

The Hawaii Student Teacher Astronomical Research Program (HI STAR)

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HI STAR Goals

The goals of the HI STAR program are:

- 1) Students will develop the skills and knowledge base for doing scientific inquiry and conducting rigorous, real-world investigations in astronomy.
- 2) Students will complete appropriate, rigorous, and real-world empirical research in astronomy for an authentic audience.
- 3) Students will improve upon oral and written communication skills in order to share their science and develop a supporting and collaborative network of peers, mentors, and the general public.



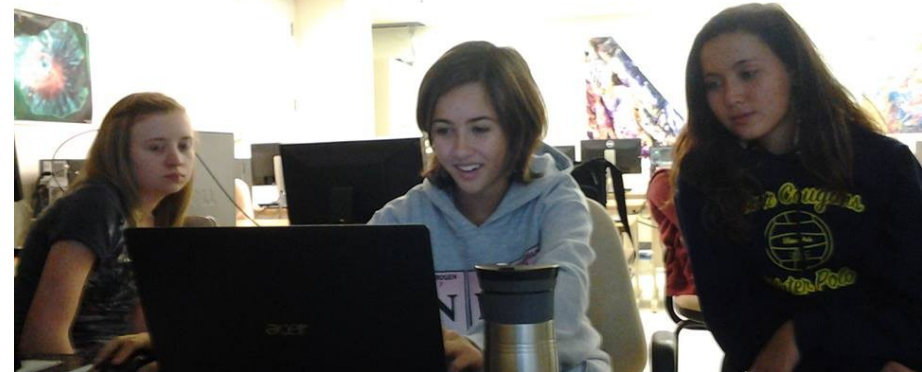
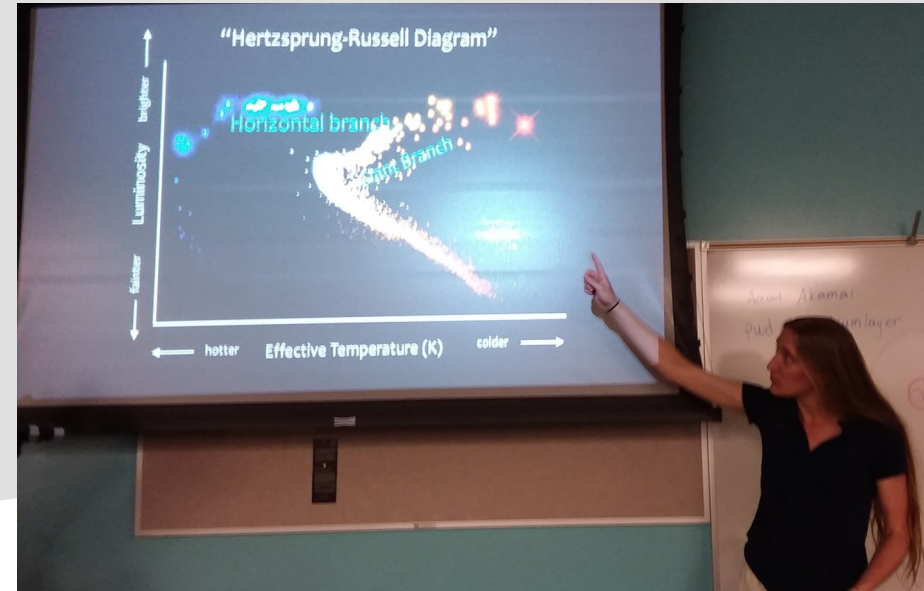
The Approach

Week long “camp” held in early summer

- 13 students attended this year
- Attend lectures
- Work on projects
- PRESENT their research

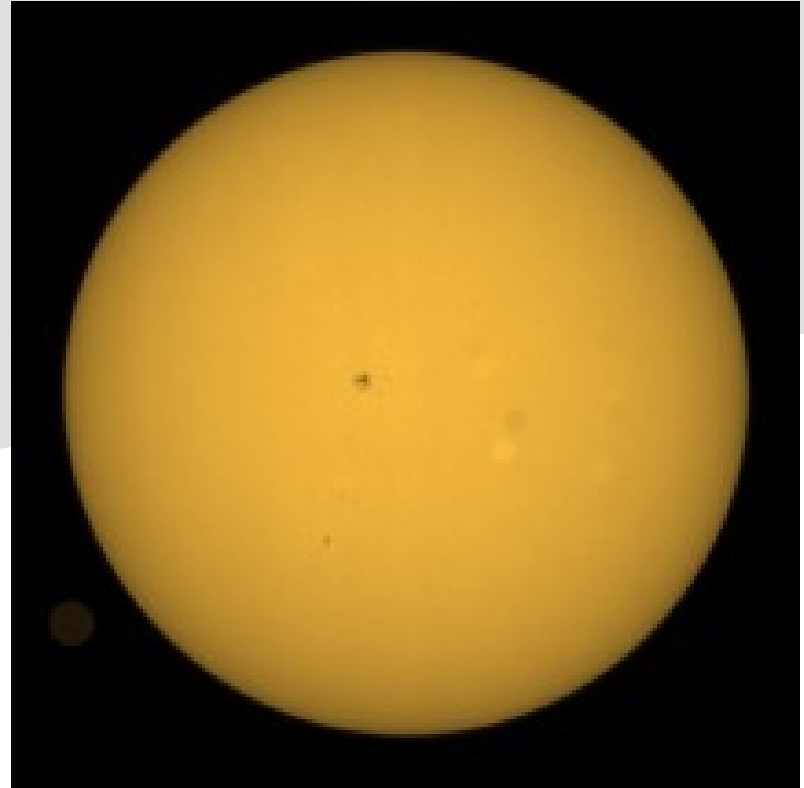
Students continue research through the year

Present the research at MCSEF as though it were a conference



Projects

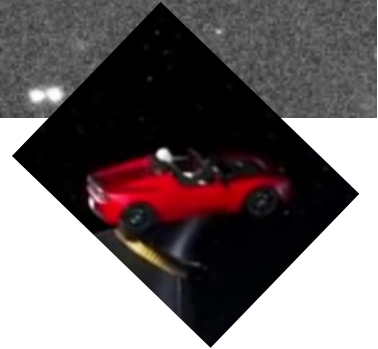
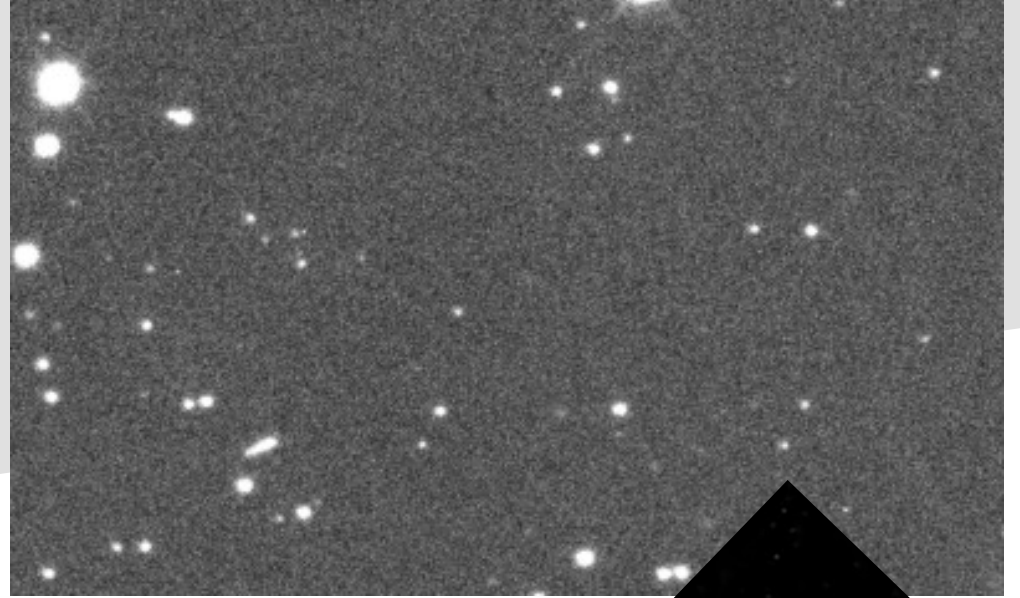
- Students have worked on projects including:
- Exoplanets
- Asteroids
- Comets
- Stars
- Active Galactic Nuclei
- Quasars



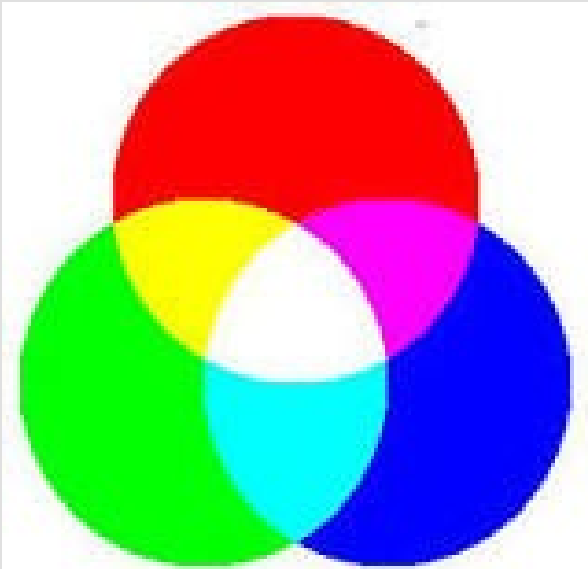
Project Example

Used Car For Sale:

- Red Tesla Roadster
- Convertible
- High mileage



Projects : Examples



Uncalibrated

White

Observed

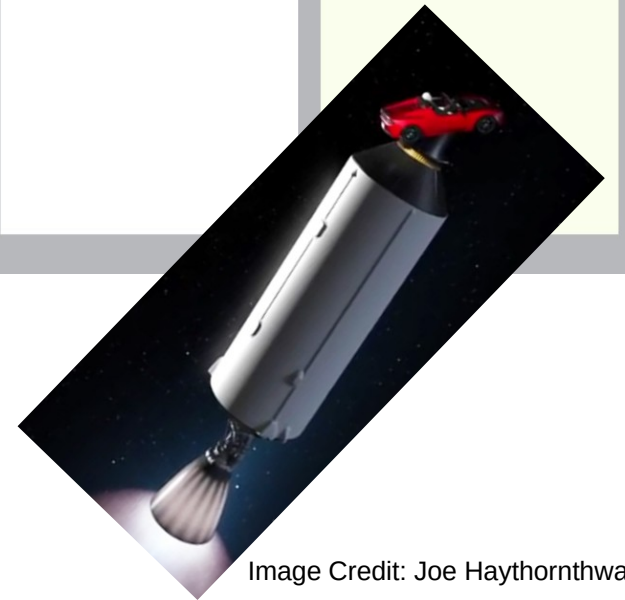


Image Credit: Joe Haythornthwaite



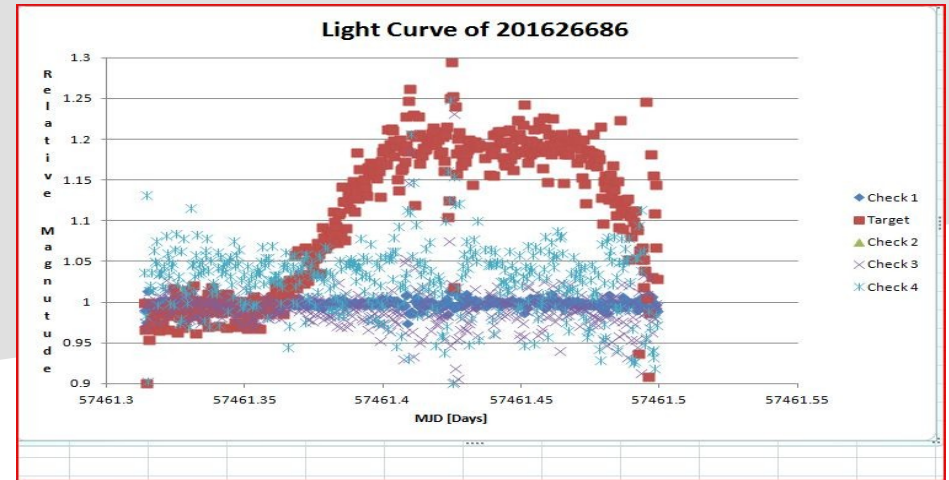
Used Car : Evaluation

- Cool
- NGST Standards
 - Wavelength
 - Energy
 - Color
 - Measurements
 - Scientific Process
- How science really happens
 - First result was wrong
 - Orange!
 - Go back and calibrate
 - Second result was unexpected
 - White

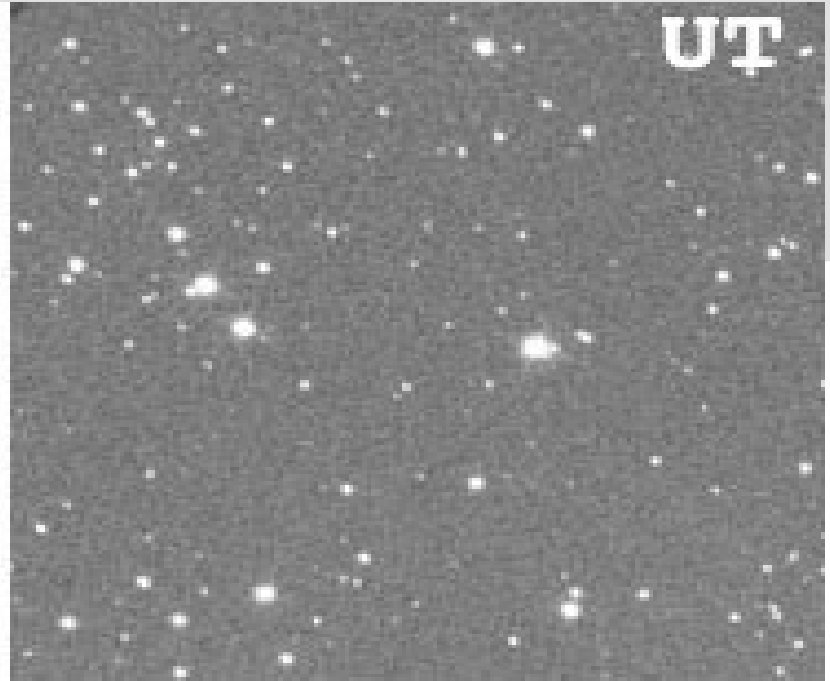
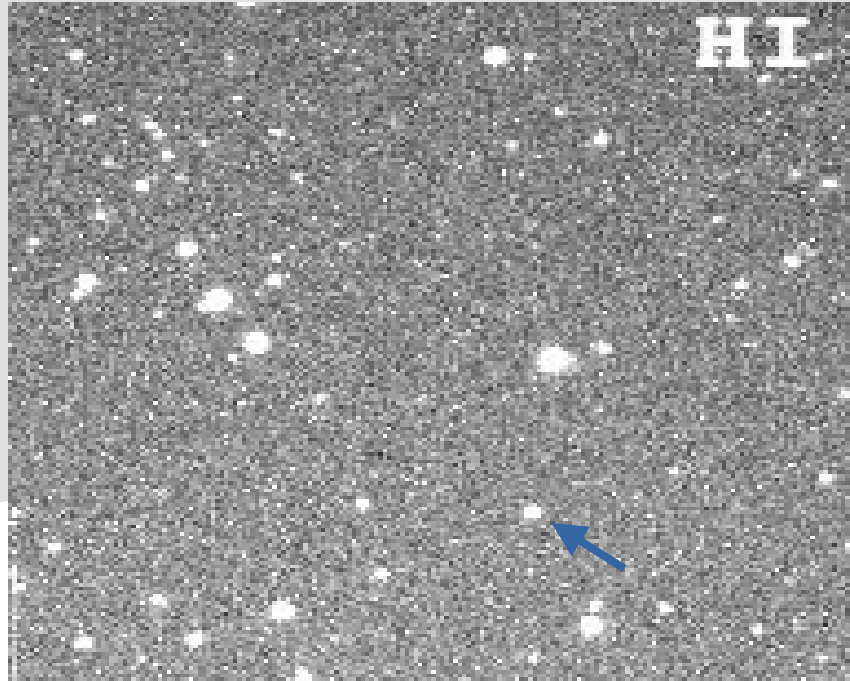


Robotic Projects

- Exoplanets
 - Can not be always be observed or completely observed from a particular site
 - Network

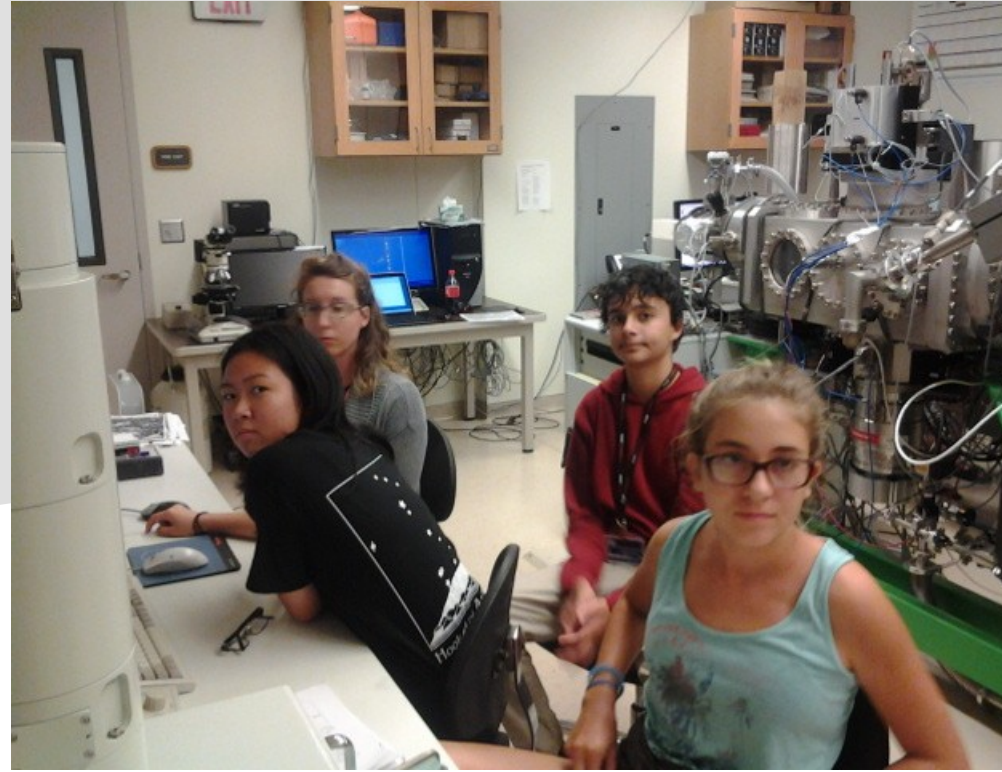


Distances to Asteroids



Program Success

- About (We haven't been keeping track of this in recent years):
- 50% male/female
- 25% at risk / underrepresented demographics
- Some students have been identified special needs.



HI STAR Awards



- Approximately 75% of students enter the science fair
- Over 20 attendances at International Science and Engineering Fair.
- Students have won over \$800K at the local, state, and international Science and Engineering Fairs.
- Students have been offered admissions to colleges such as Princeton, Harvard, Yale (one with a full scholarship), MIT, Caltech, Stanford.
- Students have been co-authors on peer-reviewed papers (while still in high school)



Supporting Science



- The program is being used on research grant proposals
 - Ben Shappee – HI STAR helps researchers win grants.
- Science Product
 - Minor Center Planet Center Circulars
 - Peer reviewed papers.
- 8 Alumni of the program have received doctorates or are in graduate school for doctorates in Astronomy related fields
 - 4 more in other STEM fields.

“What you are doing here is important. This is where the next generation of scientists will come from.” George Herbig



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