

# NDSU ADVANCE FORWARD

**Advancing Faculty  
to Move NDSU Forward**

**Climate and Gender Equity Research Program**

Dr. Kalpana S. Katti, Dept. of Civil Engineering ([kalpana.katti@ndsu.edu](mailto:kalpana.katti@ndsu.edu))  
Information Session, August 24<sup>th</sup> 2009

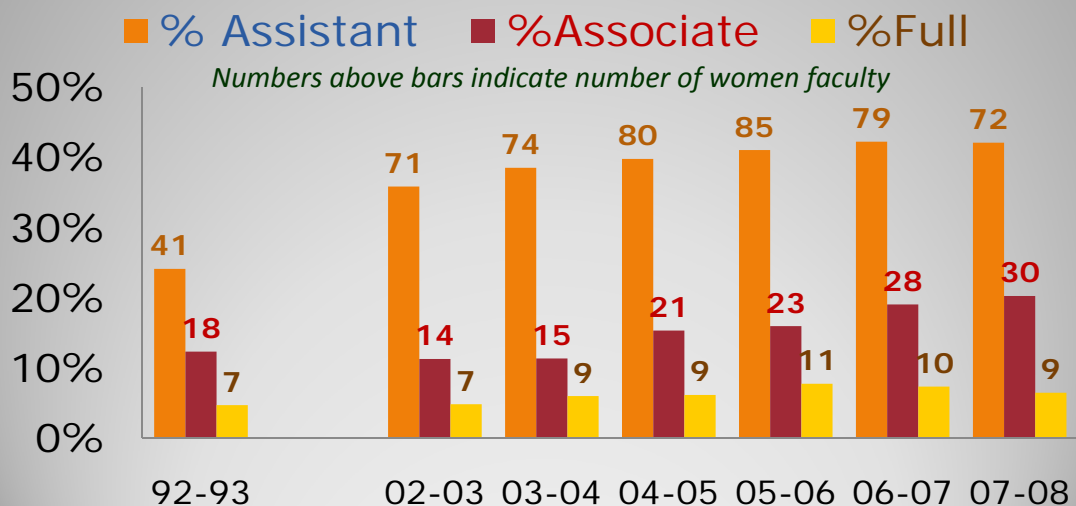
- ❖ Funding for comprehensive and sustainable institutional transformation to increase the representation and advancement of women in academic science, technology, engineering and mathematics (STEM) careers, thereby contributing to the development of a more diverse science and engineering workforce.

**NSF ADVANCE  
Institutional Transformation  
Program**

- ❖ **Improve the climate across the campus**
- ❖ Enhance recruitment of women faculty
- ❖ Increase retention of women faculty
- ❖ Promote/advance women associate professors and hire women at advanced rank to build a critical mass of senior women
- ❖ Open faculty leadership opportunities for women

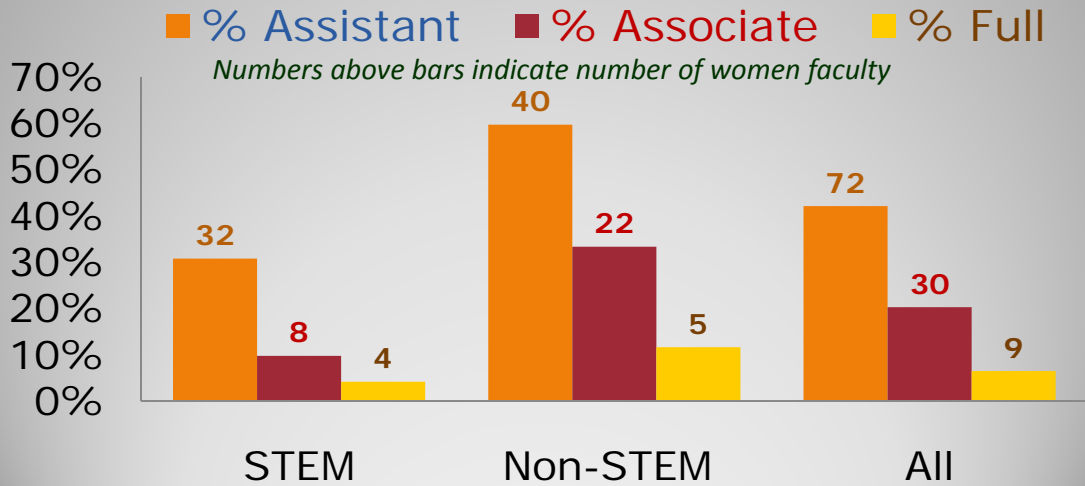
## Advance FORWARD Goals

## Percentage of NDSU Women by Rank



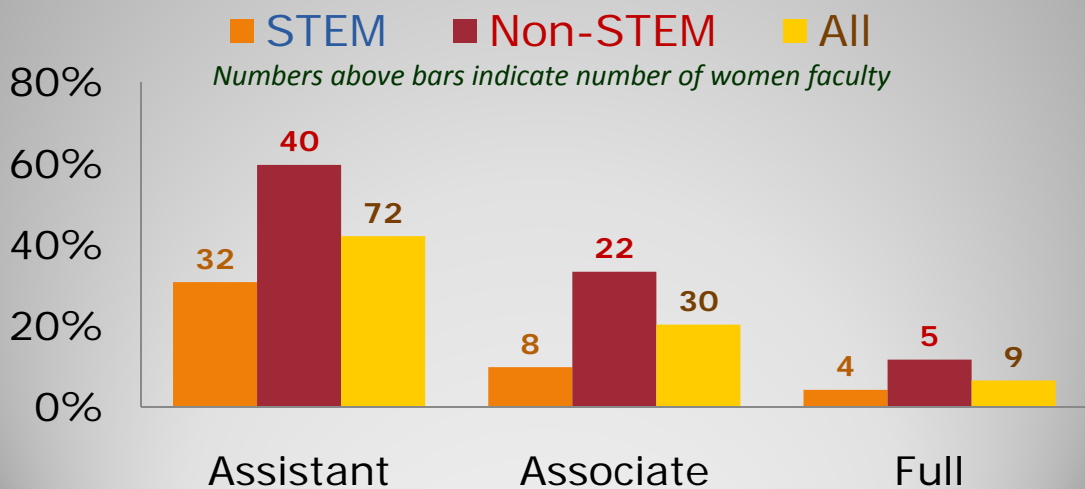
## Percentage of NDSU Women by Rank

2007-2008

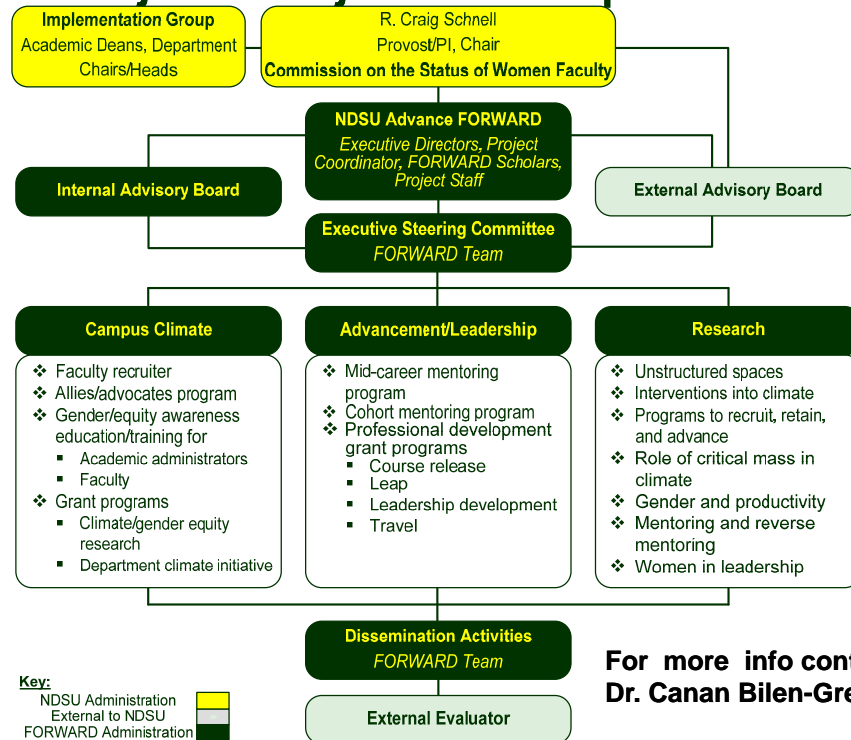


## Percentage of NDSU Women by Rank

2007-2008



# Major Project Components



## \$\$\$Funding Opportunities\$\$\$

- ❖ Course Release Grants – STEM
- ❖ Leap Research Grants – STEM
- ❖ Leadership Development Grants – All
- ❖ Travel Grants – All
- ❖ **Climate Research Grants** – All
- ❖ Mentoring Programs – All

**Advancement/Leadership:  
Professional Development**

- To engage the university in research on gender, develop interdisciplinary research teams
- Demonstrate the value of research on gender and the academy.
- Typical projects funded by this program will advance understanding of gender in the academic, especially STEM, workforce and should be separate from FORWARD related programs.

## Climate and Gender Equity Research Grant

[http://www.ndsu.edu/fileadmin/forward/climate\\_gender\\_equity\\_docs/Call\\_CGERG-09.pdf](http://www.ndsu.edu/fileadmin/forward/climate_gender_equity_docs/Call_CGERG-09.pdf)

**Contacts: Direct inquiries to Canan Bilen-Green ([canan.bilen.green@ndsu.edu](mailto:canan.bilen.green@ndsu.edu), 1-7040) and Elizabeth Birmingham ([elizabeth.birmingham@ndsu.edu](mailto:elizabeth.birmingham@ndsu.edu), 1-6587).**

- ❖ Open to tenure-track or tenured faculty in STEM **AND** NON STEM disciplines.
- Open to all interdisciplinary research teams composed of tenure-track or tenured faculty from at least two departments.

## Eligibility

- ❖ **Proposal deadline:** Sept. 18<sup>th</sup> 2009
- ❖ **Award announcement:** October 2009  
2009
- ❖ **Award period:** One year, all funds must be used by September 1, 2010.

## Timeline

- ❖ **Budget cap:** \$10,000
- **Allowable budget items:** Salary, including student stipends; budget fringe at NDSU levels; supplies; **and** travel and publication costs. **Budget direct costs only (no overhead).**

## Budget

- ❖ Advance FORWARD Climate and Gender Grant cover sheet
- ❖ Project Description: Not to exceed three single-spaced pages including tables and figures. Write to the level of a wide audience of potential reviewers.
- ❖ Budget with justification: Budget justification not to exceed one single-spaced page. Itemize, describe, and justify each budget item. Use the NDSU budget form; see (<http://www.ndsu.edu/research/spa/forms/excel/NDSU%20Standard%20Budget%20Form.xls>)
- ❖ List funding agency(s) and program(s) to which you will submit a proposal. Include target date(s) for submission(s) and estimated budget amount(s).
- ❖ References cited
- ❖ Vita – two pages

## Proposal Format

<http://www.ndsu.edu/research/spa/forms/excel/NDSU%20Standard%20Budget%20Form.xls>

### NDSU

#### Standard Proposal Budget

##### Salaries & Wages

Full time faculty	_____	
Fringe Benefits @30%	_____	
Full time staff, research assoc., techs, post docs	_____	
Fringe Benefits @35%	_____	
Graduate & undergraduate students	_____	
Fringe Benefits @2%	_____	
Part time staff	_____	
Fringe Benefits @10%	_____	
<b>Total Salaries &amp; Fringe Benefits</b>		<u>          \$0</u>

##### Operating Expense

Travel - Domestic	_____	
Travel - Foreign	_____	
Supplies	_____	
Postage	_____	
Printing	_____	
Repairs	_____	
Subcontracts	_____	
Rents & Leases	_____	
Major Equipment >\$5k	_____	
Operating Fees & Services	_____	
Professional Fees & Services	_____	
Miscellaneous Expense	_____	
<b>Total Operating Expense</b>		<u>          \$0</u>
<b>Total Direct Costs</b>		<u>          \$0</u>
<b>Facilities &amp; Administrative</b>		<u>          \$0</u>
<b>Total Cost</b>		<u>          \$0</u>

### **Primary Criteria**

- ❖ Intellectual merit
- ❖ Innovation and methodological rigor
- ❖ Interdisciplinary nature and credentials of the research team
- ❖ Potential for increasing journal publication of the research team and enhancing grantsmanship
- ❖ Promise in leading to a positive climate and help STEM women advance

### **Secondary Criteria**

- ❖ Soundness of the budget
- ❖ Quality of the proposal

### **Review Process**

- ❖ Proposals will be reviewed by external reviewers from other universities. The final decisions for awards will be made by an internal review committee. The decisions will be based heavily on the reviews presented by the external reviewers. The evaluation form is posted on the FORWARD web site for your information and consideration as you prepare your proposal.

## **Review Criteria**

- ❖ All funds must be used within the award period.
- ❖ **Awardees must submit manuscript(s) to peer reviewed journal(s).**
- ❖ Awardees must submit a brief synopsis on the use of Climate and Gender Equity grant at the end of the award period.
- ❖ Awardees are expected to participate in program assessment.
- ❖ Awardees must present findings to campus.
- ❖ **Awardees are strongly encouraged to submit a research proposal to a funding agency within 12 months of the end of award period**
- ❖ All scholarship resulting from this award must acknowledge support from the NDSU Advance FORWARD program sponsored by the National Science Foundation, *HRD-0811239*.

## **Obligations**



**EHR Organizations**

**Graduate Education (DGE)**

**Research on Learning in Formal and Informal  
Settings (DRL)**

**Undergraduate Education (DUE)**

**Human Resource Development (HRD)**

**Programs and Funding Opportunities HRD**

**ADVANCE: Increasing the Participation and Advancement of  
Women in Academic Science and Engineering Careers**

**Alliances for Broadening Participation in STEM (ABP) (ABP)**

**Centers of Research Excellence in Science and Technology  
(CREST) and HBCU Research Infrastructure for Science and  
Engineering (RISE) (CREST)**

**Cooperative Activity with Department of Energy Programs for  
Education and Human Resource Development (Request for  
Supplement)**

**Historically Black Colleges and Universities Undergraduate  
Program (HBCU-UP)**

**Model Institutions for Excellence - Phase III (MIE-III)  
Research in Disabilities Education (RDE)**

**Research on Gender in Science and Engineering (GSE)**

**Tribal Colleges and Universities Program (TCUP)**



Award Abstract #0733563

**GSE/COM: Role Models Make a World of Difference: Promoting Effective Outreach to Girls in Technology, Science, and Engineering**  
**NSF Org: HRD Division of Human Resource Development**

**Program Manager: Jolene K. Jesse**

HRD Division of Human Resource Development

EHR Directorate for Education & Human Resources

**Start Date: January 1, 2008**

**Expires: December 31, 2009 (Estimated)**

**Awarded Amount to Date: \$199874**

**Investigator(s): Linda Kekelis Ikekelis@chabotspace.org (Principal**

Investigator) Project director for gender-equity programs at Chabot Space and Science Center in Oakland, California She has a master's degree in Linguistics from the University of Southern California and a doctorate in Special Education from the University of California, Berkeley.

**Sponsor: Chabot Space and Science Center**

**NSF Program(s): RES ON GENDER IN SCI & ENGINE**

## NSF Award Example 1

2-Sep-09

Techbridge was founded in 2000 by Chabot Space & Science Center to build an effective model program for girls in underserved communities and to encourage and promote their interests in technology, science, and engineering. The program's emphasis on career exploration for girls has enabled staff to gain expertise training professionals and corporate partners for successful interactions between role models and students. Techbridge's evaluation data and research confirm that visits with role models and field trips to worksites have a significant and lasting impact in influencing girls' academic choices and career paths. In addition, these outreach efforts benefit organizations, boosting company morale and developing employee leadership. With a successful program in place backed by strong evaluation results, Techbridge developed a training model and resource guide for role models called "Get Involved. Make a Difference. A Guide for Classroom Visits and Field Trips for K-12 Students." The training and resource guide feature practical guidance and case studies that highlight activities and successful interactions between role models and youth. In this project, Techbridge will extend the distribution of "Get Involved. Make a Difference." to a wider audience and provide partners with research-based, field-tested resources and training to assist them in recruiting and supporting role models.

**Intellectual Merit**--The Role Models Make a World of Difference project: 1) fills an unmet need by providing information and resources that are well organized, practical, useful, and easily accessible to role models and partners; 2) provides resources and training that are based upon a robust model program that has a 7-year track record for successfully engaging role models in outreach through classroom visits and field trips; 3) engages a team that brings extensive expertise to the project, with over two decades of experience developing career resources for girls; and 4) distributes guidelines for role models, developed with input from Techbridge's research study and longitudinal investigation, to encourage role models to present in ways that are most likely to positively impact girls' academic and career aspirations.

**Broader Impacts**--The Role Models Make a World of Difference project has broad, long-term impact through outreach, training, and partnerships with educational, corporate, and government agencies that are committed to increasing girls' participation in technology, science, and engineering. It is expected that over 225,000 role models will be trained and supported during the project that will promote the participation of girls in technology, science, and engineering.

**Abstract** Award Abstract #0733563

2-Sep-09

**Award Abstract #0827461**

**Career Outcomes of Engineering Bachelor's Degree Recipients**

**NSF Org: HRD Division of Human Resource Development**

**Award Instrument: Standard Grant**

**Program Manager: Jolene K. Jesse**

HRD Division of Human Resource Development

EHR Directorate for Education & Human Resources

**Start Date: October 1, 2008**

**Expires: September 30, 2011 (Estimated)**

**Awarded Amount to Date: \$249981**

**Investigator(s): Lisa Frehill lfrehill@cpst.org (Principal Investigator)**

Executive Director of the Commission on Professionals in Science and Technology. Ph.D. in sociology with a minor in systems engineering and an M.A. in sociology both from the University of Arizona.

**Sponsor: Commission on Professionals in Science & Technology**

1200 New York Ave NW, Suite 113

Washington, DC 20005 202/326-7080

**NSF Program(s): RES ON GENDER IN SCI & ENGINE**

**NSF Award Example 2**

**Intellectual Merit:** Women are less likely than men in similar bachelor's degree cohorts to be retained in engineering (Frehill 2007a). This study will analyze existing, nationally-representative data to answer several questions about this gender difference in post-bachelor's retention in engineering. Are women less likely to stay in engineering because of work/family issues? Gendered reactions to the increasing uncertainty of engineering workplaces? Gender-based discrimination? Or do women have better success than men in moving from technical to managerial work in engineering? Researchers will analyze data from the NSF's Science and Engineering Statistical Analysis System (SESTAT) for 1993, 1997, 1999, 2003, and 2006, a compilation of three constituent surveys that provide the most comprehensive data about the U.S. STEM workforce. A second dataset includes the National Center for Education Statistics' Bachelors and Beyond panel study for the 1992/93 and 1999/2000 degree cohorts (base year plus three follow-ups for the 1992/93 degree cohort covering the 1993-2003 period), which will provide a closer examination of how individual engineering careers progress throughout the 1990s and early part of the 21st century. Finally, these nationally-representative data will be supplemented by information from two studies of U.S. engineers sponsored by the Society of Women Engineers. These latter two studies, one completed in 1993 and the other in 2005, provide data focused explicitly on career issues for engineers. This study is interested in understanding retention within the engineering workforce, which has been the subject of little systematic research.

**Broader Impacts:** The proposed research will examine the extent to which women and under-represented minorities--especially the often-overlooked intersection of these groups (women of color)--are retained in engineering after earning bachelor's degrees. The research will enable engineering educators, employers, and policy makers to develop strategies for enabling retention in engineering after graduation. Retention is important because the best ambassadors of jobs are often incumbents (Hira 2007): such role models are essential to conveying to young people that they can have long-term, meaningful careers within a particular discipline. The outreach strategy for the findings includes presentations at conferences and papers in traditional academic journals. In addition, the researchers will reach a wider audience through articles in relevant engineering disciplinary magazines, read by millions of engineers and other practitioners that will benefit from an understanding of how to make the engineering workplace a more welcoming place for diverse people.

**Abstract** Award Abstract #0827461



**Award Number: 0827484**

**GSE/RES: Women in Science from High School to College: Evidence from New York City Public School Students**

**NSF Org: HRD Division of Human Resource Development**

**Award Instrument: Standard Grant**

**Program Manager: Jolene K. Jesse**

HRD Division of Human Resource Development

EHR Directorate for Education & Human Resources

**Start Date: September 1, 2008 Expires: August 31, 2010 (Estimated)**

**Awarded Amount to Date: \$354726**

**Investigator(s): Amy Ellen Schwartz amy.schwartz@nyu.edu (Principal Investigator) Professor of Public Policy, Education, and Economics**

**NYUWagner**

Matthew Wiswall (Co-Principal Investigator) Assistant Professor New York University Department of Economics

**Sponsor: New York University**

**NSF Program(s): RES ON GENDER IN SCI & ENGINE**

## NSF Award Example 3

**Intellectual Merit:** This is a study of the sequence of educational choices and outcomes leading women and men to a college major in a science, technology, engineering, and mathematics (STEM) subject: high school STEM courses taken, learning and performance measured by grades and state examinations, and eventual college major. Research questions center on factors that, based on sociology of gender theory, are expected to affect students' decisions to major in a STEM area in college, and to affect women and men differently, including high school structure and culture, the gender composition of teachers and peers, curriculum, school-college connections, and size. The objectives are to identify factors that increase women's propensity to major in STEM fields, how these factors vary by race, language ability, immigrant status, and poverty, and how the transition from high school to college may serve to ameliorate gender inequities. The student- and school level data on several cohorts of the large and diverse New York City (NYC) public high school student population and the subset that goes to the City University of New York (CUNY) is unique by its size, diversity, the wealth of variables available, and its longitudinal nature that allows for a hierarchical linear model (HLM) analysis using students and high schools as separate levels. Large sample sizes and access to gender, race, immigration, and poverty measures at the student level, provide ample power for substantive subgroup analyses. The methodology moves beyond single outcome analysis, including test scores on several subject examinations, high school course taking in several subjects and college majors. The HLM framework links these together and the various individual- and school-level influences on these variables are analyzed. The interaction of educational institutions and student-level heterogeneity are a focus. Rather than assume that high schools affect participation in STEM in the same way for all students, the diversity of NYC high schools and students is used to estimate interaction effects of high school environments on various student subgroups. This method produces a more nuanced set of results than was previously possible using methodologies that assumed a single effect for women and men of all subgroups.

**Broader Impacts:** The broader impacts center on the contribution to understanding how high school reforms can foster greater female participation in STEM. Disadvantaged women (who tend to be overrepresented in large urban school systems) in STEM, especially those who make it into public colleges, are understudied and would greatly benefit from policy reform. Despite the geographic focus on NYC, women pursuing STEM in large, diverse school systems, and working and middle class students in public colleges are exactly the populations which policy reforms are expected to benefit the most, and they are understudied because of lack of data. CUNY, with senior and community colleges, of varying levels and requirements, and programs for students from the struggling to the gifted, is representative of many college situations that students encounter elsewhere. This research will also enlighten the nationwide debate on improving college access and success through community colleges. Through a partnership with the NYC Department of Education and wide outreach and communication, the study's findings will advance the ongoing discussion about how districts might impact the gender gap in STEM.

**Abstract** Award Abstract # 0827484

**Award Abstract #0827526**

**Looking inside high school science classrooms: An exploration of males' and females' subjective experience**

**NSF Org: HRD Division of Human Resource Development**

**Award Instrument: Standard Grant**

**Program Manager: Jolene K. Jesse**

HRD Division of Human Resource Development

EHR Directorate for Education & Human Resources

**Start Date: September 1, 2008 Expires: August 31, 2011 (Estimated)**

**Awarded Amount to Date: \$476131**

**Investigator(s): Jennifer Schmidt [jaschmidt@niu.edu](mailto:jaschmidt@niu.edu) (Principal**

**Investigator)** Assistant Professor of Educational Psychology, Department of Leadership, Educational Psychology and Foundations, NIU

M Cecil Smith (Co-Principal Investigator) Professor, Program In Educational Psychology

**Sponsor: Northern Illinois University**

**NSF Program(s): RES ON GENDER IN SCI & ENGINE**

## NSF Award Example 4

This project will provide a descriptive account of what a variety of high school science contexts feel like from the perspective of female and male students. This three-year project, to be conducted through Northern Illinois University, is focused on immediate outcomes; namely, individuals' momentary levels of cognitive and affective engagement while involved in everyday science activity. The project will systematically record students' classroom experiences as they happen, linking various aspects of subjective experience to specific courses, content units, and classroom activities. Using a combination of surveys, interviews, classroom observations, and experience sampling techniques, this mixed-methods research will make a unique contribution to the understanding of the daily processes that contribute to the engagement of both females and males in science.

**The intellectual merit** of this project is that it will provide crucial foundational knowledge about students' actual experiences in science classes. This information will fill a gap in the literature in science education in that it will explore affective processes involved in learning.

**The broader impact** of this project is that it could have substantial effects on instructional practices, course design and curriculum in high school science education. The project is positioned to produce a strong knowledge base about the affective and motivational components of science learning, linking particular subjective states to specific courses, content units, and instructional practices. Beyond this, if the expected gender differences are found in students' subjective experience, the findings could suggest specific ways to alter science curricula in an effort to fully engage males and females in science classrooms.

**Abstract** Award Abstract # #0827526