

Accession No.: 87-37

PROCESSING RECORD
SCRIPPS INSTITUTION OF OCEANOGRAPHY ARCHIVES

Preisendorfer, Rudolph William 1927-1986

Rudolph William Preisendorfer Papers, 1950-1966

Physical Description: 7 rcc

Description: Papers of mathematician Rudolph Preisendorfer, a researcher at the Visibility Laboratory. Subjects include hydrological and environmental optics, radiative transfer theory, irradiance, light fields, invariance, toroidal plasmas, and the Visibility Lab.

Rudolph William Preisendorfer
Papers, 1950-1966
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Box	Folder Title
1	Notebook I, Summer 1950
	Notebook II, Summer 1951
	Ideas on the Treatment of Contrast Reduction by Shimmer in the Atmosphere, 1950
	Interreflection Calculations, Summer 1953
	Photometry, Hydrological and Atmospheric Optics Lectures, Fall 1953
	Transient Radiant Flux, February 1954
	The Specific Calculation of the Path Function at a Point in the Atmosphere, Summer 1954
	Computations for $2F(n, x)$, June 21, 1954
	An Exact Evaluation of the Reflectance of a Flat Surface for a Radiance Distribution of the Form $N(k, \sqrt{2}) (1 + \cos O)$, August 18, 1954
	A New Method for the Determination of the Volume Scattering Function in Environmental Optics, September 20, 1954
	Lectures on Radiometry and (General Environmental) Geophysical Optics, Fall 1954
	Primary Scalar Irradiance of a Completely Homogenous Half Space, October 6, 1954
	Scattering and Absorption Functions for Environmental (Geophysical) Optics, November 1, 1954
	Scattering and Absorption Functions for Environmental Optics, November 1, 1954
	Notes on Transient Radiant Energy, Fall 1954

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- 1
- Unification of the Analytic Concepts of Reflectance and Scattering Phenomenological Level, Fall 1954
- Determining the Volume Scattering Function in Optical Media in the Presence of Emission Processes, Spring 1955
- Outline of Reflecting-Sphere Problem, Summer 1955
- Detection of Shadows in a Luminance Field, Fall 1955
- Derivation of Irradiance on Integrating Sphere Walls when Integrating Sphere is Filled with a Diffusing Material, Illuminated by Collimated Monochromatic Light, Fall 1955
- Important Reprints for Thesis Work
- Ph.D. Work: Formalities, September 1953
- Ph.D. Thesis, Notebook 1, Summer 1954-Spring 1955
- Tables of Snell's Law, February 25, 1955
- Ph.D. Thesis, Notebook 2, Spring 1955
- Ph.D. Thesis, Notebook 4, Spring 1956
- Four Papers on the Mathematical Foundations of Radiative Transfer Theory (Expository Papers), Summer-Fall 1956
- 2
- Ph.D. Thesis, Notebook 5 (Scraps), Spring 1956
- Ph.D. Thesis, Notebook 3, Summer-Fall 1955
- Thesis Manuscript (First Draft), April (1-10) 1956
- A Mathematical Foundation for Radiative Transfer Theory, First Draft, Ph.D. Thesis, May 1956
- Four Papers on the Mathematical Foundations of Radiative Transfer Theory (Expository Papers), Summer-Fall 1956

Box	Folder Title
2 (2)	A Mathematical Foundation for Radiative Transfer Theory, Ph.D. Thesis, May 1956
2	A Mathematical Foundation for Radiative Transfer Theory (Expository Paper), Manuscript, May 1956
	Geophysical Optics Notation, July 1956
	Manuscripts for the Exact Reflectance Formula for $r(m,k)$, May 20, 1957
	The Planetary Hydrosphere Problem, I. General Principles, June 1, 1957
	A Model for Radiance Distributions in Natural Hydrosols, Manuscript, July 1957
	The Divergence of the Light Field in Optical Media, Manuscript, July 1957
	Unified Irradiance Equations, Manuscript, August 1957
(5)	[Untitled Notebook]
	Radiative Transfer Axioms, October 16, 1957
	Time-Dependent Principles of Invariance, November 15, 1957
	Invariant Imbedding Relation for the Principles of Invariance, October 16, 1957
	Functional Relations for the R and T Operators on Plane-Parallel Media, November 8, 1957
	On the Simulation of Some Optical Properties of the Sea Surface by Arrays of Ergodic Cups, January 16, 1958
	A General Theory of Perturbed Light Fields, with Applications to Forward Scattering Effects in Beam Transmittance Measurements, April 1958
	On the Radiant Density Field Produced by Searchlights in Scattering Media, I. Theoretical Analysis, March 13, 1958
	Canonical Forms of the Equation of Transfer, April 1958

Box	Folder Title
2	<p>The K-Method of Determining the Path Function, May 1958</p> <p>Light Vector Associated with Standard Ellipsoidal Radiance Distribution, June 1958</p> <p>Directly Observable Quantities for Light Fields in Natural Hydrosols, June 1, 1958</p>
3	<p>On the Existence of Characteristic Diffuse Light in Natural Waters, August 8, 1958</p> <p>A Proof of the Asymptotic Radiance Hypothesis, August 1, 1958</p> <p>Some Mathematical Aspects of Geophysical Optics Concepts, August 7, 1958</p> <p>Some Practical Consequences of the Asymptotic Radiance Hypothesis, September 1, 1958</p> <p>The Measurement of Light in Natural Waters, Radiometric Concepts and Optical Properties, with John E. Tyler, October 15, 1958</p> <p>Photo Field Theory for Natural Hydrosols, September 10, 1958</p> <p>The Contrast Transmittance Distribution as a Possible Tool in Visibility Calculations, with James L. Harris, October 1, 1958</p> <p>Simple Formulas for the Volume Absorption Coefficient in Asymptotic Light Fields, with W. H. Richardson, November 21, 1958</p> <p>Theory of Attenuation Measurements in Planetary Atmospheres, November 24, 1958</p> <p>Diffusion Theory Calculations, December 1958</p> <p>On the Structure of the Light Field at Shallow Depths in Deep Homogenous Hydrosols, February 9, 1959</p> <p>Statement of Purpose, Status, and Future Plans of the Theoretical Program of the Visibility Laboratory, February 16, 1959</p>

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3

Temporal Metric Spaces in Radiative Transfer Theory

I. Temporal Semimetrics, March 1959

II. Epoch Times and Characteristic Functions, March 1959

III. Characteristic Spheroids and Ellipsoids, March 1959

IV. Temporal Diameters, March 1959

V. Local Temporal Diameters, March 1959

A Study of Light-Storage Phenomena in Scattering Media, March 1959

On Ground-Based Measurements of the Optical Properties of the Atmosphere Aloft, March 1959

Radiance Bounds, March 1959

The Universal Radiative Transport Equation, March 1959

Notes on Derivation of Transfer Equation from Maxwell Theory, April 1959

Greens Function for Irradiance on a Discrete Space, June 1959

Discrete Formulation of Cauchy-Riemann Equation, Some Consequences, June 1959

On the Direct Measurement of the Total Scattering Function, July 1959

The Covariation of the Diffuse Attenuation and Distribution Functions in Plane Parallel Media, July 1959

Radiative Transfer on Discrete Spaces, August 1959

Principles of Invariance on Discrete Spaces, August 1959

Radiative Transfer on a Linear Lattice, November 1959

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3	On the Structure of the Light Field at Shallow Depths in Deep Homogenous Hydrosols, November 1959
	Theory of Polarized Light Fields in Discrete Spaces, November 1959
4	Notes on Attenuation Function and Light Field Models, November 1959
	Radiative Transfer on a Cubic Lattice, December 1959
	Plane-Source Generated Light Fields in Discrete Spaces, December 1959
	Two Fundamental Methods of Solving Point-Source Problems in Discrete-Space Radiative Transfer Theory, December 1959
	Markov Chains and Radiative Transfer, December 1959
	General Analytical Representations of the Observable Reflectance Function, November 1959
	The Axiomatic Basis of the Principles of Radiative Transfer Theory, December 1959
	The Principles of Invariance for Directly Observable Irradiances in Plane-Parallel Media, December 1959
	Formulation of the Irradiance Transport Equations for Numerical Analog Solution Procedures, December 1959
	Recurrence-Partitions of Finite Measure Spaces with Applications to Ergodic Theory, with Roos, April 1960
	The General Contrast Transmittance Equation in Terms of Apparent and Inherent Optical Properties, June 1960
	Application of Radiative Transfer Theory to Light Measurements in the Sea, I.A.P.O. Conference in Helsinki, August 4, 1960
	Differential Equation Governing Pressure Curves in Toroidal Plasma, May 1960

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4	<p>Geometry of p-curves in Toroidal Plasmas, June 1960</p> <p>Geometry of Nested Toroidal Pressure Surfaces in Equilibrium Plasmas, June 1960</p> <p>Differential Geometry of Nested Toroidal Pressure Surfaces in Equilibrium Plasmas, July 25, 1960</p> <p>A Solution of the Extension Problem for Magnetic Fields in Equilibrium Toroidal Plasmas, July 26, 1960</p> <p>Hamiltonian Form of the Neutron Transport Equations in Plane-Parallel Media, September 1960</p> <p>Generalized Invariant Imbedding Relation, October 1960</p> <p>Spatial Semi-Groups in Neutron Transport Theory, October 6, 1960</p>
(2)	<p>Recommendations on the Standardization of Concepts, Terminology, and Notation of Hydrologic Optics, November 21, 1960</p> <p>Equation of Motion of Translating Pin-Joined Frames Subject to an Arbitrary Set of External Faces and Internal Restraints, January 5, 1960</p> <p>A Function-Theoretic Approach to Abstract Vector Space Theory, January 25, 1961</p> <p>A Note on the Proof of the Schroder-Bernstein Theorem, February 1961</p> <p>On the Best Fit to Experimental Curves Using Homogenous Two-Parameter Functions, March 16, 1961</p> <p>Relaxation Schema for a Toroidal Pinch, I. Point Blank Scheme, April 1961</p> <p>Lectures on Sets, Relations, and Number Systems, First Draft, Fall 1961</p>
5	<p>Mathematical Basis for the Automated Machining of Space Curves, May 15, 1961</p> <p>Irradiance on a Flat Collector High Above the Earth, March 1, 1962</p> <p>Sea State Estimates from Satellite Observations, September 25, 1962</p>

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5

Variable Rod-Acre Diffusion, Preliminary, March 15, 1960

Electron Geen Problem, January 7, 1960

Generalized Recursion Formulas for Appels' Integrals, April 4, 1961

Limits of Bessel Functions, January 8, 1960

Project 32.41, February 15, 1960

Kralls Problem II

Simultaneous First Order Differential Equations, January 5, 1960

Gerjog's Problem: No Complex Roots

Roots of F Determinant

Temperature-Heat Flow Equations, Durstenfele

Kralls Problem I

Lectures on Mathematical Logic, Spring 1962

Operator Formulation of the Optical Ringing Problem, Rough Drafts,
October 1962

Radiative Transfer on Discrete Spaces, Chapter V-X, Final Draft

Comments on Draft Chapters to an Introduction to Invariant Imbedding,
Richard Bellman, March 11, 1966

Dave Mac Adam Borrowed Material

Oceanography Course 220, Topics in Advanced Math Analysis, Outline
and Summary Sheets, Fall 1964

Time Dependent Second Order Radiance Laser-Type Source, June 1965

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5	Principles of Hydrologic Optics Chapter 2, Scratch Chapter 1 Chapter 2, Handwritten Manuscript Chapter 2, Typed Manuscript
6	Chapter 3, Handwritten Manuscript Chapter 3, Scratch Chapter 4, Handwritten Manuscript Chapter 5, Handwritten Manuscript Chapter 6, Handwritten Manuscript Chapter 7, Handwritten Draft Chapter 7, Preliminary Notes Chapter 8, Handwritten Manuscript Chapter 9, Handwritten Manuscript Chapter 10, Handwritten Manuscript Chapter 11, Handwritten Manuscript Chapter 12, Handwritten Manuscript Chapter 13, Handwritten Copy Radiative Transfer on Discrete Spaces Chapter I-IV, Final Draft Chapter XI-XVI, Final Draft
7	Lectures on Photometry, Hydrological Optics, Atmospheric

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7

Optics, Volume I, Fall 1953

Seven Keystones of the Calculus, 1964

Lectures on Harmonic Analysis, Fall-Winter, 1966-1967

Introduction to Fast Fourier Transforms, Spring 1967

Integral Transforms and Group Theory, Spring 1968