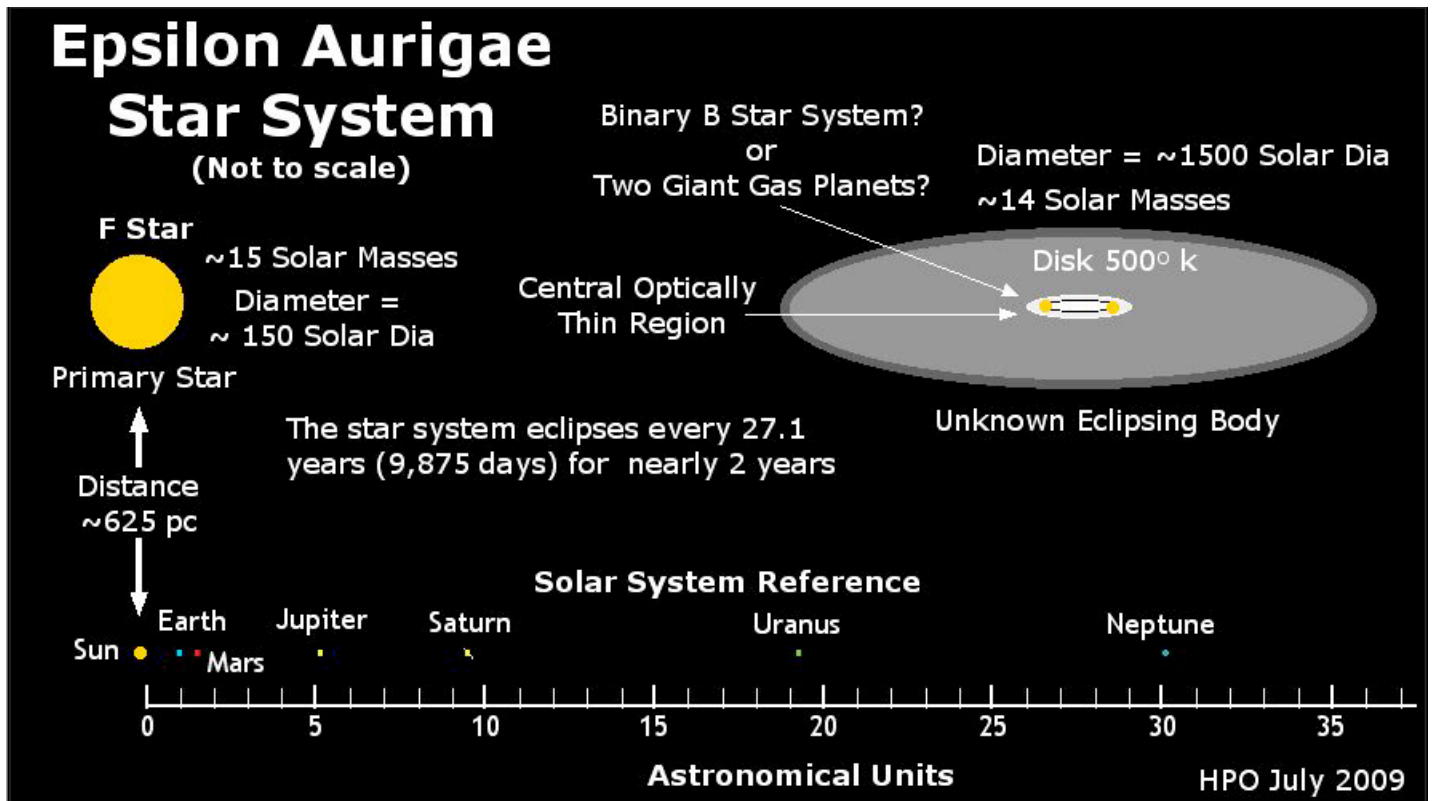


# 2009 Epsilon Aurigae Eclipse

Campaign Newsletter #14  
Summer/Fall 2009



Jeff Hopkins, Editor  
Hopkins Phoenix Observatory

Dr. Robert E. Stencel, Co-editor  
University of Denver

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

see also  
<http://www.citizensky.org> and  
[https://twitter.com/epsilon\\_Aurigae](https://twitter.com/epsilon_Aurigae)

## **In This Newsletter**

### **EDITOR'S REMARKS**

The eclipse begins  
Preliminary First Contact  
The AAVSO IYA 2009 Citizen Sky Workshops

### **IMPORTANT NOTICE**

Submitted Data

### **SUBMITTING DATA TO THE AAVSO FOR ARCHIVING**

A note from Arne Henden

### **2009/2010 SEASON PHOTOMETRY V DATA COMPOSITE PLOT**

### **PHOTOMETRY REPORTS:**

Richard Miles, Paul Beckmann, Stencel/Long, Dr. Tiziano Colombo, Des Loughney, Tom Person, Hans-Goran Lindberg, Brian McCandless, Jeff Hopkins, Frank J. Melillo, Snaevarr Gudmundsson, Dr. Mukund Kurtadikar, Gerard Samolyk

### **SPECTROSCOPY REPORTS:**

Robin Leadbeater  
Lothar Shanne

### **FROM DR. BOB:**

### **INTERESTING PAPERS:**

## Editor's Remarks

Dear Colleagues,

Thirteen observers from around the world have submitted photometric data for the 2009/2010 Campaign Season. We also have several people submitting spectroscopic data. I wish to thank all of you that have submitted data. Your work is appreciated.

We are deep into the new observing season for epsilon Aurigae. The start of the eclipse appears to have been delayed. from the predicted date. Out-of-eclipse variations go from 2.9 to 3.12 magnitudes in the visual band and similarly in other bands. This means first contact can be easily lost in this variation. At HPO we estimated average the out-of-eclipse UBV magnitudes and "very" preliminary first contacts to be :

$V_{avg} = 3.0360$  and first contact for the V band at RJD 5072.2 (29 August 2009)

$B_{avg} = 3.6065$  and first contact for the B band at RJD 5072.9 (30 August 2009)

$U_{avg} = 3.7264$  and first contact for the U band at RJD 5074.8 (01 September 2009)

**Note:** Assuming V totality at 3.80, second contact estimate is for RJD 55170 which is 05 December 2009 as opposed to the original estimate of 15 December 2009.

Other observers are encouraged to do estimates with their own data, but caution must be used. The out-of-eclipse averages are very important and it will be the end of October before we have sufficient data for a more accurate estimate of first contacts. We need first contact estimates for the R and I bands as well and the infrared JH bands.

The AAVSO Citizen Sky Project held workshops at the Adler Planetarium in Chicago, Illinois 5 - 7 August 2009. On Friday 7 August I gave two Workshop presentations, one on Spectroscopy and one on DSLR Photometry. While the Citizen Sky web site plans on making videos of the Workshops available, until they are published, go to the Campaign's web site and scroll near the bottom. Power Point Presentations and pdfs of the two Workshops I gave are available for viewing and downloading.

I have added an Analysis section and invite comments and suggestions.



Jeff Hopkins, Editor  
Hopkins Phoenix Observatory  
phxjeff@hposoft.com

## **Important Notice**

Data in this and other Newsletters and on the Campaign web site are provided for viewing and downloading. Use of any data in any papers requires approval from the observer(s). Please contact me at [phxjeff@hposoft.com](mailto:phxjeff@hposoft.com) or the specific observer(s) for more information and permission.

Thank you.

# SUBMITTING DATA TO THE AAVSO FOR ARCHIVING

There have been questions regarding the archiving of data. Your data belongs to you and you have a right to do with it as you please. Submitting data to the Campaign does not mean you lose any rights. I have added a note on the Campaign web site about using the data. It is requested that credit be assigned for observers whose data is used in any papers.

I have had recent communications with Arne Henden, Director of the AAVSO, regarding the submittal of data to the AAVSO web site database. Here is Arne's response:

\*\*\*\*\*

"Our policy is that all submitted data are public. This means that any researcher can download the observations and use them in his/her research; there is no embargo time; there is no restriction on who can use the observations; there is no \*requirement\* that anything more than an acknowledgment of the use of the database be present. As with all scientific projects, the acknowledgment and citation of contributors is left up to the author, and most are extremely careful of this privilege and do the right thing.

"All observations go into the database, and by default, all observations are shown or downloaded by our tools. Visual as well as non-visual observations are shown. An example: let's go to the main web site: <http://www.aavso.org/> go to the Pick a star window in the upper left, enter Z UMi, click create a light curve, and press GO. Note that BVRI, visual and "fainter than" are shown for the past 400 days. If you go to the bottom of that page, you see one way in which we give credit: about 50 observers contributed to this light curve. Note that, as opposed to the few observers shown on your eps Aur light curve, we cannot use different symbols to show this number of observers (and many light curves, especially over long periods of time, have many more contributors). However, if you click the Plot New Light Curve link near the middle, it gives you lots of flexibility for plotting - including turning off those nasty visual estimates. In addition, you can highlight an individual observer's data in the "highlight your own observations" blank. So lets do the following: enter HQA as the observer initials (that is my observer code), click "box" for the highlight type, unclick visual, unknown, fainter than and unvalidated, and then press plot data.

"The new plot shows my submitted data with blue boxes drawn around them; you can see that I contributed a fair amount of BVRI data in this period. There are BVRI observations prior to mine and after mine; however, a researcher could see where my observations occur. Now, press the Quick Look Data link. You will see that every recent observation is listed there, along with the observer code. You can easily cross-match observer codes here with names/codes given on the light curve plot, or you can ask HQ to give you names and get you in contact with the observer. So we've given credit where possible. If you instead clicked "Download Complete Data Archive" on the previous page, you would get the entire data set, with all flags and comments, in a convenient machine-readable format for your research.

"We request on download that the researcher consider granting coauthorship to any observer who contributes substantially to the research; we ask that the International Database be acknowledged if any observations are used. It would be rare that all 50 observers contributing to Z UMi over the past 400 days could become coauthors or even be credited individually; for earlier data, it may be impossible to contact observers as they will have moved or passed away. Some fields have lots of visual contributors; some like SS Cyg or U Gem have lots of CCD time series.

This is the process that we've found to work best with the professional researcher - quick, easy access to data, and to as much of the existing data as possible. We go back through the literature and import as many published observations as possible, and probably would have done so for your 1980's eclipse - except that your machine-readable file is much easier to work with (which is why I'm always asking for data rather than pdfs). We have to be generic; no one contributor gets more control over their data than another."

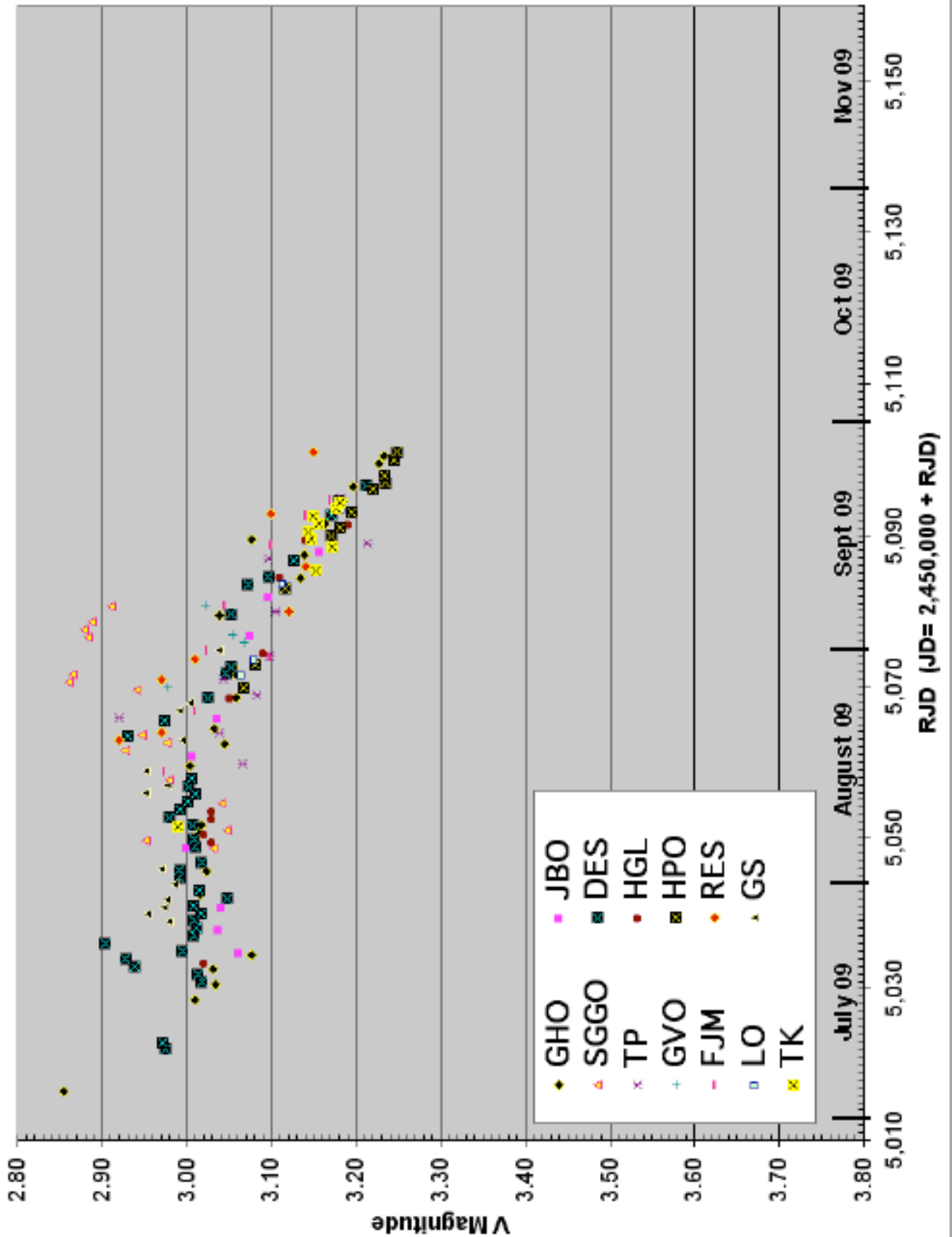
\*\*\*\*\*

**Editor:**

I have submitted my epsilon Aurigae data and encourage you to consider archiving yours the same way. The Campaign is planning some papers as well as an end-of-eclipse meeting. All observers will be credited and are invited to the meeting. Detail will be announced closer to the end of the eclipse.

# 2009-2010 Season Photometry V Data Composite Plot

## Epsilon Aurigae 2009/2010 Season



# Plot Observer Key

- GHO** - Golden Hills Observatory, Richard Miles, Dorset, England  
**JBO** - Jim Beckmann Observatory, Paul J. Beckmann, Mendota Heights, MN USA  
**SGGO** - S. Giovanni Gatano al Observatory, Tiziano Colombo, Pisa, Italy  
**DES** - Des Loughney, Edinburgh, Scotland, UK  
**TP** - Tom Person, Virginia Beach, Virginia USA  
**HGL** - Hans-Goran Lindberg, Skultuna, Sweden  
**GVO** - Grand View Observatory, Brian E. McCandless, Elkton, MD USA  
**HPO** - Hopkins Phoenix Observatory, Jeff Hopkins, Phoenix, Arizona USA  
**FJM** - Frank J. Melillo, Holtsville, NY USA  
**RES** - Stencel/Long, University of Denver, Denver, Colorado USA  
**LO** - Lindarberg Observatory, Snaevarr Gudmundsson, Hafnarfjordur, Iceland  
**GS** - Gerard Samolyk, Greenfield, Wisconsin, USA  
**TK** - Thomas Karisson, Varaberg Observatory, Sweden  
**Note:** RJD is Reduced Julian Date, 2,450,000 has been subtracted from it.

## 2009 Season Photometry Data Summary

### Paul J. Beckmann: Jim Beckmann Observatory (JBO) Mendota Heights, MN USA

Latitude/Longitude/Altitude (ASL):

44°53'17.46" N 93°06'53.45" W 953 feet ASL

Time Zone: GMT -6 hours Telescope: 8" f/10 Meade 2080 optics

Optec SSP-3a Filter Set: Optec Johnson BVRI

UT Date	RJD	B	SD	V	SD	R	SD	I	SD
07/21/2009	5034.87	3.368	0.046	3.062	0.025	2.475	0.002	2.314	0.062
07/24/2009	5037.87	3.390	0.034	3.037	0.015	2.467	0.006	2.279	0.032
07/27/2009	5040.85	3.336	0.040	3.040	0.011	2.464	0.012	2.327	0.044
08/04/2009	5048.85	3.398	0.016	2.999	0.023	2.441	0.021	2.222	0.061
08/11/2009	5056.85	3.442	0.015	3.003	0.014	2.444	0.011	2.201	0.026
08/16/2009	5060.85	3.498	0.009	3.006	0.021	2.461	0.005	2.174	0.016
08/21/2009	5065.86	3.504	0.010	3.035	0.012	2.478	0.015	2.205	0.036
09/01/2009	5076.86	3.608	0.134	3.075	0.002	2.523	0.003	2.198	0.014
09/06/2009	5081.89	3.649	0.012	3.096	0.005	2.531	0.008	2.200	0.016
09/12/2009	5087.88	3.707	0.037	3.157	0.009	2.583	0.009	2.249	0.012

**JD = RJD + 2,450,000**

### Robert E. Stencel, University of Denver, Denver, Colorado USA

DSLR V Band Data, Comparison Star eta Aurigae assumed to be V-3.17

JD	V	SD
2455019.92	3.01	-
2455062.89	2.92	0.06
2455063.88	2.97	0.04
2455070.88	2.97	0.02
2455079.86	3.12	0.05
2455085.89	3.14	0.01
2455092.89	3.10	0.02
2455100.91	3.15	0.04



## 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	RJD	UT	V mag	SD	Ic	SD
11/12 May 2009	4963.389	21:20	2.927	.025	-	-
30/31 May 2009	4982.390	21:20	2.98	0.01	-	-
01/02 June 2009	4984.410	21:50	3.010	0.015	-	-
07/08 June 2009	4990.420	22:11	2.991	0.006	-	-
23/24 June 2009	5006.430	22:19	2.894	0.016	-	-
03/04 July 2009	5016.476	23:03	2.854	0.036	2.21	0.05
15/16 July 2009	5028.571	02:07	3.010	0.025	2.29	0.015
17/18 July 2009	5030.587	01:54	3.034	0.015	2.324	0.018
19/20 July 2009	5032.535	01:03	3.031	0.008	2.330	0.015
21/22 July 2009	5034.526	00:52	3.076	0.031	2.323	0.025
29/30 July 2009	5042.518	01:00	3.016	0.012	2.355	0.011
01/02 August 2009	5045.532	00:34	3.023	0.012	2.314	0.018
06/07 August 2009	5050.605	02:31	3.016	0.008	2.321	0.008
07/08 August 2009	5051.586	02:31	3.017	0.008	2.313	0.010
15/16 August 2009	5059.494	23:48	3.003	0.010	2.308	0.010
18/19 August 2009*	5062.445	22:40	3.044	0.006	2.333	0.007
20/21 August 2009*	5064.483	23:24	3.032	0.006	2.325	0.006
24/25 August 2009*	5068.435	22:51	3.058	0.008	2.384	0.005
27/28 August 2009*	5071.539	-	3.059	0.006	2.375	0.006
28/29 August 2009*	5072.648	-	3.055	0.010	2.370	0.004
04/05 September 2009*	5079.438	-	3.038	0.010	2.407	0.011
09/10 September 2009	5084.400		3.134	0.007	2.434	0.013
12/13 September 2009	5087.426		3.139	0.006	2.456	0.010
14/15 September 2009	5089.397		3.076	0.006	2.397	0.012
16/17 September 2009	5091.418		3.163	0.005	2.469	0.012
19/20 September 2009	5094.456		3.184	0.018	2.458	0.015
21/22 September 2009	5096.418		3.197	0.005	2.510	0.008
24/25 September 2009	5099.424		3.227	0.005	2.532	0.005
25/26 September 2009	5100.427		3.233	0.004	2.534	0.004

$$JD = RJD + 2,450,000$$

RJDs and UTs are average for V and Ic observations.

**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.

**Dr. Tiziano Colombo, S. Giovanni Gatano al Observatory  
Pisa, Italy**

CCD Camera: Mead DSI Pro, 2 sec exposures, 20 images stacked, F 2.8

<b>RJD</b>	<b>V Mag</b>	<b>SD</b>	<b>R Mag</b>	<b>SD</b>
5048.6292	3.031	0.213	-	-
5049.6139	2.952	0.164	-	-
5050.9181	3.047	0.097	-	-
5054.6160	3.042	0.148	-	-
5055.6243	3.011	0.197	-	-
5056.6111	2.613	0.165	-	-
5057.6208	2.979	0.109	-	-
5061.5688	2.927	0.094	-	-
5062.5597	2.976	0.014	-	-
5063.5896	2.948	0.091	-	-
5069.5660	2.941	0.112	-	-
5070.5597	2.861	-	-	-
5071.5646	2.866	0.009	2.383	0.038
5076.5450	2.884	0.014	2.415	0.048
5077.5444	2.879	0.014	2.406	0.070
5078.5200	2.888	0.025	2.419	0.077
5080.6100	2.911	0.018	2.432	0.014

**JD = RJD + 2,450,000**

**Tom Person  
Virginia Beach, Virginia USA**

DSLR Canon 20 D , 400 ISO, f5.6, 58 mm lens/70 mm FL,  
Exposure 5 seconds 30 Images Stacked

<b>RJD</b>	<b>UT Date</b>	<b>UT</b>	<b>V Mag</b>	<b>SD</b>	<b>X</b>
5059.8604	15/16 August 2009	08:42	3.066	0.011	1.4228
5063.8694	19/20 August 2009	08:52	3.039	0.050	1.2719
5065.8063	21/22 August 2009	07:21	2.92	0.092	1.6550
5068.8715	24/25 August 2009	08:55	3.083	0.057	1.2074
5070.8736	26/27 August 2009	08:58	3.043	0.030	1.1808
5073.8806	29/30 August 2009	08:58	3.098	0.022	1.1345
5079.8896	04/05 September 2009	09:21	3.105	0.014	1.0757
5086.8833	11/12 September 2009	09:12	3.097	0.050	1.0536
5088.8354	13/14 September 2009	08:03	3.213	0.049	1.1464
5094.8764	19/20 September 2009	09:02	3.183	0.032	1.0339

**JD = 2,450,000 + RJD**

## Des Loughney

### Edinburgh, Scotland, UK

Canon DSLR, 200 ISO, f4, 85 mm lens, Exposure 5 seconds

Eta Aurigae used as the comparison star at  $V = 3.18$

Des uses a remote switch to activate the Canon 200 Digital Single Lens Reflex (DSLR) camera with 85 mm lens. He takes between 10 and 20 exposures stacks and processes them with AIP4WIN.

RJD	UT Date	UT	V Mag	SD
4994	11 June 2009	23.50	2.56	
	(Very high air Mass)			
5022	10 July 2009	02.20	2.975	0.002
5023	11 July 2009	02:15	2.971	0.012
5031	19 July 2009	04.75	3.017	0.005
5032	20 July 2009	04.70	3.013	0.008
5033	21 July 2009	04.70	2.939	0.005
5034	22 July 2009	04.65	2.927	0.008
5035	23 July 2009	04.65	2.994	0.012
5036	24 July 2009	04.65	2.904	0.008
5037	25 July 2009	04.60	3.008	0.015
5038	26 July 2009	05.05	3.012	0.007
5039	27 July 2009	05.10	3.008	0.005
5040	28 July 2009	05.10	3.017	0.008
5041	29 July 2009	05.10	3.008	0.007
5042	30 July 2009	05.10	3.047	0.007
5043	31 July 2009	05.10	3.015	0.011
5044.713	01 August 2009	-	2.992	0.005
5045.713	02 August 2009	-	2.992	0.007
5046.715	03 August 2009	-	3.017	0.008
5048.715	05 August 2009	-	3.009	0.008
5049.715	06 August 2009	-	3.008	0.004
5051.715	08 August 2009	-	3.006	0.005
5052.715	09 August 2009	-	2.980	0.007
5053.715	10 August 2009	-	2.992	0.004
5054.715	11 August 2009	-	3.001	0.007
5055.715	12 August 2009	-	3.009	0.005
5056.717	13 August 2009	-	3.002	0.002
5057.717	14 August 2009	-	3.005	0.003
5063.485	20 August 2009	-	2.931	0.007
5065.510	22 August 2009	-	2.974	0.004
5068.521	25 August 2009	-	3.025	0.014
5071.652	28 August 2009	-	3.046	0.005
5072.656	29 August 2009	-	3.052	0.006
5079.535	05 September 2009	-	3.053	0.004
5083.502	09 September 2009	-	3.072	0.007
5084.51	10 September 2009	-	3.096	0.004
5086.633	12 September 2009	-	3.127	0.007
5092.652	18 September 2009	-	3.171	0.003
5094.502	20 September 2009	-	3.180	0.001
5096.642	22 September 2009	-	3.212	0.005

**JD = 2,450,000 + RJD**

**Hans-Goran Lindberg**  
**Skultuna, Sweden**

Observation using:

(50 mm fl camera lens, HX-516 B/W Camera, y2-filter

Exp 30\*3 sec, .fits images stacked

TeleAuto software, with Superstar)

Comp star lambda Aurigae at V= 4.71

<b>Date</b>	<b>RJD</b>	<b>CV</b>
19/20 July 2009	5033.4503	3.02
04/05 August 2009	5049.4653	3.03
05/06 August 2009	5050.4944	3.02
07/08 August 2009	5052.4958	3.03
08/09 August 2009	5053.4792	3.03
23/24 August 2009	5068.4799	3.05
29/30 August 2009	5074.4167	3.09
09/10 September 2009	5084.4472	3.11
14/15 September 2009	5089.3750	3.14
16/17 September 2009	5091.4028	3.19

$$\text{JD} = 2,450,000 + \text{RJD}$$

**Thomas Karisson**  
**Varberg Observatory**  
**Varberg, Sweden**

Observation using: Canon 450D 6 second exposures EF 35 - 80 mm

Comparison star is lambda Aurigae V= 4.705

<b>Date</b>	<b>RJD</b>	<b>V</b>	<b>SD</b>
07 August 2009	5051.4160	2.990	0.010
10 September 2009	5085.4236	3.152	0.031
13 September 2009	5088.4028	3.172	0.042
14 September 2009	5089.4194	3.146	0.044
15 September 2009	5090.4229	3.144	0.024
16 September 2009	5091.4028	3.155	0.060
17 September 2009	5092.4271	3.149	0.049
18 September 2009	5093.4201	3.177	0.008
19 September 2009	5094.4250	3.181	0.020

$$\text{JD} = 2,450,000 + \text{RJD}$$

**Brian E. McCandless, Grand View Observatory****Elkton, MD USA**

Telescope: CGE1400

Detector \*(BVRI): SSP-3 Detector (JH): SSP-4 @ T= - 40C

Comp = Lam Aur HD34411

**Note:** B= 5.34 V= 4.71 R= 4.19 I= 3.88 J= 3.62 H= 3.33

<b>UT Date</b>	<b>RJD</b>	<b>X</b>	<b>F</b>	<b>Mag</b>	<b>Error</b>	<b>T/RH/Seeing</b>
6-Sep-09	5080.80417	1.334	H	1.697	0.010	65/55/poor
6-Sep-09	5080.80292	1.341	J	1.987	0.016	65/55/poor
6-Sep-09	5080.79875	1.364	H	1.719	0.011	65/55/poor
6-Sep-09	5080.79708	1.391	J	1.901	0.015	65/55/poor
6-Sep-09	5080.78333	1.457	I	2.172	0.008	65/55/poor
6-Sep-09	5080.77625	1.505	R	2.551	0.002	65/55/poor
6-Sep-09	5080.77208	1.536	V	3.022	0.007	65/55/poor
2-Sep-09	5076.88458	1.096	I	2.184	0.003	60/60/good
2-Sep-09	5076.87917	1.103	B	3.689	0.003	60/60/good
2-Sep-09	5076.87292	1.118	R	2.544	0.005	60/60/good
2-Sep-09	5076.87208	1.120	V	3.056	0.003	60/60/good
2-Sep-09	5076.86250	1.146	R	2.550	0.003	60/60/good
2-Sep-09	5076.86125	1.151	V	3.051	0.004	60/60/good
2-Sep-09	5076.83625	1.704	H	1.704	0.012	60/60/good
2-Sep-09	5076.83542	1.240	J	1.924	0.005	60/60/good
2-Sep-09	5076.83042	1.261	H	1.680	0.003	60/60/good
2-Sep-09	5076.82917	1.267	J	1.956	0.005	60/60/good
2-Sep-09	5076.81958	1.312	H	1.697	0.005	60/60/good
2-Sep-09	5076.81792	1.319	J	1.889	0.004	60/60/good
1-Sep-09	5075.88625	1.093	I	2.172	0.002	60/50/excellent
1-Sep-09	5075.88208	1.103	B	3.624	0.002	60/50/excellent
1-Sep-09	5075.88000	1.108	B	3.628	0.003	60/50/excellent
1-Sep-09	5075.87708	1.115	R	2.555	0.003	60/50/excellent
1-Sep-09	5075.87625	1.116	V	3.073	0.001	60/50/excellent
1-Sep-09	5075.86375	1.150	R	2.551	0.001	60/50/excellent
1-Sep-09	5075.86250	1.155	V	3.060	0.002	60/50/excellent
1-Sep-09	5075.84875	1.200	H	1.679	0.003	60/50/excellent
1-Sep-09	5075.84708	1.205	J	1.930	0.005	60/50/excellent
1-Sep-09	5075.84292	1.221	H	1.709	0.002	60/50/excellent
1-Sep-09	5075.84167	1.226	J	1.913	0.002	60/50/excellent
1-Sep-09	5075.83750	1.300	H	1.658	0.003	60/50/excellent
1-Sep-09	5075.83625	1.305	J	1.963	0.007	60/50/excellent
26-Aug-09	5069.88333	1.142	H	1.569	0.018	69/65/good
26-Aug-09	5069.88208	1.145	J	1.804	0.027	69/65/good
26-Aug-09	5069.88000	1.152	H	1.552	0.018	69/65/good
26-Aug-09	5069.87833	1.156	J	1.759	0.051	69/65/good
26-Aug-09	5069.84708	1.271	R	2.536	0.005	69/65/good
26-Aug-09	5069.84583	1.277	V	2.971	0.001	69/65/good
26-Aug-09	5069.83875	1.310	R	2.495	0.004	69/65/good
26-Aug-09	5069.83750	1.317	V	2.975	0.003	69/65/good
26-Aug-09	5069.83042	1.353	R	2.510	0.004	69/65/good
26-Aug-09	5069.82917	1.361	V	2.987	0.002	69/65/good

**JD = 2,450,000 + RJD**

## Seeing comments:

Excellent = no visible haze, good stability, no breeze

Good = low haze, good stability, no breeze

Poor = high haze and/or excessive scintillation, possible breeze

## Other Activities:

1. Collected photometry in Wing A, B and C bands (band passes at 712, 754 and 1025 nm). Motivation for this lies with possible TiO and VO content in "companion cloud" also continuum values in the far-red and NIR.

2. Collected data on low-amplitude variable PU Aurigae on all dates in VR and JH.

3. Collaboration with Bob Stencil on using zeta Aurigae as comparison/check star on 2-Sept-09; the JD was 2455076.81792 to 2455076.81792.81958:

JH sequences of Eps Aur using lam Aur:

J = 1.913 +/- 0.004 H = 1.697 +/- 0.006 (J-H = 0.22)

Eps Aur using zeta Aur:

J = 1.976 +/- 0.004 H = 1.729 +/- 0.006 (J-H = 0.25)

HD32655 using lam Aur:

J = 5.125 +/- 0.054 H = 5.059 +/- 0.053

HD32655 using zeta Aur:

J = 5.225 +/- 0.047 H = 5.088 +/- 0.034

Additional JH sequences of Eps Aur with lam Aur as Com star as the morning progressed:

JD.81792 J = 1.913 +/- 0.004 H = 1.697 +/- 0.006

JD.82917 J = 1.956 +/- 0.005 H = 1.680 +/- 0.003

JD.83542 J = 1.924 +/- 0.005 H = 1.704 +/- 0.002

## Jeff Hopkins

### Hopkins Phoenix Observatory (HPO)

#### 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

Data transformed and corrected for nightly extinction.

	<b>UT Date</b>	<b>RJD</b>	<b>U</b>	<b>SD</b>	<b>B</b>	<b>SD</b>	<b>V</b>	<b>SD</b>
	25/26 August 2009	5069.9433	3.6940	0.0156	3.6251	0.0069	3.0669	0.0030
	28/29 August 2009	5072.9732	3.7242	0.0112	3.6359	0.0205	3.0811	0.0087
	07/08 September 2009	5082.9565	3.7768	0.0135	3.6819	0.0021	3.1163	0.0074
	14/15 September 2009	5089.9704	3.8572	0.0013	3.7416	0.0030	3.1707	0.0024
	15/16 September 2009	5090.9774	3.8667	0.0011	3.7489	0.0008	3.1821	0.0022
	17/18 September 2009	5092.9662	3.8933	0.0030	3.7622	0.0044	3.1944	0.0074
	20/21 September 2009	5095.9753	3.9174	0.0072	3.7940	0.0030	3.2220	0.0019
	21/22 September 2009	5096.9669	3.9356	0.0119	3.8033	0.0072	3.2351	0.0014
	22/23 September 2009	5097.9655	3.9445	0.0086	3.8086	0.0018	3.2326	0.0036
	24/25 September 2009	5099.9225	3.9466	0.0019	3.8238	0.0044	3.2460	0.0045
	25/26 September 2009	5100.9774	3.9655	0.0150	3.8271	0.0080	3.2476	0.0030
	27/28 September 2009	5102.9308	3.9741	0.0032	3.8478	0.0049	3.2718	0.0042

**JD = RJD + 2,450,000**

**Frank J. Melillo****Holtsville, NY USA**

Lat:+ 40d 40' Long: 73 W Elevation: 100'

Instrument: Optec SSP-3, Telescope: C-8 8"

Gate Time: 10 Seconds

<b>RJD</b>	<b>Date</b>	<b>UT</b>	<b>V Mag</b>	<b>#</b>	<b>SD</b>
5058.8090	14/15 August 2009	07:25	2.973	12	0.017
5066.7951	22/23 August 2009	07:05	3.010	12	0.019
5073.8806	29/30 August 2009	08:58	3.098	12	0.022
5074.7639	30/31 August 2009	06:20	3.023	12	-
5080.7514	05/06 September 2009	06:28	3.044	12	0.012
5088.7361	13/14 September 2009	-	3.10 3	-	
5092.7361	17/18 September 2009	05:40	3.14	12	0.017
5094.7500	19/20 September 2009	06:00	3.17	12	0.01
5100.7263	25/26 September 2009	05:30	3.20	12	0.013

**JD = RJD + 2,450,000**

**Snaevarr Gudmundsson (Hafnarfjordur, Iceland)****Lindarberg Observatory**

Location (WGS 84)

Latitude:+64d 03.740

Longitude:21d 55.297

Optec SSP-3 on 12" Meade LX 200

<b>Double Date</b>	<b>RJD</b>	<b>V</b>	<b>#</b>	<b>SD</b>	<b>X</b>
10/11 April 2009	4927.4696	2.965	4	0.049	1.61
15/16 April 2009	4933.5003	2.975	4	0.021	1.87
27/28 August 2009	5071.5463	3.065	4	0.007	1.86
29/30 August 2009	5073.6379	3.080	4	0.014	1.36
08/09 September 2009	5083.6001	3.113	3	0.006	1.40
18/19 September 2009	5093.5748	3.183	3	0.006	1.57

**JD = RJD + 2,450,000**

**Gerard Samolyk****Greenmailed, Wisconsin, USA**

Equipment, CCD Camera and Camera Lens, ST9XE + 50 mm lens

<b>UT Date</b>	<b>RJD</b>	<b>V</b>	<b>SD</b>	<b>B</b>	<b>SD</b>
26 July 2009	5038.8770	2.980	0.009	3.567	0.011
27 July 2009	5039.8840	2.955	0.013	3.560	0.015
28 July 2009	5040.8178	2.973	0.018	3.566	0.014
29 July 2009	5041.8184	2.976	0.009	3.566	0.013
31 July 2009	5043.8183	2.985	0.015	3.562	0.010
02 August 2009	5045.8605	2.970	0.008	3.539	0.017
12 August 2009	5055.8670	2.952	0.012	3.533	0.009
13 August 2009	5056.8689	2.978	0.005	3.532	0.017
15 August 2009	5058.8482	2.952	0.012	3.515	0.015
19 August 2009	5062.8575	2.995	0.019	3.542	0.015
23 August 2009	5066.8375	2.992	0.017	3.587	0.017
24 August 2009	5067.8512	3.003	0.005	3.597	0.016
31 August 2009	5074.8333	3.038	0.011	3.600	0.007

**JD = RJD + 2,450,000**

# Spectroscopy Report

**Robin Leadbeater Report**  
**Location: Cubria, England**

## Equipment:

### Telescope

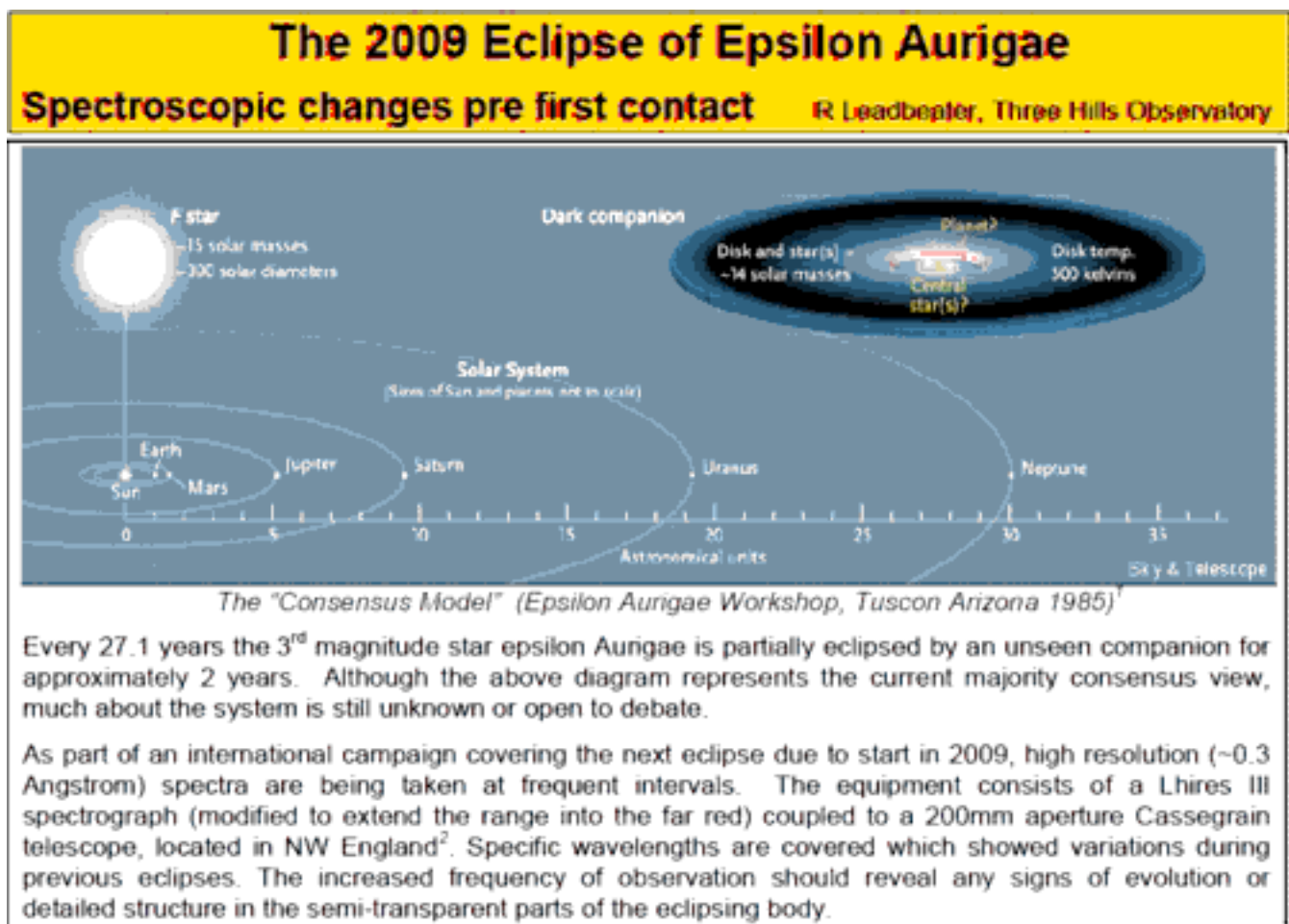
Vixen VC200L Cassegrain, 200mm f 6.4/f9

### Spectrographs

Star Analyser

Lhires III

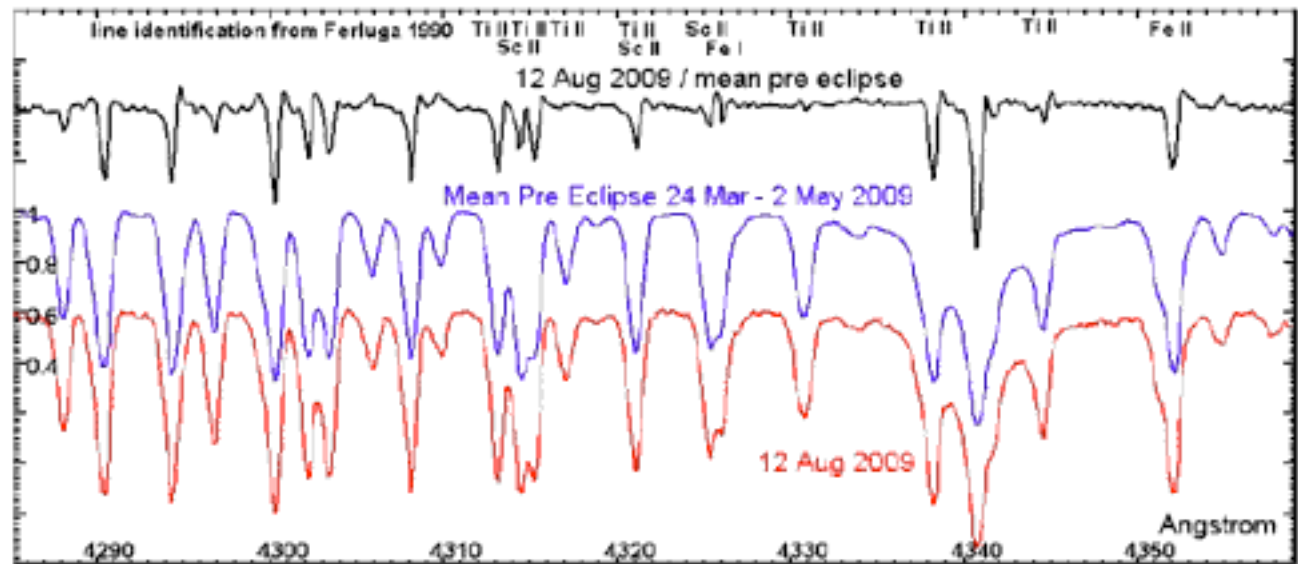
**Poster Paper Given**  
**5 September 2009 at the Leeds BAA, England**





Poster Paper Given  
5 September 2009 at the Leeds BAA, England  
(Continued)

**The shell spectrum**

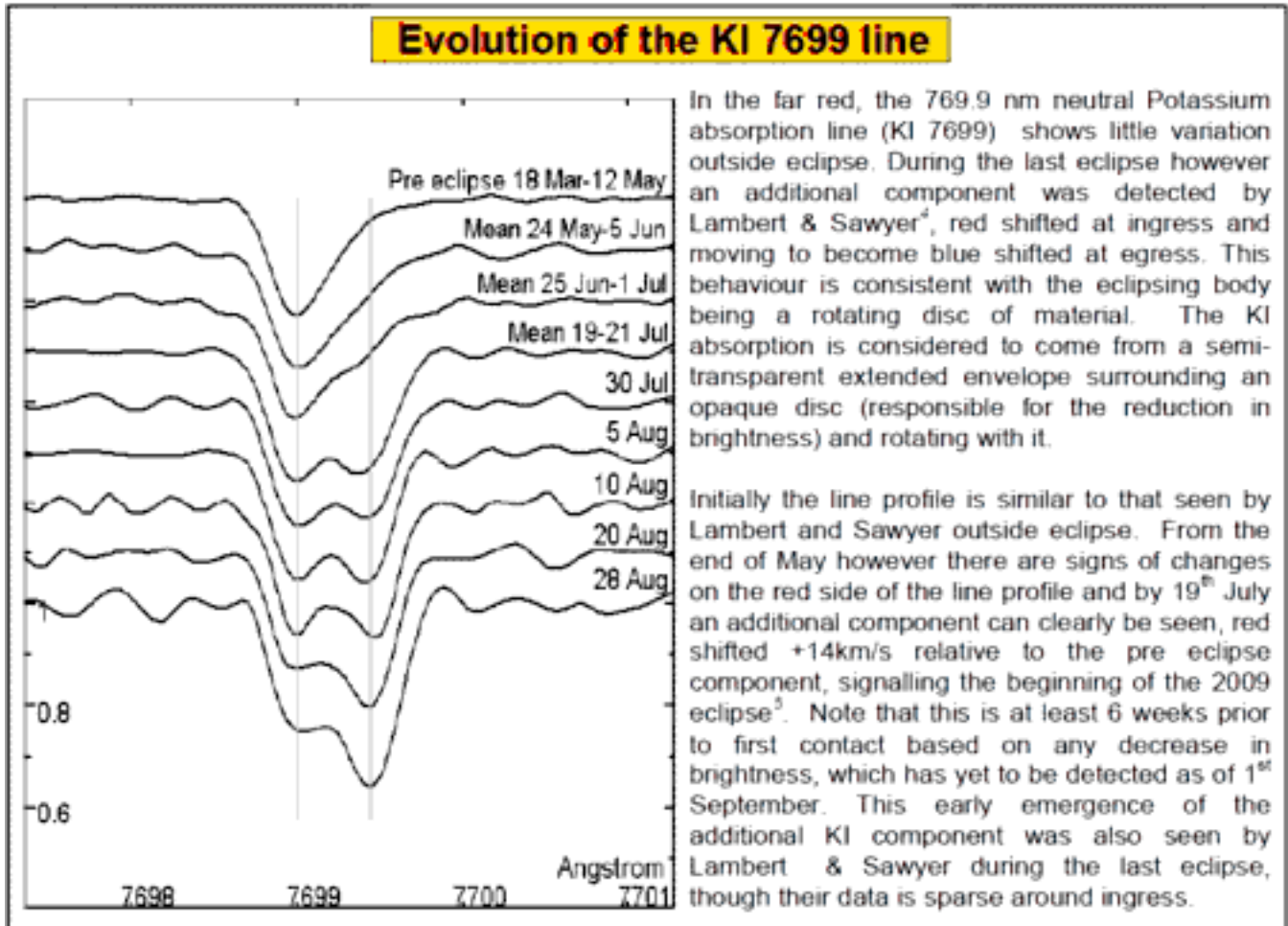


Subtle changes are seen during eclipse at the blue end of the spectrum, superimposed on the ionised metal lines from the primary star photosphere. These are revealed by dividing spectra taken during eclipse by that of the primary outside eclipse. The resulting "shell" absorption spectrum is believed to originate from an ionised semi-transparent shell of gas surrounding an opaque eclipsing disc. This spectrum was studied in detail by Ferluga & Mangiacapra during the last eclipse<sup>3</sup>.

The spectrum above was taken 12<sup>th</sup> August 2009, around the predicted time of photometric first contact and shows the emergence of the shell spectrum, though no brightness drop had been detected by this time. Note the narrowness of the lines compared with the photospheric lines.

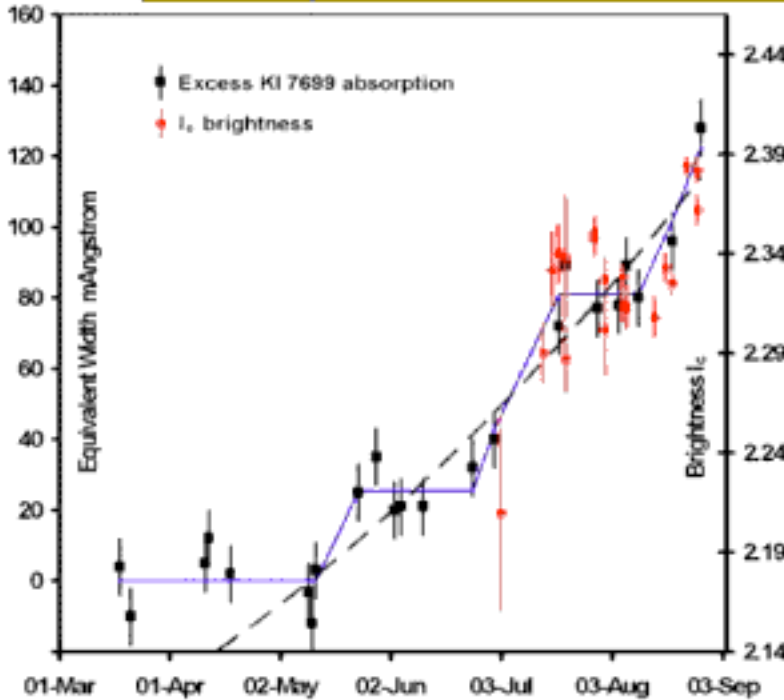
1. R E Stencel, *Workshop on the recent eclipse of epsilon Aurigae*, NASA conference publication 2384, 1985
2. [www.threehillsobservatory.co.uk](http://www.threehillsobservatory.co.uk)
3. S Ferluga, D Mangiacapra, *Astron. Astrophys.* 243, 230-238 (1991)
4. D L Lambert, S R Sawyer, *PASP* 98:389-402 April 1986

**Poster Paper Given  
5 September 2009 at the Leeds BAA, England  
(Continued)**



Poster Paper Given  
 5 September 2009 at the Leeds BAA, England  
 (Continued)

**Time dependent variations in the KI 7699 line intensity**

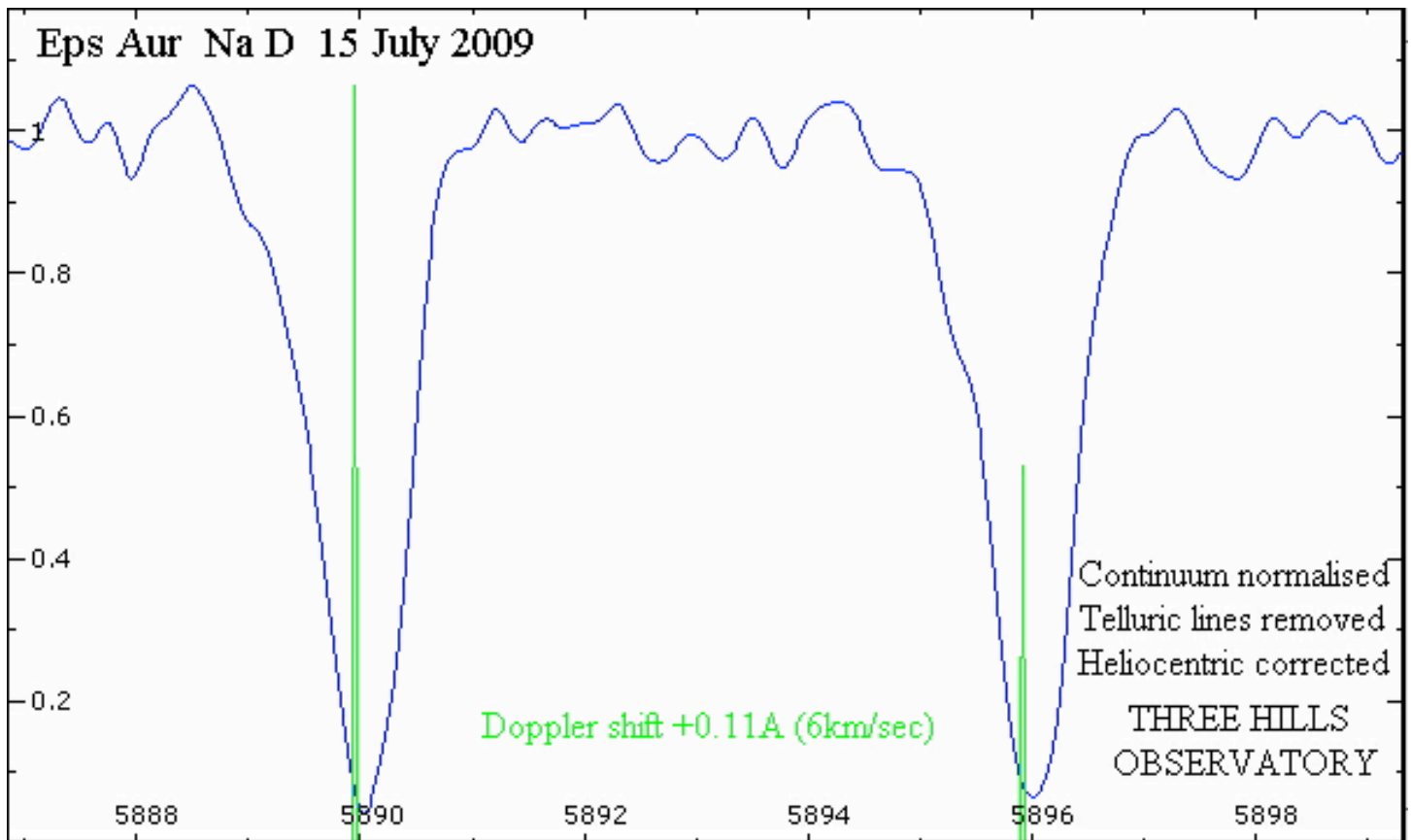


By subtracting the out of eclipse component in the KI 7669 line it is possible to estimate the magnitude (EW) of the absorption due to the eclipsing body. The increased frequency of observation allows a detailed study of this absorption with time. There are indications that the increase in absorption on the approach to photometric first contact may not be progressing smoothly. A reduction in brightness seen in the I band also correlates with the second step<sup>7</sup>. This could be an indication of inhomogeneity in the extended outer regions of the eclipsing body (perhaps part of a multi-ring structure similar to that proposed by Ferluga for the opaque inner region of the disc<sup>6</sup>). Further measurements at egress may clarify this.

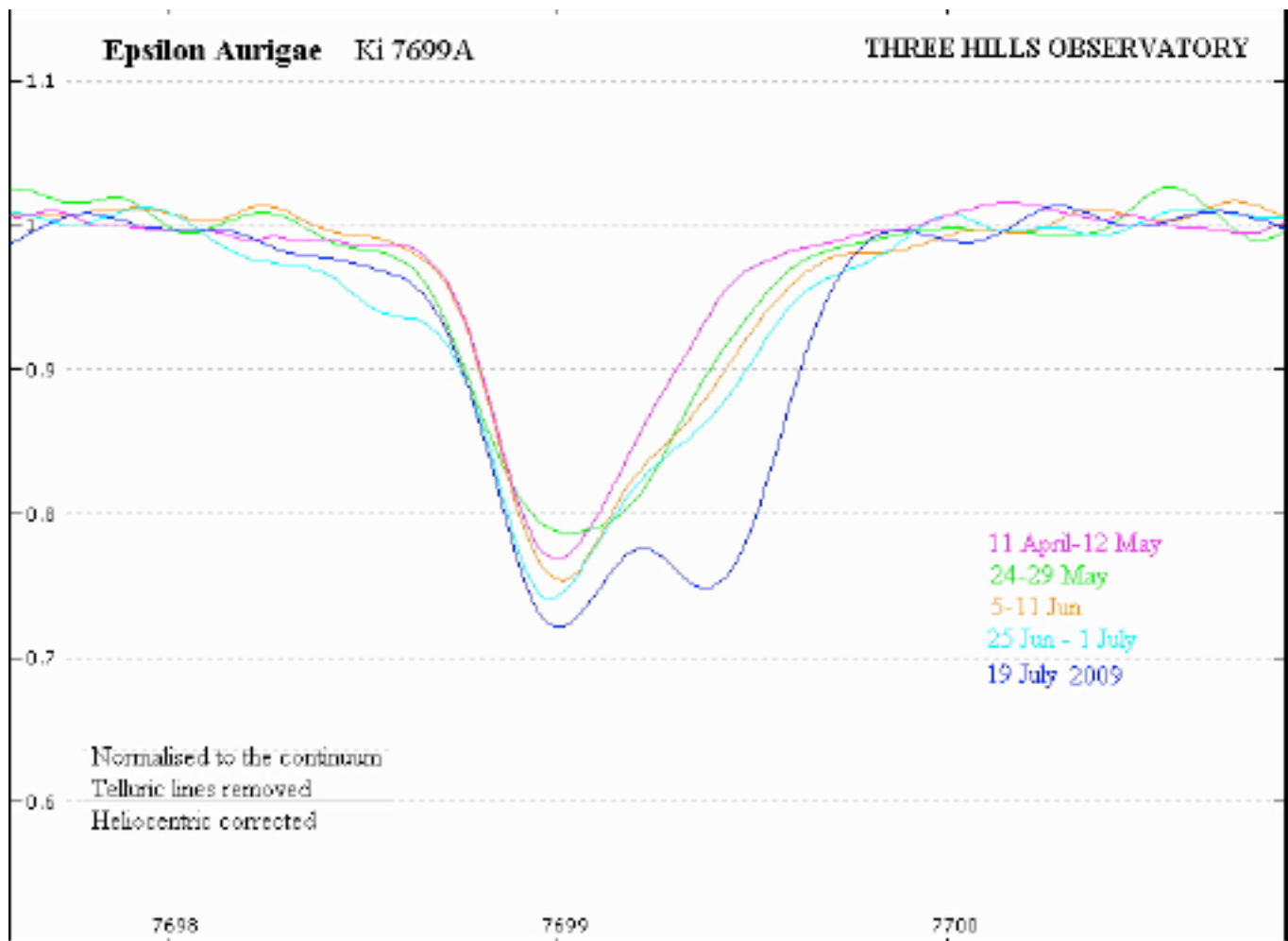


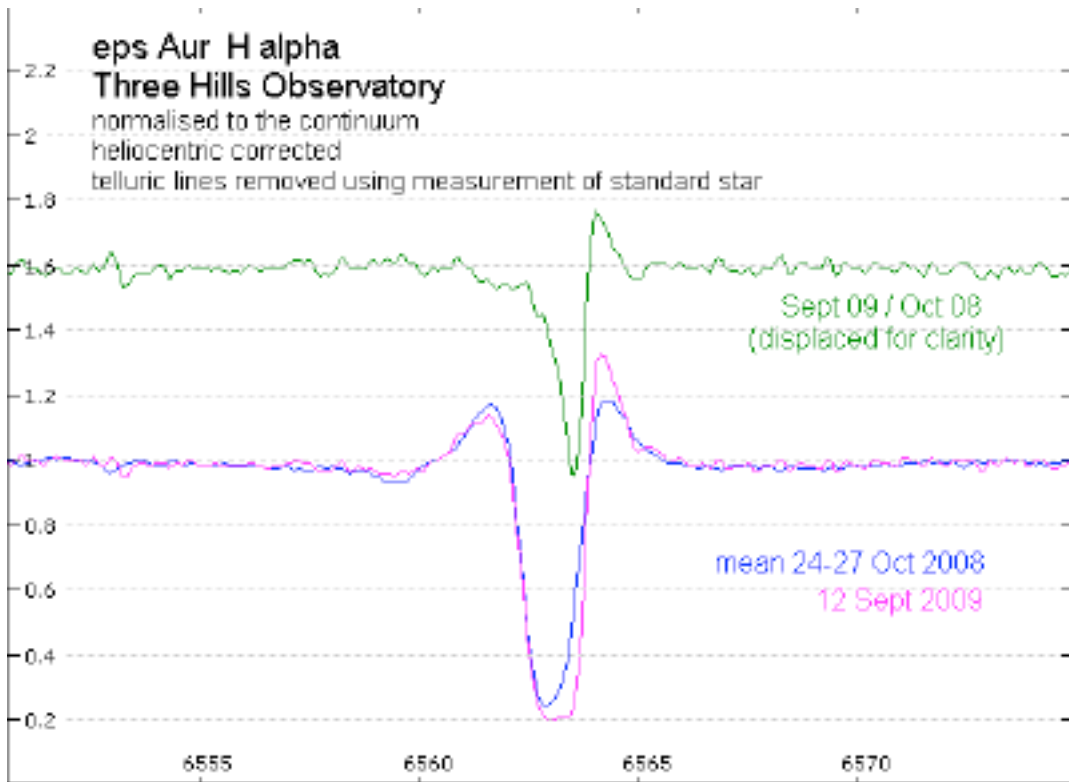
5. Central Bureau for Astronomical Telegrams CBAT 1885 27th July 2009
6. S Ferluga, *Astron. Astrophys.* 238, 270-278 (1990)
7. R. Miles, Golden Hill Observatory

**Robin Leadbeater Report (continued)**



## Robin Leadbeater Report (continued)





## Robin Leadbeater Report (continued)

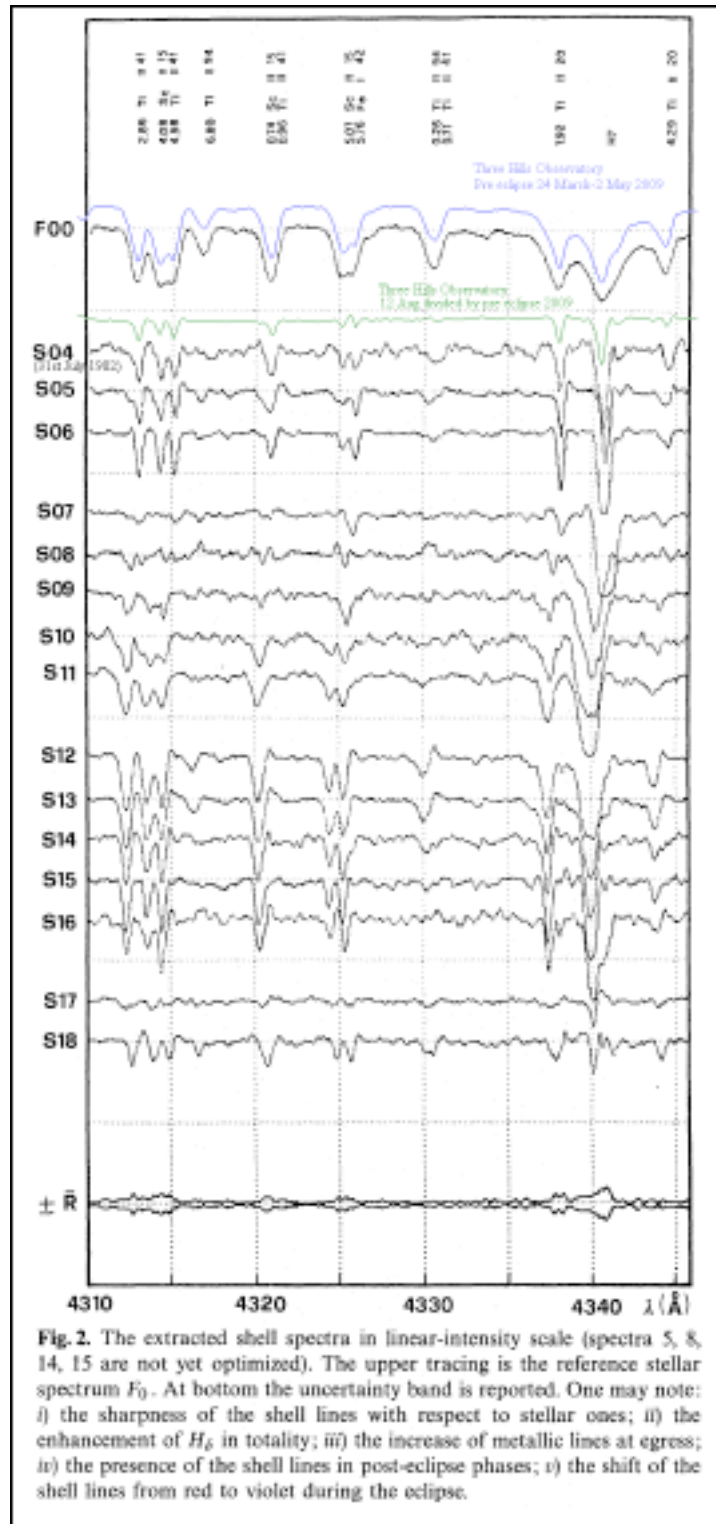
13 August 2009

There are signs of the shell spectrum in my epsilon Aurigae spectrum from last night in the 4310 -4350A region as reported by Ferluga. See attached comparison with Ferluga from

<http://adsabs.harvard.edu/abs/1991A%26A...243..230F>

Can't be long now!

Robin



**Dr. Lothar Schanne**

Hohlstrasse 19

D-66333 Völklingen-Ludweiler, Germany

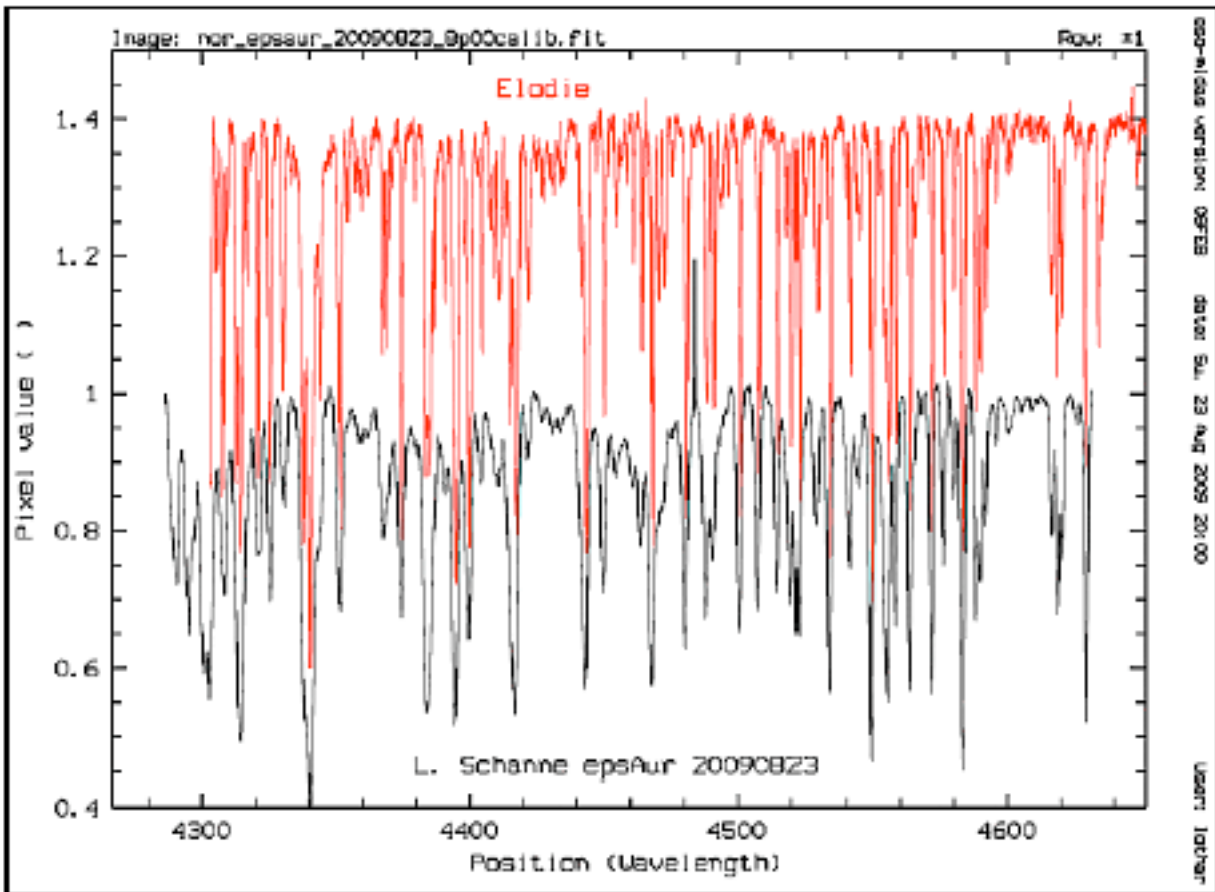
**Comparison of the spectrum of  $\epsilon$  Aur of 23.8.2009 with a spectrum of 2003 (Elodie)**

*In order to examine, whether in the optical spectrum of  $\epsilon$  Aur effects of the beginning eclipse can be recognized already, I compare in the following at 23.8.2009 measured spectra with the spectrum from Elodie, which is loadable in the Internet (<http://atlas.obs-hp.fr/elodie/fE.cgi?c=o&o=HD031964>).*

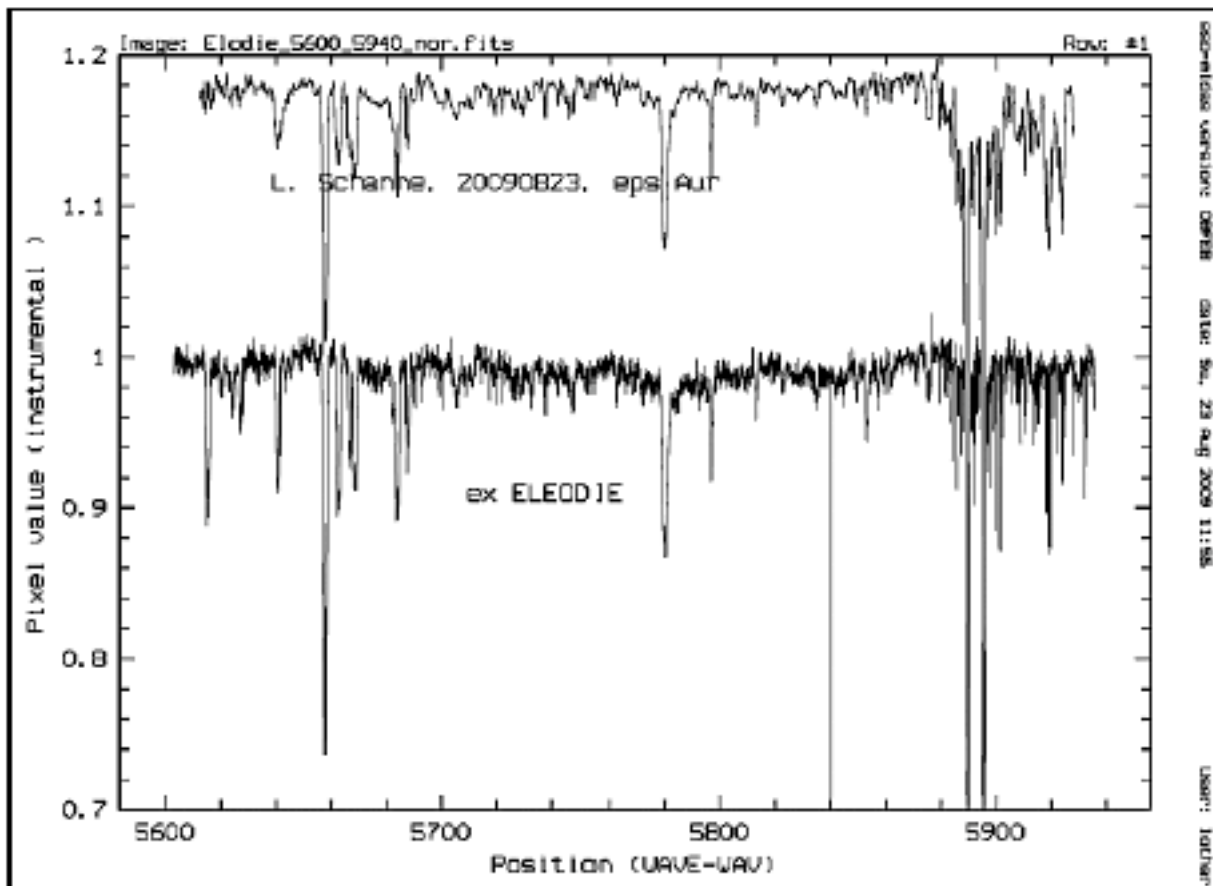
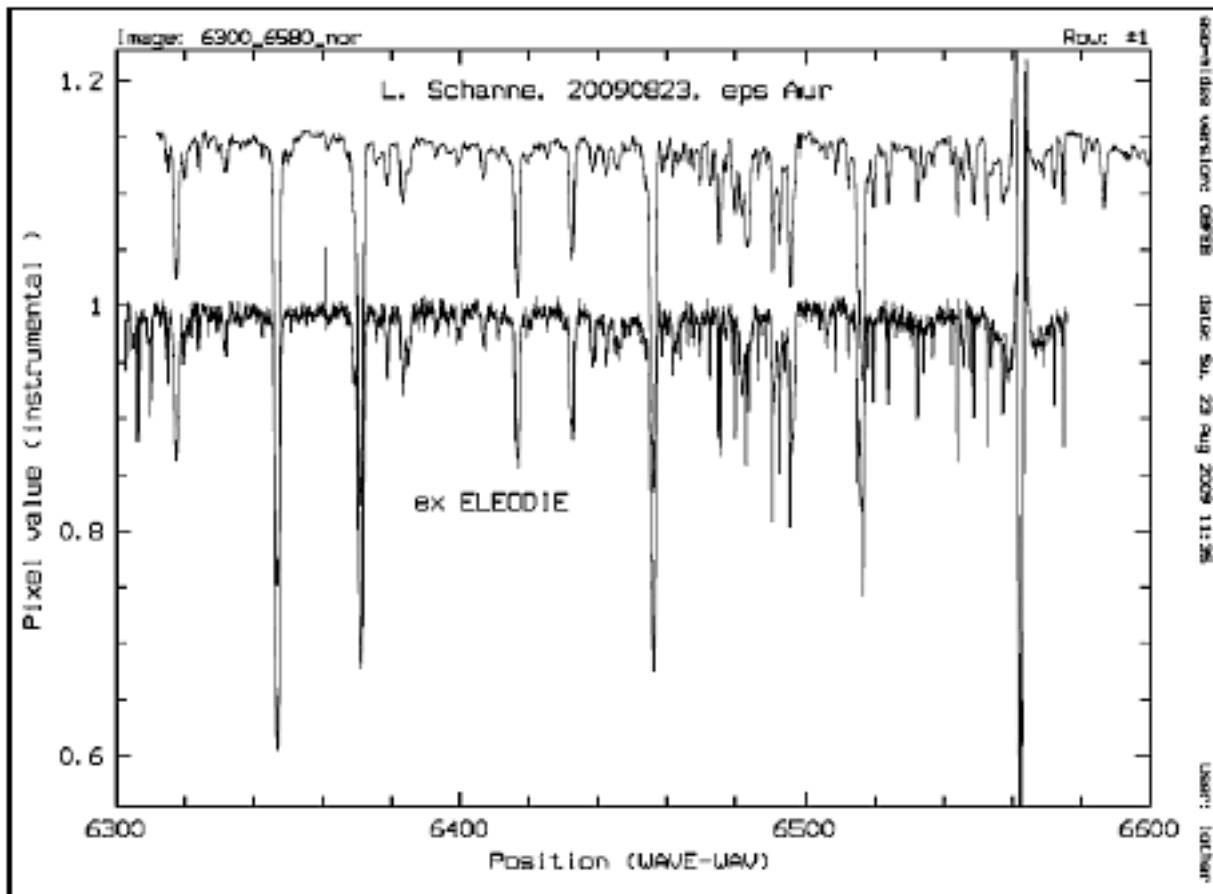
*This reference spectrum was based on 01.11.2003, thus far outside of the eclipse. My spectra are measured with a C14 + reducer, Lhires III with F# /5, 22  $\mu$ m slit, 1800g/mm grating (50x50mm 2), CCD = sigma 1603ME (- 15°C). Total exposure 20 min.*

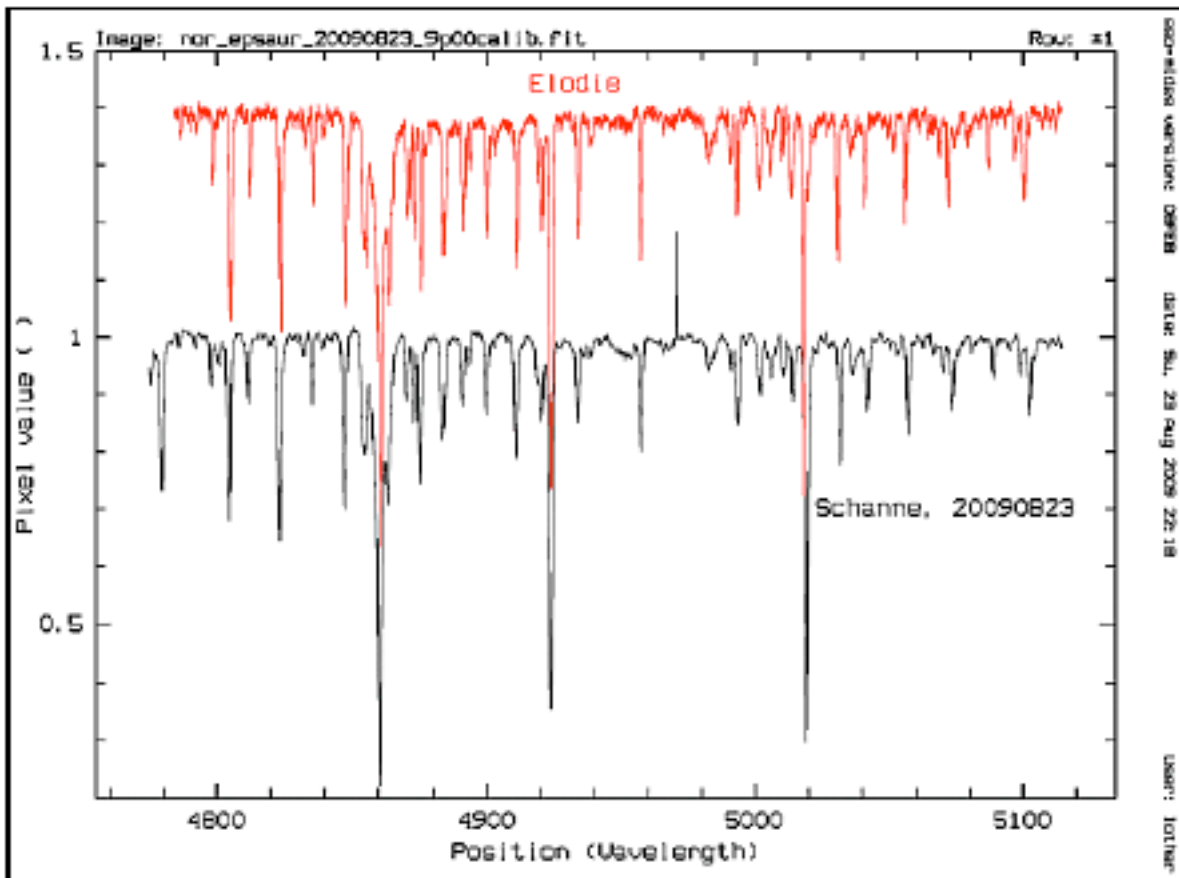
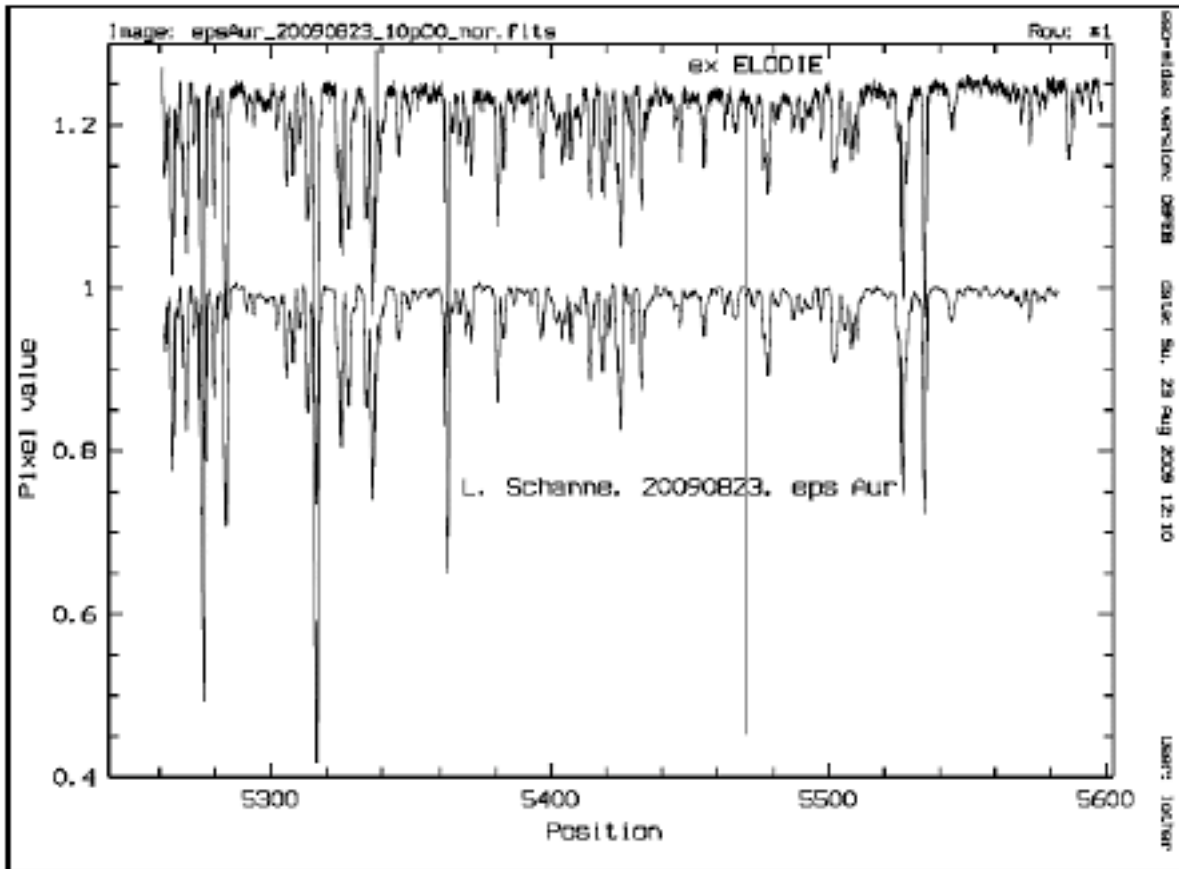
*The FWHM of the terr. Lines amount to about 0,5 angstroms in my spectra (> 480nm). The resolution in the Elodie spectrum is somewhat higher.*

**As the illustrations show, so far no relevant changes in the spectrum of  $\epsilon$  Aur are recognizable in the context of the obtained resolution.**









## From Dr. Bob

As the eclipse begins, we begin to deliberate when First Contact really occurred. Whether the final answer is JD 2,455,072 or a week earlier, in either event it appears to be at least one week after predicted start (55055), which probably means further changes in eclipse shape and duration. As the rate of eclipse steepens this autumn toward totality at end of year, we encourage everyone to collect and record observations in whatever unique way is available to you. Chances are that you might have the only clear weather on Earth when something peculiar happens. Only with coverage, can we put all the observations in context. Be sure to sign up at [www.citizensky.org](http://www.citizensky.org) to report your visual estimates and keep up with developments, plus review Arne Henden's article in this newsletter.

Denver grad student Brian Kloppenborg has been diligently working on reductions of the summer, daytime SSP4 data (J and H band photometry) from our high altitude site, and hopes to provide a data summary for the next newsletter. Bright sky results in large correction factors, making this exercise non-trivial, but it is still important in terms of attempting to measure next summer's mid-eclipse brightening.

Also on the science front, it was pleasing to hear Don Hoard speak at the Adler Planetarium meeting about new and recalibrated Spitzer observations that help confirm the presence of a 600K component in the epsilon Aurigae system, presumably the dark disk causing the eclipse. Interferometric observations are on the schedule at CHARA, but the Mt. Wilson area "Station" fire has derailed a lot of plans. Quoting from Hal McAlister's 9/25/09 blog: "We will now focus on clean up in order to resume routine science operations as soon as possible. The protective spraying of fire retardant gel on four of the six CHARA telescope domes and selected other structures, during the recent Red Flag/Santa Ana combination will require a good deal of work to remove the residue which, when dry, turns into fine flakes that are amenable to being blown onto telescope mirror surfaces by even light winds. So, that will delay CHARA's restart for a few days. We also must inspect the vacuum light tube joints, which are linked with wide neoprene sleeves that may in a few spots have been affected by underlying heat from the back fire. Any damaged sleeves will be identified and replaced." We remain optimistic that closure phase imaging during ingress this fall can still be accomplished, and are depending on your photometry and spectroscopy to help us put that observation in context.



Dr. Robert E. Stencel, Co- Editor  
University of Denver Astronomy Program  
<[rstencel@du.edu](mailto:rstencel@du.edu)>  
[https://twitter.com/epsilon\\_Aurigae](https://twitter.com/epsilon_Aurigae)

## Interesting Papers

Astronomy magazine October 2009 (Vol. 37 No. 10) includes a 6 page feature article about epsilon Aurigae, written by Robert Zimmerman. It features a fine summary of the history of the object, discussion of science goals and new artwork by Adolf Schaller.

### BOOK

## *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.

**Note:** We only have a handful of copies left. While we plan to provide a second addition after the eclipse, there will be no second printing of the first edition. This is a last chance to get a first edition copy of the book.

**For more information**

**<http://www.hposoft.com/EAuro09/Book.html>**

**\$29.95 + S&H**

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