NANOGrav-PIRE

SmartStart Evaluation Newsletter

Volume 3 Quarter 2 December 2012

This newsletter presents findings from Quarter 2, 2012 evaluations of the usefulness and impact of the Fall Science Meeting, Science Seminar Series, Pulsar Search Collaboratory and Research Abroad Experience.

2012 NANOGrav-PIRE Fall Science Meeting

Thirty-seven people attended the NANOGrav-PIRE Fall Science Meeting held October 24-26, 2012 at Oberlin College in Oberlin, OH.

Full group sessions: 88% rated *very* to *extremely useful*

Parallel sessions:

◊ 62% rated *very* to *extremely useful*

◊ 38% rated *somewhat useful*

Student nominated discussions: Friday student nominated discussions received lowest ratings due to very low attendance.

Participants' suggestions:

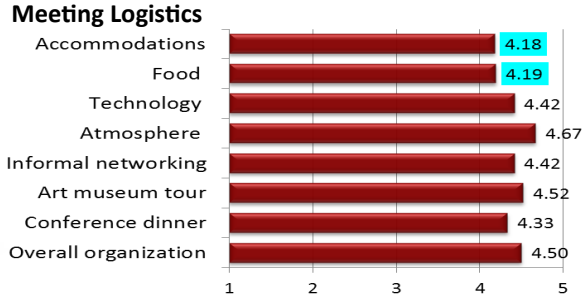
- *More time to work in small collaborative groups.*
- *Don't overlap working group sessions.*
- *Prepare and send agenda and invitations to presenters and participants earlier.*
- *Conduct a full group session at end of each day and at end of the entire meeting.*
- *Include presentations and/or a panel on careers.*
- *Conduct a student session before or after, rather than during, the first parallel sessions.*

PROJECT GOALS

Goal 1: **Knowledge**
Goal 2: **Education**
Goal 3: **Partnerships**
Goal 4: **Institutional Capacity**
Goal 5: **Workforce Development**

Meeting Impacts

Meeting Logistics



Science Seminar Series

Five online science seminars have been conducted. Logistics and selection of speakers were rated very high.

Date	Presenter	Number of attendees					Response rate
		Total	SR/F	PD	GS	U	
August 6	Weiwei Zhu, Justin Ellis	19	11	2	4	3	--
September 10	Joanna Rankin	18	11	5	2	0	39%
October 1	Michele Vallisneri	17	7	6	2	1	35%
November 5	Andy Fruchter	19	9	6	4	0	74%
December 3	Robert Owen	16	6	7	3	0	31%

- Greater impact was noted in *astrophysics-related knowledge* and in *sense of collaboration with other scientists.*
- Lower impact in *ability to conduct research in science fields.*
- Only 4 of 89 participants are undergraduates.

Broaden invitations for presenters and attendees to undergrads, other astrophysics fields and to IPTA.

Future topics suggestions:

- Diverse applications of pulsar timing and GW detection
- Gravitational wave detection algorithms and theory
- Timing noise
- Interstellar medium mitigation
- Cosmic string stochastic backgrounds
- Black holes and gravitational waves

Pulsar Search Collaboratory (PSC)

PSC is a joint project funded by an NSF ITEST grant (NRAO & WVU) providing HS students opportunities to search for new pulsars.

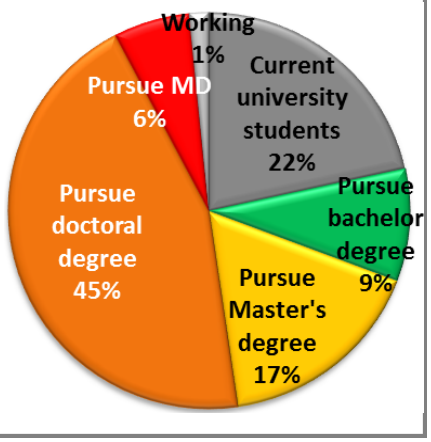
PSC Goal 3: Increase ability to use information technology

75% of PSC students indicated *good* to *great increases* in ability to use information technologies including:

* Analyze and interpret data * Use findings to write scientifically
* Document findings using online communication tools
* Return results to the database * Do research online

PSC Goal 5: Increase interest and awareness of STEM careers

- 40% to 62% of students reported *good* to *great increases* in interest and awareness.
- Students have high educational aspirations; 68% of current high school students report plans to pursue a Ph.D., MD, or MS (grey sections indicate HS graduates).



Research Abroad Experience (RAE)

Baseline to RAE post-survey results

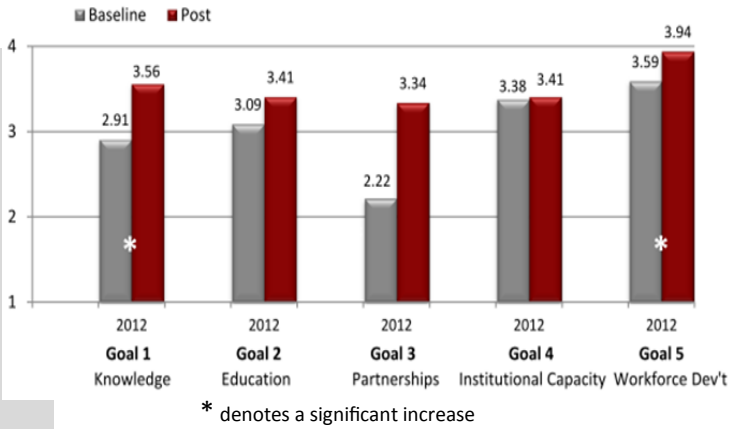
During the summer of 2012, four students (2 UG & 2 GS) completed research abroad experiences. All are male; 3 Caucasian ,1 Hispanic.

- Considerable growth in knowledge, skills, cultural understanding, partnerships, and workforce development
- Minimal growth in belief their institution is recognizing the value of global collaborations

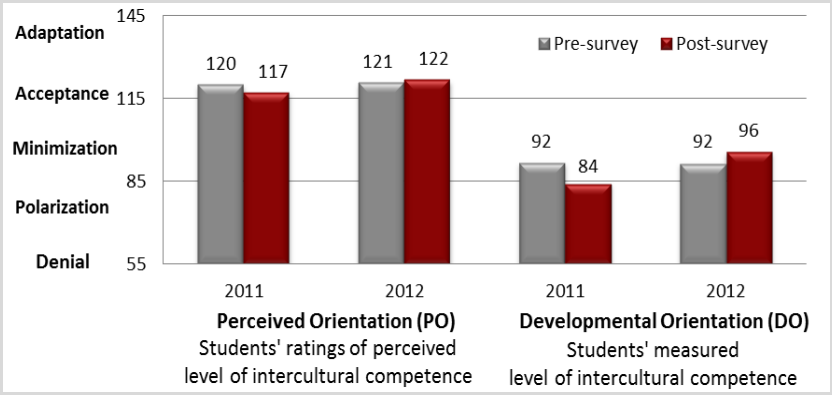
Students' home institution	Research abroad institution	Amount of time abroad	Home advisor attend?
UWM, Milwaukee, WI	Jodrell Bank Center for Astrophysics Manchester, UK	1.5 months	Yes
UTB, Brownsville, TX	Max Planck Institute of Radio Astronomy, Bonn, Germany	2 months	Yes
WVU, Morgantown, WV	McGill University Montreal, Canada	3 months	No
WVU, Morgantown, WV	Swinburne University Victoria, Australia	1.5 months	Yes

Intercultural Development Inventory (IDI)

The IDI assesses growth in perceived (PO) and developmental (DO) cultural orientation. PO scores increased negligibly; DO scores increased slightly. Individual DO scores changed between -3 and +15 points, indicating 2012 RAEs had varying impacts on students. Differences between students' perceived and developmental orientation decreased from 2011 (33 points) to 2012 (26 points), indicating that 2012 students had closer alignment between perceived and actual intercultural competence, possibly resulting from increased preparation for the RAE.



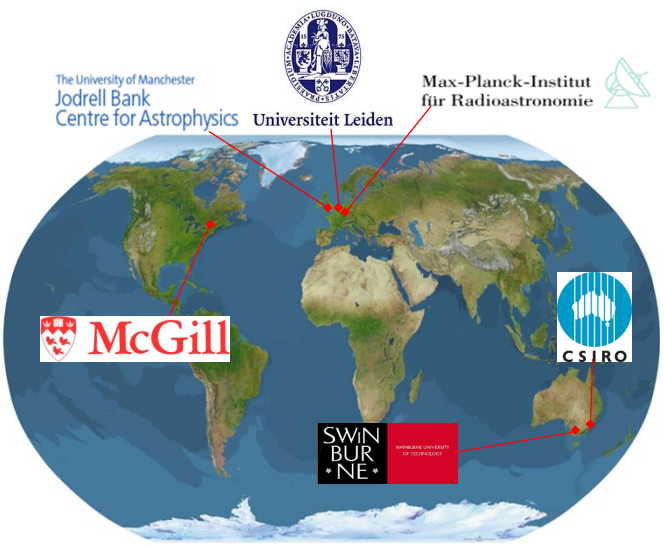
* denotes a significant increase



Students' suggestions:

- ◊ *Pre-departure orientation*
- ◊ *Language preparation*
- ◊ *Connect students with peers abroad*
- ◊ *Increase amount of time abroad*
- ◊ *Encourage mentors to check in with students more often*

Prior Research Abroad Locations



Mentor interviews

The majority reported strengthened relationships with the PIRE project and enthusiasm to host another international PIRE student. Students made important contributions to the research. Students were well-prepared. Mentors suggested they could benefit from additional background information and skills in the following areas:

- Fundamental principles of mathematics
- Instrumentation (visit a local telescope)
- Software packages (use online tutorials)
- Critical thinking skills in how to approach and solve problems.

Overall Project Recommendations

♦ **NANOGrav-PIRE leadership**—As NANOGrav chair is transitioning, it will be important to delineate responsibilities between NANOGrav chair and PIRE PI. Both individuals should be included in the majority of discussions, decisions, and evaluation-related information.

♦ **Benchmarks -** Working groups should revisit benchmarks 2x/year to assess progress , evaluate appropriateness, and add new benchmarks.

♦ **Institutional capacity -** Leadership needs to identify specific areas to improve and then work towards implementing project components

♦ **Education -** Consider establishing more interdisciplinary partnerships in order to bring together fresh perspectives. Consider what the next generation of astrophysics students need to know in the short and long term future of gravitational wave science.

Upcoming Evaluation Activities

- Continued evaluation of Science Seminar Series
- Baseline survey of new participants
- Evaluation of spring NANOGrav meeting

SMARTSTART EDUCATIONAL CONSULTING SERVICES