News from The Society for Astronomical Sciences

Vol. 6, Number 1

2008 Planning for SAS Symposium and Workshop Schedule nearly Complete

Planning and scheduling for the 2008 SAS Symposium is nearly complete. As in the past few years we are continuing with a Workshop series on the Tuesday (5/20) prior to the Symposium. This year there are two workshops planned.

Bob Denny: ACP Observatory Control Software-Tuesday Morning

This workshop will cover ACP Observatory Control Software, an off-the shelf automation system for observatories that includes secure web-based remote observing. The workshop will focus on using ACP for science data acquisition. It will show how to create observing requests offline (e.g. on an airplane or in your living room), upload them to the ACP-controlled observatory, and start a night's hands-off data acquisition run. The various things that one can do in an observing plan will be covered, again as applied to science data acquisition. This will be a hands-on workshop. A maximum of 15 minutes will be provided for software setup. PC requirements are Windows XP (Home or Pro) Service Pack 2, at least a 1GHz CPU, 1Gb RAM, and a minimum 1280x1024 screen size. You should have already installed the ASCOM Platform 5, Max-Im DL 4.5x/4.6x, ACP Obs Control, and ACP Planner. You'll learn how to set up ACP so you just need to have it installed. Either a fully licensed copy or 30 day trial version of MaxIm DL must be installed, ACP will run free for 60 days full-function. ASCOM Platform and ACP Planner are free. Downloadlinks:http://ASCOM-Standards.org/ (ASCOM Platform 5) http://ACP.DC3.com/download.html (ACP and Planner).

Doug George: Understanding and Using MaxIm DL for Scientific Astronomy-Tuesday Afternoon

A hands-on workshop that will cover the use of MaxIm DL as it applies to scientific astronomical images. Learn how to use the extensive analytical-functions including photometry and light curves, astrometric analysis, image statistics and profiles. The details of image acquisition, processing, advanced calibration, batch processing, and scripting are just a few of the topics that will be covered. Attendees will need to bring their own PCs running Windows and have, at a minimum, the demo version of MaxIm DL loaded on their machine.

The tentative speaker schedule is given on pages 3 and 4. As you can see we have a full and interesting program planned for the 2008 meeting!

In This Issue

Tim Parker of JPL to deliver the Keynote address this year at the SAS Symposium

Dr. Tim Parker was the originator of the Mars Ocean hypothesis. He earned his Ph.D. at the University of Southern Cali-

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fornia in 1994, with a dissertation entitled "Martian Paleolakes and Oceans." His research papers on the subject of ancient aqueous environments on Mars, beginning in 1989, have played a significant role in the development of the "follow the water" theme of Mars exploration and influenced the graduate studies of a number of students around the world.

Tim's flight project experience at JPL includes CRAF, Magellan, Mars Pathfinder, Mars Exploration Rovers (MER), and the upcoming Phoenix and MSL missions. He is a member of the Athena science team on MER and serves as a Geology Team Group Lead. He played a critical role in landing site selection for Pathfinder and MER and leads traverse geological assessments for MER, which involves comparing high resolution MOC orbiter views of the MER landing sites with overhead projections of images acquired by the rover vehicles on the ground. Continuous updates of these location maps are critical for the successful operation of the rovers.

The title of his talk is "Life on Mars: Four Years of Extended Mission Science for the Spirit and Opportunity Rovers"

Last years SAS Symposium participants enjoying a bit of sun before the lunch break. Come and enjoy it this year.

Membership Information

Membership in your new Society for Astronomical Sciences (SAS).

As was pointed out with the last issue, it was felt that a modest membership fee would greatly help SAS to produce a better product for its members. This fee will be $25.00 per year. What will this membership fee provide? Well for one thing it WILL NOT go to any committee members as part of their efforts within SAS. We volunteer our time for The Society.

Members will receive a discount for the registration fee each year for the Symposium at Big Bear. It will assure you that you will get a copy of the published proceedings each year, even if you do not attend the Symposium. It will help defray costs in bringing in outside speakers (professionals) to the symposium.

Membership is annual and runs from July to June of the following year. To become a member, send $25 to: Society for Astronomical Sciences, 8300 Utica Avenue, Suite 105, Rancho Cucamonga, CA 91730. You may also join online at the registration page of the web site. Membership dues are tax deductible.

We currently have 82 members with many renewals due in by June 1.

The SAS is a 501(c)(3) charitable organization.

Your Participation Wanted!

As I have mentioned in previous Newsletters, we need your participation in the Newsletter. We don't want this to become a one person or just a couple person show. If you have an article which can cover a variety of topics, please put it together for a future Newsletter. Work in progress is always welcome. In addition, we have started a "letters to the Editor" section where we would like to add 2-3 letters from the members/ participants. We had no letters to incorporate into this Newsletter edition. Constructive comments are always welcome as we are always looking for ways to improve not only the quality of the Newsletter but also the quality of the Symposium. We want the SAS to become a year around organization not just a once a year group.

News from The Society for Astronomical Sciences

Tentative Speaker Schedule for the 2008 Symposium on Telescope

Wednesday 5/21

Coffee/ Registration		***8:00***	***8:45***
Welcome		8:45	9:00
Buchheim	Observing Double Stars	9:00	9:30
Johnson	Double Star Research at Community Colleges and High Schools	9:30	10:00
Lee Snyder	Eclipse Brigthening Feature in Eclipsing Binary Stars	10:00	10:30
Coffee Break		***10:30***	***10:45 15 MINUTES***
Riggs	Four-Channel Solar Radio	10:45	11:15
Howe	Solar Astronomy at DSES	11:15	11:45
Henden	Joint AAVSO Meeting Announcement.	11:45	12:00
Lunch		***12:00***	***13:30 90 MINUTES***
Thizzy	Be Stars	13:30	14:00
Horne	Three Eclipsing Binaries	14:00	14:30
Stephens	Working Long Period Asteroids	14:30	15:00
Coffee		***15:00***	***15:15 15 MINUTES***
Hopkins/Schanne/ Stencel	Gearing up for the epsilon Aurigae Campaign	15:15	15:45
Mais/Stencel	Adventures in Interferometry	15:45	16:15
Benn	Observatory for Short-Interval Solar Spectroscopy	16:15	16:30
Sponsor Infomercials		16:30	17:00

Thursday 5/22

Coffee		***8:30***	***8:45***	
Welcome, Annouce-ments		8:45	9:00	
Young	Variable Star Astronomy Education/Public Outreach Ini-tiative	9:00	9:30	
Warner	Observations and Results for Four Variable Stars	9:30	10:00	
Cole	Automating a Telescope for Spectroscopy	10:00	10:30	
Coffee		***10:30***	***10:45***	***15 MINUTES***
Foote	The Challenging Road to Exoplanet Observing	10:45	11:15	
Vander Haagen	Techniques for the Study of High-Frequency Optical Phe-nomena	11:15	11:45	
Group Photo		***11:45***	***12:00***	
Lunch		***12:00***	***13:30***	***90 MINUTES***
Genet	The Alt-Az Telescope Initiative	13:30	14:00	
Smith	Remote Observing and Beyond	14:00	14:30	
Richardson/	Upgrade/Availability of the TransitSearch.org Telescope	14:30	15:00	
Coffee		***15:00***	***15:15***	***15 MINUTES***
La Pointe	Measuring the Hubble Constant	15:15	15:45	
Steve Gifford	Astronomical Coma Image Restoration Using Localized Deconvolution	15:45	16:15	
Hoot	Automating Image Science	16:15	16:45	
		16:45	17:00	Closing Remarks
Dinner		***17:30***		
Keynote Speaker				
Tim Parker (JPL)		**19:00**	**20:00**	**The Mars Rovers**

Don’t forget this years Riverside Telescope Makers

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Dispatches from the Members
Vol. 6, Number 1

The Hertzsprung-Russell Diagram

Dale Mais

One of the most powerful diagrams in all of science is the Hertzsprung-Russell Diagram. The discovery of the relationships portrayed in this diagram are attributed to Ejnar Hertzsprung and the famous American astronomer, Henry Norris Russell. In 1907, he published "Zur Bestimmung der photographischen Sterngrössen", in which he combines his experience from his hobby, photography, with the important astrophysical questions. He sent a preprint to Schwarzchild, the director of the Göttinger Observatory, and after they met in 1908, he proposed Hertzsprung as an extraordinary professor. In 1909 they both moved to Potsdam Observatory. During a travel to the USA in 1910, Schwarzchild met Russell, who had come to the same results as Hertzsprung. The work of Hertzsprung and Russell was first published in graphical form in 1911. However, for many years afterwords the diagram was known as the Russell diagram. This was finally corrected in 1931 when it was pointed out that Hertzsprung actually was the first to publish his work. He published it in an obscure photography journal that simply was not read by any astronomers! Since that time it has been known as the Hertzsprung-Russell diagram, or the H-R diagram.

What makes the diagram work is the fact that spectral type (or temperature) was plotted versus absolute magnitude. Using absolute magnitude meant that the distance was negated and that one was dealing directly with the energy out put of the star (luminosity) That is why often you will see the y-axis as either absolute magnitude or luminosity (with respect to the suns luminosity = 1) or both (Figure 1). What was recognized early on was the a majority of the stars fell along a slanted S curve which came to be known as the Main Sequence (MS). While stars are on the the MS, they are fusing hydrogen into helium as their source of energy. Later it was recognized that the MS is a mass sequence also. In other words the hotter the star is on the main sequence (the greater the luminosity) the greater the mass of the star. The recognition of this was from work with eclipsing where the individual masses of MS stars could actually be calculated based on the orbital dynamics. It was found that there was a strong correlation between Mass and Luminosity (Figure 2).

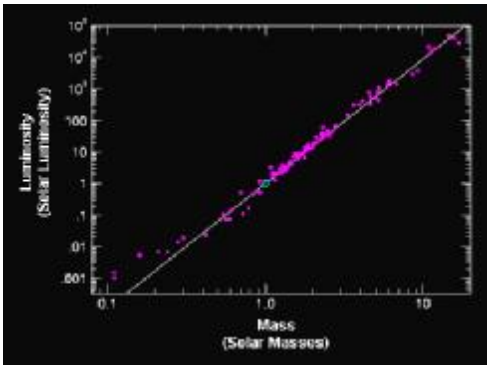

Figure 2, Mass-Luminosity Correlation

Early in the history of the H-R diagram it was believed the stars migrated from the right side of the diagram during a stars birth and ultimately settled on the MS, where the stars would then, during their evolution, slide down the MS from hotter to cooler spectral types. Now we know this to be wrong and stars

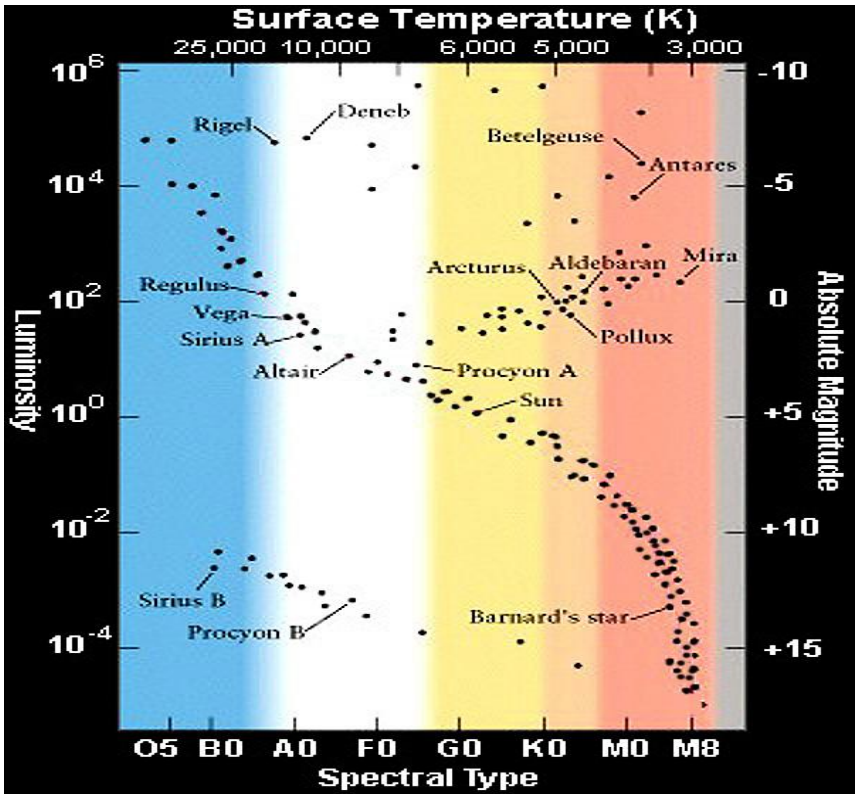

Figure 1, The H-R Diagram

The Hertzsprung-Russell Diagram

Dale Mais

maintain their position on the MS during their entire hydrogen fusion lifetime before migrating off the Mais sequence when the core hydrogen is spent.

Finally, in the early 1940's a third dimension was added to the HR diagram in the form of the Luminosity classes (Figure 3). What forced this addition was that it was known for a given spectral type, say K0, there could be a huge difference in luminosity, even though the temperatures were the same. It was recognized that was due to size differences of the stars. In terms of how this manifests itself on the diagram in terms of size, one must look at one of the most important yet simple equations in stellar astrophysics, which expresses the Luminosity-Radius-Temerature relationship.

$$L = 4pR^2 s T^4$$

In this relationship, the luminosity of a star is related to the radius of the star, R, in the form of the stars emitting surface area $4\pi R^2$ and its temperature, T, raised to the fourth power. Embedded in this equation is Stefens Law $E \sim T^4$ which was discovered during the hay day of the development of the theory of blackbody radiation curves. It simply states that the total emitted energy of a body is proportional to the temperature raised to the fourth power.

This size of stars displays itself on the H-R diagram as a series of stellar radii running diagonally across the diagram (Figure 4), such that small stars are in the lower left corner and as one proceeds upward and to the right the stellar radii increases dramatically. The sizes displayed are with respect to the solar radius = 1.

So the history and information contained in the H-R diagram is rich and continues to be added to even today.

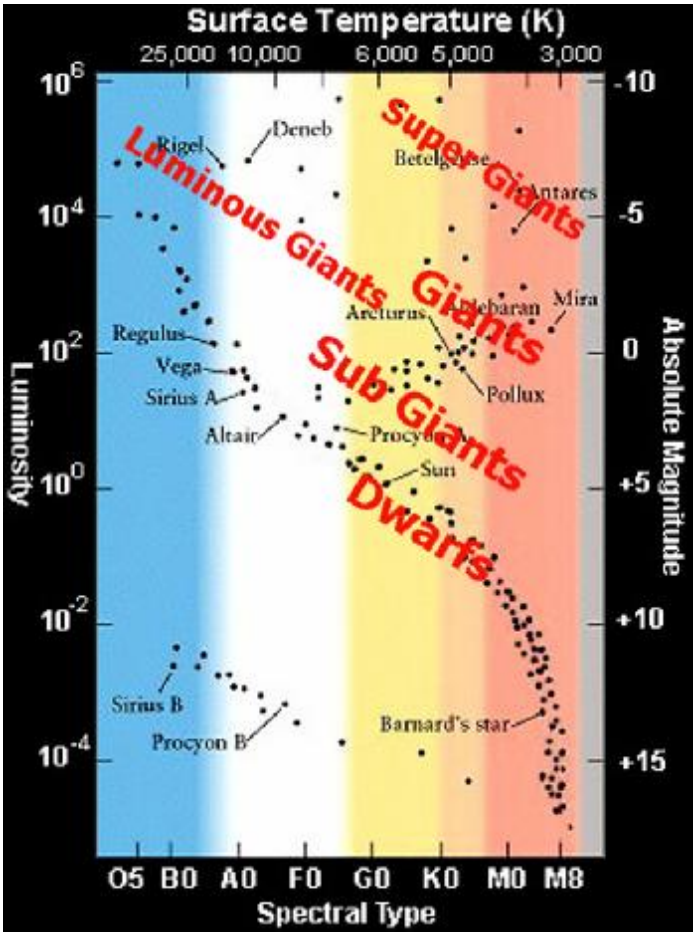

Figure 3, Luminosity Classes on HR Diagram

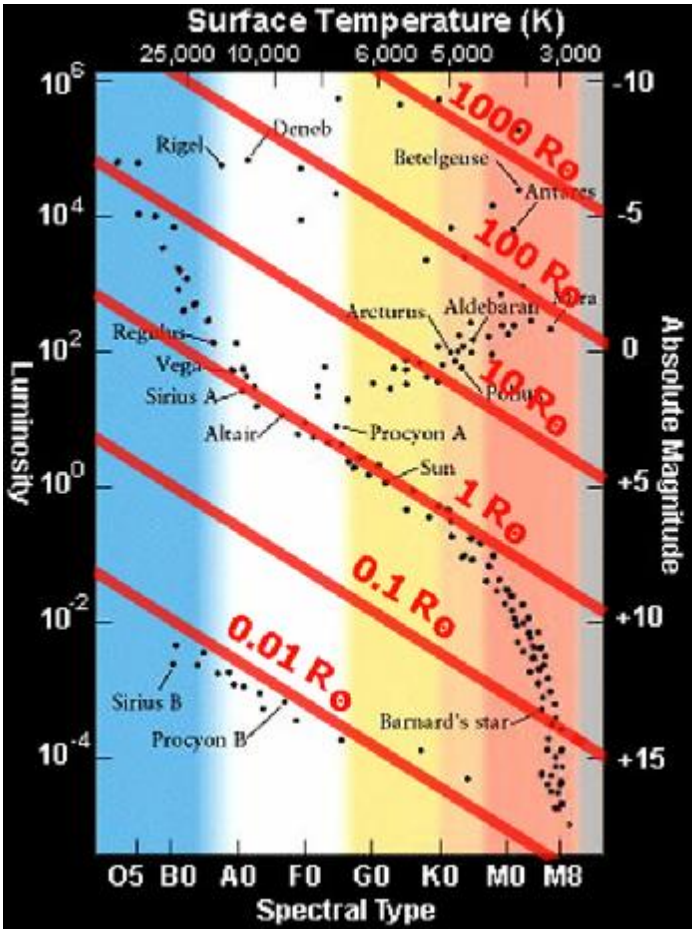

Figure 4, The third dimension of the H-R diagram, R.