Carl Eckart Papers

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Washington, D.C.
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http://hdl.loc.gov/loc.mss/eadmss.ms001014

LC Online Catalog record:
http://lccn.loc.gov/mm82065557

Prepared by Donna Ellis
Collection Summary
Title: Carl Eckart Papers
Span Dates: 1921-1973
Bulk Dates: (bulk 1935-1970)
ID No.: MSS65557
Creator: Eckart, Carl, 1902-
Extent: 8,400 items ; 24 containers plus 1 oversize ; 13 linear feet
Language: Collection material in English, and German
Location: Manuscript Division, Library of Congress, Washington, D.C.
Summary: Physicist, oceanographer, and educator. Correspondence, writings, lectures, subject files, biographical information, printed material, photographs, and other material relating to Eckart's career as oceanographer and physicist.

Selected Search Terms
The following terms have been used to index the description of this collection in the Library's online catalog. They are grouped by name of person or organization, by subject or location, and by occupation and listed alphabetically therein.

People
Lorentz, H. A. (Hendrik Antoon), 1853-1928.
Pauli, Wolfgang, 1900-1958.
Schrödinger, Erwin, 1887-1961.
Sommerfeld, Arnold, 1868-1951.
Von Neumann, John, 1903-1957.
Wigner, Eugene Paul, 1902-

Organizations
General Dynamics Corporation.
Institute for Defense Analyses.
National Academy of Sciences (U.S.). Committee on Science and Public Policy.
Rand Corporation.
Scripps Institution of Oceanography. Marine Physical Laboratory.
Scripps Institution of Oceanography.--Faculty.
University of Chicago Faculty.

Subjects
Atomic bomb.
Geophysics.
Oceanography.
Physics.
Quantum theory.
Science--History.
Science--Societies, etc.
Submarine warfare.
Thermodynamics.
Universities and colleges--California.
Universities and colleges--Illinois.
World War, 1939-1945--Naval operations--Submarine.
Biographical Note

**Date** | **Event**
--- | ---
1902, May 4 | Born, St. Louis, Mo.
1923-1925 | Ph.D. in physics, Princeton University, Princeton, N.J.
1926 | Married Edith Louise Frazee (divorced 1948)
1927-1928 | Studied in Berlin, Germany, as a John Simon Guggenheim Memorial Foundation fellow
1928-1946 | Professor of physics, University of Chicago, Chicago, Ill.
1934-1935 | Sabbatical to attend Institute for Advanced Study, Princeton University (also in 1952-1953 and 1960-1961)
1942-1946 | Assistant (and eventually director), War Research Division, University of California, San Diego, Calif.
1946-1952 | Director, Marine Physical Laboratory, University of California, San Diego, Calif.
1946-1971 | Professor of geophysics, Scripps Institution of Oceanography, University of California, San Diego, Calif.
1952 | Elected member of the National Academy of Sciences
1958  Married Klara Dan Von Neumann (died 1963)


1965-1967  Vice-chancellor for academic affairs, University of California, San Diego, Calif.

1966  Awarded Alexander Agassiz Medal by National Academy of Sciences for contributions to oceanography

1972  Awarded William Bowie Medal by American Geophysical Union for outstanding contributions to fundamental geophysics

1973, Oct. 23  Died, La Jolla, Calif.

**Scope and Content Note**

The papers of Carl Henry Eckart (1902-1973) span the years 1921-1973, with the bulk of the items concentrated in the period 1935-1970. Included are biographical data, correspondence, lectures and writings, and subject files.

Eckart's distinguished career as a physicist and physical oceanographer spanned fifty years. His academic career, his involvement with professional organizations, and his achievements are noted in the *Biographical Data* series. Due to the classified nature of some of his research projects, Eckart had to submit detailed security clearance forms. These, in addition to biographical statements for the University of California, various professional directories, and newspaper articles, yield much information. Eckart authored more than seventy articles between 1923 and 1970. His published works are listed in a bibliography in this series. Photographs (1921-1973) of Eckart, his family, and colleagues are included here. His significant achievements are recorded in several awards and certificates of merit (1944-1971), including one signed by President Harry Truman (1948) located in an oversize box. A folder of miscellaneous items contains his mother's will (1953) and a statement (1971) regarding his decision in 1941 to withdraw from the "Uranium Committee" of the National Defense Research Committee and the infant Manhattan Project because of his anti-atomic bomb sentiments.

The *General Correspondence* series contains letters from Eckart's colleagues and copies of his replies. Subject matter revolves around research interests, academic affairs, and the internal management of professional organizations. There is little personal correspondence. Significant correspondents include P. A. M. Dirac (a 1935 letter discussing the "Compton effect" and the interaction of radiation with electrons), Werner Heisenberg (a 1936 letter stating the uncertainty of his plans to visit the United States and a 1948 letter in German regarding a publication honoring Arnold Sommerfeld), Robert Andrews Millikan (a 1934 letter commenting on Eckart's paper on cosmic-ray curves), Wolfgang Pauli (eight letters from 1935 to 1936 discussing the symbolic logic method's relation to physics, Albert Einstein's opposition to the quantum theory, Heisenberg's cosmic ray showers, and the Copenhagen conference of physicists), Erwin Schrödinger (a 1935 letter citing a published source for a 1919 speech), Arnold Sommerfeld (several 1936 letters in German), and Eugene Paul Wigner (an undated letter regarding his work on the representations of the Lorentz group in Hilbert space).

Eckart was on the faculty of the University of Chicago during the years when that institution was supervising the development of nuclear energy at the Oak Ridge National Laboratory (then known as the Clinton Laboratories) in Oak Ridge, Tennessee. He remained in touch with his former colleagues in this field even though he changed to the study of physical oceanography. In 1949 Alvin Weinberg offered Eckart the directorship of the Theoretical Division of the laboratory. Eckart declined the position, and his response, dated 12 May 1949, summarizes his philosophy of science and, in particular, his dissatisfaction with nuclear physics and "Big Science."

Reprints of Eckart's scientific articles (1923-1968) are bound in four volumes and placed at the beginning of the *Lectures and Writings* series. The rest of the series contains, in alphabetical order by topic, Eckart's mathematical calculations, notes, outlines, drafts, and correspondence relating to his publications, classroom lectures, and research projects.

Early in his career Eckart was involved in theoretical physics. At the University of Chicago, he taught courses in electrodynamics and circuit theory. During the 1930s his research revolved around the developing field of quantum
physics—the nature of the atom and its components. By the end of that decade he had become interested in thermodynamics and had published a series of articles under the general title of "The Thermodynamics of Irreversible Processes."

World War II was a turning point in Eckart's career. Prior to its official involvement, the United States engaged in war preparations, including the formation of the National Defense Research Committee in 1940. Eckart served on this so-called "Uranium Committee" as a consultant to the subsection on the theory of nuclear chain reactions. At a meeting of physicists and chemists held at the University of Chicago during Christmas week 1941, Arthur H. Compton and J. Robert Oppenheimer announced a reorganization of the program, which would become known as the Manhattan Project. Although the atom bomb was not specifically mentioned at this meeting, Eckart realized that such a device could and would be developed. Opposed to such an action, he withdrew from the project and became associated with the underwater detection of submarines at the War Research Division of the University of California.

It was through this detection work that Eckart became interested in the physical properties and dynamics of oceans. After the war (1946), he left the University of Chicago to become director of the Marine Physical Laboratory of the University of California, and then director of the Scripps Institution of Oceanography, also affiliated with the University of California. He made a significant contribution to geophysics by linking theoretical hydrodynamic exercises to actual physical properties of water. The following decades were devoted to research on thermal layering in the oceans and atmospheres (which led to his only book in 1960), the transmission of sound in the sea, turbulence, the generation and structure of surface and internal ocean waves, and air-sea interaction.

Late in his career (1970s), Eckart acquired an interest in the origin and development of exact sciences. This interest is reflected in the Lectures and Writings series under such topics as calendars (1971), history of science (1971-1973), origins of geometry (1971-1972), and the problem of Plato (1971-1973).

Eckart's participation in numerous organizations is documented in the Subject File series. In 1952 he was elected to the National Academy of Sciences and served on several of its committees. His work on the Committee on Science and Public Policy is particularly noteworthy and is represented by correspondence, memoranda, meeting agendas, reports, and notes on meetings and conversations with colleagues. Additional material was collected into a scrapbook (1967-1972), which covers such topics as the environment and use of the earth's resources, financial support of research, education of future scientists, relationship of the scientific community to government, and technology and progress versus social responsibility in light of the Vietnam War and the arms race.

Eckart also served as the University of California's alternate representative to the Institute for Defense Analyses (1967-1968). The institute, made up of twelve member universities, functioned as an independent source of studies and advice for the Department of Defense. The IDA's largest section was the Weapons Systems Evaluation Division, which produced technical, operational, and economical analyses of various weapons (including ballistic missiles), tactical strategies, and logistics. Other sections prepared studies on economic, political, and communication matters relating to national security. Eckart served at a time when, pressured by anti-Vietnam War sentiments and congressional opposition, the IDA took measures to diversify its work to include nondefense activities. The IDA file contains minutes, reports, and Eckart's summaries of the institute's actions.

The Subject File series contains material pertaining to Eckart's activities as a reviewer for scientific journals (1958-1972), a consultant for commercial firms such as General Dynamics Corporation and the Rand Corporation (1959-1970), and as a member of the Editorial Advisory Board for the Johns Hopkins University Applied Physics Laboratory's series on applied mathematics and mechanics (1957-1959).

Eckart's long relationship with Pergamon Press, the publisher of his book on oceans and atmospheres, is illuminated by correspondence and contracts (1958-1972). Apparently, other publishers solicited the manuscript, which became a standard work on the subject.

The file pertaining to the prominent mathematician, John Von Neumann, consists chiefly of Eckart's contribution toward publishing some of Von Neumann's works posthumously. Eckart later married Von Neumann's widow, Klara.

A brief correspondence between Eckart and J. Robert Oppenheimer appears in the file on sabbaticals. During his 1952 sabbatical, Eckart was invited to join the School of Mathematics at the Institute for Advanced Study, Princeton University. The letters discuss Eckart's proposed research plans.
Also of interest in the Subject File series are Eckart’s notes (1928) compiled during his stay in Berlin, Germany, as a John Simon Guggenheim Memorial Foundation fellow, a patent (1953) he received with George W. Downs for an echo-ranging system, and notes (1926-1927) written by Nobel Prize-winner, Hendrik Antoon Lorentz, using some of Eckart’s equations for his calculations.

Organization of the Papers

The collection is arranged in five series:

- Biographical Data, 1921-1973
- General Correspondence, 1934-1972
- Lectures and Writings, 1923-1973
- Subject File, 1926-1972
- Oversize, 1948-1970
## Description of Series

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<td>Security clearances, directory listings, university biographies, and publicity; publication lists; photographs of Eckart, his family and colleagues; certificates and awards; and miscellany. Arranged by type of item, then chronologically.</td>
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<td>General Correspondence, 1934-1972</td>
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<td>BOX 20-24</td>
<td>Subject File, 1926-1972</td>
<td>Correspondence, memoranda, and reports relating to various scientific and academic associations; agreements, correspondence, and reports pertaining to consultant work for companies and organizations; Eckart's reviews of colleagues' articles; agreements, royalty statements, and correspondence concerning Eckart's publications; and data for registering a patent. Arranged alphabetically by subject or type of material, then chronologically.</td>
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## Container List

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Photographs  
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  Eckart, Carl, and others, 1939-1968, undated  
  Family and colleagues, 1921, undated  
  Presentation of silver apple to G. P. Harnwell, director of University of California's Division of War Research, 1946  
  University of California's Division of War Research Survivors Party, 1966  
Publications, 1967-1971  
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| BOX 2     | K-Z and unidentified, 1934-1972  
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| BOX 2-20  | **Lectures and Writings, 1923-1973**  
Bound volumes of published articles, arranged chronologically; and unbound calculations,  
notes, outlines, drafts, and correspondence relating to Eckart's research endeavors and  
classroom lectures.  
Arranged alphabetically by subject. |
| BOX 2     | Bound material, published works  
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  Vol. III, 1946-1965  
|           | Unbound material  
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Acoustic streaming in chemically active fluids, 1954
Address to aquanauts, 1965
Analysis of physical concepts, 1937
Analysis of space-time, 1948

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Analyzing dispersion data, 1954-1956
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Application of the Rankine-Hugoniot equations to cavitation, 1949
Approximate solution of one-dimensional wave equations, 1948
Approximation of one matrix by another of lower rank, 1936
Astronomy, 1971
Atlantic temperature salinity interpol, 1967
Atmospheres III, 1966
Atomic theory, 1937-1939
Attenuation of sound in the sea, 1946
Bearing fluctuations, 1973
Beta-plane method, 1969
Calendars, 1971
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Calorimetry, 1967-1970
Canonic transformations and the calculus of variations, 1966-1968
Changing relationship of science to society and technology, 1970
Circuit theory, circa 1930s
Coherence of scattered sound, 1947
Conceptual background for transmission experiments-I, 1969
Construction of space-time, 1948
Continuing research projects, 1968, 1970

BOX 5
Cosmic radiation, circa 1940
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Criteria for a steady flow in a shallow rotating basin, 1969-1970
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Deformation and distortion
   Dynamics, undated
   Geometrical, 1964-1965
   Kinematic, 1965
Description of the differences between the theory of elasticity and the theory of anelasticity, 1948
Determination and causality, 1939
Development of Euclidean geometry from the concept of congruence, 1945
Differential analyzer problems at Scripps Institution of Oceanography, La Jolla, Calif., 1955
Differential equations of physical oceanography, 1947
Dynamics of oceans and atmospheres, 1955, 1959
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Edge-wave theory, 1957
Electrodynamics
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[1934]
Electrodynamics of dispersive media, 1938
Electromagnetic theory; communication theory, 1950
Electrostatics, 1936-1938, 1965
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Empirical determination of the thermodynamic functions of sea water, 1967
   I. Introduction; II. Thermodynamic functions of a pure fluid
   III. Gibbs-Duhem principle
   IV. Aqueous solutions
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BOX 7
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Feasibility study of buoy systems, 1968
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General arithmetics, 1966-1968
General solutions of the hydrodynamic equations, 1949
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Geostrophic equations and three dimensional maps, 1968-1970
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Gibraltar project, 1929-1968
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Graphs of one-dimensional water waves, 1952
Heisenberg, Werner, lectures, 1929
History of science, 1971-1973
   (5 folders)
Homopolar dynamo, 1967
Hydrodynamics
   1951-1961
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Hydrodynamics of oceans and atmospheres, 1960-1962
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Hydrostatic approximation in descriptive oceanography, 1959
Inductive reasoning, 1950
Internal wave problems, 1964
Internal waves
   In rotating gas with cylindrical symmetry, 1962
   In the ocean, 1961
Interpretation of temperature-salinity diagrams, 1968-1969
   (2 folders)
Isentropic motion of an elastic fluid in a gravitational field, 1948
Lie algebra, 1966

BOX 10
Logical analysis of quantum theory, 1946
Marine Physical Laboratory, San Diego, Calif., 1948
Mathematical foundations
   Of mechanistic physics, undated
   Of the kinetic theory, 1938
Mathematical method and the natural sciences, circa 1946
Measurement and detection of steady ac (alternating current) and dc (direct current) signals in noise, 1951
Measure-preserving transfer?, 1969
Motion, 1962
Motion of the earth's pole, undated
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   For the electron theory of material, 1937
   In geophysical hydrodynamics, 1968
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Non-linear effects on the motion of a stratified fluid, 1961
North Pacific velocity profiles, 1970
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Ocean temperature, 1968
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On the relations between stability, sigma T and entropy, undated
Optimal rectifier systems for the detection of steady signals, 1952
Ordinary differential equations, 1967
Origins of geometry, 1971-1972
Oscillations, 1957
Outline of the thermodynamics of sea water, 1957-1965
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Periods of sexagesimal fractions, 1973
Perturbation theory of the Langrangian equations, 1961
Phase boundaries and shock waves, 1967
Physical oceanography, 1949, 1970
   (2 folders)
Physical properties of sea water, undated

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Physics, 1938, 1949
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Physics (advanced mechanics), 1962-1963
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Physics Laboratory, University of Chicago, Chicago, Ill., 1932
Poisson's problem, 1961
Polynomials for curve fitting, undated
Population theory, 1957
Pressure-driven surface waves, 1947
Principles of hydrodynamics, 1954
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Propagation of sound in a stratified medium, 1954
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Ray theory, 1970-1971
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Reexamination of the methods of [?] Sturm and [Joseph] Liouville, undated
References to hydrographic data, 1959
Reflection of electrons, 1927
Regents versus the faculty, 1950
Relations between strain, distortions, and deformation, 1957
Relations between the turbulent and steady motions of the sea, 1959
Revelle dedication speech, 1965
Rotational motion of an incompressible fluid, undated
Ruling engine, 1932-1933, 1940-1941
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Ryerson Laboratory, University of Chicago, Chicago, Ill., research notes, 1934, 1940-1941
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Second-order effects in acoustics, 1947-1948
Set of axioms for thermodynamics, 1970

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Shockwaves and phase discontinuities, 1959-1960
Simplified discussion of sea return, undated
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<td>Theory of noise and related phenomena, 1951-1953</td>
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<td>Theory of propagation of sound waves in turbulent flow, comments on, undated</td>
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Carl Eckart Papers
Theory of wakes, 1956

Thermodynamic data on sea water, 1967-1970, undated
(3 folders)

Thermodynamics, 1938

Thermodynamics (introduction to article by Leo Szilard), 1971

"Thermodynamics of Irreversible Processes," 1940, 1956

"Thermodynamics of Irreversible Processes" (V. Shock waves and phase boundaries), 1967-1968

Thermodynamics of systems with a finite number of degrees of freedom, undated

Tidal theory, 1966

Transport through the Florida straits, circa 1970

Turbulence in shallow rotating basins, 1969

Unified theory of the electromagnetic field, undated

Upswelling, 1963, 1969

Variation principles of hydrodynamics, 1966-1970

Vibrations in viscous medium and sound waves of finite amplitude, 1946
(1 folder)

Viscous flow, 1953

Water data, 1967

Wave equations, 1962

Wave mechanics I and II, 1929
(2 folders)

Wave theory data, 1953-1954, 1969

Wave theory seminar, 1946

Waves, water, shallow, 1959


"Why Study Ocean Current?" undated

Wind waves, 1970

Zonal motion of an atmosphere, 1957-1966

Unidentified, 1958-1973, undated
(2 folders)

**Subject File, 1926-1972**

Correspondence, memoranda, and reports relating to various scientific and academic associations; agreements, correspondence, and reports pertaining to consultant work for companies and organizations; Eckart's reviews of colleagues' articles; agreements, royalty statements, and correspondence concerning Eckart's publications; and data for registering a patent.

Arranged alphabetically by subject or type of material, then chronologically.

American Academy of Achievement, Golden Plate Award, 1967-1968

American Academy of Arts and Sciences, 1959

American Geophysical Union, William Bowie Medal, 1971-1972

American Meteorological Society, Sverdrup Gold Medal Committee, 1964-1969

American Physical Society, Division of Fluid Dynamics, 1962-1964

Andes wave, 1958-1962

Computer instructions, undated
Document receipts, 1961-1964
Echo-ranging system patent, 1944-1972
Editorial reviews
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  (3 folders)
  1969-1972

**Encyclopaedia Britannica**, 1945-1952
Equation of state of water and sea water, 1956-1964 *See also Container 6, same heading*
Faculty research lecture, 1951
Federation of American Scientists, 1949
General Dynamics Corporation/Convair Division
  Consultant agreements and invoices, 1968-1970
  Reports and correspondence, 1968, 1970
Handler, Philip, 1969
Institute for Defense Analyses, 1962-1970
  (2 folders)
John Simon Guggenheim Memorial Foundation Fellowship (Germany), notes, 1928
Johns Hopkins University, Applied Physics Laboratory, Silver Spring, Md., Advisory Editorial Board, 1957-1959
Lawrence Radiation Laboratory, Berkeley, Calif., 1958-1963, 1967
Lorentz, Hendrik Antoon, notes on motion and waves, 1926-1927
Los Alamos Scientific Laboratory, Los Alamos, N.Mex., 1959
Medical insurance, 1970-1972
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  Committee on Atmospheric Sciences, correspondence, 1958, 1961
  Committee on Oceanography, radioactivity in the marine environment, 1970
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    Education of graduate students in science and engineering, 1968
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  Slichter Committee, 1967  
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  Pergamon Press *(Hydrodynamics of oceans and atmospheres)*  
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  (2 folders)  
  Preisendorfer, Rudolf, 1956, 1965-1971  
  President's Committee on the National Medal of Science, 1966, 1968  
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  Reprint requests, 1966-1969  
  Rudnick, Philip, 1958-1959  
  Sabbaticals, 1952-1964  
  Specific volume of sea water, 1961-1964  
  Speeches, 1966-1967  
  Springer, Bernard, 1969  
  Szilard, Leo, 1958-1969  
  Taub, A. H., 1958, 1960  |
| BOX 24    | Travel, 1958-1972  
  (2 folders)  
  United States Atomic Energy Commission, gas centrifuge flow theory study group, 1971-1972  
  University of California, San Diego, Calif.  
  General, 1958-1971  
  (2 folders)  
  Institute of Geophysics, 1958-1970  
  Scripps Institution of Oceanography, 1949  
  War Research Division, 1941-1948  
  University of Chicago, Chicago, Ill., 1942-1946  
  Voit, Sergey, 1970  
  Von Neumann, John, 1942-1967  
  Washington University, St. Louis, Mo., 1967  
  Whitham, G. B., undated  
  Young Men's Christian Association, "How to Stay in College" program, 1965-1967  |
| BOX OV 1  | Oversize, 1948-1970  
  Computer print-outs and certificates.  |
| BOX OV 1  | Certificate of merit, signed by President Harry Truman, 1948  
  Computer print-outs  
  Eastern North Atlantic temperature and salinity, 1957-1958  
  Geophysical time series, circa 1963  
  Sound channel programs, 1970  |