Chaos Memorial Symposium in Asuka

Selected Papers Dedicated to
Professor Yoshisuke UEDA
on the Occasion of his 60th Birthday

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March 14 - 15, 1997

At Asuka Institute of Kansai University : Ueda Memorial Hall
Inabuchi, Asukamura, Takaichi-gun, Nara, JAPAN

Program

Welcome Anouncement

Tohru KODA, Professor, Kyushu University

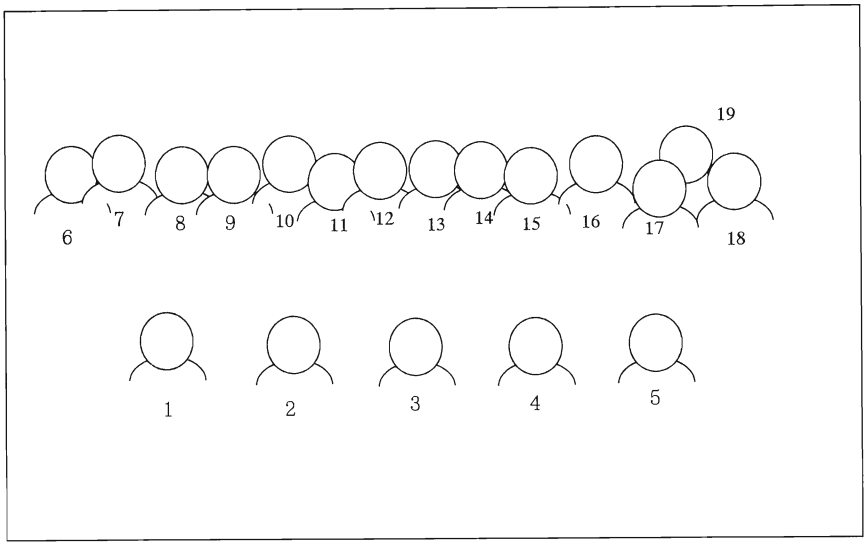
Lectures

Toshiro KOGA, Professor Emeritus, Kyushu University
Kazumasa HIRAI, Professor Emeritus, Kobe University
Kohshi OKUMURA, Professor, Kyoto University

Shin'ichi OHISHI, Professor, Waseda University
Kazuyuki AIHARA, Associate Professor, Tokyo University
Shinsaku MORI, Professor Emeritus, Keio University

Shuji YOSHIZAWA, Professor, Tokyo University
Chikara SATO, Professor Emeritus, Keio University
Yoshisuke UEDA, Professor, Kyoto University

Closing Anouncement



1. Prof. S. Mori
2. Prof. C.Sato
3. Prof. Y.Ueda
4. Prof. T.Koga
5. Prof. K.Hirai
6. Prof. T.Matsumura
7. Prof. T.Okamoto
8. Prof. Y.Oohama
9. Prof. S.Yoshizawa
10. Prof. K.Okumura
11. Prof. K.Aihara
12. Prof. T.Saito
13. Prof. T.Kohda
14. Prof. K.Nakajima
15. Prof. A.Ushida
16. Prof. T.Endo
17. Prof. S.Ohishi
18. Prof. T.Ushio
19. Prof. T.Hikihara

Preface

On the 23rd December, 1996, we celebrated the sixtieth birthday of Professor Yoshisuke Ueda. On that occasion, we planned to hold "Chaos Memorial Symposium in Asuka" and publication of a book collecting papers dedicated to Professor Ueda.

The symposium was held on the 14-15 March, 1997, at Ueda Memorial Hall of Asuka Institute of Kansai University in Nara Prefecture. Asuka was the Capital of the ancient Asuka dynasty lasted for 118 years in 6-7 centuries, where the Japanese Buddhism culture, called the Asuka Culture, was initiated. There are many ancient tombs with huge sizes, in which the biggest one has a diameter of 278 meters. And also many mysterious remains still exist. In the symposium, nine lectures were given, and was chaired by Professor T. Kohda of Kyushu University. Professor T. Koga of Kurume Institute of Technology (Professor Emeritus, Kyushu University) gave the first lecture. Here he remarked that a Japanese mythology was originally described in Asuka and has an idea of chaos as similar as in Greek myths. The next lectures were given by Professor K. Hirai of Kohnan University (Professor Emeritus, Kobe University), Professor K. Okumura of Kyoto University, Professor S. Oishi of Waseda University, Professor K. Aihara of Tokyo University, Professor S. Mori of Keio University, Professor S. Yoshizawa of Tokyo University, and Professor C. Sato of Keio University.

The final lecture titled "Point of Reference for Research" was given by Professor Ueda who had firstly found out chaotic phenomena in 1961. In the lecture, at first, he referred to his teachers when he was a graduate student in Kyoto University; Professors C. Hayashi, H. Shibayama, M. Kuwahara, Y. Nishikawa, M. Abe and H. Hirai from whom he was educated and greatly influenced.

In the next, he reminisced of the original drawing of his strange attractor of van der Pol - Duffing mixed type equation which was firstly emerged from his pencil plots on the Poincaré section on the 27th November, 1961. In 1978, Professor Ueda met with Professor D. Ruelle in Kyoto who named Ueda's strange attractor as "Japanese attractor". Professor Ruelle referred to and gave detailed reviews of the Ueda's Japanese attractor in his articles in the following four scientific publications : La Recherche (Vol. 1), The Mathematical Intelligencer (Vol. 2), Czech. J. Physics (Vol. A32), and Mathematics Calendar (Springer, Nov. 1981). These publications made Japanese people notice and acknowledge the Ueda's Japanese attractor.

Professor Ueda referred to Professor J. M. T. Thompson and Dr. H. B. Stewart who firstly referred and introduced Ueda's (Japanese) attractor in their book titled "Nonlinear Dynamics and Chaos (Wiley, 1986)". In 1988, an exhibition "Portraits of Chaos" was performed in Berkner Hall in Brookhaven National Laboratory in U.S.A by Dr. H. B. Stewart where the original plots of 1961 of the Ueda's Japanese attractor were displayed. Dr. H. Bruce Stewart and Professor R. H. Abraham also made another important contribution to make Professor Ueda publish a monograph collecting his selected scientific papers on chaotic dynamics, entitled "The Road to Chaos(1992)". In 1991, under the supervision of Professor Ueda, a translated issue in Japanese of "Chaos–Making a New Science–(by James Gleick, 1987, Penguin Books, USA)", which was translated into Japanese by Mrs. Masako Ohnuki, was published. This issue was so well-timed that it received very much favorable reviews even for peoples who were not scientists or engineers. In the lecture, many other greatly excellent scientists whom Professor Ueda had met, and who made essential contributions to the study of chaotic dynamics, were also referred: Professors Ya.

G. Sinai, Y. Takahashi, F. Moon, P. Holmes, J. Guckenheimer, M. J. Feigenbaum, T-Y. Li, J. A. Yorke, C. Grebogi, O. E. Roessler, and E. N. Lorenz.

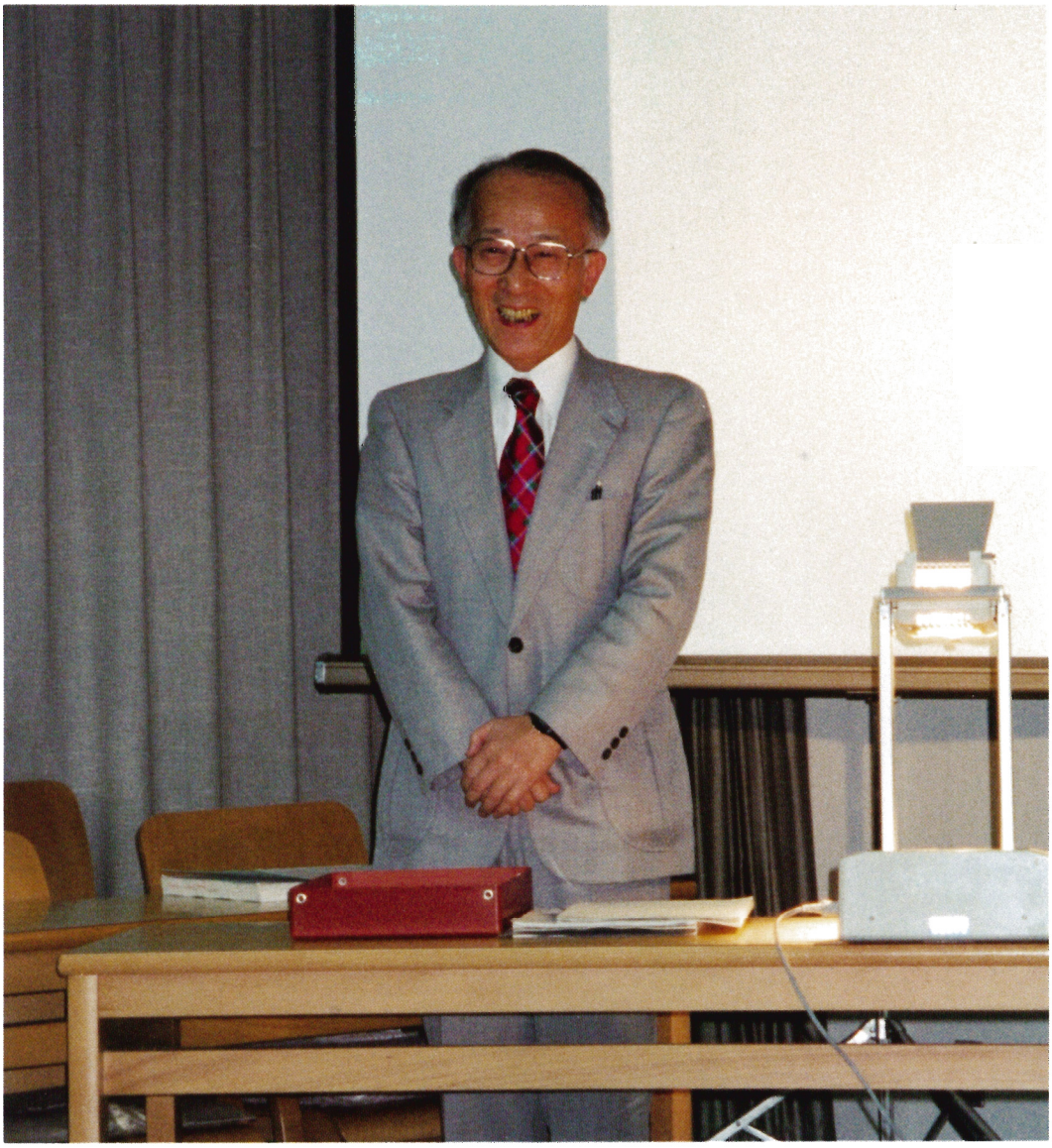
This issue is dedicated to Professor Yoshisuke Ueda on the occasion of his sixtieth birthday. Many of the authors of the papers included in the present volume are themselves excellent engineers and scientists. Some of them were greatly influenced by Professor Ueda in the course of their careers, and some greatly influenced Professor Ueda in the course of his career.

In the present volume, reader will find a variety of approaches to clarify and characterize complex dynamics in nonlinear systems. It is also hoped that the present volume will stimulate the interest of many students and senior researchers of nonlinear dynamics.

Professor Yoshisuke Ueda is still quite an active researcher and will continue to produce new ideas to understand nonlinear phenomena in nature which has many fascinating structures. We wish him many more years of healthy and productive life.

Tohru KOHDA
Kohshi OKUMURA
Shin'ichi OISHI
Hisao OKAMOTO
Takashi HIKIHARA

Contents



Professor Yoshisuke Ueda

March 14, 1997

Curriculum Vitae of Professor Ueda

Born :

December 23, 1936, Kobe, Japan

Education :

Kyoto University, 1959. Electrical Engineering
Graduate School of Engineering, Kyoto University 1959-1964
Dr. Eng (Kougakuhakushi) 1965, Kyoto University

Professional Experience :

1964-1967	Instructor, Dept. Electr. Eng., Kyoto Univ.
1967-1971	Lecturer, Dept. Electr. Eng., Kyoto Univ.
1971-1985	Associate Professor, Dept. Electr. Eng., Kyoto Univ.
1985-	Professor, Dept. Electr. Eng., Kyoto Univ.
1979	New Approaches to Nonlinear Problems in Dynamics
12/9-14	(Chair : Philip J. Holmes)
1979	International Conference on Nonlinear Dynamics,
12/16-21	New York Academy of Science
	(Chair : Robert H.G. Helleman)
1991	The Impact of Chaos on Science and Society
4/15-17	(Chair : Celso Grebogi and James A. Yorke)
1982-1984	Chairman of the Professional Group on Nonlinear Problems, Institute of Electronics, Information and Communication Engineers of Japan
1989-1992	Chairman of the Professional Group on Rotating Machines, Institute of Electrical Engineers of Japan
1992-1993	Member of the board of directors, Institute of Electrical Engineers of Japan
1993-1994	Vice-President, Institute of Electrical Engineers of Japan
1991-1995	Member of the Advisory Board of an Interdisciplinary Journal of Nonlinear Science : CHAOS (American Institute of Physics)
1998-	Member of the Advisory Board of an Interdisciplinary Journal of Nonlinear Science : CHAOS (American Institute of Physics)
1991-	Member of the Editorial Board of the International Journal of Bifurcation and Chaos (Ed. Leon O. Chua, World Scientific)
1991-	Member of Honorary Editors of the International Journal of Chaos, Solitons and Fractals (Executive Ed. M.S.El Naschie, Pergamon Press)
1995-	Member of the Advisory Board of an International Journal of Nonlinear Dynamics and Chaos in Engineering Systems : Nonlinear Dynamics (Ed. in Chief, Ali H. Nayfeh, Kluwer Academic Publishers)

Membership :

Institute of Electronics, Information and
Communication Engineers of Japan,
Institute of Electrical Engineers of Japan,
Mathematical Society of Japan,
Japan Society for Industrial and Applied Mathematics,
Institute of Electrical and Electronics Engineers,
New York Academy of Science