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## Guide to the Papers of Robert B. Leighton, 1938-1988

### Collection number: Consult repository

Archives

California Institute of Technology  
Pasadena, California

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Date Completed:

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### Descriptive Summary

**Title:** Robert B. Leighton papers,

**Date (inclusive):** 1938-1988

**Collection number:** Consult repository

**Creator:** Leighton, Robert B., 1919-1997

**Extent:** 7 linear feet.

**Repository:** California Institute of Technology. Archives.

Pasadena, California 91125

**Abstract:** This collection documents the career of Robert B. Leighton, who served as a member of the physics faculty at the California Institute of Technology from 1949 until 1986. The materials relating to the California Institute of Technology include research proposals for funding on design projects for NASA, radio and optical telescope dish designs (Owens Valley Radio Observatory and Keck Telescope), and radio astronomy, and other observational data. The papers also contain lecture notes to courses led by Richard Feynman and Murray Gell-Mann, as well as publication files on Feynman's Lectures on Physics.

**Language:** English

#### Access

The collection is open for research. Researchers must apply in writing for access.

#### Publication Rights

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#### **Preferred Citation**

[Identification of item, box and file number], Papers of Robert B. Leighton. Archives, California Institute of Technology.

#### **Acquisition Information**

The Robert B. Leighton collection was donated to the Institute Archives in several installments originating from various sources. The bulk of the collection was obtained from the Physics Division in 1992. Two years later, a lot of photographic material was acquired by the Archives from Dr. Leighton's son, Allan, Professors G. Neugebauer and T. Phillips. Finally, the third installment came in 1995 from Allan Leighton and from the Astrophysics Library.

#### **Processing History**

This collection was processed by Laurence M. Dupray, Nurit Lifshitz, and Anne Simms. Processing completed July 2000.

The processing of the Robert B. Leighton collection and the creation of the finding aid was made possible in part by a grant from the Richard Lounsbery Foundation and the Friends of the Center for History of Physics, American Institute of Physics.

#### **Biography**

Born in Detroit on September 10, 1919, Robert B. Leighton was raised in Long Beach by his mother. He exhibited at an early age an interest in science, particularly in astronomy and photography. He spent his high-school years in Long Beach and Los Angeles schools. He then started a long tenure at Caltech: Bachelor of Science in 1941, Master of Science of 1944, PhD in 1947, research fellowship, and assistant professorship in 1949.

His scientific career debut was in the field of particle physics. He made many important contributions, among them the identification of the mu-meson decay products, the measurement of the energy spectrum of decay electrons, and the first observation of a strange particle decay.

It was only in the mid-1950's that Robert Leighton started to take an active role in astronomy. He turned his attention to the physics of the sun. He developed Doppler-shift and Zeeman-effect solar cameras which were used to demonstrate the existence of the sun's magnetic field and five-minute oscillations.

In the early 1960's, he and Gerry Neugebauer developed a small infrared telescope, used to produce the first infrared survey of the sky. This 60-inch telescope was first set up at Caltech and then moved to the Mount Wilson Observatory.

He became involved in several Mariner projects, particularly the Mariner IV mission where he was the principal investigator for the television experiment. This mission led to the discovery of Martian craters and the determination of the density of the Martian atmosphere. It also returned 22 television pictures covering about one percent of the planet's surface.

In 1970, Professor Leighton's interest shifted to building large, inexpensive dish antennae for millimeter and submillimeter observations. This resulted in the construction of three 10-meter dishes at Owens Valley Radio Observatory and one in Hawaii for submillimeter interferometry.

Besides these accomplishments, Dr. Leighton remained very active in teaching at the Institute. He taught an undergraduate course for many years. He also edited the Feynman Lectures for publication and wrote two textbooks: *Principles of Modern Physics* and *Exercises in Introductory Physics*, the latter in collaboration with Dr. Rochus Vogt.

His outstanding academic career is reflected by his nomination to the prestigious National Academy of Sciences in 1963.

#### **Scope and Content of Collection**

Includes correspondence, teaching materials, technical files, meetings reports and correspondence, manuscripts and talks, and films of planets taken by Dr. Leighton at Mount Wilson observatory in the late 1950s. The materials relating to the California Institute of Technology include research proposals for funding on design projects for NASA, radio and optical telescope dish designs (Owens Valley Radio Observatory and Keck Telescope), and radio astronomy, and other observational data. Also contains lecture notes to courses by Richard Feynman and Murray Gell-Mann and publication files on Feynman's lectures on physics; and reports, correspondence, and notes relating to his membership in the National Academy of Sciences.

I. Correspondence. This large section is arranged first in alphabetical order, then chronologically for each person.

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II. Caltech. This section contains material related to the California Institute of Technology. Each subsection is organized in chronological order, starting with the oldest material. The first subsection contains research proposals which were submitted over a period of twenty years to various funding agencies for the support and construction of various astronomical devices. The title of the following subsection is teaching. It contains material related to two courses offered by the physics division: Physics 234, with Gell-Mann as the instructor, and Physics 1 abc, with Robert Leighton as one of several instructors. The last subsection contains miscellaneous documents pertinent to the California Institute of Technology.

III. Technical Files. This section contains information on the astronomical work done by Dr. Leighton. It begins with the construction of the 60-inch, infrared telescope at the Mount Wilson Observatory. The following subcategory relates to the Owens Valley Radio Observatory, and the construction of the 10-meter dish telescopes (later called the Leighton telescopes) for millimeter-wave observations. It contains proposals, mechanical design notes and correspondence. The following category entitled "Submillimeter-wave astronomy" deals with the telescope built at the Caltech Submillimeter Observatory in Hawaii. The content of this section is the same as the previous one. The last section, "Miscellaneous," contains three notebooks; two of them deal with particle physics, and the other one with astronomy.

IV. Professional Organizations. Dr. Leighton was a member of the National Academy of Sciences. Reports, correspondence and notes of the meetings he participated are contained in this section.

V. Manuscripts and Talks. The first subsection, Manuscripts, contains mostly drafts of papers which were never published. The most important ones are five Feynman lectures which were never edited for publication.

VI. Films. The last section deals with "The Planet Movies," which were a series of short footages from planets taken by Dr. Leighton during his observation times at Mount Wilson in the 1950's. These 16-mm films were recently transferred to a videotape and can be found in the Archives' audio-visual material.

### **Indexing Terms**

The following terms have been used to index the description of this collection.

### **People**

Gell-Mann, Murray

Feynman, Richard Phillips

### **Corporations**

California Institute of Technology

Mount Wilson Observatory

National Academy of Sciences (U.S.)

Owens Valley Radio Observatory

United States. National Aeronautics and Space Administration

W.M. Keck Observatory

Keck Telescope

### **Subjects**

Astronomy

Physics--Study and teaching

Radio--Antennas--Design

Radio astronomy

Radio telescopes

Telescopes--Design

### **Genres and Forms of Materials**

Lecture notes

Motion pictures

Publications

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**Occupations**

Physicists

**Related Collections**

Records of the Owens Valley Radio Observatory (OVRO)

Papers of Alan T. Moffet

Margaret L. Leighton Oral History Interview (1995)

Robert B. Leighton Oral History Interview (1986-1987)

Gerry Neugebauer Oral History Interview (1991)

Series I: Correspondence

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Box 1, Folder 25     ***Astrophysical Letters* 1968-1969; 1974**  
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Box 1, Folder 42     **Black, N.A. 1965**  
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Box 2, Folder 2      **Boley, F.I. 1964-1968**

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	<b>Boyce, P. 1975-1976; 1978 See: National Science Foundation</b>
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	<b>Cameron, A.G.W. 1963, 1965 See: NASA</b>
Box 2, Folder 10	<b>CBS News 1963</b>
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	<b>Chandrasekhar, S. See: <i>Astrophysical Journal</i></b>
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Box 3, Folder 14      **Goldberg, L. 1961; 1964-1966; 1971-1972; 1976 See also: American Astronomical Association**  
Box 3, Folder 15      ***Annual Review of Astronomy and Astrophysics***  
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Box 3, Folder 35	<b>Jefferies, J.T. 1965-1966; 1968; 1970-1971; 1978-1979</b>
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Box 5, Folder 2	<b>Physics and Astronomy (Roman, N.) 1963-1978</b>
Box 5, Folder 3	<b>Theoretical Division 1963; 1966; 1970</b>
Box 5, Folder 4	<b>National Geographic Magazine 1964-1965; 1967; 1969-1970</b>
Box 5, Folder 5	<b>National Radio Astronomy Observatory (NRAO) 1974-1980</b>
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	<b>Newell, H.E. 1963-1966 See: NASA: Office of Space Sciences</b>
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Box 5, Folder 35      **Q--Miscellaneous**

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Box 6, Folder 10      **Schuster, R.P. 1966-1968**  
Box 6, Folder 11      **Schoolman, S.A. 1973**  
Box 6, Folder 12      **Science 1964; 1966-1967; 1969**  
Box 6, Folder 13      **Scientific American 1964; 1966; 1968-1970**  
Box 6, Folder 14      **Scott, D.C. 1968-1969**  
Box 6, Folder 15      **Sefi, R.R. 1979**  
Box 6, Folder 16      **Sharp, R.P. 1968**  
Box 6, Folder 17      **Shell Development Company 1966-1967**  
Box 6, Folder 18      **Shenton, D.B. 1975**  
Box 6, Folder 19      **Simmons, R.O. 1978**  
Box 6, Folder 20      **Simon, G.W. 1963-1964; 1966**  
Box 6, Folder 21      **Simpson, J.A. 1965; 1967**  
Box 6, Folder 22      **Singer, F.S. 1966**  
Box 6, Folder 23      **Sky and Telescope 1962; 1972; 1974; 1976**  
Box 6, Folder 24      **Smith, B.A. 1965; 1967; 1970**  
Box 6, Folder 25      **Smith, S. 1964**  
Box 6, Folder 26      **Smithsonian Institution 1969-1970**  
Box 6, Folder 27      **Smoluchowski, R. 1969-1970**  
Box 6, Folder 28      **Space Science Reviews 1967**  
Box 6, Folder 29      **Space Technology Laboratories, Inc. 1962**  
Box 6, Folder 30      **Sproull, R.L. See: Advanced Research Projects Agency**  
Box 6, Folder 30      **Stam, T.L. 1967, 1977**

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Series I: Correspondence

- S -

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Box 6, Folder 31	<b>Stevens, L. 1974</b>
Box 6, Folder 32	<b>Stewart, J.W. 1965; 1969</b>
Box 6, Folder 33	<b>Strand, K.A. 1964</b>
Box 6, Folder 34	<b>Strassenburg, A.A. 1963-1964</b>
Box 6, Folder 35	<b>Stull, J.L. 1962</b>
Box 6, Folder 36	<b>Sturrock, P.A. 1965; 1967; 1971</b>
Box 6, Folder 37	<b>Suemoto, Z. 1962; 1964</b>
Box 6, Folder 38	<b>Švestka, Z. 1966; 1969</b>
Box 6, Folder 39	<b>S--Miscellaneous I</b>
Box 6, Folder 40	<b>S--Miscellaneous II</b>

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- T -

Box 7, Folder 1	<b>Taylor, A.H., Jr. 1981-1982; 1985</b>
Box 7, Folder 2	<b>Teske, R.G. 1969; 1973</b>
Box 7, Folder 3	<b>Tollestrup, E. 1976; 1978</b>
Box 7, Folder 4	<b>Townes, C.H. 1967; 1970-1971; 1978; 1980</b>
Box 7, Folder 5	<b>T--Miscellaneous</b>

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- U -

Box 7, Folder 6	<b>Ulrich, B.T. 1964; 1969 See also: Parratt, L.G.</b>
Box 7, Folder 7	<b>UMSCHAU in Wissenschaft und Technik 1966-1967; 1969</b>
Box 7, Folder 8	<b>U--Miscellaneous</b>

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- V -

Box 7, Folder 9	<b>Veio, F.N. 1964; 1972; 1975</b>
Box 7, Folder 10	<b>Vogt, R.E. 1978-1982, 1984</b>
Box 7, Folder 11	<b>V--Miscellaneous</b>

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- W -

Box 7, Folder 12	<b>Waddell, J. 1964-1965</b>
Box 7, Folder 13	<b>Waldo, R. 1974-1975</b>
Box 7, Folder 14	<b>Wallerstein, G. 1974-1975</b>
Box 7, Folder 15	<b>Ward, F.W., Jr. 1964-1965</b>
Box 7, Folder 16	<b>Weaver, A.B. 1961</b>
Box 7, Folder 17	<b>Weiss, N.O. 1962; 1964</b>
Box 7, Folder 18	<b>Wells, R.A. 1967-1968</b>
Box 7, Folder 19	<b>White, R.E. 1968; 1974</b>
Box 7, Folder 20	<b>Whitney, C.A. 1961-1962</b>
Box 7, Folder 21	<b>Wilcox, J.M. 1965-1966; 1972</b>
Box 7, Folder 22	<b>Wildt, R. 1968</b>
Box 7, Folder 23	<b>Wilkerson, G.W. 1967; 1969</b>
Box 7, Folder 24	<b>Wilson, E.R. 1975-1976</b>
Box 7, Folder 25	<b>Wilson, P.R. 1962; 1964</b>
Box 7, Folder 26	<b>Winckler, J.R. 1963; 1966-1968</b>
Box 7, Folder 27	<b>W--Miscellaneous I</b>
Box 7, Folder 28	<b>W--Miscellaneous II</b>

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Series I: Correspondence

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- Y -

Box 7, Folder 29	<b>York, C.M. 1964</b>
Box 7, Folder 30	<b>Yoshimura, H. 1975</b>
Box 7, Folder 31	<b>Young, A.T. 1963</b>
Box 7, Folder 32	<b>Y--Miscellaneous</b>

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- Z -

Box 7, Folder 33	<b>Zapffe, C.A. 1964</b>
Box 7, Folder 34	<b>Zirin, H. 1963-1964; 1971</b>
Box 7, Folder 35	<b>Zisch, W.E. 1965; 1974</b>
Box 7, Folder 36	<b>Zweig, F. 1965-1966</b>
Box 7, Folder 37	<b>Z - Miscellaneous</b>

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Series II: Caltech

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Part A. Research Proposals

**NASA (National Aeronautics and Space Administration) Grant NsG-426 (study of cosmic rays, infrared astronomy, planetary magnetic fields, theoretical astrophysics, planetary spectroscopy, instrument development)**

**Semi-annual status report**

Box 8, Folder 1            **Apr. 1 - Oct. 1, 1963; Oct. 1, 1963 - Apr. 1, 1964**  
 Box 8, Folder 2            **Apr. 1 - Oct. 1, 1964**  
 Box 8, Folder 3            **Oct. 1, 1964 - March 31, 1965**  
 Box 8, Folder 4            **Apr. 1 - Sept. 30, 1965**  
 Box 8, Folder 5            **Oct. 1, 1965 - Mar. 31, 1966**  
 Box 8, Folder 6            **Request for additional funds Oct. 27, 1965**

**NASA Grant NGL 05-002-007**

Box 8, Folder 7            **Semi-annual status report Oct. 1, 1969 - March 31, 1970**  
 Box 8, Folder 8            **Summaries of research**  
 Box 8, Folder 9            **Final technical report [1976]**

**NASA Grant NGR 05-002-142**

Box 8, Folder 10           **Final technical report Sept. 1975**

**NASA Grant NSG-7136 on "Millimeter-wave interferometry."**

Box 8, Folder 11           **Proposal Feb. 1, 1975**  
 Box 8, Folder 12           **Status report July, 1975**  
                                  **Status and final technical reports Jan. 1976**

**NASA Grant NAS5-23696 on "Antenna design and millimeter-wave interferometry."**

Box 8, Folder 13           **Contract**  
 Box 8, Folder 14           **Proposal Feb.1, 1976**  
 Box 8, Folder 15           **Preliminary report Nov. 1976**  
 Box 8, Folder 16           **Final report May 1977**

**NASA Grant NGR 05-002-181**

Box 8, Folder 17           **Final technical report on "Mariner 6 and 7 picture analysis." n.d.**

**NASA/Ames Grant NAG 2-125 on "An experimental study of surface precision limits for machined panel submillimeter dishes."**

Box 8, Folder 18           **Final technical report 1982**

**NSF on "Millimeter-wave array"**

Box 8, Folder 19           **Draft July 1974**  
 Box 8, Folder 20           **Technical rßsumß of Caltech proposal to build four millimeter-wave telescopes Oct. 1974**

**NSF (National Science Foundation) Project AST 76-13334**

**"For the construction and initial operation of a millimeter-wave interferometric array."**

Box 8, Folder 21           **Proposal July 1 - Dec. 1, 1977**

**"For the construction of a millimeter-wave interferometer and a sub-millimeter radiometric telescope."**

**Proposal**

Box 8, Folder 22           **July 1 - Dec. 1, 1977**  
 Box 8, Folder 23           **Dec. 1, 1977 - Dec. 1, 1978**  
 Box 8, Folder 24           **Dec. 1, 1978 - Dec. 1, 1979**  
 Box 8, Folder 25           **May 1980 - May 1981**  
 Box 8, Folder 26           **Final technical report Oct. 1981**

**NSF and Ford Foundation "For the fundamental revision and improvement of introductory physics."**

Box 8, Folder 27           **Final report 1965**

Box 8, Folder 28           **Proposal for private funding of Caltech radio-astronomy program Nov. 1974**

**President's Fund**

Box 8, Folder 29           **Final report "Development of precision reflector segments for a large submillimeter space telescope."**  
                                  **July 12, 1983**

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**Part B. Teaching**

**Ph 234 abc. Relativistic quantum mechanics and field theory. Instructor: Gell-Mann, M.**

**Course notes**

Box 8, Folder 30

**Fall 1958**

Box 8, Folder 31

**Spring 1959**

Box 9, Folder 1

**Winter 1959**

**Ph 1 abc. Kinematics, particle mechanics and electric forces.**

**Laboratory 1961-1962**

Box 9, Folder 2

**General instructions, topics and experiments**

**Recitation 1961-1962**

Box 9, Folder 3

**Homework, problem sets, midterm examination and quizzes**

Box 9, Folder 4

**Problem sets on ( Note: Some of these problem sets were used in the Feynman "Lectures on physics. Exercises.")**

Box 9, Folder 4

**Collisions**

Box 9, Folder 4

**Electromagnetic radiation**

Box 9, Folder 4

**General**

Box 9, Folder 5

**Gravitation**

Box 9, Folder 5

**Kinematic dynamics**

Box 9, Folder 5

**Kinetic theory and statistical mechanics**

Box 9, Folder 6

**Mathematics**

Box 9, Folder 6

**Modes**

Box 9, Folder 6

**Optics**

Box 9, Folder 6

**Oscillations**

Box 9, Folder 7

**Potentials**

Box 9, Folder 7

**Relativity**

Box 9, Folder 7

**Rotational dynamics**

Box 9, Folder 8

**Statics**

Box 9, Folder 8

**Thermodynamics**

Box 9, Folder 8

**Transport phenomena**

Box 9, Folder 9

**Units and dimensions**

Box 9, Folder 9

**Wave mechanics**

Box 9, Folder 9

**Waves**

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**Part C. Miscellaneous**

Box 9, Folder 10

**Daybook 1969-1975**

Box 9, Folder 11

**Draft of report [unidentified] [1970's?] [re: Physics division accomplishments]**

Series III: Technical Files

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**Mount Wilson observatory**

**Notebooks**

Box 10, Folder 1      **June 1953 - Dec. 1957**  
Box 10, Folder 2      **1955-1958 (misc. research notes)**  
Box 10, Folder 3      **1960-1961**  
Box 10, Folder 4      **1961 (on 65-foot tower)**  
Box 10, Folder 5      **of Robert W. Noyes 1961-1962**

**Logbook on**

Box 10, Folder 6      **Solar plate 1960-1961**  
Box 10, Folder 7      **62" mirror 1964-1968**  
Box 10, Folder 8      **Proposal for a new mirror system for the 60-foot solar tower 1961**  
Box 10, Folder 9      **Newspaper clipping 1962**  
Box 11, Folder 1      **Photographs of 62" infrared telescope 1965**

**Notes on**

Box 11, Folder 2      **Diffusion of solar magnetic fields and solar cycle 1963-1965**  
Box 11, Folder 3      **Solar cycle 1967-1968**  
Box 11, Folder 4      **Solar cycle model 1968-1971**

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**Millimeter-wave interferometry [Owens Valley Radio Observatory (OVRO)]**

Box 11, Folder 5      **General/importance 1974**  
Box 11, Folder 6      **Scientific rationale Oct. 1974**  
Box 11, Folder 7      **10-meter dish, prototype correspondence 1973-1974**  
Box 11, Folder 8      **Photographs**  
Box 11, Folder 9      **Album of prints, OVRO first dish ca. 1973-1975**  
Box 11, Folder 10      **Slides of OVRO ca 1974-1983**  
Box 11, Folder 11      **Negatives of OVRO, first dish, in shop ca. 1975-1976**  
Box 11, Folder 13      **Photographs n.d.**  
Box 11, Folder 14      **"Proposed scientific operations plan multi-dish millimeter array, Owens valley radio observatory." Aug. 18, 1975**  
Box 11, Folder 15      **"Proposed millimeter-interferometer mounting pad arrangement." Jan. 22, 1979**  
Box 11, Folder 16      **10-meter dish maintenance/inspection and modifications 1981**  
Box 11, Folder 17      **Notebooks on 10-meter dish n.d.**  
**Mechanical design notes**  
Box 12, Folder 1      **Panel layout and dimensions (misc.) 1974-1988**  
Box 12, Folder 2      **Feed-leg/dish surface/ back-up structure design for dish #1 1975**  
Box 12, Folder 3      **Detail for surface for dish #2 ca 1980**  
Box 12, Folder 4      **Dish adjustment data, dishes 1-3 OVRO 1980-1981**  
Box 12, Folder 5      **19SPOTS program data 1981-1984**  
Box 12, Folder 6      **Correspondence 1975-1980**

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**Submillimeter-wave astronomy {Caltech Submillimeter Astronomy (CSO)}**

**10.4-M submillimeter-wave telescope dome**  
Box 12, Folder 7      **Principal components Jan. 1981**  
Box 12, Folder 8      **Overview of proposal by Rule, B.H. n.d.**  
Box 12, Folder 9      **Correspondence 1981**  
Box 12, Folder 10      **Photographs and slides of model 1981**  
Box 12, Folder 11      **Mechanical design notes and dish rework details 1988**

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Miscellaneous

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Miscellaneous

Notebook

Box 12, Folder 12	1938-1942 (content: misc. notes)
Box 12, Folder 13	1945 (on "Investigations concerning the modes of vibration of crystal lattices")
Box 12, Folder 17	1971 (120" mirror)

**Series IV: Professional Organizations**

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**Joint US-USSR Editorial Board "The foundations of space biology and medicine."**

Box 13, Folder 1      **Formation and members**  
Box 13, Folder 2      **Outline**  
Box 13, Folder 3      **Memorandum 1967**  
Box 13, Folder 4      **Correspondence 1967**

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**National Academy of Sciences**

**Space Science Board (SSB) [member, Oct. 1973 - Oct. 1976]**

Box 13, Folder 5      **Members**  
Box 13, Folder 6      **Organization and activities**  
                         **Minutes of**  
Box 13, Folder 7      **46th meeting July 24-25, 1973**  
Box 13, Folder 8      **47th meeting Oct. 10-11, 1973**  
Box 13, Folder 9      **48th meeting Feb. 7-8, 1974**  
Box 13, Folder 10      **49th meeting May 9-10, 1974**  
Box 13, Folder 11      **50th meeting Oct. 10-12, 1974**  
Box 13, Folder 12      **Draft of report on "Scientific uses of the space shuttle." Nov. 16, 1973**  
Box 13, Folder 13      **Report on "Study of opportunities and choices in space science" Nov. 11, 1974**  
                         **Memorandum**  
Box 13, Folder 14      **1963**  
Box 13, Folder 15      **1974**  
Box 13, Folder 16      **1975**  
  
**Space Science Board committee on space astronomy 1973-1974**  
Box 13, Folder 17      **Report on the Sept. 18-19, 1973 meeting**  
Box 13, Folder 18      **Recommendations Apr. 8 1974**  
**Geophysics Research Board (GRB)**  
Box 13, Folder 19      **Proposal for the support of the GRB and its affiliates Sept. 17, 1976**  
Box 13, Folder 20      **Draft of report on "The upper atmosphere and magnetosphere." Sept. 30, 1976**  
Box 13, Folder 21      **Memorandum 1976-1977**

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**National Science Foundation [consultant]**

Box 13, Folder 22      **Appointment 1975**

Series V: Manuscripts and Talks

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Part A. Manuscripts

Box 14, Folder 1 "Exercises in introductory physics." (1969) Part I  
Box 14, Folder 2 "Transport of magnetic fields on the Sun." Leighton, R.B. draft [1964] [unpublished?]  
"Lectures on Physics. Volume I: Freshman lectures." Feynman, R.P.  
Lectures on how to solve problems.  
Box 14, Folder 3 Review A (first term) Dec. 1, 1961 [unpublished]  
Box 14, Folder 4 Review B Dec. 5, 1961 [unpublished]  
Box 14, Folder 5 Review C Dec. 8, 1961 [unpublished]  
Box 14, Folder 6 Lecture 20A n.d. [unpublished]  
Box 14, Folder 7 Miscellaneous notes n.d.  
Box 14, Folder 8 "The motion of planets around the sun." March 13, 1964 [unpublished]  
Box 14, Folder 9 "Correlations between large-scale photospheric and chromospheric motions, Call(K) emission, and magnetic fields." Simon, G.W. and Leighton, R.B. [unpublished]

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Part B. Talks

Box 14, Folder 10 Abstract for Alumni seminar May 10, 1969  
Box 14, Folder 11 "Report on Mariner-Mars experiment." Leighton, R.B. International Astronomical Union conference Prague

Series VI: Films

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Box 14, Folder 12 "Film of Mars in 1956." Leighton, R.B. Mount Wilson 60-inch reflector

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Box 14, Folder 13 "Close-up of mass." Film transcript

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Oversize box, from top to bottom:

**Planet Movies**

Box 15, Reel 1 "Jupiter, 14 Sept. 1952." (2 short sequences, 30 and 20 sec., respectively)  
Box 15, Reel 2 "Saturn, Jupiter, 14 Dec.1953." (23 sec.)  
Box 15, Reel 3 "Jupiter, 5 Feb. 1955; Alice and Alan Leighton, May 1955" (1¼ min.)  
Box 15, Reel 4 "Jupiter and ?." n.d. (3 segments, 1min.)  
Box 15, Reel 5 "Mars, 1954." (2 or more short segments, 1 min.)  
Box 15, Reel 6 "Jupiter." n.d. (2 segments of Jupiter with red spot visible, 1 min. each segment)  
Box 15, Reel 7 "Mars and very brief Saturn, Aug. 1956." (4½ min.)  
Box 15, Reel 8 "Mars, Aug. 1956." (4 min.)  
Box 15, Reel 9 "Jupiter and Mars, Aug. 1956." (2 segments, 2¼ min.)  
Box 15, Reel 10 "Mars." n.d. (6½ min.)  
Box 15, Reel 11 "Mars, Saturn, Moon Crater?, Jupiter." n.d. (2 min. 20 sec.)  
Box 15, Reel 12 "Mars." n.d. (2 or more segments, 5½ min.)

**Solar Movies and Mariner Mission**

Box 15, Reel 13 "Film on solar oscillations." (3 min 20 sec.)  
Box 15, Reel 14 "Radio hot spots on the quiet sun." (6 min. 20 sec.)  
Box 15, Reel 15 "Mariner 7 far-encounter photographs." (2¾ min.)  
Box 15, Reel 16 "Mariner 7 far-encounter photos." (3 min.)

**Mars Movies**

Box 15, Reel 17 "Men encounter Mars." n.d. (28 min.)  
Box 15, Reel 18 "Close-up of Mars." n.d.  
Box 15, Reel 19 "The martian investigators." (28 min.)