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## DEDICATION for Prof. Sueo UENO

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### ◆ Introduction

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We students of Professor Sueo Ueno dedicate this publication to the living memory of our beloved teacher. We mean by the word, “dedicate,” to give full-heartedly, as Prof. Ueno has dedicated himself to scholarship and teaching. He taught us not only complex concepts and techniques and inspired us to carry out our own research programs, but also through his own example he showed us how to live a fulfilling life. We miss our Professor’s physical presence but his kind and powerful spirit will always be with us.

We also dedicate this compilation to the Ueno family: his late wife Misa Kato Ueno, his daughter Sister Cecilia Hisaye, his son Fumihiko, Fumihiko’s son Akihiko, and Akihiko’s son Takumi who was born December 2010. They have generously shared his time and attention with us, his students. To his family we extend our deepest appreciation and our sincerest best wishes.

### ◆ Curriculum Vitae of Sueo Ueno

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B.S., 1935; M.S., 1937; Dr. Sci., 1955;

Kyoto Imperial University, Department of  
Cosmophysics;

now Kyoto University, Department of Astronomy

1935-45. Technological Major, Japanese Army, radars and  
remote sensing

1945-70. Professor, Institute of Astrophysics, Kyoto  
University

1970-73. Consultant to RAND Corporation, Santa Monica,  
California

1973-87. Professor and Director, Information Science  
Laboratory,

Kanazawa Institute of Technology, Kanazawa, Japan

1987-98. Director, Information Science Laboratory,  
Kyoto School of Computer Science, Kyoto, Japan

The many honors of Prof. Ueno include Japan’s prestigious Kunsanto Medal, 1983; Jinji Koshin Roku, 1993; Who’s Who in the World, 1999. His research positions included maitre de recherche, Paris Observatory, Centre National de Recherche Scientifique; NSF postdoctoral fellow in astronomy,

NASA Goddard Institute for Space Studies, New York. He was visiting professor at the University of Southern California, Los Angeles, and at the University of Massachusetts, Amherst. His editorships included Astrophysics and Space Science and Applied Mathematics and Computation. He provided active leadership in the International Astronomical Union, IEEE Geoscience and Remote Sensing Society of Tokyo. He was principal investigator of the US-Japan Cooperative Science Program, Radiative Transfer in Terrestrial Atmosphere. Sueo Ueno published the books, Multiple Scattering Processes: Inverse and Direct, 1975, and Terrestrial Radiative Transfer: Modeling, Computation, and Data Analysis, 1998.

Sueo Ueno was an internationally renowned astrophysicist and information systems scientist. He published two scholarly books on multiple scattering and 270 scientific papers in Japanese, French, English and in various international journals. He enjoyed close friendships with the world’s leading scientists such as V.A. Ambarzumian, V. Sobolev, V. Kourganoff, S. Chandrasekhar, I. Busbridge, J. Lenoble, R. Bellman, and R. Kalaba.

### ◆ Research

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It is impossible to capture the scope of the research of Sueo Ueno. Here, we consider the development of his work in radiative transfer. In 1996 he prepared this list of 13 of his papers which followed upon the work of Ambarzumian, Sobolev, and Chandrasekhar.

1. Invariant imbedding and diffuse reflection from a two-dimensional flat layer, 1963.

2. Invariant imbedding and time-dependent diffuse reflection of a pencil of radiation by a finite inhomogeneous flat layer - I. Icarus, 1963.

3. On the identification of systems and the unscrambling of data. II. An inverse problem in radiative transfer. Proc. Nat. Acad. Sci. USA, 1965.

4. Invariant imbedding and the computation of internal fields for transport processes. Jour. Math. Anal. Appl., 1965.

5. Diffuse transmission of light from a central source through an inhomogeneous spherical shell with isotropic scattering. *J. Math. Phys.*, 1968.
6. Initial-value methods for integral equations arising in theories of the solar atmosphere. *Astrofizika*, 1968.
7. New derivation of the integro-differential equations for Chandrasekhar's X and Y functions. *J. Math. Phys.*, 1968.
8. Reflection and transmission functions for finite isotropically scattering atmospheres with specular reflectors. *JQSRT*, 1969.
9. Some mathematical aspects of multiple scattering in a finite inhomogeneous slab with anisotropic scattering. *Astr. Soc. Japan.*, 1970.
10. Radiometric correction for atmospheric and topographic effects on Landsat MSS images. *Int. J. Remote Sensing*, 1988.
11. Stochastic approach to Cauchy system of Chandrasekhar's planetary problem with specular reflector. *Astrophys. Space Sci.*, 1988.
12. Reflection function of linearized Couette flow via stochastic approach. *ISCIE*, 1991.
13. Searchlight on a target with a diffuse background. *J. Math. Phys.*, 1993, 1994.

Here are additional selections from papers published in subsequent years:

14. The surface albedo retrieval of mountainous forest area from satellite MSS data. *Appl. Math. Comput.*, 1995.
15. The estimation of parameters in time-dependent transport problems. *Comput. Math. Appl.*, 1999.
16. Cauchy problem for least squares estimation with semi-degenerate covariance. *Appl. Math. Lett.*, 1999.
17. Cauchy systems for Fredholm integral equations with parameter imbedding. *Appl. Math. Comput.*, 2000.

Sueo Ueno pioneered in the application of multiple scattering theory to radiation dosimetry:

18. Invariant imbedding and radiation dosimetry: finite order

scattering and transmission function, 1972.

A.T. Bharucha-Reid stated in his 1960 book on Markov processes, "The stochastic approach to the equations of radiative transfer is due to S. Ueno." We can add that a great many of the fundamental equations of radiative transfer can be attributed to S. Ueno.

Prof. Ueno clearly made lasting contributions to the theory and application of multiple scattering; to remote sensing, system identification, and inverse problems; as well as to the analytical and computational aspects of the mathematics of integral equations.

In the year 2000, a special issue of *Applied Mathematics and Computation* (Vol. 116) honored five decades of research by Sueo Ueno. A complete list of publications is presented on pp 11-38 of that issue, and the pages of all of his papers have been digitized by Kyoto School of Computer Science.

#### ◆ Summary

Sueo Ueno, the youngest son of the samurai Tokuzo Ueno and Kuwa Koketsu, certainly made a mark in this world. He was born on February 26, 1911 and passed away peacefully on October 17, 2011 at age one hundred. He lived through four eras, Meiji through Heisei. He helped usher in a new age of culture and scholarship. He was a man of his time and for all time.

We are fortunate to have known Sueo Ueno, an inspiration to us all. We dedicate our efforts to preserving his legacy.

