



Association of Universities for Research in Astronomy

AURA Comment Submitted to the NSF Portfolio Review Concerning Partnership for Astronomy and Astrophysics Research and Education

December 15, 2011

Over the past several years, AURA member institutions have benefited from the NSF's PAARE program, the only Broadening Participation program specific to Astronomy. Although not eligible for PAARE grants, AURA centers have offered a rich research and mentoring environment for academic institutions that are able to submit proposals. (The Appendix below lists PAARE students who have done research at AURA centers.) NSF has recently indicated that it will review the effectiveness of the PAARE program in order to make a decision on its continuation. The AURA Committee on Workforce and Diversity has discussed with the NSF possible alternatives that might make PAARE or its follow-on even more successful.

Fundamental to defining such a follow on program is the question, "What are the NSF's goals for an astronomy-oriented broadening participation program? More minority astronomers? More minorities in STEM? Partnerships to push minority student involvement in the astronomy enterprise?" A clear definition of the basic intent will enable proposers to develop more effective proposals and programs.

It is important to review the Decadal Survey language that supports broadening participation of URMs:

"For many reasons, improving the involvement of minority Americans and women is a matter of the highest priority... CONCLUSION: Little progress has been made in increasing the number of minorities in astronomy. Agencies, astronomy departments, and the community as a whole need to refocus their efforts on attracting members of underrepresented minorities to the field."

AURA first suggests that more feedback on the program's successes and difficulties be regularly solicited from PAARE stakeholders such as:

- 1) PAARE Awardees
- 2) PAARE Applicants who were close to cut
- 3) PAARE panel members
- 4) Partner institution mentors of successful programs

A recent article in the AAS's CSMA's Newsletter, Spectrum, contains discussion of interviews with a few of these stakeholders. See the article entitled, "The Future of NSF/AST's Partnerships in Astronomy and Astrophysics Research and Education Program: Where is PAARE", in the September 2011 issue at <http://csma.aas.org/spectrum.html>.

In modifying PAARE, AURA suggests an in depth consideration of the following alternative features:

1) Broaden to include other NSF directorates

An advantage of this may be funding stability and/or increases for the program budget. However a major disadvantage would be the possibility that Astronomy may be swamped by other larger disciplines. NSF should work to make sure that Astronomy remains a focus.

2) Broaden to include other Astro related disciplines (astro-instrumentation, etc)

In this case a focus on Astronomy projects should be kept not just science and engineering. Although the current PAARE program accommodates these other disciplines, it may be necessary to specifically encourage more proposals to include astro-informatics, astro-instrumentation, astro-computation as part of their program.

However, it is important to note that the above suggestions may also lead to additional narrowing of the number of MSIs' with the ability to apply in these fields, despite the fact that they may more sharply focus on NSF priorities.

3) Modify focus to also include mentor (i.e. MSI proposer) research strengthening

In order for programs to be successful, it may be helpful to include more of an opportunity for MSI proposers to strengthen their own research by proposing for small pilot grants that enable PIs to better establish partnerships with non-MSI institutions, or build up a program that can then submit proposals for a larger more comprehensive grant (also see #6 below).

4) Modify to more strongly encourage institutional partner interaction

Many MSIs lack the administrative infrastructure to support large (or small) grants. Allowing non-MSI institutions to act as the PI for proposals with strong requirements for funding to go directly to the partner MSI in order to build up research capacity may help with this problem. This could also include NSF facilities such as astronomical observatories.

5) Ideas to more effectively reach target audience for applications

Suggestions above (3, 4) may help with reaching MSI audience since non-MSI research institutions may have more resources for identifying/putting together NSF proposals.

6) Funding of many smaller proposals versus full funding of a few

One central question to address is how broad the program should be in order to attain optimal effectiveness. The NSF should make sure that there is at least the opportunity for large excellent programs to receive funding. It would be counter-productive to dilute a potentially good program to where it is unable to accomplish anything.

Perhaps it would also be fruitful to develop a mechanism for small funding grants for exploratory projects to initiate/explore programs between MSIs and non-MSI institutions.

7) PAARE is based on Partnerships for Research and Education in Materials (PREM)

One analog, PREM, has had good success over the years because MSIs tend to have active engineering departments. However, very few MSIs have astronomy departments and it is difficult for them to make connections to institutions with astronomy Departments. Helping to facilitate the beginnings of these relationships through the suggestions above (see #3,4) could help improve the effectiveness of PAARE or a similar program.

8) Modifying the when proposal calls are placed

Based on the PREM analog, it may also be more productive to issue calls every other year, rather than each year.

Appendix of PAARE Students at AURA Centers

- Tomy LeBlanc (Fisk-Vanderbilt Bridge Program) - STScI 2008 "*Characteristics of Giant Stars in NGC 346 in the Small Magellanic Cloud*" (in prep) , Nota, T. Le Blanc, E. Sabbi, D. Lennon
- Matthew Richardson (Fisk-Vanderbilt Bridge Program) - NSO 2009 "*No Evidence Supporting Flare Driven High-Frequency Global Oscillations*", Richardson, M., Hill, F., & Stasson, K. 2011, Solar Physics, submitted
- Jessica Harris (Fisk-Vanderbilt Bridge Program) - STScI 2010 "*Spectrophotometry of the Huygens Region of the Orion Nebula, the Extended Orion Nebula, and M43; Scattered Light Systematically Distorts Condition Derived from Emission-Lines*". O'Dell, C.R. and Harris, J., 2010, *Astronomical Journal*, 140, p985.
- Patrick Durant (South Carolina State University) -NOAO 2009 "Spectral Variations of Several RV Tauri Type Stars", Durant, P., Howell, S. B., Cash, J., & Walter, D. K. 2010, *Bulletin of the American Astronomical Society*, 42, #417.14
- Eva Nesmith (South Carolina State University) - NOAO 2010 "*The Correlation Between the Photometric Variability and Spectra of Seven RV Tauri and Semi-Regular Stars*", Nesmith, E., Howell, S., Walter, D., Cash, J., & Mighell, K. 2011, *Bulletin of the American Astronomical Society*, 43, #342.13
- Jared Lalmansingh (South Carolina State University) -NOAO 2010 "*A Spectral and Lightcurve Study of 50+ Blue Stars from the Burrell-Optical-Kepler-Survey (BOKS)*", Lalmansingh, J., Howell, S., Walter, D., Cash, J., & Mighell, K. 2011, *Bulletin of the American Astronomical Society*, 43, #140.11
- Mark Bryant (Fisk-Vanderbilt Bridge Program) – NOAO-S 2010
- Felipe Colazo (Fisk-Vanderbilt Bridge Program) - Gemini South 2010-2011

- Eugenio Garcia (Fisk-Vanderbilt Bridge Program) - Gemini North 2011 - First-author paper in prep.