

William Ralph Bennett Papers
A Finding Aid to the Collection in the Library of Congress



Manuscript Division, Library of Congress
Washington, D.C.
2011

Contact information: <https://hdl.loc.gov/loc.mss/mss.contact>

Catalog Record: <https://lcn.loc.gov/mm2009085461>

Additional search options available at: <https://hdl.loc.gov/loc.mss/eadmss.ms012047>

Prepared by Manuscript Division staff

Finding aid encoded by Library of Congress Manuscript Division, 2012
Revised 2023 November

Collection Summary

Title: William Ralph Bennett Papers

Inclusive Dates: 1922-circa 1998

Bulk Dates: 1958-1996

ID No.: MSS85461

Creator: Bennett, William Ralph, 1930-2008

Extent: 43,400 items

Extent: 124 containers plus 21 oversize

Extent: 49.6 linear feet

Language: Collection material in English, with Russian

Location: Manuscript Division, Library of Congress, Washington, D.C.

LC Catalog record: <https://lccn.loc.gov/mm2009085461>

Summary: Physicist, inventor, educator, and author. Topical files, notebooks, records of scientific experiments, research material, correspondence, scientific papers, lecture files, drafts of books with related background and research material, printed matter, and miscellaneous material documenting Bennett's development of the gas laser and other inventions, his academic and professional career, and his authorship of scientific papers and books.

Selected Search Terms

The following terms have been used to index the description of this collection in the LC Catalog. They are grouped by name of person or organization, by subject or location, and by occupation and listed alphabetically.

People

Bennett, William R. (William Ralph), 1904- William R. Bennett papers.

Bennett, William Ralph, 1930-2008.

Bennett, William Ralph, 1930-2008. Introduction to computer applications for non-science students (BASIC). 1976.

Bennett, William Ralph, 1930-2008. Scientific and engineering problem-solving with the computer. 1976.

Chebotaev, V. P. (Veniamin Pavlovich), 1938-

Gould, Gordon, 1920-2005.

Kahn, Leonard R.

Mussorgsky, Modest Petrovich, 1839-1881.

Steinberger, J.

Organizations

Bell Telephone Laboratories.

Columbia University.

Yale University.

Subjects

Cryptography.

Electromagnetic fields--Health aspects.

Force and energy.

Gas lasers.

Hearing aids.

Helium-neon lasers.

Information theory.

Music--Russia.

Phonocardiography.

Physics.

Science--Russia.

World War, 1939-1945--Communications.

Places

Russia--Civilization.

Occupations

Authors.
Educators.
Inventors.
Physicists.

Acquisition Information

The papers of William Ralph Bennett, physicist, inventor, educator, and author, were given to the Library of Congress by his wife, Frances C. Bennett, in 2009.

Processing History

The William Ralph Bennett Papers were processed by Joseph K. Brooks with the assistance of Jewel McPherson in 2011.

Transfers

Some reel-to-reel audiotapes, audiocassettes, a phonograph record, and VCR tapes have been transferred to the Motion Picture, Broadcasting, and Recorded Sound Division where they are identified as part of the William Ralph Bennett Papers.

Copyright Status

The status of copyright in the unpublished writings of William Ralph Bennett is governed by the Copyright Law of the United States (Title 17, U.S.C.).

Access and Restrictions

The papers of William Ralph Bennett are open to research. Researchers are advised to contact the Manuscript Reading Room prior to visiting. Many collections are stored off-site and advance notice is needed to retrieve them for research use.

Preferred Citation

Researchers wishing to cite this collection should include the following information: Container number, William Ralph Bennett Papers, Manuscript Division, Library of Congress, Washington, D. C.

Biographical Note

| Date | Event |
|---------------|---|
| 1930, Jan. 30 | Born, Jersey City, N.J. |
| 1951 | Graduated, Princeton University, Princeton, N.J. |
| 1952 | Married Frances Commins |
| 1957 | Ph.D. in physics, Columbia University, New York, N.Y. |
| 1959-1962 | Member, technical staff, Bell Telephone Laboratories, Murray Hill, N.J. |
| 1960 | Invented with Ali Jarvan the first gas (helium-neon) laser |
| 1962-1964 | Associate professor of physics and applied science, Yale University, New Haven, Conn. |
| 1964-1972 | Professor of physics and applied science, Yale University, New Haven, Conn. |
| 1965 | Received the Morris N. Liebman Award of the Institute of Electrical and Electronics Engineers |

| | |
|---------------|--|
| 1976 | Published <i>Introduction to Computer Applications for Non-Science Students and Scientific and Engineering Problem-Solving with the Computer</i> : Englewood Cliffs, N.J.: Prentice-Hall |
| 1977 | Published <i>Physics of Gas Lasers</i> . New York: Gordon and Breach |
| 1979 | Published <i>Atomic Gas Laser Transition Data: A Critical Evaluation</i> . New York: Plenum |
| 1981-1987 | Master, Silliman College, Yale University, New Haven, Conn. |
| 2000 | Awarded Devane Medal for distinguished scholarship and teaching at Yale University, New Haven, Conn.; retired from the university |
| 2008, June 29 | Died, Haverford, Pa. |

Scope and Content Note

The papers of William Ralph Bennett (1930-2008) span 1922-circa 1998, with the bulk of the material dating from 1958 to 1996. Bennett was on the technical staff of Bell Telephone Laboratories from 1959 to 1962 where with Ali Jarvan he developed and built the first gas (helium-neon) laser, an invention that made applications and devices such as laser surgery, supermarket scanners, and compact disk players practicable. The collection is in English with some material in Russian, a reflection of Bennett's interest in scientific developments in Russia and in the culture, especially the music, of that country. The papers are described to the file level and organized into four series: [Academic File](#), [Subject File](#), [Speeches and Writings](#), and [Oversize](#).

Bennett's invention of the gas laser was a direct outgrowth of his doctoral work. The experimental and theoretical work at Columbia University that led to the development of the gas laser is documented in the [Academic File](#). Also represented in the Academic File is Bennett's nearly half-century career as a professor of physics and applied science at Yale University. Most of the Yale material is lecture notes and graphical classroom aids such as slides.

Bennett's efforts during his academic career relating to his continued work with gas lasers, his other inventions, and his wide-ranging interests are documented as part of the [Subject File](#). Besides material relating to various types of gas lasers, the Subject File series includes files on Bennett's efforts to elucidate the health effects of electromagnetic fields emanating from sources as varied as electric power transmission wires and consumer electronics such as cell phones; on his efforts to prove experimentally at a canal lock in Washington State the existence of a "fifth force" of nature; and on his development of dynamic spectral phonocardiograph and hearing aid technology.

The [Subject File](#) also includes material on Bennett's time at Bell Telephone Laboratories when he was working on the helium-neon laser, and on his tracking developments in information theory and cryptography, interests he shared with his father, William R. Bennett (1904-1983), a communications scientist who also worked at Bell Telephone Laboratories. There is a large grouping of documents on the senior Bennett in the Subject File, including his participation in the development of "SIGSALY," the scrambler telephone system that Franklin Roosevelt and Winston Churchill used to communicate securely during World War II.

Also part of the [Subject File](#) are files of correspondence and other material relating to Russian scientists, especially laser pioneer V. P. Chebotayev; and on Gordon Gould and J. Steinberger. There is a large file on Bennett efforts to help Leonard R. Kahn get his AM stereo technology accepted as a radio broadcast industry standard.

The [Speeches and Writings](#) series features Bennett's articles and scientific papers and a large file of scientific papers by other scientists mainly relating to lasers. Also part of the Speeches and Writings are drafts and research files relating to Bennett's books, including the influential textbooks *Introduction to Computer Applications for Non-Science Students and Scientific and Engineering Problem-Solving with the Computer*, both published in 1976. Bennett was an accomplished amateur musician and avocational musicologist, and the Speeches and Writings contain a file on his unpublished book-length study on a suite by the Russian composer Modest Petrovich Mussorgsky, "Pictures at an Exhibition: An Historical Interpretation of the Mussorgsky Work."

Arrangement of the Papers

The collection is arranged in four series:

- [Academic File, circa 1954-circa 1998](#)

- Subject File, 1922-1996
- Speeches and Writings, circa 1954-1984
- Oversize, 1960-1989

Description of Series

| Container | Series |
|----------------|---|
| BOX 1-13 | <p><u>Academic File, circa 1954-circa 1998</u></p> <p>Student papers, lecture notes, notebooks, research files, correspondence, printed matter, topical files, and miscellaneous material.</p> <p>Arranged largely as received by name of academic institution and thereunder by topic or type of material.</p> |
| BOX 13-58 | <p><u>Subject File, 1922-1996</u></p> <p>Research files, scientific papers, records of scientific experiments, correspondence, patents, copyrights, notes, topical files, printed matter, and miscellaneous material.</p> <p>Arranged alphabetically by main topic or type of material largely as received. Files within main categories are unsorted.</p> |
| BOX 59-124 | <p><u>Speeches and Writings, circa 1954-1984</u></p> <p>Scientific papers, drafts of books, articles, research files, correspondence, photographs, illustrations, topical files, printed matter, and miscellaneous material.</p> <p>Arranged into writings by Bennett and by others and therein by type of writing and topic or subject.</p> |
| BOX OV 1-OV 21 | <p><u>Oversize, 1960-1989</u></p> <p>Slides, physics and mathematical notes, photographs, maps, drawings, and musical scores.</p> <p>Arranged and described according to the series, container, and file from which the matter was removed.</p> |

Container List

| Container | Contents |
|-----------|---|
| BOX 1-13 | Academic File, circa 1954-circa 1998 Student papers, lecture notes, notebooks, research files, correspondence, printed matter, topical files, and miscellaneous material. Arranged largely as received by name of academic institution and thereunder by topic or type of material. |
| BOX 1 | Columbia University, New York, N.Y. Bibliographies Dynamics course Examination reviews (2 folders) Miscellany Notebooks Electricity and magnetism (3 folders) Loose leaf No. 1 (2 folders) |
| BOX 2 | Nos. 2-6 (7 folders) |
| BOX 3 | Miscellaneous, nos. 1-9 (9 folders) |
| BOX 4 | Quantum mechanics, nos. 1-3 (3 folders) "Optical Spectra Excited in the Noble Gases at High Pressures by Polonium Alpha Particles," Bennett's thesis, 1959 (3 folders) Quantum mechanics course (2 folders) |
| BOX 5 | Statistical mechanics course Topics Charge exchange articles Collision processes Dirac theory Double crossing, helium-helium, helium-neon Fermi: hyperfine structure Electronic collisions Feynman's theory Hydrogenic atom Ions and electrons Metastable life-times Nitrogen Noble gas molecular states and vacuum ultraviolet spectrum |

Academic File, circa 1954-circa 1998

Container

Contents

| | |
|-------|--|
| BOX 6 | Photo tubes Positron g-value experiment Positronium (2 folders) Transition probabilities Yale University, New Haven, Conn. Lecture no. 2 Lecture no. 3 Lecture no. 5 Lecture no. 23, live Fourier program |
| BOX 7 | Two language Computer monkeys Laser lecture, 1975 Russian Monkey film International baccalaureate, mathematics, examination, 1981 Billiards Cryptography, no. 10, 1979 Negative feedback amplifier problem, 1979 Lecture no. 18, epidemiology Dynamics Japanese, Yashikazu Okuyama AIDS Lasers, 1981 Lecture no. 24 Lecture no. 25 Mechanics Dynamics final no.16 Miscellaneous programs |
| BOX 8 | Lecture no. 1 Entropy Fourth order Shakespearean monkeys Monkey programs Appendixes A and B Style analysis and information theory Plotting, supplement to chapter 3 Compression, cryptography Lecture no. 11, Voynich manuscript Voice, figs. Lecture no. 8, monkeys Printed matter and clippings |
| BOX 9 | Handouts Monkeys Applied Physics 207, final examination Lecture slides Applied Physics 207 <i>See Oversize</i> |

Academic File, circa 1954-circa 1998

Container

Contents

| | |
|-----------|--|
| | Miscellaneous <i>See also Oversize</i> |
| | Monkeys |
| | Fourier transform |
| | Monkeys, 1975 |
| | Monkeys, 1973 |
| | Fortran |
| | Fourier transform and damped S. H. O. |
| | Manley-Rowe relations |
| BOX 10 | Lecture no. 21, Fourier series |
| | Random walk problem, 1978 |
| | Lecture no. 17, random walk |
| | Lecture no. 19, least squares |
| | Lasers, 1979 |
| | Lecture no. 26, lasers |
| | QM and lasers |
| | Lasers |
| | Lecture no. 7, surfaces |
| | Surfaces handouts |
| | Surfaces |
| BOX 11 | Mars, pictures, 1976 |
| | Lecture no. 13, falling bodies, Big Bertha, football |
| | Lecture no. 14, Dynamics |
| | Lecture no.15, Dynamics |
| | Quadratic fields |
| | Hewlett Packard, HP 1000 computer |
| BOX 12 | E and AS 118, introduction |
| | Applied Physics 207, 1987 |
| | Fortran |
| | E and AS course, evaluations |
| | Matrix inversion, Fortran |
| | Plotting |
| | Wavelets |
| | Notebook |
| | (2 folders) |
| | Slides |
| | Introduction to basic Fortran |
| | Computer course for non-scientists <i>See also Oversize</i> |
| BOX 13 | Photographs, E an AS course |
| | Applied Physics course, relativity |
| | Miscellany <i>See also Oversize</i> |
| | (2 folders) |
| | View graphs |
| | (2 folders) |
| BOX 13-58 | Subject File, 1922-1996 |
| | Research files, scientific papers, records of scientific experiments, correspondence, patents, copyrights, notes, topical files, printed matter, and miscellaneous material. |

Subject File, 1922-1996

Container

Contents

Arranged alphabetically by main topic or type of material largely as received. Files within main categories are unsorted.

| | |
|---------------|---|
| BOX 13 | Bell, Alexander Graham Bell Telephone Laboratories Chronological file 1959 (1 folder) |
| BOX 14 | (5 folders) 1960 1961 (4 folders) |
| BOX 15 | (2 folders) 1962 (5 folders) |
| BOX 16 | 1963-1971 (9 folders) Drawings Electron beam pump Fabre-Perot interferometer |
| BOX 17 | Gain measurements Helium-neon transfer data Hole burning, 1961 (2 folders) Lamb, Willis E. Life time data, helium-neon laser |
| BOX 18 | Masers Optics Patents, 1958-1969 Photographs Review of helium-neon laser discovery, 1968, 1984 |
| BOX 19 | Technical publications (3 folders) Bennett, William Ralph (1904-1983) (father) Bell Telephone System, technical publications Biographical material, 1922-1983 |
| BOX 20 | Campbell, George Ashley Columbia University, New York, N.Y., 1928-1932 (4 folders) Death, 1984 Filter problem Hartley, R. V. L. Kac, Mark, 1947 Miscellany |
| BOX 21 | Noise (2 folders) Photographs |

Subject File, 1922-1996

| Container | Contents |
|-----------|--|
| | Prime number notebook |
| | Riordan, J., "Combinatoric" |
| BOX 22 | Scientific papers (2 folders) |
| | "SIGSALY" (7 folders) |
| BOX 23 | Writings "C. Rudmore," pseudonym for science fiction writings, 1949 (2 folders) |
| | Miscellaneous (4 folders) |
| BOX 24 | Biographical material and awards CBS Laboratories Commins, Eugene D. Copyright forms Dudley, Homer Dynamic spectral phonocardiograph (9 folders) |
| BOX 25 | (9 folders) |
| BOX 26 | (7 folders) |
| BOX 27 | (8 folders) |
| BOX 28 | (4 folders) |
| | Einstein, Albert |
| | Electromagnetic fields, health effects |
| | Alphabetical file |
| | A (6 folders) |
| BOX 29 | B-C (11 folders) |
| BOX 30 | D-M (8 folders) |
| BOX 31 | N-V (5 folders) |
| | General (4 folders) |
| BOX 32 | (6 folders) |
| BOX 33 | (6 folders) |
| | <i>CRC Handbook of Biological Effects of Electromagnetic Fields</i> , by John Polk and Elliot Postow (2 folders) |
| BOX 34 | <i>Health Effects of Low-Frequency Electric and Magnetic Fields</i> , Oak Ridge Associated Universities, 1992 |
| | Notebook |
| | Printed matter (3 folders) |
| BOX 35 | (5 folders) |
| | "Fifth force" experiments, 1988-1990 <i>See also Oversize</i> (3 folders) |

Subject File, 1922-1996

| Container | Contents |
|-----------|---|
| BOX 36 | (14 folders) |
| BOX 37 | (5 folders) |
| BOX 38 | (8 folders) |
| BOX 39 | Fletcher, Harvey Gas lasers Argon laser, consulting and lectures file 1952-1964 (12 folders) |
| BOX 40 | 1965-1977 (19 folders) |
| BOX 41 | 1978-1996 (10 folders) Chronological file 1960 |
| BOX 42 | 1964-1965 (5 folders) 1966 Miscellany |
| BOX 43 | Notebooks, Jan.-Dec., undated (6 folders) |
| BOX 44 | Xenon laser 1967-1971 (8 folders) |
| BOX 45 | 1972-1974 (5 folders) Topical file Chemical laser conference, 1964 Figures (Bennett) Atmospheric absorption data Line broadening paper Nitrogen (N ₂) Lasers |
| BOX 46 | Nitrogen (N ₂) lifetimes Patents Ring lasers Perturbed optical transmission lines Saturation spectroscopy paper |
| BOX 47 | Wexler, B. C., and Bennett, "Saturated Gain and Absorption Line Widths of the 4880 Argon Ion Laser Transition" Cadmium-selenium internally scanned laser Nitrogen (N ₂) laser, National Science Foundation proposal, 1972 Two-photon absorption, 1975 Solitons Jabr thesis EAS 14a, course Quantum mechanics problems, 1963 EAS 100a, course Department of Engineering and Applied Science courses, final problems |

Subject File, 1922-1996

Container

Contents

| | |
|--------|--|
| | EAS 100a, course, 1967 |
| | DLE 202, course |
| | Maser talks and correspondence |
| | EAS 145b, course |
| BOX 48 | EAS 107b, course, 1968 |
| | Eight lectures, 207b, course, 1975 |
| | Examinations, 1948-1954 |
| | Department of Engineering and Applied Science, high school science lecture |
| | McMaster lecture, 1975 |
| | Lifetime talk, 1975 |
| | Gordon and Breach, 1968 |
| | National Science Foundation, 1972 |
| | Hole burning paper |
| | <i>Physics Today</i> , 1993 |
| | Argon laser, figures |
| BOX 49 | Patents |
| | (2 folders) |
| | Stability |
| | (6 folders) |
| BOX 50 | Notebook, 1963-1983 |
| | Kramers-Kronig and Bode relationships |
| | Gould, Gordon |
| | (4 folders) |
| BOX 51 | (7 folders) |
| BOX 52 | Hearing aids |
| | (11 folders) |
| BOX 53 | History of lasers |
| | Hutchins, Carleen |
| | Infinite monkey theorem |
| | (7 folders) |
| BOX 54 | (3 folders) |
| | Kahn, Leonard R. |
| | Miscellany |
| | (4 folders) |
| | Notebook |
| | (1 folder) |
| BOX 55 | (3 folders) |
| | Laser Sciences, Inc. |
| | Newspaper clippings |
| | Neural networks |
| BOX 56 | Nobel, Alfred |
| | Notes and correspondence |
| | Oppenheimer, J. Robert |
| | Pierce, John R. |
| | Positronium experiment <i>See also Oversize</i> |
| | Programs |
| | Publication, digital |

Subject File, 1922-1996

| Container | Contents |
|------------|---|
| | Printed matter (4 folders) |
| BOX 57 | (1 folder) |
| | Russian scientists Chebotayev, V. P. (7 folders) |
| BOX 58 | Miscellaneous Shackleton, Nicholas John Steinberger, J. Townes, Charles H. Wu, C., and Arthur L. Schawlow Voynitch Manuscript (6 folders) |
| BOX 59-124 | Speeches and Writings, circa 1954-1984 Scientific papers, drafts of books, articles, research files, correspondence, photographs, illustrations, topical files, printed matter, and miscellaneous material. Arranged into writings by Bennett and by others and therein by type of writing and topic or subject. |
| BOX 59 | By Bennett Articles and scientific papers (6 folders) |
| BOX 60 | (7 folders) |
| BOX 61 | (5 folders) |
| BOX 62 | (5 folders) |
| BOX 63 | (6 folders) |
| BOX 64 | (10 folders) |
| BOX 65 | (6 folders) |
| BOX 66 | (2 folders) |
| | Books <i>Atomic Gas Laser Transition Data: A Critical Evaluation</i> (1979) Drawings Line Breadth Bibliography Plenum Publishing Co., 1979-1980 (3 folders) |
| | Gases National Bureau of Standards tables Xenon tables Oxygen table Neon table Iodine table Helium Krypton |
| BOX 67 | Mercury Europium Germanium |

Speeches and Writings, circa 1954-1984

Container

Contents

| | |
|--------|--|
| | Helium |
| | Iodine |
| | Manganese |
| | Magnesium |
| | Neon |
| | Nitrogen |
| | Oxygen |
| | Phosphorus |
| | Samarium |
| | Selenium |
| | Silicon |
| | Sulfur |
| | Tellurium |
| | Ytterbium |
| | Argon |
| | Arsenic |
| BOX 68 | Bromine |
| | Chlorine |
| | Numerical file |
| | R 1-R 70 |
| | (4 folders) |
| BOX 69 | R 71-R 120 |
| | (7 folders) |
| BOX 70 | R 121-R 309 |
| | (8 folders) |
| BOX 71 | R 310-R 400 |
| | (3 folders) |
| | Miscellany |
| | (3 folders) |
| BOX 72 | <i>Introduction to Computer Applications for Non-Science Students</i> (1976) |
| | Draft |
| | Miscellaneous material |
| | Computer data |
| | Newspaper clippings |
| | Inverting of matrices of high order |
| | Walsh functions |
| | Julesz, Bela |
| | DuPraw, Ernest J. |
| | Picture recognition |
| | Pi, calculation to 100,000 decimals |
| | Fourth and fifth order monkeys |
| | Thomas, Lewis |
| BOX 73 | Braille |
| | Miscellaneous material |
| | Gibbs, Josiah W. |
| | <i>Hamlet</i> , Act III |
| | Arabic |

Speeches and Writings, circa 1954-1984

Container

Contents

| | |
|--------|---|
| | Bach-monkey project |
| | Chaucer, Geoffrey |
| | Sun Wei |
| | Ramanu, Juan |
| BOX 74 | "Gadsby," by Ernest Vincent Wright, 50,000 word novel written without the letter "e" |
| | Dewey, Godfrey, on the relative frequency of English speech sounds |
| | <i>The Art of the Fugue</i> |
| | Vonnegut, Kurt |
| | Third order monkeys |
| | Chapter 4, figs. |
| | Chapter 3, March final original |
| | <i>Hamlet</i> , Act III correlation action |
| | Gettysburg Address |
| BOX 75 | Language comparison |
| | "The Gold Bug" |
| | Bacon, Roger |
| | Entropy, fig. |
| | Chu, Otto |
| | <i>Sensory World</i> |
| | Hawaiian language |
| | Human brain |
| | Dolezel, Lubomir, and Richard W. Bailey, <i>Statistics and Style</i> |
| BOX 76 | Entropy and anthropology |
| | <i>The Physics of Gas Lasers</i> (1977) |
| | (12 folders) |
| | "Pictures at an Exhibition: An Historical Interpretation of the Mussorsky Work," 1980 |
| | Drafts |
| | (1 folder) |
| BOX 77 | (1 folder) |
| | Appendixes |
| | Translations |
| | Williams, Edward V. |
| | (2 folders) |
| | <i>New York Times</i> , letter to the editor |
| | Platt, Alexander |
| BOX 78 | "Con Mortius," musical score |
| | "Baba Yaga," musical score |
| | Conclusion |
| | "Great Gate of Kiev," musical score |
| | References |
| | Frankenstein, Alfred |
| | New York, N.Y., library trip |
| | Miscellaneous material |
| | Preface |
| | "Promenade", musical score |
| | "Gnomus," musical score |
| | "Promenade," musical score |

Speeches and Writings, circa 1954-1984

Container

Contents

| | |
|--------|--|
| | "Vecchio Castello," musical score |
| | "Promenade," musical score |
| | "Tuileries" (children), musical score |
| | "Bydlo," musical score |
| | "Promenade," musical score |
| | "Ballet of Chicks," musical score |
| | "Two Jews," musical score |
| BOX 79 | Missing "Promenade", musical score |
| | "Limoges," musical score |
| | "Catacombae," musical score |
| | Draft |
| | Correspondence, 1980 |
| | Musical scores <i>See also Oversize</i> |
| | Draft |
| | Pianos |
| BOX 80 | <i>Khovanshchina</i> (opera) |
| | (3 folders) |
| | "The Witches," musical score |
| | Drafts |
| | (2 folders) |
| | Reconstruction fragments |
| | Photographs |
| | (3 folders) |
| BOX 81 | (1 folder) |
| | References |
| | Musical Scores and text reduced by Kodak for publication |
| | Miscellaneous material |
| | (2 folders) |
| | "Pictures at an Exhibition," for the piano, musical score |
| BOX 82 | <i>Scientific and Engineering Problem-Solving with the Computer</i> (1976) |
| | Draft |
| | (2 folders) |
| | Prentice-Hall, working correspondence |
| | Bell Telephone Laboratories |
| | Permissions, chapters 1-8 |
| | Prentice-Hall, book |
| | Correspondence, Prentice-Hall |
| | Correspondence |
| | Computer book reviews |
| BOX 83 | Draft |
| | Prentice-Hall |
| | Chapter 2 |
| | Pi, tables |
| | Joyce, James |
| | Yardley, Herbert O., <i>The American Black Chamber</i> |
| | Cuneiform writing |
| | Hallo, William W. |

Speeches and Writings, circa 1954-1984

Container

Contents

| | |
|--------|--|
| | Rosetta Stone and Greek <i>See also Oversize</i> |
| | Balzac cipher, 1974 |
| | Cryptography, general |
| | Literary crypts |
| | Bacon, Francis |
| BOX 84 | Poe, Edgar Allan |
| | Voynich manuscript <i>See also Oversize</i> |
| | Yardley, Herbert O. |
| | Godwin, William, <i>Lives of the Necromancers</i> |
| | Dee, John |
| | French, Peter J., <i>John Dee, the World of an Elizabethan Magus</i> |
| | Bailey, Richard W., <i>An Annotated Bibliography of Statistical Stylistics</i> |
| | Wright, Ernest Vincent, <i>Gadsby</i> |
| BOX 85 | Pratt, Fletcher, <i>Secret and Urgent</i> |
| | Kahn, David |
| | (2 folders) |
| | News clippings |
| BOX 86 | Figures |
| | Information theory paper |
| | Fourth order programs |
| | Runge-Kutta |
| | Wind-air resistance |
| | Alexander, R. McNeil, animal mechanics |
| | McColl, John W., spin sphere |
| | Daish, C. B., ball games |
| | E-Type Jaguar |
| | Hoerner drag |
| | Transportation |
| | Rockets and space program |
| | Comets |
| | Bussing |
| | Special relativity and Mercury |
| | Mechanics, celestial |
| | Balls |
| | Einstein, Albert |
| | Frank, S. G. F., "Theory and Experiments on Beta Particle Trapping" |
| BOX 87 | Energy |
| | (2 folders) |
| | Tops |
| | Computer book, correspondence |
| | Super coil algorithm |
| | Chapters 5-7 |
| | Reviews |
| | AIDS |
| | (2 folders) |
| | News clippings |
| | Printed matter |

Speeches and Writings, circa 1954-1984

Container

Contents

| | | |
|--|---|---|
| BOX 88 | Miscellaneous material | |
| | Applied Physics 207 course, computer lab notes | |
| | Bell Telephone Laboratories | |
| | Lecture 6, TTY plotting | |
| | Vectors, matrices | |
| | Lecture 4, matrices | |
| | Fox and Li, calculations | |
| | Miscellaneous material | |
| | Circuits | |
| | Oscillator | |
| | Nyquist, Harry | |
| | Black, Harold | |
| | Dolby | |
| BOX 89 | Pulse filters | |
| | Ultra short laser pulses | |
| | Miscellaneous material | |
| | Mass spectrometers | |
| | Tucker, V. A., "The Energetic Cost of Moving About" | |
| | Windmills | |
| | Gravity | |
| | Scientific papers | |
| | Brown, Robert | |
| | Apollo module re-entry | |
| | BOX 90 | Mechanics notes |
| | | Routh, Edward J., <i>A Treatise on the Dynamics of a Particle</i> |
| | | Coach Routh |
| Babcock, H. W., "The Topology of the Sun's Magnetic Field and 22-Year Cycle" | | |
| <i>New York Times</i> , clippings | | |
| Draft lottery | | |
| Einstein, Albert | | |
| Brownian motion | | |
| RND | | |
| Corrections, chapter 7 | | |
| Gypsy moth | | |
| Venereal disease | | |
| Random walk | | |
| Optimization | | |
| Newspaper clippings | | |
| Fourier transforms | | |
| Hopkins exp. | | |
| Jean's harpsichord problem | | |
| BOX 91 | Least square fits | |
| | Miscellaneous material | |
| | Michelson, A. A., <i>Light Waves and Their Uses</i> | |
| | Well-tempered scale | |
| | Nixon lecture | |

Speeches and Writings, circa 1954-1984

Container

Contents

| | |
|--------|--|
| | Trumpet, Burkhardt, 1973 |
| | Letters of permission |
| BOX 92 | Correspondence |
| | Copyright, masks |
| | Book cover |
| | Illustrations |
| | Chapter 1 |
| | Chapter 3 |
| | Newspaper articles |
| | Eddington, Arthur |
| | Tillotson, John |
| | Cartoon |
| | Chapter 4 |
| BOX 93 | Voynich manuscript |
| | Dee, John |
| | Monkey cartoon |
| | Decree of Canopus |
| | "A Method for Obtaining Digital Signatures and Public-Key Cryptosystems," Laboratory for Computer Science, Massachusetts Institute of Technology, Cambridge, Mass., 1977 |
| | Newspaper articles |
| | Chapter 4 |
| | Poe cipher no. 2 |
| | Newspaper articles |
| | Chapter 5 |
| | Chapter 6 |
| | Diffusion |
| BOX 94 | Prentice-Hall (2 folders) |
| | Chapter 5 (2 folders) |
| | Chapter 6 |
| | Pattern recognition |
| | Solar flare problem |
| | Accelerators |
| | Least squares and optimization |
| | Quadrupole mass filter |
| | Reentry |
| | Wavelets |
| | Chapter 8 (2 folders) |
| | Meteor film |
| BOX 95 | By others |
| | Articles and scientific papers |
| | Part I |
| | Abella, I. D.-Bagaev, S. N. (16 folders) |

Speeches and Writings, circa 1954-1984

| Container | Contents |
|-----------|--|
| BOX 96 | Bagman, I. L.-Bazhulin, P. A. (15 folders) |
| BOX 97 | Beahn, T. J.-Beutler, H. (17 folders) |
| BOX 98 | Biondi, M. Breit, G. (27 folders) |
| BOX 99 | Brewer, R. G.-Coccoli, J. D. (29 folders) |
| BOX 100 | Cochran, J. A.-de Bruin, T. L. (26 folders) |
| BOX 101 | Deech, J. S.-Eriksson, K. B. S. (24 folders) |
| BOX 102 | Esterowitz, L.-Franken, P. A. (22 folders) |
| BOX 103 | Freed, C.-Hahn, E. L. (24 folders) |
| BOX 104 | Haisma, J.-Herriott, D. R. (26 folders) |
| BOX 105 | Herchbach, D. R.-Hughes, V. W. (18 folders) |
| BOX 106 | Humphreys, C. J.-Kiefer, L. J. (20 folders) |
| BOX 107 | Kiess, C. C.-Kronic, R. De L. (27 folders) |
| BOX 108 | Krotkov, R. V.-Letokhov, V. S. (16 folders) |
| BOX 109 | Levenson, M. D.-Malone, D. F. (26 folders) |
| BOX 110 | Mandel, L.-McCumber, D. E. (19 folders) |
| BOX 111 | McDowell, M. R. C.-Odintsov, A. I. (26 folders) |
| BOX 112 | Offenberger, A. A.-Pollack, M. A. (25 folders) |
| BOX 113 | Porto, S. P. S.-Sargent, M. (28 folders) |
| BOX 114 | Sauermann, H.-Serber, R. (21 folders) |
| BOX 115 | Shank, C. V.-Stanley, R. W. (16 folders) |
| BOX 116 | Stark, H.-Tang, C. L. (18 folders) |
| BOX 117 | Targ, R.-Tukey, J. W. (17 folders) |
| BOX 118 | Tuteur, F. B.-Wittke, J. P. (31 folders) |
| BOX 119 | Wolf, E.-Zory, P. (10 folders) |

Speeches and Writings, circa 1954-1984

| Container | Contents |
|----------------|--|
| | Part II |
| | A-C (5 folders) |
| BOX 120 | D-H (4 folders) |
| BOX 121 | I-M (5 folders) |
| BOX 122 | N-W (6 folders) |
| BOX 123 | V-Z |
| | George J. Schulz Lectures, Yale University, New Haven, Conn. |
| | Garwin, Richard L. |
| | Sagan, Carl, 1984 |
| | Segré, Emilio |
| | Serber, Robert |
| | Miscellany (2 folders) |
| BOX 124 | (1 folder) |
| BOX OV 1-OV 21 | Oversize, 1960-1989 Slides, physics and mathematical notes, photographs, maps, drawings, and musical scores. Arranged and described according to the series, container, and file from which the matter was removed. |
| BOX OV 1-OV 4 | Academic File Yale University, New Haven, Conn. Lecture slides Applied Physics 207 (Container 9) |
| BOX OV 5-OV 14 | Miscellaneous (Container 9) |
| BOX OV 15 | Computer course for non-scientists Photographs (Container 12) |
| BOX OV 16 | Miscellany EAS 40 course and notes for unidentified courses (Container 13) |
| BOX OV 17 | Subject File "Fifth force" Schematics, drawings, charts, photographs, maps (Container 38) |
| BOX OV 18 | Positronium experiment Drawings and graphs, 1960 (Container 56) |
| BOX OV 19 | Speeches and Writings Books "Pictures at an Exhibition: An Historical Interpretation of the Mussorgsky Work," 1980 Musical scores (Container 79) |
| BOX OV 20 | <i>Scientific and Engineering Problem-Solving with the Computer</i> (1976) Rosetta Stone Photographs and drawings (Container 83) |
| BOX OV 21 | Voynich manuscript, photographic copy (Container 84) |