
Marshall N. Rosenbluth Papers

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Descriptive Summary

Languages: English

Contributing Institution: Special Collections & Archives, UC San Diego

9500 Gilman Drive

La Jolla 92093-0175

Title: Marshall N. Rosenbluth Papers

Identifier/Call Number: MSS 0670

Physical Description: 1.4 Linear feet(4 archives boxes)

Date (inclusive): 1960-2003

Abstract: Papers of Marshall Rosenbluth, professor at University of California, San Diego, and plasma physicist noted for his work in thermonuclear fusion, the Rosenbluth formula on theoretical scattering, and his role in the discovery of Rosenbluth-Hinton flows. The bulk of the collection contains his writings, speeches, photocopies of lecture transparencies, and documents relating to the International Thermonuclear Experimental Reactor (ITER) and the JASON Defense Advisory Group.

Biography

Born in Albany, New York, on February 5, 1927, Marshall N. Rosenbluth graduated from high school in 1942 and after two years in the U.S. Navy, graduated from Harvard with his bachelor's degree in 1946. He went on in 1949 to receive his Ph.D. with a focus on high energy particle physics from the University of Chicago.

After his post-doctoral position at Stanford University (1949-1950) where he derived the Rosenbluth formula, he joined the Los Alamos Laboratory and worked on the hydrogen bomb and other projects from 1950-1956. Rosenbluth's time at Los Alamo began his life-long pursuit of fusion as an alternate energy source.

In 1956 Rosenbluth took the position of senior research advisor with the nuclear energy research company General Atomics (GA) in San Diego. He continued working with GA even after being appointed professor of physics at University of California, San Diego in 1960. After 1967, Rosenbluth took professorships at the Princeton Institute of Advanced Study and then at the University of Texas at Austin before returning to UCSD and GA twenty years later in 1987. Rosenbluth retired from these positions in 1993 and began work as the chief scientist of the Central Team for the International Thermonuclear Experimental Reactor (ITER) until 1999. During this time, he was also involved with the JASON Defense Advisory Group, an independent group of scientists that advised the United States government on military, science, and energy-related issues.

During his career Rosenbluth received many awards and recognitions including the E.O. Lawrence Prize, awarded by the U.S. Atomic Energy Commission in 1964; the James Clerk Maxwell Prize in Plasma Physics, awarded by the American Physical Society in 1976; the National Medal of Science, awarded by President Clinton in 1997; and the Nicholson Medal from the American Physical Society in 2000.

Rosenbluth died in 2003.

Scope and Content of Collection

The Marshall Rosenbluth Papers document Rosenbluth's research and writings in the field of plasma physics and the commercial use of fusion as an energy source. The collection is arranged in six series: 1) CORRESPONDENCE, 2) WRITINGS, 3) SPEECHES AND REMARKS, 4) TRANSPARENCIES, 5) BIOGRAPHICAL, and 6) MISCELLANEOUS.

Series 1: CORRESPONDENCE

The CORRESPONDENCE series dates from 1960 to 2003, is arranged chronologically, and includes correspondence with Dr. Philip Handler, John D. Lindl, Dr. Steven Koonin, and others, in addition to correspondence with the U.S. Secretary of Energy Advisory Board.

Series 2: WRITINGS

The WRITINGS series is arranged into two subseries: General and JASON Defense Advisory Group. Both subseries are arranged alphabetically by title.

Series 3: SPEECHES AND REMARKS

The SPEECHES AND REMARKS series is arranged alphabetically by title and comprises mostly award acceptance speeches and lectures on fusion.

Series 4: TRANSPARENCIES

The TRANSPARENCIES series contains both hand-written and typed transparencies used by Rosenbluth during lectures.

They are arranged alphabetically according to subject terms found within the transparencies themselves. Subjects covered include the International Thermonuclear Experimental Reactor (ITER), free electron lasers, and tokamaks. For preservation,

hand-written transparencies have been photocopied and the originals have been removed.

Series 5: BIOGRAPHICAL

The BIOGRAPHICAL series includes articles about and interviews with Rosenbluth, awards received and documents on his family history.

Series 6: MISCELLANEOUS

The MISCELLANEOUS series comprises two conference pamphlets and an article written by R. J. Bickerton with Rosenbluth's handwritten notes in the margins.

Preferred Citation

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Publication Rights

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Acquisition Information

Acquired 2005.

Subjects and Indexing Terms

Physicists -- United States

Plasma (Ionized gases)

Controlled fusion

Nuclear energy

Nuclear fusion

Rosenbluth, M. N. -- Archives

Koonin, Steven E. -- Correspondence

Lindl, John -- Correspondence

Handler, Philip, 1917-1981 -- Correspondence

CORRESPONDENCE 1980-2002

Box 1, Folder 1

U.S. Department of Energy, Secretary of Energy Advisory Board 1992

Box 1, Folder 2

Correspondence A-Z 1980-2002

WRITINGS

General

Box 1, Folder 3

"Asymptotic Analysis of the Time Dependent Image from a Perfect Lens." Preprint 2002

General

Includes handwritten formulas by Rosenbluth on the back of two of the sheets. Notes begin "Ions lost by flux wandering..."

Box 1, Folder 4

"Calculation of the Kolmogorov Entropy for Motion Along a Stochastic Magnetic Field." Photocopy of reprint 1979

Box 1, Folder 5

"Comprehensive Gyrokinetic Simulation of Tokamak Turbulence at Finite Relative Gyroradius." Typescript undated

Box 1, Folder 6

"Continuum Damping of High-Mode-Number Toroidal Alfvén Waves." Drafts 1991

Box 1, Folder 7

"Effect of Atmosphere Wind Profiles on Atmospheric Propagation." Photocopy with notes undated

Box 1, Folder 8

"Electron Heat Transport in a Tokamak with Destroyed Magnetic Surfaces." Photocopy with notes 1978

Box 1, Folder 9

"Energy Exchange Between Electrons and Ions." Draft report September 29, 1960

Box 1, Folder 10

"Feedback of Resistive Wall Modes." Typescript undated

Box 1, Folder 11

"Finite-Resistivity Instabilities of a Sheet Pinch." Photocopy 1963

Box 1, Folder 12	"Free-Electron Lasers with Variable Parameter Wigglers." Reprint 1981
Box 1, Folder 13	[General Neoclassical Dynamo.] Notes 2003
Box 1, Folder 14	"Genesis of the Thermonuclear Era." Manuscript draft undated
Box 1, Folder 15	"Gyrokinetic Turbulence Simulation of Profile Shear Stabilization and Broken GyroBohm Scaling." Draft September 12, 2001
Box 1, Folder 16	"Investigations of the Role of Nonlinear Couplings in Structure Formation and Transport Regulation: Experiment, Simulation, and Theory." Typescript undated
Box 1, Folder 17	"Ion Pulse Transport in Target Chambers." Photocopy of reprint undated
Box 1, Folder 18	"A New Regime for Tearing Modes." Printed draft 1989
Box 1, Folder 19	"Nonlinear Electron Response to Electromagnetic Fluctuations in the Zero Electron Mass Limit." Printed copy undated
Box 1, Folder 20	"On Sand Piles with Bi-Stable Automata Rules: Towards a Minimal Model of Pedestal Formation and Structure." Photocopy of reprint August 29, 2002
Box 1, Folder 21	"A Physicist's Perspective on Fusion Research." Typescript undated
Box 1, Folder 22	"Plasma Transport in Toroidal Confinement Systems." Reprint 1972
Box 1, Folder 23	"Poloidal Flow Driven by Ion-Temperature-Gradient Turbulence in Tokamaks." Reprint and notes January 26, 1998
Box 1, Folder 24	"Reduced Equations for Electromagnetic Turbulence in Tokamaks." Reprint 2003
Box 1, Folder 25	"Review of the Department of Energy's Inertial Confinement Fusion Program." Committee report March 1986
Box 1, Folder 26	"Strong Lumped Circuit Solutions." Preprint 1988
Box 1, Folder 27	"STRS revisited." Handwritten drafts undated
Box 1, Folder 28	Untitled. Drafts and handwritten equations undated
Box 1, Folder 29	"With regard to MIC, I have the following comments." Proposal review undated
Box 1, Folder 30	"A Young Man Encounters Enrico Fermi." Typescript draft of Rosenbluth's contribution to the book <i>Fermi Remembered</i> edited by James W. Cronin 2003

JASON Defense Advisory Group

Box 2, Folder 1	"Airborne Laser" September 10, 1992
Box 2, Folder 2	"Effects of Intermittent Atmospheric Fluctuations on Hel Propagation in the Atmosphere" August 1, 1989
Box 2, Folder 3	"Effect of Random Winds on Blooming" June 19, 1989 and July 26, 1990
Box 2, Folder 4	"Effect of Windshear on Wind Clearing Time" August 5, 1988
Box 2, Folder 5	"Free Electron Lasers: Winter 1988 Comments on Atmospheric Propagation Issues" June 1990
Box 2, Folder 6	[Inertial confinement.] Transparencies undated
Box 2, Folder 7	"JASON Review of the SDIO Free Electron Laser Program" October 1990
Box 2, Folder 8	"Metamaterials with Negative Permeability and Negative Permittivity" August 18, 2003
Box 2, Folder 9	[Science Based Stockpile stewardship (SBSS).] Transparencies undated
Box 2, Folder 10	"Summer 1988 FEL Report: Discussions of Some Major Issues" August 1988
Box 2, Folder 11	"Thermal Blooming in the Presence of Random Wind Shear" August 16, 1991

SPEECHES AND REMARKS

Box 2, Folder 12	"Acceptance Remarks by Marshall N. Rosenbluth." Ernest O. Lawrence Award Ceremony April 30, 1964
Box 2, Folder 13	"Acceptance Remarks on Receipt of Maxwell Prize" November 23, 1976
Box 2, Folder 14	"Development of Nuclear Fusion Research" May 18, 1987
Box 2, Folder 15	"From Yearning to Burning: Possible Guidelines for 'Burning Plasma' Thinking" 2000
Box 2, Folder 16	"Fusion- Past, Present, and ITER." Given at dedication of Naka site of the International Thermonuclear Engineering Reactor (ITER) undated
Box 2, Folder 17	"Genesis of the Monte Carlo Algorithm for Statistical Mechanics." Lecture given at the Monte Carlo Method in the Physical Sciences, Los Alamos, NM June 9-11, 2003
Box 2, Folder 18	Harold P. Furth memorial remarks 2002
Box 2, Folder 19	"My Life in Fusion." Printed copy June 2002
Box 2, Folder 20	Remarks at the Fermi Award presentation February 6, 1986

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- Box 2, Folder 21 **"The Role of the Weibel Instability in Energy Transport Experiments." Presented at 5th Workshop on Fast Ignition of Fusion Targets, Madeira, Portugal June 19, 2001**
- Box 2, Folder 22 **"Some Cold War Stories in Tribute to a Dear Friend on His 70th Birthday: Marshall N. Rosenbluth for Roald Z. Sagdeev" 2002**

TRANSPARENCIES

- Box 2, Folder 23 **[ARIES and Pulsar]**
- Box 2, Folder 24 **[Department goals for fusion]**
- Box 2, Folder 25 **[Effects of energetic particles on tokamak stability]**
- Box 2, Folder 26 **[Electron lasers]**
- Box 3, Folder 1 **[Fusion issues and the ITER challenge]**
- Box 3, Folder 2 **[Fusion perspectives]**
- Box 3, Folder 3 **[Fusion time scales]**
- Box 3, Folder 4 **[Inertial Confinement Fusion (ICF)]**
- Box 3, Folder 5 **[Instability of resistive sheet pinch]**
- Box 3, Folder 6 **[The interchange instability]**
- Box 3, Folder 7 **[ITER and cyclone]**
- Box 3, Folder 8-9 **[ITER and Engineering Design Activities (EDA)]**
- Box 3, Folder 10-11 **[Magnetohydrodynamic (MHD)]**
- Box 3, Folder 12 **[Magnetohydrodynamic (MHD) stability]**
- Box 3, Folder 13 **[Reasons for fusion's problems]**
- Box 3, Folder 14 **[Resistive wall modes]**
- Box 3, Folder 15 **[Sensitivity study]**
- Box 3, Folder 16 **[Shear Alfvén waves]**
- Box 3, Folder 17 **[Spheromaks]**
- Box 3, Folder 18 **[Tandem mirrors]**
- Box 3, Folder 19 **[Thermal blooming experiment]**
- Box 3, Folder 20 **[Tokamak]**
- Box 3, Folder 21 **[Toroidal Alfvén Eigenmodes]**
- Box 3, Folder 22 **[Transport initiative]**
- Box 3, Folder 23 **[United States magnetic fusion strategy]**
- Box 4, Folder 1-3 **Untitled**

BIOGRAPHICAL

- Box 4, Folder 4 **Articles about Marshall Rosenbluth 1987-1993**
- Box 4, Folder 5 **Awards**
- Box 4, Folder 6 **Curriculum Vitae July 1987**
- Box 4, Folder 7 **Family tree**
- Box 4, Folder 8 **"In Memoriam: Marshall N. Rosenbluth" 2004**
- Box 4, Folder 9 **"Interview with Marshall Rosenbluth by Kai-Henrik Barth: Session 1" August 11, 2003**
- Box 4, Folder 10 **Photographs of Marshall Rosenbluth**
- Box 4, Folder 11 **"The Many Lives of Robert Rosenbluth: His Autobiography." Mimeograph by Robert Rosenbluth (father) 1962**

MISCELLANEOUS

- Box 4, Folder 12 **Bickerton, R.J. - "History of the Approach to Ignition." Printed copy with notes by Rosenbluth Undated**
- Box 4, Folder 13 **"Direction des Sciences de la Matière Département de Recherches sur la Fusion Contrôlée: Visite de M. Rosenbluth." Flyer April 4, 2001**
- Box 4, Folder 14 **"Energy Independence Conference: Fusion Energy and Plasma Physics." Conference pamphlet, Rio de Janeiro, Brazil August 17-21, 1987**