

GuideStar



November, 2012

Volume 30, #11

At the November 2 Meeting

Cosmological Distance Ladder

Don Selle

How do we know how far it is to anything in the sky? The moon? The Sun? The planets? The stars? Other galaxies? If someone hadn't told you or if you hadn't looked up the distances to these objects, how would you figure it out? Needless to say this is a problem that has vexed astronomers for centuries. As we learn more and as we have better instruments we are able to determine the distance to objects more accurately.

The history of this effort is fascinating. This month, Don will tell us about the early successes and failures to measure distances and about what we currently know about the distance to objects in space.

**The *GuideStar* is the winner of the 2012
Astronomical League Mabel Sterns
Newsletter award.**



The Houston Astronomical Society is a member of the Astronomical League.

Highlights:

The Antikytheran Mechanism	6
Herschel Space Telescope	9
Lisa Judd—Eagle Eye	10
Earth Sized Planet at Alpha Cen B	17
Kids Outreach and Public Star Parties	19
AM Her — An X-Ray Star	20

HAS Web Page:

<http://www.AstronomyHouston.org>

See the *GuideStar's* Monthly Calendar of Events to confirm dates and times of all events for the month, and check the Web Page for any last minute changes.

Schedule of meeting activities:

All meetings are at the University of Houston Science and Research building. See the inside back page for directions to the location.

Novice meeting: 7:00 p.m.

Justin McCollum (chair) — TBD

General meeting: 8:00 p.m

**See last page for directions
and more information.**

The Houston Astronomical Society

The Houston Astronomical Society is a non-profit corporation organized under section 501 (C) 3 of the Internal Revenue Code. The Society was formed for education and scientific purposes. All contributions and gifts are deductible for federal income tax purposes. General membership meetings are open to the public and attendance is encouraged.

Officers & Past President

President: Gordon Houston C:713-906-9101
 Vice Pres: Bill Pellerin C:713-598-8543
 Secretary: Doug McCormick C:281-932-6082
 Treasurer: Warren Murdoch H:281-293-8164
 Past President: Ken Miller C:713-826-1049

Directors at Large

Greg Barolak H:281-467-5780
 Mike Edstrom
 Mark Holdsworth H:713-478-4109
 Mike Rao 832-689-4584
 John Haynes H:802-363-8123

Committee Chairpersons

Audit Scott Mitchell H:281-293-7818
 Education Debbie Moran
 Field Tr./Obsg Siobhan Saragusa H:713-376-5873
 Patricia Nadema
 Novice Justin McCollum H:409-212-2795
 Observatory Bob Rogers H:281-460-1573
 Program Brian Cudnik H:832-912-1244
 Publicity Mike Rao 832-689-4584
 Telescope John Haynes H:802-363-8123
 Welcoming Vacant
 Membership Steve Fast 713-898-2188

Ad-Hoc Committee Chairpersons

Texas Star Party ... Steve Goldberg H:713-721-5077
 AL Awards Amelia Goldberg H:713-721-5077
 GuideStar Bill Pellerin C:713-598-8543
 Outreach Alan Rossiter H:713-660-9503
 Webmaster Jeffery McLaughlin
 Email: webmaster@astronomyhouston.org
 By-Laws Review ... Scott Mitchell H:281-293-7818

Advisors

Dr. Reginald DuFour, Rice Univ.
 Dr. Lawrence Pinsky, U. of H.
 Dr. Lawrence Armendarez, U. of St. Thomas

Dues and Membership Information

Annual Dues:Regular\$36
 Associate\$6
 Sustaining\$50
 Student\$12
 Honorary N/C

All members have the right to participate in Society functions and to use the Observatory Site. Regular and Student Members receive a subscription to *The Reflector*. *The GuideStar*, the monthly publication of the Houston Astronomical Society is available on the web site. Associate Members, immediate family members of a Regular Member, have all membership rights, but do not receive publications. Sustaining members have the same rights as regular members with the additional dues treated as a donation to the Society. *Sky & Telescope* and *Astronomy* magazines are available to members at a discount.

Membership Application: Send funds to address shown on last page of *GuideStar*. Attention - Treasurer, along with the following information: Name, Address, Phone Number, Special Interests in Astronomy, Do you own a Telescope? (If so, what kind?), and where you first heard of H.A.S.

Table of Contents

3	.....President's Message
4	.....November/December Calendar
5	.....Observations of the Editor
6	.....The Antikytheran Mechanism
9	.....Herschel Space Telescope
10	.....Lisa Judd - Eagle Eye
15	.....Observatory Corner
16	.....Highlights from October Meeting
17	.....Earth Sized Planet At Alpha Cen B
19	.....Kids Outreach and Star Parties
20	.....AM Her -- An X-Ray Star

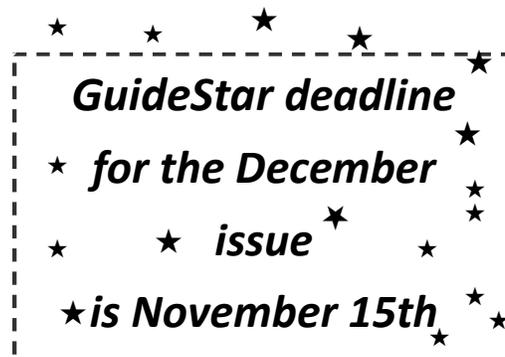
Other Meetings...

Johnson Space Center Astronomical Society meets in the the Lunar and Planetary Institute on the 2nd Friday of each month. Web site: www.jscas.net

Fort Bend Astronomy Club meets the third Friday of the month at 8:00 p.m. at the First Colony conference Center. Novice meeting begins at 7:00, regular meeting begins at 8:00. Web site: <http://www.fbac.org>

North Houston Astronomy Club meets at 7:30 p.m. on the 4th Friday of each month in the Teaching Theatre of the Student Center at Kingwood College. Call 281-312-1650 or E-mail bill.leach@nhmccd.edu. Web site: www.astronomyclub.org

Brazosport Astronomy Club meets the third Tuesday of each month at the Brazosport planetarium at 7:45 p.m. The Brazosport planetarium is located at 400 College Boulevard, Clute, TX, 77531. For more information call 979-265-3376



President's Message

by Gordon Houston, President

Hello HAS,

I know each of you is thinking about how to arrange for clear nights 365 days a year with excellent seeing, say at least 8 magnitude and 10 on the transparency index. Well, my recommendations are move to the moon and have eye surgery, implanting bionic eyes, or at least consider a flying 747 observatory like Sofia. The reality is that living in Houston is sometime akin to living on Venus. That is the challenge for us as observers, being ready and motivated when clear skies are upon us. Sometimes we miss good opportunities as we get out of the mode of observing, when extended poor conditions exist. Well, let's hope for great observing ahead this fall and winter.

Our annual elections and business meeting are upon us at our November meeting. I know that Bill Pellerin and his nominating committee have put together a slate of officers to lead the club next year. I have repeatedly talked about volunteering this past year and so, I won't disappoint. There are many opportunities to contribute outside of annual leadership positions. Many times there is one time need for help and I hope each of you take the time to lend a hand when you can.

I always like to take this opportunity to point out special contributions to HAS and this month, and that special recognition goes to Mike Rao, our publicity chair, whose \$1000 donation was the catalyst for installing the new internet Wi-Fi system out at the Columbus Observatory. I would also like to recognize two unsung workers, Allen Wilkerson and Ed Fraini. These two work tirelessly at the observatory and Allen has stepped in helping Bob with the site orientation classes. I would again like to thank Don Taylor for his excellent astrophotography pictures he has been providing as door prizes. Finally, I first want to recognize the Two Minute Drill observing tip presenter in October which was Mike Edstrom. These messages were quick and concise. I look forward to hearing the November TMDs. Until then, keep observing and Clear Skies.

Ad astra,

..Gordon Houston

President HAS

Observations... of the editor

by Bill Pellerin, GuideStar Editor

HAS Elections...

We'll vote for new officers at the November meeting. While the nominating committee has done a great job of establishing candidates for the elected positions within the HAS nominations from the floor will be accepted at the November meeting prior to the vote. (See page 16 for the list of nominees.)

If you nominate someone (you can nominate yourself) be sure that the person you nominate is willing to serve in the position for the 2013 club year.

Thanks to the nominating committee — Doug McCormick, Bill Flanagan, Don Selle, and Steve Fast for their efforts.

Lesson Learned...

You've probably heard someone talk about the right telescope for the kind of observing you are going to do, but how about the right telescope for the observing conditions you're likely to find.

On October 12 we had a star party at the Camp for All site near Brenham, TX. Last year I took my LX200 GPS alt/az mounted 8" telescope, and it worked very well indeed. It found objects in the sky for me and tracked them so that I didn't have to nudge the telescope to keep the object in the eyepiece. Worked great.

This year, it didn't work well at all, and it wasn't because anything malfunctioned, it was because observing conditions were very difficult. We had a 50 to 75 percent cloudy sky at the site, with a few stars shining through (notably Vega). The LX200 requires a two star alignment, and on a clear night it's easy to accomplish. On a night where clouds are coming and going, alignment is virtually impossible. The 'scope slewed to Alpheratz, said 'center Alpheratz', Alpheratz went behind a cloud, and so on.

What would have been better under these circumstances is an alt-az mounted manually pointed telescope. With that kind of telescope I could have pushed it to, say, Mizar, a nice triple star system. Or to Albireo, a lovely double star in Cygnus. (Ok... I could have manually pointed the LX-200 as well, but it doesn't lend itself to manual pointing easily.)

Repurposing

The word 'repurposing' has been used recently in the business world to describe the reallocation of a piece of equipment from its previous function, to a new function.

That said, let me tell you about an equipment 'repurpose'. My AT&T router comes with a Belkin 12 volt d.c. power supply. The power supply includes a battery so that even if the power goes out

there is 12 volts d.c. available to power the router. Why? Because the router must be operational for the telephone to work, and the idea is that if there's a power outage the homeowner may need to use the 'land line' phone for emergency calls.

That said, I was at an amateur radio flea market on October 20 and one guy was selling these power supplies at bargain prices. If you think about these power supplies as a battery charger and a 12 volt 7 amp-hour battery, here's what you can do. Charge the battery at home and take the unit to your observing site. Use the battery as power for your computerized telescope. Make sure that your consumption is less than 7 amp-hours and you'll be in business. These units can be picked up for little money on Internet selling sites as well.

I haven't tried this out yet, but it ought to work.

Until next time...

clear skies and new moons!

..Bill

The Antikytheran Mechanism

- An Ancient Greek Computer

By Don Selle

Book Review of "Decoding the Heavens" by Jo Marchant, 2009, Da Capo Press

If it had been recognized for what it was when it was initially discovered in 1901, it would have been world-wide news. Instead, the intricate bronze "clockwork" mechanism found among a jumbled pile of marble and bronze statuary in a shipwreck from the 1st Century BC was initially overlooked. Compared to the bonanza of original sculpture and other luxury items, it was just several non-descript lumps of corroded and calcified bronze, consigned to a box of un-cataloged fragments in the collection of a museum in Athens. One of the true marvels of the ancient world, this discovery was very nearly relegated to obscurity.

Though it took over 100 years, some very good luck and the dedication



of researchers who would literally put their careers on the line, the story of the Antikytheran Mechanism would be told. This treasure from antiquity, rescued from the bottom of the sea and the obscurity of time, stands as proof that the ancients possessed a level of technology and sophistication undreamed of before it was discovered and deciphered.

I first heard of the Antikytheran Mechanism in late 2006, when an international scientific conference on the device was held in Athens in November of that year. The results announced by several research teams examining this remarkable device were totally unprecedented. An influential paper in the journal "Nature" written by one of the research teams, along with an article describing the device and the story behind it, written by the journal's news editor, Jo Marchant, <http://www.nature.com/nature/journal/v444/n7119/full/444534a.html#a1> brought this remarkable discovery to public attention. As a result, news of the device was chronicled by several prominent newspapers and in the popular astronomy press, which is where I learned of it.

Here was a 2000-year-old device, an astronomical clock (some would say analog computer) which calculated and displayed the motions of

the planets through the Zodiac, displayed the phases of the moon, and predicted both solar and lunar eclipses. It also appears to account for the orbital eccentricity of the moon, which is repeated over a 9-year-cycle. It also kept the date and marked the four-year period of the Olympic games. "It looks just like the inside of a wristwatch...it's one of the most stunning artifacts we have from classical antiquity"¹.

In fact, the implications of this device were so stunning that early researchers felt it was not from the same time period as the shipwreck. One improbable theory advanced was that the device was a navigation instrument lost overboard, from a ship which passed by the Antikytheran wreck at least 1,400 years later. Somehow it miraculously found its way into the jumble of the wreck's precious cargo. The device was also cited by Erich von Daniken ("Chariot of the Gods? Unsolved Mysteries of the Past" - 1968) as evidence that alien astronauts had visited ancient societies.

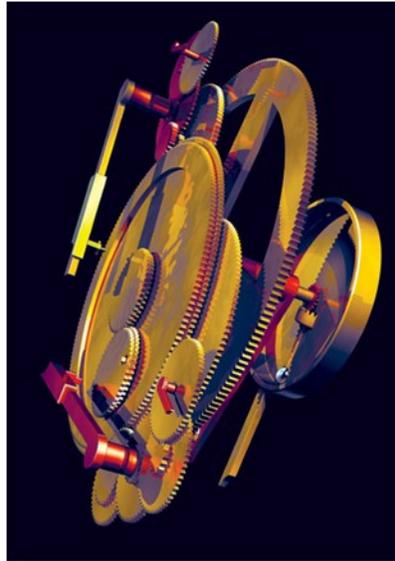
The Antikytheran Mechanism combines the scientific understanding of its makers (which was known through various writings) with a technical sophistication which was not thought to exist until well into the Renaissance. Artifacts found with the device, such as coins and vases place the origin of the ship's cargo as the island of Rhodes in the 1st Century BCE. The astronomical knowledge embedded in the device, including the 9-year lunar cycle, point to the astronomer Hipparchus as its author. Hipparchus, who was at Rhodes during this period, was the first to describe this cycle. The fact that the ship carried luxury goods including many sculptures, indicates that it might have been returning the spoils of war to Rome from one of several campaigns under way in the

(Continued on page 7)

(Continued from page 6)

eastern Mediterranean at that time.

Marchant became so intrigued by this device and what it represents that she spent much of the next several years writing a book about it. In her book, "Decoding the Heavens", published in 2009, she tells the story of the discovery of the Antikythera Mechanism. This well written and researched work brings to life this piece of ancient history and the quest to understand it. In the process of doing so, Marchant provides a solid background for why this discovery is so important, as well as a clear depiction of how this type of scholarly work is undertaken. Along the way, she clearly describes the thrill of discovery, the obsessive search for understanding, and the drama of scientific competition which gripped the researchers who struggled to decipher the enigma of the Antikythera Mechanism, and the effect it had on many of those around them.



The story of the Antikythera Mechanism begins with a history of sponge diving in the Mediterranean and how it was practiced at the beginning of the 20th Century. On a fateful day in the autumn of 1901, sponge diver Elias Stadiatis descended into the waters just off the island Antikythera, looking for a few more sponges to harvest before returning to his home port. What he found was not sponges, but a jumbled pile of people and horses on the seabed 60 meters below. The experienced sponge diver was obviously upset when he returned to the surface, and it was only after considerable discussion with Dimitri Kontos, the boat's captain, that the crew of sponge divers overcame their superstition to realize that what they had found was the wreck of a ship loaded with statuary.

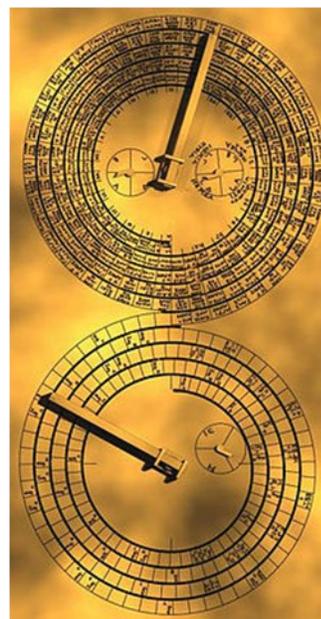
That Kontos and his crew were even at Antekythera Island was due to the fact that they had to seek refuge from a storm in the small harbor on the island. It would delay their voyage home after a successful season of sponge diving. So the fact that the wreck was discovered at all was a bit of a fluke. More importantly, the fact that the device was lost at sea, where it was out of reach until its discovery, ensured its survival. The value of bronze throughout history has meant that very few bronze pieces have survived.

On the basis of a couple of small artifacts that the divers recovered, Kontos was able to convince the National Museum of Greece to pay for an expedition to recover what could be salvaged from the wreck. It would be good additional income for Kontos and his divers, and, more importantly, would be the first ancient wreck from which archeological artifacts would be recovered.

Among the marble and bronze statuary recovered from the wreck were several fairly non-descript fragments of deteriorating bronze that were parts of some sort of mechanism with an obvious dial and several gears. Additionally, many artifacts would eventually be recovered which would help researchers fix the origin of the ship and the approximate period of time in which the wreck took place.

At first sight, the device now known as the Antikythera Mechanism, currently on display at the Greek National Museum of Antiquities, is very unimpressive. It consists of several fragments of corroding bronze metal, encrusted with (and, in many places, cemented together) with limestone deposited on it due to biological activity as it lay buried in the sand. It had once been enclosed in what was obviously at one time a well-made wooden box, which had severely deteriorated.

Upon closer inspection, however, it was clear it was some sort of instrument, complete



with gears and at least one dial. To the trained eyes of Valerios Stais, director of the museum at the time of its discovery, the device looked so out of place, that he wrote several papers describing it, though he had no way truly evaluate what it was. However, several

readable inscriptions on it indicated it was related to astronomy.

The fragments of the Antikytheran Mechanism would remain in boxes in storage for almost 50 years in relative obscurity. It was studied and photographed but "it's fair to

(Continued on page 8)

(Continued from page 7)

say that up until the Second World War scholars studying... [it] had floundered"². Its true nature was not recognized until physicist and historian of science Derek de Sola Price began his study of the device. Price's specialty, the development of scientific instruments (many of them astronomical) through the ages, and his love of things mechanical, were tailor made for this work, and he saw it as a way to make a big name for himself. He would be the first to try to reconstruct the device using x-rays of it which he commissioned.

While de Sola Price would ensure that the Antikytheran Mechanism would be recognized as a type of astronomical clock, it would be the painstaking work of Michael Wright that would uncover how truly extraordinary the device is. Wright, who was curator of Scientific Instruments for the Science Museum in London, would spend much of his career researching and crafting a re-creation of the device in his home workshop.

Hampered by his professional commitments and a lack of funding, Wright's work would span decades. During that period, he would develop a method to x-ray the fragments of the device with the focus of the image at varying depths, as is done in modern day CT scans. He would spend several months of painstaking work imaging the fragments, only to lose the resulting photographs to a colleague and lead researcher (who had provided the funding), who made little progress in publishing any results before contracting cancer. He would return most of the photos to Wright before his untimely death.

When Wright had at last started to make significant progress publishing his results, he learned that he had competition from a well-funded team of researchers headed by astronomer Mike Edmunds of Cardiff University and mathematician Tony Freeth. The two had run across the work of Derek de Sola Price, and were amazed that such a device was so little known. Together they would enlist the help of a researcher with very sophisticated imaging technology to tease out the inscriptions on the face and back of the device, as well as a company developing specialized x-ray tomography machines for use in the aerospace industry.

Without spoiling the story, the results of the research have uncovered the true nature of this remarkable artifact. Marchant's in-depth research and clear writing style bring this story to the reader in a very compelling way. If you are interested in ancient history, archeology, archeo-astronomy or the way modern research is done and communicated, this book is very good read and highly recommended.

Notes:

1. "In Search of Lost Time" Nature, 30 November 2006, Jo Marchant
2. "Decoding the Heavens", page 46

(Continued from page 18)

We've seen stars that appear to vary because star spots are transported across the face of the star as it rotates. We've witnessed stars being eclipsed by unseen companions in extremely close orbits around their center of gravity, and now we can see the incredibly small changes in the light of a star as a planet crosses in front of it from our point of view.

Alpha Centauri B exhibits all of these phenomena at the same time. It rotates, it pulsates, it has spots, it's a member of a binary system, and now we know it has a planet, perhaps several, and there is a chance we can see them transit the face of our close stellar neighbor if we turn our satellites on them. It is becoming apparent that the more we look, the more we will find planets around stars everywhere. It has also become obvious that the closer we look, the more we will find every star is a variable star to one degree or another at one time or another in its life. Alpha Centauri B is another interesting and exciting member of the variable star zoo.

*This content distributed by the
AAVSO Writer's Bureau*

A Cosmic Tease:

Trials of the Herschel Space Telescope Science Teams

By Dr. Marc J. Kushner

Vast fields of marble-sized chunks of ice and rock spun slowly in the darkness this week, and I sat in the back of a grey conference room with white plastic tables spread with papers and laptops. I was sitting in on a meeting of an international team of astronomers gathered to analyze data from the Herschel Infrared Observatory. This telescope, sometimes just called Herschel, orbits the Sun about a million miles from the Earth.

The meeting began with dinner at Karl's house. Karl charred chorizo on the backyard grill while the airplanes dribbled into Dulles air-



Samuel Pierpoint Langley, who developed the bolometer in 1878. His instrument detects a broad range of infrared wavelengths, sensitive to differences in temperature of one hundred-thousandth of a degree Celsius (0.00001 C). In 1961, Frank Low developed the germanium bolometer, which is hundreds of

senses infrared light, a kind of light that we would probably refer to as heat if we could feel it. But the idea of pointing the bolometer at the stars was not to collect ordinary starlight. It was to measure heat coming from the vicinity of these stars, like an infrared security camera, in case there was something else to be found lurking nearby.

And lo and behold, for a handful of stars, the bolometer measurements were off the charts! Maybe something was orbiting these stars. From the details of the bolometer readings—which channels lit up and so on—you would guess that this stuff took the form of majestic fields or rings of icy and rocky particles. It would be a new kind of disk, a discovery worth writing home to Madrid about.

port. Our colleagues arrived, jetlagged and yawning, from Germany, Sweden, and Spain, and we sat on Karl's couches catching up on the latest gossip. The unemployment level in Spain is about twenty percent, so research funding there is hard to come by these days. That's not nice to hear. But it cheered us up to be with old friends.

The meeting commenced the next morning, as the vast fields of ice and rock continued to spin—shards glinting in the starlight. Or maybe they didn't. Maybe they didn't exist at all.

You see, this team is looking at a series of images of stars taken by a device called a bolometer that is blind to ordinary starlight. Instead, the bolometer inside Herschel

NASA Space Place

There are several teams of astronomers analyzing data from the Herschel Space Telescope. They call themselves by oddly inappropriate sounding acronyms: GASPS, DUNES, DEBRIS. For the time being, the scientists on these teams are the only ones with access to the Herschel data. But in January, all the data these teams are working on will suddenly be released to the public. So they are all under pressure to finish their work by then. The team whose meeting I was sitting in on would like to publish a paper about the new disks by then.

But it's not so simple. The stars that this team had measured were relatively nearby as stars go, less than a few hundred light years. But the universe is big, and full of galaxies of all kinds—a sea of galaxies starting from maybe a hundred thousand light years away, and stretching on and on. Maybe one of those background galaxies was lined up with each of the stars that had lit up the bolometer—fooling us into thinking they were seeing disks around these stars.

The team argued and paced, and then broke for lunch. We marched to the cafeteria through the rain. Meanwhile, vast fields of marble-sized chunks of ice and rock spun slowly in the darkness. Or maybe they didn't.

What else did Herschel recently uncover? Find out at <http://spaceplace.nasa.gov/comet-ocean>.

Dr. Marc J. Kushner is an astrophysicist at the Exoplanets and Stellar Astrophysics Laboratory at NASA's Goddard Space Flight Center. NASA's Astrophysics Division works on big questions about the origin and evolution of the universe, galaxies, and planetary systems. Explore more at <http://www.science.nasa.gov/astrophysics/>.

Just Looking

A GuideStar Interview by Clayton L. Jeter

Lisa Judd — Eagle Eye



I have known Lisa Judd for at least a decade. This lady is an outstanding visual observer. Her eyesight is a total 5-star plus. And.... She does all her observing with a vintage Edmund Scientific 6" f8 with no finder scope. She actually prefers to star-hop while looking down the optical tube assembly (OTA) as a reference. She has removed the finder and simply sights down the tube.

At this year's Okie Tex Star Party held in September, I was lucky enough to be able to observe next to her. I learned a lot about her star hopping



technique among other tips and tricks. It's really amazing how well a good collimated 6" f8 (the standard scope dozens of years ago) can perform in dark skies. She would holler at me in the darkness, "Hey Clayton, I found another Arp galaxy....wanna see?" I would peek through the eyepiece and Bingo, there it was! How did she do that I wondered...no finder, only 6" of aperture, and uses

paper charts.

I think you'll really like her Bio, but the interview will be memorable. Here she is, meet Lisa...

The Lisa Judd bio...

Lisa Judd is an experienced observer who loves to participate in clubs and attend all the country's large star parties. Although she never got the hang of astrophotography (who knows - there's still time), she loves working observing lists from the Astronomical League and other sources she finds. She has traveled to the southern hemisphere twice, and is about to embark on another jaunt to Lake Tekapo in New Zealand for more to fill her log. She often describes the goal of collecting

astronomical objects as feeling just like collecting Pokemon.

Although most astronomers got the bug either from childhood or from the influence of the Apollo program, Lisa came along a bit later, becoming fascinated with planetary science during the Voyager missions. After studying icy satellites throughout the latter part of childhood, she got into the observational aspect of astronomy in her 20's, and was privileged to be learning her constellations in the desert southwest while walking to graveyard shift work to get herself through college. After a short aerospace career contributing to the International Space Station in Houston and growing with clubs there, she now resides in Colorado and serves as Vice President of the Denver Astronomical Society.

Lisa is partial to the sharp optics of classic Edmund scopes, and is currently using a 6" purchased used at TSP in 2003 from an as-yet-unknown person from Michigan. This little sharp scope, despite the size, has revealed almost all of the Herschel II's under dark skies and with consistently-developed observing skills, and to date it is the only one of her telescopes that she has ever paid for. She is restoring a 12.5" Cave in her garage, which will, she hopes, be ready for show at the next big star party - TSP, Okie-Tex or WSP.

The Lisa Judd interview...

Clayton: It's so nice to have you here with us this month Lisa. Thanks for taking the time to discuss your astronomy passion. I learned much watching you star hop, note taking (recording your observations), and your drive to find that next elusive galaxy. You're a real

(Continued on page 11)

(Continued from page 10)

die-hard visual astronomer...me too.

You stated in your bio that you're now restoring an old Cave 12 1/2" Newtonian. Are you racing to get this project completed to being able to see more faint fuzzies or are you happy with your portable 6" Newt?

Lisa: Well, both. I refuse to race with the Cave as that could spell doom for the quality, and in the meantime there's still plenty to try with what I've got. Of course, aperture fever can't be cured – and there's a whole lot more to try with what I don't have available yet. This great little scope has gotten me through almost all of the Herschel II's, and I love that! But, there's a dozen or so that are just plain out of reach of a 6", and that means getting the Cave ready before I can finish the list. It's tough to tell when you've exhausted the capabilities of a favorite scope – but I'd feel unfaithful if I didn't use it to its fullest extent. Also, it's important to note that I'm just finding some of those Herschel II's, not enjoying them – called flea-hunting.

The main focus for restoring this scope is portability. It was permanently mounted in someone's yard before being moved a few times, and now my task is to work with some Edmund pier legs that our club prez sold me (thanks Ron!) to be able to set it up in a field of my choice. The tube is 7 feet long, so the scariest part is to design it so that I can cut it into 3 sliding pieces without sacrificing collimation. With luck and brains and enough time to do it right, my lofty goal is to stuff it into the back seat of my little Mustang. Ron's laughing now, but I'll prove him wrong eventually.

Clayton: I would assume that your old Cave telescope has pristine optics. Tell us more about this "oldie but a goodie". Where did you get it?

Lisa: Glad you asked! Participating in an astronomy club is so rewarding, and among the many perks is that there's always someone who can't house their scope anymore and wants to make sure it goes to a good home. I have Vic Burhans to thank for giving me this beautiful project, and it was one of the first things to fall upon me after offering to be Vice Prez. There's a history of hands that it has passed through as a "one of these days" project, and I hope I'm its last stop so it can really perform. In addition to getting it ready to finally see some use after so many years, it'll be an equally important project to hunt up the entire history back to 1965.

I'm still working with the portable pier, which means I can't "really" look through it yet, but last time I simply held the tube up and hand-held an eyepiece to focus from the secondary, it didn't look all that sharp. So, wonderful friend Mike Hotka from Longmont sold me a 1973 Coulter mirror, which has a bit longer focal length so I may have to move the spider all the way to the end of the tube (or past). I'll keep the old mirror for another project that I've always wanted to do, cobbling it together with a mirror cell that I got at WSP and an old rusted-out hibachi. My townhouse is the first place I've lived that has a garage, so I'm making full use of it.

Clayton: You tend to always use modest equipment and yet have spectacular results. I'm thinking that you have "Steven O'Meara/Matt Delevoryas" type eyesight. How would you rate your seeing ability?

Lisa: I've always known that I've been blessed with eagle eyes (she said modestly), and that they wouldn't last. I'm coming up on 43, and my vision is only now starting to go, seeing distant telephone poles as double. I miss the days of seeing 3 Galilean moons naked-eye in a dark sky, and hope I've filled the blessing now that I couldn't filch Regulus out of Venus' glare last Wednesday without binoculars. It's a totally new thing for me to try to shop for a vision plan amongst health-insurance offerings, but there's a time for every lesson, and this is it. Meanwhile, I'll use them until they fall out of my head. I've always said that I could deal with losing a limb or two, but if I lost my sight I'd really be in trouble.

Clayton: Why no finder scope on your Edmund?

Lisa: In a phrase, "why bother?" I like balancing the tube to be my longest chore in setting up, and anything that takes more time than that seems like a waste. Also, finder scopes are held in place with three bolts but have perpendicular cross-hairs, so you have two coordinate systems in mind – 3rds and 4ths - when you adjust them. For musicians in Houston, have you ever tried snapping one hand's fingers in whole measure, the other in half-measure, and then tapping one of your feet in thirds within the measure and the other in fourths? I can do 1's and 2's and 3's together, or 1's and 2's and 4's, and can easily switch between those – but I can't do 3's and 4's together. Can you?

When you get out to a dark site, it's nice to have simplicity in setting up so that you can spend more time observing and not worrying about dropping a screw in the dark that you might never find

(Continued on page 12)

(Continued from page 11)

again. I used to enjoy finding ways to run a laptop on a DC source and customizing my car to hold elaborate setups, but it didn't take long before I found that playing with the toys didn't hold a candle to using them. I've been through a few cheap "camping laptops", but in the end I just thought it was easier to scribble the old way and type in the observations later. Becky Ramotowski (then Schultz) taught me to put notebook hole reinforcement stickers on my star maps, which in the field allows me to zoom through a whole area making list-worthy observations without skipping over anything important. I also keep just a few accessories in a fanny pack rather than bringing the whole eyepiece case.

Clayton: Tell us a bit about your Denver club. Are they generally an outreach group? Do you all have an observatory? And you're the Vice President! Congratulations. Are you the next in line for Prez?

Lisa: DAS is unique in that we take care of an old observatory from 1894, sitting in the middle of town but still with surprisingly low light pollution levels. We're there every Tuesday and Thursday night, making use of a fully-working 20" Alvan-Clark refractor with a doublet lens that's considered priceless today. The historic observatory belongs to DU but is run by the club, so the school gets all this free slave labor for their outreach requirements and we get this wonderful instrument to play with. The club's been going since about 1948, and we've always been married to Chamberlin – so instead of going out to schools and groups, they come to us. We also have a dark site an hour east of town with a new observatory; heavily used.

Prez and Vice Prez are two different animals, and it's usually just as hard for a nominating committee to find either one. I prefer the vice prez position because it allows me to use the specific leadership skills I've got. For almost any club, the veep's main job is to schedule the speakers, and I consider it just as important to do some speaking to other groups as it is to ask people to speak to ours. With the huge amount of talent mainly concentrated in Boulder, I committed for 3 years just to have enough meeting dates to accommodate all the requests and recommendations. My other big job is to organize the parties – holiday, summer picnic, and spring banquet. The banquet is meant to welcome each year's new officers and is the most heavily attended one, even in a deep snow, so the speaker needs to be prestigious.

I've also had fun piloting a "job jar", meant to give specifics for calls for volunteers to farm the next group of leaders; it's been working very well in just a few months' publishing in our newsletter, and allowed us to decentralize so that one or two people aren't over-busy doing all the jobs for such a large (~400) club. I may not make a very good prez, though, as I have a disorder that makes me use wrong words for things on the fly which could cause trouble. I'm fully in awe of our club prez and any club's prez, though, in that the prez gets to handle whatever comes at them whereas a veep's job is often more predictable. Overall, though, the kudos go to the members! Good officers are worth nothing

without good people holding them up.

Clayton: From the Houston area, how did you find your way to Colorado? Do you miss Houston?

Lisa: Goodness, yes! Those were my best career days. When the Space Launch Initiative – one of many attempts to replace the shuttle - threatened layoffs for the entire industry around Johnson Space Center, my managers took great pains to stash me in Littleton on a temporary gig to get the Spitzer (then SIRTf) ready for launch, then come back later, missing the bloodletting. Unfortunately, SIRTf had its own funding problems and they had to dump me back on the Houston pay system right when the layoffs were coming through. So I voluntarily took a temporary layoff, while on TDY in another state during the Christmas season, and then Columbia happened soon afterward, so it turned into a permanent layoff.

I came to Colorado Springs to try to finish my Masters' degree, which was found to be pathetically disorganized; and I've been stuck here ever since, working a series of military jobs that always disappear after a few months due to very bad strategy and ineffective leadership. Now on layoff #4, with lots of resume gaps, I've had a sudden opportunity to leave the industry behind until I see less pretending and more critical thinking. Serving the astronomy club has afforded me the opportunity to feel like I have my NASA days back – great people (in Denver, anyway), real thinkers, adults, responsible and diverse. It's nice to be spending my time and talents to accomplish great things again, now that I don't have to worry about making a salary just to eat.

Clayton: What's your attraction to the night skies? Got a favorite object?

Lisa: I feel right at home swimming amongst things I've never looked at before; a natural night owl whose eyes work better in the dark. I've always called it an exercise in humility, as a good contrast

(Continued on page 13)

(Continued from page 12)

to all the things people do to feel a little bit extra-special as a person (while conveniently not doing anything to earn it) or form a misplaced identity from. It's a discipline of discovery, which keeps us on our toes, allows us to stretch our minds outside what we like to think we know, and prevents us from getting conceited. It's worldly as well – stargazers come in all cultures – and point-blank natural history is a whole lot larger than human history.

Although 9 out of 10 objects on any given list might be boring, that 10th one is a memorable one that you may have never seen if you hadn't been working a list. It's tough to pick a favorite because there are apples, oranges, bananas, wheat stalks and steaks out there. But, what I recommend to others are those little known ones outside of what we call "the usual eye candy" – thus spurring others to explore new things. I get excited about showing off the Double Bubble, the Owl cluster (or E.T. cluster), the Blue Snowball, a weird little dark nebula in Lacerta called DN 1910, the Silver Coin and NGC 288 (always together), and telescopic asterisms like Ally's Braid in the Pleiades or Kemball's Cascade ending in my "road kill owl" cluster.

Clayton: How would you like to see your own astronomy grow?

Lisa: Right now, while enjoying lists, I'm still in the reconnaissance phase doing a volume business. I keep my logs in Microsoft Access and am now just over 3000 records, but still consider it as my own general sky survey. As I age and my eyes get worse, it'll be time to develop a little more patience, which means getting into imaging finally. At that point, I can sit down with a particular object and work for quality rather than quantity, studying more about the object itself and learning the science of how it works, rather than getting excited about the hunt of finding it. Naturally, it'd be a requirement to get more technical about precise equipment and more complicated setups. Maybe I'll even start using my finderscope ;-)

Clayton: So you too are a star party nut. I too try to make at least 5 per year. Have you got a favorite, and why?

Lisa: Okie-Tex is my favorite, with Texas Star Party a close second. It seems like Okie-Tex has all the good things that TSP has, but without some of the academic politics or posturing that cause a false sense of reverence. Every star party has its own flavor – WSP does kids programs and competes with other attractions around Florida; western star parties like RMSS, WUTS and NSP combine scoping with a camping and fishing feel; and DSRSG forces late-night relaxation and naked-eye astronomy in a lawn chair when the ground cloud rolls in and fogs optics.

The uniqueness that I referred to in the next to last question also means that fall skies give access to the "other" smattering of galaxies that extend to the southern horizon. As observers know, galaxies are found at the north and south poles of our own galaxy – in Coma Berenices and Sculptor, respectively – so they're found

90 degrees in either direction from the Milky Way. In either hemisphere, springtime happens to be galaxy time, so while we look at Coma at TSP we have to wait until the southern hemisphere's spring (fall here) to go through all the wonders of Piscis Austrinus, Grus, Phoenix, Eridanus, the Fornax cluster, and of course Sculptor.

Of the three week-long ones – TSP, Okie-Tex and WSP in the Florida Keys – Okie-Tex is the one that I always take the most away from, whether it be record numbers of observations, new friends met and old ones re-met, or that perfect and unique thing that I always seem to find every year at the swap meet. It's only a 5-hour drive, wildfires have never been a problem, there's some good rockhounding and wild-west history in the area, and I've been lucky in that every year I've been able to go the weather has been perfect; every year I haven't gone it's been crummy. Usually, the round borders of the Gegenschein are obvious, even as it sets behind the hill at dawn at the end of a sky-wide line of ecliptic glow from the zodiacal light.

Clayton: It seems in recent years that the younger people are not that interested in amateur astronomy, or any of the sciences. Are you attaining any young club members in the Denver area? How can we turn this around?

Lisa: Yes indeed! The Denver club has long had a scholarship program that's very well received, and students and young adults contribute; high schools have intern requirements. Our August speaker was a home-schooled junior, and meetings are bus-accessible. I've noticed that sky appreciation and astronomy in general has become an "in" thing more lately across the country, and I've no doubt that we have the efforts of many nameless others to thank for that. The western half of the US doesn't have the same kinds of light pollution problems, and certainly the efforts in national parks have con-

(Continued on page 14)

(Continued from page 13)

tributed to getting families with kids involved in astronomy. With all the nature-related goings on in Colorado culture, the odds are in our favor.

One caution, though – 3rd through 6th grade is the “hooking” age for anything that would eventually create a career, so keep in mind that there’s a minimum age for astronomy. Trying to introduce a 6-year-old to the immensity of the universe is a mistake, despite what proud parents may try to believe. It takes awhile for minds to open up wide enough for this kind of information; until then the “yes I see it” that you hear out of the mouths of babes is meant to please mom and dad, not to learn about what they’re looking at. Better to point out a wild rabbit on the ground, where depth perception can come into use. My neighbor’s pre-schooler had lots of fun with the Moon through a plastic Galileoscope – even demonstrated an ability to find it (!), but couldn’t understand Jupiter and swore it was a streetlight. Overcast skies also don’t compute; a small child expects a galaxy to be painted into the glass.

Clayton: Do you have any helpful advice to pass on to observers just starting out in astronomy?

Lisa: With the large amount of new members we’ve got, this is something we love to talk about. As opposed to 10 years ago, people come just with an interest rather than questions about how to use a new scope they might’ve bought, which is great. Instead of getting lost in the vast expanse of milky way that you see in a dark place with no moon, it’s better to divide the sky into 40 pictures, which gives a sense of organization and allows you to navigate to where the cool stuff is. And with binoculars, you always have a context of where you’re pointing and where you need to go, which the field of view of a telescope won’t give you.

The usual spiel is that rushing out to buy a telescope is not step 1. Instead, to gain an appreciation of the sky, you get a lawn chair and a good star map and a red flashlight, and enough patience and persistence to spend the first year learning constellations. Also, a decent pair of cheap binoculars will help to see the fuzzy things in those constellations as they become familiar. Some people go for an after-dinner walk every night, and soon get an idea for what rises and sets at different times of night for different times of year. So any time you have a new person introduce themselves to your club at a meeting, don’t ask what kind of scope they have right off the bat. If they’re already experienced, they’ll volunteer that info.

Clayton: Is there an email address that you have that a Houston Astronomical Society member could contact you for an additional question or two?

Lisa: Certainly! I love to hear from anyone – it’s:
lm_judd@hotmail.com

Clayton: Thank Lisa for taking the time to share your interest and thoughts within our HAS newsletter, the *GuideStar*. We wish you

luck with all of your astronomy interests. Please come visit our society when in the Houston area, we’d love to see you again.

Lisa: Of course! I’d love to come spend a week there and re-visit any of my old haunts that may still be standing. It’s most likely to happen if the Lunar and Planetary Science Conference sees fit to move back into the Johnson Space Center area rather than being up north of the city.

Clayton: Clear skies always,

Lisa: Clear, dark skies is DAS’ new motto these days, and I wish them to all of you.

Clayton L. Jeter is an avid SCT visual observer and a longtime member of the Houston Astronomical Society. Contact him at: stonebloke@gmail.com

Observatory Corner

By Bob Rogers, Observatory Chairman

Hello everyone.

The work continues on the Observatory upkeep and repairs. Allen Wilkerson has put in a lot of weekends at the site working on the Observatory and doing a lot of mowing. He has the place looking really good. Thanks Allen for your help.

On the weekend of October 6th, Allen Wilkerson, Rene Gedaly, Don and Anna Taylor and I dug up the old bathroom sidewalk lights and wiring and installed 5 new red lights and wiring all encased in PVC pipe to protect the wiring from the elements. I want to extend a big thank you to everyone for all their help on this.

Below is a list of things done in the last 2 months at the site. As everyone can see, the Observatory Committee does more than just mowing.

Mowed the East, West, South fields, Entry and Exit, Observing field, around Observatory, Picnic and trailer areas, and the North fence line as well as trimmed (weed eating).

- Replaced the heating element in the water heater.
- Lubricated the rolloff roof mechanism.
- Repaired the broken focus knob on the C14.
- Removed fallen limbs and trash to the burn pile.
- Replaced the refrigerator in the Bunkhouse.
- Unstopped the toilets and re-saturated the septic system.
- Replaced 3 nonfunctioning Entry/Exit lights and repair one Exit light wiring issue.
- Replace bathroom sidewalk lights with new lights and run the electrical power for them in conduit.
- Replaced the riding mower deck with new one and moved all spindles and blades to new deck.
- Conducted electrical survey of trailer pole loading and 30 amp plugs.
- Replaced the transformer on the Bunkhouse timing relay.
- Replaced the transformer on the Corby system and the Corby board. Repaired the Observatory to Chartroom button timer.
- Removed 7 bags of trash and debris off site.
- Restocked fuel for the tractor and riding lawnmower.
- Lubricated the F5 and F7 mounts.
- Collimated the F5 and F7.
- Cleaned the Observatory eyepieces.
- Organized, labeled, and properly protected (individual bolt cases) stored the eyepieces in the Observatory.
- Repaired the nonfunctioning Telrad on the F7 (replaced the battery holder – old one corroded).
- Cleaned the Dobshed and tractor sheds.
- Applied Roundup to the Observatory parking lot, roadways, and Entry area.
- Installed privacy curtain in Bunkhouse.
- Trimmed the pathway to the rest-rooms.
- One new Key holder trained by John Haynes and Allen Wilkerson.
- New bunk bed for the Bunk house
- Coffee maker for the Star parties (hospitality), Coffee and condiments donated by Rene Gedaly.
- Antenna and Router from the previous Wi-Fi service are being used. Don Selle and Mike Edstrom went to the site to allow the Tech to install the new Wi-Fi service.
- Filled all trailer spots with renters.
- Will have electrician come out and install new pole in picnic area with two 30amp drops to have room for 2 more weekend trailer spots.
- New cooking stove (donated, Don Selle) and grills installed in the cooking area for improvement of cooking area. Getting rid of the old Charcoal grills.
- Added Rene Gedaly to the Observatory Committee for her help with the new Novice group.

And the work goes on

I **do need** to remind everyone that we need

(Continued on page 16)



Highlights from the October Meeting of the Houston Astronomical Society

By Doug McCormick, Secretary

- HAS President, Gordon Houston, welcomed the new members and visitors present at the meeting.
- HAS Vice President, Bill Pellerin, presented the nominations for club positions for 2013:
 - President, Bill Pellerin
 - Vice President, Mike Edstrom
 - Secretary, Rene Gedaly
 - Treasurer, Don Selle
 - Board, Greg Barolak
 - Board, Mark Holdsworth
 - Board, Mike Rao
 - Board, John Haynes
 - Board, Brian Cudnik
 - Audit, Scott Mitchell
 - Education, Debbie Moran
 - Field Trip/Observing, Steve Fast
 - Novice, Debbie Moran (update)
 - Observatory, Bob Rogers
 - Program, Brian Cudnik
 - Publicity, Mike Rao
 - Telescope, John Haynes
 - Welcoming, Open
- Bill Flanagan announced an upcoming outreach opportunity: Fathers and Flashlights on 10/6/12.
- Gordon Houston reminded everyone of the Regional Clubs meeting on 10/19 and Astronomy Day on 10/20/12.
- Education Chair, Debbie Moran, encouraged everyone to get their scopes out for the public on Halloween. She also spoke about her recent efforts in the fight against light pollution.
- Gordon Houston and Doug McCormick presented a beautiful picture of the Elephant Trunk nebula to Leland Dolan.
- Mike Edstrom presented a two-minute drill talk about deep sky observing with tips about jiggling the scope and using the eye as a camera.
- Member, Larry Mitchell, delivered his presentation on Abell Planetaries.

(Continued from page 15)

to start filling out Log Reports at the site so I can give this information to the Fondren Foundation. The property is on a 99 year lease and part of the Lease agreement is that HAS needs to report every year to the Fondren Foundation that the Property is being used. The Log Reports are located in the box in the middle of the field. Just open the cover, fill out the report and then slide it into the slot that is in the inside of the cover and then close the box. It is very important that everyone fill out a Log Report so that we are showing that the Observing site is being used. Your help on this is very much appreciated.

If you have a Randalls card, and have not done so, please have it coded for the Houston Astronomical Society. Our number is #6618. The Society gets 1% of the gross sales that members spend at Randalls. Randalls totals up the amount spent each quarter and will send us a check if the amount goes over \$2,500.00, otherwise the total rolls over to the next quarter or zeros out at the end of the calendar year. So please link your Randalls card to the Houston Astronomical Society so that the society can benefit from this Randalls program. Our number is

#6618. This is very easy to do, just go to the Courtesy Booth and tell the person there what you want to do.

If you have any suggestions or thoughts for the site, let me know.

Thanks,

Bob Rogers

Observatory Chairman

281-460-1573

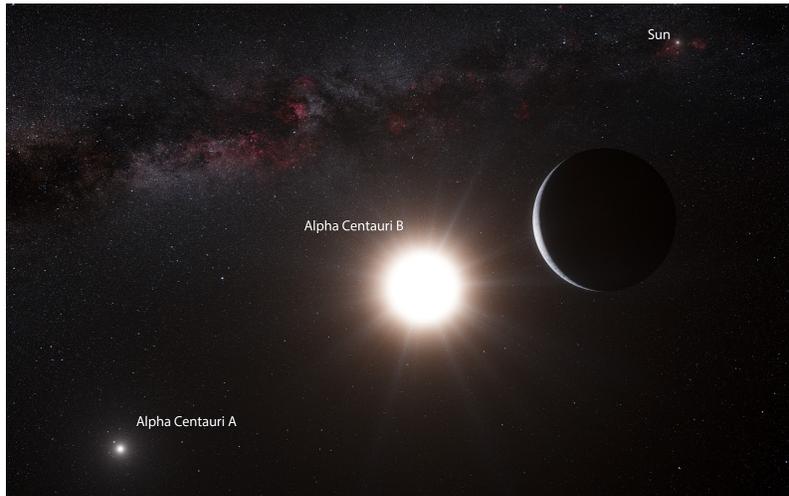
siteworkerbob@hotmail.com

Trailer/RV spots available free for weekend use at the site. Contact the Observatory Chairman, Bob Rogers siteworkerbob@hotmail.com for more information

Earth Sized Planet Found Orbiting Alpha Centauri B

By Mike Simonsen, Sismostronomy

<http://sismostronomy.blogspot.com/>



One of the most exciting exoplanet discoveries in decades was announced yesterday in an online ESO press conference. The discovery was to be officially announced in an article in the journal *Nature today*, but due to the excitement surrounding this discovery ESO and *Nature* agreed to lift the embargo a day early. I think they realized they weren't going to be able to keep the lid on it for another day. The fact that an Earth sized planet had been discovered orbiting one of our nearest stellar neighbors, Alpha Centauri B, was a headline dying to be exploited by the press.

The planet was detected using the HARPS instrument on the 3.6-meter telescope at ESO's La Silla Observatory in Chile. HARPS can measure the radial velocity of a star with extraordinary precision. A planet in orbit around a star causes the star to move towards and away from an observer on Earth. Due to the Doppler effect, this radial velocity change induces a redshift of the star's spectrum towards longer wavelengths as it moves away and a blueshift as it approaches. This tiny shift of the star's spectrum can be measured with a high-precision spectrograph such as HARPS and used to infer the presence of a planet. Of course it's not quite as simple as that.

How Do They Do That?

Alpha Cen B is a spectral type K1V star only slightly less massive than our Sun and cooler. There are a lot of competing signals combined in the light from Alpha Cen B, inducing a radial-velocity "jitter". In the process of filtering out these additional sources of noise the team of astronomers was able to learn quite a bit more about the star itself. They determined that the star has spots like our Sun. As a star rotates, spots will appear to move from one side of the stellar disk to the other, introducing a periodic signal. This will correspond to the rotational

period of the star. The radial velocities of Alpha Centauri B show a clear signal at 38.7 days, the rotational period of the star. They also learned the star has a solar-like star spot cycle with activity increasing and then decreasing over the four year period of the observations.

Additionally, the team had to filter out the effects of the radial velocity changes due to the star being a member of a binary system, as well as the fact that on some occasions of poor seeing the light from Alpha Cen B was contaminated with light from the primary, Alpha Cen A. As if that weren't enough, they also had to remove the effect of the changing velocity of the Earth in the direction of the star as it orbits the Sun before the signal of a small rocky planet orbiting the star could be detected.

"Our observations extended over more than four years using the HARPS instrument and have revealed a tiny, but real, signal from a planet orbiting Alpha Centauri B every 3.2 days," says lead author of the paper, Xavier Dumusque (Geneva Observatory, Switzerland and Centro de Astrofísica da Universidade do Porto, Portugal). "It's an extraordinary discovery and it has pushed our technique to the limit!"

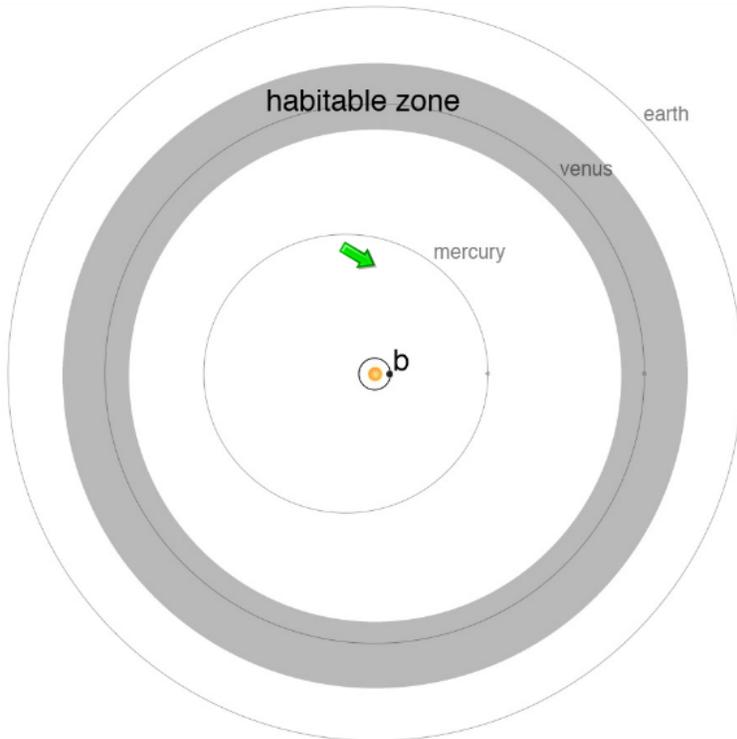
Why is this important?

The technical achievement alone makes this an extraordinary discovery. It is the lowest mass exoplanet ever discovered, and now the closest known. This is a major step forward in detecting Earth twins. Unfortunately, the planet orbits so close to its parent star (0.04 AU) that its surface temperature is estimated to be approximately 1500 degrees Kelvin, so the chance of the planet supporting any kind of

(Continued on page 18)

(Continued from page 17)

life is doubtful. But, the precision required to obtain this result would also allow astronomers to detect a planet four times the mass of Earth in the habitable zone of a Sun-like star (habitable super-Earths) with periods in the range of 200. The fact that this planet was discovered orbiting a star in the Alpha Centauri system sparks the imagination. How many science fiction books have speculated about the existence



Alpha Cen Bb and the habitable zone around the host star. Credit: Greg Laughlin from EPO press conference

of planets around our nearest stellar neighbor? Now it is science fact. There is at least one planet in the Alpha Centauri system, and probably more.

"This is the first planet with a mass similar to Earth ever found around a star like the Sun. Its orbit is very close to its star and it must be much too hot for life as we know it," adds Stephane Udry (Geneva Observatory), a co-author of the paper and member of the team, "but it may well be just one planet in a system of several. Our other HARPS results, and new findings from Kepler, both show clearly that the majority of low-mass planets are found in such systems."

The Kepler mission has found 2300 candidate planets by searching for exoplanet transits among the 10,000 or more stars it monitors continuously. The majority of planet candidates detected by this transit method are very distant from us. In contrast, the planets found by HARPS are around stars close to the Sun, this new discovery being

the closest yet. This makes them better targets for many kinds of additional follow-up observations such as characterizing the planet's atmosphere.

What next?

Astronomers will now continue with extensive Doppler monitoring of Alpha Centauri B to try to detect additional planets, perhaps some in the habitable zone. This will become increasingly difficult as the separation between the Alpha Cen binary is decreasing over the next several years. They may also try to observe it from space to see if they can detect the transit of the star across the face of Alpha Cen B. The eclipse will be too shallow to observe from the ground. There is about a 10% chance of success, with the odds being higher if the orbital plane is in line with the binary plane, estimated at 11% inclination with respect to Earth.

How does this fit into variable star science? The study of variable stars is really the study of the secret lives of stars. How are they formed, how they live out their lives and what changes occur internally and externally as they evolve. We learn about the environments surrounding them, including planets and other companions, and their affect on these partners; and finally, how they end their lives slowly fading away, stripped of their atmospheres or violently exploding, seeding the universe with the materials to build more stars, planets and us.

At almost every phase in a star's life it varies in its light output. If the variation is large enough and occurs on human timescales, we, the observers of the AAVSO, can record and study these changes, and we have now for over 100 years.

In that time we have learned about all kinds of variations in stellar output and how to interpret it. Some stars vary as they pulsate, actually changing size physically, growing and then shrinking again, sometimes with a precise period, sometimes irregularly.

(Continued on page 8)

Kids Outreach & Public Star Parties, October - December 2012

Event: Thornton Middle School

Type: **Urban** School Star Party – Astronomy is the Main Event!

Date: Friday, 11/16/2012 (1/18/2013 as rain date)

Time: 6:30 PM – 8:30 PM

Location: 19802 Kieth Harrow Blvd., Katy, Texas, 77449 (off Fry Road)

Event: Arcadian West Star Party

Type: **Urban** Observing & Talk for Apartment Complex

Date: Monday, 11/19/2012

Time: 7:00 PM – 9:00 PM

Location: Arcadian West Apartments, 14220 Park Row, Houston, TX 77084 TX

Event: Askew Elementary Star Party

Type: Elementary Science Night, with numerous organized activities. Telescopes outside + indoor astronomy activity.

Date: Tuesday, 11/27/2012

Time: 6:00 PM - 8:30 PM

Location: Askew Elementary, 11200 Wood Lodge, Houston, TX 77077 (west side of Houston, near Wilcrest @ Briar Forest)

Event: Tinsley Elementary "The Great Reading Campout"

Type: Elementary School Literature & Science Night. Numerous organized activities.

Date: Thursday, 11/29/2012

Time: 6:00 PM - 8:00 PM

Location: Tinsley Elementary, 11035 Bob White Dr., Houston, TX 77096 (southwest side of Houston, near Fondren @ West Bellfort)

Name: The Houston Arboretum Spring Star Party

Type: Mostly Adults – Arboretum Members. An evening at the Arboretum. Food & Drink!

Date: Saturday, 12/08/2012

Time: 7:00 PM – 9:00 PM (tentative)

Location: Houston Arboretum, 4501 Woodway Drive

Event: Tents in Town

Type: Urban Overnight Camp for Kids & Parents. Numerous organized activities.

Date: Saturday, 4/06/2013

Time: 6:00 PM - 9:00 PM

Location: Zindler Park, 7008 South Rice, Bellaire, TX 77401

Details – especially times – are subject to change

Shallow Sky Object of the Month

AM Her—An X-Ray Star

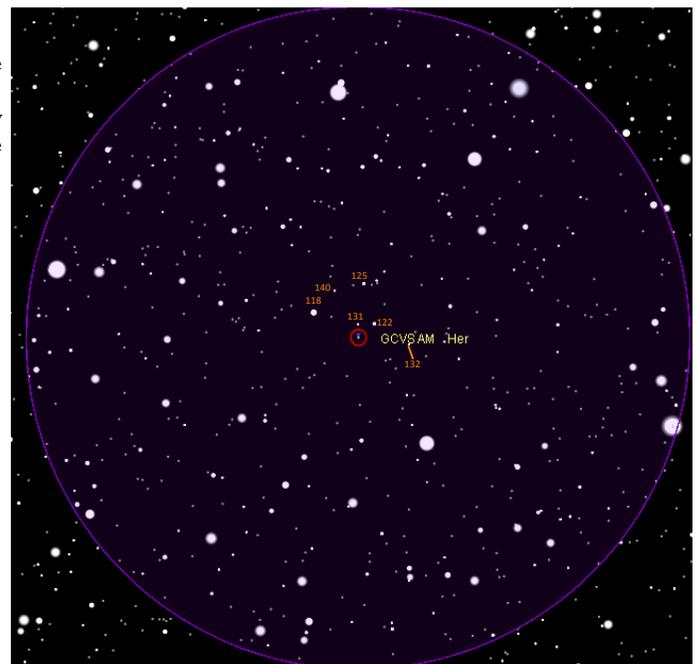
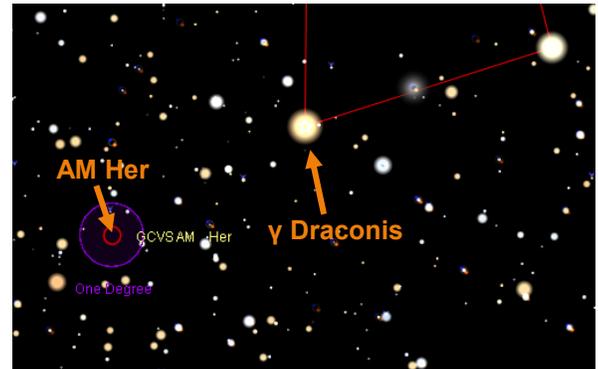
The following is from the July, 1978 issue of the newsletter of the Houston Astronomical Society provided to me by Steve and Amelia Goldberg. References to various charts in the text were changed here.

The July observing project, like that in June, is a faint but interesting object. The star AM Herculis has been known to be a variable star since 1923. In the past few years however, it has been discovered that AM her is also the x-ray source 3U 1809+50. Recent studies of this interesting object indicate that it is a binary star. The members of the pair include a cool star of about half the diameter and mas of the sun, and a white dwarf with a mass approximately equal to that of the sun. The visual brightness of AM Her varies from ~ 12m when the white dwarf is not eclipsed by the cool star, to fainter than 14m. Because of the absence of the x-rays during the eclipse, these became known as the "on" condition and the "off" condition. The period of rotation is 03 hours, 05 minutes and 38 seconds, so the "on condition is visible during some portion of every night for observation.

AM Her is well placed for observation during the summer months. As shown on the (included) finder charts... it lies near the boarder between Hercules, Lyra, and Draco, and can be located near the bright star γ Draconis. You should be able to identify the 5.1m star to the east of γ Dra easily in your finder. Then switch to your lowest powered eyepiece, and locate the 9.5m star in your telescope field. This star is also shown in (the included chart). After you are sure you have the correct field identified, increase the magnification on your scope until you can identify AM Her.

Observers with a 4 1/2" telescope might be able to see AM Her when it is in the "on" condition on a good dark night. With any larger telescope, it should be possible to see AM Her under any reasonable seeing conditions, and with any telescope larger than 8", it should be possible to follow AM Her completely through an eclipse. Use the comparison stars (on AAVSO charts) to plot a light curve for an eclipse if possible. It will be considerably different than the normal type of EB variable.

If you are interested in more details on this interesting star, it was described in "The Story



Get a chart for this star at AAVSO.org. Enter the star name, and click 'Create a Finder Chart'. Data for chart above is from the AAVSO web site. North is up, east to the left. Circle is 1 degree.

of AM Herculis" by William Liller, Sky and Telescope, May 1977.

GOOD SEEING

Houston Astronomical Society

P.O. Box 20332

Houston, TX 77225-0332

General Membership Meeting

The Houston Astronomical Society holds its regular monthly General Membership Meeting on the first Friday of each month, unless rescheduled due to a holiday or a conflict with other events at the University of Houston.

Board of Directors Meeting

The Board of Directors Meeting is held on dates and at locations scheduled by the board. Information provided to *GuideStar* will be published. The meetings are open to all members of the Society in good standing. Attendance is encouraged.

GuideStar Information

The H.A.S. *GuideStar* is published monthly by the Houston Astronomical Society. All opinions expressed herein are those of the contributor and not necessarily of Houston Astronomical Society. The monthly Meeting Notice is included herein. *GuideStar* is available on the HAS web site to all members of H.A.S., and to persons interested in the organization's activities. Contributions to *GuideStar* by members are encouraged. Electronic submission is helpful. Submit the article in text, MS-Word format via email BillPellerin@sbcglobal.net. Copy must be received by the 15th of the month for inclusion in the issue to be available near the end of the same month. Or, bring copy to the General Membership Meeting and give it to the Editor, or phone to make special arrangements.

Editing & Production: Bill Pellerin,

713-880-8061

Email: BillPellerin@sbcglobal.net

Advertising: Advertisers may inquire concerning ad rates and availability of space.

The Houston Astronomical Society welcomes you to our organization. The HAS is a group of dedicated amateur astronomers, most of whom are observers, but some are armchair astronomers.

The benefits of membership are:

- Access to our 18 acre observing site west of Houston -- a great place to observe the universe!
- A telescope loaner program -- borrow a HAS telescope and try observing for yourself!
- A monthly novice meeting, site orientation meeting, and general meeting with speakers of interest.
- Opportunities to participate in programs that promote astronomy to the general public (such as Star Parties at schools)
- A yearly all-clubs meeting for Houston area organizations
- Meet other amateurs and share experiences, learn techniques, and swap stories

You're invited to attend our next meeting.

You'll have a great time.

Houston Astronomical Society

Meeting on Friday, November 2, 2012

7:00 Novice Meeting, room 116 Science & Research 1 Bldg

8:00 General Meeting, room 117 Science & Research 1 Bldg

University of Houston

Directions to meeting:

From I-45 going south (from downtown)

- exit at Cullen Boulevard
- turn right on Cullen
- turn right into the parking lot (by the stadium)
- Science and Research is across the street (2nd building back)

From I-45 going north (from NASA/Galveston)

- exit at Cullen Boulevard
- turn left on Cullen
- turn right into the parking lot (by the stadium)
- Science and Research is across the street (2nd building back)

Parking:

There is Free Parking, **BUT DO NOT PARK IN ANY RESERVED PARKING SPACES AT ANY TIME.**

U of H parking enforcement will ticket your vehicle.

UPDATE — Due to construction in the stadium parking lot, use entrances 15D and 15F. You can park in this area, but NOT in a RESERVED space.