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Naval Research Laboratory Space Science Videohistory Collection, 1986-1987

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Smithsonian Institution Archives
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Table of Contents

Collection Overview

Repository:	Smithsonian Institution Archives, Washington, D.C., *osiaref@si.edu*
Title:	Naval Research Laboratory Space Science Videohistory Collection
Identifier:	Record Unit 9539
Date:	1986-1987
Extent:	8 videotapes (Reference copies). 22 digital .wmv files and .rm files (Reference copies).
Creator::	
Language:	English

Administrative Information

Prefered Citation

Smithsonian Institution Archives, Record Unit 9539, Naval Research Laboratory Space Science Videohistory Collection

Historical Note

World War II and the advent of the Cold War led the United States government to underwrite basic scientific research that could be applied to military purposes. Because the United States Navy was concerned about the effect of nuclear radiation on its wireless radio communication system, it funded studies in astronomy and aeronomy--the examination of the earth's atmosphere--at the Naval Research Laboratory (NRL) in Washington, D.C. Wartime advances in rocketry and electronics enabled physicists and engineers to study non-visible radiation at ever greater distances from the earth's surface. These studies resulted in more sophisticated views of the composition of the atmosphere and of solar radiation, and in the revelation of the presence of stellar X-ray radiation between 1946 and the early 1960s. By the latter period, however, the National Aeronautics and Space Administration (NASA) began to eclipse NRL's pre-eminence in space science.

Herbert Friedman was born in 1916, received his Ph.D. in physics from Johns Hopkins University in 1940, and began working at the NRL a year later. After two years of using X-ray radiation to detect manufacturing flaws, he was appointed head of the Electron Optics branch of the Rocketry Division. In 1958 Friedman took over the Space Science Division until his retirement.

Edward T. Byram earned his degree in mechanical engineering from the University of Toledo before the war, during which he served in the U.S. Army for three years. He spent two years at the Glenn L. Martin Aircraft Company and joined the NRL's Electron Optics branch in December, 1947. Between 1962 and 1972 he contributed to 54 papers on X-ray astronomy.

Talbot A. Chubb was born in 1923 and took the B.A. in physics that he received from Princeton University to the Clinton Engineer Works in Oak Ridge, Tennessee, in 1944. His doctoral advisor in physics at the

University of North Carolina referred him to the NRL in 1950. Chubb headed the Lab's Upper Air Physics branch from 1959 to 1981.

Robert Kreplin spent the summers of 1948 and 1949 at the NRL while finishing his B.A. in physics at Dartmouth University. After receiving his M.A. in 1952, Kreplin returned to the NRL permanently.

Charles Y. Johnson was born in 1920 and received his B.E.E. from the University of Virginia in 1942. After serving in the U.S. Navy during World War II he joined the Cosmic Ray Section of the NRL. He headed the Air and Ion Composition Section from 1954 to 1958 and the Aeronomy Section until his retirement.

Julian C. Holmes was born in 1930 and received his A.B. in physics from Bowdoin College in Brunswick, Maine, in 1951. He joined Johnson at the NRL in 1956 as a Physicist.

Introduction

The Smithsonian Videohistory Program, funded by the Alfred P. Sloan Foundation from 1986 until 1992, used video in historical research. Additional collections have been added since the grant project ended. Videohistory uses the video camera as a historical research tool to record moving visual information. Video works best in historical research when recording people at work in environments, explaining artifacts, demonstrating process, or in group discussion. The experimental program recorded projects that reflected the Institution's concern with the conduct of contemporary science and technology.

Smithsonian historians participated in the program to document visual aspects of their on-going historical research. Projects covered topics in the physical and biological sciences as well as in technological design and manufacture. To capture site, process, and interaction most effectively, projects were taped in offices, factories, quarries, laboratories, observatories, and museums. Resulting footage was duplicated, transcribed, and deposited in the Smithsonian Institution Archives for scholarship, education, and exhibition. The collection is open to qualified researchers.

Descriptive Entry

David H. DeVorkin, curator at the Smithsonian's National Air and Space Museum (NASM), recorded five sessions with the men at the NRL who pioneered the sciences of X-ray astronomy and aeronomy. DeVorkin was particularly interested in how technologies and techniques developed for one purpose crossed disciplinary boundaries to affect or create others. Participants detailed how they adopted, applied, or improved on extant technologies for their hybrid research; throughout the sessions there is ample visual documentation of artifacts and working equipment used at the NRL. The video sessions were arranged in two series: 1) X-ray astronomy and 2) aeronomy.

This collection consists of five interview sessions, separated into two series, totally approximately 16:00 hours of recordings and 390 pages of transcript.

Names and Subject Terms

This collection is indexed in the online catalog of the Smithsonian Institution under the following terms:

Subjects:

Aerobee rockets

Astronomy
Astrophysics
Interviews
Oral history
Science -- History
Technology -- History

Types of Materials:

Transcripts
Videotapes

Names:

Byram, Edward T.
Chubb, Talbot A. (Talbot Albert)
DeVorkin, David H., 1944- , interviewer
Friedman, Herbert, 1916-2000
Holmes, Julian C.
Johnson, Charles Yothers, 1920-
Kreplin, Robert
Naval Research Laboratory (U.S.)
Naval Research Laboratory (U.S.). Electron Optics Branch
Naval Research Laboratory (U.S.). Rocketry Division

Container Listing

Series 1: Early X-ray Astronomy

This series contains three sessions with four of the pioneers of early X-ray astronomy at the Electron Optics Branch of the NRL: Edward T. Byram, Talbot A. Chubb, Herbert Friedman, and Robert Kreplin. They discussed the sources of employees and equipment; changes in equipment and launch vehicles; preparation of equipment for launches; working environment at the NRL; and interpretation of experimental data. DeVorkin complemented each interview with extensive visual documentation of the equipment discussed and of the laboratories where it was developed and tested. Sessions were recorded at the National Air and Space Museum and the Naval Research Laboratory between December 1986 and July 1987.

In Sessions One through Three, DeVorkin interviewed all four participants in a group and then in pairs to review the progression of astronomical research at the NRL between 1945 and the early 1960s. Scientists from physics and engineering backgrounds collaborated on the adaptation and development of radiation detection equipment to exploit the higher altitudes attained by successive generations of rockets.

Interviews

Interviews **Session 1: November 12, 1986**

Interviews In the Director's Conference Room at the National Air and Space Museum, featured Friedman, Byram, Kreplin, and Chubb on the chronology of NRL's astronomical research, c. 1945-1964, including: backgrounds of interviewees; research freedom, and lab culture at the NRL; development of gas-tube radiation detection technology; technical problems with different rockets; defining research goals in stellar and solar astronomy; 1950s rockoon program and ultraviolet research; solar flare and X-ray studies; participation in International Geophysical Year, 1957-1958; Vanguard satellite program and influence of NASA on NRL; reasons for U.S. Navy's commitment to astronomy. Visual documentation included: assortment of gas tubes for radiation detection; 1950s cartoon of NRL personalities; period photographs of tubes, NRL staff, rockets and launch sites; diagrams of instrument components.

Interviews Transcript, 1-114 pages of videotape recording, 6 hours.

Interviews Recording of Interview: Total Recording Time: 6 hours

Note:
- Original Masters: 6 U-Matic videotapes
- Preservation Masters: 6 Motion jpeg 2000 and 6 mpeg digital files
- Dubbing Masters: 4 U-Matic videotapes
- Reference Copies: 2 VHS videotapes, 6 Windows Media Video and 6 Real Media digital files

Interviews **Session 2: July 8, 1987**

Interviews

In Rooms 219-A and 231-A of Building 209 at the Naval Research Laboratory, featured Byram and Chubb on the functions of their respective laboratories, c. 1949-1987, including: operation of vacuum chamber for High Energy Astrophysical Observatory (HEAO); cooperation with NASA; comparison of NASA and NRL standards for testing; Byram's training for work with vacuums; operation of gas filling station; comparison of gas filling techniques, 1950s and 1980st; collective approach to equipment development; development of halogen gas tube; development of gas quench agents; Chubb's training for work with gases. Visual documentation included: HEAO vacuum chamber and components in operation; late 1960s-model Geiger counter; procedure diagram for Oriented Scintillation Spectrograph Experiment; equipment for ultraviolet astronomy in room 231A; 1950s-model gas-filling station and components in operation; BS-1 halogen tube; tube-testing equipment in operation; Seyea-Namioka spectrograph and its components.

Interviews

Transcript, 1-43 pages, of videotape recording, 1 hour, 40 minutes.

Interviews

Recording of Interview: Total Recording Time: 1 hour, 40 minutes

Note:

- Original Masters: 5 U-Matic videotapes
- Preservation Masters: 5 Motion jpeg 2000 and 5 mpeg digital files
- Dubbing Masters: 2 U-Matic videotapes
- Reference Copies: 1 VHS videotape, 5 Windows Media Video and 5 Real Media digital files

Interviews

Session 3: July 31, 1987

Interviews

In the Building 209 video studio at the Naval Research Laboratory, featured Byram and Kreplin on instrumentation for rocket-launched astronomic research, c. 1948-1979, including: development of Geiger counter tube technology; development of ionization chamber technology; integration of radiation detectors to Solrad satellite series; development of collimator and X-ray detector technology; solar radiation research, 1950s through Solrad; discovery of Scorpius X-1 and Crab Nebula X-ray sources; application of telescopes to stellar ultraviolet astronomy; development of HEAO detector; NRL relationships with contractors and NASA; determining the aspect of a rocket; quality of computer hardware and software. Visual documentation included: assortment of gas tubes and components for ultraviolet and X-ray radiation detection; Lyman alpha ionization chamber and sensitivity curve chart; collimator components; period photographs of rockets, instruments, and scientists; collimated telescope experiment components; HEAO detector and components; aspect calculator; Sco X-1 telemetry printout.

Interviews

Transcript, 1-109 pages, of videotape recording, 4 hours.

Interviews

Recording of Interview: Total Time Recording: 4 hours

Note:

- Original Masters: 4 U-Matic videotapes

- Preservation Masters: 4 Motion jpeg 2000 and 4 mpeg digital files
- Dubbing Masters: 4 U-Matic videotapes
- Reference Copies: 2 VHS videotapes, 5 Windows Media Video and 5 Real Media digital files

Return to Table of Contents

Series 2: Aeronomy

This contains two sessions with Julian C. Holms and Charles Y. Johnson, who led the postwar development of aeronomy at the NRL. They discussed the design and operation of specialized laboratory space and equipment; design and operation of the Aerobee rocket's instrument space; and the interpretation of experimental data. DeVorkin complemented both interviews with extensive visual documentation of the equipment discussed and of the laboratories where it was developed and tested. Sessions were recorded at the Naval Research laboratory in July 1987.

In Sessions One and Two of this second series, DeVorkin interviewed the two men who led the NRL's study of the upper atmosphere between 1945 and 1980. Here too the need to exploit newly available rocket technology required a combination of theoretical and applied sciences as well as technical craftsmanship to develop and adapt the appropriate experimental equipment.

Interviews

Interviews **Session 1: July 8, 1987**

Interviews In Building 209 of the Naval Research Laboratory, featured Charles Y. Johnson on lab testing of equipment, c. 1945-1987, including: development of mass spectrometers; development of vacuum chambers; comparison of spectrometers in lab and at launch site; electronics of electrometer unit; Johnson's training for vacuum chamber construction; reasons for U.S. Navy's commitment to upper atmosphere research; specifications for laboratory construction. Visual documentation included: Bennett mass spectrometer vacuum test chamber and components in operation; mass spectrometers and electrometers; period photographs of lab and launch site testing facilities, 1950s; array of equipment in Room 324A; construction of electronically shielded room; equipment for current NRL projects.

Interviews Transcript, 1-41 pages, of videotape recording, 1 hour, 20 minutes.

Interviews Recording of Interview: Total Recording Time: 1 hour, 20 minutes

Note:
- Original Masters: 4 U-Matic videotapes
- Preservation Masters: 4 Motion jpeg 2000 and 4 mpeg digital files
- Dubbing Masters: 2 U-Matic videotapes
- Reference Copies: 1 VHS videotape, 4 Windows Media Video and 4 Real Media digital files

Interviews **Session 2: July 30, 1987**

Interviews In the video studio in Building 222 at the NRL, featured Julian C. Holmes and Charles Y. Johnson on the instrument payloads of Aerobee rockets, c. 1949-1979, including: composition and contents of Aerobee payload and nosecone; determining and maintaining aspect of rocket; changes in instrument technology and sources of its manufacture; examining telemetry and mass spectroscopy data; development of instrumentation rack; factors in successful group design; checking Aerobee and payload at launch

sites; early use of V-2 rockets; mechanics of date and nosecone recovery; significance of upper atmosphere research. Visual documentation included: Aerobee rocket components; instrumentation rack and instruments; aspect-sensing and -calculating devices; telemetry and data printouts and charts; despin components; collimators, photometers, and channeltron; mass spectrometers and components; photographs of various rockets, especially Aerobees; diagram of spectrometer operation.

Interviews

Transcript, 1-83 pages, of videotape recording, 3 hours.

Interviews

Recording of Interview: Total Recording Time: 3 hours

Note:

- Original Masters: 3 U-Matic videotapes
- Preservation Masters: 3 Motion jpeg 2000 and 3 mpeg digital files
- Dubbing Masters: 3 U-Matic videotapes
- Reference Copies: 2 VHS videotapes, 3 Windows Media Video and 3 Real Media digital files

Return to Table of Contents