

MCDONALD OBSERVATORY BOARD OF VISITORS SUMMER MEETING

July 26-27 in West Texas



Thank You for Another Great Meeting

Friday, July 25, through Saturday, July 26, McDonald Observatory hosted the annual Board of Visitors Summer Meeting. Featuring science talks, discussion groups, and telescope tours and viewings, the event connected almost 200 attendees with the latest astronomical research. Although there were minor bouts of stormy weather, each evening the clouds cleared to reveal dazzling views of the night sky.

This year's program provided an advanced glimpse of the Hobby-Eberly Telescope Dark Energy Experiment's (HETDEX) highly anticipated results and explained the core scientific concepts behind its success.

Talks on HETDEX shared:

- Preliminary results and how the project was able to achieve them
- How observing galaxy clustering in the universe can be used to measure its expansion
- Unexpected findings in the HETDEX data and what they may mean

In addition, science discussion groups shared the unexpected challenges of maintaining telescopes; the importance of artificial intelligence in cosmological analysis; new research on molecular clouds; and how exhibits connect the public with our science.

To those who could make it to the BOV Summer Meeting, thank you for joining us! It was a pleasure to share our passion for discovery with you. And to all of our BOV members, thank you for your continued support of McDonald Observatory and the Department of Astronomy.

Membership Meeting & Opening Remarks

Membership Meeting

On Saturday, the Board of Visitors voted in new members. Welcome!

- Father Joseph "Joe" Barbieri of San Angelo, Texas
- Michael Griffin and Gerard Flores of Los Angeles, California

Opening Remarks

Marty Heaner, BOV Chair

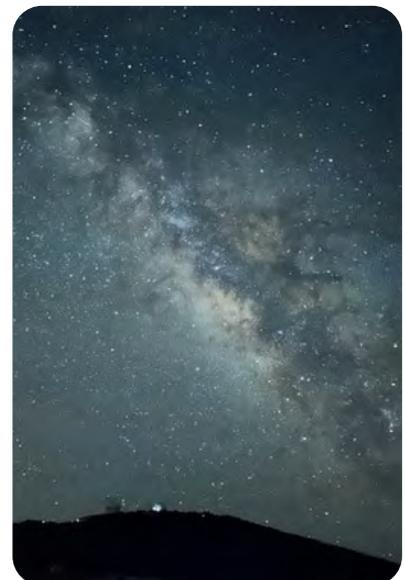
- Thanks to new telescopes and computational tools, we are in a golden age of astronomical research. UT is uniquely positioned to provide talent for the field thanks to its hands on approach to education; access to the [Texas Advanced Computing Center](#); and support from the BOV.
- The BOV executive committee has formed a new subcommittee to review the group's bylaws.
- The fiscal year starts September 1. With it comes the reminder to pay annual dues.

Top: BOV Chair Marty Heaner presents opening remarks.
Credit: Cara Arlauskas, McDonald Observatory.



Bottom right: The Milky Way above the Otto Struve and Harlan J. Smith Telescopes on Mount Locke. Credit: BOV member David Rose.

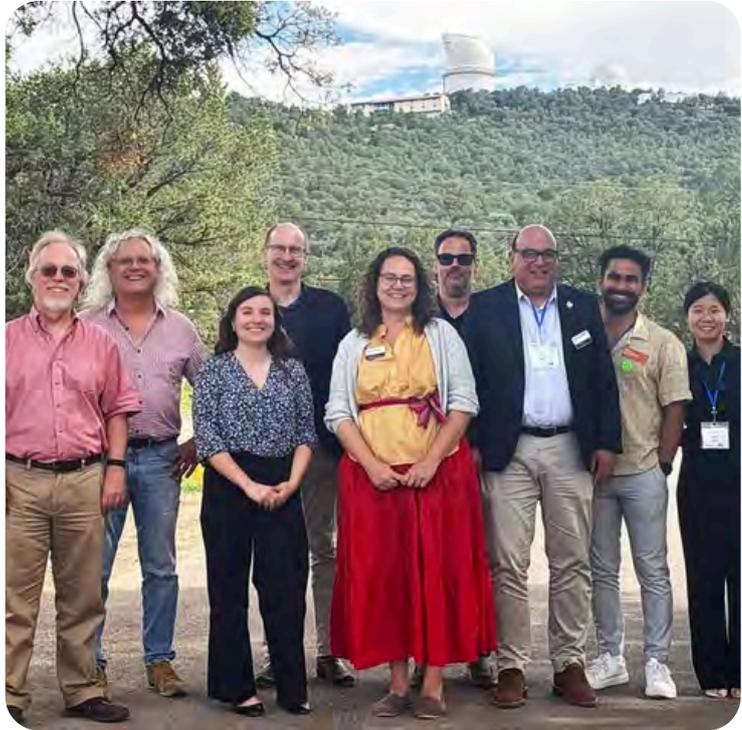
Bottom left: BOV members get a behind-the-scenes look at the Hobby-Eberly Telescope's control room. Credit: Emily Howard, McDonald Observatory.



Opening Remarks

Taft Armandroff, McDonald Observatory Director

- To enable HETDEX, McDonald Observatory had to make significant upgrades to the Hobby-Eberly Telescope. These included a new tracker, guides, and sensors; adding 35,000 optical fibers; and installing 156 VIRUS spectrographs.
- Additional improvements are underway at McDonald Observatory, including:
 - Installation of the High-Resolution Spectrograph on the Hobby-Eberly Telescope.
 - Installation of the VIRUS2 spectrograph on the Harlan J. Smith Telescope.
 - New exhibits, plaza rehabilitation, and outdoor restrooms at the Visitors Center.
- Thanks to an anonymous BOV donor, McDonald Observatory has installed new HD panoramic cameras onsite. In addition to helping observers and staff monitor weather, these cameras will be a great resource for engaging with the public. [BOV members can access the cameras at http://bit.ly/3JA9LEA](http://bit.ly/3JA9LEA).
- Giant Magellan Telescope:
 - In June, the telescope [advanced to the National Science Foundation Final Design Phase](#), one of the final steps before becoming eligible for federal construction funding. This is a major milestone!
 - BOV members are invited to a fundraising gala on November 13, 2025, at Chicago's Adler Planetarium. If interested, reach out to Taft (director@astro.as.utexas.edu) or Anna (anna.boxall@austin.utexas.edu).



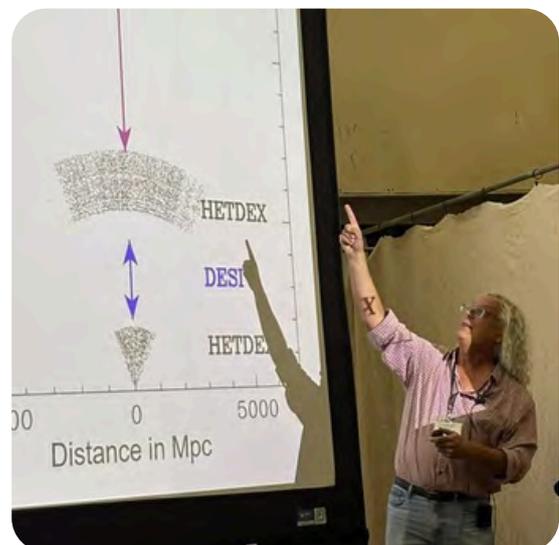
This year's BOV speakers. From left to right: B-G Andersson, Karl Gebhardt, Laurel Weiss, Andreas Matouschek, Katie Kizziar, Niv Drory, Taft Armandroff, Mahdi Qezlou, and Kuan Wang. Credit: Cara Arlauskas, McDonald Observatory.

Opening Remarks

Karl Gebhardt, Astronomy Department Chair

- While other programs have had to pare down due to funding issues, UT Astronomy has been able to take in more graduate students thanks to BOV-funded endowments and fellowships. This makes us uniquely positioned to attract top talent.
- Faculty updates:
 - New faculty member Sebastian Gomez joins us this August. He is a leader in transient follow-up, with a focus on understanding the most exotic supernovae.
 - New faculty member ChangHoon Hahn also joins us this August. He is a leader in applying AI methods to cosmological analysis.
 - Stella Offner is participating in the Simons Foundation's [Open Interval](#) project, which pairs artists and scientists to create unique, collaborative artwork.
 - Steve Finkelstein was inducted into UT's [Academy of Distinguished Teachers](#). The Academy advises the president and provost on matters related to the university's instructional mission.
- Centers and projects:
 - The [Cosmic Frontier Center](#) has discovered [the most distant confirmed black hole](#).
 - [CosmicAI](#) continues to make advances in applying machine learning to complex astronomical problems.
 - The [Center for Planetary System Habitability](#) is training undergraduate and graduate students to contribute to Texas's space industry.
 - The [Wooten Center for Astrophysical Plasma Properties](#) acts as a training ground to prepare talent for the United States national labs.
 - [HETDEX](#) results will publish in the coming months.
- We continue to develop our Harlan J. Smith Undergraduate Scholars program. Through it, 19 students to date have participated in observing runs at McDonald Observatory. Thank you to all the BOV members who have contributed to building a successful future for this program.

Right: Karl Gebhardt shares preliminary results of the Hobby-Eberly Telescope Dark Energy Experiment during his science talk. Credit: Cara Arlauskas, McDonald Observatory.



Opening Remarks and Science Talks

Andreas Matouschek, College of Natural Sciences Interim Dean

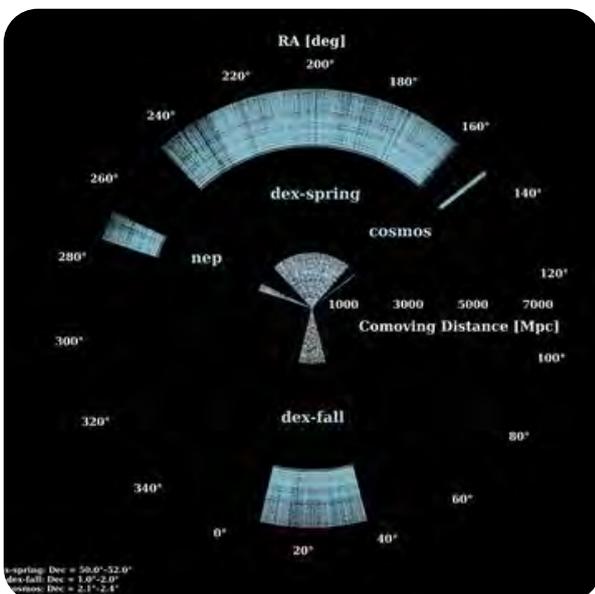
- In May, the [Cosmic Frontier Center](#) hosted the [CFC25 conference](#), bringing together scientists from across the globe to explore questions on the early universe.
- The Giant Magellan Telescope's [advancement to the National Science Foundation Final Design Phase](#) is a testament to Taft Armandroff's tireless advocacy for the project.
- UT Austin is the only university with two AI institutes. One of these is [CosmicAI](#).
- Our thanks to the BOV for being ambassadors of science within their communities.

Science Talks

The HETDEX Survey, Science, and Results

Karl Gebhardt, Astronomy Department Chair

Gebhardt unveiled the first scientific results from the Hobby-Eberly Telescope Dark Energy Experiment ([HETDEX](#)). In the twenty years since its conception, the project has created the largest map of galaxies in the early and nearby universe. By calculating the distances between various galaxies, HETDEX has identified patterns in the distribution of matter and, in turn, how quickly the universe was expanding 11 billion years ago. This will help astronomers finally uncover the nature of dark energy – the mysterious substance causing the universe to expand more and more quickly.



This experiment has been a major collaborative effort. Our thanks to the BOV for its generous support through the years.

Left: This figure contains the entire source catalog from the full eight years of observations from HETDEX. In it, we are at the center, and the radial distance from the center corresponds with the distance objects are from Earth. Credit: Mukae, S. and the HETDEX team.

Science Talks

Galaxy Clustering: A Large-Scale Ruler for Cosmology

Kuan Wang, HETDEX Cosmology Fellow

HETDEX uses patterns in galaxy clustering to measure the expansion of the universe during different epochs. Sound waves from the Big Bang rippled through the early universe, causing subtle over- and under-densities in matter. As the universe cooled, these ripples – called Baryon Acoustic Oscillations (BAO) – became frozen in place. As the universe expanded, so did the ripples.

Though they aren't visible, BAO can be detected by measuring the distance between galaxies. This technique has been key to the success of HETDEX in identifying the expansion rate of the early universe.

Top right: BOV members drive the Otto Struve Telescope with help from Engineering Scientist John Kuehne. Credit: Emily Howard, McDonald Observatory.



Bottom left: A rainbow over the Hobby-Eberly Telescope. Credit: Emily Howard, McDonald Observatory.

Bottom right: Science talks took place on the dome floor of the Harlan J. Smith Telescope. Credit: Emily Howard, McDonald Observatory.



Science Talks

Serendipity in Science: Finding Lyman Alpha Absorption in HETDEX

Laurel Weiss, Astronomy Graduate Student

When an electron in hydrogen drops from an excited state to ground, it releases a burst of energy known as a Lyman alpha emission. This emission line, seen as a dramatic peak in spectral data, acts as a tell-tale sign of the presence of a galaxy. Identifying Lyman alpha emissions has allowed HETDEX to map the far-off universe.

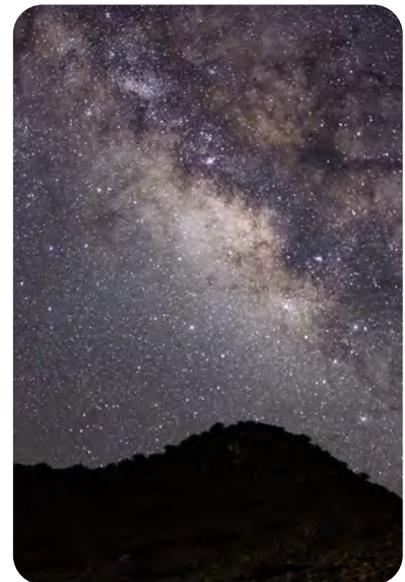
As part of her Ph.D. research, Weiss noticed an unexpected and consistent dip in the lines on either side of the Lyman alpha data. These troughs aren't typical, so she launched an investigation. Through her research, she concluded that the light from these galaxies was being removed twice – once when background light was subtracted from the data and then again when light from these galaxies traveled through clouds of gas and dust on its journey to Earth.



Top and bottom left: Evening showers gave way to dramatic sunsets. Credit: Cara Arlauskas, McDonald Observatory.



Dusk at the Friday, July 25, Star Party. Credit: Cara Arlauskas, McDonald Observatory.



The Milky Way unfurls above the Davis Mountains. Credit: BOV member Chris Morissette.

Science Discussion Groups

A Bright Future for an Old Telescope: Refurbishing the HJST

Niv Drory, Senior Research Scientist

Originally built in the 1960s, the Harlan J. Smith Telescope remains a vital tool for modern astronomy. That's possible through ongoing upgrades to its instrumentation. However, this isn't always a straightforward task. Drory shared an overview of the unique challenges that come with maintaining the telescope - missing, incomplete, or inaccurate documentation; unmarked wiring; classified electrical component data sheets; lost knowledge – and how the McDonald team overcomes these hurdles.

HETDEX in the Age of Artificial Intelligence: Decoding the Nature of the Cosmos

Mahdi Qezlou, HETDEX Cosmology Fellow

Machine learning is revolutionizing the analysis of astronomical data. To understand the evolution of the universe, HETDEX runs simulations on how variations in ten factors in the early cosmos – the amount of matter present, its distribution, and more – would play out over time. Because astronomers have to take so many factors and so much data into account, machine learning is vital to this process. A simulation that would take 343,000 years to run manually now only takes three months.

Do All Interstellar Clouds Form Stars? If Not, Why Not?

B-G Andersson, McDonald Observatory Assistant Director for Research Support

Andersson's research probes a common assumption in astronomy: that all interstellar clouds eventually form stars. The [recent discovery of a nearby molecular cloud](#), named Eos, presented astronomers with a unique opportunity to study star-formation up close. However, follow-up observations using the Tull Spectrograph on the Harlan J. Smith Telescope have shown no signs of it. This may be due to the hot stars already present nearby pushing out a hot bubble of gas and destroying the conditions required for new star formation. Follow-up studies will provide more insight into the cloud's chemistry and if it is in the process of evaporating.

Science Discussion Groups

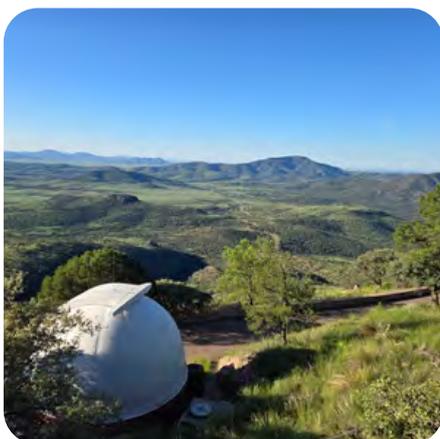
New Horizons: McDonald Observatory Exhibit Development and Collaborations

Katie Kizziar, McDonald Observatory Assistant Director for Education and Outreach

Kizziar shared how the Observatory researches and develops engaging and educational astronomy exhibits for the public. As a top tourist destination in the area, these exhibits are an important way the Observatory fulfills its mission to advance humanity's knowledge of the universe. New updates will ensure we communicate the latest science.

Towards this goal, McDonald Observatory also partners with institutions across the state. Recently, this has included collaborating on the "[Big Eye on Dark Skies](#)" exhibit at UT Austin's [Texas Science & Natural History Museum](#) and an upcoming astronomy exhibit with the [Grace Museum](#) in Abilene.

Top right: An exhibit on light pollution, recently installed in the Frank N. Bash Visitors Center. McDonald Observatory is updating additional exhibits and other public spaces to share the latest science with our visitors. Credit: Michael Ortiz.



Bottom left: This year's meeting featured lush scenery. Credit: Emily Howard, McDonald Observatory

Bottom right: Taft Armandroff provides a tour of the Hobby-Eberly Telescope. Credit: Emily Howard, McDonald Observatory.

Mark Your Calendar For the Board of Visitors Winter Meeting

March 6-7, 2026 in Austin, Texas

We look forward to seeing you again at the Board of Visitors 2026 Winter Meeting. It will take place March 6-7 in Austin, Texas, on the University of Texas campus.

Event details will be posted at sites.utexas.edu/bov/meetings as they become available.

