

Using the MONET Telescope to Study White Dwarf Pulsations

By George Miller

4th year

University of Texas at Austin

Adviser: Don Winget

MONET Telescope

(MOnitoring NEtwork of Telescopes)

1.2m Primary Mirror
1024x1024 pixel ccd
32 arcseconds/pixel



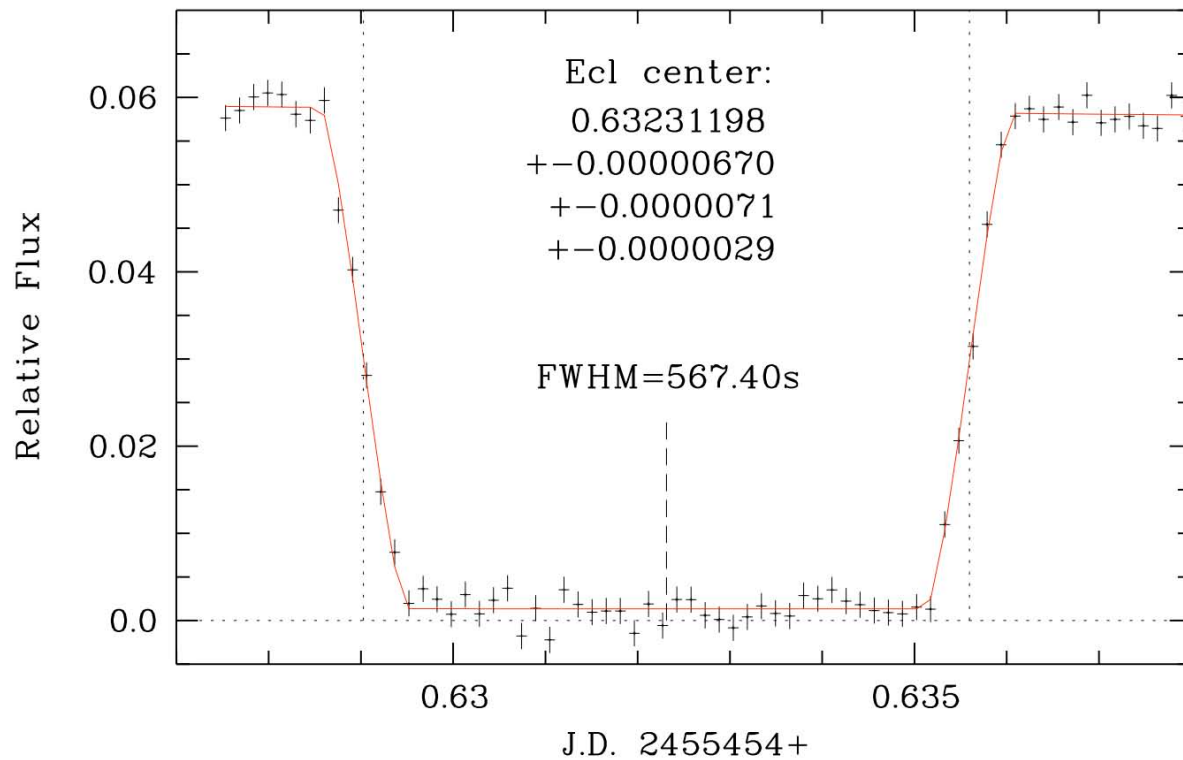
Available Filters

Filter Name	Description	Central Wavelength [nm]	FWHM [nm]	Peak Wavelength [nm]	T _{max} [%]
none	no filter	(CCD)	(CCD)	(CCD)	(CCD)
clear	BG glass	(CCD)	(CCD)	(CCD)	97%
U	Johnson-Bessel uv	360	51	364	62%
B	Johnson-Bessel blue	440	94	431	66%
V	Johnson-Bessel visual	550	109	520	93%
R	Johnson-Bessel red	660	142	600	83%
I	Johnson-Bessel infrared	800	156	805	94%
Sloan g'	SDSS green	475	150	492	96%
Sloan r'	SDSS red	619	132	629	0%
Hα	neutral hydrogen	655.8/656.2	8.2	656	0%
OIII	twice ionized oxygen	498.20/498.90	11.60/11.80	500	87%
Sloan z'	SDSS near-IR	> 900			95%

**MONET Teacher
professional development
workshop
July 8-10, 2010**



NN Serpentis

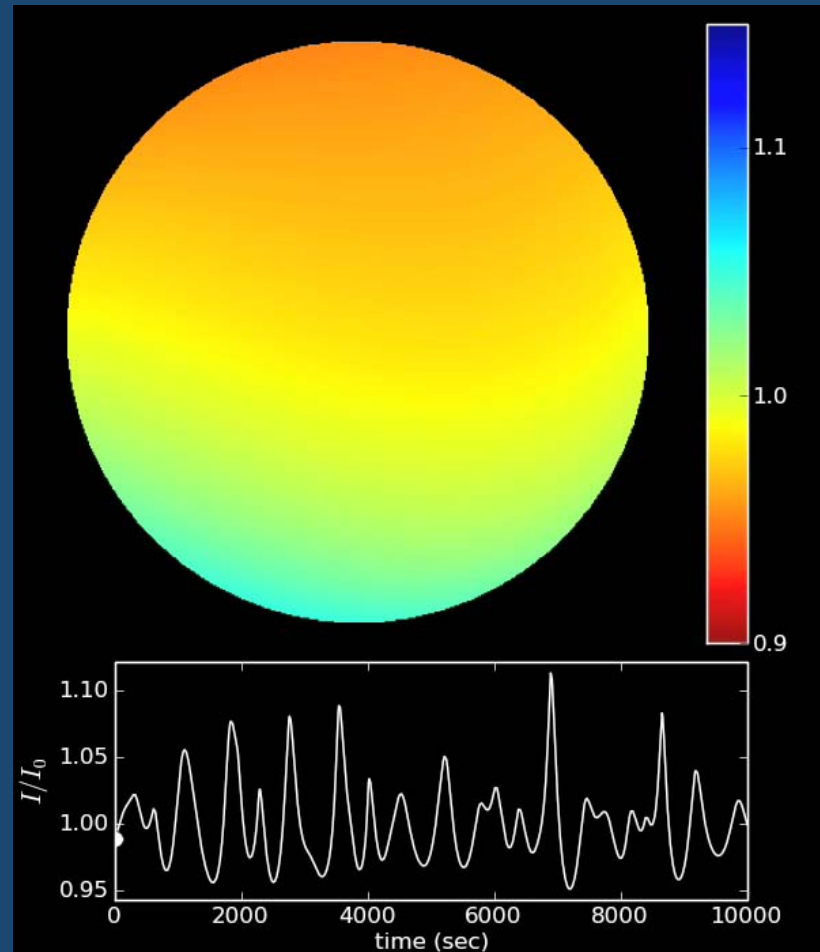


White Dwarf Pulsations

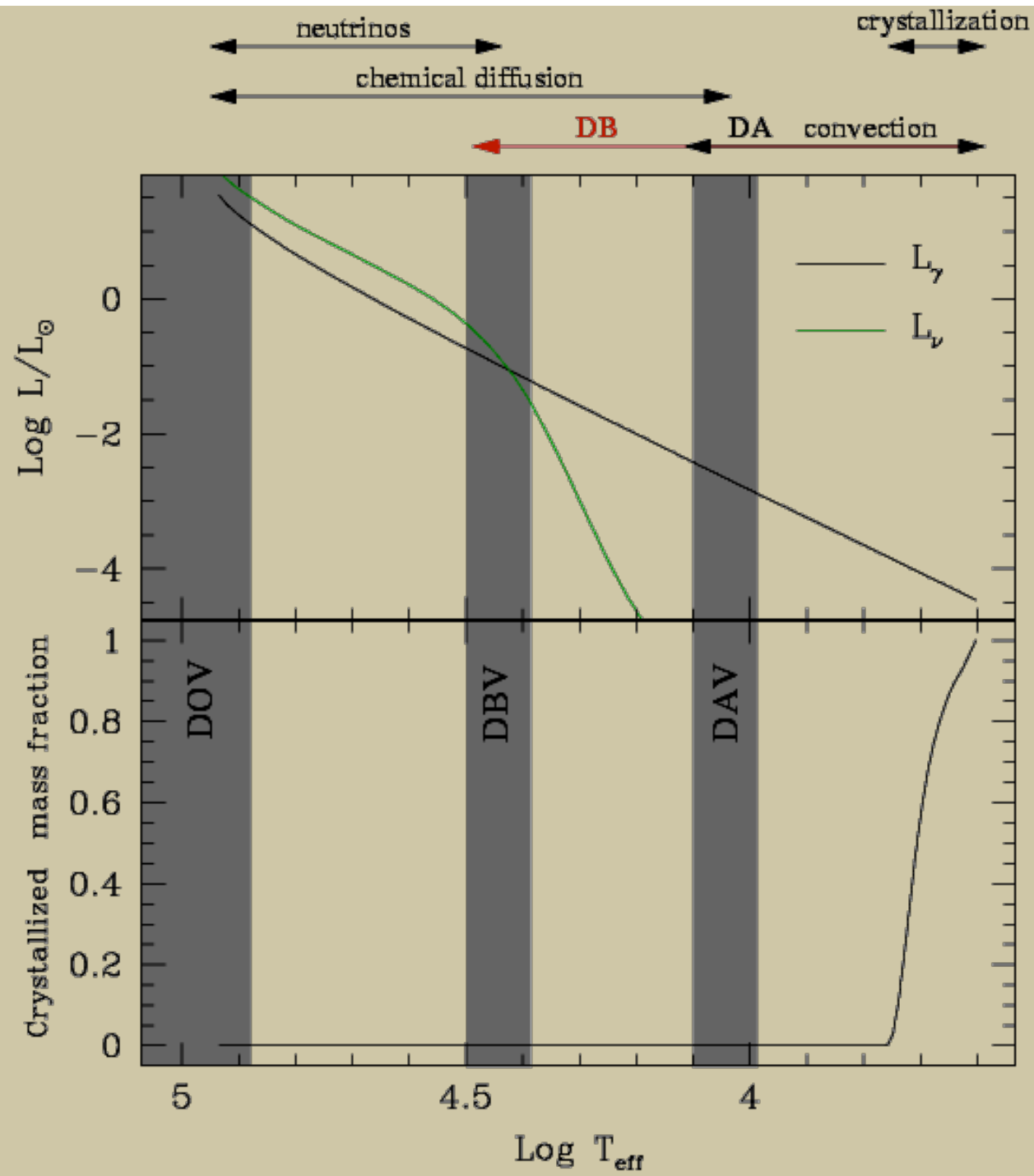
■

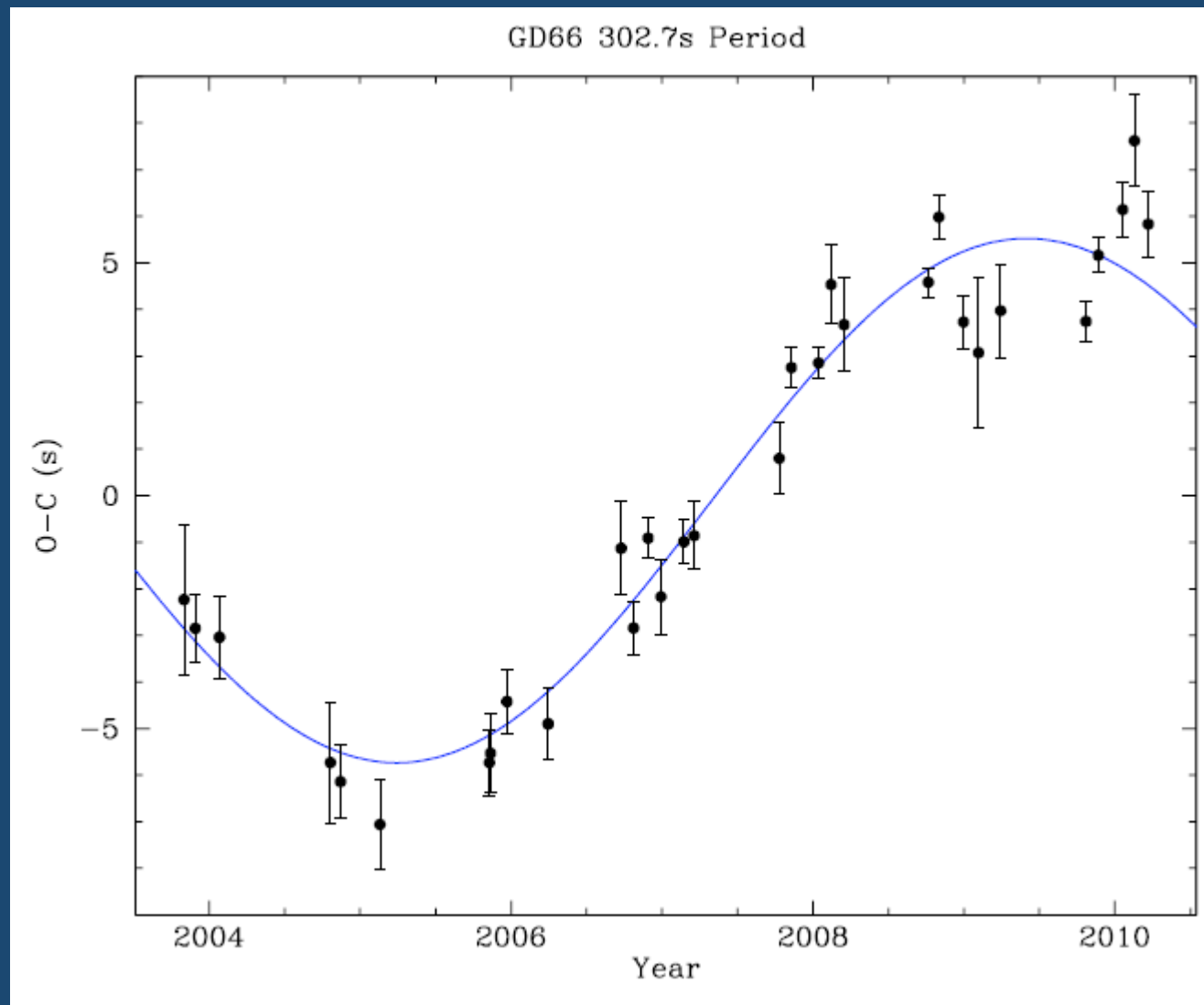
Period (s)

422.561	1	1
423.898	1	-1
463.376	1	1
464.209	1	0
465.034	1	-1
571.735	1	1
574.162	1	0
575.933	1	-1
699.684	1	0
810.291	1	0
852.502	1	0
962.385	1	0



Animation by Mike Montgomery



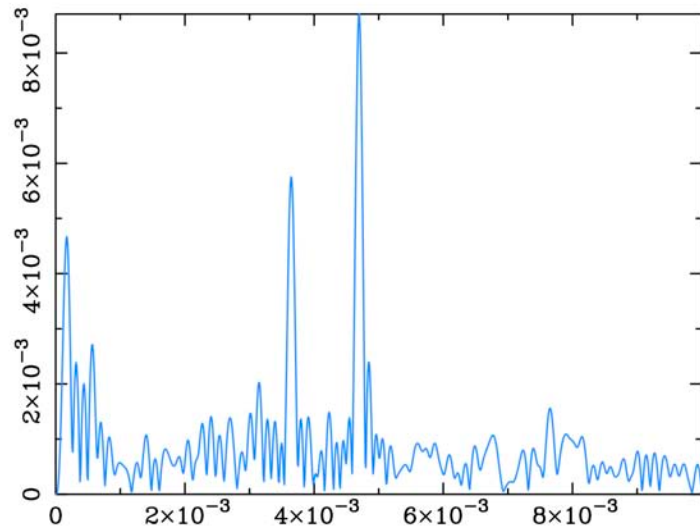


Limiting factors in pulsation studies:

- Requires long runs
- May require multiple runs stretching years
- Requires good weather and little moonlight due to dim targets

R548

14.2 Magnitude



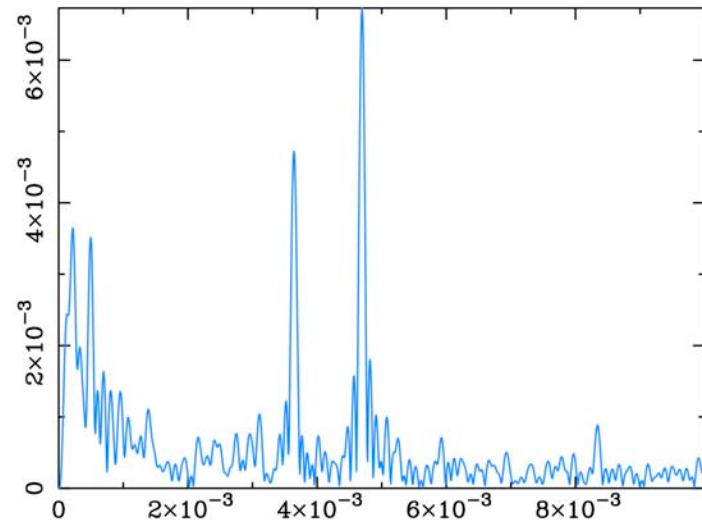
ccd.gfm335 8-Sep-2011 16:48

Monet Telescope

Periods:

212.97+- 0.15 seconds

274.44+- 0.34 seconds



ccd 8-Sep-2011 16:50

82" Telescope

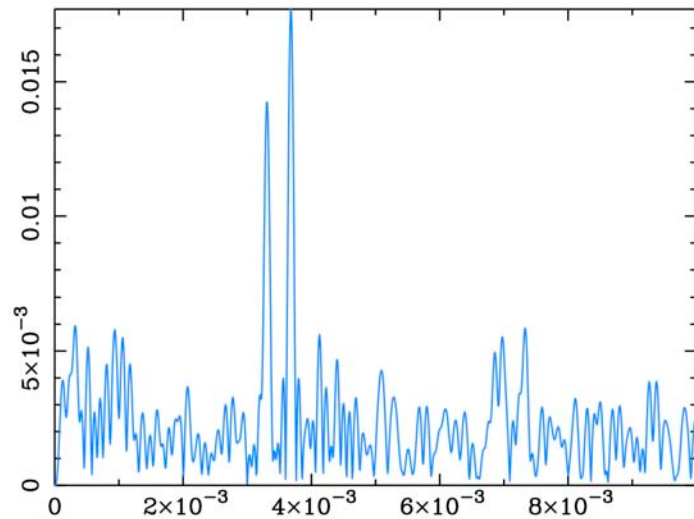
Periods:

212.988+- 0.075 seconds

274.51+- 0.16 seconds

GD66

15.6 Magnitude

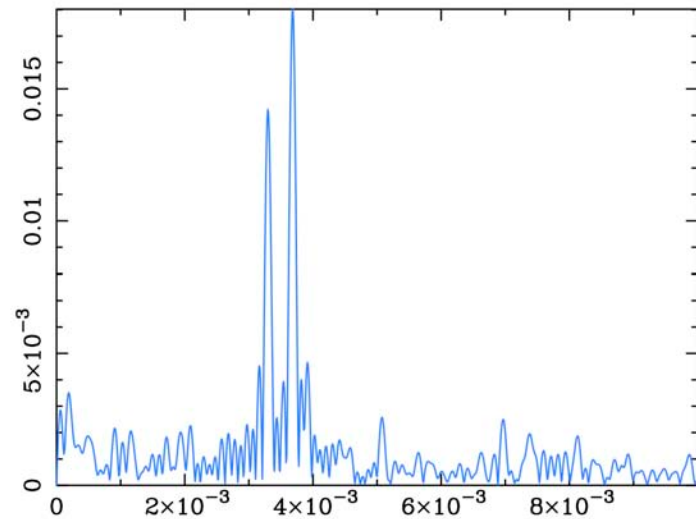


Monet Telescope

Periods:

271.70 +- 0.31 seconds

301.99 +- 0.47 seconds



82" Telescope

Periods:

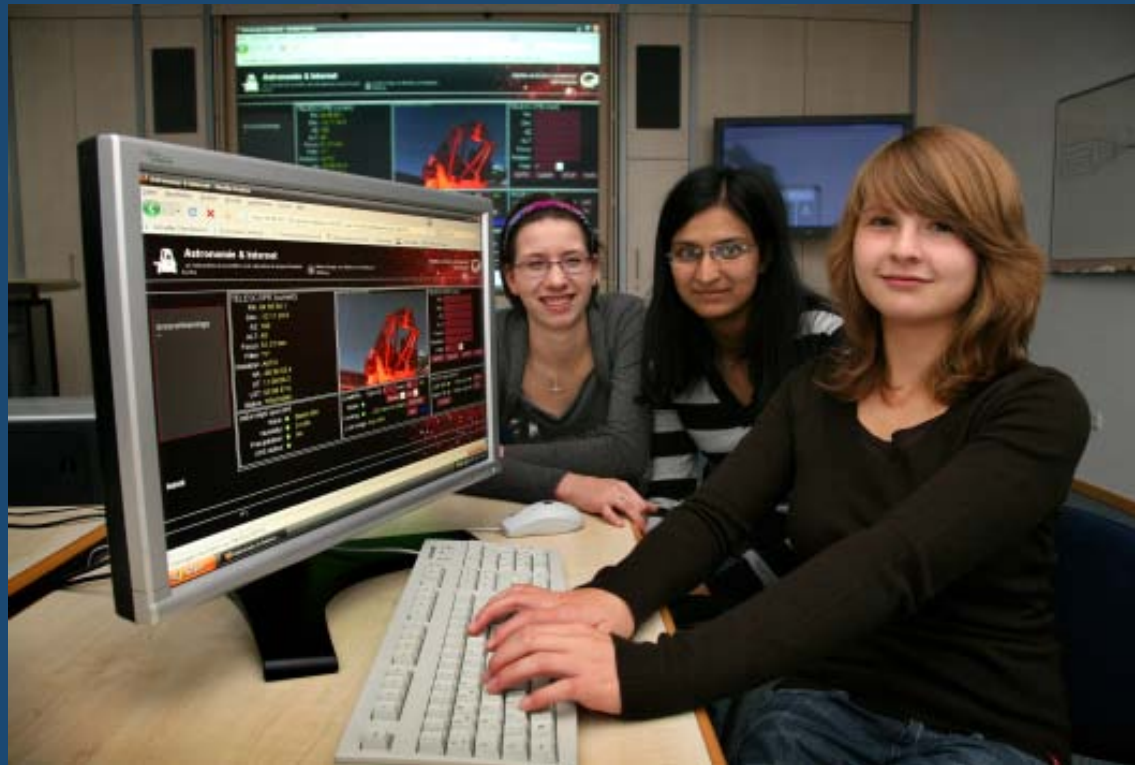
271.501+- 0.098 seconds

302.89+- 0.12 seconds

Advantages of using the MONET for pulsation studies

- No travel funds required
- Easy to obtain time-sensitive data
- Data may be obtained evenly throughout the year
- Can be used as a guinea pig before using larger telescopes
- and...

Can be used by undergraduates!



Thanks to: Don Winget, Mike Montgomery,
Frederic Hessman, Mary Kay Hemenway, JJ
Hermes, and the White Dwarf FRI Stream