



# Kac (Mark) papers

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## Summary Information

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<b>Repository:</b>	Rockefeller Archive Center
<b>Creator:</b>	Rockefeller University
<b>Creator:</b>	Rockefeller Institute for Medical Research
<b>Creator - aut:</b>	Kac, Mark
<b>Title:</b>	Mark Kac papers, Rockefeller University Faculty
<b>ID:</b>	FA170
<b>Date [inclusive]:</b>	1939-1984
<b>Physical Description:</b>	22.99 Cubic Feet 61 boxes
<b>Physical Description:</b>	61 boxes.
<b>Language of the Material:</b>	English

### Preferred Citation

Information regarding the Rockefeller Archive Center's preferred elements and forms of citation can be found at <http://www.rockarch.org/research/citations.php>

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## Biographical/Historical note

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Mark Kac was born in Poland in 1914. His family was forced to evacuate to Moscow following World War I. Once there, his father, who had been a professor of philosophy at the University of Leipzig, made a living tutoring students in the family's one-room apartment. Kac began studying mathematics at the early age of 5, listening in on his father's lectures. Upon returning to Poland, he was taught by a French governess as a child, learning Russian, French, Hebrew and Polish. At 15 he entered the Lycée of Krzemieniec, studying Latin and Greek as well as mathematics, physics and chemistry. He next entered the Jan Kasimir University of Lvov where he was taught by Hugo Steinhaus, was awarded a doctorate in 1937, and learned English.

In 1938 Kac came to the United States on a scholarship to Johns Hopkins University. From 1939 to 1943, Kac served as an instructor at Cornell University. From 1943, the year he became a citizen, he served as an assistant professor, being promoted to full professor in 1947. In 1961 Kac came to Rockefeller

University, where he spent twenty years, after which he spent the rest of his career at the University of Southern California.

Kac pioneered the modern development of mathematical probability, in particular its applications to statistical physics. This was an introduction of probabilistic methods in number theory, which he developed along with Paul Erdős. The method of quantization now in use involves the Feynman-Kac integral, developed along with Richard Feynman. He published a classic text *Statistical Independence in Probability, Analysis and Number Theory* in 1959. His most famous work is a paper he wrote for the *American Mathematical Monthly* in 1966 titled "Can One Hear the Shape of a Drum?" For this work, Kac received the Chauvenet Prize from the Mathematical Association of America in 1968 for the most outstanding expository article on a mathematical topic. In 1978 he won the George David Birkhoff Prize in Applied Mathematics, a joint prize of the American Mathematical Society and the Society for Industrial and Applied Mathematics.

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## Scope and Contents

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Types of records include: correspondence, manuscripts, administrative files, notes, personal material, student work, and audio-visual materials.

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## Arrangement note

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Arranged in chronological and alphabetical order.

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## File Plan note

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Former Classification: I 450 K11

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## Administrative Information

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### Publication Statement

Rockefeller Archive Center

15 Dayton Avenue

Sleepy Hollow 10591

[archive@rockarch.org](mailto:archive@rockarch.org)

URL: <http://www.rockarch.org>

### Conditions Governing Access note

Access to this collection is restricted pending permission from Rockefeller University.

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## Controlled Access Headings

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- Statistics
- Statistical physics
- Physics
- Mathematics
- Medical education

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## Collection Inventory

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### Correspondence, 1940-1981

Physical Description: 14.52 Cubic Feet

#### Scope and Contents note

Includes both personal and professional correspondence.

#### Arrangement note

Arranged in alphabetical order by correspondent's last name; some in chronological order.

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Title/Description	Instances
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undated	box 1	folder 1
1943-1960	box 1	folder 2
1943-1960	box 1	folder 3
1943-1960	box 1	folder 4
1943-1960	box 1	folder 5
1948	box 1	folder 6
1948	box 1	folder 7
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1950s	box 1	folder 9
1960s	box 1	folder 10
1960	box 1	folder 11
1961	box 1	folder 12
1962-1964	box 1	folder 13
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Ablowitz, Mark J.	box 3	folder 3
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Alfred Jurzykowski Foundation	box 3	folder 5
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American Board of Arts and Sciences	box 3	folder 7
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American Mathematical Society	box 3	folder 9

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Baclawski, Kenneth P.	box 4	folder 5
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Barcilon, Victor	box 4	folder 7
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Biographies and Bibliographies	box 4	folder 10
Blum, J.R.	box 5	folder 1
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Boltzmann Symposium	box 5	folder 3
Borowski, Zbigniew	box 5	folder 4
Brookhaven National Laboratory	box 5	folder 5
Burton, Yuri	box 5	folder 6
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Cannon, John T.	box 6	folder 1
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Catastrophe Theory	box 6	folder 3
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Dole, Vincent P.	box 8	folder 6
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Drobot, Adam Thomas	box 8	folder 8
Dyson, Freeman	box 8	folder 9
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Feinberg, Jerry M.	box 9	folder 8
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O'Neil, Patrick E.	box 19	folder 7
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Singer, Jonathon	box 26	folder 8
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Sloan Science Book Committee	box 28	folder 1
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Smoluchowski, Roman	box 28	folder 5
Smoluchowski, Zofia	box 28	folder 6
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Steinhaus, Hugo	box 28	folder 9
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Sylvester, Garrett Smith	box 28	folder 12
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Tharp, Leslie H.	box 29	folder 4
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Wegrowicz, Lucjan	box 32	folder 6
Weinberg, Alvin M.	box 32	folder 7
Weizmann Institute of Science	box 32	folder 8
Weizmann Institute of Science	box 32	folder 9
Weizmann Institute of Science	box 32	folder 10
Weizmann Institute of Science	box 33	folder 1
Weizmann Institute of Science	box 33	folder 2
Weizmann Institute of Science	box 33	folder 3
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X-Y-Z	box 33	folder 6
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Yale University Council Committee	box 33	folder 8
Yanenko Affair	box 33	folder 9
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## Manuscripts, 1940-1981

Physical Description: 1.32 Cubic Feet

**Scope and Contents note**

Includes early drafts of published articles; some correspondence.

**Arrangement note**

Arranged in alphabetical order by manuscript title or subject.

<b>Title/Description</b>	<b>Instances</b>	
1945-1947	box 34	folder 1
1975	box 34	folder 2
"About Brownian Motion and Bound States"	box 34	folder 3
Bibliography of Multivariate Statistical Analysis	box 34	folder 4
Birkhoff's Ergodic Theorem	box 34	folder 5
Birkhoff Prize Talks, Atlanta, 1978	box 34	folder 6
Catastrophe Theory as Applied to the Social and Biological Sciences	box 34	folder 7
Computers	box 34	folder 8
Enciclopedia Italiana	box 34	folder 9
Feynman Manuscript	box 34	folder 10
Functional Integration	box 34	folder 11
Gabor Szego	box 34	folder 12
"A Heuristic Approach to Ornstein-Zernike Theory"	box 34	folder 13
Journals	box 34	folder 14
Krein Volume	box 34	folder 15
"The Making of Statistician"	box 34	folder 16
"Marceli Stark in Memoriam"	box 34	folder 17
"Marian Smoluchowski and the Evolution of Statistical Thought in Physics"	box 34	folder 18
"Master Equations for Finite Systems"	box 34	folder 19
"A Mathematical View of the Theory of Changes Phase"	box 34	folder 20
"Mathematics: Reflections on the Present and Thoughts About the Future"	box 35	folder 1
"Mathematics in the Physical Sciences"	box 35	folder 2
Miscellaneous Historical Papers and Letters	box 35	folder 3
"A Note on Eigenvalues and Eigenfunctions of the Laplace Operator"	box 35	folder 4



One-dimensional Objects	box 35	folder 5
Papers, 1978-1981	box 35	folder 6
Polish manuscripts, 1942	box 35	folder 7
[Probability Density]	box 35	folder 8
Pythagorean Theorem on the Surface of a Sphere	box 35	folder 9
Reviews of Kac Articles	box 35	folder 10
Scientific American Article-first draft	box 35	folder 11
Scientific American Article-revised version	box 35	folder 12
"The Search"	box 36	folder 1
"Some Applications of the Theory of Brownian Motion to Potential Theory"	box 36	folder 2
"Some Remarks on the Various Ensembles Used"	box 36	folder 3
"Statistical Analysis of a Certain Random Walk	box 36	folder 4
"Statistical Mechanics of Some One-dimensional Systems"	box 36	folder 5
Steinhaus Manuscript	box 36	folder 6
Steinhaus' Polish Manuscripts	box 36	folder 7
Taylor Manuscripts	box 36	folder 8
"The Themes and Trends of Mathematics"	box 36	folder 9
"A Theory of Diffusion"	box 36	folder 10
Von Neumann, John	box 36	folder 11

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## Administrative Files, 1958-1971

Physical Description: 1.32 Cubic Feet

### Scope and Contents note

Includes editorial work for professional journals and administrative work for Rockefeller University.

### Arrangement note

Arranged in alphabetical order by subject.

Title/Description	Instances	
Appointments and Promotions	box 37	folder 1
Memoranda/Meetings	box 37	folder 2
Calendars, 1971-1975		

	box 37	folder 3
Calendars, 1976-1980	box 37	folder 4
National Academy of Science (NAS)	box 37	folder 5
NAS Editorial Board	box 37	folder 6
NAS Exchange of Scientists USSR	box 37	folder 7
NAS Nominations	box 37	folder 8
NAS Report Review Committee	box 37	folder 9
NAS Report Review Committee	box 38	folder 1
NAS "TNG in Statistical Mathematics"	box 38	folder 2
"Nut" file	box 38	folder 3
Press	box 38	folder 4
Press	box 38	folder 5
Rockefeller University (RU) Computer Center	box 38	folder 6
RU Faculty Appointments	box 38	folder 7
RU Faculty Club	box 38	folder 8
RU General, 1973	box 38	folder 9
RU General, 1974	box 39	folder 1
RU General, 1975	box 39	folder 2
RU General, 1976	box 39	folder 3
RU General, 1977	box 39	folder 4
RU General, 1978	box 39	folder 5
RU General, 1979-1981	box 39	folder 6
RU President's Office	box 39	folder 7
RU Press	box 39	folder 8
Security	box 39	folder 9

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## Lecture Files, 1960-1975

Physical Description: 1.76 Cubic Feet

### Scope and Contents note

Includes transcripts of lectures, some correspondence, and notes.

**Arrangement note**

Arranged in alphabetical order by lecture title or subject.

<b>Title/Description</b>	<b>Instances</b>	
Lecture notes Summer, 1995	box 40	folder 1
Notes, 1964-1965	box 40	folder 2
1972	box 40	folder 3
1978-1979	box 40	folder 4
Brandeis Lectures on Phase Transitions	box 40	folder 5
Brandeis University Summer School, 1966	box 40	folder 6
Catastrophe Theory	box 40	folder 7
Chance and Regularity, Merrimack College, 1965	box 40	folder 8
Christmas Lecture Notes	box 40	folder 9
City University of New York, Fall, 1964	box 40	folder 10
"Conference on Mathematical Theory of Elementary...."	box 40	folder 11
Congress of Scholars and Scientists of Polish Background	box 40	folder 12
Cornell University Centenary, 1965 April	box 40	folder 13
Dog Flea Model Pictures	box 41	folder 1
Engineering College Council-Cornell University	box 41	folder 2
Ferromagnetism	box 41	folder 3
Fifth Berkeley Symposium on Mathematics	box 41	folder 4
Gas Dynamics Colloquium-Northwestern University, 1964	box 41	folder 5
George Washington Project	box 41	folder 6
Gibbs Lecture and Related Material	box 41	folder 7
Harrelson Lectures, 1965 November 29-December 3	box 41	folder 8
Hierarchical Model	box 41	folder 9
Holiday Lectures, 1962	box 41	folder 10
Important Lectures	box 41	folder 11
Introduction to the General Theory of Relativity	box 42	folder 1
Josiah Willard Gibbs Lecture, 1967 January 24	box 42	folder 2
Kac Lectures	box 42	folder 3
Lecture Notes on Thermodynamics	box 42	folder 4
Lectures in Probability	box 42	folder 5

Leiden, 1963 April 20	box 42	folder 6
MAA Cooperative Summer Seminar	box 42	folder 7
Mathematics-Science Seminars Summer, 1967	box 42	folder 8
MacMillan Company	box 42	folder 9
MIT Conference on Information Transfer, 1965 August 2	box 42	folder 10
NAS Symposium on Stability of Celestial Mechanics, 1967 June-July	box 43	folder 1
Notes on 1947-1948 Kac Lectures by Bill Newcomb, 1947-1948	box 43	folder 2
Potential Theory in Three Dimensions	box 43	folder 3
Probability Theory and Differential Equations	box 43	folder 4
"The Pythagorean Theorem on the Surface of a Sphere", 1966	box 43	folder 5
Relevance of the College Experience March 1966, 1966 March	box 43	folder 6
Rockefeller Institute Holiday Science Lectures	box 43	folder 7
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Schedules	box 43	folder 9
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Science and Engineering Television, 1963 February 14	box 43	folder 11
SIAM, 1960-1965	box 44	folder 1
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SIAM Meeting Courant Symposium, 1965 June	box 44	folder 3
Society for Natural Philosophy, 1966 October 21-22	box 44	folder 4
Some Interconnections between Mathematics and Other Disciplines	box 44	folder 5
Swathmore College Fall, 1965	box 44	folder 6
Towson State College Baltimore, 1966 October 26	box 44	folder 7
University of Kentucky Centennial, 1965	box 44	folder 8
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Wittenberg University Address, 1966 October 13	box 44	folder 12

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## Laboratory Notebooks, 1942-1964

Physical Description: 4.84 Cubic Feet

### Scope and Contents note

Includes notes of laboratory experiments.

### Arrangement note

Arranged in chronological and in alphabetical order.

Title/Description	Instances	
1942	box 45	folder 1
Notebook III, 1946 October	box 45	folder 2
1952	box 45	folder 3
1953	box 45	folder 4
Summer 1953	box 45	folder 5
1954	box 45	folder 6
1957 November	box 45	folder 7
1959 March	box 45	folder 8
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1960 January	box 45	folder 10
1960 July-August	box 46	folder 1
1961 January-June	box 46	folder 2
1961 March	box 46	folder 3
1961 September	box 46	folder 4
1962 January	box 46	folder 5
1962 October	box 46	folder 6
1963 January	box 46	folder 7
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1963 August	box 47	folder 5
1964 January	box 47	folder 6
1964 May	box 47	folder 7
1964 May		

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1965 January	box 48	folder 1
1965 July	box 48	folder 2
1966 June	box 48	folder 3
1966 August	box 48	folder 4
1967 February	box 48	folder 5
1967 October	box 48	folder 6
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1970 October	box 49	folder 1
1971 March	box 49	folder 2
1971 August	box 49	folder 3
197? February	box 49	folder 4
1973 November	box 49	folder 5
1974 August	box 49	folder 6
Algebra Over the Complex Number	box 49	folder 7
Analytic Number Theory	box 49	folder 8
Benel Functions	box 50	folder 1
Complex Variables	box 50	folder 2
Complex Variables-Math 531/32	box 50	folder 3
Complex Variables-Math 531/32	box 50	folder 4
Derivation of Boltzmann's Equation	box 50	folder 5
Ehrenfest Example	box 50	folder 6
Ehrenfest Model	box 50	folder 7
Equation of Continuity	box 50	folder 8
4-body Toda Problem	box 50	folder 9
Generalized Diffusion Theory	box 50	folder 10
Kinetic Theory	box 51	folder 1
Kinetic Theory	box 51	folder 2
Kinetic Theory and Related Topics	box 51	folder 3
Langenian Equation for a Brownian Particle	box 51	folder 4

Linear Boltzmann Equation	box 51	folder 5
Linville's Equation	box 51	folder 6
Marnoff Chains	box 51	folder 7
"Master Equation" for the Simplified Model	box 51	folder 8
Mathematical Physics	box 51	folder 9
Mathematics 400	box 51	folder 10
Mathematics 721-22	box 51	folder 11
Matrix of Transitions Probabilities	box 52	folder 1
Method of Steepest Descent	box 52	folder 2
Miscellaneous	box 52	folder 3
Miscellaneous	box 52	folder 4
Miscellaneous II	box 52	folder 5
Miscellaneous Notes	box 52	folder 6
Moran Models	box 52	folder 7
Non-linear Models	box 53	folder 1
Notebook, 1946 August 1	box 53	folder 2
Notebook, 1946 August 2	box 53	folder 3
Notebook, 1947 March 5	box 53	folder 4
Notebook, 1946 November 9	box 53	folder 5
"On the Distribution of Distances of Points Chosen at Random"	box 53	folder 6
"On the Distribution of Eigenvalues of Certain Integral Equations"	box 53	folder 7
"On the Theory of Random Noise in Radio Receivers"	box 53	folder 8
Particle Density	box 53	folder 9
Princeton, 1951-1952	box 54	folder 1
"Probabilistic Approach to Kinetic Theory of Gases"	box 54	folder 2
Propagation of sound in rarefied gases	box 54	folder 3
Ray's derivation of Spitzer's Theorem	box 54	folder 4
Rayleigh's treatment of convection	box 54	folder 5
Remarks on the first passage time for the Uhlenbeck-Ornstein Process	box 54	folder 6
Remarks on Markoff Chains	box 54	folder 7
Rotating bucket notes	box 54	folder 8
Second Law of Thermodynamics		

	box 54	folder 9
Spherical Model	box 54	folder 10
Statistical Mechanics Seminar Spring, 1948	box 55	folder 1
Statistical Thermodynamics	box 55	folder 2
Stellar Statistics	box 55	folder 3
Three-body Toda problem	box 55	folder 4
Theory of Random Process, 1948	box 55	folder 5
Translation Kernels	box 55	folder 6
Two-dimensional Markoff Process	box 55	folder 7
Uhlenbeck's Notebook on Quantum Electrodynamics	box 55	folder 8
[unidentified]	box 55	folder 9

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## Audio-Visual Material, 1960s

Physical Description: 0.5 Cubic Feet

### Scope and Contents note

Recordings of several lectures and 14 glass slides, unidentified.

### Arrangement note

Arranged in chronological order by title of lecture.

Title/Description	Instances	
"Role of Mathematical Models in Science", 1969 February 12	box 56	folder 1
<u>Conditions Governing Access:</u> <b>Conditions Governing Access</b>  RAC is unable to provide access to obsolete media. When feasible, a digital surrogate may be created via special order. All applicable charges will apply. See RAC Head of Archival Services or RAC Head of Digital Programs for details.		
"How to Hear the Shape of a Drum", 1964 August	box 56	folder 2
<u>Conditions Governing Access:</u> <b>Conditions Governing Access</b>  RAC is unable to provide access to obsolete media. When feasible, a digital surrogate may be created via special order. All applicable charges will apply. See RAC Head of		



Archival Services or RAC Head of Digital Programs for details.

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"How to Hear the Shape of a Drum", 1964 August	box 56	folder 3
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Conditions Governing Access:

**Conditions Governing Access**

RAC is unable to provide access to obsolete media. When feasible, a digital surrogate may be created via special order. All applicable charges will apply. See RAC Head of Archival Services or RAC Head of Digital Programs for details.

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"How to Hear the Shape of a Drum", 1964 August	box 56	folder 4
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Conditions Governing Access:

**Conditions Governing Access**

RAC is unable to provide access to obsolete media. When feasible, a digital surrogate may be created via special order. All applicable charges will apply. See RAC Head of Archival Services or RAC Head of Digital Programs for details.

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"Computer Music"	box 56	folder 5
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Conditions Governing Access:

**Conditions Governing Access**

RAC is unable to provide access to obsolete media. When feasible, a digital surrogate may be created via special order. All applicable charges will apply. See RAC Head of Archival Services or RAC Head of Digital Programs for details.

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"Wiener"	box 56	folder 6
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Conditions Governing Access:

**Conditions Governing Access**

RAC is unable to provide access to obsolete media. When feasible, a digital surrogate may be created via special order. All applicable charges will apply. See RAC Head of Archival Services or RAC Head of Digital Programs for details.

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[unidentified reel]	box 56	folder 7
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Conditions Governing Access:

**Conditions Governing Access**

RAC is unable to provide access to obsolete media. When feasible, a digital surrogate may be created via special order. All applicable charges will apply. See RAC Head of

Archival Services or RAC Head of Digital Programs for details.

14 unidentified glass slides, 1964

box 56

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## Student Thesis, 1940-1982

Physical Description: 1.32 Cubic Feet

### Scope and Contents note

Includes students' theses who had been advised by Kac.

### Arrangement note

Arranged in alphabetical order by student's last name.

Title/Description	Instances	
Eustaquio S. Baclig, Jr., 1953	box 57	folder 1
Harlan G.H. Bartram, 1950	box 57	folder 2
Donald Elro Bedo, 1957	box 57	folder 3
Jack Logan Bellamy, 1950	box 57	folder 4
Martin Roy Bates, 1949	box 57	folder 5
Tseng Tung Cheng, 1949	box 57	folder 6
Robert Cohen, 1956	box 57	folder 7
Joanne Elliott, 1949	box 57	folder 8
Ernest Slavko Elyash, 1950	box 57	folder 9
Charles Hatfield Jr., 1944	box 58	
James Henry Hayes	box 58	
Phillip S. Jastram	box 58	
Mario Leon Juncosa, 1945	box 58	
Talbot Michael Katz, 1982	box 58	
Harry Kesten, 1958	box 58	
Abraham Morton Mark, 1945	box 59	folder 1
Abraham Morton Mark, 1947	box 59	folder 2
Henry S. McGaughan, 1949	box 59	folder 3
David Frederick Neu, 1960	box 59	folder 4
David S. Newman, 1963	box 59	folder 5

Alfred Milton Peiser, 1944	box 59	folder 6
Murray Rosenblatt, 1949	box 59	folder 7
Irma Schocken, 1946	box 59	folder 8
Jerome C. Smith, 1945	box 59	folder 9
Murray R. Spiegel, 1949	box 60	folder 1
Alan Gustave Konheim, 1960	box 60	folder 2
Paul Joseph Lochak, 1951	box 60	folder 3
William Judson Leveque, 1947	box 60	folder 4
Charles C. Torrance, 1927	box 60	folder 5
Michael Waldner, 1948	box 60	folder 6

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## Personal File, 1939-1984

Physical Description: 0.25 Cubic Feet

### Scope and Contents note

Includes biographical material and photographs.

### Arrangement note

Arranged in chronological order.

Title/Description	Instances	
Biographical material	box 61	folder 1
Photographs	box 61	folder 2

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