

Undergraduate Double Star Research Seminars



Jolyon Johnson
Maui International Double Star Conference
February 8, 2013

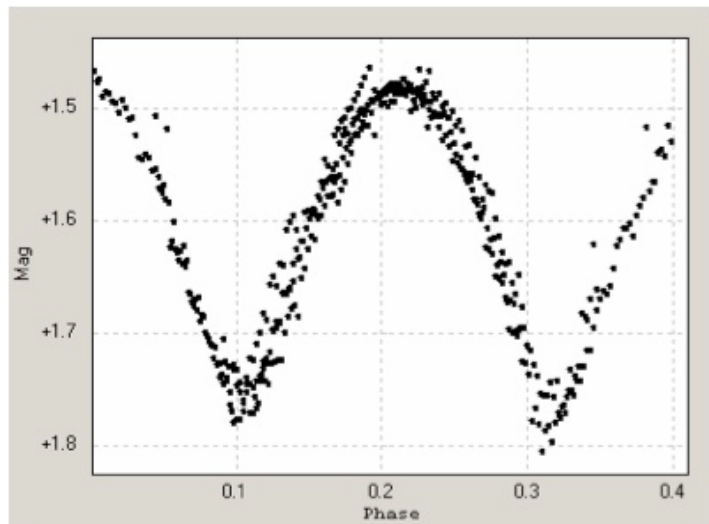
Topics

- Why Students Should do Research
- Cuesta College and High School Seminars
- Why Visual Double Stars
- Beyond San Luis Obsipo
- Advanced Techniques

Learn Science by Doing Science



Arizona and Early Cuesta



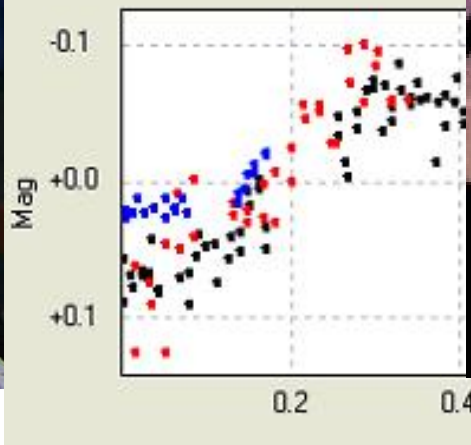
THE SKY IS YOUR LABORATORY

Advanced Astronomy Projects for Amateurs

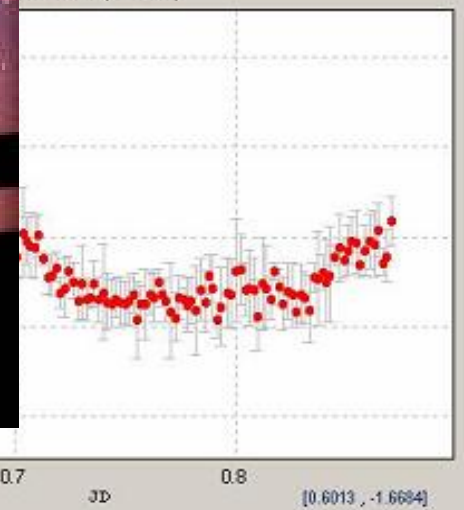
Robert K. Büchheim

 Springer

 PRAXIS



WASP1 (5 obs)



High School Seminars



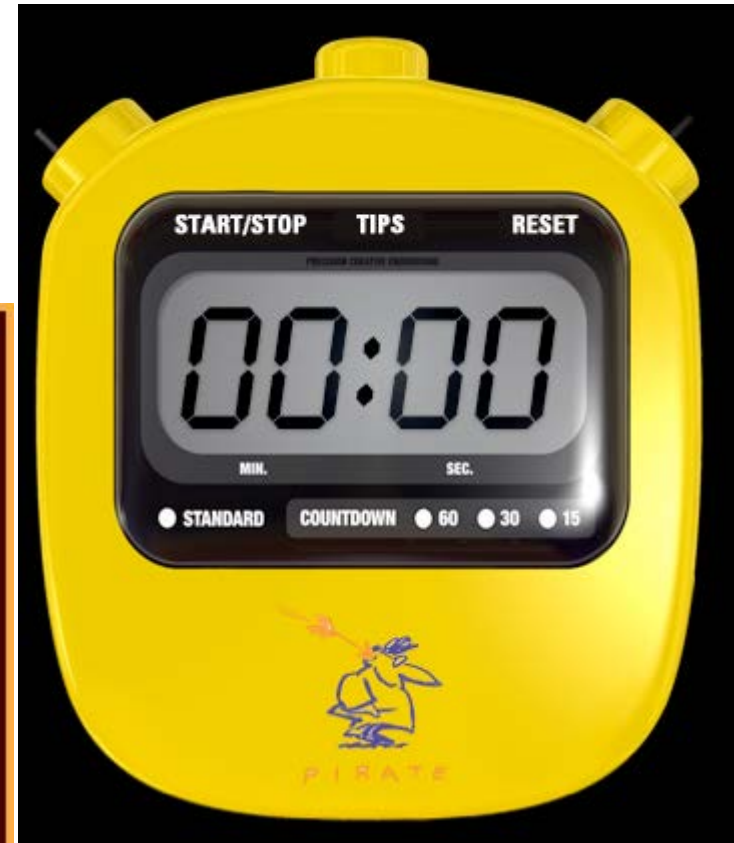
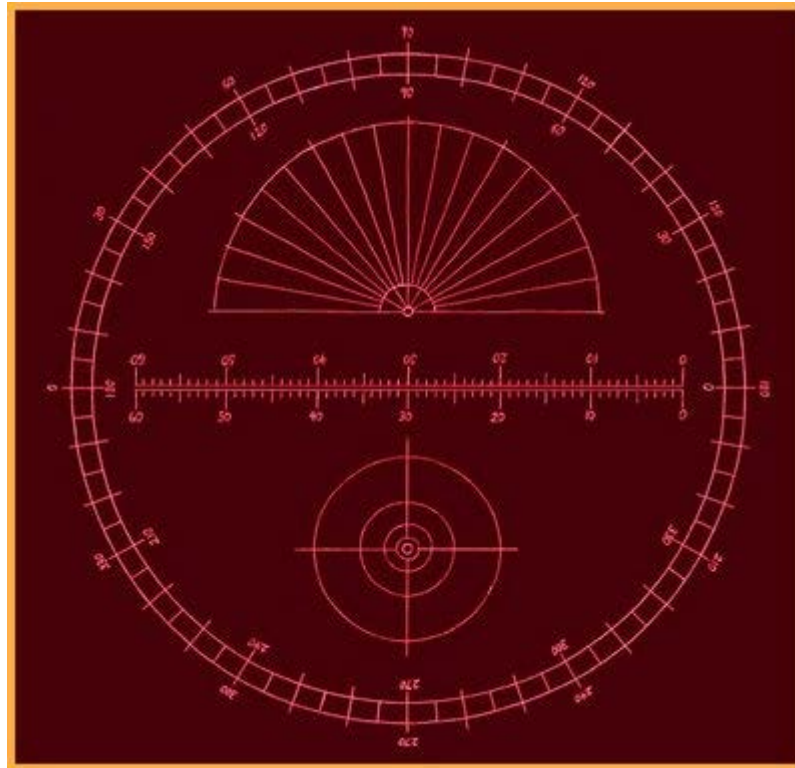
Arroyo Grande High School



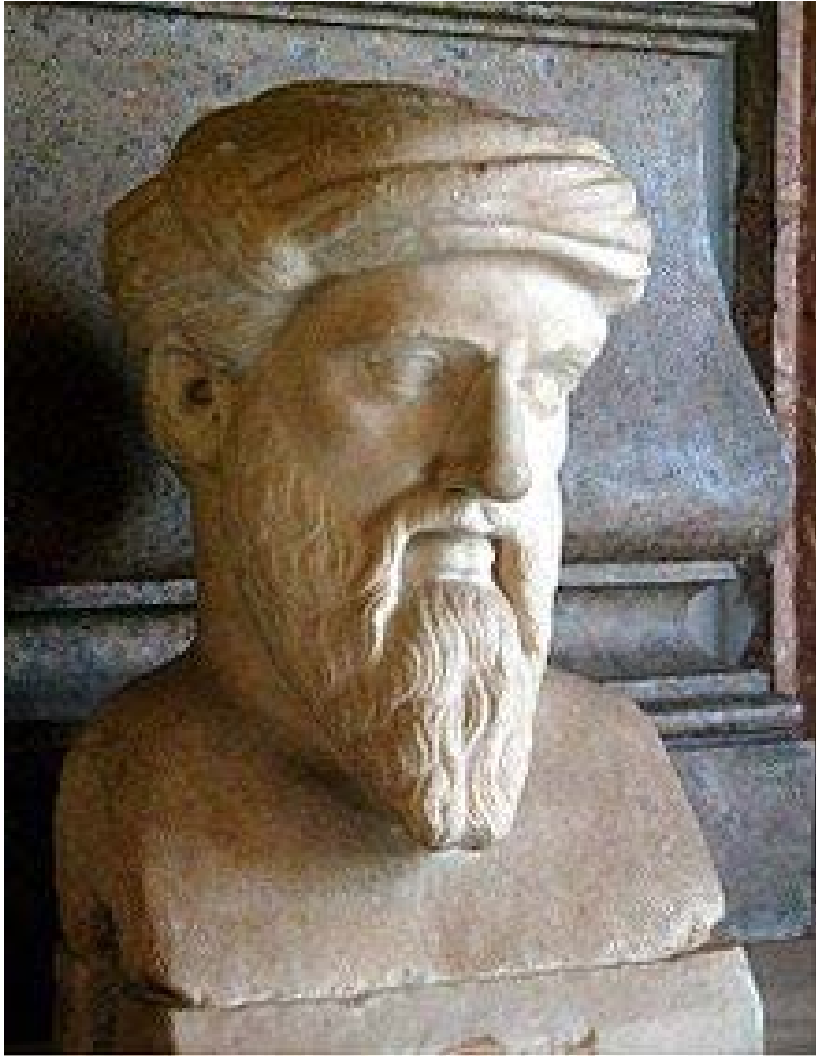
Coast Union High School



Low Cost Equipment



Accessible to Humanities



Pythagoras

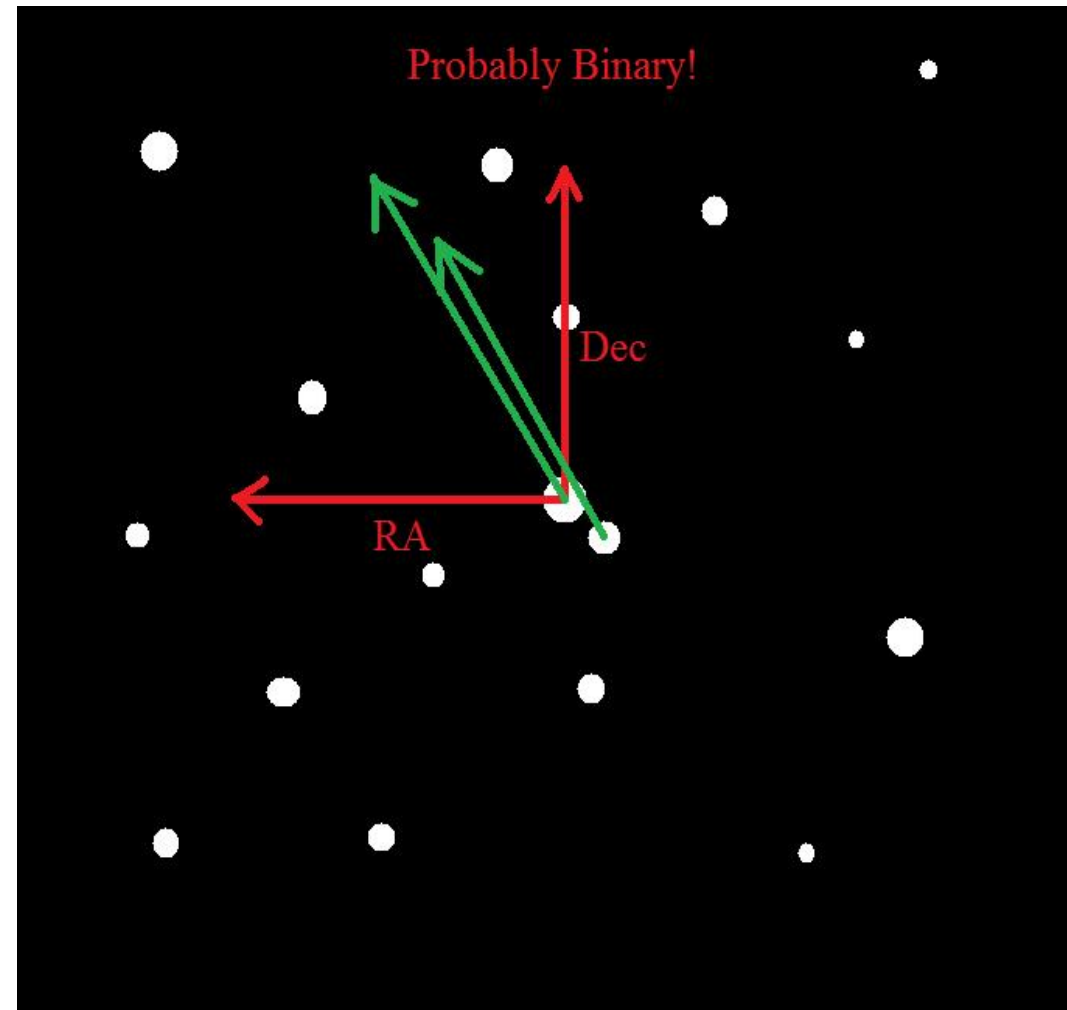
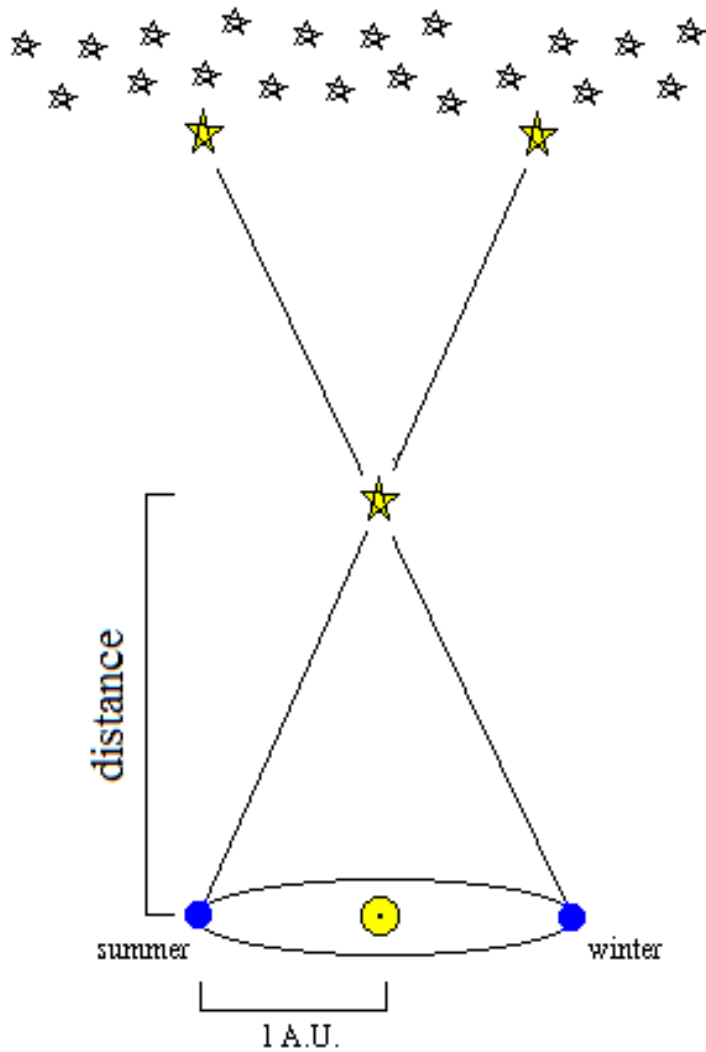


Kepler

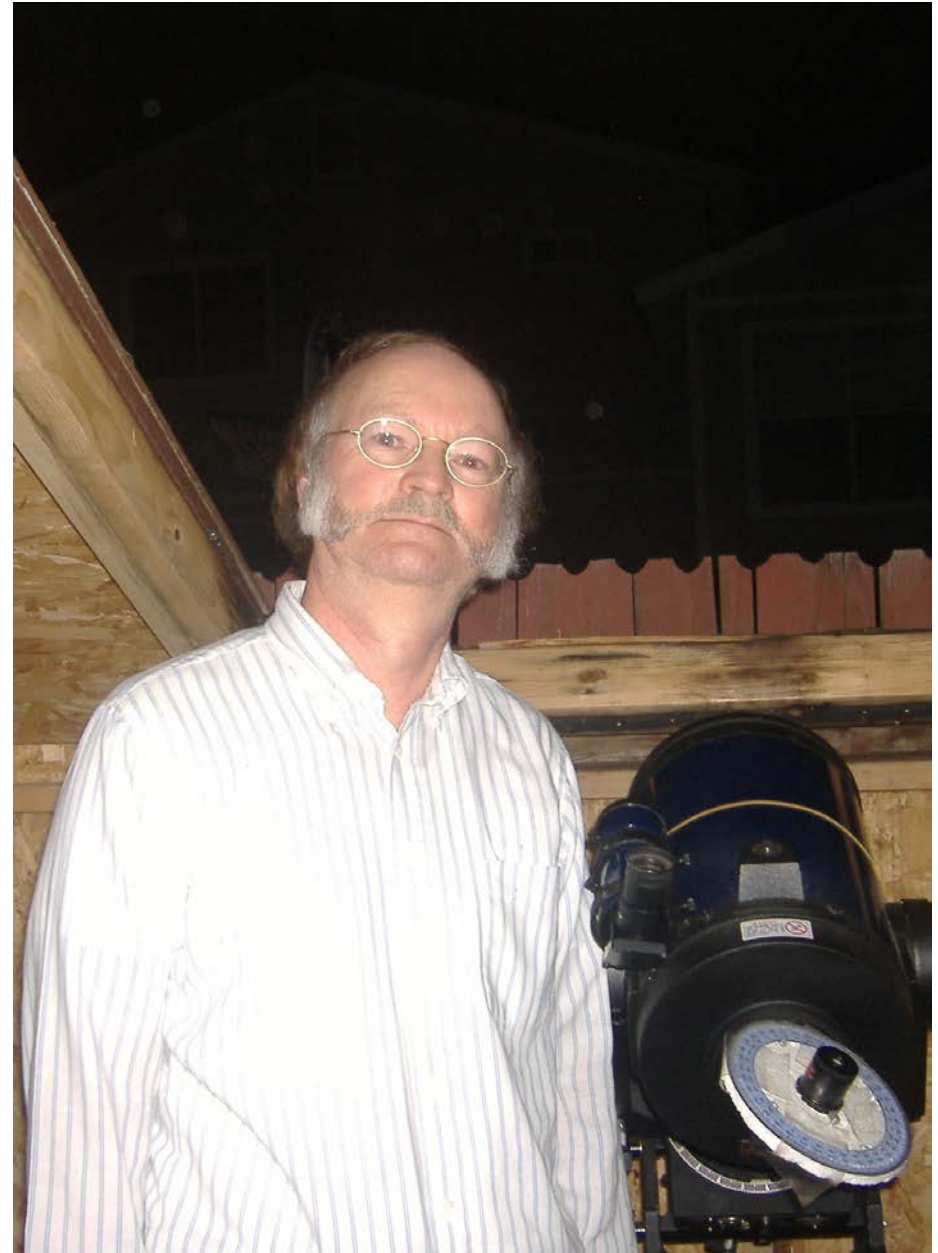
Exposure to Quantitative Research

- Averages, Standard Deviations, and Standard Errors of the Mean
- Calibration Equation
- Baseline Epoch
- Parallax/Distance

Learn Basic Astrophysics



Collaboration with Experts



Swift Publication

Journal of Double Star Observations

[Current Issue](#) [About the JDSO](#) [Archives](#) [Errata \(As Of: 11-3-2011\)](#) [JDSO Index](#) [Publication Guide](#) [Search](#)

[Student Measurements of the DoubleStar STFA 28AB Compared with 18th-21st Century Observations](#)

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Mark Brewer, Jolyon Johnson, Russell Genet, Anthony Rogers, Deanna Zapata, William Buehlman, Gary Ridge, Hannah Jarrett, Stephen McGaughey, Joseph Carro

[CD Double Star Measures, Jack Jones Memorial Observatory: Report #5](#)

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James L. Jones

[Observation and Measurement of 10 Double Stars: April 2012 – July 2012](#)

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Gaetano Lauritano

[Comparing Two Calibration Methods of a Micro Guide Eyepiece using STF 1744AB](#)

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Eric Weise, Jolyon Johnson, Russ Genet, Ryan Gelston, Brian Reinhardt, Tess Downs, Tori Gibson, and Austin Ross

[Visual Measurements of the Double Star STFA 38 AD](#)

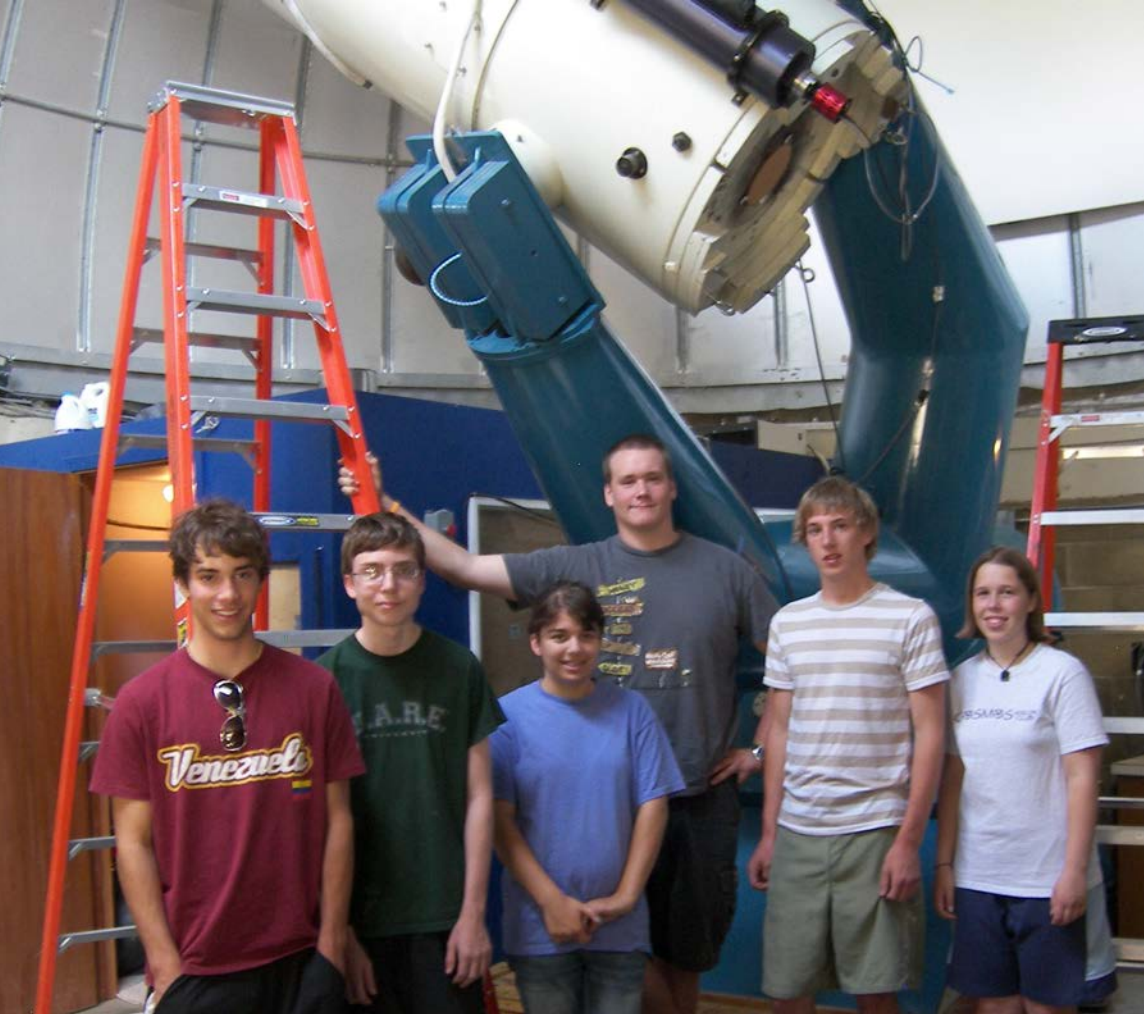
55

Jolyon Johnson, Eric Weise, Russell Genet, Michael Anderson, Samantha Choy, Melinda Hart, Bailey Kelley, Zachery Noble, Samantha Spurlin, Bret Tabrizi, and Sheena Wu

[Two Cuesta College Teams Observe Albireo](#)

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Jolyon Johnson, Joseph Carro, Eric Weise, Russell Genet, Brian Cahn, Brittany Chezum, C. McKenney Degnan, Nicole Ford, Anna Greene, Nicholas Jaeger, Rachel Johnson, Kristen Nicholson, Devanee Richards, Joseph Richardson, and Samantha Thompson



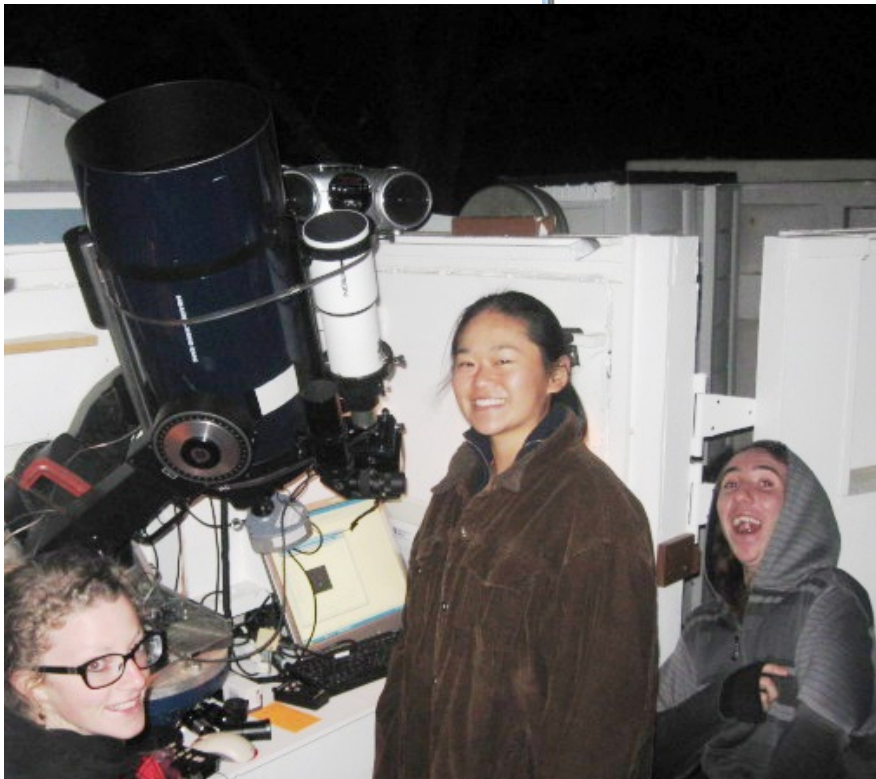
Keys to Successful Seminars

- Some projects are more amenable to a short time frame than others.
- Require publication of research.
- Have experts ready to review papers.
- Offering college credit really helps.
- Let students repeat the course so a corps of students will build up.
- Over 40 papers so far have been published.
- Over 200 students have taken the course.

Fall 2012 Lucky Imaging

The screenshot shows the Réduc software interface with the following details:

- Title Bar:** Réduc : C:\Users\Jolyon\Desktop\Thumb Drive Save 2\12 06 01 Rafa Hi Stars\12 03 06 Indiana photos\HiStarC.fit [1...
- Menu Bar:** File Processing Special Interferometry Window Options ?
- Image Properties:** 728 x 490 pixels, Max/Min : 32381 / 3732, Moy / Sig : 23981 / 286.89, Med : 24051.
- Positioning:** (X,Y) : (145, 19), Lum : 23283.00
- Processing Options:** Inv, Sel: 1, % 100, 59And.fit
- Centering:** Manual, Automatic, 5 x 5
- Statistics:** Max : 32381, Moy : 27829, Min : 24692, Seuil : 28536
- Buttons:** comp A, comp B, AutoReduc, Drift Analysis, Synthetic Drift
- Values:** 32758.93, 21997.63, Auto, Log, 10
- View:** Bias, showing a dark field with two bright stars.



Sources

- The Journal of Double Star Observations (2007-2013)
- Small Telescopes and Astronomical Research (2010)
- The Double Star Reader (2013)
- Amateur Astronomy (2010)
- The Classroom Astronomer (2012)
- Society for Astronomical Sciences (2008-2012)
- American Astronomical Society (2011)