MONTHLY MEETING
Friday, July 12, 2019
ETC 2.136 - UT Campus
Engineering Teaching Center
Dean Keeton and Speedway

NO PRACTICAL ASTRONOMY

7:30 PM
GENERAL ASSEMBLY

**Featured Speaker**
Dr. Weinberg’s Presentation
“Gravitational Wave Astronomy”
Dr. Weinberg, who is an exciting and accomplished speaker, will talk about a new kind of astronomy that has recently begun, with the detection and analysis of gravitational waves from distant sources.

**The Game’s Afoot**

Thanks to all for your private well wishes sent my way after my introductory message. I’m heartened by the encouragement and excited about the year ahead.

I’d like to announce that over the last few weeks some great progress has been made on several fronts:

- Welcome Mike Marotta to the EC, filling one of our Member at Large vacancies
- Thanks to Terry Phillips for taking on the role of Secretary
- We have completed the edits on the agreement with Alan Carruth for the use of his property as a dark-sky site for Members and AAS Member events and all that remains is for Alan, his wife, and I to get together and sign. There will be more information on how to take advantage of this site and AAS-sponsored events coming soon
- Thanks to Tim Brown for the work he’s done finding amazing speakers for our monthly meetings – the first is Nobel recipient, Dr. Steven Weinberg who will be presenting his talk on “Gravitational Wave Astronomy” at our July 12 meeting. I encourage you to attend and bring your friends.
- Your EC attended a day-long planning session at my home on June
29th, and we have set dates for Member-Only observing, Outreach events, dark-sky site work days, AUTS and more. Please check the AAS website for specific dates and look for further communications coming soon.

Finally, we’ve begun planning for observation of our 50th anniversary as an organization; looking at enhancing our relationship with the folks at Astronomy on Tap; exploring some exciting ideas for our “Central Texas Star Party”, and much more.

This is just a taste of the things that are afoot, all to help make 2019/2020 an exciting year!

Clear Skies,

Jim

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**ASTRONOMY FOR PAY**

We’ve been asked to see if anyone wants to do some astronomy for pay on July 13 in Manor. This is for the Beast Out East music festival.

If you are interested, contact Devin James Fry at sayit@namesayers.com

Joyce Lynch, Outreach Chair
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Steven Weinberg

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AAS AFFILIATIONS

IDA
INTERNATIONAL DARK-SKY ASSOCIATION

http://darksky.org/

Night Sky Network

https://nightsky.jpl.nasa.gov

ASTRONOMICAL LEAGUE

https://www.astroleague.org/

TEXAS SPACE GRANT CONSORTIUM

http://www.tsgc.utexas.edu/
Dr. Steven Weinberg, who is an exciting and accomplished speaker, will talk about a new kind of astronomy that has recently begun, with the detection and analysis of gravitational waves from distant sources.

Don’t miss Dr. Weinberg’s presentation at the Austin Astronomical Society’s July 12th 7:30pm Meeting on the UT Campus – Mechanical Engineer Building, ETC rm. 2.136

Complete Bio
Steven Weinberg is a professor of physics and astronomy at the University of Texas at Austin. His research on elementary particle physics and cosmology has been honored with the Nobel Prize in Physics, the National Medal of Science, the Benjamin Franklin Medal of the American Philosophical Society, the Dannie Heinemann Prize for Mathematical Physics, and numerous other awards. He has been elected to the National Academy of Science and Britain’s Royal Society and other academies, and holds sixteen honorary doctoral degrees. He has written over 300 scientific articles, and six treatises on general relativity, quantum field theory, cosmology, and quantum mechanics. Among his books for general readers are Dreams of a Final Theory and The First Three Minutes, and two collections of published essays, Facing Up: Science and its Cultural Adversaries, and Lake Views: This World and the Universe. Many of these essays first appeared in The New York Review of Books. For this writing, he has received the Lewis Thomas Award for the Scientist as Poet and other awards. His latest book, To Explain the World: The Discovery of Modern Science, was published in 2015. Educated at Cornell, Copenhagen, and Princeton, he taught at Columbia, Berkeley, M.I.T. and Harvard, where he was Higgins Professor of Physics, before coming to Texas in 1982.
### Officers of the Society 2019-2020

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**Austin Under the Stars**

26 October 2019 | 6P - 12P |
Hosted by | St. Stephen’s Episcopal School
Presented by | The Austin Astronomical Society
Saturn is at opposition this month, beckoning to future explorers with its beautiful rings and varied, mysterious moons. The Moon prominently passes Saturn mid-month, just in time for the 50th anniversary of Apollo 11!

Saturn is in opposition on July 9, rising in the east as the Sun sets in the west. It is visible all night, hovering right above the teapot of Sagittarius. Saturn is not nearly as bright as Jupiter, nearby and close to Scorpius, but both giant planets are easily the brightest objects in their constellations, making them easy to identify. A full Moon scrapes by the ringed planet late in the evening of the 15th through the early morning of the 16th. Some observers in South America will even see the Moon occult, or pass in front of, Saturn. Observe how fast the Moon moves in relation to Saturn throughout the night by recording their positions every half hour or so via sketches or photos.

While observing the Saturn-Moon celestial dance the early morning of the 16th, you can also contemplate the 50th anniversary of the launch of the Apollo 11 mission! On June 16, 1969, Apollo 11 blasted off from Cape Canaveral in Florida on a journey of almost a quarter million miles to our nearest celestial neighbor, a mission made possible by the tremendous power of the Saturn V rocket – still the most powerful rocket ever launched. Just a few days later, on July 20, 1969 at 10:56 pm EDT, Neil Armstrong and Buzz Aldrin set foot on the lunar surface and became the first people in history to walk on another world. The astronauts set up equipment including a solar wind sampler, laser ranging retroreflector, and seismometer, and gathered up almost 22 kilograms (48 pounds) of precious lunar rocks and soil.
samples. After spending less than a day on the Moon’s surface, the duo blasted off and returned to the orbiting Columbia Command Module, piloted by Michael Collins. Just a few days later, on July 24, all three astronauts splashed down safely in the Pacific Ocean. You can follow the timeline of the Apollo 11 mission in greater detail at bit.ly/Timeline-Apollo11 and dig deep into mission history and science on NASA’s Apollo History Site: bit.ly/ApolloNASA.

Have you ever wanted to see the flag on the Moon left behind by the Apollo astronauts? While no telescope on Earth is powerful enough to see any items left behind the landing sites, you can discover how much you can observe with the Flag on the Moon handout: bit.ly/MoonFlag

You can catch up on all of NASA’s current and future missions at nasa.gov

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**FOR SALE**

**Brand New Skywatcher 8” Collapsible Dobsonian with Synscan computer drive.**

*Already assembled and ready to use.*

Paid $1100. Will sell for $900 (negotiable). Selling because I bought a more portable Celestron Nexstar 6SE.

Contact
Mike Albrecht 512-497-2803

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Caption: Earth-based telescopes can’t see any equipment left behind at the Apollo 11 landing site, but the cameras onboard NASA’s Lunar Reconnaissance Orbiter (LRO) can. This is Tranquility Base as seen from the LRO, just 24 kilometers (15 miles) above the Moon's surface, with helpful labels added by the imaging team. Image Credit: NASA Goddard/Arizona State University. See more landing sites at: bit.ly/ApolloLRO
June was a busy month for outreach. Our first event was at Ruiz Library in Southeast Austin on the 7th. We showed about 40 visitors the moon and various planets. Thanks to Gordon Schaefering, Mike Marotta, Domingo Rochin, and Jim Lynch.

The next night we had a public star party at Pedernales Falls State Park. The sky was great, and there were at least 200 visitors. The following members helped out: Gordon Schaefering, Domingo Rochin, Lawrence and Christina Young, Ramon Salvania, Ravi Vellore, Richard Nugent, Hemant Kulkarni, Margaret and Lester Wetherell, Steven Bingham, Maxine and Gary Goodson, Joi Chevalier and Jon Etkins, and Jim Lynch.

On the 15th several of us did a star party for the Teravista neighborhood. The planets were a big hit—Jupiter, Mars, and Mercury. Members who attended were Gordon Schaefering, Margaret and Lester Wetherell, Scott Demaree, Tom Campbell, Christina and Lawrence Young, Steven Bingham, and Jim Lynch.

At the Upbring day camp on June 18, I talked with preschoolers about the planets, and we made our own solar system (photo below).

Dougherty Arts Center invited us to come on the 19th. Gordon Schaefering, Domingo Rochin, and Jim Lynch joined me for an hour or so of solar viewing before clouds got in the way. We stuck around for a while to chat with visitors, and right before we left we were able to show Jupiter to a few people.

Here's the July and early August schedule. Look for emails with details as each date gets closer.

**July 6**  Inks Lake State Park

**July 18**  Bee Cave Library

**July 19**  West Cypress Hills Cub Scouts

**July 31**  Liberty Hill Library

**August 3**  Sweetwater neighborhood
Successful Outreach at Ruiz Branch Library
By Michael Marotta

On Friday, June 7, Domingo, Gordon, and I supported Jim and Joyce at the “Get Star-struck” night sponsored by the Austin Public Library Ruiz Branch. The adults-only event included indoor lectures, planetarium shows, and a crafts table. Outdoors, we had four telescopes and a pair of binoculars for the twenty or so guests who came to see the night sky. The crescent moon was an easy target in the early hours. Eventually, Mercury was visible, and then, Mars. By the time they slipped behind the trees, Jupiter was rising. From 9:35 to 9:37, we watched the International Space Station, a negative 3.7 magnitude moving star, cross the sky from northwest to southeast. Before we packed up, Jim trained his “light bucket” on the Mizar-Alcor system and explained to the last of the crowd what they were looking at.
Asteroid hunting is one of the activities of amateur astronomers that intersects the work of professionals. Comet hunting is another. I was pleasantly surprised by Dr. Nugent’s easy explanation of why, contrary to our common assumptions, asteroids and comets are often the same. That was one of several interesting facts in a flawed presentation. Overall, this is an inspired little book with a lot of problems.

I expected to read about amateur and professional astronomers, including photographs of the instruments used by researchers who work for the love of it. Instead, I soon met the first of over 20 errors of fact. It started with the vernacular American style and jarring grammatical lapses. “There wasn’t going to be any surprises.” (page 15) and “… there’s a few…” (page 73) were just two among many. Nugent says that “Space is cold.” (page 64). It is not cold if you are in direct sunlight. Then, it is hot.

Nugent wrongly claims that astronomers in 1800 thought that the planets orbit in circles. “Existing methods of the time [1800-1802] used the assumption that the planets traveled around the Sun in circular paths, when in reality they traveled on a specific geometric path called an ellipse.” (page 43) But it was Kepler who first fit the orbits of the planets into elliptical paths about 1605.

At that point, Nugent already referenced Kepler, though she never mentioned Newton. Kepler showed that the planets travel in ellipses and then that was proved as mathematically necessary by Newton. Newton’s calculus demonstrated that objects moving under the influence of a central force do so in paths that are conic sections. The shape of the orbit (line, hyperbola, parabola, ellipse, circle) depends on the velocity of the object.

An underlying theme of this book is that getting money to search for near-Earth asteroids has been difficult because the political agencies that fund such research consider the possibility of catastrophe to be remote. Anyone who cares to think about it usually assumes that the kind of asteroid that could end life as we know it comes only every 65 million years. However, two asteroids dramatically became meteorites in recent times: the Sudan 2008 TC3; and Siberia 2012DA14 (Chelyabinsk). The Sudan fall was predicted only a few hours ahead of impact. The Siberia fall was a complete surprise. More government money has been forthcoming.

Discussing the impact of asteroid Shoemaker-Levy 9 with Jupiter, Nugent is in such a rush to tell the story that she both errs in her description and leaves out the interesting parts. “Unfortunately, the impact was going to hit the side of Jupiter that was facing away from Earth, so astronomers with telescopes wouldn’t have a direct view. … A fleet of spacecraft was trained on Jupiter, including the Hubble Space Telescope, the ROSAT X-ray satellite, and …” (page 81) However, neither of those was in any position to see the far side of Jupiter. Both Hubble and ROSAT orbited Earth. In fact, Hubble did send images from after the impact. (You can see them on the Hubble Telescope website at http://hubblesite.org/image/170.)

Significantly, this was not a single event but a series of impacts. The comet had broken up two years earlier in a previous pass-by in July 1992. The fragment stream impacted the planet over six days, July 16-22, 1994. As Jupiter rotates on its axis with a period of about 10 hours (9 hr 55 min 30 sec), the effects of the fall could still be detected. In fact, “ripples” on Jupiter out to its thin ring were recorded as late as 2002.
The Waning Crescent Moon

The crescent Moon shrinks as it swings towards the Sun for a total solar eclipse on July 2nd visible from Chile and Argentina. This image was taken from Austin, Texas on 2019-06-26 at 09:45 UT. A HDR composite imaged with a Sony a7iii mirrorless camera with a Nikkor 300mm f/4.5 AI-s with 1.4 teleconverter. The Moon exposed at f/8 for 1/25 sec at ISO 100 with the best 8 of 200 images drizzle stacked in Autostakkert 3 and deconvolved in Lynkeos. The oak tree exposed at ISO 400 for 30 sec with 5 images stacked. Final HDR composite, crop, and exposure in Photoshop.
by Rathijit Banerjee

**M16 (Eagle Nebula) & the Pillars of Creation**

Imaging telescope: Celestron EdgeHD 1100 with 0.7x Reducer
Imaging camera: ZWO ASI1600MM-P
Mount: Losmandy G-11GFT Gemini 2
Software: AstroPixel Processor, PixInsight, Adobe Photoshop CC
Filters: Astrodon Ha 36mm 5nm: 36x300", Astrodon Oiii 36mm 3nm: 111x300", Astrodon SII 36mm 3nm: 62x300"
Integration: 17.4 hours  Location: Austin (Suburban Sky)

by Tom Campbell

**Moon**
Members’ Gallery

by Rick Glasebrook

Jupiter and Antares above the Milky Way

This shows Jupiter and Antares above the Milky Way on 6/24/19 at 23:32. I used a Nikon D800 with a Zeiss Milvus 1.4/50. The exposure was three seconds with an ISO of 6400. Processed with Images Plus 6.5, Photoshop CS6.0.

by Rick Glasebrook

Milky Way at Sagittarius

This shows the Milky Way at Sagittarius on 6/24/19 at 23:28. I used a Nikon D800 with a Zeiss Milvus 1.4/50. The exposure was three seconds with an ISO of 6400.

by Rick Glasebrook

This is not really astronomy, but it was still fun to watch. I took the picture on 5/6/19 at 23:03. I used a Nikon D800 with a Zeiss Milvus 1.4/50. The exposure was 10 seconds with an ISO of 1600.
Have you ever wanted to start and complete more of the Astronomical League’s observing programs but just didn’t know how? Mike Hotka’s new book, Exploring Amateur Astronomy – Goal Oriented Observing, will not only help you start more observing programs, but will also share an observing methodology to help you get more out of your observing sessions. Mike is a Platinum Master Observer and has completed all but three of the currently existing observing programs. In his book, he shares tips and tricks he learned throughout the years of how to overcome some of these program’s learning curves, so that you can start recording observations sooner. He wrote this book because of his love of astronomy and his desire to share his knowledge of observing celestial objects with others.

Mike’s book explains the concept of setting SMART goals to ensure you observe on a regular basis. The book goes on to explain a methodology that Mike has developed and refined over the years of how to plan an observing session, find the resources you will need in the field and the importance of keeping a good observing log of your observations.

The remainder of the book contains a chapter for each of the observing programs that Mike has completed. These chapters describe how Mike approached each observing program and he shares the techniques that were effective in completing the observations for each program. With this knowledge, you will be able to start making observations from the very beginning for even the most difficult of observing programs.

This book emphasizes learning and refining astronomical observing techniques. It is designed to aid the beginner as well as the experienced amateur astronomer to train their eye to see faint celestial objects. This book is dedicated to those that would like to start and complete more Astronomical League observing programs.

Exploring Amateur Astronomy – Goal Oriented Observing can be purchased in a paperback or eBook version from Amazon.com.
MEMBERSHIP CARDS NOW IN YOUR PROFILES

At last, Wild Apricot, our membership database vendor, has made available to its customers membership card templates. Now, under your AAS membership profile you will see a mockup of a card with your name, Membership ID and membership expiration date. You are offered two options for displaying your card: one which is suitable for displaying from a smartphone, and another printable PDF which you can cut and laminate to your heart’s delight.

NIGHT SKY NETWORK

The Night Sky Network is a nationwide coalition of amateur astronomy clubs bringing the science, technology, and inspiration of NASA’s missions to the general public. AAS members can register with NSN and receive the NSN newsletter and email about upcoming webinars and any additional information or announcements created by the NSN for members. They will be able to search for resources, view all of the toolkits and the files, and access the downloads in each kit.

If you are interested in registering, here is the procedure.

2. Enter your zip code in the upper right box for CURRENT LOCATION.
3. Scroll down to CLUBS NEAR YOU and click on AAS.
4. Click on Register in the toolbar on our page.
5. Fill out the form and submit.
6. Your form will be sent to the club for approval.

If you have any questions, email outreach@austinastro.org
**JOINING AAS OR RENEWING MEMBERSHIP**

To join or renew your membership to AAS, please visit: [http://austinastro.org/index.php/why-should-you-be-a-member/](http://austinastro.org/index.php/why-should-you-be-a-member/) There are six membership levels to choose from:

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Visit Dawn Davies' *Earthbound Astronomer* website at [https://www.earthboundastronomer.com/](https://www.earthboundastronomer.com/)


Rob Pettengill’s site can be found at [http://astronomy.robpettengill.org/](http://astronomy.robpettengill.org/). Rob’s material shared per CC BY-NC-SA 4.0 license.

Celestial Teapot’s product catalog can be found at [http://messierplanisphere.com/](http://messierplanisphere.com/)

Joseph Macry writes a weekly column for Manor Community News: “This Week in Astronomy”. You can read the online edition here: [http://manorcommunitynews.com/](http://manorcommunitynews.com/)