PEP Telecon Jan 2026

2nd Quarter Observing

Betelgeuse update

Software

Alpha Cygnis data

Beta Cepheids

Jan-Mar Targets

Odds and Ends

PEP Activity

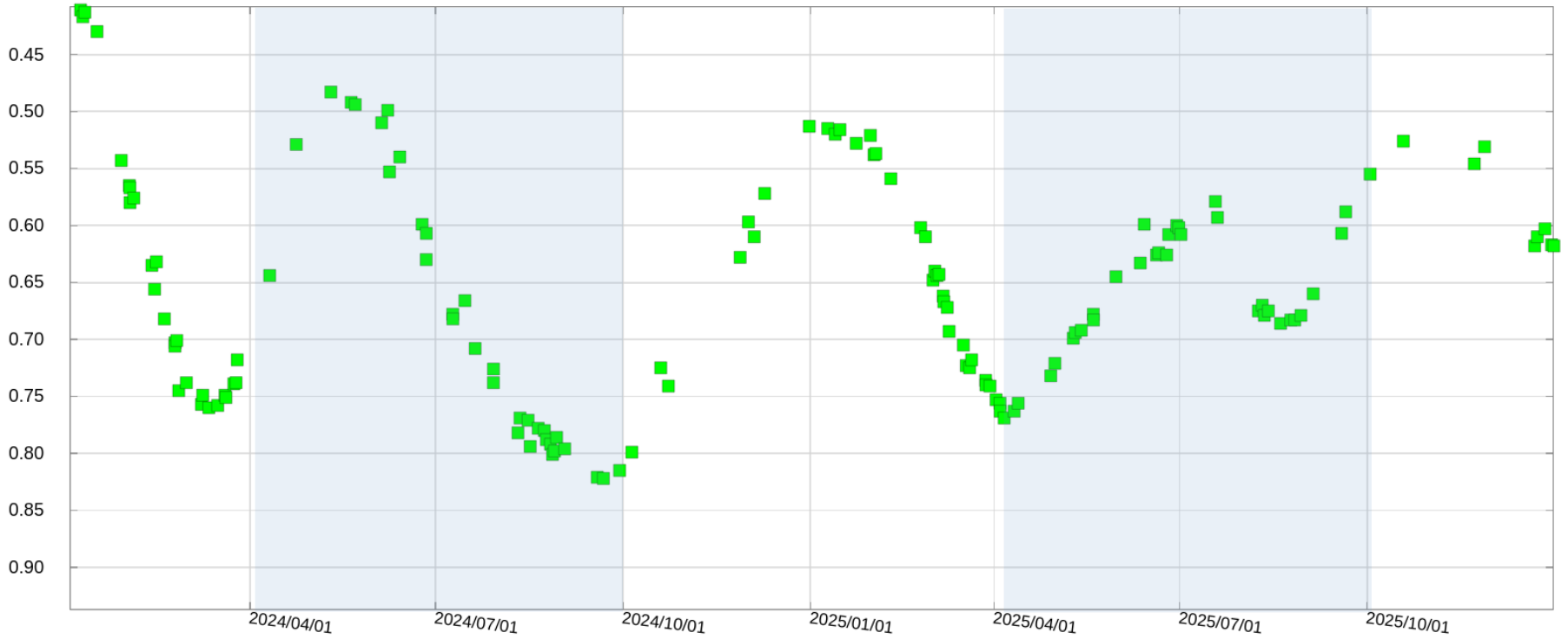
Oct-Dec: ~270 observations

Tom, Pam, Paul, Erwin, Brad,
Frank, Jim, Jeffrey

Betelgeuse Update

Latest lightcurve

Jan 2024-Jan 2026
PEP + Daytime



Note: Otmar Nickel (NOT) doing *some* nighttime CCD

Companion Star: paper 1

Betelgeuse's Buddy: X-Ray Constraints on the Nature of α Ori B

Anna J. G. O'Grady[1,13,14], Brendan O'Connor[1,13,14], Jared A. Goldberg[2], Meridith Joyce[3,4,5], László Molnár[4,5,6], Christian I. Johnson[7], Jeremy Hare[8,9,10], Katelyn Breivik[1], Maria R. Drout[11], Maxwell Moe[3], and Annalisa Calamida[7,12]

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Discussion

Based on Chandra observations

Prior research indicates mass 0.5x to 2.0x solar

If companion formed at same time as Betelgeuse...

...main sequence star almost entirely ruled out

Companion likely a white dwarf, neutron star, or YSO

No significant X-ray emission found (accretion)...

...eliminating WD and NS

That leaves Young Stellar Object

Companion Star: paper 2

Betelgeuse, Betelgeuse, Betelgeuse, Betel-buddy? Constraints on the Dynamical Companion to α Orionis from HST

Jared A. Goldberg[1], Anna J. G. O'Grady[2,12], Meridith Joyce[3,4,5], Christian I. Johnson[6], László Molnár[4,5,7], Andrea K. Dupree[8], Brendan O'Connor[2,12], Maria R. Drout[9], Maxwell Moe[3], Katelyn Breivik[2], Annalisa Calamida[6,10], Iman Behbehani[11], and Niall J. Miller[3]

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Discussion, I

Based on Hubble far-UV observations

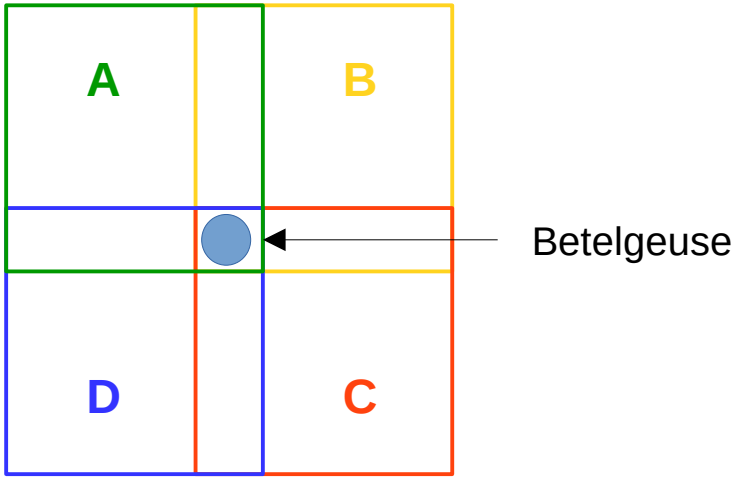
Look for spectral signatures of YSO companion...

...when companion is at maximum separation

Discussion, II

Image four quadrants, Betelgeuse in corner of each

Companion’s UV should stick out in one quadrant



No significant detection

Mass must be less than 1.5x solar

Companion Star: paper 3

Betelgeuse: Detection of the Expanding Wake of the Companion Star

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Paul I. Cristofari*
Leiden Observatory, Leiden University, PO Box 9513, 2300 RA Leiden, The Netherlands

Morgan MacLeod
Center for Astrophysics | Harvard & Smithsonian, 60 Garden St, Cambridge, MA 02138, United States

Kateryna Kravchenko
Max Planck Institute for Extraterrestrial Physics, Gießenbachstraße 1,D-85748 Garching, Germany

Discussion

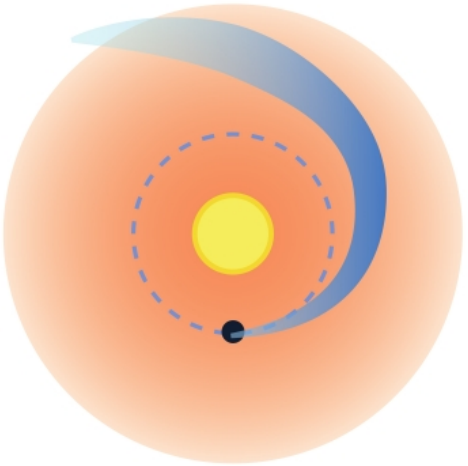
Optical and UV spectroscopy

Companion temporarily concentrates chromosphere

Absorption should increase in the “wake”

Absorption *does* vary with companion motion

Increase after transit, decrease during eclipse



transit

Software

SSP DataQ

We have the source code

Written in Liberty Basic (Windows)

Working on development/test environment

Must fix a bug affecting New Zealand DST

Check the uncertainty calculation

Add some metadata

Alternate “DataQ”

Windows application in development

By Michael Camilleri (New Zealand)

Data logging (+ scope movement?)

Reduce with speadsheet

PEP Spreadsheets, etc

Temporarily hosted at **http://aavsopep.info**

No security certificate

Must create new “transforms” document

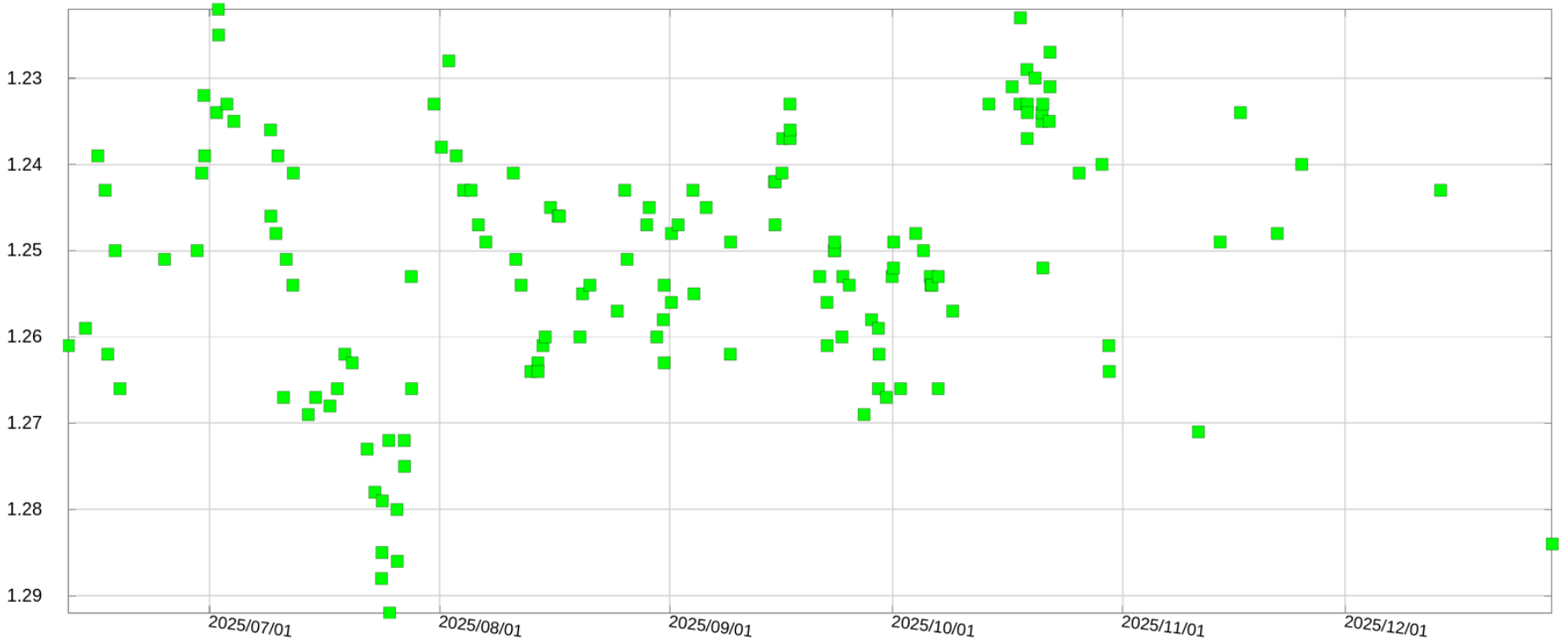
Alpha Cygnis project

Latest News

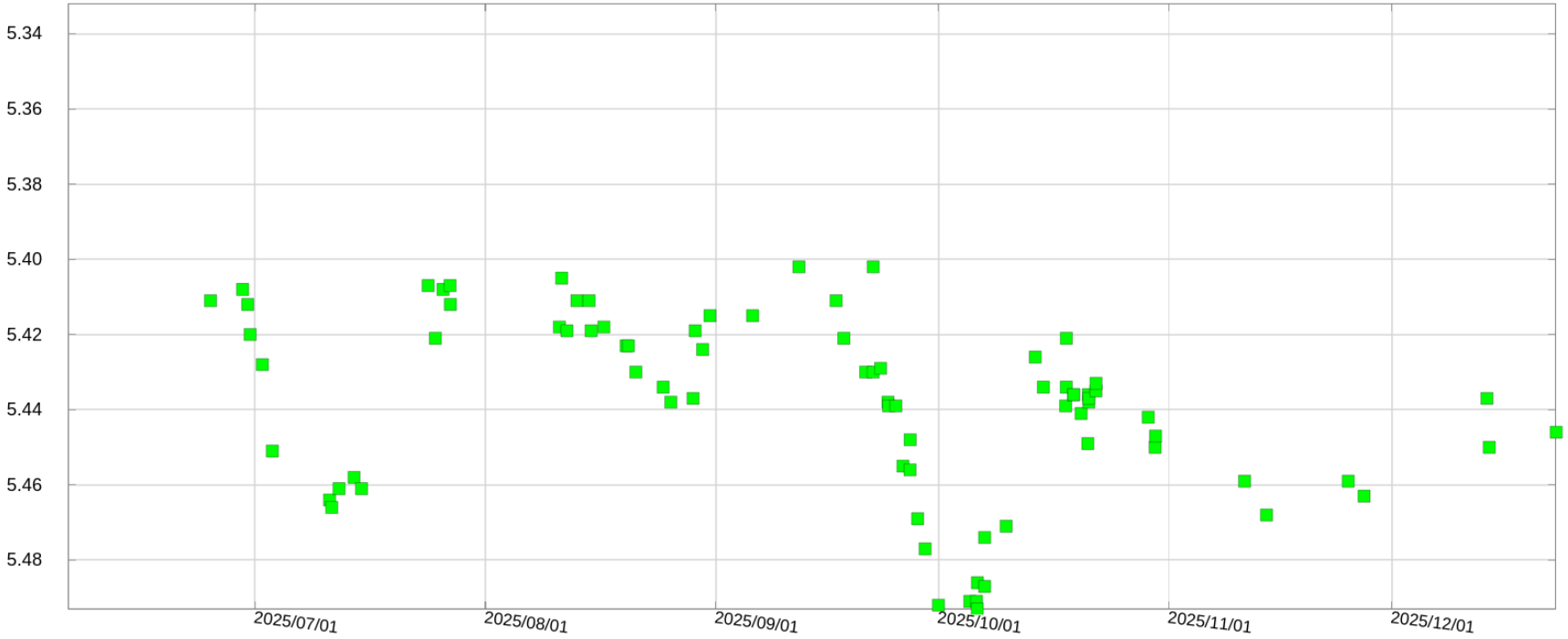
Onboarding and recruiting going slow

Not much activity on Rigel yet

Deneb 2025 Results

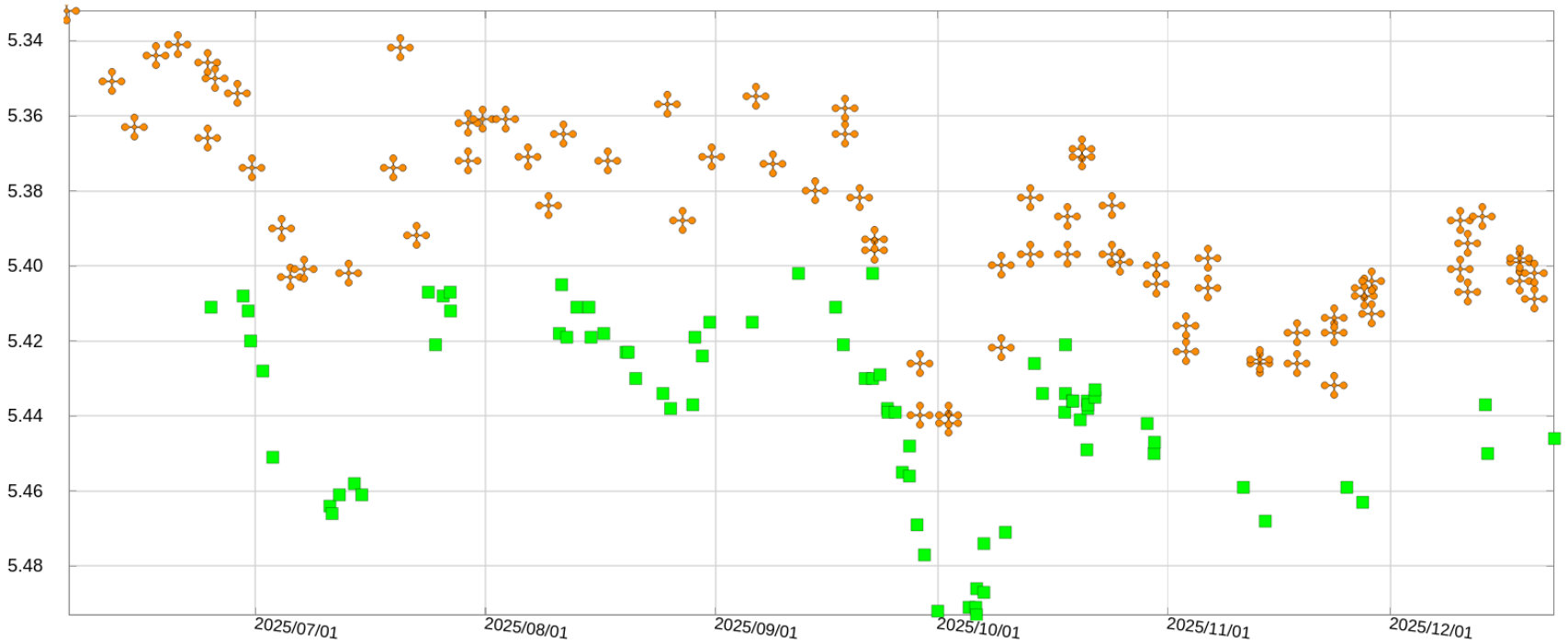


V566 Cas 2025



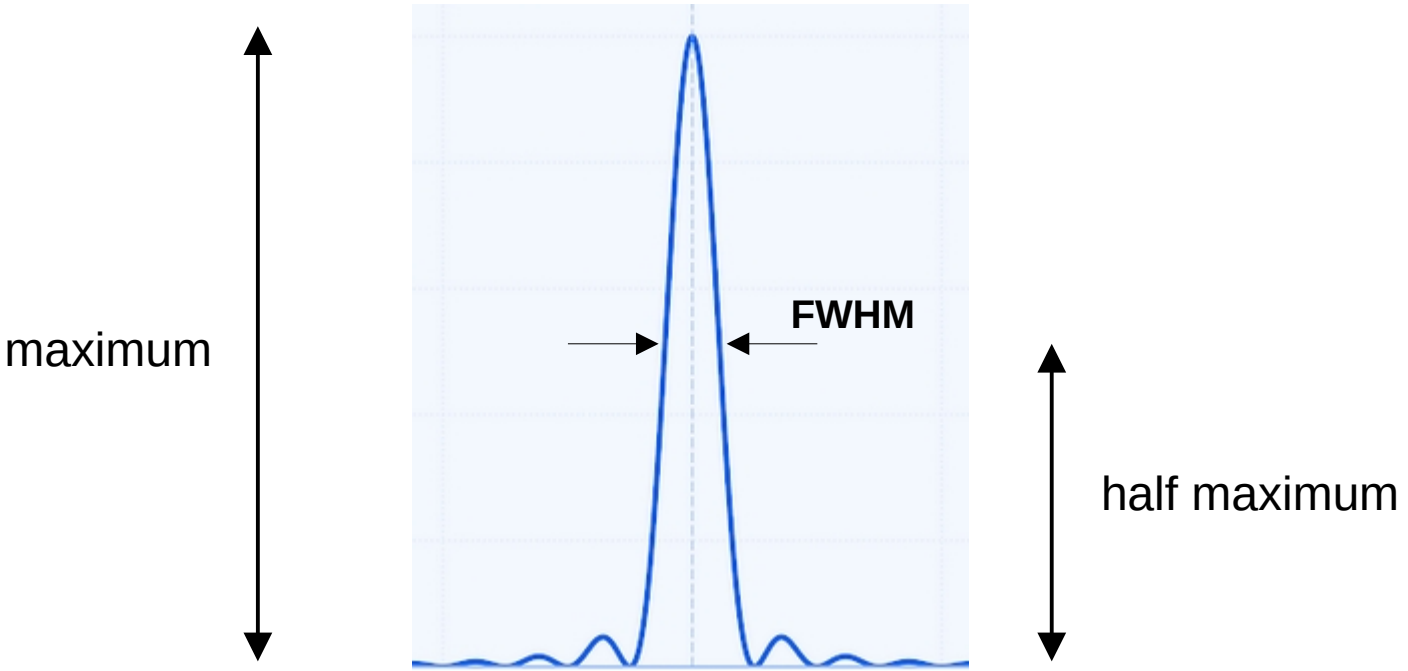
V566 Cas 2025

Continuing problem with Vollman (DSLR)



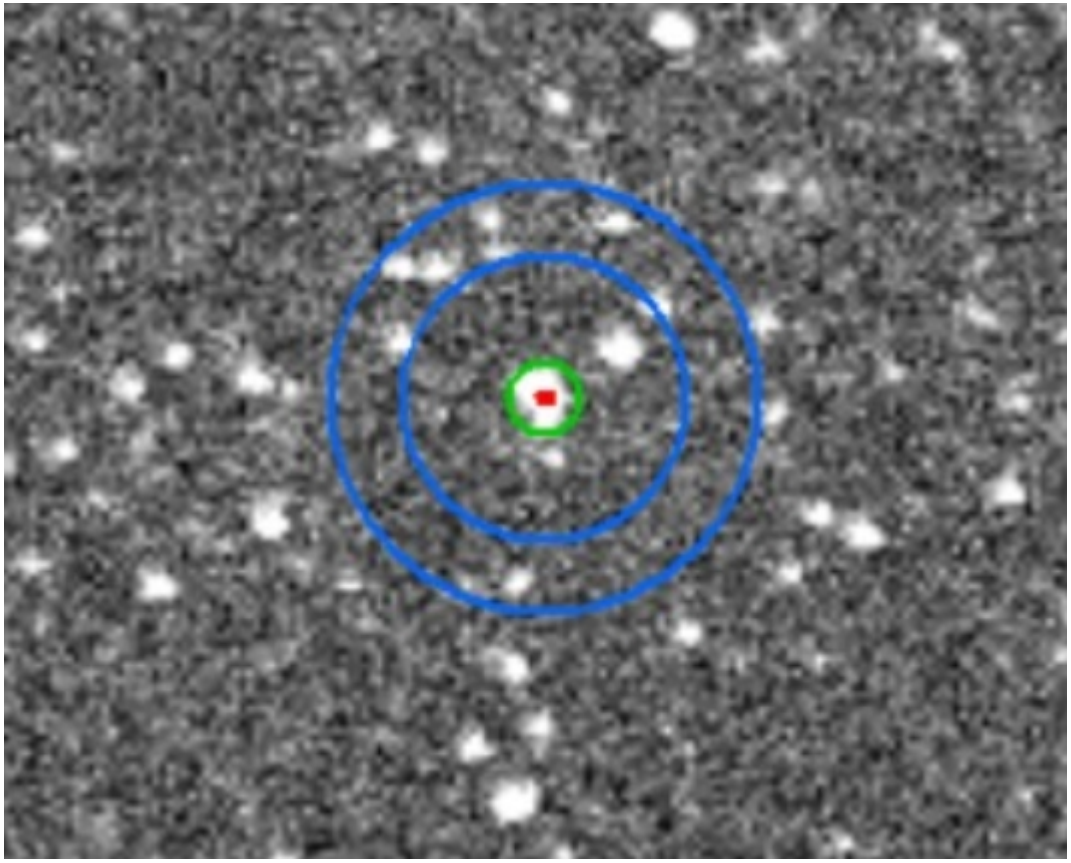
Quick Definition

“Full Width of Half Maximum” (FWHM)



Vollman Aperture Photometry

Defocused image; 50mm lens



Red = FWHM

Green = aperture

Blue = sky annulus

Problem with aperture, problem with sky background

Beta Cepheids

Small-amplitude Pulsators

Early-type giant stars (β Cep = B0.5 III)

Small variation (< 0.1 in V, more in U&B)

Quick pulse (as short as a few hours)

Polarimetry by Daniel Cotton @ MIRA

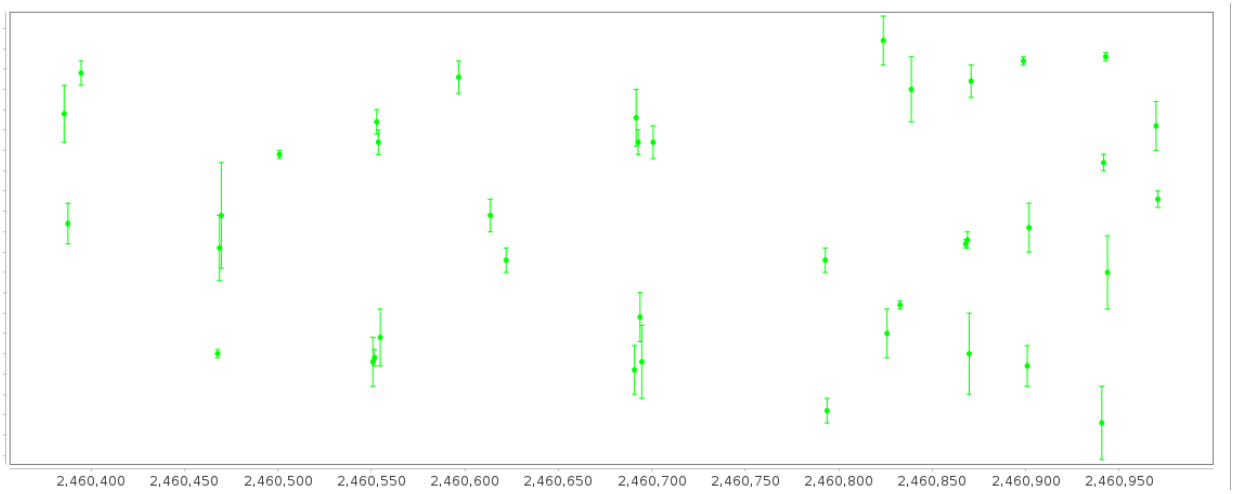
Daniel has asked for help

(He is also doing Deneb)

Sidebar: Phase Plots

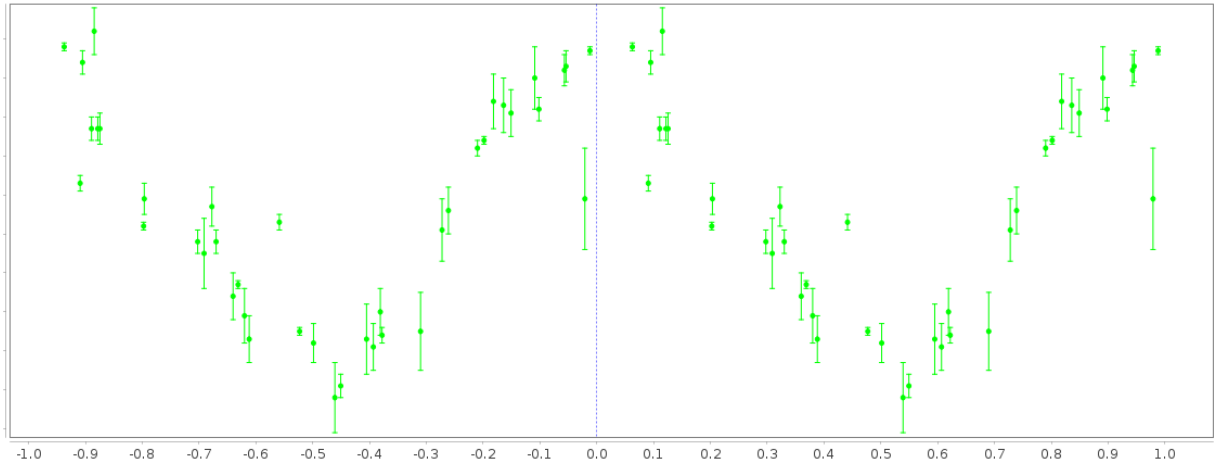
For highly periodic variables - show all data as a single cycle

Two years of Polaris – standard plot



VStar graphics

Phase plot

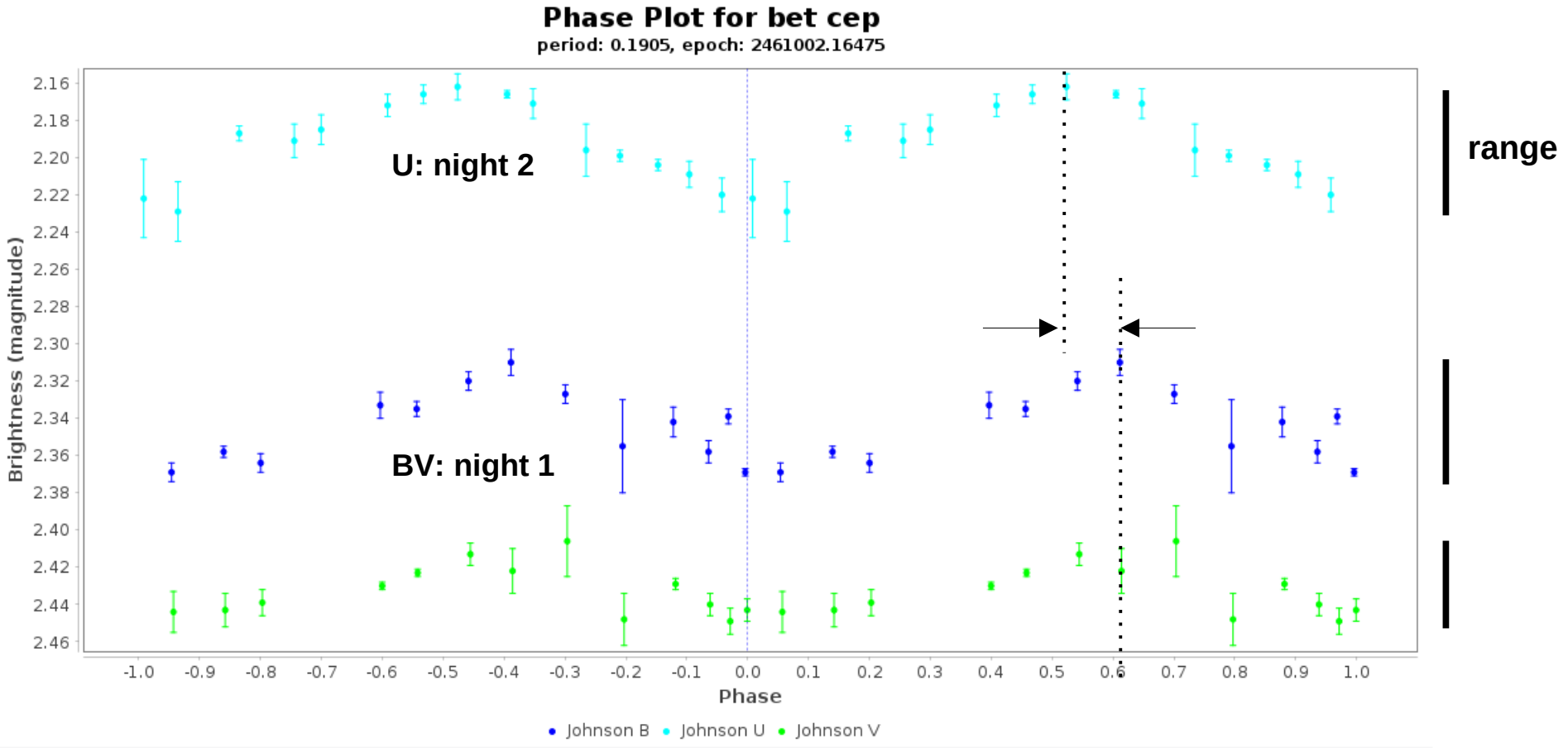


Trial runs on beta Cep, itself

Star has a nearby companion

Must use SSP-5 for reliable sampling

Two nights



Hard Work!

4½ hours of photometry

BSM as a possible alternative

BSM tests inconclusive at this point

Hazard to PEP!

Target List

Star	Dec	V change	period
bet Cep	+71	0.050	4.5h
eps Per	+40	0.020	4.6h
gam Peg	+15	0.040	3.6h
alf Vir	-11	0.009	mutliple periods
lam Sco	-37	?	
bet CMa	-18	0.030	6.0h
niu Eri	-03	0.140	4.2h
zet Cas	+54	?	
iot Her	+46	0.020	3.5d
tau Her	+46	0.030	1.2d
bet Cen	-60	0.045	3.8h
bet Cru	-60	0.060	4.6h

Assuming the project goes ahead...

I can’t do all the stars - would ask for help

You would need automatic data logging

I have an extra logger for Gen 1 photometers

Jan-Mar Targets

Northern Hemisphere

Prime targets

Rigel Betelgeuse

V566 Cas

Constant targets

niu Aur

Secondary targets

For BV & RI:

V509 Cas rho Cas (hypergiants)

X Per

X Persei

X-ray binary

Neutron star with Be star shedding mass

Accretion outburst expected

Currently B=~6.5, V=~6.2, R&I brighter

Check with me if interested

T CrB is Back

Watch AAVSO forums for outbust alert

https://forums.aavso.org/

Check each evening (if you expect clear sky)

Star available before sunrise

BV if you can

Southern Hemisphere

Prime targets

Rigel Betelgeuse

Constant targets

21 Orion

(42 Orion not yet configured)

Secondary targets

Odds and Ends

Transforms

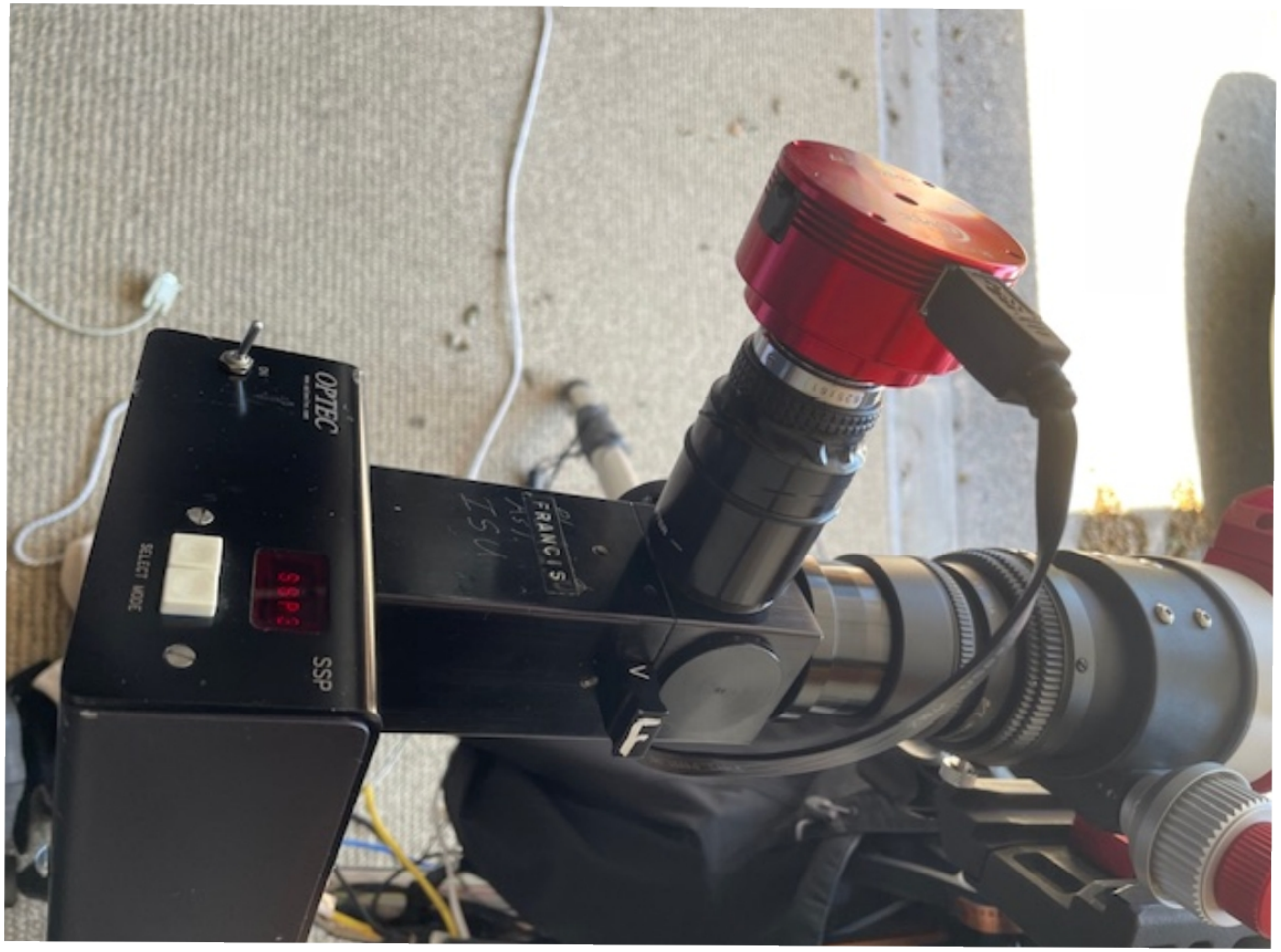
Perseus pair available (but still needs work) ***V only***

Leo Minor pair available by about 1am

Sculptor pair in south available until about 1am DST

SSP-3 Camera Adaptation

Michael Camilleri



Applicable to SSP-4 (stars IR bright, visually dim)

Persha Legacy to AAVSO

SSP-5A and two SSP-4A

Assorted SSP electronics

Optical bench for reticle alignment

Auxiliary camera

Spectrograph

Cash

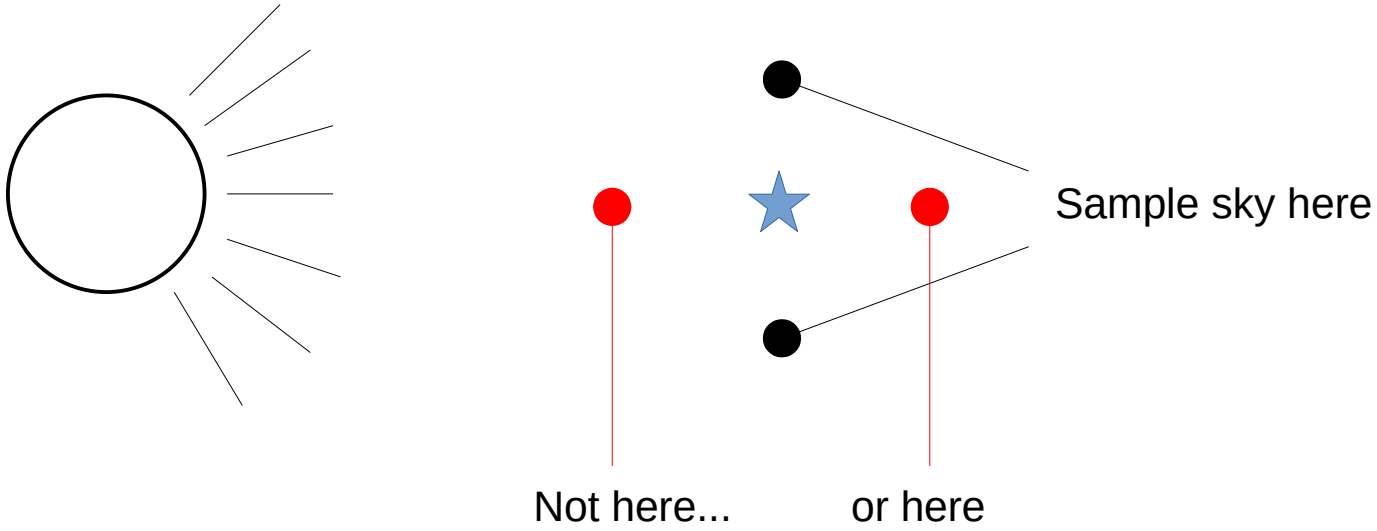
Bright Moon Concern

Don’t work with a bright moon close to Var/Comp/Check

25 degree limit? Depends on your optical tube baffling

When near (but not too near) be careful with sky samples

Try not to move closer-to or further-from the moon



Annual Meeting Presentation

Have aCyg R

Adventures ramping up an international PEP campaign

Went well – proceedings paper has been submitted

AAVSO Headquarters

Elizabeth (our prime contact) has retired

Tim Lyster and Whitney Armentor have moved on

HQ will be short-staffed in Q1 and perhaps Q2

New “educator” hopefully starting in Q1

“peptalk” mailing list

Is now gone

Presently trying to get everyone hooked up to forums

Please don’t post to “announce” thread

Contact me with problems

AAVSO Webinars

Interest is waning - likely to be discontinued

Future of CHOICE up to new educator

Merciful End