Hawai’i Student Astronomy Research Projects

AAVSO Fall Meeting
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Boston, MA

Mary Ann Kadooka, UH Institute for Astronomy
James D. Armstrong, UH IfA Maui
Mike Nassir, UH Physics/Astronomy
Overview

- Key Resources – Telescopes and Mentors
- HI STAR Program Goals & Action Plan
- Student Projects at Science Fairs
- HI STAR Follow Up
  - Alumni ➔ College ➔ Programs
- Presentation: Circumstellar Disks of Stars
  - Mimi Hang
Telescope Resources

(1) 2 m Faulkes Telescope North (FTN), Haleakala, Maui, owned by LCOGT

(2) 0.6 m DeKalb Telescope, Indiana, 5-6 hr time difference, owned by Donn Starkey

(3) GRAS – Global Rent-a-Scope that Bill Dillon got for us has not been used.
10 laptops to loan.
Mira for photometry
Astrometrica
Photometrica - from M. Kran and G. Klingenberg for our advanced students.
Future – AIP Win for spectroscopy??
Motivation - access to 2 m Faulkes Telescope.

Mentors & students are matched according to:

1. Research topic of interest.
2. Personalities.
HI STAR
Goal: STEM college majors for students

Objective: Pre-college students conduct authentic research projects.

- Students learn physics/astronomy basics and image processing skills.
- Astronomer mentors design and lead group projects.
- 12-16 yr old students continue projects for Science Fair entry.
- HI STAR alumni serve as junior mentors and continue to be mentored.
- Cost - $500 @ student who pay only $100 registration fee.
HI STAR Science Fairs Projects

2007 – 3 projects in 2008 Fairs/3 students
2008 – 6 projects in 2009 Fairs/10 students
~40% (13 of 33 students) completed projects
2009 – 63% (10/16) working on projects for 2010 Fair.

Recruiting Workshops are crucial for HI STAR

Other Islands - 7 since 2007
Oahu – 4-6 sessions each for SPARK program in 2008 and 2009
Best of Category Award – Physics & Astronomy

12 yr old Malia Swartz with IfA mentor Dr. Ilia Roussev from Bulgaria.

Currently working on solar minima/pandemic correlation research.
What is the Rotation Period and Shape of Asteroid 1270 Datura?

2009 Hawaii State Science Fair - 2nd place Junior Research Division
Best of Category Award for Physics and Astronomy

13 yr olds Gina Hyun and Kira Fox, SPARK and HI STAR participants who are working on Main Belt Comet recovery for MBC mission proposal.

IfA graduate student mentor Nick Moskovitz received his PhD in May, and is now at Carnegie Institute of Science, Washington DC
Extrasolar Planet – Comparison of Theoretical and Experimental Transit Times of WASP 2b

Awards:

2009 Intel International Science and Engineering Fair – AAPT 3rd Award

2009 Hawaii State Science Fair – 3rd place
Senior Research Division + Sigma Chi, HI
Academy of Science and other awards

Astronomer Mentors

Dr. John Johnson, NASA
Exoplanet Institute

Dr. JD Armstrong, UH Maui IfA

Travis Le, 16 yr old, has a Vietnamese immigrant, electrical engineer father
Projects on:
Comets, Asteroids, Stars
Extrasolar Planet, Nebula
Galaxies, Sunspot Cycles
HI STAR Student Role Models

Iat Leong, 2007 HI STAR
- Astronomy software mentor

Mimi Hang, 2007-2008 HI STAR
- 2006 Comet Tempel 1
- 2008 Mass of Galaxies Projects
- 2009 HI STAR counselor and comet/nebula project mentor

Travis Le, 2008-2009 HI STAR
- 2009 student aide and extrasolar planet project mentor to 7th grader.
<table>
<thead>
<tr>
<th>Name, Gender, Year of Graduation</th>
<th>College or School</th>
<th>College Major and/or Program</th>
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<tbody>
<tr>
<td>Iat Ieong (m), 2007</td>
<td>Illinois Inst of Tech</td>
<td>Electrical Engineering</td>
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<tr>
<td>Mimi Hang (f), 2008</td>
<td>Mt. Holyoke</td>
<td>Physics/Chemistry 2009 Summer Research</td>
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<tr>
<td>Melody Lindsay, 2009</td>
<td>Princeton</td>
<td>Mechanical Engineering</td>
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<td>3 students (50%), 2009</td>
<td>OSU, U FL, Marines</td>
<td>Business Manage., Span Educ, Infantry</td>
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<tr>
<td>Kira Fox &amp; Gina Hyun, 2013</td>
<td>Kaiser High</td>
<td>NASA Ames Inspire</td>
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Challenges

- Committed teachers or parents needed.
- Follow up of other island students is difficult.
- Grad student/postdoc mentor replacements.
- Grants/donations needed.

HI STAR Has
Fantastic Human Resources!
MAKE A DIFFERENCE!

- Collaborate for resources.
- Share your science passion.
- Recruit curious students.
- Be a mentor for projects.
- Enjoy doing EPO (Education and Public Outreach)
  &
- You will have Fantastic Outcomes. 😊
Acknowledgments

- Karen Meech – UH NAI team PI, EPO funding
- Wayne Rosing – Las Cumbres Observatory Global Telescope
- Donn Starkey – DeKalb Observatory
- Herbert Raab – Astrometrica
- Astronomer Mentors – Dave Rupke, Elena Moise, Ilia Roussev, Jana Pittichova, Roberto Mendez, John Johnson
- Graduate Student Mentors - Marco Micheli, Nick Moskovitz, Joseph Masiero, Geoff Mathews
- REU Student Mentors – Nicole Cabrera, Tereka Hart
- Donors – Mark and JoAnn Schindler, Wayne Rosing
- SPARK director for laptops loan – Susan Kusunoki
- IfA staff – Adrian Lee, Diane Tokumura
- Photographers – Katie Whitman, Karen Teramura
What’s Next?

Circumstellar Disk Project Presentation

by Mimi Hang, HI STAR alumnus