April 06, 2018 | General Meeting

"Painting the Sky • Art of the Cosmos • An Artist's Story, An Illustrated Timeline • From Astronomy Magazine to the Planetarium and Beyond."

The April HAS General Meeting speaker will be Mark Paternostro from Chicago, IL. Mark is a renowned astronomical artist whose innate talent and diverse background combine with a keen interest in science and is ranked among the world’s leading space science artists, producing a varied body of personal work.

Mark studied fine art at the University of Wisconsin, Madison, and later taught art and illustration at the Milwaukee Institute of Art and Design. In 1976, Mark joined Astronomy Magazine as resident staff artist. His flair for accurate and accessible portrayals of complex astronomical subjects made him a sought-after artist whose work has graced the covers and pages of magazines worldwide. His work has appeared in numerous books, including Isaac Asimov’s Library of the Universe series, and has been featured on network television programs, including Nightline and the PBS Nova series.

Mark Paternostro’s career arc flourished upon joining the Adler Planetarium staff in 1985, serving as Artist, Art Director, Show Director and Producer. Mark provided a distinctive vision, dynamic art direction and innovative creative skills to the numerous full-dome sky shows and exhibits featured at the planetarium over three decades of service. More recently, Mark managed a team of professional artists, voice talent, and others to bring NASA’s Interstellar Boundary Explorer mission (IBEX), to the public. “Relying on traditional artistic skills combined with current media tools allows me to create a vision of the Universe that is both compelling and realistic,” Mark observes.

**Important**

The General Meeting for April is not at the University of Houston. It will be held at the Trini Mendenhall Community Center, 1414 Wirt Rd, Houston, TX 77055.

**Date:** Friday, April 6th

**Novice Meeting:** 6:00 pm

**General Meeting:** 7:00 pm - 9:00 pm.
**CALENDAR**

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<th>Time</th>
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<tbody>
<tr>
<td>APRIL 6</td>
<td>6:00 p.m.</td>
<td>HAS Novice Meeting</td>
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<td>7:00 p.m.</td>
<td>HAS General Meeting</td>
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<tr>
<td>APRIL 7</td>
<td>7:00 p.m.</td>
<td>Novice Lab, Dark Site</td>
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<td>APRIL 8</td>
<td>2:18 a.m.</td>
<td>Last Quarter Moon</td>
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<tr>
<td>APRIL 14</td>
<td>4:46 p.m.</td>
<td>Prime Night, Dark Site</td>
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<tr>
<td>APRIL 15</td>
<td>8:57 p.m.</td>
<td>New Moon</td>
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<tr>
<td>APRIL 18</td>
<td>7:00 p.m.</td>
<td>VSIG Meeting, Mendenhall Center</td>
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<tr>
<td>APRIL 21</td>
<td>12:00 p.m.</td>
<td>Spring Astronomy Day, Insperity Observatory</td>
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<tr>
<td>APRIL 22</td>
<td>4:46 p.m.</td>
<td>First Quarter Moon</td>
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<tr>
<td>APRIL 29</td>
<td>7:58 p.m.</td>
<td>Full Moon</td>
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<tr>
<td>MAY 4</td>
<td>7:00 p.m.</td>
<td>HAS Novice Meeting, U of H</td>
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<td></td>
<td>8:00 p.m.</td>
<td>HAS General Meeting, U of H</td>
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<tr>
<td>MAY 5</td>
<td>7:30 p.m.</td>
<td>Novice Lab, Dark Site</td>
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<tr>
<td>MAY 7</td>
<td>9:09 p.m.</td>
<td>Last Quarter Moon</td>
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<tr>
<td>MAY 8</td>
<td>8:00 p.m.</td>
<td>Jupiter at opposition</td>
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<td>MAY 12</td>
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<td>Prime Night, Dark Site</td>
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<tr>
<td>MAY 15</td>
<td>6:48 a.m.</td>
<td>New Moon</td>
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<tr>
<td>MAY 16</td>
<td>7:00 p.m.</td>
<td>Loaner Telescope Training, Mendenhall Center</td>
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<td>MAY 19</td>
<td>2:00 p.m.</td>
<td>Observatory Training, Dark Site</td>
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<tr>
<td>MAY 22</td>
<td>10:49 p.m.</td>
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<td>9:20 a.m.</td>
<td>Full Moon</td>
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**FOR THE LATEST INFORMATION ON CLUB EVENTS, GO TO ASTRONOMYHOUSTON.ORG**

**HAS MEETINGS**

All meetings are at the University of Houston Science and Research building. See the last page for directions to the location and more information.

**NOVICE MEETING**

7:00 P.M. room 117 Science & Research 1 Bldg

**GENERAL MEETING**

8:00 P.M room 117 Science & Research 1 Bldg

**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.

**UPCOMING EVENTS**

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6:00 p.m. HAS Novice Meeting
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**OTHER MEETINGS**

**JOHNSON SPACE CENTER ASTRONOMICAL SOCIETY | jscas.net**

Meets in the Lunar and Planetary Institute on the 2nd Friday of each month.

**FORT BEND ASTRONOMY CLUB | fbac.org/club_meetings.htm.**

Meets the third Friday of the month at 8:00 p.m. at the Houston Community College Southwest Campus in Stafford, Texas.

**NORTH HOUSTON ASTRONOMY CLUB | astronomyclub.org**

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.

**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.
HAS BOARD MEETING

HAS Board meetings are scheduled regularly. All members are invited to attend these meetings, but only board members can vote on issues brought before the board. Meetings are held at the Trini Mendenhall Community Center (1414 Wirt Road) at 6:30 p.m. on the date specified the calendar.
One of the exceptional things about our hobby is that amateur astronomy is a gateway to lifelong learning. I’m so convinced of this fact that when discussing STEM education, I’ve recently been referring to astronomy as a “gateway science”.

It’s very common at outreach events, to hear young and old alike, exclaim their astonishment and glee when looking through the business end of an eyepiece for the first time. This experience almost certainly leads the new “observer” to a sense of awe when they see with their own eyes that there are worlds out there beyond their normal experience. Many begin to question how the universe works in a way that such things can exist, and to wonder about our place in it. Some will follow through on this inspiration to become interested to learn astronomy, and from there the door is opened to all the other physical sciences (hence astronomy is a “gateway science”).

Learning comes when we follow our interest in astronomy and reach out for new knowledge. Understanding comes when we take our learning and put it into practice or use it to answer new questions or solve problems.

It’s been this way since Galileo turned his telescope on the Moon and planets. He was interested in the Earth’s place in the universe. When he fabricated his telescope, he followed his interest and what he saw when he looked at Jupiter and Venus astonished him and convinced him that he had found proof that Copernicus heliocentric model of the cosmos was correct.

One of the most direct paths to understanding astronomy, is to teach others what we have learned. HAS has a very active outreach program, and all HAS members should consider participating in a couple of outreach events every year. Passing your knowledge of stargazing to others will increase your own understanding, and the challenge of answering the questions which come from the public will give you motivation to learn more.

BYOT OUTREACH EVENT

On March 24, HAS held its first Bring Your Own Telescope outreach event for both our newer members and the public. Attendance at the Trini Mendenhall Community Center was good. Interest was high as several people came to learn more about our hobby and 5 or 6 attendees brought their telescopes looking for guidance on how to set them up and use them.

Joe Khalaf gave a presentation on the different types of telescopes, and what to consider when choosing one. He also touched on navigating the night sky and what to expect to see when using a typical amateur telescope.

The fun really got started after the Q&A session, when volunteers Allen Wilkerson, Sherry Irby, Jim King, Lauren Herrington, Sarah Silva and Bram Weisman helped attendees set up their own scopes. After the event, all of the HAS volunteers agreed that it had been a worthwhile first event and that we should hold it two or three times per year.
SKYNET JUNIOR SCHOLARS

Stargazing is only a part (an important part to be sure) of what we do in our “hobby”. We can and do use many online resources to pursue our interest in astronomy and achieve the goals we set for ourselves. This includes many sources of online astronomy information and data, as well as online astronomy research tools and analysis applications. The amount of professional data and tools available to amateurs online is truly amazing.

HAS has partnered with Bellaire High School Physics and Astronomy teacher Jimmy Newland (who is also an HAS member) to support a Skynet Junior Scholars (SJS) group. This group has youth members from both Bellaire HS and HAS.

The Skynet Junior Scholars program is maintained by the University of North Carolina Chapel Hill with participation of several other major universities and the National Science Foundation. SJS is a unique informal educational program for middle and high school students which “is designed to engage young explorers in the study of the universe using the same tools as professionals. The SJS web portal connects middle and high-school aged youth with activities, resources and guidance to become scholars of the sky.”

Professional astronomers spend the majority of their “observing time” in their offices, online, setting up requests for observing time on remote telescopes. They plan their observations and specify what CCD images through various filters the telescope will take. The observing run is then submitted, and the images that will be used to in their research are downloaded for processing and measurement.

The SJS program exposes students to this environment and workflow, and in the process teaches them not only about astronomy, but how the science of astronomy is done. The Skynet web interface allows observers to choose robotic telescopes from around the world and to image the night sky with a variety of filters in a queue-scheduled format. The program allows leaders to create users and assign groups and manage time on the network. Group members also get to interact with professional astronomers.

In addition to providing adult leadership, HAS support will include some hands-on astronomy experience. We hope to provide the students with some practical astronomy experience at our observatory site in Columbus. This way we can provide them with a different learning experience which should aid in their overall understanding of astronomy and how it is done.

I can tell you from first hand experience, that the students involved in this group are interested and engaged. Whether they stay in the field of astronomy and astrophysics, or move into some other field you can rest assured that they will become lifelong learners themselves, and in the process, they will provide their adult leaders with the motivation to keep learning and understanding alongside them.

For more information on HAS Outreach events or the SJS program, please send you questions to: president@astronomyhouston.org
**H.A.S. KARAOKE PARTY!**

**FRIDAY, APRIL 27TH – 7:00 TO 10:00 PM**
**THE HAYWORTH APARTMENTS**

We are being hosted by The Hayworth Apartments, who’s providing the space and Beer, wine and Hayworth Signature Margaritas!

Plenty to eat too, including sliders (beef and chicken), veggies and other treats.

HAS is providing the Karaoke DJ and all the Talent!

Don’t sing? Not a problem. Dance if you want to, or just come enjoy the event. There will be plenty of space to retreat from the music if you want to converse with someone.

**IMPORTANT:** We need to let the Hayworth know how much food to provide, so please RSVP by April 13th to publicity@astronomyhouston.org. And feel free to send your playlist suggestions and karaoke favorites too.

Karaoke Houston does a great job and can probably pull anything you want from the cloud on the fly, but it helps if they know in advance what we want to hear and perform.

**WHEN:** April 27th 7pm-10pm
**WHERE:** The Hayworth Apartments
1414 Wood Hollow Dr, Houston, TX 77057
https://goo.gl/maps/xm6Y2tnPFVC2

**PARK IN HAYWORTH GARAGE**
The University of Texas at Austin McDonald Observatory has entered into a partnership with the National Park Service (NPS) to train park rangers in bringing the wonders of the night sky to their visitors. The observatory also will create outreach programs for the park service.

“We are extremely pleased to join forces with the McDonald Observatory to bring this training to NPS park and regional office staff,” said Ray Sauvajot, NPS Associate Director for Natural Resource Stewardship and Science. “The observatory’s experience with hands on training combined with the expertise of our Natural Sounds and Night Skies Division will provide new opportunities for career development, capacity building for the field, and leveraging our efforts toward enhancing visitor experience and the preservation of our national park night skies.”

Marc Wetzel, the observatory’s Senior Outreach Program Coordinator, will give two workshops for national park rangers. One workshop will occur in the spring at McDonald Observatory, and another on-site at a national park. The project will develop fun activities for daytime and nighttime visitors to the national parks and create a curriculum for the park service, he said.

“This is a really fantastic partnership,” Wetzel said. “The National Park Service shares similar goals for interpreting the night skies for visitors as we do.” He explained that “dark skies are one of the parks’ natural resources, in addition to water, mountains, and wildlife.

Located near Fort Davis, Texas, the observatory hosts multiple telescopes undertaking a wide range of astronomical research under the darkest night skies of any professional observatory in the continental United States. It is home to the consortium-run Hobby-Eberly Telescope (HET), one of the world’s largest, which has recently completed a $40-million upgrade. An internationally known leader in astronomy education and outreach, McDonald Observatory is also pioneering the next generation of astronomical research as a founding partner of the Giant Magellan Telescope.
As far as we know, water is essential for every form of life. It’s a simple molecule, and we know a lot about it. Water has two hydrogen atoms and one oxygen atom. It boils at 212°F (100°C) and freezes at 32°F (0°C). The Earth’s surface is more than 70 percent covered in water.

On our planet, we find water at every stage: liquid, solid (ice), and gas (steam and vapor). Our bodies are mostly water. We use it to drink, bathe, clean, grow crops, make energy, and more. With everything it does, measuring where the water on Earth is, and how it moves, is no easy task.

The world’s oceans, lakes, rivers and streams are water. However, there’s also water frozen in the ice caps, glaciers, and icebergs. There’s water held in the tiny spaces between rocks and soils deep underground. With so much water all over the planet—including some of it hidden where we can’t see—NASA scientists have to get creative to study it all. One way that NASA will measure where all that water is and how it moves, is by launching a set of spacecraft this spring called GRACE-FO.

GRACE-FO stands for the “Gravity Recovery and Climate Experiment Follow-on.” “Follow-on” means it’s the second satellite mission like this—a follow-up to the original GRACE mission. GRACE-FO will use two satellites. One satellite will be about 137 miles (220 km) behind the other as they orbit the Earth. As the satellites move, the gravity of the Earth will pull on them.

Gravity isn’t the same everywhere on Earth. Areas with more mass—like big mountains—have a stronger gravitational pull than areas with less mass. When the GRACE-FO satellites fly towards an area with stronger gravitational pull, the first satellite will be pulled a little faster. When the second GRACE-FO satellite reaches the stronger gravity area, it will be pulled faster, and catch up.

Scientists combine this distance between the two satellites with lots of other information to create a map of Earth’s gravity field each month. The changes in that map will tell them how land and water move on our planet. For example, a melting glacier will have less water, and so less mass, as it melts. Less mass means less gravitational pull, so the GRACE-FO satellites will have less distance between them. That data can be used to help scientists figure out if the glacier is melting.

GRACE-FO will also be able to look at how Earth’s overall weather changes from year to year. For example, the satellite can monitor certain regions to help us figure out how severe a drought is. These satellites will help us keep track of one of the most important things to all life on this planet: water.

You can learn more about our planet’s most important molecule here: https://spaceplace.nasa.gov/water
ASTERISMS – BROSCH 1, VIRGO DIAMOND

ASTERISM: a grouping of stars that form a recognizable pattern.

CONSTELLATION: Virgo

RIGHT ASCENSION: 12H 33M 19.0S

DECLINATION: -00 38' 42"

MAGNITUDE: 11 to 13

SIZE: 42

This asterism is located in Virgo. Starting with Spica, locate star Porrima Gamma ζ VIRGO. This star is the “anchor point” for the semi-circle of stars in Virgo.

Just above a line from Porrima to Zaniah Eta η VIRGO, Brosch 1 can be located.

Brosch 1 is a square or diamond, depending on how it appears in your eyepiece. The object first appears as 4 stars. But looking closer, one of the stars is a double. See if you can split that double. Another name for this asterism is the Virgo Diamond, which is very descriptive.

Brosch 1 is named for Noah Brosch, an Israeli astronomer still doing research today. The Wiki info on Brosch may be found at this link: Wiki Noah Brosch
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, unformatted MS-Word format via email GuideStar@astronomyhouston.org. 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. Contact the editor for writing guidelines.

EDITING & PRODUCTION:
Bob Wiesner | 713-240-7059
GuideStar@astronomyhouston.org

MEMBER PROJECTS SPOTLIGHT
We want to spotlight the astronomical projects and observations that you are working on.

Send us an email at GUIDESTAR@ASTRONOMYHOUSTON.ORG and tell us. Whether it be a specific research project in astronomy that you’re working on, an astro league observing program, an astrophotography project, or something else, let us know so we can let the rest of the society know.

GUIDESTAR ADVERTISING POLICIES
PERSONAL ADVERTISEMENTS
• Members in good standing of the Houston Astronomical Society (HAS) may request that an ad be placed in the GuideStar for personal items (for sale or wanted).
• Items offered for sale must be of interest to amateur astronomers.
• No more than two telescopes may be advertised within any calendar year.
• Ads will not run for more than 3 consecutive months
• Ads will be run on a space-available basis.
• Ads must be provided to the editor in electronic format (email, text file) by the 15th of the month preceding the month-of-issue.

COMMERCIAL ADVERTISEMENTS
• Advertisement sizes:
  o Full page = 6.875"w x 9"h
  o Half page = 6.875"w x 4.25" h
  o Quarter page = 3.31” w x 4.25” h (allows for column gutter)
• Commercial advertisements will be run in the GuideStar at the following fee schedule:

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<thead>
<tr>
<th>Size</th>
<th>One Time</th>
<th>One Quarter (3 consecutive months)</th>
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<tr>
<td>Full page</td>
<td>$100.00</td>
<td>$250.00</td>
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<tr>
<td>Half page</td>
<td>$50.00</td>
<td>$125.00</td>
</tr>
<tr>
<td>Quarter page</td>
<td>$25.00</td>
<td>$62.50</td>
</tr>
</tbody>
</table>

• Artwork provided must be in electronic format (image file, PDF, etc.) and must be in the correct proportions to fit the space provided. Contact editor with questions.
• Artwork may be in color or in black and white.
• Items or services advertised must be of interest to amateur astronomers
• Payment for advertisements must be done in advance (pay to the ‘Houston Astronomical Society’)

THE GUIDESTAR IS THE WINNER OF THE 2012 ASTRONOMICAL LEAGUE MABEL STERNS NEWSLETTER AWARD
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. Access to meeting videos on the HAS web site.
- Opportunities to participate in programs that promote astronomy to the general public (such as Star Parties at schools)
- A yearly all-club 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! 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
You can join (or renew at the organization web site, www.astronomyhouston.org. Click the ‘Join HAS’ Tab. 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.

EVENT NOTIFICATION OR CANCELLATION
HAS uses RAINEDOUT.NET to communicate late breaking updates about our various events. Message delivery is via text messaging and e-mail. There are several ways to subscribe. If you would like to receive these notices via text messaging directly to your phone, subscribe to any of the sub-groups which interest you.

RainedOut notices will also automatically be sent to our e-mail list. Note that regular e-mail list conversations are not part of RainedOut communications and will not be sent to your phone as part of this service. Instructions to sign up for the e-mail list (a great way to keep your finger on the pulse of the club) are found here: http://www.astronomyhouston.org/about/email-list.

To receive text messages, send any or all of the following (one at a time) to 84483

OUTREACH Public Outreach Events
STARPARTY Members only star Parties
URBAN Urban Observing Events
MEETINGS HAS Meetings

You will receive a confirmation message back for each successful enrollment. For more information, please visit www.RainedOut.net.
DIRECTIONS TO MEETING
From I-45 going south (from downtown)
- exit at Cullen Boulevard
- turn right on Cullen
- turn right on Holman Street; the parking lot is past the Hoffeinz Pavilion
- 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 on Holman Street; the parking lot is past the Hoffeinz Pavilion
- Science and Research is across the street (2nd building back)

PARKING AT THE UNIVERSITY OF HOUSTON MAIN CAMPUS
For the monthly Houston Astronomical Society Meeting
The map below shows the location of the 15C parking lot, west of Cullen Boulevard on Holman Street.

The map is from the University of Houston web site and identifies the lot that is available for parking while attending the Houston Astronomical Society monthly meeting. This parking is available from 6:30 p.m. until 10:00 p.m. on the Friday night of the HAS meeting (usually the first Friday of the month).

This parking is free. If you get a notice from the UH campus police on the night of the meeting, call the UH Security office and let them know that this area has been made available on HAS meeting night by the Parking Department.