NASA Technical Memorandum 88283

United States Atlas of Optical Telescopes

(Second Edition)

Stephen Paul Meszaros

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National Aeronautics and
Space Administration

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Stephen Paul Meszaros
Ames Research Center, Dryden Flight Research Facility, Edwards, California

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Edwards, California 93523-5000

CONTENTS

SUMMARY

This atlas shows the locations of and gives information about optical telescopes used for astronomical research in the United States, as of late 1986. Those instruments with mirror or lens diameters of 3/4 m (approximately 30 in) and larger are included. The smaller telescopes are found in various concentrations all across the country. The larger ones are concentrated in the Southwest, on the West Coast, and on the island of Hawaii.

INTRODUCTION

This atlas represents an update to a previously published atlas of the same name, and is an extension to a previously published atlas entitled "World Atlas of Large Optical Telescopes" (see Bibliography) by the author. The World Atlas showed the locations around the globe of optical telescopes in a size range of 1 m (approximately 40 in) and larger. (Instrument size is measured by the diameter of the objective lens or mirror of the telescope.)

This "United States Atlas of Optical Telescopes" is concerned with telescopes located only within the United States. Instruments of 3/4 m (approximately 30 in) and larger are included. The atlas maps show the locations of telescopes and observatories, and the tables list more detailed information about them. Generally, the information presented here represents the United States astronomical instruments in use as of late 1986.

Although most U.S. optical telescopes are listed in this atlas, a few have not been included. Among these are the Baker-Nunn cameras which are designed for special sky surveys, NASA telescopes used primarily for laser ranging studies, U.S. Air Force telescopes used for various engineering purposes, and orbiting space telescopes. Despite these omissions, the reader will find the great majority of larger American optical telescopes dedicated to astronomical research listed.

The information on the various telescopes in this atlas was obtained primarily through publications. Consequently the accuracy of the material presented is almost entirely dependent upon the sources selected. Where conflicts arose between sources, the most up-to-date or reliable source (in the author's opinion) or both were used. The major publications consulted are listed in the Bibliography.

Please send any corrections or additions to Stephen P. Meszaros, NASA Ames-Dryden Flight Research Facility, Mail Stop D-ATD, P.O. Box 273, Edwards, California 93523-5000.

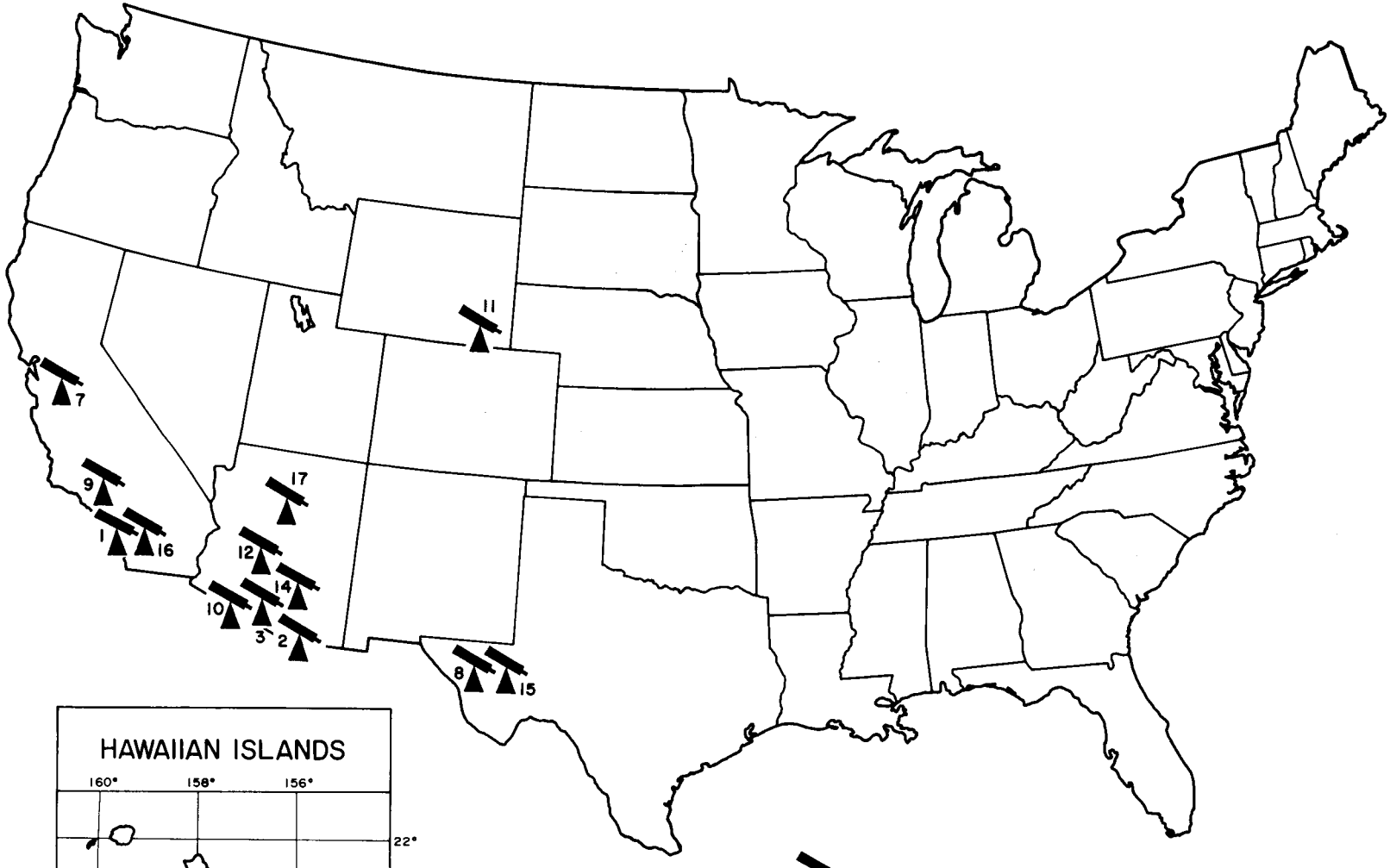
Map 1. MAJOR UNITED STATES TELESCOPES

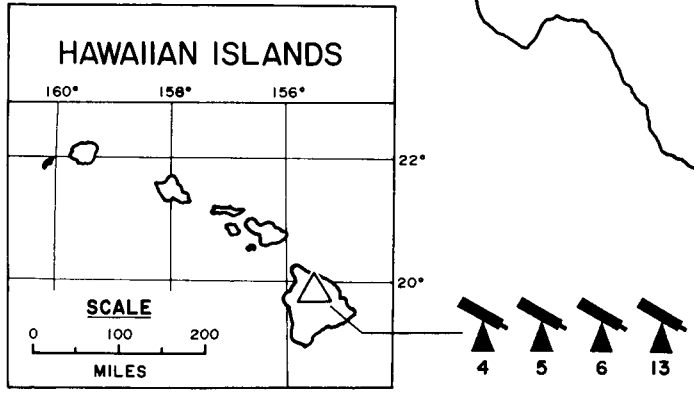
Mirror Diameter 183 cm (72 in) and Larger

Map location number	Size	Observatory
1	508 cm (200 in)	Palomar
2	6:183 cm (6:72 in)*	Whipple (MMT)
3	401 cm (158 in)	Kitt Peak
4	381 cm (150 in)	Mauna Kea
5	366 cm (142 in)	Mauna Kea
6	305 cm (120 in)	Mauna Kea
7	305 cm (120 in)	Lick
8	272 cm (107 in)	McDonald
9	254 cm (100 in)	Mt. Wilson
10	241 cm (95 in)	McGraw-Hill
11	234 cm (92 in)	Wyoming Infrared
12	229 cm (90 in)	Steward
13	224 cm (88 in)	Mauna Kea
14	213 cm (84 in)	Kitt Peak
15	208 cm (82 in)	McDonald
16	122 cm/183 cm (48 in/72 in)	Palomar
17	183 cm (72 in)	Lowell-Ohio

*The six 183-cm (72-in) mirrors combined are equivalent to a single 447-cm (176-in) mirror.

MAJOR UNITED STATES TELESCOPES





MAJOR TELESCOPES

SCALE

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MILES

Map 2. WESTERN UNITED STATES OBSERVATORIES

State	Map location number	Observatory
Arizona	1	Lowell
	2	Lowell-Ohio
	3	U.S. Naval
	4	Mt. Lemmon
	5	Catalina
	6	Kitt Peak
	7	Steward
	8	McGraw-Hill
	9	Warner and Swasey
	10	Whipple
California	1	Palomar
	2	Mt. Wilson
	3	Lick
	4	Kuiper Airborne
	5	MIRA
	6	Leuschner
Nebraska	1	Behlen
New Mexico	1	Sacramento Peak
	2	Langmuir Laboratory
Texas	1	McDonald
Washington	1	Battelle
	2	Manastash
Wyoming	1	Wyoming Infrared

WESTERN UNITED STATES OBSERVATORIES

Map 3. EASTERN UNITED STATES OBSERVATORIES

State	Map location number	Observatory
Florida	1	Hill
Georgia	1	Fernbank
	2	Bradley
Illinois	1	Lindheimer
	2	Prairie
Indiana	1	Holcomb
	2	Goethe Link
Louisiana	1	Louisiana State University
Massachusetts	1	Agassiz Station
Michigan	1	University of Michigan
Minnesota	1	O'Brien
New Jersey	1	Princeton University
Ohio	1	Ritter
	2	Warner and Swasey
	3	Perkins
Pennsylvania	1	Pennsylvania State University
	2	Allegheny
Tennessee	1	Southwestern
Virginia	1	Fan Mountain Station
Wisconsin	1	Yerkes
	2	Pine Bluff

EASTERN UNITED STATES OBSERVATORIES

GUIDE TO THE TABLE

The following table of United States optical telescopes is arranged alphabetically by state. It gives the following information:

Location: Observatory location, either the name of the mountain or a nearby town or city. In some cases two locations are given if the first (and closer) is not well-known.

Observatory: Observatory name and/or the name of the sponsoring institution.

Type: Telescope type, using the following nomenclature:

Re	reflecting telescope
Rf	refracting telescope
S	Schmidt telescope
Sol	solar telescope
IR	telescope used primarily for infrared observations
MMT	multiple-mirror telescope

Size: Diameter of telescope mirror or lens, in centimeters and inches. (For Schmidt telescopes both the mirror and correcting-lens diameters are given.)

Name: Special name, if the telescope is well-known by one.

Notes: Comments about specific telescopes, indicated by note numbers and given in the Notes section following the table.

TABLE OF UNITED STATES TELESCOPES

Location	Observatory	Type	Size	Name	Notes
Alabama	(None above 76 cm (30 in) in size listed)				
Alaska	(None above 76 cm (30 in) in size listed)				
Arizona					
Flagstaff	Lowell	Re	107 cm (42 in)		
Flagstaff	Lowell	Re	79 cm (31 in)		
Anderson Mesa (Flagstaff)	Lowell-Ohio	Re	183 cm (72 in)		1
Flagstaff	U.S. Naval	Re	155 cm (61 in)		
Flagstaff	U.S. Naval	Re	102 cm (40 in)		
Mt. Lemmon	Mt. Lemmon (Univ. of Minnesota and Univ. of California)	IR	152 cm (60 in)		
Mt. Lemmon	Mt. Lemmon (NASA)	IR	152 cm (60 in)		
Mt. Lemmon	Mt. Lemmon (Univ. of Arizona)	IR	102 cm (40 in)		
Catalina Site (Catalina Mts.)	Catalina (Univ. of Arizona)	Re	155 cm (61 in)		
Catalina Site (Catalina Mts.)	Catalina (Univ. of Arizona)	Re	100 cm (39 in)		
Kitt Peak	Kitt Peak National	Re	401 cm (158 in)	Mayall	2, 3
Kitt Peak	Kitt Peak National	Re	213 cm (84 in)		
Kitt Peak	Kitt Peak National	Sol	152 cm (60 in)	McMath	4

TABLE OF UNITED STATES TELESCOPES, CONTINUED

Location	Observatory	Type	Size	Name	Notes
Kitt Peak	Kitt Peak National	Re	127 cm (50 in)		
Kitt Peak	Kitt Peak National	Re	91 cm (36 in)		
Kitt Peak	Kitt Peak National	Re	91 cm (36 in)		
Kitt Peak	Steward (Univ. of Arizona)	Re	229 cm (90 in)		
Kitt Peak	Steward (Univ. of Arizona)	Re	91 cm (36 in)		
Kitt Peak	McGraw-Hill (Univ. of Michigan)	Re	241 cm (95 in)		5
Kitt Peak	McGraw-Hill (Univ. of Michigan)	Re	132 cm (52 in)		
Kitt Peak	Warner and Swasey (Case Western Reserve Univ.)	S	61 cm/91 cm (24 in/36 in)		
Mt. Hopkins	Whipple	MMT	6:183 cm (6:72 in)		6
Mt. Hopkins	Whipple	Re	152 cm (60 in)		
Arkansas	(None above 76 cm (30 in) in size listed)				
California					
Palomar Mountain	Palomar (Cal. Tech.)	Re	508 cm (200 in)	Hale	7
Palomar Mountain	Palomar (Cal. Tech.)	Re	152 cm (60 in)		
Palomar Mountain	Palomar (Cal. Tech.)	S	122 cm/183 cm (48 in/72 in)		8
Mt. Wilson	Mt. Wilson (Carnegie Institution)	Re	254 cm (100 in)	Hooker	

TABLE OF UNITED STATES TELESCOPES, CONTINUED

Location	Observatory	Type	Size	Name	Notes
Mt. Wilson	Mt. Wilson (Carnegie Institution)	Re	152 cm (60 in)		
Mt. Wilson	Mt. Wilson (Carnegie Institution)	Re	102 cm (40 in)		
Mt. Hamilton	Lick (Univ. of California)	Re	305 cm (120 in)	Shane	
Mt. Hamilton	Lick (Univ. of California)	Re	102 cm (40 in)		
Mt. Hamilton	Lick (Univ. of California)	Rf	91 cm (36 in)		9
Mt. Hamilton	Lick (Univ. of California)	Re	91 cm (36 in)	Crossley	
Ames Research Center	Kuiper Airborne (NASA)	Re	91 cm (36 in)		10
Chews Ridge (Jamesburg)	MIRA (Monterey Institute for Research in Astronomy)	Re	91 cm (36 in)		
Lafayette	Leuschner (Univ. of Cal., Berkeley)	Re	76 cm (30 in)		
Colorado	(None above 76 cm (30 in) in size listed)				
Connecticut	(None above 76 cm (30 in) in size listed)				
Delaware	(None above 76 cm (30 in) in size listed)				
Florida					
Gainesville	Hill (Univ. of Florida)	Re	76 cm (30 in)		
Georgia					
Atlanta	Fernbank Science Center	Re	91 cm (36 in)		

TABLE OF UNITED STATES TELESCOPES, CONTINUED

Location	Observatory	Type	Size	Name	Notes
Decatur	Bradley (Agnes Scott College)	Re	76 cm (30 in)		
Hawaii					
Mauna Kea	Mauna Kea (UKIRT)	IR	381 cm (150 in)	UKIRT	11
Mauna Kea	Mauna Kea (CFHT)	Re	361 cm (142 in)	CFHT	12
Mauna Kea	Mauna Kea (NASA)	IR	305 cm (120 in)		13
Mauna Kea	Mauna Kea (Univ. of Hawaii)	Re	224 cm (88 in)		
Idaho	(None above 76 cm (30 in) in size listed)				
Illinois					
Evanston	Lindheimer (Northwestern Univ.)	Re	102 cm (40 in)		
Oakland	Prairie (Univ. of Illinois)	Re	102 cm (40 in)		
Indiana					
Indianapolis	Holcomb (Butler Univ.)	Re	97 cm (38 in)		
Brooklyn	Goethe Link (Indiana Univ.)	Re	91 cm (36 in)		
Iowa	(None above 76 cm (30 in) in size listed)				
Kansas	(None above 76 cm (30 in) in size listed)				
Kentucky	(None above 76 cm (30 in) in size listed)				
Louisiana					
Baton Rouge	Louisiana State University	Re	91 cm (36 in)		

TABLE OF UNITED STATES TELESCOPES, CONTINUED

Location	Observatory	Type	Size	Name	Notes
Maine	(None above 76 cm (30 in) in size listed)				
Maryland	(None above 76 cm (30 in) in size listed)				
Massachusetts					
Harvard	Agassiz Station (Harvard College)	Re	155 cm (61 in)	Wyeth	
Harvard	Agassiz Station (Harvard College)	S	61 cm/84 cm (24 in/33 in)		
Michigan					
Ann Arbor	University of Michigan	Re	94 cm (37 in)		
Minnesota					
Minneapolis	O'Brien (Univ. of Minnesota)	Re	76 cm (30 in)		
Mississippi	(None above 76 cm (30 in) in size listed)				
Missouri	(None above 76 cm (30 in) in size listed)				
Montana	(None above 76 cm (30 in) in size listed)				
Nebraska					
Mead	Behlen (Univ. of Nebraska)	Re	76 cm (30 in)		
Nevada	(None above 76 cm (30 in) in size listed)				
New Hampshire	(None above 76 cm (30 in) in size listed)				
New Jersey					
Princeton	Princeton University	Re	91 cm (36 in)		
New Mexico					
Sacramento Peak (Sunspot)	Sacramento Peak (NOAO)	Sol	163 cm (64 in)		14

TABLE OF UNITED STATES TELESCOPES, CONTINUED

Location	Observatory	Type	Size	Name	Notes
South Baldy Peak (Magdalena Mts.)	Langmuir Laboratory (New Mexico Tech.)	Re	76 cm (30 in)		
New York	(None above 76 cm (30 in) in size listed)				
North Carolina	(None above 76 cm (30 in) in size listed)				
North Dakota	(None above 76 cm (30 in) in size listed)				
Ohio					
Toledo	Ritter (Univ. of Toledo)	Re	102 cm (40 in)		
East Cleveland	Warner and Swasey (Case Western Reserve Univ.)	Re	91 cm (36 in)		
Delaware	Perkins (Ohio State Univ. and Ohio Wesleyan Univ.)	Re	81 cm (32 in)		
Oklahoma	(None above 76 cm (30 in) in size listed)				
Oregon	(None above 76 cm (30 in) in size listed)				
Pennsylvania					
Rattlesnake Mountain	Penn. State University	Re	152 cm (60 in)		
Pittsburgh	Allegheny (Univ. of Pittsburgh)	Re	79 cm (31 in)		
Pittsburgh	Allegheny (Univ. of Pittsburgh)	Rf	76 cm (30 in)	Thaw	
Rhode Island	(None above 76 cm (30 in) in size listed)				
South Carolina	(None above 76 cm (30 in) in size listed)				
South Dakota	(None above 76 cm (30 in) in size listed)				

TABLE OF UNITED STATES TELESCOPES, CONTINUED

Location	Observatory	Type	Size	Name	Notes
Tennessee					
Memphis	Southwestern	Re	79 cm (31 in)		
Texas					
Mt. Locke (Fort Davis)	McDonald (Univ. of Texas)	Re	272 cm (107 in)		
Mt. Locke (Fort Davis)	McDonald (Univ. of Texas)	Re	208 cm (82 in)	Struve	
Mt. Locke (Fort Davis)	McDonald (Univ. of Texas)	Re	91 cm (36 in)		
Mt. Locke (Fort Davis)	McDonald (Univ. of Texas)	Re	76 cm (30 in)		
Utah	(None above 76 cm (30 in) in size listed)				
Vermont	(None above 76 cm (30 in) in size listed)				
Virginia					
Fan Mt. Station (Charlottesville)	Fan Mt. Station (Univ. of Virginia)	Re	102 cm (40 in)		
Fan Mt. Station (Charlottesville)	Fan Mt. Station (Univ. of Virginia)	Re	81 cm (32 in)		
Washington					
Richland	Battelle	Re	79 cm (31 in)		
Ellensburg	Manastash (Univ. of Washington)	Re	76 cm (30 in)		
West Virginia	(None above 76 cm (30 in) in size listed)				
Wisconsin					
Williams Bay	Yerkes (Univ. of Chicago)	Re	104 cm (41 in)		

TABLE OF UNITED STATES TELESCOPES, CONTINUED

Location	Observatory	Type	Size	Name	Notes
Williams Bay	Yerkes (Univ. of Chicago)	Rf	102 cm (40 in)		15
Pine Bluff (Madison)	Pine Bluff (Univ. of Wisconsin)	Re	91 cm (36 in)		
Wyoming					
Jelm Mountain	Wyoming Infrared (Univ. of Wyoming)	IR	234 cm (92 in)		

NOTES

1. The Lowell-Ohio Observatory telescope is operated jointly by Lowell Observatory, Ohio State University, and Ohio Wesleyan University.

2. The 401-cm (158-in) Mayall reflector of Kitt Peak National Observatory is the second largest single mirror telescope in the United States. (See also Notes 6 and 7.)

3. Kitt Peak National Observatory is operated by the National Optical Astronomy Observatories (NOAO) for the Association of Universities for Research in Astronomy (AURA). Member universities are University of Arizona, California Institute of Technology, University of California, University of Chicago, University of Colorado, Harvard University, University of Hawaii, University of Illinois, Indiana University, Johns Hopkins University, Massachusetts Institute of Technology, University of Michigan, Ohio State University, Princeton University, University of Texas, University of Wisconsin, and Yale University.

4. The McMath solar telescope at Kitt Peak National Observatory is the largest of its type in the world, with a focal length of 91 m (300 ft).

5. The McGraw-Hill Observatory is managed by the University of Michigan, Dartmouth College, and the Massachusetts Institute of Technology.

6. The Multiple-Mirror Telescope (MMT) concentrates the light from six 183-cm (72-in) mirrors at a common focus. The light collecting area of these mirrors is equal to that of one large 447-cm (176-in) mirror.

7. The 508-cm (200-in) Hale reflector on Palomar Mountain is the largest telescope in the United States and second largest in the world.

8. The 122/183-cm (48/72-in) Schmidt telescope on Palomar Mountain is the largest of its type in the United States.

9. The 91-cm (36-in) telescope of Lick Observatory is the second largest refracting telescope in the world. (See also Note 15.)

10. The Kuiper Airborne Observatory is a 91-cm (36-in) telescope designed to operate at high altitudes from a specially equipped C-141 Starlifter aircraft. Home base for the observatory aircraft is the NASA Ames Research Center.

11. The 381-cm (150-in) United Kingdom Infrared Telescope (UKIRT) is operated at Mauna Kea Observatory by England.

12. The 361-cm (142-in) Canada-France-Hawaii Telescope (CFHT) is operated at Mauna Kea Observatory by Canada, France, and Hawaii.

13. The 305-cm (120-in) telescope of the National Aeronautics and Space Administration is operated at Mauna Kea Observatory by the University of Hawaii's Institute for Astronomy.

14. The 163-cm (64-in) solar telescope of Sacramento Peak Observatory is operated by the National Optical Astronomy Observatories (NOAO).

15. The 102-cm (40-in) telescope of Yerkes Observatory is the largest refracting telescope in the world.

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15. Supplementary Notes

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16. Abstract

This atlas shows the locations of and gives information about optical telescopes used for astronomical research in the United States, as of late 1986. Those instruments with mirror or lens diameters of 3/4 m (approximately 30 in) and larger are included. The smaller telescopes are found in various concentrations all across the country. The larger ones are concentrated in the Southwest, on the West Coast, and on the island of Hawaii.

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