2009 Epsilon Aurigae Eclipse
Campaign Newsletter #10
Winter 2008/2009

Jeff Hopkins, Editor
Hopkins Phoenix Observatory

Campaign Web Site
http://www.hposoft.com/Campaign09.html

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In This Newsletter

Editor's Remarks

Dear Colleagues,

We are entering mid-season for observing epsilon Aurigae. Currently eplsilon Aurigae is near its brightest at brighter than 3.00 magnitudes in the V band. We have just a few months remaining where we can study out-of-eclipse data. It is also a last chance to fine tune techniques prior to the eclipse. There is a chance to catch some pre-ellipse phenomena due to the secondary. During the 1982 - 1984 eclipse there was some very wild light variation just before 1st contact and just after 4th contact.

For those interested in spectropolarimetry Greg Jone pointd out an interesting paper Instrumentation for *Astrophysical Spectropolaimetry* by Christoph U. Keller. A pdf can be downloaded at:
http://www.noao.edu/noao/staff/keller/lectures/iac2000.pdf/

Jeff Hopkins
Campaign Newsletter Editor

EE Cephei Project

23 December 2008

Dear Sirs

We are organizing observational campaign for the current eclipse of the EE Cep, the cousin of the epsilon Aurigae system.

The web page address devoted to the campaign is:
http://www.astri.uni.torun.pl/~cgalan/EECep/

The eclipse have started already and the observations are in progress.
Quite large interest is with photometric observations. However, we have not any instrument for infrared JHK photometry. It's a pity, because infrared photometry can be very important in order to observe the secondary component. We suppose that it is quite large chance for successful observations of the secondary component in infrared. Would it be possible, that you would use your instruments for JH photometry of EE Cep between 12.2008-3.2009? The minimum of the eclipse should take place in the mid of January 2009.

We are also interested to take part in observations of the epsilon Aurigae in 2009-2011. We have started BVR photometry in December and we are interested in spectroscopy (we would like to use Schmidt Cassegrain Telescope 60/90cm with spectrograph (1200 l/mm)).

With best regards,
Cezary Galan
Cezary.Galan@astri.uni.torun.pl

Eps Aur and the 2009 International Year of Astronomy
Aaron Price AAVSO

In August, 2007 the United States IYA working group for citizen science chose the Eps Aur project as its cornerstone IYA event. The AAVSO is the main hosting organization for the project which also involves the Adler Planetarium, the California Academy of Science and Johns Hopkins University. A large, 3-year funding proposal has been submitted to fund the project. Early response has been very favorable and a decision is expected by the end of January.

If funded, the project will be very large in scope. The goal of the project is to involve the public in every aspect of the scientific process. It begins with data collection (with an emphasis on visual observing, but photometric observing is also included) but also includes components for analyzing data and eventually writing a scientific paper that will be peer reviewed and (if accepted) published in a special edition of the Journal of the AAVSO. Public workshops will be planned for the summers of 2009 (Chicago) and 2010 (San Francisco) with the goal to teach participants about data analysis and scientific writing. Travel grants will be available on a competitive basis (similar to the AAVSO/NASA High Energy Astrophysics workshops from 2000-2006). There will be significant education and public outreach activity as well, including the creation of a short planetarium show and interactive 3D visualizations. It will all be coordinated through a new web site called "Home Base", being designed by the AAVSO webmaster and one of the webmasters of the GalaxyZoo site. The site will involve blogs by professional and amateur astronomers, discussion forums, new java-based data analysis tools and more.

If the project is not funded, then the AAVSO will continue to run the campaign as it would run other major campaigns. However, the focus will be on amateur astronomers and data collection with less focus on the general public and data analysis. Cross your fingers!

The United Nations has officially declared 2009 to be the International Year of Astronomy. The United States IYA Program Committee has created a Research Experiences for Students, Teachers and Citizen Science working group. That group has chosen the Eps Aur eclipse as the focus of their 2009 efforts. The AAVSO has submitted a proposal to the National Science Foundation to create the largest active research citizen science project in history. If funded, the program will recruit members of the public to observe Eps Aur

Zeta Aurigae Eclipse

As a test of your techniques, zeta Aurigae will be entering its 972 day (2.66 years) eclipse for 40 days around 03 March 2009 and exiting around 10 April. Using the original epoch the eclipse is due 22 March, but based on the 1985 eclipse the 03 March date seems more likely. Observations should begin by mid-February. While this is an important and interesting event in itself and worthy of observation and study, it also provides an excellent trial for catching a long period eclipsing binary eclipse prior to the epsilon Aurigae eclipse a few months later. I highly recommend it. If you are using a wide field CCD technique for epsilon Aurigae, the star is already in the same image as epsilon. If you are doing single channel photometry you can just add the observations and use lambda as the comparison star for both epsilon and zeta. Note the eclipse is deeper in the shorter wavelengths. This would also be an excellent project for spectroscopy. A chance to see how the spectrum changes as the eclipse starts and throughout the eclipse through egress. I encourage those with either or both high or low resolution spectrometers to give it a try and report what you find.

Epsilon Aurigae Distance and Size Estimate Update

There has always been some confusion over the distance to the epsilon Aurigae star system. Sizes of the F star and companion are directly related to the correct distance. The has also been some confusion of whether 200 Rsolar meant the diameter of the F star was 200 Rsolar or the F star's radius was 200 Rsolar. It is now agreed that all measurements are in terms of the objects radius unless specifically noted otherwise.

In the S. Carroll 1991 article on page 279: "on the basis of Castelli's 1978 estimate for the radius of the F star, R = 277 Rsolar." And then on page 285: "R(F star) = 1.40 x 10^13 cm = 200 Rsolar. The disk thus has a radius Rd = 2000 Rsolar = 9.3 AU." They assumed a distance of 1,057 pc for these figures, and apparently labeled the figure accordingly with radii.

If distance is reduced to the Hipparcos value 625 pc, that's 625 pc/1057 pc = 0.59, their radii become smaller at 59%=> 118 Rsolar for the F star, 1180 for the disk.

Recent interferometrically measured "diameter" of the F star by Stencel was 2.27 milliarcsec --> 2.12 x 10^13 cm. For Hipparcos distance, which equals a 1.06 x 10^13 cm or "radius" = 151 Rsolar which is a bit smaller than the S. Carroll value (200).

As mentioned above these radii are dependent on what distance you assume. S. Carroll 1991 liked 1057 pc based on the reddening, A_sub_v. We are using the Hipparcos (1997) distance 625 pc because it is a more direct parallax measurement, 1.60 mas with errors +/- 1.16 mas --> max parallax = 2.76 mas --> d = 1/par = 362 pc, and min parallax = 0.44 mas 2,272 pc. See the discussion in Guinan's fine 2002 paper: **http://adsabs.harvard.edu/abs/2002ASPC..279..121G** sections 4.2, 4.3 --> R(F*)= 150 Rsolar.

Until further refined, we assume a distance of 625 pc, an F star radius of 151 Rsolar and companion radius of 1180 Rsolar.

Eta and Zeta Aurigae Photometry

As noted in the last Newsletter, some CCD and visual observers are using eta and zeta Aurigae as comparison stars, HPO has added those stars to the UBV data observations to see how stable they are. They will be observed throughout the eclipse of zeta Aurigae in March 2009. The following is a list of the data to-date:

Eta Aurigae

UT Date	JD	V Mag	SD	B Mag	SD	U Mag	SD
18 Jan 09	4,849	3.2340	0.0024	3.2263	0.0053	2.6805	0.0200
16 Jan 09	4,847	3.2447	0.0066	3.2423	0.0024	2.7014	0.0110
14 Jan 09	4,845	3.2324	0.0049	3.2309	0.0008	2.7016	0.0100
10 Jan 09	4,841	3.2343	0.0017	3.2304	0.0081	2.6781	0.0100
08 Jan 09	4,839	3.2403	0.0152	3.2361	0.0093	2.6937	0.0120
03 Jan 09	4,834	3.2315	0.0024	3.2287	0.0045	2.6841	0.0210
01 Jan 09	4,832	3.2279	0.0084	3.2248	0.0052	2.6898	0.0070
31 Dec 08	4,831	3.2386	0.0030	3.2352	0.0062	2.6951	0.0050
30 Dec 08	4,830	3.2281	0.0054	3.2260	0.0013	2.6924	0.0019
29 Dec 08	4,829	3.2620	0.0285	3.2585	0.0178	2.7504	0.0450
21 Dec 08	4,821	3.2396	0.0042	3.2339	0.0012	2.6919	0.0100
05 Dec 08	4,805	3.2386	0.0087	3.2275	0.0094	2.6977	0.0230
03 Dec 08	4,803	3.2353	0.0032	3.2267	0.0170	2.6977	0.0090
01 Dec 08	4,801	3.2347	0.0049	3.2312	0.0022	2.6937	0.0210
30 Nov 08	4,800	3.2249	0.0047	3.2322	0.0014	2.6856	0.0140
24 Nov 08	4,794	3.2182	0.0087	3.1905	0.0372	2.6475	0.0569
19 Nov 08	4,789	3.2391	0.0023	3.2336	0.0037	2.6979	0.0150
17 Nov 08	4,787	3.2293	0.0058	3.2259	0.0018	2.6811	0.0043
15 Nov 08	4,785	3.2373	0.0010	3.2322	0.0018	2.6985	0.0110

Zeta Aurigae

UT Date	JD	V Mag	SD	B Mag	SD	U Mag	SD
18 Jan 09	4,849	3.7352	0.0038	4.8742	0.0096	5.2121	0.0040
16 Jan 09	4,847	3.7410	0.0025	4.8742	0.0046	5.2118	0.0120
14 Jan 09	4,845	3.7415	0.0015	4.8719	0.0080	5.2205	0.0060
10 Jan 09	4,841	3.7347	0.0008	4.8679	0.0010	5.2077	0.0260
08 Jan 09	4,839	3.7390	0.0069	4.8694	0.0067	5.2062	0.0060
03 Jan 09	4,834	3.7394	0.0046	4.8726	0.0053	5.2096	0.0020
01 Jan 09	4,832	3.7258	0.0095	4.8593	0.0040	5.2090	0.0090
31 Dec 08	4,831	3.7695	0.0016	4.9030	0.0010	5.2307	0.0010
30 Dec 08	4,830	3.7265	0.0028	4.8638	0.0080	5.2018	0.0079
29 Dec 08	4,829	3.7435	0.0007	4.8698	0.0064	5.2066	0.0130
27 Dec 08	4,827	3.7075	0.0319	4.8460	0.0288	5.1692	0.0400
21 Dec 08	4,821	3.7613	0.0330	4.8876	0.0262	5.2511	0.0580
05 Dec 08	4,805	3.7322	0.0145	4.8610	0.0105	5.1930	0.0170
03 Dec 08	4,803	3.7301	0.0022	4.8482	0.0188	5.2070	0.0110
01 Dec 08	4,801	3.7269	0.0113	4.8627	0.0070	5.2093	0.0130
30 Nov 08	4,800	3.7260	0.0048	4.8607	0.0014	5.1923	0.0180
24 Nov 08	4,794	3.7082	0.0458	4.8215	0.0652	5.1451	0.0890
19 Nov 08	4,789	3.7309	0.0050	4.8626	0.0051	5.2064	0.0060
17 Nov 08	4,787	3.7313	0.0074	4.8609	0.0039	5.1896	0.0109
15 Nov 08	4,785	3.7194	0.0036	4.8598	0.0024	5.1792	0.0105

Differential Photometry λ Aurigae as Comparison star V= 4.71; B= 5.34; U= 5.46

Note: JD is 2,450,000 +, magnitudes are average of 3 reduced magnitudes, extinction corrected with nightly extinction coefficients determined, color transformed.

2008/2009 Season Photometry Data Summary

Neil Short
18 January 2009

Further to your comments re the NEAS activities in the last Newsletter, I can update you as below.

1. Two parallel photometry measurement set-ups are underway. Both will utilise 50 - 55mm camera lens optics, B and V filters and (differing) CCD cameras.

2. The first of these is taking measurements. Member Keith Elliot has this set up in his back garden (Chelmsford Essex UK) and both B and V figures have been achieved and are in the process of being checked and repeated. It is hoped that input figures into the campaign (either through myself or Keith direct) will begin to occur in the near future.

3. The second system is under final construction at the NEAS Observatory in Wakes Colne (Essex, UK) and measurement activities are hoped to start by the end of January.

4. We have purchased (and just received) a Star Analyser and look to begin spectral experiments/measurements in the next few weeks max.

Best Regards,

Neil Short
Hon Sec
North Essex Astronomical Society

David Daiku Trowbridge
Comp stars 1 Aur, 2 Aur and Omega in order to average results I had obtained using Eta and Zeta on July 21 (I have no images of Lambda yet).

B	3.319	+/-0.12	V	3.134	+/-0.042
R	2.374	+/-0.139	I	2.062	+/-0.195

Des Loughney
Canon DSLR, 200 ISO, f4, 85 mm lens, Exposure 5 seconds
Eta Aurigae used as the comparison star at V = 3.18

Des Loughney Summary

UT Date	UT	Epsilon Aurigae V Mag	Zeta Aurigae V Mag
08 January 2009	21.75	2.98	3.73
05 January 2009	20.95	2.97	3.72
05 January 2009	18.65	2.97	3.72
29 December 2008	20.95	3.01	3.73
26 December 2008	23.95	2.98	3.73
26 December 2008	21.00	3.00	3.73
26 December 2008	02.20	2.98	3.73
20 December 2008	00.00	2.98	3.72
19 December 2008	22.20	2.98	3.73
18 December 2008	21.85	2.96	3.72
18 December 2008	22.35	2.98	3.74
16 December 2008	22.35	2.99	3.73
16 December 2008	21.05	2.98	3.73
15 December 2008	00.57	2.97	3.72
09 December 2008	23.95	2.99	3.74
09 December 2008	23.20	2.98	3.72
08 December 2008	22.95	2.98	3.74
08 December 2008	22.45	2.97	3.72
01 December 2008	20.90	2.98	3.73
30 November 2008	21.80	2.97	3.72
30 November 2008	00.80	2.98	3.72
28 November 2008	08.80	2.97	
23 November 2008	21.85	2.99	3.71
24 November 2008	21.30	3.01	3.72
24 November 2008	22.60	3.01	3.73
24 November 2008	23.45	3.02	3.73
19 November 2008	21.90	3.00	
18 November 2008	22.55	3.06	
03 November 2008	00.20	3.06	
02 November 2008	21.80	3.03	

Brian E. McCandless
Elkton, MD
Telescope: CGE1400
Detector *(BVRI): SSP-3
Detector (JH): SSP-4 @ T= - 40C
Comp = Lam Aur HD34411
B= 5.34 V= 4.71 R= 4.19 I= 3.88 J= 3.62 H= 3.33

JD	AM	B	Error	V	Error	Rc	Error	Ic	Error
2454831.49	1.330			2.975	0.006				
2454831.48	1.383	3.509	0.004						
2454830.53	1.157							2.115	0.009
2454830.52	1.219					2.483	0.004		
2454830.51	1.224			2.980	0.003				
2454830.50	1.289			3.003	0.010				
2454830.50	1.296	3.551	0.015						
2454830.49	1.323					2.477	0.008		
2454830.49	1.330			2.982	0.007				
2454814.59	1.120					2.418	0.008		
2454814.59	1.124			2.961	0.002				
2454806.60	1.012					2.437	0.003		
2454806.60	1.011			2.956	0.001				
2454804.54	1.077					2.469	0.005		
2454804.53	1.080			2.977	0.007				
2454796.66	1.077					2.469	0.003		
2454796.66	1.080			2.977	0.005				
2454792.73	1.005					2.485	0.003		
2454792.72	1.015			3.001	0.002				
2454792.59	1.350			3.060	0.006				
2454792.58	1.393			2.990	0.002				
2454781.67	1.154			3.030	0.003				
2454771.79	1.007			3.034	0.005				
2454771.72	1.091			3.017	0.010				
2454771.71	1.117							2.128	0.005
2454771.71	1.120					2.508	0.008		
2454770.00	1.072			3.018	0.008				
2454770.00	1.193			3.029	0.008				
2454770.00	1.198	3.609	0.015						
2454766.72	1.134							2.120	0.007
2454766.72	1.138					2.491	0.005		
2454766.70	1.172			3.001	0.005				
2454766.70	1.178	3.589	0.012						
2454763.69	1.256			2.971	0.010				
2454750.76	1.118	3.581	0.015						
2454750.76	1.121			2.959	0.006				
2454750.76	1.127							2.093	0.003
2454750.76	1.130					2.473	0.005		
2454750.73	1.212								
2454750.74	1.218								
2454710.86	1.148								
2454710.86	1.153								
2454710.83	1.246							2.096	0.015
2454710.83	1.260					2.473	0.015		
2454710.83	1.270	3.544	0.01						
2454710.82	1.292			2.977	0.012				
2454710.82	1.409			2.962	0.012				

Brian E. McCandless (Continued)

JD	AM	J	Error	H	Error
2454806.60	1.158			1.564	0.005
2454806.60	1.162	1.794	0.007		
2454792.66	1.094			1.592	0.002
2454792.66	1.097	1.813	0.005		
2454781.66	1.172			1.604	0.008
2454781.66	1.176	1.836	0.005		
2454771.69	1.166			1.599	0.007
2454771.69	1.170	1.804	0.005		
2454760.69	1.250			1.582	0.010
2454760.69	1.253	1.833	0.004		
2454710.86	1.148	1.624	0.04		
2454710.86	1.153			1.860	0.05

Richard Miles
Golden Hill Observatory
Location: Stourton Caundle, Dorset, England
Latitude/Longitude/Altitude (ASL): West 2.405 deg, North 50.931 deg
Time Zone: GMT = 0 hours
Telescope: 0.06-m Refractor (Takahashi FS60C)
Filter Set: Johnson V, Cousins Ic
Detector: CCD Camera (Type: Starlight Xpress SXV-H9)

Observation Date: 25/26 November 2008 22:58 UT
JD: 2,454,796.4573
Johnson V magnitude: 2.989 +/-0.005
Cousins Ic magnitude: 2.206 +/-0.012
V-Ic magnitude: 0.783 +/-0.015
Observation Date: 26/27 December 2008 19:48 UT
JD: 2,454,827.3253
Johnson V magnitude: 2.990 +/-0.004
Cousins Ic magnitude: 2.232 +/-0.010
V-Ic magnitude: 0.759 +/-0.011

Comments: Mean, standard deviation of 4 determinations bracketed either side in time by Lambda Aurigae.

Assumes V=4.71, Ic=3.99 for Lambda Aurigae

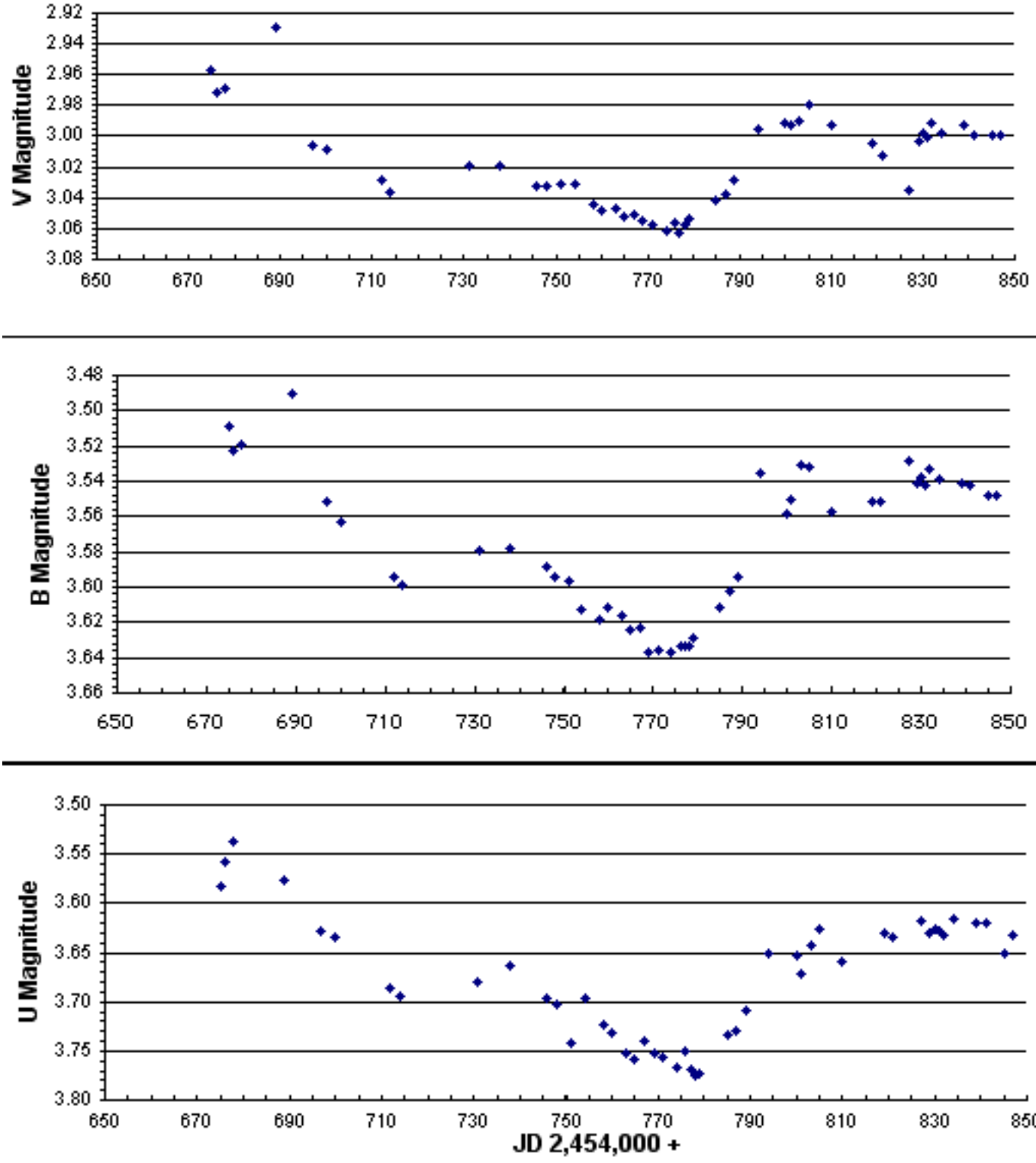
Each determination was an average of 50 frames.

Telescope was moved so that same area of CCD used to image both the variable and comparison star.

Jeff Hopkins
Hopkins Phoenix Observatory
Phoenix, Arizona USA, Latitude: 33.5017 North , Longitude: 112.2228 West
Altitude: 1097 feet ASL, Time Zone: MST (UT -7)
Telescope: C-8 8" SCT , Filter Set: UBV Standard
Detector: 1P21 PMT in Photon Counting Mode, Differential Photometry
lambda Aurigae as Comparison star , V= 4.71; B= 5.34; U= 5.46

HJD	V	SD	B	SD	U	SD
January 2009						
2454849.6649	2.9938	.0045	3.5455	.0010	3.6470	.0060
2454847.6885	2.9998	.0050	3.5479	.0071	3.6321	.0301
2454845.7163	2.9996	.0030	3.5481	.0059	3.6521	.0028
2454841.6635	2.9990	.0029	3.5418	.0035	3.6208	.0079
2454839.6683	2.9932	.0068	3.5405	.0034	3.6196	.0122
2454834.6801	2.9978	.0017	3.5385	.0016	3.6163	.0199
2454832.6892	2.9919	.0074	3.5328	.0066	3.6329	.0011
December 2008						
2454831.6892	3.0011	.0028	3.5420	.0058	3.6278	.0044
2454830.7142	2.9984	.0030	3.5383	.0078	3.6260	.0141
2454829.7538	3.0030	.0009	3.5410	.0050	3.6312	.0089
2454827.7260	3.0353	.0162	3.5282	.0570	3.6165	.0477
2454821.7260	3.0128	.0028	3.5522	.0048	3.6335	.0235
2454819.7100	3.0045		3.5517		3.6303	
2454810.7524	2.9934		3.5572		3.6586	
2454805.6954	2.9789	.0044	3.5316	.0087	3.6265	.0082
2454803.6954	2.9903	.0036	3.5306	.0242	3.6424	.0212
2454801.7690	2.9930	.0007	3.5495	.0070	3.6719	.0117
November 2008						
2454800.7420	2.9909	.0029	3.5586	.0038	3.6544	.0211
2454794.7524	2.9949	.0365	3.5350	.0511	3.6520	.0539
2454790.7649	3.0282	.0031	3.5938	.0034	3.7104	.0082
2454787.7857	3.0378	.0039	3.6020	.0051	3.7292	.0216
2454785.7697	3.0421	.0068	3.6113	.0045	3.7328	.0166
2454779.7850	3.0540	.0039	3.6285	.0012	3.7731	.0047
2454778.7864	3.0568	.0004	3.6329	.0068	3.7750	.0090
2454777.8010	3.0625	.0023	3.6342	.0039	3.7680	.0114
2454776.7850	3.0559	.0021	3.6332	.0023	3.7513	.0120
2454774.7788	3.0619	.0031	3.6371	.0016	3.7667	.0051
2454771.7857	3.0584	.0054	3.6363	.0059	3.7555	.0128
October 2008						
2454769.7996	3.0548	.0046	3.6373	.0059	3.7523	.0129
2454767.7808	3.0510	.0022	3.6234	.0054	3.7389	.0058
2454765.8093	3.0519	.0006	3.6236	.0056	3.7580	.0130
2454763.8134	3.0472	.0019	3.6164	.0039	3.7533	.0166
2454760.8030	3.0479	.0039	3.6122	.0095	3.7309	.0207
2454758.8162	3.0437	.0034	3.6193	.0037	3.7237	.0135
2454754.8350	3.0309	.0063	3.6126	.0108	3.6967	.0034
2454751.8732	3.0311	.0098	3.5974	.0025	3.7416	.0159
2454748.8371	3.0329	.0054	3.5938	.0041	3.7023	.0074
2454746.8190	3.0326	.0036	3.5892	.0027	3.6971	.0155
September 2008						
2454738.8593	3.0189	.0031	3.5779	.0031	3.6640	.0068
2454731.9002	3.0192	.0021	3.5794	.0044	3.6806	.0114
2454714.9655	3.0362	.0012	3.5986	.0061	3.6935	.0248
2454712.9454	3.0292	.0048	3.5941	.0050	3.6863	.0125

HJD	V	SD	B	SD	U	SD
August 2008						
2454700.9565	3.0080	.0009	3.5628	.0057	3.6348	.0134
2454697.9634	3.0064	.0068	3.5519	.0016	3.6281	.0129
2454689.9704	2.9289	.0219	3.4897	.0193	3.5766	.0375
July 2008						
2454678.9551	2.9691	.0393	3.5190	.0373	3.5369	.0698
2454676.9503	2.9709	.0128	3.5234	.0086	3.5577	.0203
2454675.9621	2.9570	.0106	3.5088	.0099	3.5815	.0103



Hopkins Phoenix Observatory UBV Data Plots July 2008 - January 2009

Frank J. Melillo
#:CID #030
Holtsville, NY USA
Lat:+ 40d 40' Long: 73 W Elevation: 100'
Instrument: Optec SSP-3
Telescope: C-8 8"
Gate Time: 10 Seconds

Date	UT	V Mag	#	SD
02/03 Dec 08	05:30	2.98	4	
02/03 Dec 08	05:50	2.96	4	

Dr. Tiziano Colombo

Magn. Eps AUR	N° meas.	Magn. Rho AUR	Hour UTC	Median J.D.
3.16	6	4.80	2:30	2454698.60416
3.17	5	4.82	2:00	2454705.58333
2.99	9	4.69	1:37	2454712.56736
3.21	7	4.72	3:10	2454713.63194
3.05	13	4.90	2:35	2454719.60763
3.25	6	4.70	2:42	2454720.63055

Spectroscopy Report

From Olivier Thizy
14 January 2009

Hello all,

First of all, all my best wishes to all of you for this New Year 2009.

Have you ever thought about a spectrograph with enough resolution for your project but a wider spectral domain? A spectrograph with optic fiber for higher mechanical and thermal stability? A spectrograph designed for larger telescope?... well, eShel is now available: 2009 will be a year to remember! :-)

eShel is the first industrial and professional echelle spectroscopy solution specially designed for astronomy with four modules:

1. a Fiber Injection & Guiding Unit with 50µm hole, designed for large telescopes (f/6 or f/9 available)

2. an echelle Spectrograph with R=10000 power of resolution through 450-700nm spectral domain

3. a remote controlled Calibration Unit with flat & ThAr Thorium-Argon lamp

4. MS-windows based software to acquire & automatically process your spectra 'on the fly' (based on AudeLA platform)

Our web site (http://www.shelyak.com/en/eshel.html) includes a more detailed description and examples of applications.

Thank you in advance to relay this announcement to any amateur or professional astronomer that may be interested in echelle spectroscopy.

Cordialement,

Olivier Thizy
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Phone: +33.(0)4.76.41.36.81
Mobile: +33.(0)6.89.92.74.23
Web: http://www.shelyak.com
...vous ne verrez plus les étoiles comme avant !

From Nadine Manset
06 January 2009

Aloha from Hawaii,

After consulting the Campaign 2009 web pages, I took some spectropolarimetric observations of Eps Aur, on Aug 25 UT (R=68,000, S/N over 1000). The whole spectrum covers 370 to 1,050 nm, but I attach a zoom on the Halpha line (intensity only). I also see a signal in Stokes U at Halpha.

Nadine Manset
Resident Astronomer & QSO Manager, CFHT Corporation
CASCA Secretary
65-1238 Mamalahoa Hwy Kamuela HI 96743 USA
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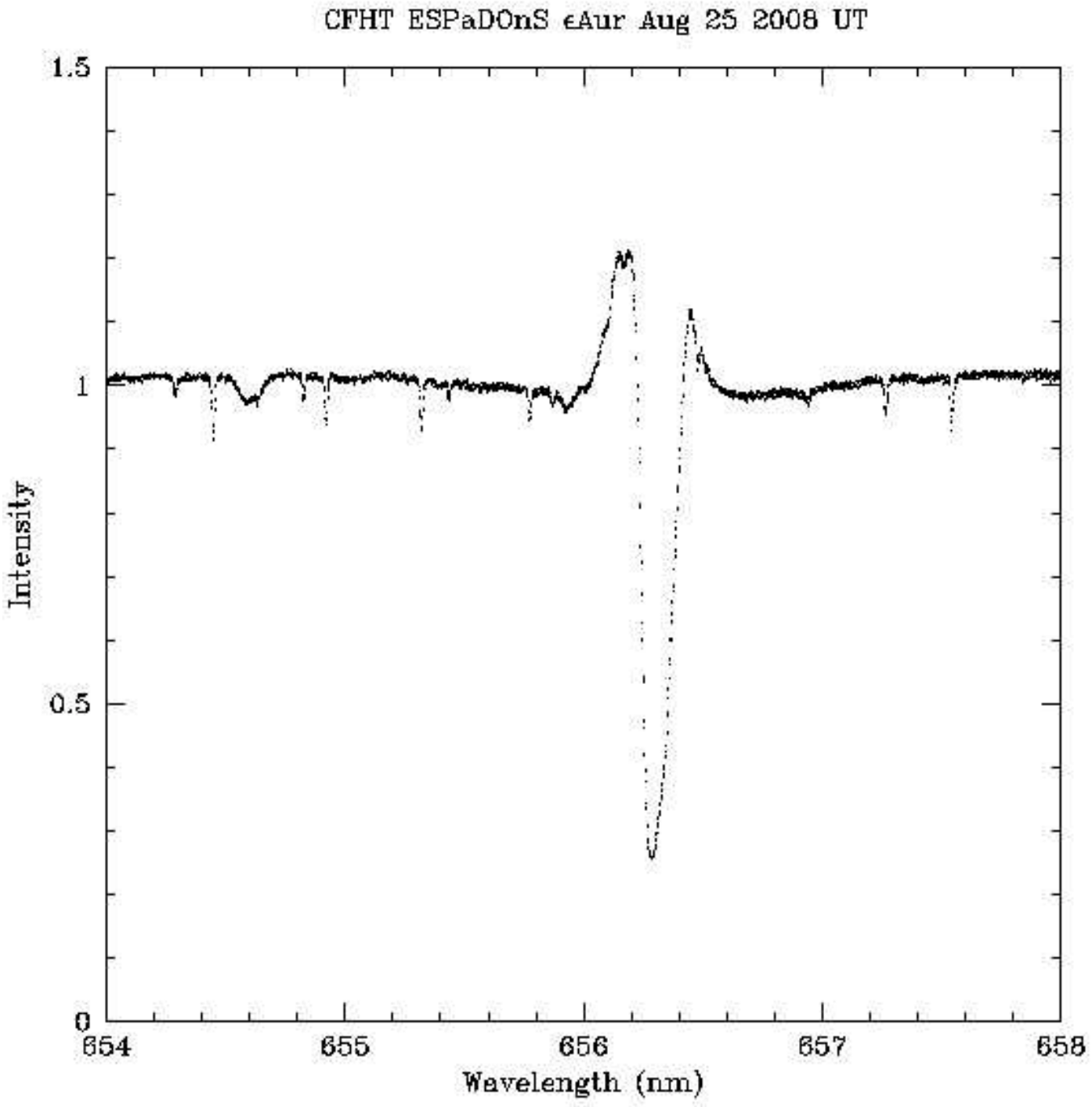
manset@cfht.hawaii.edu

Nadine Manset
Canada-France-Hawaii Telescope

Stokes U is one of the 4 parameters that describe light (you need 4, and only 4).
Stokes I is the intensity everybody knows about.
Stokes V measures the circular polarisation.
Stokes Q and U measure the linear polarisation.

If you would like a bit more information, check out the list of suggested readings here: http://www.cfht.hawaii.edu/~manset/polarisation.html

The very basics of polarization can be understood after reading that:
http://www.cfht.hawaii.edu/~manset/PolarIntro_eng.html
Stokes QVU are explained in the PowerPoint presentation.



Nadine Manset epsilon Aurigae Hydrogen α Profile
25 August 2008
Canada-France-Hawaii Telescope

From: Jeffrey Hall
Lowell Observatory
14 January 2009

Hello Bob and Jeff,

I found your epsilon Aurigae campaign page a while ago, and I've been meaning to email you for a while. I and my colleagues Wes Lockwood and Brian Skiff have been running a solar/stellar variations program here at Lowell Observatory in Flagstaff for quite a while now. We have just upgraded our spectrograph with new CCDs and camera controllers and are funded through 2010. Our principal target list is ~100 F-K solar analogs, but eps Aur doesn't take long to observe, so just for fun I added it to our list after we got back up and running with the new cameras last August. We took our first observation Oct 10, 2008 and have spectra of it on 23 nights so far. Our spectrograph is an R~12000 fiber fed system that covers the long-studied activity proxy Ca II H&K, plus an echelle that goes from 5000-7600 with 70% coverage, including Mg b, Na D, and Ha.

Since we will get a good run-up to next year's eclipse and have funding through most of the totality, we decided to see what we can see. Our spectral coverage is perhaps not ideal for this system, but you never know what might turn up.

For more about our instrument and solar/stellar variations program, see, e.g., AJ 133 862 or AJ 133 2206. As part of our current grant objectives, we're also greatly expanding our web site both at technical and layperson levels, so you can read more there as well: **http://www.lowell.edu/users/jch/sss/index.php**

I look forward to hearing from you, and I hope we might be able to contribute in some small way to our understanding of this very interesting system.

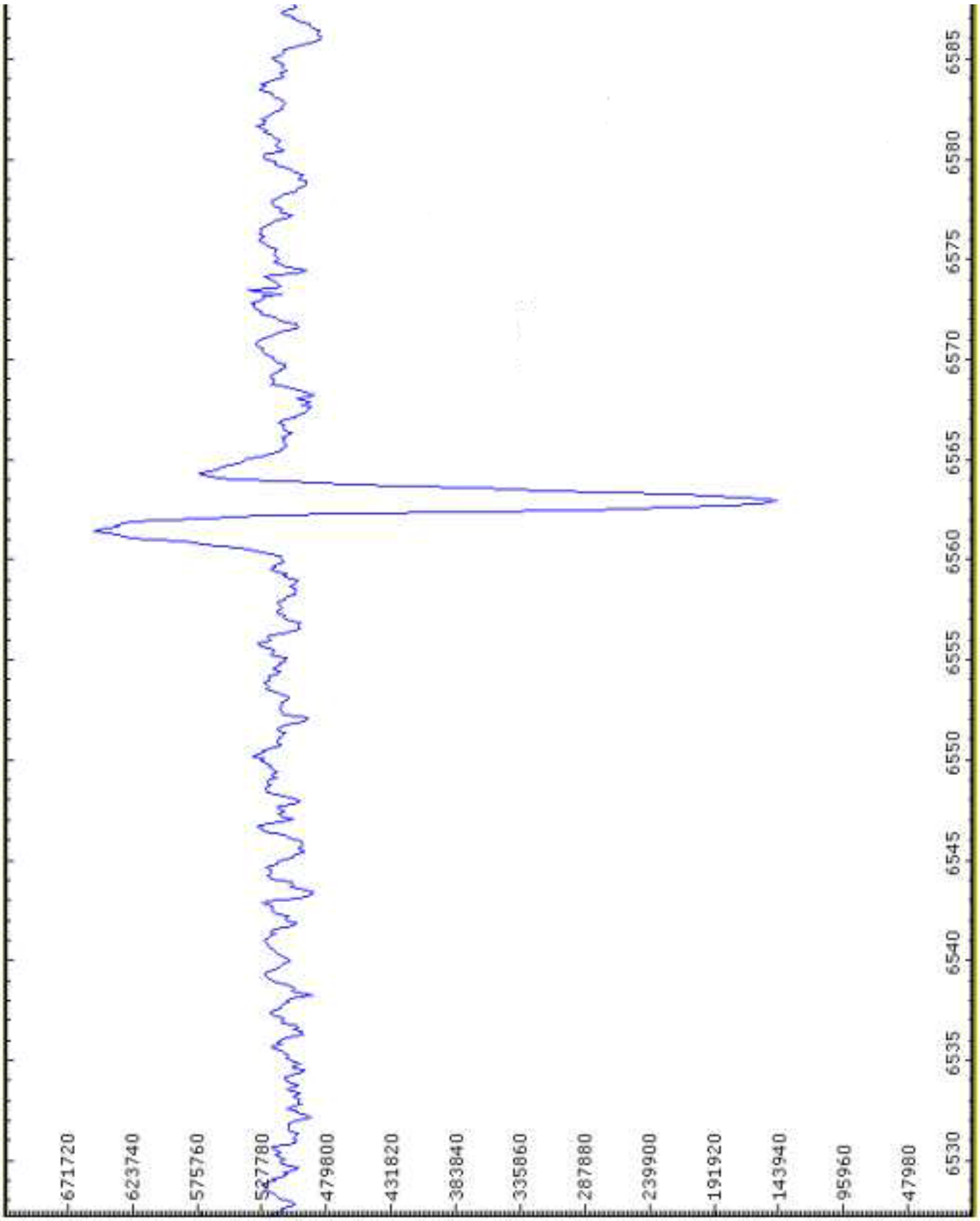
Best regards,

Jeffrey Hall
Lowell Observatory
"Jeffrey Hall" <jch@lowell.edu>

Hopkins Phoenix Observatory
2008/2009 Season Spectroscopy Summary
Epsilon Aurigae Hydrogen a

UT Date	Emissive Blue Horn		Absorption		Emissive Red Horn	
2008	EW	Center λ Å	EW	Center λ Å	EW	Center λ Å
08/11	0.424	6,561.3978	-1.009	6,563.1077	0.001	6,564.7693
08/22	0.273	6,561.5203	-1.056	6,563.1004	0.000	N/A
09/03	0.292	6,561.3262	-0.904	6,563.1091	-0.023	6,564.7608
09/05	0.342	6,561.5125	-0.887	6,563.1476	-0.118	6,565.2872
09/22	0.265	6,561.1194	-0.993	6,562.8485	0.059	6,564.5903
09/29	0.163	6,560.7093	-1.327	6,565.5004	0.009	6,564.1222
10/12	0.225	6,560.5245	-1.003	6,562.1402	0.138	6,563.4827
10/14	0.378	6,560.6200	-1.127	6,561.9833	0.108	6,563.2498
10/15	0.343	6,561.2796	-1.002	6,562.9844	0.328	6,564.7789
10/19	0.256	6,561.6593	-1.088	6,563.4063	0.080	6,564.7593
10/19	0.268	6,561.3191	-1.070	6,562.9504	0.220	6,564.7161
10/21	0.342	6,561.3240	-1.011	6,563.0071	0.223	6,564.6527
1 0/21	0.262	6,561.5048	-1.015	6,563.1595	0.130	6,564.8250
10/24	0.396	6,560.1378	-0.881	6,561.6064	0.275	6,563.0207
10/26	0.341	6,561.4131	-1.051	6,563.0688	0.207	6,564.5645
10/28	0.359	6,561.2978	-1.025	6,562.9785	0.243	6,564.5925
10/30	0.305	6,561.3082	-0.992	6,563.0608	0.256	6,565.0644
11/01	0.136	6,561.5021	-1.046	6,562.9444	0.091	6,564.2025
11/04	0.203	6,561.5381	-1.027	6,563.1266	0.142	6,564.5385
11/06	0.317	6,561.5188	-1.007	6,563.0287	0.267	6,564.6141
11/07	0.451	6,561.3351	-0.966	6,562.9734	0.186	6,564.6481
11/09	0.309	6,561.1547	-0.882	6,562.7936	0.129	6,565.4320
11/15	0.432	6,561.4236	-0.911	6,562.8626	0.361	6,564.3547
11/17	0.545	6,561.5102	-0.944	6,563.0296	0.320	6,564.5967
11/19	0.578	6,561.6205	-0.892	6,563.0867	0.255	6,564.5330
11/24	0.477	6,561.4438	-0.924	6,562.9020	0.273	6,564.4018
11/30	0.479	6,561.6164	-0.926	6,563.0356	0.222	6,564.6310
12/01	0.547	6,561.5750	-0.949	6,563.0643	0.199	6,564.5535
12/03	0.423	6,561.6100	-0.949	6,563.0340	0.235	6,564.5394
12/04	0.659	6,561.7096	-0.828	6,563.1293	0.030	6,564.3809
12/05	0.376	6,561.5982	-0.907	6,563.0482	0.273	6,564.5582
12/10	0.603	6,561.7050	-0.807	6,563.1535	0.232	6,564.6842
12/19	0.644	6,561.7398	-0.754	6,563.1450	0.094	6,564.4872
12/21	0.652	6,561.5929	-0.665	6,562.9508	0.091	6,564.3220
12/27	0.545	6,561.1744	-0.826	6,563.4989	0.278	6,565.0852
12/31	0.619	6,561.3328	-0.813	6,562.8627	0.193	6,564.4703
2009						
01/03	0.615	6,560.8804	-0.749	6,562.4440	0.255	6,553.9945
01/10	0.542	6,561.5783	-0.833	6,563.1726	0.235	6,564.7521
01/14	0.328	6,561.5325	-0.879	6,563.1417	0.090	6,564.6826
01/16	0.588	6,561.5038	-0.782	6,563.0887	0.137	6,564.5501

Spectral Data Summary of Hopkins Phoenix Observatory
Lhires III 2,400 l/mm, 12" LX200 GPS, DSI Pro II



Epsilon Aurigae Hydrogen α Spectrum Line Profile
Hopkins Phoenix Observatory
16 January 2009, 03:29 UT
12" LX200GPS. Lhires III 2,400 l/mm, DSI Pro II
1- 8 Minute Exposure, Atmos and HC Corrected

From Dr. Bob

Recently I noticed a series of papers about high dispersion spectroscopy of binary stars, by Ulisse Munari and colleagues at the INAF Osservatorio Astronomico di Padova in Italy and wrote to them about the epsilon Aur campaign. He inquired: "(a) what exactly to investigate of epsilon Aurigae and how and with what instruments, (b) how you plan to organize the collaboration you are mounting on this object." To answer these questions, we suggest:

(a) High dispersion spectroscopy can help confirm two important observations made during the course of the previous eclipse, 1982-84. These include the appearance of shell spectra in the blue region (4000-4500AA) described by Steno Ferluga, **http://adsabs.harvard.edu/abs/1991A%26A...243..230F** , and the appearance of strong K I 7699AA absorption, starting at mid-eclipse, as reported by Lambert and Sawyer **http://adsabs.harvard.edu/abs/1986PASP...98..389L**

(b) Jeff Hopkins in Arizona and I have been promoting an observing campaign since 2003 in order to encourage photometry, spectroscopy, polarimetry and interferometric observations of the total eclipse predicted to start August 2009 and running through spring 2011.

What are the science goals, and what measurements are crucial? Partial phases of the eclipse have been getting shorter during the 20th century, and the low amplitude out of eclipse light variations have been getting faster during the past 50 years. In the context of the prevailing model, where a massive disk eclipses the F supergiant star, these changes can be interpreted as disk evolution, possibly due to planet forming activity. Thus, testing this idea requires good photometric coverage, ideally UBVRI and JHK. Also, the most sensitive indicators of the disk have been the optical spectra mentioned above. If the disk is changing, then the blue region and the K I lines should differ from the past eclipse behavior. H-alpha and spectro-polarimetry data are equally important and will provide context for other observations, such as continuing photometry and interferometry. Finally, modern interferometry has the chance to directly resolve the disk transiting the supergiant star, and those observations are underway, with an initial report recently published: ***Interferometric Studies of the extreme binary, ε Aurigae: Pre-eclipse Observations***, by R.Stencel, M. Creech-Eakman, A. Hart, J. Hopkins, B.Kloppenborg & D.Mais [2008 Dec. 20 ApJ Letters]. For reference:

http://arxiv.org/abs/0810.5382 and
http://www.hposoft.com/EAur09/EAUR%20pdfs/2008StencelApJLepsAurPTI.pdf

Aims of the Asiago program: The aim of Asiago Eclipsing Binaries Program is to derive accurate orbits and physical parameters (in particular masses and radii) for a selection of double-lined eclipsing binaries by means of Echelle high resolution, high S/N spectroscopy, and B, V photometry. Atmospheric parameters (T_eff, log g, [M/H], xi , V_rot) and individual chemical abundances are provided by spectral

analysis. Reddening is derived from intensity of NaI (5890.0 & 5895.9 Å) and KI (7699.0 Å) interstellar lines.

Brian Kloppenborg and I had a successful half-night on the NASA Infrared Telescope Facility, a 4 meter atop Mauna Kea. With remote observing, we collected 80 high quality spectra of epsilon Aur plus spectral ratio and telluric comparison stars, in an effort to monitor the 2.3 micron CO band region. Pre-eclipse this region is just continuum, but as seen during the last eclipse, we anticipate the appearance of CO bands once eclipse begins. Whether these persist past end of eclipse, as they did in 1985, is the experimental objective.

See Hinkle and Simon,
http://adsabs.harvard.edu/abs/1987ApJ...315..296H .

Thanks to Scott Wolk at Harvard, we anticipate an observation of epsilon Aurigae with the European XMM X-ray satellite this season. The purpose of the experiment is to make the most sensitive test to date for the presence of a hot source in the system. Previous, less sensitive measurements have not detected an X-ray source in the system, but XMM is a more powerful instrument. X rays could arise from a small black hole or interacting objects in the center of the dark disks.

Reminder: Original paper copies of the 1985 epsilon Aurigae Workshop Proceedings are available on request, free, if interested parties will provide me with a snail mail address. A collector's item! Whiles supplies last.

Dr. Robert Stencel
University of Denver Astronomy Program
<rstencel@du.edu>

Interesting Papers

High-Resolution Spectroscopy for Cephieds Distance Determination

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A&A 489, 1263–1269 (2008)
Received 15 February 2008 / Accepted 1 April 2008
http://www.aanda.org/10.1051/0004-6361:200809589

Abstract

C**ontext.** In recent years, infrared interferometry has revealed the presence of faint dusty circumstellar envelopes (CSE) around Cephieds. However the size, shape, chemical nature, and the interaction of the CSE with the star itself are still under investigation. The presence of a CSE might have an effect on the angular diameter estimates used in the interferometric Baade-Wesselink and surface-brightness methods of determining the distance of Cephieds.

Aims. By studying H profiles as a function of the period, we investigate the permanent mass loss and the CSE around Cephieds. Our high spectral- and time-resolution data, combined with a very good S/N, will be useful in constraining future hydrodynamical models of Cephieds atmosphere and their close environment.

Methods. We present HARPS (High Accuracy Radial velocity Planetary Search project developed by the European Southern Observatory.) high-resolution spectroscopy (R = 120 000) of eight galactic Cephieds: R Tra, S Cru, Y Sgr, Dor, Gem, RZ Vel, Car, and RS Pup, providing a good period sampling (P = 3.39 d to P = 41.52 d). The H line profiles are described for all stars using a 2D (wavelength versus pulsation phase) representation. For each star, an average spectral line profile is derived, together with its first moment (-velocity) and its asymmetry (-asymmetry).

Results. Short-period Cephieds show H line profiles following the pulsating envelope of the star, while long-period Cephieds show very complex line profiles and, in particular, large asymmetries. We find a new relationship between the period of Cephieds and their -velocities and -asymmetries. These results may be related to the dynamical structure of the atmosphere and to a permanent mass loss of Cephieds. In particular, we confirm for Car a dominant absorption component whose velocity is constant and nearly of zero km s-1 in the stellar rest frame. This component is attributed to the presence of circumstellar envelope.

Conclusions. To understand these very subtle effects, fully consistent hydrodynamical models are required, including pulsating and evolutionary theories, connective energy transport, adaptive numerical meshes, and a refined calculation of the radiative transfer.

BOOK
(Now Available)

Epsilon Aurigae A Mysterious Star System

by

Hopkins and Stencel

This is a 287 page soft cover book covering the history of epsilon Aurigae and the observations both in and out of eclipse as well as the different techniques used.

For more information

http://www.hposoft.com/EAur09/Book.html

**** Note: SPECIAL REDUCED PRICE ****

$19.95 +S&H

Normally the Book sells for $29.95 + S&H.
For a limited time - Campaign members and members of the AAVSO,
from now until 1 April 2009 the price is **$19.95** + S&H
Just mention your membership when ordering.

****

Anyone wishing to contribute to the Newsletter, is most welcome. Please send contributions to me at phxjeff@hposoft.com.

Anyone desiring not to receive the Newsletter announcements, please e-mail me and I will remove your name from the mailing list.

Clear Skies!

Jeff
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