programming and policies responsive to the needs of WVU faculty. The Board will be chaired by incoming Provost Wheatly and includes Cilento (Dean, CEMR), Almasy, (Interim Dean, ECAS), Oberhauser (Geology and Geography/Director of Women's Studies), McLaughlin (Physics), Withers (Biology), Temple (WVU Law School), Dean (Institutional Research), as well as Co-PI Tower.

*Fifth, to gain insights and implement best practices from previous ADVANCE awardees, particularly in the area of department level change, as well as to draw on the experience of members of higher education, government, and industry in the achievement of project goals, we have assembled an External Advisory board consisting of ADVANCE PIs and Co-PIs as well as other women leaders in higher education, industry, and government.* The External Advisory Board will convene yearly to review project outcomes and provide feedback based on their respective fields. Mazey (Provost, Auburn) is a WVU Sociology alumna and a former Dean of ECAS; thus, she brings a working knowledge of WVU and a commitment to the institution. Callister (PI, Utah State), Silver (PI, University of Rhode Island), and Bird (Co-PI, Iowa State) bring experience running ADVANCE programs and expertise in the area of department level change. Pawley, (Co-PI, Purdue) brings a background and experience in engineering, as well as experience in applying feminist theoretical models. Richmond brings experience in chemistry and mentoring women in science through leadership workshops. Marts provides over 30 years of experience working at the interface of government and private engineering industries.

## **7. Project Evaluation**

The comprehensive evaluation plan was developed based on the ADVANCE indicator toolkit, the published literature, and the WVU PRIDE program design. The evaluation effort focuses primarily on *impact* analysis, in order to assess the effects of WVU PRIDE. For each evaluation question, they have developed specific questions to be addressed, the data sources for answering the questions, and the schedule for collecting information. These plans have been informed by existing research on the evaluation of ADVANCE programs and allow comparisons with other ADVANCE universities. The *summative* questions implied by impact analysis will be supplemented by *formative* questions to allow the process to be examined as it unfolds. Thus, the evaluators will be examining such questions as whether the proposed Center has been established and given appropriate support, whether departments and other units are using the Center, and how diversity initiatives are being supported at the College level and perceived at the departmental level. Utilization of resources and the outcomes of such utilization will be examined from a *policy* perspective. A central question of the overall evaluation effort will be whether the goals of WVU PRIDE have been achieved. However, efforts to answer this question will occur in the context of *lessons learned* (e.g., did unanticipated obstacles stand in the way of some accomplishments) and *best practices* (e.g., can WVU PRIDE's accomplishments be attributed to successful strategies that should be emulated elsewhere). Evaluation findings and conclusions will be *disseminated* in the form of reports to advisory committees, professional presentations, and refereed publications.

An internal evaluator, external evaluator, internal advisory board, and the external advisory board are all utilized to provide an overall **evaluation strategy** that uses multiple forms of evaluation to improve program impact and sustainability. The internal evaluator is Darrah and the external evaluator is Hougland. The external evaluator will be responsible for oversight of the evaluation of the project and the internal evaluator will be responsible for the day-to-day implementation of the plan. The internal evaluator, with graduate student support, will perform data collection (using methodologies developed and approved by both evaluators) and analysis of the data, providing the project team with formative evaluation information for project and process improvement. The external evaluator will be supplied with summary reports of all aspects of the formative evaluation data and will develop yearly reports and

conclusions of the project’s overall success in achieving its goals and work with the internal evaluator to develop reports of lessons learned and best practices. The External and Internal Evaluators will provide information and input to the Internal and External Advisory Boards, as well as the ADVANCE community at large. The evaluation team will give feedback into the design and implementation at multiple points throughout the project. Formal feedback will be given yearly in internal and external evaluation reports. Informal feedback will be given to the team in a timely manner in the form of summary reports for the ongoing assessments of activities. Multiple feedback points will allow the team to modify processes to achieve the maximum benefit from planned activities. The following timeline details how project activities will be organized and implemented:

<b>WVU Center for Faculty Equity</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Years 6-10</b>
Hire Executive Director, Program Coordinator, Graduate Research Assistants	→					
Network with campus stakeholders and facilitate policy work	→	→	→	→	→	
Begin Communication Campaign	→					
Select and Confirm Training and Workshop Tools	→					
Confirm Speakers for Fall and Spring	→	→	→	→	→	
Work with Development Staff on WISE Giving Circle	→					
Establish Associate Application Process	→					
Provide Networking and Mentoring Meetings Twice a Semester	→	→	→	→	→	
WiSE Giving Circle awards Emerging Leader Associates		→			→	
Accept Associate Applications	→	→	→	→	→	
Associates are Awarded/Interview Sponsors, Associate Workshops		→	→	→	→	
Appalachian College Association and Marshall Conference		→			→	
WiSE Endowment Reaches Full Funding Level					→	
WVU Funds the Center for Faculty Equity (Including Permanent Position)						→
Expand WVU ADVANCE Network Regionally						→
<b>Department Level Work</b>						
Department Survey Development, Pre-Testing, Modifying (Summer-Fall)	→	→	→	→	→	
Begin Engagements (1-2 Hours Each) with first Four Departments	→					
Department Survey Implementation, Analysis, Feedback Session, and Dialogue	→	→	→	→	→	
Conference Planning (March) and Systems Planning Event (April)	→	→	→	→	→	
Complete Phase I Department Level Work/Begin Phase II with Four New STEM Departments		→				
Diversity and Faculty Development Plans Due (Fall)		→	→	→	→	
Complete Phase II Department Level Work/Begin Phase III with Four New STEM Departments			→			
Complete Phase III Department Level Work/Begin Phase IV with Four New STEM Departments				→		
Complete Phase IV Department Level Work					→	
<b>Evaluation</b>						
Examine Departmental Meeting Agendas and Minutes	→	→	→	→	→	
Interview Department Chairs, Conduct Focus Groups, and Assess Center Documents	→	→	→	→	→	
Collect and Review Institutional Research Data	→	→	→	→	→	
Administer and Assess WVU Internal Climate Survey	→	→	→	→	→	
Examine Hiring Committee Documents	→	→	→	→	→	
Participate in Harvard COACHE Survey					→	
Institutionalize Diversity Data Collection and Gender Policy Review		→	→	→	→	→
Institutionalize Salary, Resource, Climate, and Exit Surveys		→	→	→	→	→
Prepare a State-Wide Gender Policy Impact Study				→	→	→

## 8. Results from Prior NSF Support

**Jackson, Bolyard, Carver, Miller and Withers:** "Teaching Excellence At College for High Achievement in West Virginia (TEACH-WV)" (Award # DUE-0833111), \$748,334, 2009-2013. To recruit 20 STEM majors to graduate with a master's in education and teach in high need school districts.

**Korakakis, Hornak, Edwards, Jackson, and Hensel:** "NUE: The Nanosystems Emphasis- Valuing Disciplinary Depth and Differences in Nanoscale Science and Engineering Teams" (Award # EEC-0741399), \$179,204, 2008-2010. To establish a 9 credit undergraduate Nanosystems Emphasis Area.

**Withers, Miller, Jackson, and Richards-Babb:** "The Pursuit of Excellence: Transforming Undergraduate Science Education through Evidence-Based Practice" (Award # DUE-0919800), \$472,457, 2010-2013. To run a workshop to enhance pedagogy in STEM courses in the WV region.

**Lewis and Jackson:** "Collaborative Research: Electronic Processes in Disordered and Biomolecular Systems" (Award # DMR-0903225), \$75,000, 2009-2011. To offer a REU conference in Appalachia.

## References

- Akiyama, Yoshio and Nolan, James (2000). "An Index of Disagreement via Conditional Probability. Presented at the Annual Meeting of the American Psychological Association." Washington, DC.
- Bandura, Albert. (2001). "Social Cognitive Theory: An Agentic Perspective." *Annual Review of Psychology*, 52. 1-26
- Bandura, Albert. (2002). "Self-efficacy assessment." In R. Fernandez-Ballesteros (Ed.), *Encyclopedia of psychological assessment*. London: Sage Publications.
- Bion, Wilfred R. (1959). *Experiences in Groups And Other Papers*. London: Tavistock
- Bird, Sharon and Hamrick, Florence A. (2008). " ISU ADVANCE Collaborative Transformation Project: First Round Focal Department Synthesis Report." Retrieved from [http://www.advance.iastate.edu/ctransformation/ctrans\\_home2.shtml#ctreports](http://www.advance.iastate.edu/ctransformation/ctrans_home2.shtml#ctreports) on November 5, 2009.
- Burke, W. Warner. (2008). *Organization Change Theory and Practice*. Los Angeles: Sage Publications.
- Callister, Ronda R. (2006). "The Impact of Gender and Department Climate on Job Satisfaction and Intentions to Quit for Faculty in Science and Engineering Fields." *Journal of Technology Transfer*, 31. 367-375.
- Child, John. (2005). "Effecting Organizational Change." Pp. 277-308 in *Organization: Contemporary Principles and Practice*. Hoboken, NJ: Wiley-Blackwell.
- Clements, James P. (2009). "State of the University 2009: A Shared Vision." Address delivered on October 12, 2009. Retrieved at <http://president.wvu.edu/speeches/stateofuniversity09> on November 5, 2009.
- Committee on Gender Differences in the Careers of Science, Engineering, and Mathematics Faculty; Committee on Women in Science, Engineering, and Medicine (CWSEM); National Research Council (NRC). (2009). *Gender Differences at Critical Transitions in the Careers of Science, Engineering and Mathematics Faculty (Free Executive Summary)*. Washington, D.C.: National Academies Press. Retrieved from [http://books.nap.edu/catalog.php?record\\_id=12062](http://books.nap.edu/catalog.php?record_id=12062) on November 4, 2009.
- Ding, Waverly W., Murray, Fiona, and Stuart, Toby E. (2006). "Gender Differences in Patenting in the Academic Life Sciences." *Science*, 313. 665-667.
- Etzkowitz, Henry, Kemelgor, Carol, and Uzzi, Brian. (2000). *Athena Unbound: The Advancement of Women in Science and Technology*. Cambridge, UK: Cambridge University Press.
- Feng, Mary, Hailey, Christine, Dupont, R. Ryan, and Sullivan, Kim. (2005). "Recruiting and Retaining Engineering Female Faculty at Utah State University." *Proceedings of the 2005 American Society for Engineering Education Annual Conference & Exposition*.

Frehill, Lisa M. (2006). "Measuring Occupational Sex Segregation of Academic Science and Engineering." *Journal of Technology Transfer*, 31. 345–354.

Guinier, Lani and Minow, Martha. (2007). "Dynamism, Not Just Diversity." *Harvard Journal of Law and Gender*, 30. 269-277.

Iowa State University. (2007). "ISU ADVANCE: Annual Report Year 1: June 2007." Retrieved from <http://www.portal.advance.vt.edu/Categories/Filetype/Reports%20And%20Papers.html> on November 5, 2009.

Iowa State University. (2008). "ISU ADVANCE: Annual Report Year 2: June 2008." Retrieved from <http://www.portal.advance.vt.edu/Categories/Filetype/Reports%20And%20Papers.html> on November 5, 2009.

Jacobs, C. D., Bergen, M. R., and Korn, D. (2000). "Impact of a Program to Diminish Gender Insensitivity and Sexual Harassment at a Medical School." *Academic Medicine*, 75. 464-469.

June, Audrey Williams. (November 1, 2009). "Meeting Notes Progress for Women in Academic Science, but More Work to Do." *The Chronicle of Higher Education*. Retrieved from <http://chronicle.com/article/Meeting-Notes-Progress-for/49017/?key=TG51IFg5ZiAfYSVjK3QWcnNQOHV7JUJ%2FbHRBZSAaYlpT> on November 4, 2009.

Kavathas, P., LaFrance, M. and Benhabib, S. *Task Force on the Retention and Promotion of Junior Faculty, Yale Women Faculty Forum*. For more information or the complete questionnaire contact [WFF@yale.edu](mailto:WFF@yale.edu).

Kalev, Alexandra, Dobbin, Frank, and Kelly, Erin. (2006). "Best Practices or Best Guesses: Assessing the Efficacy of Corporate Affirmative Action and Diversity Practices." *American Sociological Review*, 71. 589-617.

LaVaque-Manty, Danielle. (2007). "Transforming the Scientific Enterprise: An Interview with Alice Hogan." Pp. 21-27 in *Transforming Science and Engineering: Advancing Academic Women*. Edited by Abigail J. Stewart, Janet E. Malley, and Danielle LaVaque-Manty. Ann Arbor, MI: The University of Michigan Press.

Levin, Jack and Nolan, James (forthcoming 2010). *The Violence of Hate: Confronting Racism, Anti-Semitism, and Other Forms of Bigotry* 3<sup>rd</sup> ed. Boston: Pearson Allyn and Bacon.

Lewin, Kurt. (1947). *Frontiers in Group Dynamics: I. Concept, Method and Reality in Social Science; Social Equilibria and Social Change.* Human Relations.

Lewin, Kurt. (1951|1997). *Resolving Social Conflicts and Field Theory in Social Science*. Washington, DC: American Psychological Association.

Massachusetts Institute of Technology (MIT). (1999). *A Study on the Status of Women Faculty in Science at MIT*. Cambridge, MA: Author.

National Academy of Sciences, National Academy of Engineering, and Institute of Medicine. (2007). *Beyond Bias and Barriers: Fulfilling the Potential of Women in Academic Science and Engineering*. Washington, D.C.: The National Academies Press.

Prochaska, Janice M., Mauriello, Leanne M., Sherman, Karen J., Harlow, Lisa, Silver, Barbara, and Trubatch, Janet. (2006). "Assessing Readiness for Advancing Women Scientists Using the Transtheoretical Model." *Sex Roles*, 54. 869–880.

Rabinowitz, Vita C. and Valian, Virginia. (2007). "Beyond Mentoring: A Sponsorship Program to Improve Women's Success." Pp. 96-115 in *Transforming Science and Engineering: Advancing Academic Women*. Edited by Abigail J. Stewart, Janet E. Malley, and Danielle LaVaque-Manty. Ann Arbor, MI: The University of Michigan Press.

Rioch, M.J. (1975), "All we like sheep – " [Isaiah 53:6]: followers and leaders"", in Colman, A.D., Bexton, W.H. (Eds), *Group Relations Reader*, Associates Printing and Publishing, San Rafael, CA, pp. 159-77.

Rosa, Peter and Dawson, Alison. (2006). "Gender and the Commercialization of University Science: Academic Founders of Spinout Companies." *Entrepreneurship & Regional Development*, 18. 341–366.

Rosser, Sue V. (2008). "Are Women Included in Leading Edge Trends in Science and Technology? Gender and Patents." Presented at the *Inclusive Science: Articulating Theory, Practice, and Action* conference. St. Paul, MN.

Sampson, Robert J. and Raudenbush, Steve. (1999). Systematic Social Observation of Public Spaces: A New Look at Disorder in Urban Neighborhoods . *American Journal of Sociology*, 105. 603-651.

Settles, Isis, Cortina, Lilia M., Malley, Janet, and Stewart, Abigail J. (2006). "The Climate for Women in Academic Science: The Good, the Bad, and the Changeable." *Psychology of Women Quarterly*, 30. 47–58.

Silver, Barbara, Prochaska, Janice M., Mederer, Helen, Harlow, Lisa, and Sherman, Karen. (2007). "Advancing Women Scientists: Exploring a Theoretically Grounded Climate Change Workshop Model." *Journal of Women and Minorities in Science and Engineering*, 13. 207-230.

Sturm, Susan. (2006). "The Architecture of Inclusion: Advancing Workplace Equity in Higher Education." *Harvard Journal of Law & Gender*, 29. 247-334.

Sturm, Susan. (2007). "Gender Equity as Institutional Transformation: The Pivotal Role of 'Organizational Catalysts'." Pp. 262-280 in *Transforming Science and Engineering: Advancing Academic Women*. Edited by Abigail J. Stewart, Janet E. Malley, and Danielle LaVaque-Manty. Ann Arbor, MI: The University of Michigan Press.

University of Washington. "2001-2007 Final Report." Retrieved from <http://www.portal.advance.vt.edu/Categories/ADVANCE%20Program&Work/ADVANCE%20Reports/Final%20Reports.html> on November 5, 2009.

Utah State University (2005). "Year End Report for NSF ADVANCE Project: Year 2: June, 2005." Retrieved from <http://www.portal.advance.vt.edu/Categories/Filetype/Reports%20And%20Papers.html> on November 4, 2009.

Utah State University (2006). "Year End Report for NSF ADVANCE Project: Year 3: July, 2006." Retrieved from <http://www.portal.advance.vt.edu/Categories/Filetype/Reports%20And%20Papers.html> on November 4, 2009.

Wachs, Faye L. and Nemiro, Jill. (2007). "Speaking Out on Gender: Reflections on Women's Advancement in the STEM Disciplines." *Journal of Women and Minorities in Science and Engineering*, 13. 77-94.

Weisbord, Marvin, and Janoff, Sandra. (1995). *Future Search*. San Francisco: Berrett-Koehler.

Wheelan, Susan. A. (1994). *Group Processes: A Developmental Perspective*. Boston: Allyn and Bacon.

Yen, Joyce W. and Loving, Christopher J. (2005). "The Cross-Department Cultural Change Program at the University of Washington." *Proceedings of the 2005 American Society for Engineering Education Annual Conference & Exposition*.

Zimbardo, Philip G. (2004). "A Situationist Perspective on the Psychology of Evil: Understanding How Good People are Transformed into Perpetrators." In *The Social Psychology of Good and Evil: Understanding Our Capacity for Kindness and Cruelty*. Edited by Arthur Miller. New York: Guilford.