

***Project Summary: The Inclusive Connective Corridor:
Social Networks and the ADVANCEment of Women STEM Faculty***

Syracuse University (SU) is uniquely positioned to offer a fresh approach to recruiting, promoting and retaining women, especially women of color, and women with disabilities in science, technology, engineering, and mathematics (STEM). Driven by its vision of Scholarship in Action – scholarly excellence and intellectual engagement across boundaries – SU fosters a stimulating, university-wide interdisciplinary research and teaching environment with signature programs that are stronger than the sum of their parts, integrating innovative university-industry partnerships. One such program, the “Connective Corridor,” links the intellectual, cultural, and economic development assets of the City of Syracuse with the University to create a vibrant, inclusive, and unifying cityscape that cultivates a shared sense of belonging across traditional social lines—a metaphor, in significant ways, for the intended impact of our ADVANCE project.

Despite SU’s deep commitment to equity and inclusion, the number of women in the STEM disciplines in all career stages remains significantly below the national average. The vast majority of present STEM faculty members are men, making their involvement essential to achieve lasting transformation. Data from focus groups conducted in preparation for this proposal suggest that a cohort of SU male faculty exists who feel that improving the climate for women is a top priority. Empowering these individuals as nuclei for change, together with training and activities designed to nurture strong social networks will develop a generation of inclusive leaders to disseminate skills, strategies, and methods for enhancing equity across the STEM disciplines. These programs will catalyze sustainable improvements to pool development, hiring, evaluation, third-year review, promotion, and tenure processes as well as interdisciplinary, cross-sectoral, research collaboration.

The proposed institutional transformation project will use the concepts of Scholarship in Action and the Connective Corridor to create a sustainable, *inclusive connective corridor* for women faculty and male faculty partners within STEM. Current and future women faculty members will work in interdisciplinary centers and institutes, and will be connected with each other, industrial partners and equity resource centers on campus to create a social network structure for enhancing recruitment, retention and advancement of women STEM faculty.

The *intellectual merit* of the proposed project lies in harnessing a rich body of theory and empirical research in the organizational and sociological aspects of social networks in application to barriers limiting recruitment and advancement of women in STEM. The project will combine established social science methods (e.g., attitude measurement) with social network analysis to evaluate both the research hypotheses and the success of the interventions. The research study will evaluate the importance of department chair-faculty relationships, strength and content of social ties, and perceived support from one’s dean and/or trustworthiness of senior administration in predicting STEM faculty employment outcomes and attitudes, with a focus on women’s experiences. In addition, the study will explore whether particularly robust social exchange relationships of one kind or another can compensate for shortcomings in others. The study strives to establish which social relationships have the strongest impact on change and will generalize in ways that allow other universities to better target their intervention efforts.

The *broader impacts* of the proposed project will lie in the dissemination and adoption of social network-based influence and organizational change strategies that may be generalizable to institutions with an entrepreneurial and interdisciplinary emphasis. The proposed approach tests a fresh and powerful toolkit of institutional transformation strategies with which only a limited cadre of universities has experimented to date.

1. Introduction

The overarching strategy for this project is to create an equity-based, inclusive “connective corridor” to facilitate and anchor social relationships among women and male faculty in the 12 STEM departments at Syracuse University (SU), and to link these faculty and units within a web of “resource hubs” on and off campus that arise from three-way university-industry-community partnerships. The Inclusive Connective Corridor builds on existing successful partnerships that have resulted in unique research opportunities for STEM faculty: the JPMorgan Chase Technology Center, the Biomaterials Institute, the Center of Excellence in Environmental and Energy Systems, Welch Allyn’s Blue Highway, NY State Center for Applied Research in System Engineering, Say Yes to Education, the Mellon CNY Humanities Corridor, and the Kauffman-funded “E-initiative” promoting campus-community entrepreneurship. The scope and success of such efforts earned SU the Carnegie Foundation for the Advancement of Teaching’s designation as a university committed to Community Engagement. The Carnegie Corporation also awarded Chancellor Nancy Cantor a 2008 Academic Leadership Award.

Much like a physical corridor, a passageway providing access to vital spaces, the Inclusive Connective Corridor will create a passageway of active relationships, opportunities, and resources in which women STEM faculty may excel and share strengths. Collaborative and interdisciplinary scholarship undergirds this project to reshape the landscape of the STEM fields at Syracuse such that the interdisciplinary research centers and external partnerships will become supportive, integrative communities that will welcome female faculty, with the long term goals of equal representation and full integration in a welcoming intellectual and professional environment.

2. Overview of Objectives and Initiatives

Despite SU’s deep commitment towards equity and inclusion, only 21% of SU STEM faculty members are women (Section 3 provides additional details below). The number of women in full professorships is also significantly below national averages. The absence of senior women significantly impacts a department’s ability to attract, mentor and promote junior women faculty. Given that the great majority of faculty members in STEM are male, the goals of equity and inclusion cannot be achieved without male involvement and commitment. Figure 1 provides a conceptual overview how the four planned initiatives in the Inclusive Connective Corridor help to achieve the target objectives:

- *Increase the number of women at full professor rank in STEM departments over the course of five years by 25% while maintaining or increasing the proportion of women at lower ranks.*
- *Double the percentage of women in STEM faculty applicant pools.*
- *Enable peer networking and mentoring among all women faculty in STEM to reduce isolation.*
- *Open doors for all women faculty in STEM to participate in interdisciplinary research using Syracuse’s unique network of external partnerships.*
- *Engage no less than half the male faculty in equity and inclusion activities to promote a broadly shared understanding of the importance and benefits of an equitable and inclusive environment.*

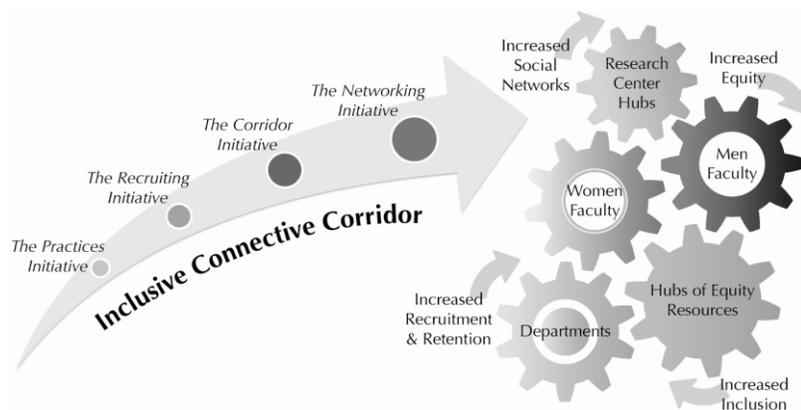


Figure 1 – Conceptual model of Inclusive Connective Corridor

An integrated theoretical and methodological framework supports the goals for advancing women faculty in the STEM community (please see section five and the supplement for detail). This project will *facilitate and strengthen social and intellectual connections* to foster a shared vision of equity and inclusion, empower inclusive leaders, and coordinate action that improves the recruitment, retention and advancement of STEM women faculty, including women of color and women with disabilities. The project binds “Scholarship in Action”—a vision for the university that focuses its intellectual capital on problems in and of the world—with social network theories and methodologies, and agile strategies for creating and recalibrating productive relationships in the service of equity and inclusion. An innovative element will be the engagement of male faculty as partners in hiring, retaining, and promoting women. Enhancements to the social structure will increase the depth and breadth of collaborative, supportive, and productive ties among faculty members in STEM and to link them with resource hubs: campus interdisciplinary research centers; campus equity resources; industry collaborators, and experienced mentors. Practices, procedures and accountability measures will accompany the initiatives to ensure long-term success and sustainability.

The cultivation of individuals with the knowledge and commitment to equity and inclusion will catalyze sustainable improvements to pool development, hiring, annual evaluation, third-year review, promotion and tenure processes, and research collaboration. All interventions will be implemented, tested, evaluated, and refined within a theoretically guided social science framework to ensure maximum generalizability. The four initiatives planned in order to reach the objectives are:

- 1. The Networking Initiative:** Connect women faculty to each other, to mentors, to research centers, and campus resources to increase the number and density of social networks supporting their journey towards full professorship and beyond. Increase the quality of social networks and interlock social connections to address identified equity and inclusion barriers and to coordinate action.
- 2. The Corridor Initiative:** Develop cross-sector partnerships (i.e. university, industry, government, etc.) to advance new research paradigms, where collaboration and team-based projects are encouraged and valued for promotion and tenure. Provide professional development and support for women faculty to excel in interdisciplinary, cross-sector research. Build equity and inclusion goals into the design of interdisciplinary research centers, academy-industry partnerships.
- 3. The Recruiting Initiative:** Increase recruitment, retention, and advancement of women STEM faculty, especially women of color and women with disabilities. Expand candidate pools by building faculty ownership for identifying and recruiting women STEM faculty. Diffuse attitudes, skills, and behaviors necessary to support *early and continuous recruitment* and for advancement of women.
- 4. The Practices Initiative:** Engage and support all STEM faculty members as leaders and active participants in creating a diverse faculty and inclusive environment. Engage male faculty partners not only in hiring, retaining, and promoting women, but also in collaboratively and creatively visioning the future of STEM. Develop practices related to tenure and promotion that facilitate and sustain an infrastructure of inclusion and equity. Encourage and support effective departmental diversity planning with clear action goals, process checkpoints and accountability measures.

Note that these four initiatives are discussed in detail in Section 6.

3. Institutional Context and Data

SU is a private, comprehensive, doctoral, research university with 944 full-time and 522 part-time faculty teaching 17,928 undergraduate and graduate students. Women students comprise 55% of the total enrollment. Women comprise 36% (n=339) of faculty across all departments. Among undergraduates, about 14.5% fit the NSF’s definition of underrepresented minorities, while only 10.3% of the faculty fit this definition. The STEM disciplines reside in 12 distinct departments across three academic units: the

College of Arts and Sciences, the LC Smith College of Engineering and Computer Science and the School of Information Studies. Female faculty members in these STEM departments comprise 21% of all faculty compared to the national percentage of 33% [1,2]. Although a few departments show relative parity between men and women, others (i.e., physics and chemistry, with 11% and 10% ratios respectively) have had substantial historical difficulty hiring and retaining female faculty members. Exceptions exist: Notable recent successes in earth science (30% female faculty) have arisen from two strategic dual career hiring decisions. One department, Communication Sciences and Disorders, is comprised of only female faculty (7:0). In contrast, Mechanical and Aerospace Engineering, has only male faculty, and Electrical Engineering/Computer Science has only 8% female faculty. The overall average percentage of women faculty for natural science departments is 15%; engineering and computer science is only 11%.

The picture worsens when examining gender by rank. By rank, 33% of women STEM faculty members are at the assistant professor level, 40% at the associate level and 27% at the full professor level. Furthermore, there is only one woman faculty member in STEM from an underrepresented group and none with reported disabilities. Out of the 12 STEM departments, only 6 departments have at least one woman full professor. The College of Engineering & Computer Science has only one woman full professor (other than the dean) across all departments, constituting 3% of the faculty, compared to the national average of 14% [1,2]. Attempts to increase the number of women faculty in STEM have not met with lasting success. Hiring case studies conducted in preparation for this proposal revealed that women on average made up less than 10% of the recent applicant pools. Intensive hiring efforts and temporary success in some departments notwithstanding, the overall numbers of female faculty in STEM at Syracuse University have declined over the past three years, especially in Electrical Engineering & Computer Science and Chemistry.

These low numbers for STEM women faculty are in stark contrast to significant increases in the number of women faculty in leadership positions, most notably, the present Chancellor. Of the 13 schools and colleges at SU, five are headed by female deans; including the College of Engineering & Computer Science and the School of Information Studies. At the department level, two women currently occupy chair positions in STEM. To understand this contrast, the state of the university was examined with respect to gender equity and inclusion in STEM using a) institutional data (COACHE, 2005, junior faculty job satisfaction), b) case studies of 2008-2009 faculty searches, c) institutional promotion and tenure data and d) data from a series of focus groups run in 2009 with gender separated groups. In the 2005 COACHE survey n=87 (57%) of the targeted faculty responded; of these respondents, 22 were STEM faculty (4 women and 18 men). Notably, men rated formal mentoring programs as most important to their career progress, whereas women indicated informal mentoring as more important. Put differently, women rely upon trusted individuals within their professional social networks for career support and guidance. Prior research in related areas supports women's preference for informal social networks [3].

The 2009 focus group data, however, suggested that women SU STEM faculty feel disconnected from appropriate professional support. One woman faculty said, "New faculty have voiced that lack of (connection) as well...it's very important when you come into a new setting to feel a cohesiveness with your department." The study further indicated that the sense of isolation and disconnectedness is particularly acute for junior faculty, but extends up to the highest ranks, linking isolation and disconnection with unsatisfactory career advancement for women in STEM at Syracuse.

In contrast with the rather dismal story portrayed above, Syracuse as an institution has a variety of positive assets that set the stage for beneficial institutional transformation and improvement of gender equity in STEM. The 2009 focus groups with male STEM faculty revealed an interest and hopefulness about equity and inclusion, as expressed by, "engage me in the process...help me to learn more about

myself so that I can be aware of my behaviors; both what I'm doing well and other things I can improve." Male faculty urged action, wanting to be, "...more proactive and not just reporting on the set of issues that women face... we need to digest them into action plans." When discussing research collaboration with the university's industry partners, a participant asked, "Are [women] getting similar encouragement or opportunity [as men] to pursue entrepreneurial aspects besides doing basic science or engineering research?" The 2008 University Leadership Council report [4] indicated faculty ownership of diversity is essential, and at least some male faculty members at Syracuse seem prepared for that ownership.

Likewise, Syracuse hosts several notable interdisciplinary research centers and industrial partnerships on campus. These partnerships and centers are poised to attract junior faculty who realize their research goals by working in a stimulating cross-sectoral, research environment. The *Syracuse Biomaterials Institute*, one such hub, integrates faculty from five STEM departments; working with SUNY Upstate Medical University it fosters collaboration across institutional boundaries. Another resource is the *Syracuse Center of Excellence in Environmental and Energy Systems*, a hive of 200 university-industry collaborations that focuses on improving health and performance in built environments, as well as the development of clean and renewable energy sources. A partnership with enormous value for engineering and computer science is the *JPMorgan Chase Technology Center*, which has corporate employees, faculty, and students working together to develop new software and technology. The *CASE Center for Systems Engineering* is a New York State-supported applied research center that facilitates faculty partnerships with industry. One of the jewels in the CASE crown is, *Blue Highway*, a unique innovation center founded by the medical device firm Welch Allyn. Work on the academy-industry interface is providing extraordinary opportunities for faculty conducting interdisciplinary research by establishing extensive networking opportunities to support research and seed innovation.

In support of the *cross-sectoral* (meaning that they bridge academia into other sectors of society) research opportunities described above, SU recently revamped its promotion and tenure policies through an extensive two-year, faculty-driven process. These new policies explicitly recognize the value and importance of interdisciplinary scholarship, and help tenure and promotion committees recognize their value. The new vision, plus a growing concern that women faculty may be left behind, mandates intervention to increase the presence of women, women of color, and women with disabilities in research centers and STEM departments. In conclusion, SU is ready and eager to engage in an institutional transformation process towards gender equity and inclusion.

4. Institutional Commitment and Sustainability

Chancellor Nancy Cantor has signaled her strong commitment to institutional transformation by consistently demonstrating her dedication to increasing the participation of underrepresented groups in the STEM disciplines, as evident in her scholarship [5-20], the creation of 15 multi-year STEM University Fellowships for minority graduate students; institution of performance evaluation metrics for chairs and deans that include recruiting underrepresented graduate students and; pursuit of external funding and support for the NSF-sponsored Alliances for Graduate Education and the Professoriate (AGEP) and the Louis Stokes Alliance for Minority Participation Program (LSAMP). Many of SU's LSAMP students are now in STEM graduate programs, and AGEP scholars occupy either industrial or government positions, or are engaged in postdoctoral work with the goal to enter academia.

The campus is ready to embrace institutional transformation and diversify its faculty. The provost and the deans have pledged to provide extensive personnel and financial support during and after completion of this project, as indicated in their support letters. All involved understand that institutional transformation is a long-term process that will need to be sustained. Commitments from the provost and deans will ensure a minimum of five years of continuation of project activities beyond the award period.

The Chancellor and Provost have pledged a total of over \$1m of university resources in support of activities integrated with the proposed project, and are especially supportive of initiatives (e.g., the Chancellor's Visiting Assistant Professorship, see Section 6.3 below) that are not allowable as project expenses. The budget justification contains additional details on many activities that will be supported by the university rather than by direct project expenditures.

5. Connecting the Conceptual Framework

Pilot research for this proposal uncovered a dearth of relevant informal social connections within the STEM academic units among women faculty members, chairs, search committee members, promotion and tenure committee members, and other key individuals who influence the recruitment and advancement of women faculty in STEM. It is believed that this deficit leads to isolation and inhibits access to information, resources, and social capital relevant for the success of these processes. Research springing from the classic 1973 paper by Granovetter [21] – “The Strength of Weak Ties,” suggests that fostering informal network ties among these individuals can catalyze organizational change. Although organizational science offers ways to understand transformation processes, using social network concepts provides a powerful new lens for understanding the diffusion of influence and ideas as well as the creation of ties. These ties allow female faculty access to resources and opportunities they would otherwise not have or are excluded from [22-32].

Informal social networks describe the relation of interactions, patterns of influence, and exchange of resources/value in the connections between people [23-25]. A social network is a structure made of individuals or organizations called "nodes" which are connected through relationships that serve as conduits for the flow of resources such as social support, instrumental information or finances. Individuals and organizations derive value, including access to information, expertise and other resources from their position in the overall social structure. When nodes are disconnected, information and expertise cannot freely flow. The social structure of networks (density, centrality, proximity, intimacy, etc.) can influence behaviors among network actors. The content of exchanges can be personal (confiding, socializing) or authoritative (formal supervisory authority) [24-28].

An extensive body of prior research shows the power of social networks with respect to a wide range of outcomes. For example, Ibarra [29] found that gender differences influence the network structure and women's access to resources based on their position in the network and their network composition decisions. Ibarra [30] also noted that women have the tendency to create more heterogeneous network ties than men, who usually operate in homogenous structures, choosing other male co-workers when it comes to professional ties. Combs [31] found that both gender and race impact access to networks. Furthermore, Combs [31] found that “having effective informal social networks, with sufficient intimacy and utility, may weigh heavily as a factor for career success.” Valente [32] demonstrated that social networks can apply external influence and idea leadership to channel the diffusion of innovation.

At the New Jersey Institute of Technology (NJIT), Nancy Steffen-Fluhr conducted an ADVANCE IT project entitled “More than the Sum of Its Parts: Advancing Women at NJIT through Collaborative Research Networks” and has reported the results in two conference papers [33-34]. This was one of the first documented efforts, to our knowledge, in using a social network approach toward developing research collaborations between women faculty as a means to achieve a functional critical mass of women researchers in an institution. Steffen-Fluhr reports frankly on the substantial challenges involved in conducting social network analysis on faculty respondents, but she also praises the power of using social network techniques as a tool for generating meaningful and beneficial organizational change [34]: “At its best, it allows us to step out of our square on the matrix and see the big picture in which our individual lives are embedded.” (Steffen-Fluhr has kindly agreed to serve as a consultant.) This project is taking the social networking approach further by not only linking within the University, but also to

research centers, and industry to further inclusion in collaborative research that fosters scientific innovation and new applications that confront the world's enduring challenges.

A trove of equity resources already exists on the Syracuse campus to help us achieve the goals set such as WiSE (Women in Science and Engineering Program), Women's and Gender Studies Department, the Education for Disability and Gender Equity project, and the Burton Blatt Institute (disability inclusion in education) are a few examples. Tempting as it may be to appoint a diversity "czar" to centrally manage such resources, the history of NSF's ADVANCE institutional transformation projects (as well as a body of relevant research [4,5,6,18,34]) suggests that while senior administrative support is critical, a pure top-down strategy is ineffective. Through social connections to their professional networks, faculty can benefit from such links for themselves, their colleagues, and their academic units. By integrating on- and off-campus networking (partly through research centers) women can fill the number of "structural holes" or gaps in their overall social network structures. In turn, these efforts can create opportunities for obtaining valuable information and support, which in turn can lead to creative ideas and collaborations that further their careers [3].

The research study incorporated in this project seeks to expand findings from previous ADVANCE IT Projects [e.g., 33,34] and contribute to social science research by assessing and understanding the importance of social connections for predicting gender differences between outcomes (i.e., promotion, tenure, voluntary turnover), and attitudes (e.g., intent to leave, diversity climate, overall job satisfaction): (1) department-head to faculty member relationships, (2) the density and strength of peer professional ties of the faculty member, (3) degree of connectedness to upper level administration, including deans, Provost and the Chancellor's office. While using social networks as a unifying conceptual theme, the study also builds upon prior work from organizational science, sociology, psychology, and gender studies. Please refer to the five-page supplement for more detailed information.

6. Proposed Initiatives for Innovative, Systemic Institutional Transformation

At SU, the WiSE program has a twelve year history of promoting the interests and advancement of women, with faculty volunteers developing successful support programs for women students in STEM. Recognizing the possible synergies across multiple efforts to empower women scientists and engineers, the offices of the Provost and Chancellor have selected the WiSE office to serve as the hub for the present proposal. Using the initiatives described below, the WiSE office will provide non-bureaucratic methods of establishing connections among equity resources on campus and female faculty members. Initiatives will also initiate increased diffusion of knowledge about promising practices in equity and inclusion, greater gender and cultural competence, and disability awareness and accessibility.

As Schneider, et al. [35] made clear, the only hope in creating permanent organizational change lies in shifting the culture of an organization. In a loosely coupled, flat organization where performance standards vary widely among different units, cultural change must be nurtured through a gradual, continuous bottom-up strategy. Many of these sentiments are also reflected in The University Leadership Council 2008 report [4]. Facilitated by the WiSE office, STEM departments and interdisciplinary research centers will become the breeding grounds for these gradual changes. Weick and Quinn [36] described key considerations in promoting change within a loosely coupled organization: "*The distinctive quality of continuous change is the idea that small continuous adjustments, created simultaneously across units, can accumulate and create substantial change... these same continuous adjustments... remain important as pockets of innovation that may prove appropriate in future environments.*"

6.1 The Networking Initiative: Connecting with Peers and Mentors

The prime objective of this first initiative is to connect women faculty to other STEM women, social networks and campus hubs of innovation and expertise so they are supported throughout their

journey to tenure and a full professorship. This initiative will focus on networking events, will address professional isolation and will empower women faculty. To this effect the following will be offered:

- ***Provide opportunity to participate in a 360 Evaluation.*** Up to 13 women faculty will participate in this personal evaluation process (years 1–4) for a total of 52 women. The evaluation will include mapping of the professional network and developing a strategy for improving it.
- ***Short-term coaching for individual women faculty.*** 2 short-term coaching sessions per individual will be offered to up to 10 women per year (years 1–5) for a total of 50. A general guide for proposed topics, consistent with the goals of this project, will be developed.
- An informal ***mentoring network*** will be developed. Senior faculty members will engage with junior faculty members in round-robin, collegial, social events. This preliminary “matchmaking process” will foster multiple informal mentoring relationships. Mentoring will be coupled with training sessions on the role of mentors and mentees and provide alternate models of mentoring in years 1-5. Industry partners will participate in this training. The Chancellor’s Visiting Assistant Professors, described in a later initiative, will also partake in this program.
- ***Empowerment workshops*** for women on such topics as assembling your own board of mentors and support network, mapping and evaluating the strength of your personal and professional networks, preventing burnout (caused by social isolation, crisis oriented and reactive systems of work, and poor work-life balance), assertive communication, etc. One workshop will be offered annually in years 1-5. The topics of these workshops and priority of order will be based on a poll. Women faculty from sister colleges, such as Lemoyne College and Clarkson University, as well as from other neighboring institutions will be invited to participate. Informal ties to Colgate, Cornell, Hamilton College, SUNY Oswego, and SUNY Institute of Technology will be used to promote events for their STEM faculty. Informal networking opportunities over a meal will be included.

6.2 The Corridor Initiative: Connecting with Scholarship in Action

The unique set of interdisciplinary research centers on campus is destined to serve as nuclei for recruiting and retaining women faculty. Centers’ close connections will be utilized to open the dialogue on the interface between academia and industry to allow for cross-fertilization and to examine the practices of industry partners to create diverse workforces. Notably, several industry partners (e.g., JPMorgan Chase and Welch Allyn) have received recognition [37] for their innovative diversity practices and subsequent results. The ability to engage in successful collaborative research requires the development of new networking and entrepreneurial skills and attitudes that have not typically been taught in graduate school [38]. Through a set of training opportunities STEM faculty will gain the necessary tools to thrive at this interface. This training will provide another professional venue for women and men faculty to connect over a common subject. In addition, existing academy-industry collaborations are rich sources of information for this project.

The following strategies will prepare women faculty for cross-sector collaborative research:

- ***Opportunity Development Grants*** (years 1-5) will provide funds for women faculty to strengthen their collaborative research and increase connections with industry partners. Examples of activities include supporting attendance at professional meetings, face-to-face meetings with research partners, child care during travel, etc. Up to 10 grants will be awarded annually based on competitive proposals from individual women faculty. The Provosts Office will fund up to 5 of the 10 per year (years 1-5) at \$1,500 each.
- ***Full day conference:*** Once per year, in (years 2–5) a full day retreat will be conducted for all STEM faculty to promote understanding and develop skills, as well as increase the density of social networks. Activities will include the following sessions:

- ***Collaborative Interdisciplinary Workshops (half day, women only)*** covering: entrepreneurial skill sets, legal issues and administrative considerations, project and inclusive leadership, communication and presentation skills, effective skills and strategies for interdisciplinary research.
 - ***Equity & Inclusion seminars (half day, male faculty)***: opportunities to learn about and consider the consequences of exclusion and benefits of inclusion, best practices for diversity and consider changes within the campus culture. The topic of these seminars will be based on the evaluative work of the male engagement committee (see below).
 - ***Research Round Robin Luncheon***: All faculty and research center directors will present over lunch brief, highly informal overview (90 seconds) of their ongoing research.
 - ***Equity, Inclusion and Diversity Planning Best Practice Workshops (half day, faculty and administrators)*** led by industry leaders in diversity, especially in the STEM areas.
 - ***Networking Reception and Dinner*** will follow to encourage networking and the formation of mentor- mentee relationships.
- ***Understanding and adapting best practices in training and diversity planning from industry (half day, all faculty and administrators)***: Industry partners have agreed to support training in the areas of diversity planning and accountability, inclusive leadership, mentoring, project team leadership, communication etc.
 - ***Two week job shadowing opportunity with project team leaders in industry or on campus*** will be offered for up to two STEM women faculty per year during summer months for years 2–5. These opportunities will facilitate the articulation of collaborative research directions.
 - ***Women Industry Leaders/Researchers***. To facilitate the formulation of collaborative research projects, special temporary faculty-of-practice positions will be filled by women from industry. Aside from teaching special topic lectures, these visits will allow the formulation of shared research interests and agreements.

6.3 The Recruiting Initiative: Connecting Searches with Women Faculty Candidates

As increasing the number of women faculty is a central goal of this project, a series of activities to increase the number of qualified female applicants, along with special activities for departments and search committees will comprise the core of this initiative. To ensure effective recruiting, a series of networking and training activities will strive to increase the number of females in the candidate pool:

- ***Search Committee Training and Support***: In years 1–5, annual search training will be conducted in the early fall to foster year round identification of candidates [39]. Training will emphasize social networking strategies to enrich the candidate pool. To encourage ownership at the departmental level, departmental opportunity grants of \$3,000 will be awarded to 4 departments annually (years 1-5) to enhance the search process by helping to identify and form relationships with referral sources and potential candidates during the early stages of a search and provide year-round networking for continuous identification of promising women, women of color, and women with disabilities. Departments will submit proposals that outline the strategies.
- ***Dual Career Support***: Of note in the 2005 COACHE survey was that women and men both felt that spousal hiring programs were critical to their success, and most ranked SU’s efforts in this area as ineffective or somewhat ineffective. This activity will connect department and search chairs with best practices around campus as well as develop a dual career hiring tool kit for search committees.
- ***Chancellor’s Visiting Assistant Professorship*** – In years 2–5, this program will bring two promising female doctoral graduates for a one academic year term appointment and provide them with skills and resources to succeed in academia and interdisciplinary research. These will be women who feel unready to enter the academic job market but who show distinctive promise. A special effort will be

made to recruit women of color and women with disabilities. Funding for this initiative will be provided jointly by the provost and deans of the respective colleges. These women will be carefully mentored following a development plan exclusive to their needs around the topics of collaborative research, teaching and personal empowerment. They will also be included in project activities.

- ***Development Effort:*** Under the direction of the Chancellor, SU's development office will set goals to raise funds for hiring accomplished senior women faculty in named professorships and chair positions. The goal is to raise funds for two such positions over the lifetime of the grant. Additionally, the three deans have pledged to offer support for target-of-opportunity hiring when a woman has been identified as critical to departmental expertise needs but no search is open.
- ***Leadership Training:*** Existing leadership retreats and training are already in place, such as the Chancellor's retreat for Deans and the Chair's retreat organized by the Provost. These existing venues will be infused with opportunities to strengthen the campus goals for diversity. This project will support these efforts by providing key information and consultants to aide in the programming. Team leaders will create opportunities for university leadership to understand the extent of the problem, learn about best practices, establish standards and metrics and boost accountability.

6.4 The Practices Initiative: Connecting Equity Goals and Internal Processes

As hiring, tenure and promotion policies are critical for all faculty, transparency of the various requirements is key, as it is essential to effective communication, mentoring and address inclusion and equity. En route to the paradigm of research collaboration, Male faculty will be actively engaged and supported as inclusive leaders and active participants. Specific activities will include:

- ***Diffusion of Innovations in Policies and Practices:*** A "policy information network" will be developed among members of the university senate (who have expertise in the revised promotion and tenure policies), associate deans, department chairs, and personnel committee chairs for the purpose of increasing transparency regarding gender equity, diversity and inclusion issues. With recently revamped promotion and tenure policy there is a need to facilitate discussion about increasing understanding among promotion and tenure committees in each college. The network will also serve as an informational clearinghouse for the diffusion of metrics toolkits, sharing of survey results, and benchmarking with other institutions on equity and inclusion.
- ***Research Associate to Improve Transparency:*** In order to establish, monitor and report on metrics for equity and inclusion a part-time research associate will work within the Office of Institutional Research and Assessment (OIRA) specifically on equity and inclusion metrics in STEM (also part of the evaluation plan, see below). This initiative connects the project to this hub of expertise to help keep the STEM context visible to faculty and leaders.
- ***Engaging Male Faculty as full partners in Equity and Inclusion:*** Data from SU's 2009 focus groups revealed that a critical group of male faculty are receptive to improving the diversity climate. Male faculty will be tied to the cause and action plans through membership in a group that will be given an annual budget to support their activities. Through these activities individual male faculty will a) increase their awareness, understanding and skills in the area of equity and inclusion; b) develop extensive social networks and resources for optimizing opportunities to hiring, retaining and promoting women faculty; and c) feel empowered as thought leaders diffusing best practices within their social networks (departments, colleges and campus). With support of the Provost activities proposed are...
 - Awareness training (y 1-5) will be designed by male STEM faculty for male faculty to increase understanding and sensitivity on topics related to gender equity and inclusion.

- Inclusive leadership training (y 2-5, once per year) for up to 15 male faculty to develop leadership skills to help diffuse values, goals and best practices of equity and inclusion.
- Follow-up coaching for research center and department heads who have participated in the inclusive leadership training will be, upon request, provided 4 sessions over the course of a two year period directed at supporting their creation an equitable and inclusive departmental culture.

7. Dissemination and Broader Impacts

The immediate impact of this project will be a connected and mobilized campus for faculty equity and inclusion efforts at Syracuse. Female and male faculty in STEM will act as full partners in addressing and attaining the goals of equity and inclusion at individual, departmental, college and campus levels. Generalizing and communicating results is vital, however, to achieve broader impacts beyond SU. Traditional scholarly reporting will focus on national meetings such as the American Society of Engineering Education (ASEE) and other meetings with a focus on equity and inclusion in academe. Professional societies such as the American Physical Society have in recent years run occasional conferences of direct relevance to this proposal (e.g. the 2007 Gender Equity Conference). Scholarly publications, particularly around the research study, will be submitted to peer-reviewed journals in management, organizational psychology, organizational sociology, women's studies and related venues as sufficient data become available. In addition, webinars on discrete tools and activities that will allow national distribution of information will be developed. Finally, in the fifth year of the project, an all-day virtual conference connecting results to those of other ADVANCE projects as well as to international examples of faculty development projects that have supported inclusion and equity will be held.

Because of the climate of interdisciplinary work at SU, which includes industry, and broad participation of STEM faculty members and research centers, it is expected that the experience and results from this project will be of considerable interest to other institutions. In addition to the use of the ADVANCE portal (advance.vt.edu), a project website, and the standard scholarly dissemination strategies in social science journals and conferences, contemporary social media methods will be used to advance work, both while it is in progress and at the conclusion of the award. At the moment, these methods include the use of standard social media websites and the features they contain (e.g., Facebook and LinkedIn groups, Twitter, and YouTube channels). With the assistance of a recently appointed Director of Social Media Services at the School of Information Studies, however, also planned is the use of an emerging generation of scholarly social media services such as Mendeley and Zotero as well.

8. Project Personnel and Management

External Advisory Council: The role of the external advisory council will be to provide strategic advice and support in developing the project and disseminating information to a nationwide audience. In addition, the council will facilitate connections with relevant resources and information. The Council will meet annually in person with travel expenses and a small honorarium paid by the project. It will be led by Chancellor Nancy Cantor and composed of representatives from higher education and industry. Committed members include Earl Lewis, Provost of Emory University; Debbie L. Sydow, president of Onondaga Community College; Christine Larson, Chief Operating Officer for J P Morgan Chase; Julie Shimer, President and CEO of Welch Allyn; Bev Watford, Associate Dean for Academic Affairs and Director for Center for the Enhancement of Engineering Diversity (CEED) at Virginia Tech; Judy Vance, Professor and Director of the Virtual Reality Applications Center, Iowa State University and past president of Women in Engineering Leadership Institute (WELI); Kelly A. Rusch, Associate Dean for Research and Diversity Programs and Professor at Louisiana State University Department of Civil and Environmental Engineering; Patricia Rankin, Professor of Physics at the University of Colorado and an

activist for women scientists and PI on an ADVANCE IT project; and Robin E. Bell, Director for the Earth Institute ADVANCE program and a Sr. Research Scientist at Columbia University.

Internal Advisory Board: The Internal Advisory Board will facilitate systemic adaptation for sustainability, serve as tactical advisors and monitor evaluation results. This board will facilitate connections with campus resources and information that will support this project. Board members will also participate in selected communication, training, networking, and mentoring activities. The Provost, Eric Spina, will lead the board and will be joined by Kal Alston, Associate Provost for Academic Affairs; Gina Lee-Glauser, VP for Research; Laura Steinberg, Dean of the LCSmith College of Engineering & Computer Science; George Langford, Dean of the College of Arts and Sciences; Elizabeth Liddy, Dean of the School of Information Studies; Diane Murphy, Dean of the College of Human Ecology and campus activist for women; two STEM faculty representatives; and the 4 co-PIs and managing director of the project.

Management Plan: The PI on this project is Chancellor Nancy Cantor. She has written extensively on the role of universities as anchor institutions in their communities, the status of women in the academy, and on racial justice and diversity [5-20]. She will lead the External Advisory Council and serve as primary strategist for the project. An executive team comprising the four co-PIs and a Managing Director (staff position) will guide project operations. The four co-PIs are Drs. Shobha Bhatia (Engineering), Karin Ruhlandt-Senge (Chemistry), Jeffrey Stanton (School of Information Studies) and Pamela Brandes (Management). Dr. Ines Mergel, Maxwell School of Public Administration, will serve as a scientific advisor.

The *Executive Team* will plan, organize resources, develop and monitor the budget and lead the overall implementation of the project. Day to day managerial responsibility will rotate in two-year shifts among Drs. Bhatia, Ruhlandt-Senge, and Stanton, while Brandes runs the research studies. This plan will allow for continued PI oversight in a sixth unfunded year for final reporting, dissemination and publication. Bhatia (with other faculty leaders) has been a department chair, director of WiSE as well as conducted NSF ADVANCE Leadership project and brings significant experience on organizing activities on campus. Ruhlandt-Senge is the Department chair of Chemistry and has been the Chemistry REU director since 2000. She has extensive experience in program administration as well. Both of these women have wide-ranging knowledge of science and engineering on campus and are active, widely funded scholars in their respective departments. Stanton, Associate Dean for Research and Doctoral Studies at the School of Information Studies, has successfully managed multiple prior award contracts. Stanton is an organizational psychologist and has extensive experience in psychometrics and survey measurement. Brandes, professor in the Whitman School of Management, brings expertise and resources on women's leadership, organizational development, and management. Mergel is a professor in the Maxwell School of Public Administration with postdoctoral training in the Program on Networked Governance at Harvard's Kennedy School of Government. Mergel teaches, lectures, and publishes on the use of social network analysis in social science research.

Additional participating faculty members, both men and women, come from a wide variety of disciplines and backgrounds – the physical sciences, engineering, sociology, public policy, information studies –to address the various components and ensure transformation. Highlighted here several key personnel: Kal Alston is the Associate Provost for Academic Affairs. Her office supports faculty human resource functions and faculty development. Gina Lee-Glauser is the Vice President of Research and long time mentor of women on campus. Can Isik is the Senior Associate Dean of Academic & Student Affairs in the College of Engineering & Computer Science. Alan Levy is Professor and Chair in the Mechanical & Aerospace Engineering (MAE) Department (recall that the MAE department has no women faculty members at this time). Chilukuri Mohan, Professor and Chair in Electrical Engineering & Computer

Science (EECS); a department that has difficulty retaining women faculty. M. Cristina Marchetti is a professor and chair in Physics and also co-directs the Biomaterials Institute. Individual working groups will focus on the major tasks in each initiative as well as communication and dissemination.

Commitments have been obtained from external consultants with specialized expertise that supplements the project team's capabilities. Dr. Nancy Steffen-Fluhr from the New Jersey Institute of Technology, will provide guidance on the use of social network initiatives on campus. Dr. Diana Billimoria brings her expertise in organizational behavior and implementation of an ADVANCE project.

9. Project Evaluation

In this project, three uses of data will occur simultaneously throughout the award period: data for the internal evaluation, for the external evaluation, and for the scientific study. Given the intersecting needs of these three activities, the potential for data collection chaos exists unless there is strict coordination among the requests and needs of the three functions. For these reasons, the design and deployment of data collection instruments will be coordinated by co-PI Jeffrey Stanton, whose scholarly expertise lies in psychometrics, survey design, survey nonresponse, and web-based data collection. Dr. Stanton will have help in this activity from the managing director (a staff position dedicated to this project) and a small team of graduate assistants. This central data collection operation will serve the scientific study (please see the five page supplement) by obtaining baseline sociometric and attitudinal data as well as subsequent waves of these measures; will serve the internal evaluation team (centered on the Office of Institutional Research and Assessment (OIRA), see below) by fielding pre- and post-intervention process measures; and will serve the external evaluation team (Durland Associates, see below) by providing access to all data sets. The only exception to the scheme noted above pertains to institution-wide outcome measures and records obtained from the university's Human Resources department. Because these routine functions already reside in OIRA (and for privacy reasons), this office will continue to coordinate the collection and provision of institution-wide faculty employment outcomes.

Internal Evaluation Plan

Syracuse University's Office of Institutional Research and Assessment (OIRA), which reports to the Vice Chancellor and Provost, will work with the project staff to implement the internal evaluation plan. OIRA's role will be as a neutral internal observer that analyzes and reports process and outcome data to the external advisory council and internal advisory board. OIRA supports a wide range of university projects by providing assessment services, study design; data collection, processing, and analysis; and reporting of results. The award will provision OIRA with a 0.5 FTE Research Associate who will be dedicated to increasing institutional transparency by analyzing and reporting on process quality data and supporting the implementation of project-related STEM faculty surveys.

The essential institution-wide data to be gathered and analyzed in the first year of the project and updated annually thereafter includes a superset of the data types needed to assess the original 12 NSF indicators (see Data Indicators at advance.vt.edu) including faculty gender, race, disability status, rank, years in rank, movement in rank, previous ranks at Syracuse, tenure status, years on tenure track, named professorships or other awards, resource allocations (space, startup), administrative and supplemental roles, discipline/department, and other appointments. Changes in these variables will be tracked and analysis will address comparisons by gender and race particularly on rate of tenure success and rate of promotion to each rank. In addition, the evaluation strategy includes assessment of additional NSF indicators (perceived climate, productivity, perceived work/family balance) and an evaluation of intervention programming effectiveness. As part of OIRA's ongoing participation with nationwide higher education data collection initiatives, they will also support the implementation and reporting of standardized institutional surveys of faculty attitudes and outcomes in the first and fourth years of the

project. These surveys will be supplemented with questions specific to this project. All faculty data will be conducted using a census strategy – rather than sampling – among the approximately 250 STEM faculty members. Faculty will be incentivized for participating in data collections through a combination of bottom-up strategies (individual incentives, peer networking, reminders) and top down strategies (messages from Chancellor, Provost, deans, and chairs; department-level incentives). Missing data will be mitigated through three strategies: 1) use of compulsory archival data (primarily from HR records), 2) voluntary individual follow-ups (e.g., face-to-face interviews with short form instruments), 3) and statistical imputation techniques (where missing data are not due to systematic bias).

External Evaluation Plan and Metrics

The formative and summative evaluation, and particularly the evaluation of intervention activities, will be designed and performed by Durland Consulting, Inc. with onsite support from Dr. Jeffrey Stanton and his research assistants. Durland Consulting is owned by Dr. Maryann Durland, who has over thirty years experience in educational practice, research, and assessment. Dr. Durland is a recognized expert on social network analysis. She edited the New Directions for Evaluation special issue on social network Analysis (SNA) and Program evaluation, is currently authoring a field guide to social network analysis for program evaluation, to be published by Stanford University Press, and is the co-author with Kimberly Fredericks of *Social Network Analysis in Program Evaluation: New Directions for Evaluation* (Jossey-Bass, 2006). She has provided consultation to Westat, the Robert Wood Johnson Foundation, the University of Minnesota extension program, and other organizations, on the application of SNA in program evaluations. For this evaluation, Dr. Shaunti Knauth will join Dr. Durland as a research lead on the evaluation. Both Dr. Durland and Dr. Knauth will be fully involved in all aspects of the evaluation, including data collection and the reporting of findings. Dr. Durland and Dr. Knauth have had prior experience with the goals and focus of ADVANCE IT, having carried out an external evaluation component for Rensselaer Polytechnic Institute's ADVANCE IT project.

As described in the request for proposals, an outline of the evaluation plan is presented here, with the expectation that a detailed evaluation plan will be presented upon award notification. Evaluation of program objectives will be used to measure the impact of the project on STEM faculty, as well as to provide information on the project's individual initiatives and goals, thus allowing for modification and improvement of various aspects of the project over the award period. Data collected during the formative phase of the evaluation process will form the basis for the summative evaluation. The theoretical framework for the evaluation will focus on organizational change and the role and the development of change agents. This framework will provide opportunities for developing evaluation tools and Social Network Analysis measures that are informed by both extensive research on organizational change, and the goals of the ICC approach and the results of the social science research. A brief review of seven distinctive evaluation focus areas, along with objectives and measures for each area appears below:

Evaluation Focus Area 1: *Connect women STEM faculty to other STEM women, research centers, and campus resources to increase the frequency and density of social networks supporting their journey through tenure and full professorship.*

Objective 1.1: Female faculty will report increasing use of social networks at SU

Objective 1.2: Female faculty will report increasing efficacy of social networks at SU

Measures and Data Collection: SNA measures of density, frequency and improved quality.

External evaluation of SNA surveys collected through research study.

Evaluation Focus Area 2: *Prepare women faculty to excel at the interface of interdisciplinary, cross-sectoral (academia-industry-community) research.*

Objective 2.1: Projected increase of female faculty in existing SU/industry collaborations.

Objective 2.2: Projected increase in new SU/industry collaborations led by female faculty.

Measures and Data Collection: Women faculty members' knowledge of entrepreneurial opportunities and strategies, % increase of female faculty participation in existing interdisciplinary collaborations and % increase in new collaborations led by women. External evaluation interviews, survey of female faculty, review of SU documentation on SU/Industry partnerships in STEM will be used.

Evaluation Focus Area 3: *Encourage improved candidate pool development by building faculty ownership for early stage and continuous strategies for identifying and recruiting women STEM faculty.*

Objective 3.1: Double the percentage of women in faculty applicant pools.

Objective 3.2: Faculty will regularly recommend female applicants, prior to posted search.

Objective 3.3: Departments have pool of potential female applicants prior to posted search.

Measures and Data Collection: % change in female applicants in pools (baseline year 1), annual increase in faculty recommendations, and increase departmental compilation of and outreach to potential female candidates. OIRA data collection, interviews with faculty and administration, evaluation survey.

Evaluation Focus Area 4: *Engage and support male faculty as leaders and active participants in creating diverse faculty and an inclusive environment.*

Objective 4.1: Engage at least 50% of male faculty in at least 4 activities over the award period.

Objective 4.2: Increased understanding of promotion and advantages of inclusive environments.

Objective 4.3: Female faculty report increased inclusivity of environment.

Measures and Data Collection: % of male faculty attending activities, % of male faculty giving positive ratings of information and experience gained from activities, male faculty understanding of inclusive environments, female faculty perception of increased inclusion and SNA measures of inclusive environment. Collection methods will include attendance tracking, event implementation surveys, interviews with sample of faculty, and SNA analysis.

Evaluation Focus Area 5: *Encourage and support effective departmental diversity planning with clear action goals, process checkpoints and accountability measures.*

Objective 5.1: Diversity plans show actionable goals, checkpoints and accountability measures.

Objective 5.2: Increased implementation of Department Diversity Plans.

Measures and Data Collection: Evidence of increased understanding of planning, plans show clear actionable goals, process checkpoints and accountability measures and annual increase in number of departments implementing. External evaluation interviews with chairs and faculty, external survey of administration and faculty and reviews of diversity plans.

Evaluation Focus Area 6: *Support policies and procedures related to hiring, tenure and promotion that facilitate and sustain an infrastructure of inclusion and equity.*

Objective 6.1: 25% increase in the number of women at full professor rank in STEM departments over the course of 5 years while maintaining or increasing the proportion of women at lower ranks.

Objective 6.2: Consistent application of policies and procedures designed to develop and sustain inclusion and equity in promotion.

Measures and Data Collection: % change in number of female full professors based on Y1 baseline, % of Assistant and Associate female faculty based on Y1 baseline, increased reference to policies in P & T committee meetings, increase P&T committee understanding of policies and procedure around collaborative, interdisciplinary research and increase in application of policies. OIRA data collection, external evaluation interviews and review of meeting minutes.

Evaluation Focus Area 7: *Obtain research study findings of publishable quality that document the generalizability of Syracuse's interventions for continuous development and improvement of inclusive environments at SU and elsewhere.*

Objective 7.1: Findings disseminated through publication in peer-reviewed journals

Objective 7.2: Research findings inform discussion and planning at SU

Objective 7.3: Research findings inform discussion and planning at peer colleges

Measures and Data Collection: Data collection efficacy, publishable quality, dissemination to SU community. Dissemination to external communities. External evaluation of instruments, journal submissions and interviews of sampling of SU community members.

10. Results from Prior NSF-Funded Research

Nancy Cantor. HRD-0455137, \$50,000.00. 10/01/2004 – 09/30/2005, Conference: What Does It Mean to be a Fully Educated Member of the 21st Century Workforce? This award allowed Syracuse University to bring together leaders from prominent research universities, corporations, government and non-profit organizations to discuss what it truly means to be a fully educated member of the 21st century workforce. Additionally, this forum allowed these leaders to develop and discuss possible strategies which could be used to assist more individuals in society to become fully educated members of the 21st century, and more specifically to advance science, engineering and technology in obtaining this goal. Project results were disseminated on the web as videos with accompanying text.

Shobha K. Bhatia. NSF SBE-0123622. \$185,000. 01/01/02-12/31/05. ADVANCE Leadership Award: Mentoring, Leadership, Training, and Research on Geonatural Products and their Application in Engineering. In addition to research on application of natural fibers in Civil engineering, this award was focused on leadership training for the PI and the development of leadership-training sessions for Syracuse women graduate students and junior faculty members. Example publication resulting from project: Zoli, C., Bhatia, S.K., Davidson, V. and Rusch, K. (2008). *Engineering: Women and leadership*. San Rafael, CA: Morgan & Claypool Publishers.

Karin Ruhlandt-Senge: In addition to two active projects related to her chemistry research (CHE 07533807, (creativity award), \$294,000, 07/2008-06/2010) and DMR 0722962, MRI, \$297,896, 08/2008-12/2009; Ruhlandt-Senge is the PI of a continuously funded domestic REU program since 2000 (currently CHE0850756, REU Site at SU: Undergraduate Research Experiences in Chemistry, \$267,795, 04/2009-3/31/2012), and since 2005 of an international REU program (with the Technical University Graz, Austria (CHE 0755383, iREU Site: International Research Experience for Chemistry Undergraduate Students in Austria, \$175,500, 04/2008-3/31/2011). Both REU sites provide research opportunities for undergraduates in Syracuse (n=35) and Austria (n=12). The programs are jointly funded by NSF (REU, LSAMP and AGEP), Syracuse University, industrial donors, and the Technical University, Graz.

Jeffrey M. Stanton. NSF Award 0420434. \$311,389. 7/15/04 – 12/31/2008. ITWF: Culture Clash! The Adverse Effects of IT Occupational Subculture on Formative Work Experiences of IT Students. This ITWF project explored adverse influences of the information technology occupational subculture on students in higher education and tested ways to counteract them. Findings showed that adverse impacts of IT occupational culture disproportionately influenced the educational and career decision making of women and URM students. Interventions based on inoculation theory showed promise for counteracting these adverse impacts. Example publication resulting from project: Guzman, I. R., & Stanton, J. M. (2008). Women's Adaptation to the IT Culture. *Women's Studies, Special Issue on Women and Technology: Reversing the Trends of Attrition and Obtaining a Balance*, 37(3), 202-228.

Pamela Brandes: No prior NSF funding.

Proposal Title: The Inclusive Connective Corridor:
Social Networks and the ADVANCEment of Women STEM Faculty

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