

# University of Alabama-Huntsville/NASA Marshall Space Flight Center Heliophysics REU



## *A Model For Recruiting Targeted Groups*



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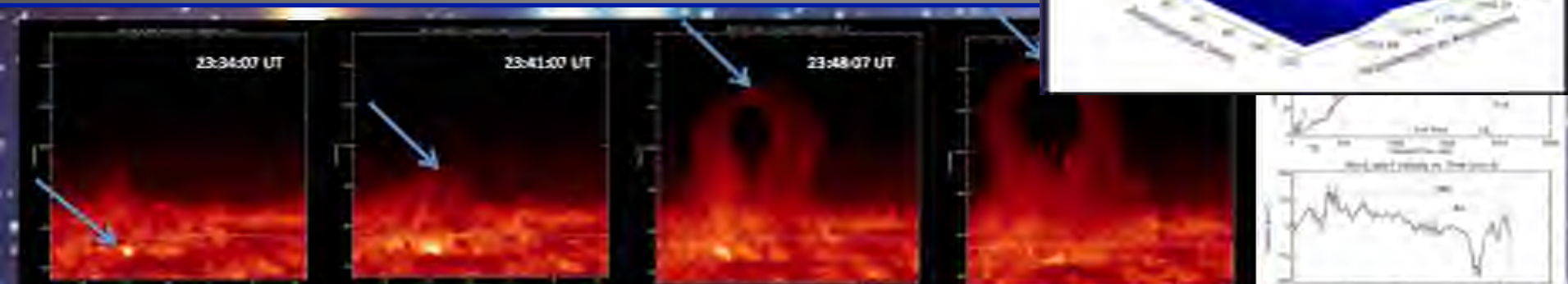
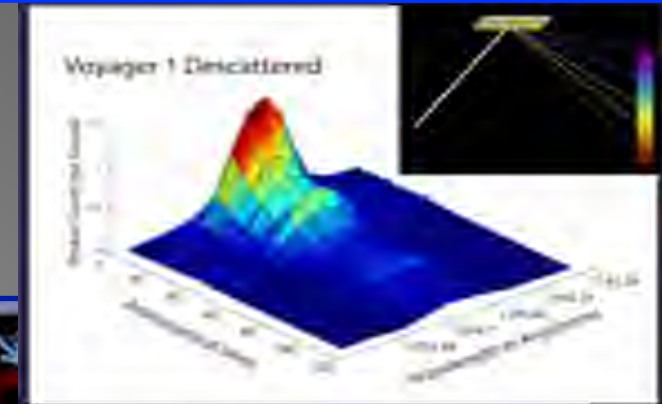
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[www.uah.edu/cspar/research/reu](http://www.uah.edu/cspar/research/reu)

# Summary

- 10 week program in Huntsville, AL
  - Requirements:
    - Full-time undergraduate student
    - 2.5 GPA, 2 letters of rec, essay.
  - Research Topics include instrument design to modeling.
- 3 years in operation > 5 year proposal submitted.



# Objectives

## 1. Reduce the attrition rate among freshman and sophomores.

- STEM students **leave** during freshman and sophomore years .
- Research can mitigate this but, **REUs** have become increasingly **competitive**. Often students with no experience, young students, and those from small non-research universities are not selected.

## 2. Increase minority participation in the sciences, heliophysics, in particular.

- Minorities are **under-represented** in every faction of STEM.
- Recruitment presents a **major** challenge to REUs.
- Expanded our reach to community college and first gens.

## 3. Provide a scientifically relevant research experience

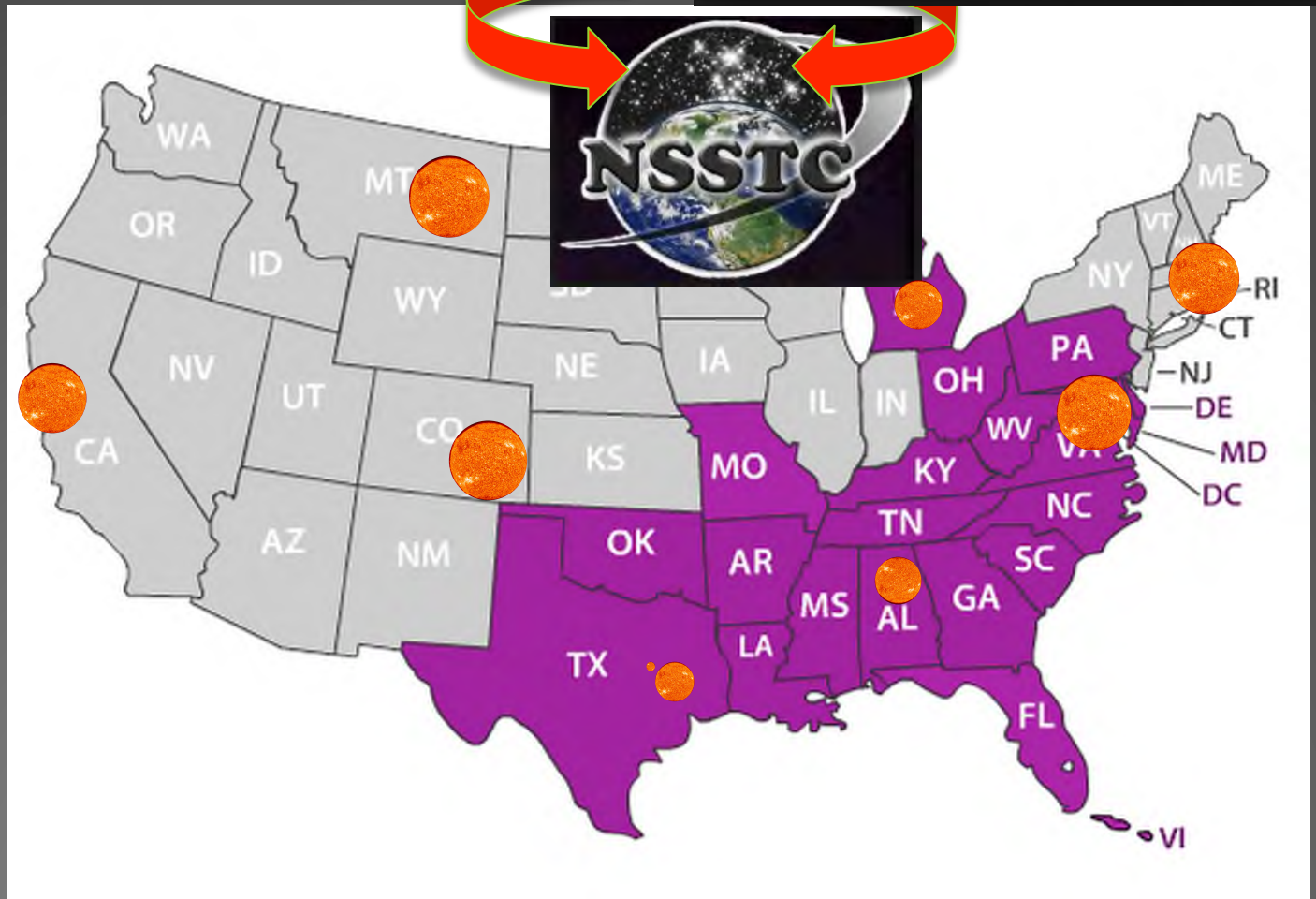
- We show that **inexperienced students** can participate in research with high scientific merit given a supportive environment.



# Advantages



- Nearby HBCUs & Universities with First Gens
- CSPAR-NASA Shared Facility



# Approach Reducing STEM Attrition Rate

- Actively seek and select students with no experience, freshman, sophomores, and students from small non-research universities.
- A mix of experienced and inexperienced students
- Active mentor placement with research projects and advisors based on experience level, advisor expectations and personality.
- Introductory tutorials and lectures geared towards students with no experience and lectures increasingly complex throughout the summer.
- Develop a healthy cohort using a shared working & living space.
- Active shared mentors, co-mentors and graduate student mentor groups, PIs and coordinator also serve as shared or group mentors, and counselors.

Careful student/mentor pairing, mixed group experienced with inexperienced students, introductory lectures, and high involvement of mentors create an environment productive to all participants

# Approach Targeted Recruitment Efforts

## In Person Recruitment Efforts

- Visit targeted schools
- Give presentations to student organizations, workshops during intro courses, and host pizza lunches.

1. Establishes a relationship with department chairs, professors and student leaders. This is critical for students at small universities/HBCUs.
2. Reduces anxiety and intimidation. This may be a major factor for students.



In person recruitment efforts at targeted universities have a large impact on applicant pool.

## Approach More Inclusive Selection Process

- Rely on recommendation letters and interest letter, rather than strictly on GPA. Some of our most successful students were below 'ideal' for other programs.
- Including a factor of "need" into our selection process. The availability of research at their home institution or nearby institutions

A more flexible selection process is key to improving minority participation in science and slowing the attrition rate among young STEM students.

**Remaining Challenge** Many first generation college students, and students from small universities do not have substantial experience writing letters of interest, nor persons to provide feedback on what REU selection committees look for.



## Approach

# Development of Student Cohort to produce Confident, Better Informed Participants

## Shared Work and Living Accommodations

Students with more programming experience assist those students with less experience.

## Career and professional development workshops.

Resume writing workshops

What to expect in graduate school

Alternative Careers in Physics

## Organized Recreation with Mentors and Scientists

Tours and frequent visits, talks, caving.



Developing a positive learning environment is important for overall research experience.

## Successes

# Increased Diversity and Participation from Freshman and Sophomores

<u>Demographics</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>
<b>Number Applicants/Participants</b>			
Total Number	37/10	61/10	55/11
Asian/Pacific Islander	0/0	3/0	2/1
African-American	5/1	18/3	21/2
Hispanic or Latino	4/1	2/2	4/0
Native American /American	0/0	1/1	0/0
No Response	6/0	6/0	7/3
<b>Women</b>	<b>11/4</b>	<b>28/3</b>	<b>23/6</b>
<b>Freshman/Sophomores</b>	<b>0</b>	<b>5</b>	<b>5</b>

- Minorities ~ 20%- 60%, Freshman & Sophomores ~50%, Non-Research intensive universities ~%50

# Successes

## Student Participation & Confidence

### Participation

- Our students have been Co-author on 5 refereed journal articles, one in *Science*. (more in prep).
- ALL students have submitted posters to AGU and we have had 18 students attend AGU over the 3 year period, also co-authors on AAS posters.
- 2 have become graduate students at UAHuntsville in Heliophysics related fields.
- # currently in graduate school.

### Student Confidence

- Frequent surveying suggests that participants have a more clear idea what graduate school. Thus, they will be able to make a more informed decision.
- ***How do you feel about conducting research under the supervision of a mentor*** Before the program 2/9 stated feeling “very comfortable”, with the rest “comfortable”. After the program 6/9 felt “very comfortable.
- Many students have had ‘life changing experiences’ .

# Visit 2014 REU Student Posters Tomorrow!!



Ian Synder SH51C-4179 Moscone West 8-12 am  
(Also Sterling, SH53D-04)

Reyann Joiner SH53b-4211 Moscone South 1:40-600pm

Shane Alpert, SH51C-4182 Moscone West 8:00-12:20pm