



Increasing gender diversity, equity, and inclusion in the science, technology, engineering, & mathematics (STEM) academic professions by promoting evidence-based, systemic changes in universities and colleges.

ADVANCE

ORGANIZATIONAL CHANGE FOR GENDER EQUITY IN STEM ACADEMIC PROFESSIONS



National Science Foundation
WHERE DISCOVERIES BEGIN

DIRECTORATE FOR EDUCATION & HUMAN RESOURCES

EHR



NSF ADVANCE FUNDING OPPORTUNITIES

www.nsf.gov/ADVANCE

INSTITUTIONAL TRANSFORMATION (IT)

Supports development of innovative organizational change strategies to enhance gender equity in STEM academics in non-profit institutions of higher education (IHEs). Projects must be innovative in terms of developing new systemic change strategies and/or addressing new gender equity issues, as well as include original research of systemic equity issues in STEM academics. All non-profit institutions of higher education that have not had a previous ADVANCE **IT** award are eligible to apply.

ADAPTATION

Supports the adaptation and implementation of successful strategies to address systemic gender equity issues for STEM faculty within one non-profit IHE or by a non-profit, non-academic organization to enhance equity nationally or regionally within one or more STEM disciplines. These awards may be made to a single non-profit IHE that has not had an ADVANCE **IT** award or to an eligible non-profit, non-academic organization.

CATALYST

Supports institutional self-assessment to identify STEM faculty inequities and pilot equity strategies to inform the development of a five-year STEM faculty equity strategic plan. Non-profit IHEs that are not, and have not been, the lead on any previous type of ADVANCE award, are eligible.

PARTNERSHIP

Supports projects involving two or more non-profit IHEs and/or non-profit, non-academic organizations to undertake systemic change projects that have national or regional reach. Projects can focus on one or multiple STEM disciplines and define and propose significant reach.

CHALLENGES

The number of women obtaining STEM doctorate degrees has increased steadily in recent decades. However, women, especially women of color, continue to be underrepresented in STEM academic positions, especially at senior ranks and in leadership positions. Research* indicates that the marginal participation and advancement of women in STEM is often a function of external systemic factors unrelated to their ability, interest, and technical skills, such as:

- » Implicit and explicit bias
- » Differential service and teaching workload and less recognition and value of this work by organizations
- » Underrepresentation of women, especially women of color, in academic leadership and decision-making positions
- » Differential effects of work and family demands
- » Culture and climate of academic departments and STEM organizations

*For overviews of the related research see Abigail J. Stewart and Virginia Valian, *An Inclusive Academy: Achieving Diversity and Excellence*. MIT Press, 2018 and Sandra Laursen and Ann E. Austin, *Building Gender Equity in the Academy: Institutional Strategies for Change*, Johns Hopkins Press, 2020.



ADVANCE PROGRAM GOALS

The long-term goal of the National Science Foundation's ADVANCE program is to address the systemic factors that result in gender inequity for STEM faculty by supporting grant projects to make systemic and cultural changes to IHEs and within STEM disciplines. The program goals and the types of grants supported by ADVANCE have changed over time in accordance with lessons learned from the work of ADVANCE grantees. After 20 years of funding the development and testing of systemic change strategies to build equity for STEM faculty; the ADVANCE program has increased emphasis on scale-up and incorporating an intersectional lens into the systemic change and gender equity work supported by the program. The 2021 program goals are:

- » To broaden the implementation of evidence-based, systemic change strategies that promote equity for STEM faculty in academic workplaces and the academic profession.
- » To promote the involvement of all genders in the design of systemic change strategies that use intersectional approaches in recognition that gender, race, and ethnicity do not exist in isolation from each other and from other categories of social identity.
- » To contribute to the research knowledge base on gender equity and the intersection of gender and other social identities in STEM academic careers.



INTERSECTIONALITY

The NSF ADVANCE program recognizes that equity barriers are not identical for all STEM faculty, therefore, the program seeks to promote systemic change that considers the intersection of gender and other social identities, especially the intersection of race and ethnicity and gender. Intersectionality was first framed in terms of employment discrimination by Kimberle Crenshaw in 1991, and further developed by many scholars.* Intersectionality recognizes that social identities do not exist in isolation from each other and may be more or less salient in any given context and interaction with STEM colleagues, faculty, and students. NSF ADVANCE has required that an intersectional lens be included in the systemic change and gender equity work supported by the program since 2016.

*RESOURCES ON INTERSECTIONALITY

Crenshaw, K. (1991) Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color. *Stanford Law Review*. 43 (6): 1241-1299

Collins, Patricia H., Bilge, Sirma. (2016) *Intersectionality*. Cambridge, UK: Polity Press.

Else-Quest, N. M., & Hyde, J. S. (2016a). *Intersectionality in Quantitative Psychological Research: I. Theoretical and Epistemological Issues*. *Psychology of Women Quarterly*, 40(2), 155-170.

Else-Quest, N. M., & Hyde, J. S. (2016b). *Intersectionality in Quantitative Psychological Research: II. Methods and Techniques*. *Psychology of Women Quarterly*, 40(3), 319-336.



Diagram depicting some of the different social identities that may intersect with each other and that may impact an individual's treatment and experience in different social contexts (examples from a STEM academic career are shown in the turquoise hexagon). An individual may be anywhere on the spectrum of the spokes and will have differential advantages and privileges as a result.

The diagram is adapted from Metcalf, H., Williams, R., and Russell, A. (2018), *Intersectionality: A critical framework for STEM equity*. Retrieved from https://www.awis.org/wp-content/uploads/AWIS_FactSheet_Intersectionalityv4.pdf.

STRATEGIES DEVELOPED BY ADVANCE AWARDEES

ENHANCE INSTITUTIONAL STRUCTURES

Written and unwritten policies, procedures, and practices can unintentionally create inequities. ADVANCE institutions have benefited from:

- » Reviewing, revising, and increasing the transparency and consistent implementation of recruitment, hiring, promotion, and tenure policies as well as processes for reporting harassment.
- » Collecting faculty data and workplace climate data; reporting this data, disaggregated by relevant demographics (at least gender and race and ethnicity but other information may be relevant such as tenure track status and rank) and expecting and rewarding the use of the data in decision-making and planning.
- » Modifying existing, or creating new, administrative leadership positions to incorporate responsibilities for implementing practices for achieving and sustaining faculty diversity, equity, and inclusion and to monitor and evaluate these practices to make changes as needed.

WORK-LIFE SUPPORT

STEM faculty job satisfaction which is highly influenced by work-life balance and can impact recruitment, retention, and promotion, especially of diverse faculty. ADVANCE institutions have benefited from:

- » Using data from faculty climate surveys and focus groups to identify the work-life issues impacting faculty, especially diverse STEM faculty and then using this data to address the concerns of faculty.
- » Developing and implementing flexible career policies that address life transitions, dual-career hiring policies tailored to the institution and region, career support programs to mitigate work-life issues for faculty such as isolation and solo status, and other needs identified by faculty.
- » Creating structures to train administrators and faculty on these policies and work-life programs and to ensure that there are no negative impacts on career progress or success for those participating in work-life programs.



EQUITABLE CAREER SUPPORT

Career support programs are important for recruitment, retention, and promotion of all faculty, particularly diverse faculty. ADVANCE institutions have benefited from:

- » Establishing formal faculty mentoring structures and providing recognition for the time and effort of the faculty mentors.
- » Developing unbiased mechanisms to assign, track, and report on service, teaching, and research resource allocations to ensure equitable distribution.
- » Developing mechanisms to recognize the wide range of professional excellence of faculty such as recognition for "invisible" service like mentoring large numbers of diverse students.
- » Providing workshops, training, timely feedback on progress, and coaching on the tenure and promotion processes to all STEM faculty.
- » Providing leadership development programs and opportunities for STEM administrative leaders and faculty that include components on diversity, equity, and inclusion.

EMPOWERMENT

Faculty, department leaders, and institutional administrators are empowered when given the knowledge, tools, and resources to address systemic inequities. ADVANCE institutions have benefited from:

- » Providing training on effective strategies to reduce the stressors that result in a greater reliance on implicit biases when making decisions, especially in search, promotion, and tenure committees.
- » Creating research-driven tools such as templates and checklists and approval processes tailored to the institution to reduce the influence of implicit biases in decision-making processes.
- » Creating processes to monitor and evaluate the effectiveness of policies in relation to gender equity, especially as faculty equity issues may change over time and external circumstances such as economic downturns or pandemics.

Many ADVANCE-developed, institutional transformation strategies can be incorporated into ongoing institutional strategic planning efforts and implemented by existing administrative and institutional offices at little to no long-term cost. This work can also align with an institutional effort to earn recognition for their equity work from the AAAS STEM Equity Achievement program (SEA Change) — seachange.aaas.org.

STEPS TOWARDS

INSTITUTIONAL TRANSFORMATION

1

REVIEW THE RESEARCH

Study the social science literature on organizational change, implicit/explicit bias, work-life issues, accumulated disadvantage, and related research on the underrepresentation of certain groups in academic STEM. Join the ADVANCE Resource and Coordination (ARC) Network to connect with a community working on equity issues and to access a library of resources developed by past ADVANCE awardees at equityinstem.org.

2

COLLECT, DISAGGREGATE, AND ANALYZE DATA

Surveys and other faculty data enable institutions to identify systemic gender inequities and to inform the data analysis to understand the reasons for the inequity which are often due to written and unwritten policies, procedures, and practices. Using an intersectional lens when collecting and analyzing data is recommended to ensure that equity issues for individuals with multiple social identities have been considered.

3

REVIEW AND REVISE POLICIES

Equity issues are often embedded in written and unwritten policies, procedures and practices for faculty recruitment, tenure and promotion and work-life programs. These can be revised to incorporate strategies to reduce implicit biases and other disadvantaging factors.



4

IDENTIFY STRATEGIES TO ADDRESS INEQUITIES

Many strategies can be adopted with little modification. However, new or modified strategies may be needed to address unique challenges at the institution. The Strategies for Effecting Gender Equity and Institutional Change (StratEGIC) toolkit includes information on ADVANCE strategies that have been implemented by others www.strategictoolkit.org.

5

REPORT OUT TO THE ACADEMIC COMMUNITY

Keep the academic community apprised of institutional data and policy and program revisions to build ownership and awareness of the efforts and to create feedback opportunities.

6

ESTABLISH PROCESSES TO MONITOR AND REVISE

Evaluate the impact of policy changes and revisions to continually monitor the effectiveness for all faculty. Remember that an intersectional lens may be necessary to ensure that all faculty benefit from the changes. Monitoring is important to identify emerging challenges that may develop over time.



RESOURCES

ADVANCE Resource and Coordination (ARC) Network

The ARC Network is a national network to advance STEM equity in academia by convening diverse audiences to collaborate, share, and implement the best practices and tools shown to effect change encompassing intersectionality, intentionality, and inclusivity. Members have access to a library of resources developed or used by ADVANCE grantees. Funding from NSF ADVANCE is not a requirement to join the network.

equityinstem.org

Strategies for Effecting Gender Equity and Institutional Change (StratEGIC) Toolkit

StratEGIC is a website that provides an overview of ADVANCE strategies developed and implemented by past awardees.

www.strategictoolkit.org

AAAS STEMM Equity Achievement (SEA) Change Program

SEA Change is a comprehensive initiative that implements a proven self-assessment process to effect sustainable change regarding diversity, equity, and inclusion in STEMM at U.S. institutions of higher education.

seachange.aaas.org



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Learn more about **ADVANCE**
at www.nsf.gov/advance or email advance@nsf.gov

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