McDonald Observatory
Fort Davis, Texas

North Houston Astronomy Club

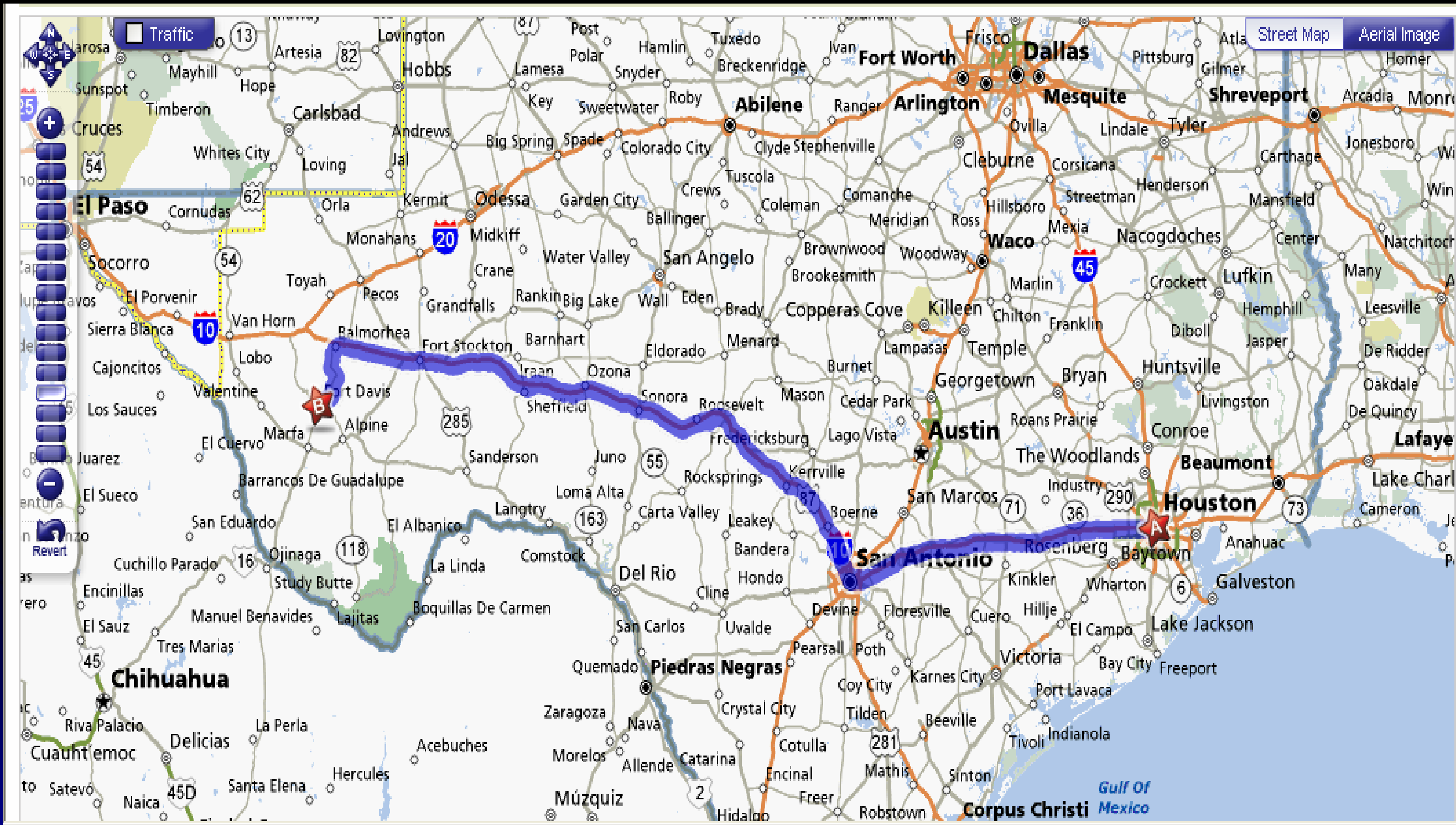
22 February 2008

Located in West Texas where the roads are long and the views nearly endless.

From Kingwood to Fort Davis:
~625 miles,
~ 9 hours driving

Fly to Midland/Odessa or to EL Paso
and drive ~3 hrs

- http://www.mapquest.com



Traffic
Street Map
Aerial Image
Revert
El Paso
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El Porvenir
Sierra Blanca
Van Horn
Lobo
Valentine
Marfa
Fort Davis
Alpine
Balmorhea
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Kermit
Odessa
Midkiff
Crane
Grandfalls
Rankin
Big Lake
Barnhart
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Sheffield
Ozona
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Roosevelt
Junction
Fredericksburg
Kerrville
Boerne
San Antonio
Rosenberg
Baytown
Houston
Galveston
Beaumont
Austin
San Marcos
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Temple
Killeen
Waco
Dallas
Fort Worth
Arlington
Mesquite
Frisco
Abilene
San Angelo
Midland
Big Spring
Carlsbad
Hobbs
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Las Cruces
Chihuahua
Cuauhtemoc
Delicias
Ojinaga
Study Butte
Lajitas
Terlingua
Boquillas De Carmen
Langtry
Comstock
Del Rio
Piedras Negras
Eagle Pass
Uvalde
Hondo
Bandera
Leakey
Rocksprings
Devine
Pearsall
Floresville
Cuero
Victoria
Port Lavaca
Bay City
Freeport
Lake Jackson
Wharton
El Campo
Corpus Christi
Gulf Of Mexico
Conroe
The Woodlands
Huntsville
Bryan
Lufkin
Nacogdoches
Shreveport
Tyler
Lake Charles
Lafayette
Sanderson
Juno
Loma Alta
Carta Valley
Brownwood
Brady
Menard
Mason
Lampasas
Copperas Cove
Corsicana
Cleburne
Hillsboro

The McDonald Observatory is located in the Davis Mountains, the oldest and largest mountain range in Texas, it was named for Jefferson Davis who was a U.S. Secretary of War and the president of the Confederacy (not at the same time however).

With elevations ranging from 3500 to over 4000 feet the Davis mountains offer breath taking views in every direction.

“Between two worlds life hovers like a star, twixt night and morn, upon the horizon’s verge”

-Lord Byron

Formation of the Davis Mountain Range started with volcanic activity beginning around 65 million years ago during the Tertiary geologic period.

The skies in west Texas are some of the darkest in the continental United States. Because of the reach of light polluting urban areas, dark skies are becoming more and more rare.

Stairway to Heaven

The original mountain location of the observatory, Mt. Locke, was picked because of the large number of clear nights, the altitude of 6800 ft., its distance from any urban areas, the low humidity and the latitude which afforded a greater view of the southern skies.

The McDonald Observatory

- http://mcdonaldobservatory.org/

Welcome to McDonald Observatory

As a unit of The University of Texas at Austin, the Observatory is one of the world's leading centers for astronomical research. Its facilities are located atop Mount Locke and Mount Fowlkes in the Davis Mountains of West Texas.

Frank N. Bash Visitors Center

Enjoy a Star Party, public tours, and other events at the Observatory under the darkest night skies in the continental United States. The Observatory also offers a unique setting for teacher workshops and student programs held year-round.

Student Programs

Our TEKS/TAKS aligned education programs allow teachers to immerse K-12 students in this unique science research environment. Student Field Experience programs are tailored for educators traveling to the Observatory with students in primary and secondary grades. For schools too distant for

Teacher Workshops

McDonald Observatory offers a unique setting for teacher workshops: the Observatory and Visitors Center in the Davis Mountains of West Texas. Not only will you do inquiry-based activities aligned with science and mathematics TEKS and TAKS, you will practice your new astronomy skills under the Observatory's dark skies, weather permitting. More »

What Are Astronomers Doing?

Do you ever wonder what astronomers do at an observatory? Updated weekly, this section of our website reveals exactly which cosmic questions the astronomers at McDonald

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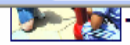
Public Programs

McDonald Observatory operates an international public outreach program, including the StarDate and Universo radio programs; StarDate magazine; StarDate Online and Universo Online websites.



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What Are Astronomers Doing?

Do you ever wonder what astronomers do at an observatory? Updated weekly, this section of our website reveals exactly which cosmic questions the astronomers at McDonald Observatory are trying to solve right now. More »

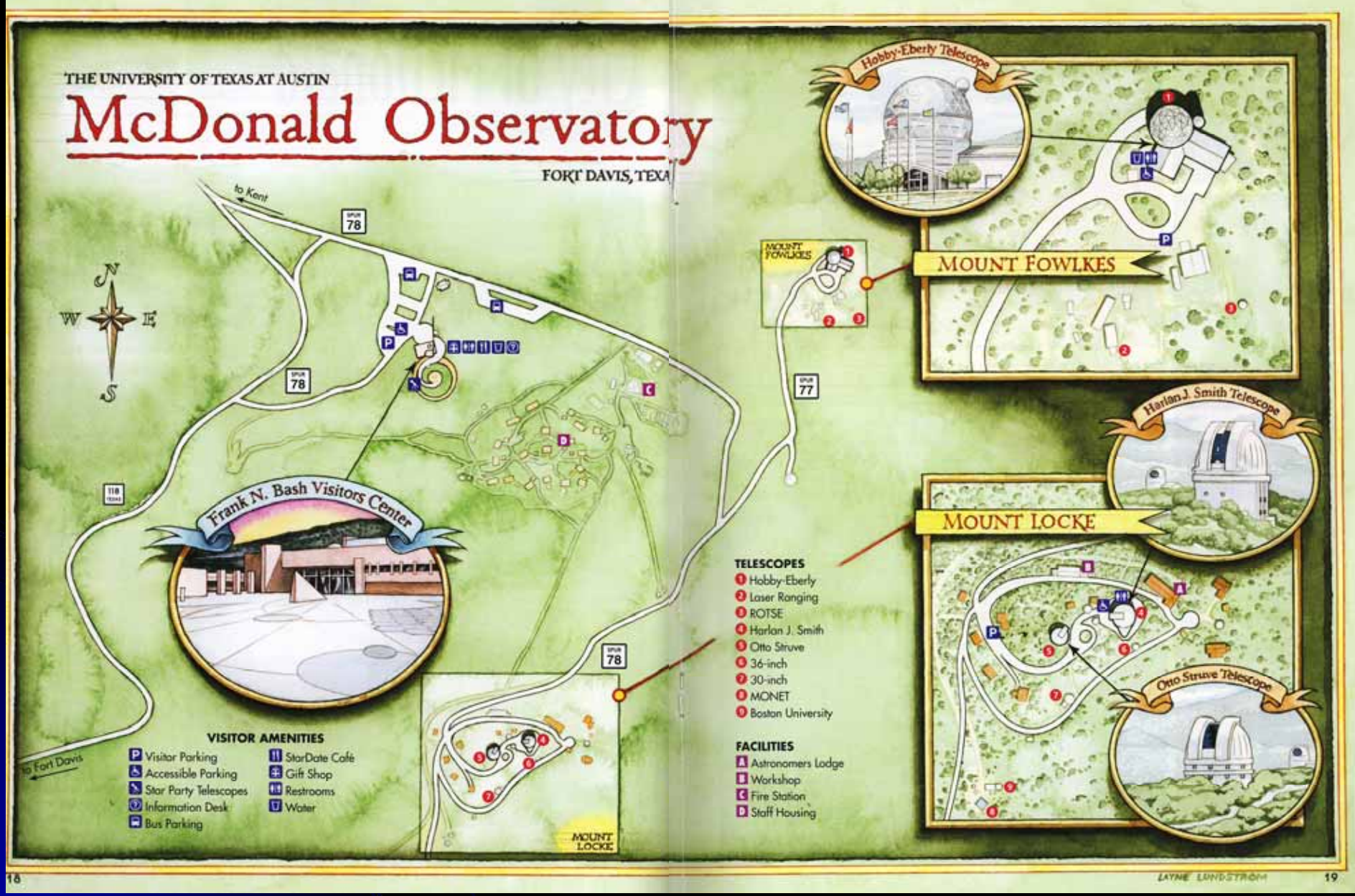
Friends of McDonald

Become a member by joining the Friends of McDonald Observatory. Members receive significant benefits that help them explore the wonders of the universe. More »

THE UNIVERSITY OF TEXAS AT AUSTIN

McDonald Observatory

FORT DAVIS, TEXA



LAYNE LUNDSTROM

Frank N. Bash Visitors Center


01 27 2008 14:34


01 27 2008 13 31


01 27 2008 14 34

Seen here are views from the visitors center of Mount Locke and related telescopes.

Around the visitors center there are many stones containing the names of donors. This one might be familiar.

A Texas Historical Landmark

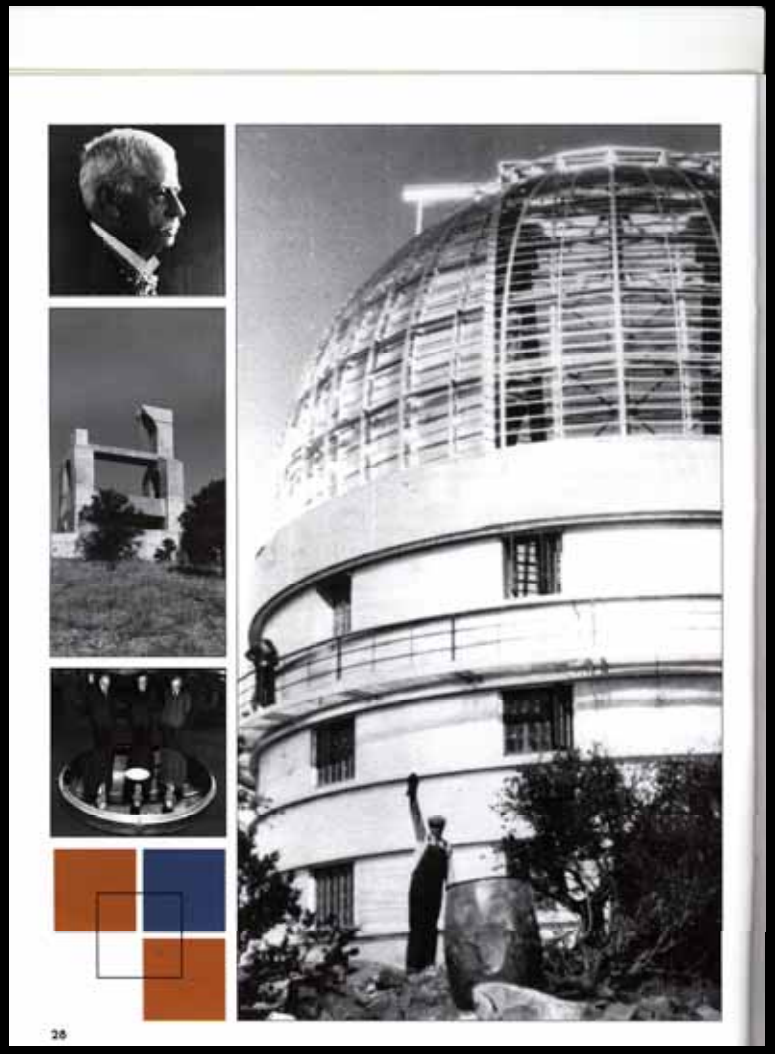
Originally endowed by William Johnson McDonald, a Paris, Texas banker that had an amateur interest in astronomy, the observatory was built in the 1930s and was operated during the first twenty-five years of its use by the University of Chicago.

Otto Struve Telescope

- http://www.as.utexas.edu/mcdonald/facilities/2.1m/2.1.html

View of the original McDonald building

- The telescope built with the original endowment left by McDonald was the second largest in the world when it was finished.

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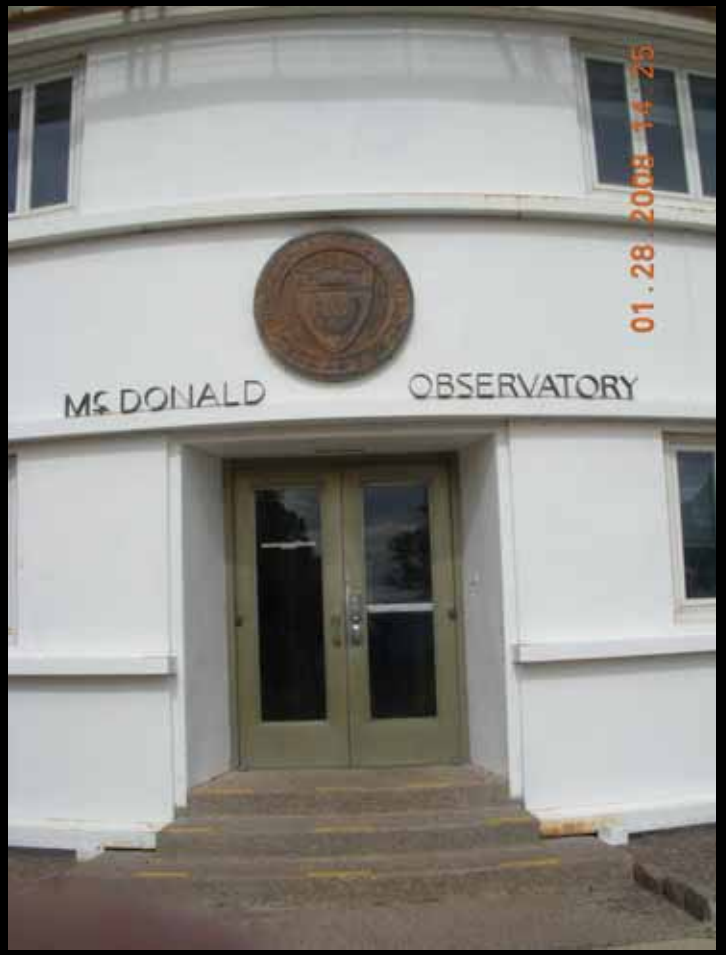
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McDONALD OBSERVATORY

Under the direction of the University of Texas the McDonald Observatory has added numerous instruments and achieved a status as a leading center for astronomy research, with visiting scientists coming from around the globe to take advantage of its unique opportunities.

http://www.as.utexas.edu/mcdonald/mcdonald.html

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9.2m Hobby-Eberly Telescope
2.7m Harlan J. Smith Telescope
2.1m Otto Struve Telescope
0.8m Telescope
0.8m Laser Ranging Telescope

McDonald Library

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Employment

McDonald Observatory

McDonald Observatory is located in the Davis Mountains, 450 miles west of Austin, Texas.

The Observatory is equipped with a wide range of state-of-the-art instrumentation for imaging and spectroscopy in the optical and infrared, and operates one of the first and most productive lunar ranging stations.

Currently, McDonald operates four research telescopes at our West Texas site:

9.2m Hobby-Eberly Telescope
2.7m Harlan J. Smith Telescope
2.1m Otto Struve Telescope
0.8m Telescope

The observatory also hosts one of the four globally networked Robotic Optical Transient Search Experiment (ROTSE) telescopes, and is a Monitoring Network of Telescopes (MONET) site.

..of note

REU
Research Experience for Undergraduates
also
Summer Undergraduate Position

MONET North
webcam
MONET home

Mt. Locke
30° 40' 17.4" N
104° 01' 21.4" W
2076 m
source

Search UT ASTRONOMY


01 27 2008 18:08

Department of Astronomy
Courses
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Current Graduate Students
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Degree & Course Information
Awards, Scholarships & Financial Aid
Research & Career Opportunities

College of Natural Sciences

Registrar
University Course Schedule

Department of Astronomy

The Department of Astronomy at the University of Texas at Austin is located on the 15th floor of the Robert Lee Moore Building, at the southeast corner of Dean Keeton (26th Street) and Speedway Avenue.


Mount Locke and Mount Fowlkes

Twenty one active teaching faculty and seventeen research scientists, as well as a number of research associates and postdoctoral fellows, maintain activity and research in virtually all areas of modern astronomy. In the past several years, the faculty have won six of the major awards given by the American Astronomical Society, in addition to numerous other honors and fellowships.

The Department's association with McDonald Observatory (located in the Davis Mountains of west Texas) provides excellent opportunities in optical astronomy. In addition, there are strong programs in millimeter, submillimeter, infrared, radio, and space astronomy, as well as theoretical astrophysics.

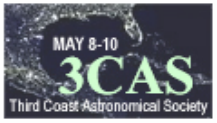
Details of the astronomical research work going on at the University of Texas at Austin can be found in the 2001-2002 Department of Astronomy Annual Report, available in our research section.

Schedule

Calendars
Weekly Calendar
Academic Calendar Spring 2008

Office Hours
Faculty Office Hours

Search UT ASTRONOMY



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Forms
Astronomy Program Forms

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2.1m Otto Struve Telescope
0.8m Telescope
0.8m Laser Ranging Telescope

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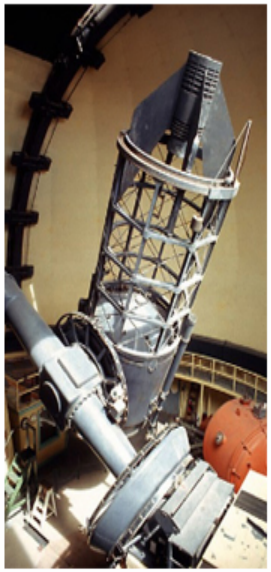
Observatory Committees

Employment

2.1m (82") Otto Struve Telescope



Instruments

Prime f/3.9 focus

Argos
- PI Instrument

Cassegrain f/13.7 focus

Sandiford Cass Echelle Spectrometer (CE)
Cassegrain Spectrometer (es2)
CCD WHT Camera
Imaging Grism Instrument (IGI)
Photometer (P45)

Cautions

2.1m Cautions

Optical

Primary Mirror

diameter: 2.08m (82")
focal length: 8.13m (26.7')
f-ratio: 3.90
field angle: 63.5 arcmin
plate scale: 25.4 arcsec/min

Cassegrain f/13.7 focus

focal length: 28.53m (96.6')
f-ratio: 13.65
field angle: 20 arcmin
plate scale: 7.25 arcsec/mm

Coudé focus - not presently in use

focal length: 47.70m (156.5')
f-ratio: 22.9

2.7m Harlan J. Smith Telescope
2.1m Otto Struve Telescope
0.8m Telescope
0.8m Laser Ranging Telescope
—
McDonald Library
—
Observatory Committees
Employment

Primary Mirror
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focal length: 28.53m (96.6')
f-ratio: 13.65
field angle: 20 arcmin
plate scale: 7.25 arcsec/mm

Coudé focus - not presently in use
focal length: 47.70m (156.5')
f-ratio: 22.9
plate scale: 4.3 arcsec/mm

Mechanical

Primary Mirror
weight: 1900kg (4200 lbs)
thickness: 29.8cm (11.75")
material: pyrex

Telescope Tube
diameter: 2.64m (8'8")
length: 8.2m (27')

Telescope
weight: 41t (45 tons)

Bearings
polar axis: ball radial trust bearings
dec axis: taped roller bearings

Dome
diameter: 19m (62')
weight: 104t (115 tons)

Historical

Construction
started: 1933
completed: 1939

Contractor
design: Otto Struve
telescope: Warner and Swasey Co.
dome: Patterson Leitch Co.
optics: C. Lundin

Harlan Smith Telescope

- http://www.as.utexas.edu/mcdonald/facilities/2.7m/2.7.html

The Harlan J. Smith Telescope,
constructed 1966-68, a 2.7-meter (107-inch) mirror, was the third largest in the world when built.

The telescope is used every clear night of the year.

Looking down the road at the Harlan J. Smith Telescope Dome

Dr. Harlan J. Smith was the director of the McDonald for 26 years and the chairman of the university of Texas astronomy department for 15 years. Smith was the first Texas director of the Observatory.

The telescope itself has been used for many years, steadily advancing astronomical knowledge.

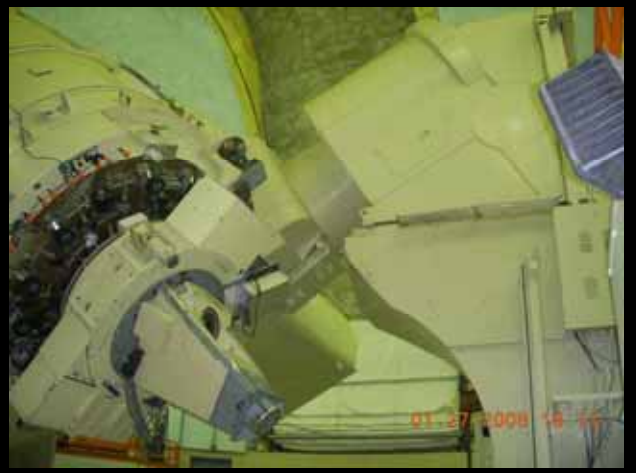
Seen here is a view of the scale of the dome housing the Harlan J. Smith telescope.

Prof Chris Johns-Krull and Dr. Linda Polo waiting for dark

It is bigger than it looks.

The Harlan J. Smith telescope, with a 12 foot diameter, a 32 foot length and a weight of 160 tons, has some serious capability.

The primary mirror is 2.72 meters and has a light gathering power that dwarfs the power of the unaided human eye by some 250,000 times.



The telescope is and has been used for a variety of research projects included measuring the distance to the moon by aiming a laser at the mirrors left by astronauts on the moon during the Apollo program.

Built with the help of funding from NASA this telescope has been an eye on the sky for many years contributing significantly to our knowledge of both the solar system

and the universe at large.

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2.1m Otto Struve Telescope
0.8m Telescope
0.8m Laser Ranging Telescope

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Observatory Committees

Employment

2.7m (107") Harlan J. Smith Telescope

Memo to Observers
June 7, 2004 — pdf

Instruments

Cassegrain f/8.8
Ritchey-Chretien focus
CCD WHT Camera
Imaging Grism Instrument (IGI)

Cassegrain f/17.7 focus
Large Cass Spectrometer (LCS)
LCS-Spectropolarimeter (SPol)
Photometer (P45)

Coudé f/32.5 focus
Coudé Spectrometer (cs1)
- Two foci available
Cross-Dispersed Echelle Spectrometer (cs2)
- Two foci available

TCS

107" TCS Manual
107" TCS Quick Start
107" TCS Troubleshooting

Cautions

2.7m Cautions

Optical

Primary Mirror

diameter: 2.72m (107")
focal length: 10.68m (35')
f-ratio: 3.93

Cassegrain f/8.8
Ritchey-Chretien focus

focal length: 23.91m (78.4')
f-ratio: 8.8
field angle: 61.5 arcmin
plate scale: 8.62 arcsec/mm

Cassegrain f/17.7 focus

focal length: 47.98m (157.4')
f-ratio: 17.65
field angle: 31 arcmin
plate scale: 4.29 arcsec/mm

Coudé f/32.5 focus

focal length: 88.43m (290.1')
f-ratio: 32.54
field angle: 3 arcmin
plate scale: 2.32 arcsec/mm

Mechanical

Primary Mirror

weight: 3540kg (7800 lbs)
thickness: 31.8cm (12.5")
material: fused silica

Telescope Tube

diameter: 3.66m (12')
length: 9.75m (32')

Telescope

weight: 145t (190 tons)

Bearings

polar axis: pressurized oil and radial thrust bearings
dec axis: preloaded ball bearings

Dome

diameter: 23m (76')
weight: 395t (435 tons)

Historical

Construction

Hobby Eberly Telescope

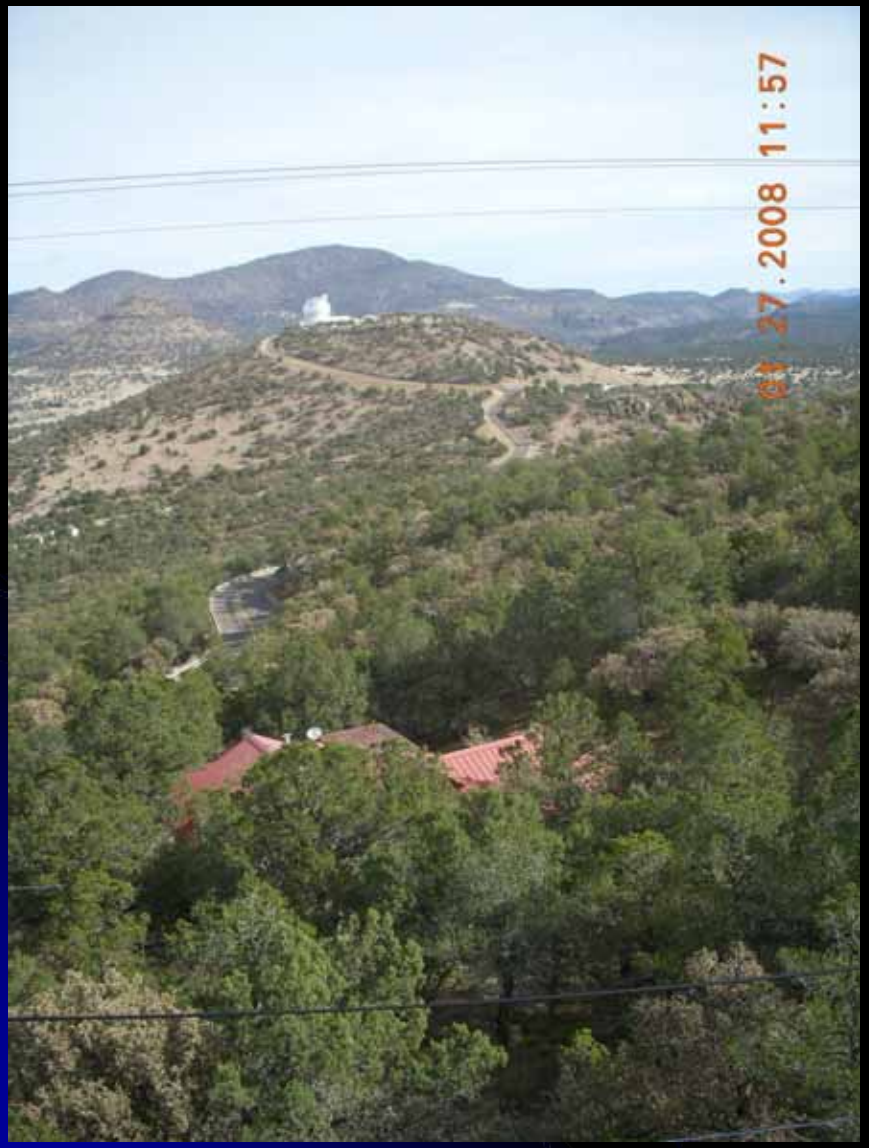
- http://www.as.utexas.edu/mcdonald/het/het.html

The third largest telescope in the world!

The Hobby-Eberly Telescope

With its 9.2-meter (433-inch) mirror, the HET is one of the world's largest optical telescopes. It's optimized for spectroscopy, the decoding of light from stars and galaxies to study their properties. This makes it ideal for searching for planets around other stars, and studying distant galaxies, exploding stars, black holes, and more.

King of the Mountain!
The Hobby-Eberly Telescope



The HET, dedicated in 1997, is a joint project of The University of Texas at Austin, The Pennsylvania State University, Stanford University, Ludwig-Maximilians-Universität München, and Georg-August-Universität Göttingen.

The McDonald Observatory and the University of Texas offer visiting researchers and scientists facilities and accommodation during their stays in this West Texas retreat. Seen here is the view of the Hobby-Eberly telescope dome from the astronomer lodge.

The mirror segments to the Hobby-Eberly telescope.

Many individual segments are linked together using computer control to form the 9.2 meter effective aperture, which makes it currently the fourth largest telescope in the world.

Inside the Hobby-Eberly visitors are given a chance to see the mechanics of the behemoth.

Seen above is a diagram showing the different parts of the Hobby-Eberly.

Seen here is a face on view of one of the mirror segments.

Hobby-Eberly Telescope
General Information
Gallery

HET Observing Support
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HRS

HET Engineering
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HET Board Site

Community Access Program Through NOAO

Hobby-Eberly Telescope

The HET was designed and constructed with a unique objective: to gather a very large amount of light, specifically for spectroscopy, at extremely low cost. A fixed elevation-axis design, based on the radio telescope at Arecibo, and an innovative system for tracking stars, contributed to an 80% reduction in initial costs compared to optical telescopes of similar size.

The primary mirror of the HET is the largest yet constructed, at 11.1 x 9.8 meters. At any given time during observations, only a portion of the mirror is utilized. The HET's 9.2 meter effective aperture makes it currently the world's fourth largest optical telescope.

The HET entered its commissioning phase in 1997, and began science operations in October of 1999. more..

Gallery
Construction of the Hobby-Eberly Telescope.

HET Observing Support
Information, such as proposal preparation, schedules, priority list, and instrument documentation, provided by the night staff.

HET Engineering

The HET at Mount Fowlkes

Search UT ASTRONOMY

HET
30° 40' 53.2" N
104° 00' 53.0" W
2026 m
source

The Hobby-Eberly Telescope is a joint project of:

University of Texas at Austin
Pennsylvania State University
Stanford University
Ludwig Maximilians Universität
Georg August Universität

optical telescope.

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104° 00' 53.0" W
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Georg August Universität

Gallery
Construction of the Hobby-Eberly Telescope.

HET Observing Support
Information, such as proposal preparation, schedules, priority list, and instrument documentation, provided by the night staff.

HET Engineering
The pages of Mt. Fowlkes engineering staff, including policies and procedures, operations schedules, the problem report management system, and other information.

The Trimester reports are prepared by the HET Lead RA and include information about the seeing, weather, allocation of observations by partner, distribution of objects and status of the equipment.

Science and Technical Publications
Bibliographic lists of HET science and technical publications.

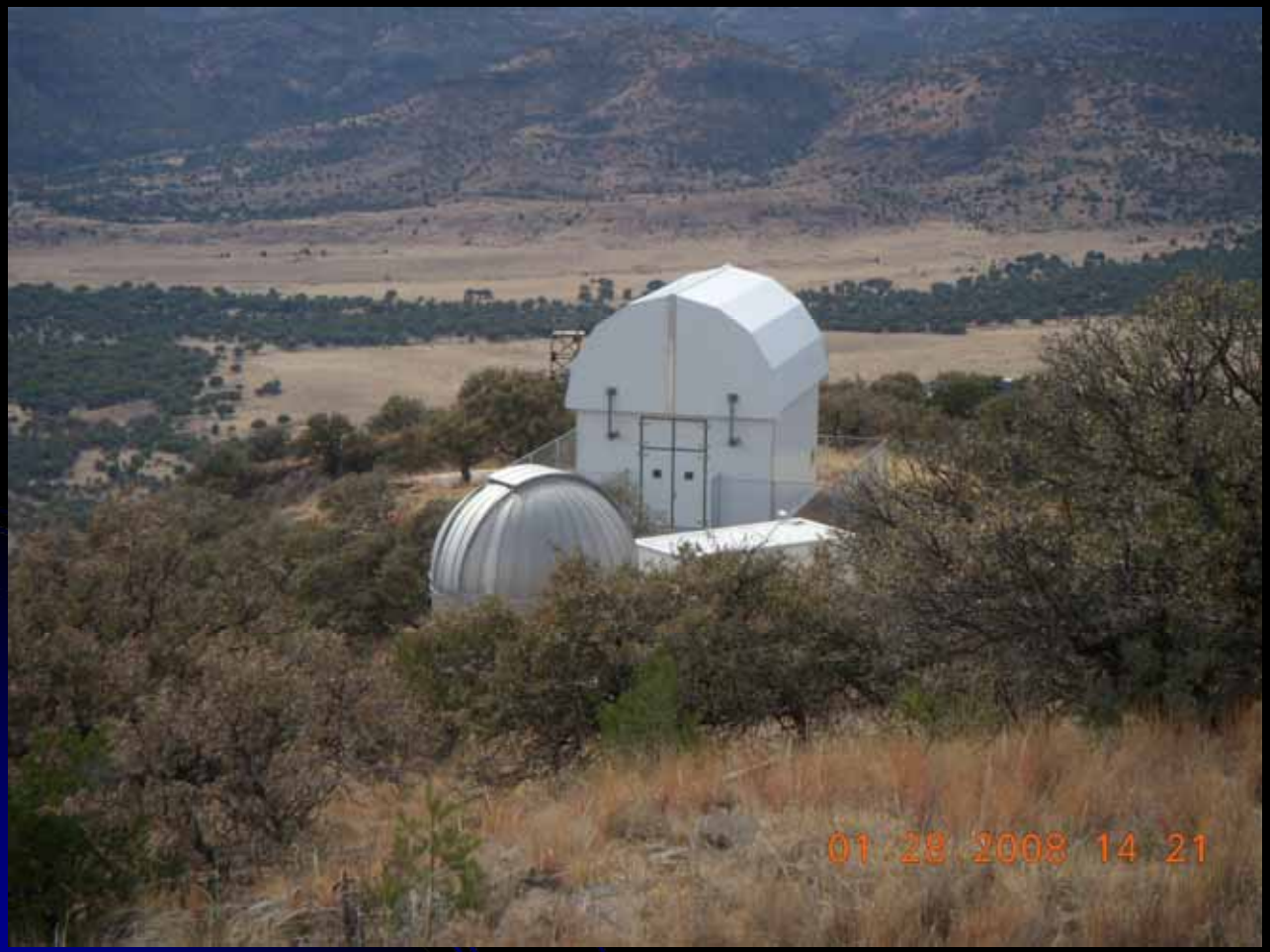
NOAO Commmunity Access Program
HET observing time is available through the NOAO proposal process, under an agreement with the National Science Foundation.

Other Telescopes

- MONET
- BOSTON UNIVERSITY

- 30” TORRE Rice HCC
- 36”

The 1.2 MONET Telescope



A remote controlled telescope, the MONET has a twin in South Africa. Together they can view both the northern and southern skies.

http://monet.uni-goettingen.de/cgi-bin/WebObjects/MonetPortal

Astronomie & Internet

Username:

Password:

LOGIN

Welcome to our network of two 1.2m robotic telescopes.

Discover what exciting possibilities will be opened to astrophysicists and school classes all over the world starting Winter 2005/2006.

Track the progress being made on the MONET telescopes, their unique enclosures, and this internet-based user, project, and image database by checking our news pages regularly.

Find out how to use the *Astronomie & Internet* telescopes to make physics, mathematics and computer instruction in your classroom more exciting - all made possible by a generous grant from the *Alfried Krupp von Bohlen und Halbach Foundation.*

This site is still under construction. Don't worry if you see an error message or other strange side effects.

THE TORRE DOME

Texas Observatory for Remote Research and Education

http://www.as.utexas.edu/mcdonald/facilities/0.8m/0.8.html

The primary mirror is 30 inches and is a recovered section from the Harlan J. Smith primary mirror. Located on Mount Locke, the TORRE scope should see first light by November 2008.

Seen Here is the TORRE telescope (a work in progress)


01 27 2008 17:42


17:41


01 27 2008 17:41

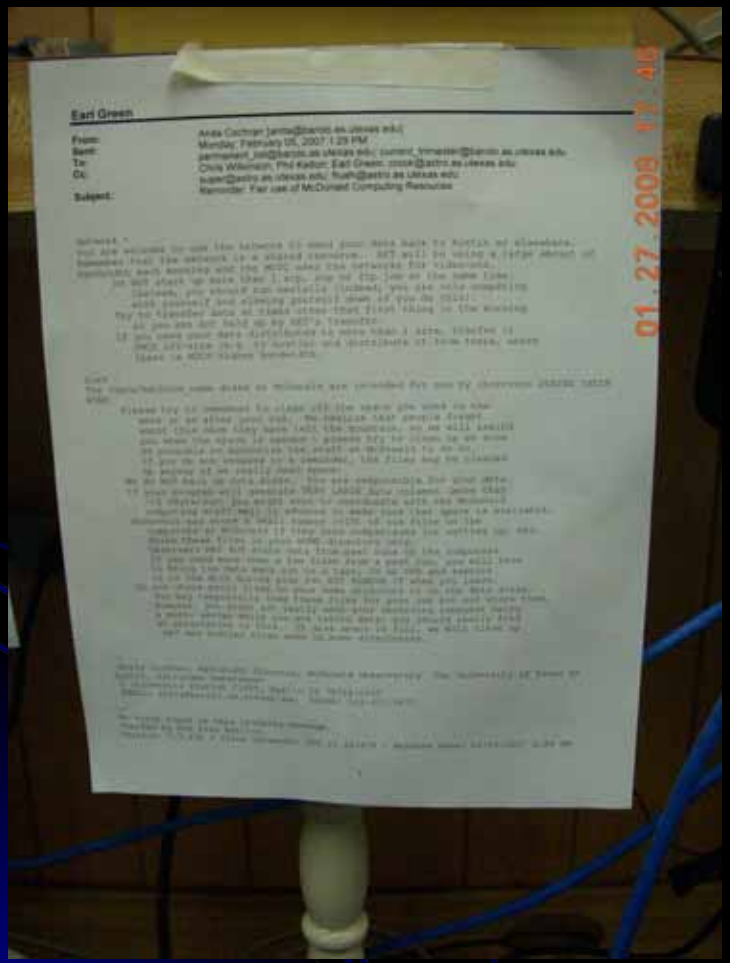

01 27 2008 17 47


01 27 2008 17 42

The control room for the TORRE telescope.

No longer do astronomers brave the elements and weather the cold in the unforgiving domes of the telescopes.
Because of the many technical advancements the images are viewed on computer screens like these.

Ah the comforts of modern astronomy (AC and heating).



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2.1m Otto Struve Telescope
0.8m Telescope
0.8m Laser Ranging Telescope

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Observatory Committees

Employment

0.8m (30") Telescope

Instruments

f/3.0 focus

Prime Focus Corrector (PFC)

Cautions

0.8m Cautions

Optical

Primary Mirror

diameter: 76.7cm (30.2")
focal length: 2.29m (90")
f-ratio: 3.0

Prime Focus Corrector (PFC)

focal length: 22.72m
f-ratio: 2.98
field angle: 46.5 arcmin
plate scale: 1.3553 arcsec/CCD pixel

Mechanical

Primary Mirror

weight: 118kg (260 lbs)
thickness: 12.7cm (5")
material: fused silica

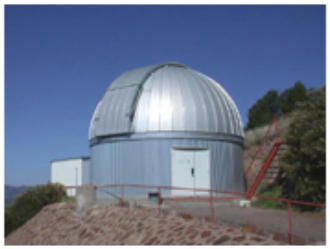
Telescope Tube

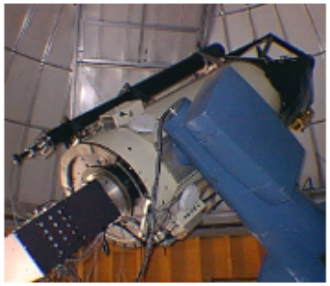
diameter: 89.4cm (35.2")
length: 2.29m (90")

Dome

diameter: 6.1m (20')

0.8m (30") Telescope





Instruments

f/3.0 focus

Prime Focus Corrector (PFC)

Cautions

0.8m Cautions

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diameter: 76.7cm (30.2")
focal length: 2.29m (90")
f-ratio: 3.0

Prime Focus Corrector (PFC)

focal length: 22.72m
f-ratio: 2.98
field angle: 46.5 arcmin
plate scale: 1.3553 arcsec/CCD pixel

Mechanical

Primary Mirror

weight: 118kg (260 lbs)
thickness: 12.7cm (5")
material: fused silica

Telescope Tube

diameter: 89.4cm (35.2")
length: 2.29m (90")

Dome

diameter: 6.1m (20')

Historical

Construction

completed: 1970
pfc: commissioned 1993

Contractor

telescope: Boller and Chivens Division, the Perkin-Elmer Co.
dome: Ash-Domes

McDonald Observatory

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9.2m Hobby-Eberly Telescope
2.7m Harlan J. Smith Telescope
2.1m Otto Struve Telescope
0.8m Telescope
0.8m Laser Ranging Telescope

McDonald Library

Observatory Committees

Employment

0.8m Telescope

f/3.0

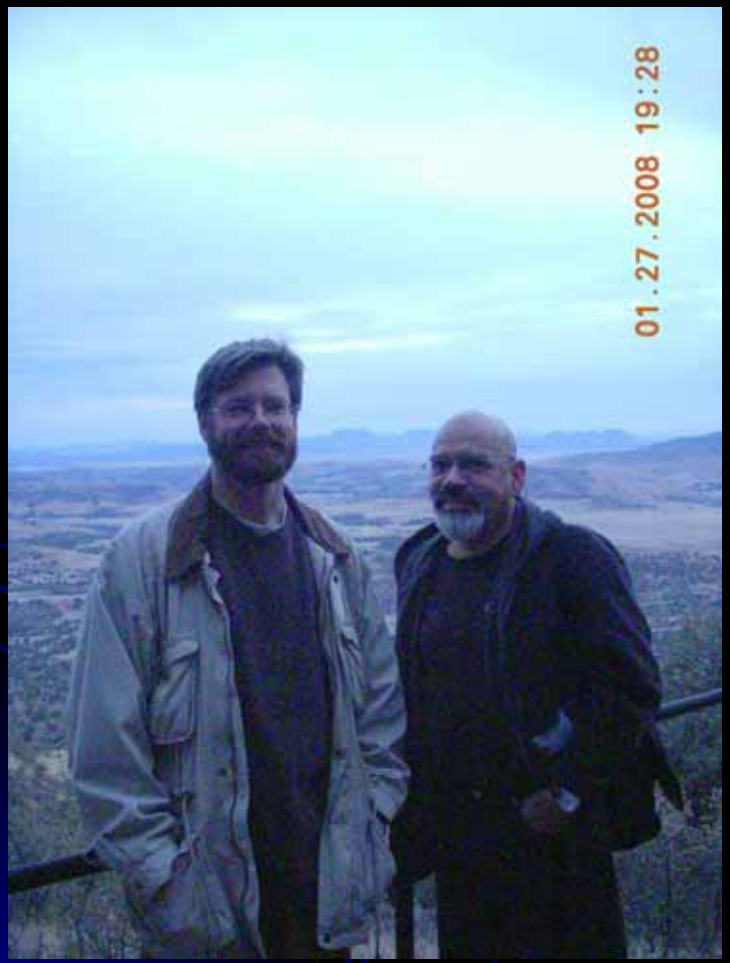
Prime Focus Corrector (PFC)

Scientist:
Dr. Phillip MacQueen
(512) 471-1470
pjm@astro.as.utexas.edu

30"/PFC Quick Start Guide

The 0.8m telescope is dedicated to an f/3.0 Prime Focus Corrector. The PFC provides a 1.10 degree field, and the Loral Fairchild 2048 x 2048 CCD covers 46.2 x 46.2 arcminutes. The CCD (LF1) has 15 micron pixels with 1.355 arcsec per pixel. The PFC operates from 3,000-10,000 Å. Five 2-inch square filter positions are available. The standard filter set is the Bessel UBVRI set. A special set of interference filters for cometary programs is available.

PI and Co_PI TORRE program
Dr. Christopher Johns-Krull (Rice University)
Dr. Juan Carlos Reina



The diligent astronomers take a needed break in the dining hall of the observers lodge.

Keep looking up!!