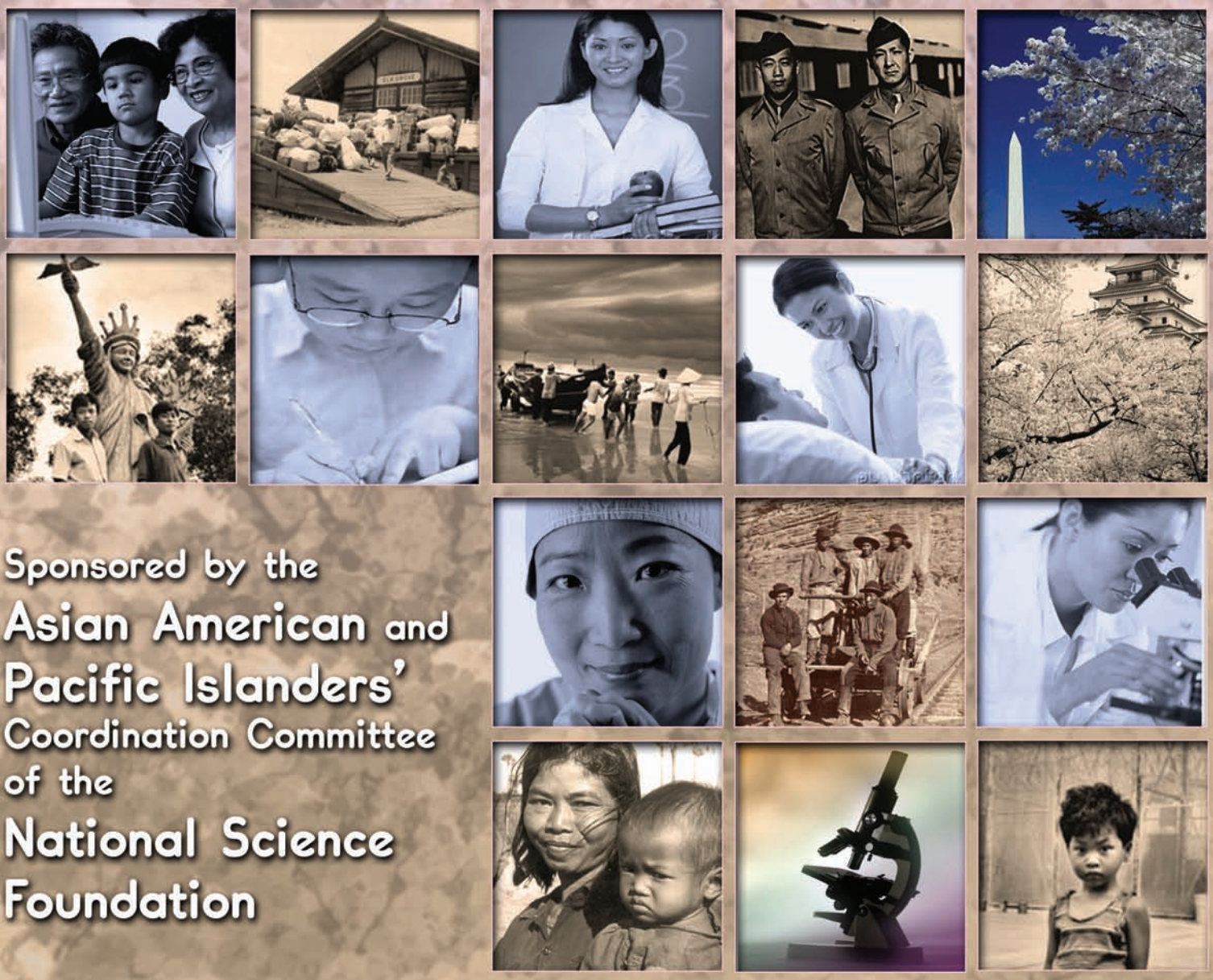
Asian Americans and Pacific Islanders' Issues:

The Challenges of Success

Workshop Proceedings
NOVEMBER 3–4, 2003



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Asian American and Pacific Islanders' Issues: The Challenges of Success

National Science Foundation

Asian American and Pacific Islander
Coordinating Committee

Acknowledgements

These proceedings are an edited version of a two-day meeting convened by the Asian American and Pacific Islander (AAPI) Coordinating Committee of the National Science Foundation. Session summaries were prepared by invited participants, several of whom were also asked to prepare papers/presentations to frame the discussion. The conference was organized by Dr. Nirmala Kannankutty and Dr. Rajinder Khosla, and co-chaired by Dr. Rajinder Khosla and Ms. Deh-I Hsiung. The conference was co-funded by the Directorate for Education and Human Resources and the Office of the Director, National Science Foundation. We would like to acknowledge the contributions of all attendees, including members of the AAPI Coordinating Committee of NSF. We would also like to acknowledge the assistance of Ms. Patricia Shelton and her staff from PRAMM Consulting, Inc., in conference planning and logistics under Contract No. REC-9911984. Special thanks go out to Mr. John Wilkinson, Office of the Director, for his generous contribution of time and expertise. Finally, we gratefully acknowledge the editorial assistance provided by Ms. Marcia Rosenberger, PRAMM Consulting, Inc., Ms. Mary Sladek and Ms. Kelly DuBose of NSF, and Ms. Sandra Geisbush and Mr. Mark Klawiter, NSF Einstein Fellows.

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Background 2

The Asian American and Pacific Islander (AAPI) Coordinating committee of the National Science Foundation (NSF) hosted a workshop on AAPI issues on November 3-4, 2003. The conference was held in Arlington, Virginia at the National Science Foundation. Participants included a diverse group of forty professionals, as well as NSF staff, all sharing a commitment to succeed in balancing the mix of Asian American and Pacific Islanders' participation in research and education programs. The workshop served as a forum for providing valuable insight into AAPI issues with the goal that all participants benefit from the exchange of information. The structure of the workshop stressed participant input, focusing on developing and connecting outreach, education, research, and workforce threads.

The AAPI Coordinating Committee functions under the direction of Dr. Joseph Bordogna, Deputy Director of the National Science Foundation. It serves in response to a White House Initiative, by Executive Order 13216, with the goal of increasing the participation of Asian Americans and Pacific Islanders in federal programs where they are currently underserved.

The AAPI Workshop was designed as a means of directly consulting with representatives of the Asian American and Pacific Island community as an initial and vital step towards developing a comprehensive plan that will best address their needs. Toward this end, the goals of the workshop were as follows:

1. To identify ways in which NSF can broaden AAPI participation in NSF programs and the Science, Technology, Engineering, and Mathematics (STEM) workforce. Of particular interest is outreach to potential grantees (principal investigators, postdocs, and students) in Asian American and Pacific Islander communities.
2. To acknowledge and celebrate the vast range of successes and contributions of Asian American and Pacific Islander scientists and engineers.

This workshop is an initial step towards the National Science Foundation's plan to increase communication and the dissemination of information in alignment with the goals of the White House Initiative and the AAPI Coordinating Committee. Speakers and participants will help define critical issues. It is expected that the networking accomplished, during the workshop activities and through the follow up report, will have a positive impact on communication and the dissemination of information for all participants, their colleagues, and all stakeholders.

Summary of Recommendations and a Vision for the Future 3

A profound dedication to the mission and a deep commitment to a shared vision energized the AAPI workshop proceedings. Attention was focused on issues vital to Asian Americans and Pacific Islanders, especially as they relate to science, technology, engineering and mathematics in education and the workforce. Areas of strength and areas of challenge were identified and prioritized. As esteemed colleagues engaged in professional discourse and proactive collaboration, a solid foundation was established on which further successes can be structured. Insightful recommendations ensued, each with the potential of guiding individuals, projects, programs, and foundations as comprehensive plans to address the diverse needs of Asian Americans and Pacific Islanders are designed and implemented.

Representatives of the Asian American and Pacific Islander communities were in general accord as they shared their views. Dr. Indira Nair stressed that supporting the AAPI community is about building a culture and climate that honors diversity and aspires to a natural state of inclusion in the greater community. Her views prompted discussion as to the importance of focusing on the domestic needs of inclusion in the STEM community rather than solely on the more alluring global focus that is popular at any given moment. Dr. Nirmala Kannankutty emphasized the range of diversity in the AAPI groups and pointed out that this diversity engenders diverse needs, especially as they pertain to underrepresented groups within the broad AAPI label. Dr. Jeffrey Chen spoke to the importance of Asian Americans and Pacific Islanders identifying and then bridging the cultural and social barriers to their own success. He expressed his views as an advocate of mentoring and coaching programs designed to guide Asian Americans and Pacific Islanders towards greater success in education and industry. Dr. Paul Kingery shared his concerns regarding AAPI representation and indicated that institutional barriers are significant and must be identified and acknowledged before they can be adequately addressed. He emphasized the need to refrain from considering Asian Americans and Pacific Islanders as a broad group, pointing out that to do so underestimates the significant achievement by some subpopulations and overestimates the success of others.

Collaborative sharing and reflective insight during the breakout sessions led to the following general recommendations:

- Identify and address issues specific to individual Asian American and Pacific Islander sub-groups, differentiating their needs to serve those who need guidance and support to succeed as well as those who are already successful and will benefit from guidance and support to develop as leaders.

- Identify culturally context-based challenges pertaining to science, technology, engineering, and math in education and in the workforce and provide support for proactive and innovative programs addressing these challenges.

- Fund and promote diverse projects that support dynamic infrastructure for K-12 science, math and technology to facilitate successful student learning and provide relevant professional development for teachers, counselors, and administrators, especially in underserved areas.

- Fund and promote undergraduate and graduate programs, including enhanced AAPI internship and fellowship programs that collaborate with K-12 students and teachers, with the goal of improving STEM content knowledge and process skills for all participants.

- Encourage and facilitate collaboration among community colleges, regional colleges, and regional universities to build partnerships with research universities that will lead to greater impact in areas such as proposal writing, mentoring, professional development, program development, student achievement, and availability of resources, especially in AAPI communities.

- Encourage and facilitate partnerships between school systems and the workforce community to foster a 'cradle to grave' concept of science, technology, engineering, and mathematics, especially in underrepresented AAPI areas.

- Support and guide teacher preparation and retention programs, targeting areas that serve Asian Americans and Pacific Islanders, ensuring that administrators and teachers understand and effectively address the individual and cultural needs of their students as they tend to diverse academic needs.

- Facilitate and support the development of local and regional science centers, mobile resources, summer camps, and online programs for K-12 students and teachers, emphasizing local environments and cultures while showing relevant connections between science and daily life.

- Continue to develop NSF as the front-runner in diversity issues by setting the standard for proactive mentoring, staff support, and staff advancement, while promoting accessibility to a wide range of opportunities for all.

- Promote AAPI participation in all NSF programs through the development and support of regional seminars, workshops, and outreach programs.

- Review NSF's Requests for Proposals to ensure that they are linguistically appropriate and explicit in Review Criteria, to enhance AAPI participation.

- Provide NSF support and funding to hold a mini-conference, commissioning specialists such as those participating in the AAPI Workshop to study specific locales using the profiles generated to support statistical analysis. There is an identified need for both statistical analysis and detailed profiles that can look at the processes of learning and the difficulties of delivering services.

- Develop and support a clearinghouse, with an inventory showing the latest research and data, to identify the kinds of indicators that are affecting particular parts of the AAPI population. Provide meta-analysis to assist in visualizing the effect size and the sample size of those studies. In considering quantifying data relating to Asian American and Pacific Islander research and issues, be aware that caution must be taken to consider the effect that culture might have on data collection and reporting. Ensure that policy recommendations are based on data and analysis.

- Utilize currently funded research, such as Math Science Partnerships (MSP), while proactively seeking out, promoting, and recruiting AAPI candidates for future opportunities.

- Increase the awareness of positive role models from AAPI communities through an ongoing, targeted, and progressive media campaign.

- Develop and sustain NSF-supported research to determine why so few Asian Americans and Pacific Islanders become teachers, while developing effective strategies and incentives to promote teaching as a positive and viable career option, addressing both recruitment and retention issues.

- Establish effective communication networks and monitor the efforts resulting from AAPI workshops in order to progress with this vision.

- Actions AAPI individuals and groups might consider to promote their cause include:

    - Join the American Educational Research Association (AERA) AAPI Special Interest Groups.
    - Utilize the NSF/AERA Research Fellows Program.
    - Submit workshop surveys with suggestions and comments.
    - Serve as an NSF principal investigator, panelist, mail reviewer, committee member, fellow, or employee.
    - Submit unsolicited proposals that address AAPI issues and concerns.

A Japanese proverb claims that vision without action is merely a daydream. The focus of the AAPI workshop was to share the vision and call for a plan of action. As Dr. Joseph Bordogna stated in his opening remarks, the success of the nation's future depends on attracting all members of its diverse population to careers in science and engineering. He pointed out that if the science and engineering workforce is not representative of the domestic population, the nation will miss the most promising opportunity for success.

Action Items 4

The following items need attention from NSF and require actions to help promote participation of members of the Asian American and Pacific Islander (AAPI) communities in NSF programs and projects:

- Identify and address issues specific to individual Asian American and Pacific Islander sub-groups, differentiating their needs and providing support for proactive and innovative programs addressing these challenges.

- Facilitate and support the development of local and regional science centers, mobile resources, summer camps, and online programs for K-12 students and teachers, emphasizing local environments and cultures while showing relevant connections between science and daily life.

- Establish effective communications networks and monitor the efforts resulting from AAPI workshops in order to progress with this vision.

- Promote AAPI participation in all NSF programs through the development and support of regional seminars, workshops, and outreach programs.

- Establish an NSF website that specifically addresses the AAPI related programs, projects, and areas of special interest to the AAPI community.

Welcoming Remarks 5

Joseph Bordogna, Ph.D.
Deputy Director
Chief Operating Officer
National Science Foundation

Joseph Bordogna serves as Deputy Director and Chief Operating Officer of the National Science Foundation (NSF), having served previously as head of NSF's Directorate for Engineering. Complementary to these tasks, he is a member of the President's Management Council and has chaired committees on Manufacturing, Environmental Technologies, and Automotive Technologies in the President's National Science and Technology Council (NSTC).

Thank you for the opportunity to make remarks today. The subject of this workshop is central to realizing NSF's strategic focus on enabling its domestic population. The success of our nation's future depends on attracting all members of its diverse population to careers in science and engineering. I think all of us here recognize that if our 21st-Century science and engineering workforce is not representative of our domestic population, we as a nation will miss the most promising opportunity for continued US success. The loss will cut two ways -- it will rob worthy individuals of the chance to enrich their lives and to contribute to the engine of our economy and culture, and it will undermine the ability of our nation to prosper within an increasingly competitive world.

Along the way in our careers, we have learned that wanting to emphasize the participation of domestic students in S&E careers is just not enough. There must be action agendas that create paths for making this happen... along with the hard, dedicated work that must be done to realize results.

Your work here at this workshop is fundamental to accelerating action on the know-how the science and engineering community, within its separate parts, has garnered over the past three decades on how to be inclusive. The intent now can be to capitalize on these myriad separate investments by integrating and synergizing them to embrace scope and realize scale.

As stated in the material describing this workshop, one of your principal aims will be to identify ways in which NSF can help broaden participation of Asian Americans and Pacific Islanders in its programs. Of particular interest is reaching out to potential grantees (principal investigators, post-docs and students) in the AAPI community. You have been chosen to participate because of your involvement with NSF programs and demonstrated interest in this area. You can help us think through how to enable all members of our nation's population to profit from connections that integrate across NSF's entire set of programs.

NSF has developed successful building blocks of its investment in people, ideas, and tools in one way or another, over several decades. Now is the time to integrate them. Now is the time to make the whole greater than the sum of the individual building blocks.

In this context, the future of science and engineering lies not only within the great legacy of success we've enjoyed up to today, but also, and more importantly, in the making of the scientists and engineers of tomorrow. Foremost in this effort is our design of the process by which we enlist, educate, engage, include, and instill passion and ethical behavior in the next generation of scientists and engineers. The design is something we can formulate now – it is a necessary next step in an accelerated journey toward change, change that will neither confine nor constrict our potential.

Most of us would agree that U.S. science and engineering education is the best in the world. The frontier research of cutting-edge tools and skill sets that characterize our nation's science and engineering schools make them intellectual magnets, drawing students from every nation of the world. The result of this global corps of scientists and engineers is the diffusing of new knowledge and technology across international borders, thus contributing to our common future on the planet.

But this raises an obvious and sobering question. If U.S. science and engineering education is the greatest in the world, why aren't domestic students flocking to the fold?

We have to ask ourselves: Will there be a robust mix of knowledgeable workers to meet the need for such talent in our society? Will an exodus of international talent, combined with growing numbers of engineers trained in other nations throughout the world, and staying where they are trained, dull the competitive edge we enjoy in the United States?

The U.S. has neglected proactive recruitment of our domestic talent. As a strategic, as well as equitable, manifestation of this intent for societal advancement, we unequivocally need more of them in the S&E workforce. If we don't encourage individuals from all diverse groups to enter into the complex and dynamic fields of science and engineering, we lose out on the opportunity to maximize the potential of our own nation's intellectual capital.

The differences that abound in race and ethnicity in our society should be encouraged and embraced. They are a gift for our future and should be nurtured. The divisions should be erased. They are a drag on our energy and creativity.

In this context, there is something more enabling about the era in which we live than any of the past.

We have moved into a whole new threshold of capabilities that breach with the past and that will catapult us beyond today's horizons, thereby muting the divisions. The advent of cyber infrastructure has resulted in a potential leveling of the playing field – it has endowed many with the capability to find the information and tools they seek to educate themselves and make contributions. Cyber infrastructure is an equalizer, an enabler. It will increasingly democratize education and opportunity. Despite such tools, though, unless the desire and the

drive exist in the individual, capability alone will not lead to success. This is where we come in. It is our job to plant the seeds of curiosity, interest, enablement, and the kind of education from which both present and future generations will sow the benefits.

But how do we go about making this change? Our well being as individuals and as a nation depends, now and far into the future, on how well we prepare all our human resources today. Every American must be "counted in" when providing opportunities and "counted on" for contributions to society. But before we can count on people, we must assume some responsibility for their preparation. That's why, at NSF, investment in "People" is one of our four strategic goals.

As steward of the health of our nation's science and engineering enterprise, NSF works at the frontier of research and education, where risks and rewards are high, and where potential benefits to society are most promising.

Congress chartered the National Science Foundation to "promote the progress of science; [and] to advance the national health, prosperity and welfare." Preparing the nation's workforce for the challenges of the 21st century world is central to this mission. The workers we educate today will be tomorrow's discoverers, innovators and entrepreneurs, and the guardians of our health and well-being. We must make sure that they are as well educated as workers anywhere in the world. And we must make sure that they represent our diverse society—all of it.

Just a few days ago, *The New York Times* interviewed Praveen Chaudhari, the director of Brookhaven National Laboratory and a former vice-president for science at IBM. Asked to provide insight on the immigration of scientists, Dr. Chaudhari replied, "In India, it's well known that you can go to the U.S. and do well. The reason most South Asians come is because they hear in the newspaper about all the great things that are possible, the jobs, the lack of discrimination."

In other words, they've seen the light of Lady Liberty's torch. Sometimes it seems the torch is more difficult to see from within our borders than from outside them. The Statue of Liberty's torch must light the way for those inside our borders as well as those from across the borders. What we need is a genuine open-door policy.

One of the challenges we must accept, if we aspire to be leaders, is this: How can we enable our domestic youth to be full participants in our great democratic system while continuing the successful policy of embracing those from abroad?

At today's workshop, you will be spending time on addressing an individual student's journey to a scientific-based career, and this path may well be idiosyncratic and serendipitous. We don't want to eliminate serendipity, or attempt to make uniform pathways. We do want to eliminate dead ends and roadblocks, build connecting roads or bridges where none exist, open locked doors, knock down barriers, and re-grade some of the steeper slopes. These are well-known tasks for scientists and engineers, though not easy ones.

Many of our existing programs address one or more of these impediments. We need now to

look at them all holistically, as parts of an interconnected system. The behavior of a system depends both on the characteristics of the individual pieces and on the way in which they are tied together. The innovative ideas may well come from looking at the connections between various pathways through the educational system and their effect on students' mobility through the entire process. The goal is synergy—combining individual career pathways supported by institutions or programs into an intersecting, supportive network whose variety and capacity exceeds the sum of its parts.

As your workshop proceeds, please discuss what we do and don't know about achieving that kind of synergy. Examine the kinds of connections that have worked well in the past, and the kinds that haven't. The roadblocks and barriers to be overcome may or may not be obvious.

As you ponder how to optimize the return on NSF's investment in the AAPI community, I implore you to think holistically. Think about how we can use the tools and knowledge we already have to restructure career pathways in science and engineering. Envision a network of pathways which allows students from many different starting points to set out for a variety of endpoints—researcher, educator, industry leader, entrepreneur. Where you see barriers, think about how to build new paths around them. Where you see chasms, build bridges across them. There will still be plenty of opportunities for the idiosyncratic twists and turns that characterize a life in science and engineering.

Highlights from Presentations by the Plenary Speakers

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Asian Americans and Pacific Islanders' Issues in Research and Education

Dr. Indira Nair, Vice Provost for Education, Carnegie Mellon University

Dr. Indira Nair chairs the National Science Foundation's (NSF) committee on Equal Opportunities in Science and Engineering and serves on the Advisory Committee for the Directorate for Education and Human Resources. Nair's work includes women in science and engineering, the inclusion of ethics and science and technology education for all Carnegie Mellon students, increasing the inclusion of underrepresented minorities across all segments, and fostering discussions of diversity and authenticity on campus.

Welcoming All Into Science

Dr. Nair began by examining the general idea of how to approach building capacity in Science, Technology, Engineering and Mathematics (STEM). She reminded workshop participants that the National Science Foundation attends to the three goals of promoting people, ideas, and tools. Dr. Nair shared Dr. Bordogna's assertion that this issue is not about building capacity for STEM. Rather, it is about the self-realization of all people, with capacity building for Science, Technology, Engineering, and Math as by-products.

While STEM is traditionally viewed as the enterprise and the people are considered an input, Dr. Nair pointed out that it would be of considerable benefit to turn this paradigm around and look at people as the enterprise and at STEM knowledge as the output. In taking this approach, all people would have a better opportunity to get to the best place possible.

Dr. Nair elaborated on the significance of this concept when she stated, "This means having a culture and a climate of doing science that is welcoming to all and that represents the cultural and community needs of all people regardless of the particular group under consideration." She went on to point out, "Done properly, all groups should stand to gain."

It was acknowledged that this approach might be more difficult to implement than the traditional route, which tends to focus on the underserved populations exclusively. However, it was pointed out that the traditional approach often does not benefit everyone. This idea is especially important when considering the diverse needs of Asian Americans and Pacific Islanders.

Disaggregating the Data

Through examination of information available to describe the Asian American and Pacific Islander population, Dr. Nair explained that existing gaps become even more apparent when the data is disaggregated. This data is expected to assist NSF in the evaluation of existing policies and their adaptation to address the specific needs of Asian Americans and Pacific Islanders.

It was emphasized, as well, that disaggregations might also show relative strengths. "We need to disaggregate the Asian groups also since they are a very diverse population," said Dr. Nair. However, she cautioned that too much disaggregating could quite conceivably lead to conclusions that are not helpful in the long run.

Dr. Nair described Asian Americans and Pacific Islanders as a group of groups, arguably the most diverse of all minority groups. Their range of diversity spans Native Hawaiians and members of the far-reaching Pacific Islands, who have distinct cultures and community ethos still intact and attached to particular locations. The Asian American and Pacific Islander designation also includes immigrants that came to the United States beginning in the mid 1800s and extending through today. East Asian groups have been brought here as laborers, Southeast Asians and Indians arrived as professionals, and recent immigrant groups have come to the United States to contribute to the information technology workforce. Thus, there is a large range of first-generation immigrants whose needs are unique, depending on the subgroup. Asian can mean a range of nations with extremely different cultures. In addition, it is important to support the population of second-generation Asian Americans who are trying to integrate the needs of both cultures.

Dr. Nair addressed the specialized needs of the Pacific Islanders as an original native group who remained in their communities, attached to their local cultures. These Pacific Islanders can be described as having a strong sense of community and their need to contribute to their community is sometimes at odds with the traditional views of the scientific community.

However, now that NSF and the scientific community in general are seeking to stimulate synthesis and integration with research that is systemic and multidisciplinary, Dr. Nair sees the role of Pacific Islanders as increasingly important. This is particularly true in the areas of Environmental Science and Ecology, which have been underserved by this group. Dr. Nair stresses that it is equally important that the AAPI community not lose its individuals that are successful in STEM, as this will lead to the loss of community-mindedness that is essential in STEM.

Equally important, according to Dr. Nair, is the need to bring the expertise and science infrastructure to these communities to enable them to compete in the world of 21st-century research science. Today, the major portion of this kind of funding goes to large research universities that are largely exclusive of AAPI communities. Dr. Nair suggested that research should focus on creating alliances with the community college systems where the AAPI communities are flourishing. She stressed the importance of taking the expertise of the universities and translating it into ways that can be effectively used at the community college level.

Bringing a Systemic Focus to Science

Dr. Nair pointed out that the tacit wisdom and knowledge that comes from the Asian Americans and Pacific Islanders can contribute to future generations in science. After introducing this issue as the Ecologies of Knowledge, Dr. Nair articulated the need to integrate the community mindedness and tacit knowledge of Asian Americans and Pacific Islanders to engage in good science that is meaningful and valuable. Dr. Nair referred to the structure of scientific research, which tends to ignore issues that are too large or complex to be described with a two or three variable equation, pointing out that this mindset creates a scientific system that undervalues and disrespects the Asian American and Pacific Islander communities. Science must not ignore the real problems of the world in order to solve the more trivial issues that can be easily quantified. As science continues to become more focused on the systemic, perhaps Asian Americans and Pacific Islanders can bring back community-approached, systemic ways of thinking. It is important to realize that we do not want to reduce our human and social dynamic to a quantitative equation.

Dr. Nair suggested that it might be valuable for all scientists to work with a cultural anthropologist, since this approach brings a more human and community-minded perspective to research.

Describing teaching in a multicultural classroom in terms of the tension between identity and authenticity, Dr. Nair stated, "The old ways of learning, for example, living with a guru in India, offered individuality and authenticity, while the classroom offers everyone the same identity." She acknowledged that it is difficult to teach without the students in the classroom experiencing a loss of authenticity. Further, it is an unrealistic expectation to think that everyone will leave with the same learning or identity.

A Call for Leadership

Dr. Nair focused attention at another facet of the AAPI population: Asian Americans who are successful graduate students, fellows, and researchers. Dr. Nair explained that it is not yet clear if a uniform set of needs may be ascertained. Statistically, this set of Asian Americans and Pacific Islanders tends to be overrepresented in the STEM research community, with 11.4 % of all NSF awards made going to this group. She warned that we must not look at this group as all Asian Americans, since that term includes many who are not educated and not successful in the STEM community.

Addressing the need for leadership and collegiality in the STEM community, Dr. Nair described the successful Asian American group as lacking in leadership skills. Asian Americans and Pacific Islanders are often drawn to the United States as a result of their mathematical abilities, which surpass their leadership skills that have yet to be developed. Dr. Nair stated, "This group needs to take their place as leaders and accept responsibility for community inclusion and collegiality. In addition, this group needs to help their children to grow in leadership and social skills as the children are now part of the domestic population and are torn between both cultures."

In conclusion, Dr. Nair suggested that supporting the AAPI community is about building a culture and climate that honors diversity and builds to a natural state of inclusion in the greater community.

Discussion

During the brief discussion period that followed, the importance of focusing on the domestic needs of inclusion in the STEM community versus the more alluring global focus that is popular at the moment was the central theme.

The need to look at the context-dependent nature of science was emphasized. It was pointed out that a more diverse group of students would be served by presenting university courses in the context of real social problems rather than the more traditional, equation-oriented method.

A Demographic Profile of Asian Americans and Pacific Islanders in the United States

Dr. Nirmala Kannankutty
Senior Analyst Division of Science Resources Statistics, National Science Foundation

Dr. Nirmala Kannankutty serves as Senior Analyst in the Division of Science Resources Statistics at the National Science Foundation. As one of the project officers for the NSF's Scientists and Engineers Statistical Data System (SESTAT), Dr. Kannankutty is responsible for the integration and production of a database that provides detailed information on the science and engineering workforce in the United States, through three national data collections.

To establish a demographic profile for reference, Dr. Kannankutty began by reviewing the numbers of Asian American and Pacific Islanders in the United States. According to current Census Bureau statistics, AAPI incidence in the U.S. population has risen from 2.9 percent in 1990 to 4.4 percent in 2002. Dr. Kannankutty further defined and recognized Asian American and Pacific Islanders as a highly diverse group, representing over 60 percent of the world's population, many cultures, and many distinct and unique ethnic backgrounds.

By definition, Asian Americans are those individuals with origins in the Far East. This geographical distinction encompasses Southeast Asia, or the Indian Subcontinent, including Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, Laos, Burma, the Philippine Islands, Thailand, Myanmar (Burma), and Vietnam. Dr. Kannankutty showed the diversity of this group by highlighting no fewer than seventeen different ethnic backgrounds.

Native Hawaiians and Other Pacific Islanders (NHOPI) are defined as those individuals with origins tracing to any of the original peoples of Hawaii, Guam, Samoa or the Pacific Islands, including Australia and New Zealand. This group was shown to contain at least eleven diverse ethnic backgrounds.

To illuminate the details of Asian American and Pacific Islander participation in education, Dr. Kannankutty presented a series of data slides that highlighted the participation of Asian American and Pacific Islanders in various stages of the educational pipeline. From this analysis, Dr. Kannankutty focused on three major points:

- Compared to other ethnic groups, relatively high proportions of Asian American and Pacific Islander students are taking high school math and science courses. Therefore, the conclusion can be drawn that some of the AAPI population is preparing for participation in science and engineering at the college level.

- Among all ethnic groups, including Asian Americans and Pacific Islanders, there is a decrease in interest in both math and science between eighth and twelfth grades, suggesting that opportunities exist to further develop math and science interest at the high school level.
- Among all ethnic groups, including Asian Americans and Pacific Islanders, there is a decrease in math proficiency between eighth and twelfth grades, indicating that proficiency could be improved for this age group through various reform measures.

In terms of college enrollment and degree attainment, Dr. Kannankutty showed that although fewer Asian Americans and Pacific Islanders are receiving financial aid, and that those who do are receiving higher than average levels of aid. It is possible that there are more Asian Americans and Pacific Islanders who need aid for college study. Although high school science and math scores have tended to drop, interest in majoring in science and engineering at the college level remains high among Asian Americans and Pacific Islanders. Dr. Kannankutty reiterated that this points to the importance of pre-college preparation, designed to improve proficiency in math and science, and could encourage college-level AAPI students to complete science and engineering degrees. In addition, Dr. Kannankutty found that at all levels (bachelor's, master's, and doctorate), Asian Americans and Pacific Islanders report earning a higher proportion of their degree in science and engineering compared to other population groups. However, she concluded that there is certainly room for growth.

Dr. Kannankutty showed that in 1999, among Asian Americans and Pacific Islanders in the U.S. whose highest degrees were in science and engineering, 22.3 percent were U.S. born and 77.7 percent were foreign born. Of the foreign-born, the top four countries leading in degrees came from India, China, Philippines, and Taiwan.

There has been significant growth in participation by Asian Americans and Pacific Islanders in science and engineering occupations, according to Dr. Kannankutty. Between 1993 and 1999 there was an increase of approximately 200,000 individuals in science and engineering fields. Most of this growth was in computer/math occupations and engineering occupations. Asian Americans and Pacific Islanders were shown to be working mostly in the industrial sector, which reported the highest median salaries for Asian Americans and Pacific Islanders, as is the case for all groups.

In summary, Dr. Kannankutty noted the range of diversity in the Asian American and Pacific Islander group, and that this diversity engendered diverse needs. This is particularly true of Native Hawaiians and Other Pacific Islanders (NHOPI) and other "underrepresented" groups within the broad "AAPI" label. Viewing Asian Americans and Pacific Islanders as one homogenous group, which is dominated by a few large subpopulations, tends to mask the complex needs that are required by some of the small subpopulations. Dr. Kannankutty also noted that educational attainment varied widely, with some groups being more educationally successful than others. Finally, Dr. Kannankutty indicates that more educationally successful Asian Americans and Pacific Islanders could participate in and contribute to the science, technology, engineering, and math workforce than currently do.

Asian American and Pacific Islander Issues In Industry

Jeffrey C. Chen, Ph.D.
Former CEO of General Science Corporation

Dr. Jeffrey C. Chen founded General Science Corporation (GSC) and served as President from 1977 to 2000. GSC has become one of the most successful Earth Sciences companies with revenue of $25 million and over 300 employees. Chen took GSC public in 1986, raising Research and Development funding of $3 million to develop an Integrated Meteorological Information Processing System (METPRO). More than 40 METPRO Systems have been installed in 20 countries worldwide to provide real time weather forecast information to millions of people.

In his workshop presentation, Dr. Chen addressed the issues of Asian Americans and Pacific Islanders in industry, bringing attention to the concept of a glass ceiling at the management level. This kind of barrier, historically charged with keeping minorities and women from attaining their financial and professional goals, keeps Asian Americans and Pacific Islanders from getting the recognition and promotions they need and deserve. Drawing on his experience as a successful entrepreneur and scientist, Dr. Chen identified various major obstacles that prevent Asian Americans and Pacific Islanders from reaching the highest levels of success in private industry.

Dr. Chen described these barriers as a combination of complex cultural and social issues that both Asian Americans and Pacific Islanders and industry must share responsibility for developing. While industry should do more to encourage greater numbers of Asian Americans and Pacific Islanders in management, Asian Americans and Pacific Islanders tend to develop cultural patterns that make climbing the proverbial ladder of success difficult in a traditional American business culture.

The Price for Humility

Dr. Chen noted that many first generation Asian Americans and Pacific Islanders are not as aggressive as they need to be if they are to advance in an American company. Dr. Chen stated the reason is because many first generation Asian Americans and Pacific Islanders often tend to graciously take what is given and not seek what is deserved. When Asian Americans and Pacific Islanders graduate, they often feel lucky and better off than the others left behind.

"We come (to the U.S.) out of necessity; when we get a job, we are happy." Dr. Chen explained that often Asian Americans and Pacific Islanders do not feel that they deserve more.

Humility is encouraged in Asian American and Pacific Islander families. For example, when a project is finished and a manager gives praise, the Asian American or Pacific Islander is likely to modestly proclaim, "No, no! The work was done by others." This culturally taught humility has a high cost in dignity in American industry. Dr. Chen claimed, "In the end, those 'others' get the credit and the promotion." Dr. Chen acknowledges humility as a great virtue, but recognizes that in the competitive world of U.S. industry, Asian Americans and Pacific Islanders must learn to speak up for themselves, and take credit for their contributions.

Staying in the Comfort Zone

Another cultural issue challenging Asian American and Pacific Islander success is that many do not feel a sense of community with Americans, and as a result they tend to stick to their own communities. Dr. Chen stated it is not a matter of being social; rather it is an issue of being more comfortable with one's own culture and people. He indicated that is why there are pockets of populations such as Chinatown or Little Saigon. The first generation is resistant to feeling isolated or blending into the dominant society, so they often decline to socialize with their non-Asian colleagues.

Dr. Chen explained that managers promote individuals they know they can work with and with whom they get along. He claims that this is the reason for management socializing. Because Asian Americans and Pacific Islanders seldom engage in social situations with their colleagues, outside of the workplace, management tends to overlook them for the best promotions. In that sense, a high level of intelligence and competence in science, technology, engineering, and math is not enough to transform Asian American and Pacific Islander scientists and engineers into managers and entrepreneurs.

On the other hand, Dr. Chen suggests, Chinese-Americans must also carry some of the blame. For example, when many Chinese-Americans encounter a social situation, they immediately scan the room for Chinese colleagues. Once identified, they tend to communicate in Mandarin because it is familiar and comfortable. As a result, the small group remains isolated and does not get to know others as well as they might have had they not been drawn together by language and culture.

Dr. Chen states that discrimination is human nature. Asian Americans and Pacific Islanders, like other minorities, face discrimination issues well beyond jobs in private industry. In academia, it is less obvious because the workforce is more integrated, Dr. Chen explained. But when Asian Americans and Pacific Islanders strive to become teachers they often encounter barriers and he suggests that even the students have problems and their own unique challenges regarding discrimination.

Dr. Chen believes that Asian Americans and Pacific Islanders must work diligently to resolve these issues. "We create it ourselves as Asian Americans and Pacific Islanders, and we must recognize that and work on the solution."

Lacking Alliances

Another apparent obstacle to Asian American and Pacific Islander success is the lack of business alliances and support. Obtaining capital, marketing goods, and customer service present challenges. A weak political lobby and alliance contributes to the situation, particularly in terms of ensuring political support, Dr. Chen explained. When politicians want votes, Asian Americans and Pacific Islanders are third or fourth down on the list of voters. "We have to be better organized or we will continue to be weak politically and economically," Dr. Chen exclaimed.

Dr. Chen pointed out that Asian Americans and Pacific Islanders often find it difficult to get funding from banks, and recited the adage that banks generally lend to those who have the least need. He suggests that Asian Americans and Pacific Islanders have to be smart and well informed. When Dr. Chen went to get minority identified funds years ago from the Small Business Administration (SBA), he had to justify why he was applying for these funds, since at the time Asian Americans and Pacific Islanders were not recognized as socially or economically disadvantaged minorities.

Instead of taking that response at face value, Dr. Chen was determined to evaluate the accuracy of the initial response. He went to the Library of Congress and researched the Exclusion Act of 1882, which barred Asian Americans and Pacific Islanders from holding certain jobs. He sent the document to the Small Business Administration, which then reversed their decision and acknowledged Asian Americans and Pacific Islanders as an identified and covered minority group. They are entitled set-aside funds, though the group is still not a priority in receiving those funds.

Dr. Chen obtained his SBA funding and 8a Classification, which gives minority-owned companies special consideration for government contracts. However, as he raised millions of dollars and his company went public, the SBA "graduated" Dr. Chen's firm from the 8a program. The effect was critical for his company. At the time, the SBA indicated that the firm exceeded the capitol-to-cash flow requirements required to remain in the program. Dr. Chen fought that requirement to no avail, but his influence and experience paved the way for others. At present, the SBA allows minority companies to strive beyond basic success.

In industry, Dr. Chen indicated that Asian Americans and Pacific Islanders do not always provide sufficient collegial support for each other and often tend to become too competitive. Dr. Chen suggested that healthy competition is welcomed, but sometimes colleagues become competitors hurting each other in business dealings, a reality that may come from feeling politically disconnected or vulnerable. A stronger political lobby, bolstered by better organization within the Asian Americans and Pacific Islanders' community, would help secure better overall support for Asian Americans and Pacific Islanders.

Threatening National Security

Dr. Chen claims that the distrust Asian Americans and Pacific Islanders might encounter varies depending on the kind of work they do. In the 1960s, when Dr. Chen's technology was first unveiled, there was much distrust of those considered to be foreigners. National security

concerns contributed to mistrust. At one time, the threat of the era was "the evil Russian empire." Now, Chen elaborates, it is perceived as the economic threat posed by Asia. Concern for national security and a lack of trust and understanding are at the heart of the problem.

As an example, Dr. Chen cited a weather satellite produced by his company. It should have easily been authorized for export. It was only cleared under the provision that Dr. Chen was exporting the technology to South America or some other country that posed no perceived threat to U.S. national security. Yet, as soon as he tried to export his technology to China, Dr. Chen's integrity was challenged when he was interviewed by the State Department and questioned as to whether his technology would be used in missile technology. Dr. Chen attested that his satellite was merely a weather forecasting system. Dr. Chen cautioned that as in his experience, an Asian American or Pacific Islander will undoubtedly encounter discrimination and must deal with it tactfully, regardless of whether it is mean-spirited or not.

Meeting Half Way

Dr. Chen concluded his discussion by saying that if Asian Americans and Pacific Islanders want respect, they must not simply demand it. They must earn it by doing their part to identify and then to bridge the cultural and social barriers to their own success. Dr. Chen advocates mentoring and coaching programs to help Asian Americans and Pacific Islanders learn how to become more successful in American industry.

Social and Educational Issues For Asian Americans and Pacific Islanders

Dr. Paul M. Kingery
Associate Dean of Research, College of Education
University of Hawaii at Manoa

Dr. Paul M. Kingery serves as the Director of the Violence Prevention Network. Prior to holding this position, Dr. Kingery served as director of the Hamilton Fish National Institute on School and Community Violence. Most recently, he was asked to serve on the Scientific Council for the International Conference on Violence in Schools and Public Policies in Paris. Dr. Kingery was called upon by the Clinton Administration to assist in formulating a national framework on violence prevention. He continues to serve on advisory panels for the U.S. Department of Education and the U.S. Justice Department.

Dr. Paul M. Kingery led into his presentation by sharing his feelings about the relative benefits and advantages of being a white male in an American society. He acknowledged that he has an absolute advantage in the professional world. Although he came from a modest family, he was rich in training and education. He claims this allowed him economic and cultural mobility while immersed and well established in the dominant society.

Dr. Kingery spoke about experiencing life from a different perspective. While that may never be witnessed in entirety, he claims that experiencing violence as a victim of a racial confrontation served to sharpen his perception of discrimination. Dr. Kingery shared his account of the time he was badly beaten by a group of African-Americans during a race riot. Dr. Kingery later chatted with the individuals who had served up this beating and discovered that at the root of their anger lingered deeply ingrained and unresolved issues with American slavery.

Dr. Kingery mentioned that his work has been cross-cultural and collaborative in nature, in association with diverse minority groups. His work and interests eventually inspired him to embrace the Native Hawaiian culture. He indicated that the Hawaiian culture is perhaps the most peaceful in America, when measured separately. Dr. Kingery acknowledged the incredible diversity of the Hawaiian Islands, yet pointed out that paradoxically, he is involved in a Hawaiian university that is predominately run by white males. Dr. Kingery stressed the costs that exist for being an ethnic minority. He mentioned that non-minorities probably do not appreciate the costs incurred by ethnic minorities. Although many Asian Americans and Pacific Islanders succeed in spite of these costs, one should not be complacent.

Institutional Barriers

Dr. Kingery stated that the institutional barriers are significant and that organizations and agencies like the National Science Foundation must identify and overcome barriers to access. He indicated that NSF has systemic biases that must be acknowledged before they can be adequately addressed. His example was that NSF does not give the same attention and priority to "messy" measures. Claiming that NSF has traditionally deferred to measures that are more scientific and less societal, he suggests that research is not always so clean and clear as to be reported in purely quantitative terms. He suggests that there are other ways of looking at data and evidence that will provide a more informative and concise picture of the research situation.

Dr. Kingery provided population data for Asian Americans and Pacific Islanders, presenting information indicating that 12.5 million Asian Americans and Pacific Islanders are in the United States and 95% of them live in metropolitan areas. Dr. Kingery mentioned that Asian Americans and Pacific Islanders are more likely to graduate from high school than whites and are least likely to drop out. Asian Americans and Pacific Islanders also fit into a niche where they are either very well paid or very poorly paid. He mentioned that this is very distinctive within the AAPI category, with Asian Americans having much higher salaries than Pacific Islanders.

Dr. Kingery stated that the poverty rate of Asian American and Pacific Islander families, at 14%, is higher than that of whites (8%). Many Asian Americans and Pacific Islanders lack such essentials as health insurance. He addressed the teaching concerns regarding Asian Americans and Pacific Islanders, pointing out that only 1% of all K-12 teachers are Asian Americans or Pacific Islanders. Only 1.5% of higher education faculties are Asian American or Pacific Islanders.

Unpacking Culture

Dr. Kingery suggested that we must consider "unpacking" culture. AAPI is a federal category. Because it is a broad group, statistical studies often underestimate the significant achievement by some subpopulations and overestimate the success of others. For example, college degrees earned by Asian Americans are 44% compared to 21% for Pacific Islanders. He mentioned that this disparity increases with advanced degrees. Dr. Kingery said, "Unpacking will help develop solutions."

Dr. Kingery pointed out that research is generally conducted in a cultural context. Variations across cultures need to be identified and studied.

Going Pacific

Dr. Kingery pointed out a need for the National Science Foundation to be better represented by Asian Americans and Pacific Islanders. He indicated that the process must begin at home and then branch out. It is logical to have a good representation of Asian Americans and Pacific Islanders as panelists and reviewers, if one is attempting to address specific problems. Science funding is one thing, but a study within a particular culture is quite another. Applied science varies widely from one culture to another, and this must be acknowledged and addressed. Dr. Kingery indicated that the National Science Foundation would benefit by distributing available funding across broader areas.

A need to prepare Request for Proposals (RFP) on Asian American and Pacific Islander culture was expressed. Dr. Kingery suggested that the National Science Foundation gauge AAPI expertise in certain studies. The perception is that NSF funding and service opportunities are out of reach for many groups in the AAPI community. NSF and AAPI individuals should be proactive, smart, and productive by developing and supporting funding projects specific to an area, for example the funding of coral reef ecosystem studies. Dr. Kingery noted that through this process, NSF could legally set up funding to minority-targeted populations.

Dr. Kingery described the logistical complexities that face Asian Americans and Pacific Islanders in regard to their geography. Asian Americans and Pacific Islanders live the farthest from Washington, D.C. of any group of Americans. Dr. Kingery suggested that the National Science Foundation embrace the Pacific in real time. Visits and meetings in the Pacific area are vital to the support of this important geographical region and its inhabitants. Dr. Kingery described the need for NSF to go "local" in acknowledging and celebrating cultural and geographic diversity. Asian Americans and Pacific Islanders have strong links to their lands. Some Islanders live on their historic and ancestral lands and some live in micro-ethnic regions. Because of this, education gains local relevance. Dr. Kingery suggested that although we are global, one still needs to acknowledge and tend to the local cultures that contribute to our purpose.

Dr. Kingery believes that the National Science Foundation needs to communicate with and attempt to understand the dynamic processes and unique needs of the culture of origin. He mentioned that it is time to "take off the lab coats." Asian Americans and Pacific Islanders have a commitment to get to the source. However, not all research has global responsibility. Asian Americans and Pacific Islanders respect themselves and their privacy and there is some research that indicates that they would not benefit by publishing for the world. Broader impact would, of necessity, be better defined by alternate measures that respected cultural concerns.

Grass Roots Effort

Dr. Kingery stated that a grass roots effort could prove effective. He encouraged the idea that Asian Americans and Pacific Islanders create more non-profit organizations and support them as they develop their own institutes. Considerations for timing are essential. NSF needs to assist by making these projects long term, since positive change develops over long-term analysis.

Dr. Kingery concluded the session by identifying measures that need to be taken immediately. He suggested that the National Science Foundation develop a Request for Proposals that targets the Pacific over a long period of time. A short-term assignment is too risky for many Asian Americans and Pacific Islanders. Another suggestion was to start with scale and move up. Dr. Kingery stated that stronger grants could be available if there was an electronic bibliography of research on Asian American and Pacific Islander topics. His closing statements encouraged ensuring that these workshops contribute to something solid, in order to successfully serve the needs of the Asian American and Pacific Islander community.

Summary of Breakout Sessions 7

Outreach: Social and Educational Opportunities and Challenges

Facilitator: Dr. Devedra P. Garg
Duke University

Discussion was initially focused on Outreach in K-12, Undergraduate, and Graduate Education. Participants identified outreach practices currently in place and the role of the National Science Foundation within these identified practices was noted. GK-12 collaboration, centers for learning and teaching, field based activities, local habitat and biology studies, development of curricular materials, were all shared as examples. Challenges regarding the transition that takes place between K-12, undergraduate, and graduate education programs were also discussed, and it was pointed out that programs that develop processes and means for a more successful transition are warranted, and should be supported.

As the discussion moved into Curriculum and Traditional Knowledge it was suggested that traditional knowledge is vitally important to one's work and is all too often overlooked. Traditional knowledge should be considered in curriculum as well as in research and design. This is especially important in understanding such areas as environmental issues. It was suggested that programs considering the influence of one's culture, as well as the impact of the local environment, would have a greater influence on student success, and funding with this in mind would prevent the loss of students as projects became more relevant to the learner.

The focus of the discussion transitioned to Counselors and Early Involvement. The tremendous influence that counselors have on students was emphasized. Unfortunately, counselors are not always aware of the opportunities available. It was suggested that NSF support the development of summer institutes, designed to increase counselors' awareness regarding opportunities for students and emphasizing the importance of engaging students in science, technology, engineering, and math. There was consensus on the importance of reaching students before they reach high school. It was suggested that NSF adopt a "cradle to grave" concept that draws and supports young Asian Americans and Pacific Islanders and guides them toward science and engineering. Dr. Robert Richmond, of the University of Guam, outlined a step approach that addresses the need for infrastructure, training, and support activities. The concept of bringing science to the students, by way of trailers that travel to less-funded districts, providing resources that would otherwise be unavailable was offered as example of an innovative approach to infrastructure. This is being done successfully throughout the country, and needs to be supported.

Participants agreed that science must be relevant to those who are learning it. Students need to see connections between the science they study and the lives they live from day to day. It was suggested that cultural science and ethno-science fit into this paradigm, and this transcends into teacher preparation, as well. A strategy for retaining teachers in the field might include 'real world' internship opportunities for Asian Americans and Pacific Islanders.

As the discussion turned towards Careers and Communication, it was pointed out that Asian American and Pacific Islander students possibly avoid going into science or engineering because they do not see these as viable career paths. For various reasons, including family goals, time considerations, financial rewards, job satisfaction, excitement, aptitude and attitude, other careers are becoming more appealing. Again, counselors were cited as being critical to the future generations of scientists and engineers. There was a deep concern that was stressed regarding the importance of quality teacher training and retention of successful teachers of science. The abundance of teachers teaching science at the lower grade levels, with virtually no science background, is a serious problem for all students, and one that must be immediately addressed. The value of partnering undergraduates, and graduate students with GK-12 programs was emphasized with participants pointing out that all groups benefit. It was suggested that the younger students often relate better to those who are closer to their own age. The older students benefit by gaining a deeper understanding of the content they are sharing. The teachers are often introduced to content and process skills they are in need of learning, and the teachers contribute their understanding of pedagogy to make sure the delivery is developmentally appropriate and stimulating.

One area that was determined by participants to be in need of funding is the Community College System, especially in areas that serve Asian American and Pacific Islander students in their cultural regions. It was pointed out that often the community college system is the only means for young people from various regions to receive an education. A realistic problem, where no one at the community college level is prepared to write proper and effective proposals was expressed. It was suggested that workshops addressing grant writing at the community college level should be supported, and participants were reminded that Congress mandates a certain amount of funding to support such needs.

Local Outreach is an area of concern that surfaced throughout the discussion. It is imperative that the community relates particular needs, including native language and local culture concerns. It was suggested that state and county levels of support be looked at to determine a need for funding, and that there was a need for more saturation in the social and behavioral sciences regarding Requests for Proposals. The need for Asian Americans and Pacific Islanders to be more properly informed about funding was reiterated. Before one can write for a grant, one needs to know of its availability. To address the challenges that community colleges face regarding grant writing, it was suggested that proactive and productive relationships between universities and local community colleges could help resolve these problems to the advantage of all partners.

Some of the concerns regarding outreach could be addressed through Review Committees and Effective Communication. More Asian Americans and Pacific Islanders need to become involved with review committees, in addition to the Chinese Americans and Indian

Americans who currently seem to already have a stronger presence. Asian Americans and Pacific Islanders need to serve on these committees, when asked, so that they are equitably represented. More Asian Americans and Pacific Islanders need to be encouraged to submit their information to be included in the NSF reviewer database.

In conclusion, the following recommendations were suggested in this breakout session:

- Fund and promote science institutes for middle and high school counselors.
- Fund and promote projects that support dynamic infrastructure for school children, especially in underserved areas.
- Fund and promote additional training for teachers, including elementary school teachers who teach science and math and all teachers in need of support in math and science content areas.
- Fund and promote enhanced AAPI internship and fellowship programs.
- Continue funding undergraduate and graduate programs that collaborate with K-12 students and teachers to improve content knowledge and process skills for all participants.
- Make better use of the community college system.
- Make Requests for Proposals linguistically appropriate.
- Increase participation of AAPI regions in NSF workshops.
- NSF needs to be explicit in 'Review Criteria' to enhance AAPI participation.
- Link AAPI regional colleges and universities with research universities for proposal writing benefits.
- Increase awareness of role models through media.
- Develop and support means for outreach programs.

Asian American and Pacific Islander Workforce Issues

Facilitator: Dr. Max Niedzwiecki
Southeast Asia Resource Action Center

The discussion began amid the examination of statistics addressing Asian American and Pacific Islander access issues. These statistics addressed concerns such as accessibility of programs, incidence of AAPI faculty members, and accessibility of resources for Asian Americans and Pacific Islanders. The discussion quickly moved toward financial gain and the potential for earning. "Money talks! When I advise my kids, I tell them to study business, not engineering," one participant conceded.

It was pointed out that the 'glass ceiling' affects Asian Americans and Pacific Islanders differently, depending on the segment of the workforce with which they are associated, be it industry, academe, or government. It was suggested that beyond that, the complex diversity of the Asian Americans and Pacific Islanders could present an even greater challenge in addressing overall success. To make this point, an example was provided that addressed the statistics showing that the Vietnamese are less linguistically advanced than the Hmong. It is suggested that this has to do with the settlement patterns of the Vietnamese, who tend more to stay together in smaller units in an attempt to retain their culture. The Hmong households tend to be larger than Vietnamese households and therefore are more likely to have someone in the unit who speaks English.

Though there is data to support these claims, it was suggested that the conclusions based on data are problematic, especially when attempts are made to quantify the data and draw conclusions. In some Asian American and Pacific Islander cultures, it is generally not considered wise to express negative feelings or bring attention to negative situations. It is often considered to be better to be evasive or even dishonest, rather than lose face or bring about dishonor by describing a negative situation with accuracy.

Another issue that was discussed addresses the situation that for some AAPI sub-groups, life expectancy becomes an issue. Some simply do not live long enough to make an impact on the workforce. For example, Hmong men often do not live beyond 30 years because of genetic disease. There is a disparity in lifespan when using data from this group to analyze the greater Asian American and Pacific Islander workplace issues.

It was pointed out that another consideration in workforce issues is that of cultural hostilities. In relating education and workforce issues that might be negatively influenced by cultural hostilities, one participant provided the example that many mainstream institutions of higher education have expectations that are hostile to Hawaiian thinking; namely, the expectation

that individuals leave their homeland to work. Other participants agreed, quoting the adage, "Hire from the outside, not from within." To address this issue, participants suggest that Asian American and Pacific Islander sub groups need to develop and advance the means for training their own experts.

Relevance and familial piety were other issues that often begin with education and extend to the workforce. Pauline Chinn of NSF elaborated, "Many Hawaiians are turned off by traditional science because it does not seem relevant to Hawaii and Hawaiians." She pointed out that Hawaiians share a deep love and loyalty to their homeland. Yet, the further one advances in education, the further one must become removed from the culture. What is being studied has relevance mostly for another place, lacking relevance for Hawaiians in their homeland.

Where for some cultures rebellion during the years of achieving higher education is expected, in Asian American and Pacific Islander cultures, it is not acceptable to challenge authority. In AAPI cultures, it often presents a disharmony in family relationships when elders are outranked. Promising students may not be encouraged to reach their potential in some AAPI cultures if it means surpassing their elders. On another note, sometimes when an Asian American or Pacific Islander does not finish school, it is because of family responsibilities. Dr. Jeffrey Chen, former CEO of General Science Corporation, pointed out that in the Chinese culture, for example, one has an obligation to the past and next generations. Americans, on the other hand, mostly take responsibility for the current generation. This cultural difference gives rise to the fact that nursing homes are so prevalent in America. In a Chinese American family, the parents and children are taken care of, regardless of expense, and education may have to be delayed or cut short to accommodate.

It was pointed out that for some Asian American sub-groups, such as the Japanese, a shadow is being cast over culture and tradition. As more generations live in the United States, the norms are gradually changing. This view was not held by representatives of some other sub-groups. As with the Chinese, some are still loyal to the old ways of caring for family, even if it is at the expense of one's education and advancement in the workforce.

It was pointed out that there are differences between the circumstance of the Asian American and Pacific Islander sub-groups that must be examined. One important difference is that Hawaiians are involuntary minorities, where many other Asians made the choice to come to America. This creates a tension between cultures and within the academic culture that must be considered when identifying barriers.

Dr. Niedzwiecki claimed that another barrier to higher education for Asian Americans and Pacific Islanders is that many of the parents are not literate in their own native tongues or in English, making it difficult for them or their children to succeed in higher education. Another factor involves the location where new and often poor immigrants are resettled. Frequently, it is in poor areas, where the newcomers follow the path, educationally and otherwise, of their lower income neighbors.

Are the cultures of Asian Americans and Pacific Islanders and the culture of being engineers or scientists in conflict? A participant suggested that one must go beyond the culture of science to become a scientist. Another suggested an approach of meeting in the middle. It

was pointed out that since many AAPIs are committed to their families as well as successful scientists and engineers, suggesting the obstacles lie somewhere else. One consideration is that the economy of Hawaii is primarily based on tourism, without another economic base to support the islands. Sara Hagedorn, in reference to Hawaiian students, claimed that perhaps one place to start would be effectively communicating the value of a college degree, under circumstances where it is not perceived as having value. This is indeed a challenge, because for some groups of Pacific Islanders, the best students are sent to the mainland and don't come back. That becomes a real and imposing cultural barrier.

Possibly, what is needed is a new paradigm for measuring success, some participants suggested. Is success measured by the ability to write and understand an equation or is it measured in happiness? Is earning a PhD the supreme measure of success? Isn't the colleague who stays on the island, foregoing the PhD to own a successful business also successful? It was suggested that the issue of sustainability – educating and keeping Hawaiians who so choose that path to be addressed as "scientists of the land," similar to the path taken by many Native Americans. Is there too much emphasis placed on advanced degrees and too little on knowledge? Has the value of cultural strength been undermined?

Though those are important questions for consideration, the reality is that many Hawaiians indicate that they are being held back by lack of higher education, often due to lack of the accessibility to institutions of higher education. It was suggested that certain areas of science are especially well suited for specific cultural and geographic considerations. The path might begin with identifying better ways of combining science, culture, and geography. The issue then becomes how to leverage this situation in terms of funding. This will require systemic reforms in education, including teacher retraining. Addressing teacher quality and preparation, curricula and instructional concerns, and accessibility and equity issues, which serve as both visible and invisible barriers to success, is a start. Ensuring that all children, regardless of gender or culture, have access to high quality programs that are challenging, relevant, and dynamic, must be at the heart of systemic reform. In all these goals, NSF can help by supporting projects that serve to advance the vision.

In an attempt to refocus the emphasis on workforce issues, questions were posed regarding NSF and AAPI individuals in its workforce. Consensus was that NSF must take on the role as a leader in the fair treatment and equitable representation of Asian Americans and Pacific Islanders on its staff. Suggestions for offering personalized coaching programs and benefits such as paying for advanced degrees were offered. It was indicated that at least part of this was already in place.

A call was made for action that would improve access to higher education and advancement in the workforce. A well-received suggestion was to open a branch of NSF on the West Coast, possibly in the Bay Area where lots of Asian Americans and Pacific Islanders have families.

Participants agreed that there is a major need to create good publicity about Asian Americans and Pacific Islanders who have taken the path of higher education and achieved workplace successes without compromising cultural and family values. Mentoring would be an essential part of this, providing role models and guidance for those considering fields in science and

engineering. The importance of this is critical. Many Asian Americans and Pacific Islanders aspire to become a nuclear physicist, for example, but few have any idea early on of what one must study to achieve this goal. In addition, there is a need to put money into training and recruiting Asian American and Pacific Islander teachers, who will stimulate interest within the culture and address issues of under-representation and access.

In conclusion, the following recommendations were suggested in this breakout session:

- It is important to identify, understand, and address issues that are specific to individual Asian American and Pacific Islander sub-groups.

- In considering quantifying data relating to Asian Americans and Pacific Islanders research and issues, caution must be taken to consider the effect that culture might have on data collection and reporting.

- When considering various aspects of the individual Asian American and Pacific Islander cultures, differences must be acknowledged that account for potential cultural misunderstandings and even hostilities.

- Both visible and invisible barriers, including familial piety and sense of responsibility, cultural ties to ancestral lands, the circumstances of resettlement, language barriers, and relevance to the culture, may temper the goals and values of Asian Americans and Pacific Islanders. To underestimate the significance of this is to fail to see the big picture.

- Teacher preparation and retention programs, especially in areas that serve Asian Americans and Pacific Islanders, must make sure that teachers understand and address the individual and cultural needs of their students, as well as their academic needs.

- NSF should be a front-runner in setting an example for mentoring, staff support and advancement, and accessibility to a wide range of opportunities.

- NSF should consider opening a branch office on the West Coast.

Education Issues

Facilitator: Jinfa Cai
University of Delaware

Tasked with identifying the educational challenges faced by Asian Americans and Pacific Islanders, and then measuring the progress that has been made and charting the next steps to be taken, participants in this breakout session made a significant contribution to the workshop as a whole. Deh-I Hsiung, of the National Science Foundation, appealed to breakout session participants to identify the educational challenges facing K-12, graduate, and undergraduate level students, teachers, and programs, especially as they relate to Asian Americans and Pacific Islanders. Facilitator Jinfa Cai, of the University of Delaware, suggested that in considering each specific level of education, they identify what makes some Asian American and Pacific Islander students successful while some struggle to succeed. He expressed the need to identify ways for recruiting and retaining skillful, qualified, and competent individuals into teaching science, technology, engineering, and math.

Possibly in part due to an overrepresentation of Asian success stories, many issues that Asian Americans and Pacific Islanders face are not being adequately addressed. Participants were reminded that the White House Initiative has provided the opportunity for stakeholders to make recommendations for programs that specifically benefit Asian Americans and Pacific Islanders.

Madeleine Long, of the American Association for the Advancement of Science, pointed out that there is a great deal of existing funding available for underserved populations with similar challenges as those experienced by Asian Americans and Pacific Islanders. The importance of establishing the fact that many Asian Americans and Pacific Islanders are not reaching the levels of success they could reach with adequate support, equity in access, and programs that address diverse needs cannot be denied. Researchers need to address this. For example, the Math Science Partnership (MSP) provides funding for the development of prospective teachers through partnerships between universities and K-12 school districts. The Principle Investigators need to be aware that it is acceptable to focus on the Asian American and Pacific Islander populations and begin to recognize this as a minority group. Effective communication from the National Science Foundation that addresses programming in this light is essential. It was suggested that NSF make an official statement to this effect, publicly recognizing Asian Americans and Pacific Islanders as an underrepresented group and an area of focus. It was cautioned that this support needed to be specifically defined to address the needs of Pacific Islanders and Southeast Asian groups.

The suggestion was made to broaden partnerships to leverage more support for projects to best serve underrepresented groups. For example, NSF could back school systems partnering with the workforce community. It was pointed out that NSF is already encouraging and supporting that type of work and that school districts are encouraged and excited about these kinds of partnerships. The challenge identified is getting the proposals written and getting productive partnerships established. Each of the pieces is available, including the funding, workforce, and teachers. The challenge is putting them in place through individuals with expertise in submitting their ideas through the NSF proposal process. As a first step towards this means, Deh-I Hsiung provided the groups with information available from NSF on how to write proposals.

A concern was noted regarding the lack of research and availability of subsequent data regarding all Asian Americans and Pacific Islanders. Without pertinent research data, it is difficult to make a case for change. Hoan Bui, of the University of Tennessee at Knoxville, shared his experience of attempting to write an educational proposal that successfully satisfied the NSF requirement for broader impact. He ran into a problem because he lacked the hard data to support his claims of need in this particular underserved population. He encountered reviewers who lacked an understanding of the issues and determined his focus to be unnecessary. Out of this area of discussion, the need for a number of steps to be taken, to gather data before approaching NSF with a policy recommendation were identified:

- There is a need for a clearinghouse with an inventory showing the latest research and data. This could provide the kinds of indicators that are affecting particular parts of the AAPI population. Further, there is need for a meta-analysis where one can see the effect size and the sample size of those studies.

- It is recommended that NSF fund a mini-conference, which could commission specialists such as those participating in the AAPI Workshop to study specific locales and use the profiles generated to support statistical analysis. There is an identified need for both statistical analysis and detailed profiles that can look at the processes of learning and the difficulties of delivering services.

- A specific policy recommendation to rewrite the language needs to be developed to open up the processes for Requests for Proposals, targeting, etc.

There was general consensus that these were steps that needed to be taken. It was pointed out that it would be essential to carefully identify the appropriate group of people to invite as participants in such a conference. It was suggested that the group look for an existing network to take the lead on the project, and the American Education Research Association was suggested. Clara Park, of California State University at Northridge, indicated that she chaired the Special Interest Group (SIG) on AAPI research, and that she has access to a list serve that would be available for use as a clearinghouse for the research being proposed. She volunteered to make this e-mail list available for this purpose. The group was reminded to consider that NSF will take unsolicited proposals.

The next step was to identify the type of program to be recommended. It was pointed out that there is a disparity of response in the four initiatives from the White House: Historically Black Colleges and Universities (HBCU), Tribal Colleges and Universities Program (TCUP),

Hispanic-Serving Institutions (HSI), and Asian Americans and Pacific Islanders (AAPI). In terms of viability and public relationships, it is perceived that Asian Americans and Pacific Islanders are still underrepresented, though this is not always acknowledged or understood because of the diversity in groups that make up the AAPI community. It was suggested that a comprehensive program, one that would separate and deal with the specific needs of the different subgroups in the AAPI community. To do otherwise, which is currently being recognized as a barrier, presents the Asian as always ahead with diminishing needs. There is a need for specific programs that address specific needs for those who are struggling. There needs to be specific programs to train those who are successful to become leaders.

The point was made that any available data must be disaggregated in order to show what is specifically needed for Pacific Islanders. It was maintained that this culture is uniquely different from the Asian group, and this must be kept in mind. Current indicators were cited that show that Pacific Islander socioeconomic positioning is more like Blacks and Hispanics than like the Asian group. Concerns were expressed, addressing this specific need for the disaggregation of data, in light of the fact that the numbers for Pacific Islanders are so small. It was indicated that there are advantages in keeping the AAPI populations grouped together because of the small numbers of Pacific Islanders, though frustration with their unique situation and concern that their specific issues would not be adequately addressed were duly noted.

In summary, the need to do a number of things, attacking the problems from all directions was described. A strong sense for keeping the Asian Americans and Pacific Islanders together as a group, yet proactively addressing individual subgroup needs was articulated. Though the need to develop the research that indicated trends is vitally important, it was elaborated that avoiding stereotyping in the process is essential.

In conclusion, the following recommendations were suggested in this breakout session:

- Utilize currently funded research, such as MSP, and proactively seek out future opportunities.

- Identify and address needs in all three phases of education: K-12, Undergraduate, Graduate and Faculty.

- Identify and address specific needs, differentiating the needs of those who need guidance and support to succeed and those who are already successful and will benefit from guidance and support to develop as leaders.

- NSF should support research that studies why so few Asian Americans and Pacific Islanders become teachers and what incentives might be effective in promoting teaching as a career.

- Assets of each culture need to be recognized and the cultural context that NSF is currently starting to fund needs to be supported.

- The development of culturally context-based science needs to be encouraged and supported.

- Structural barriers need to be identified and the means for navigating these need to be addressed.

- Effective communications networks need to be established and the monitoring of efforts resulting from the workshop needs to be in place in order to progress with this vision.

- Develop a specific action plan that includes the following:
  - o Clearinghouse for research and data
  - o Meta-analysis
  - o Mini conference
  - o Policy recommendation based on the above

Appendix A: AAPI Workshop Particpants 8

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* UNABLE TO ATTEND

Appendix B: Resources and Links 9

AERA AAPI Special Interest Group and List Serve
Plan to send in your research papers and come to the annual meeting to share information on AAPI education issues. Dr. Clara Park, SIG committee chair, can be contacted for more information. AERA meets every April and paper submission deadlines can be found on their website, http://www.aera.org/.

If you would like your email address added to the list serve, and you are not already added as a workshop participant, email Dr. Clara Park, CA State Univ.-Northridge clara.park@csn.edu.

Asian American Pacific Islander Initiative – Environmental Protection Agency
On June 7, 1999, President Clinton signed Executive Order 13125 to improve the quality of life of Asian Americans and Pacific Islanders (AAPI) through increased participation in federal programs where they are underserved. The Executive Order calls on all federal departments to mobilize their resources to address the unmet needs of Asian Americans and Pacific Islanders.

The Executive Order established the President's Advisory Commission on Asian Americans and Pacific Islanders, Federal Interagency Working Group, and the Office of the White House Initiative on Asian Americans and Pacific Islanders. Within EPA, the Office of Administration and Resources Management is the designated lead office for the Federal Interagency Working Group.

The Environmental Protection Agency strongly supports the White House Initiative on Asian Americans and Pacific Islanders. The agency is committed to protecting AAPI individuals from environmental risks to their health and the communities in which they live, learn, and work. For more information, please see: http://www.epa.gov/aapi/about.htm.

Asian and Pacific Islander Populations in the United States
The U.S. Census Bureau provides census data useful in demographic studies. For more information see: http://www.census.gov/population/www/socdemo/race/api.html .

Federal Asian Pacific American
FAPAC is an organization that promotes equal opportunity and cultural diversity for Asian Pacific Americans within the Federal government and the District of Columbia government. FAPAC encourages the participation and advancement of Asian Pacific Americans in the Government work force.

FAPAC serves as a conduit through which the interests, issues and representation of Asian Pacific Americans in the Federal, State, County, City and District of Columbia governments are addressed. Its goal is to promote partnerships with the public and private sectors in the community it serves. For more information: http://www.fapac.org.

NSF/AERA Research Fellows Program
The American Statistical Association (ASA) and the Division of Science Resources Statistics of the National Science Foundation are proud to announce the ASA/SRS-NSF Research Fellowship Program. The Program will entail having an outstanding academic researcher/fellow conduct interdisciplinary research using SRS data on-site at the National Science Foundation for a three month period plus support for 10 percent of the researcher's time at their home institution. Research areas include, but are not limited to: analysis of science and engineering resources, methodological research directed at harmonizing taxonomies of data concepts for field of science across personnel and R&D surveys, state level estimation techniques, and graphical analysis and displays of data. Compensation is commensurate with qualifications and experience. For information see www.nsf.gov/sbe/srs/grants.htm.

Pacific Asian American Advisory Council (PAAAC)
Current information on career development, recruitment programs, reports on relevant issues, scholarship programs, upcoming events and opportunities, can be found at: http://www.geocities.com/paaac/.

Social Security Administration – Asian Americans and Pacific Islanders
For quick and easy access to information of interest to Asian Americans and Pacific Islanders see: http://www.ssa.gov/aapi/index.htm.

Southeast Asia Resource Action Center (SEARAC)
SEARAC is the national advocacy organization advancing the interests of Cambodian, Laotian, and Vietnamese Americans through leadership development, capacity building, and community empowerment. For more information see http://www.searac.org.

The White House Initiative on Asian Americans and Pacific Islanders
On June 6, 2001, President George W. Bush continued the previous administration's efforts by signing Executive Order 13216 to increase opportunities for and improve the quality of life of approximately thirteen million Asian Americans and Pacific Islanders living in the United States and the U.S. and Pacific Island jurisdictions. This action renews designs of a previous Executive Order, which established the President's Advisory Commission and a federal Interagency Working Group on Asian Americans and Pacific Islanders. For more information see http://www.aapi.gov/.

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