

LEVERAGE: Strengthening the ASSIST Collaborative to Illuminate Engineering Faculty Pathways Overview

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This **design and development launch pilot** leverages the existing NSF ASSIST collaboration between the seven largest national diversity-serving engineering professional organizations to extend the American Indian Science and Engineering Society's (AISES') *Lighting the Pathway to Faculty Careers for Natives in STEM* model (EchoHawk, Ondrechen, Megginson, Cornelius, & McClanahan, 2014) to double the number of underrepresented minorities (URM) holding engineering faculty positions over the next seven years. Utilizing the American Society of Engineering Education's (ASEE's) 2014 numbers as the base (Yoder, 2015), the collective impact from this work will result in 13% URM engineering faculty at 4-year colleges and universities by 2025, taken the number of URM faculty from 1683 to 3366. The AISES' *Lighting the Pathway* model creates an integrated system of offerings and resources to support participants' persistence and success. This project will strengthen this integrated system of support and extend it to the other six diversity-serving engineering professional organizations.

Intellectual Merit

The intellectual merits of this project are considerable. This launch pilot will utilize an evidence-based approach to increasing and sustaining the diversification of engineering faculty. AISES's *Lighting the Pathway Model* created a "full circle of support ... an intergenerational community [composed] of undergraduate and graduate students, postdoctoral scholars, and junior and senior faculty." This model will be adapted and extended to fit the cultural contexts of the demographics served by the other six partner organizations and it will be strengthened by adding resources addressing the career stages of the target participants. The established communities of supplemental support will utilize a virtual mentoring infrastructure to extend the face-to-face professional development and mentoring through time and space.

Broader Impacts

The broader significance of this project is to address the extreme shortage of URM faculty of all ranks in 4-year colleges and universities, including our nation's Minority-Serving Institutions (MSIs) and most research-intensive institutions. By making significant progress toward diversifying engineering faculty on university campuses, perceptions of what the face of engineering looks like will be forever changed, benefiting all students and particularly those facing stereotype threat (Steele, 1997) and both conscious and implicit biases (Banaji & Greenwald, 2013, Greenwald et al., 2002) in the engineering educational system. In addition, diversification of STEM faculty should result in stronger engineering programs on university campuses as diversity contributes to group innovation and creativity (Page, 2007). The intergenerational communities formed around dimensions of diversity will light academic career pathways that are generative in nature. This approach draws together and links affinity groups of URM graduate students, post-doctoral scholars, junior faculty and senior faculty across the nation and across the NSF-supported engineering disciplines. This nationwide approach will create a community of potential, aspiring, and current engineering faculty who are historically underrepresented and who share scientific interests, ethnic identities, and cultural practices. Affinity group focused activities will contribute to increasing URM participation in engineering disciplines as academic faculty. This will



benefit society by tapping into an existing and grossly underutilized national asset. This project will extend established partnerships among the largest national diversity-serving organizations and will utilize an established model to significantly increase the number of faculty contributing to engineering education.

American Indian Science and Engineering Society (AISES) - <http://www.aises.org/> - AISES is a 501(c)(3) non-profit professional association. The mission of AISES is to substantially increase the representation of American Indians, Alaska Natives, Native Hawaiians, First Nations and other indigenous peoples of North America in science, technology, engineering and math (STEM) studies and careers. Its headquarters is located in Albuquerque, NM, and Sarah EchoHawk is the Chief Executive Officer. AISES offers pre-college, college, and professional programs. Through the quality and reach of its programs and the longevity and devoted commitment of its “family,” AISES is the leader in STEM opportunity in Indian Country. Members from over 200 tribal nations are represented within AISES, and AISES enjoys the support and partnership of corporate, government, academic, and tribal decisionmakers.

Great Minds in STEM™ (GMiS) - <http://www.greatmindsinstem.org/> - For 27 years, GMiS, a 501c3 educational non-membership, non-profit, has worked towards its vision to be a national leader in keeping America technologically strong by promoting STEM careers, especially in underserved communities. With support from a substantial core of STEM-based supporters, GMiS continues its history of creating a national STEM awareness campaign and supplementing the academic and career development of underserved and underrepresented students and professionals. Through a series of year-round integrated opportunities, GMiS' Kindergarten-to-Career programs have defined outcomes and objectives designed to build a culture of lifelong learning, focus on stimulating interest in STEM careers, promote a culture of diversity and inclusion, and develop current and future leaders. The most notable of these offerings is the HENAAC Conference which is GMiS' legacy in honoring and recognizing top-technical Hispanic STEM talent.

MAES, Latinos in Science and Engineering (MAES) - <http://mymaes.org/> - MAES is the foremost Latino organization for the development of STEM leaders in the academic, executive, and technical communities. The organization's mission is to promote, cultivate, and honor excellence in education and leadership among Latino engineers and scientists. MAES was founded in Los Angeles in 1974 to increase the number of Mexican Americans and other Hispanics in technical and scientific fields. MAES offers outreach, student, professional, and event programs.

National Society of Black Engineers (NSBE) - <http://www.nsbe.org/> - With more than 31,000 members, NSBE is one of the largest student-governed organizations in the country. Founded in 1975, NSBE now includes more the 394 College, Pre-College, and Technical Professional/Alumni chapters in the United States and abroad. The organization's mission is “to increase the number of culturally responsible Black Engineers who excel academically, succeed professionally and positively impact the community.” NSBE provides resources to support students, professionals, parents and educators, and corporations and partners.

Society for Advancement of Hispanics/Chicanos and Native Americans in Science (SACNAS) - <http://sacnas.org/> - SACNAS is a society of scientists dedicated to fostering the success of Chicano/Hispanic and Native American scientists – from college students to professionals – to attain degrees, careers, and positions of leadership. SACNAS is the largest National multidisciplinary scientific society serving over 25,000 minority students and professionals in Science, Technology, Engineering and Mathematical (STEM) fields. SACNAS achieves mission impact through outcome-based year-round programming and initiatives.

Society of Women Engineers (SWE) - <http://societyofwomenengineers.swe.org/> - The Society of Women Engineers (SWE), founded in 1950, is a not-for-profit educational and service organization. SWE's mission is to stimulate women to achieve their full potential in careers as engineers and leaders, expand the image of the engineering profession as a positive force in the quality of life, and demonstrate the value of diversity. SWE is the driving force that establishes engineering as a highly desirable career aspiration for women. SWE empowers women to succeed and advance in those aspirations and be recognized for their life changing contributions and achievements as engineers and leaders. SWE is comprised of over 34,000 members (students and professionals) from all engineering and technology disciplines.



Society of Hispanic Professional Engineers (SHPE) - <http://national.shpe.org/> - SHPE changes lives by empowering the Hispanic community to realize its fullest potential and to impact the world through STEM awareness, access, support and development. SHPE was founded in Los Angeles, CA, in 1974 by a group of engineers employed by the city of Los Angeles. Their objective was to form a national organization of professional engineers to serve as role models in the Hispanic community. The organization serves over 10,000 members and over 250 chapters across the nation.

