PERSONAGE IN SCIENCE

Professor V.Lakshmikantham

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V. LAKSHMIKANTHAM was born on March 16, 1924, in an Indian village where there was no school. Only at the age of 13 he started learning English and then entered a high school, which he finished three years later. Following the school, he completed two years of college. Then Lakshmikantham joined a bank and has worked there for five years. His photographic memory (which he apparently inherited from his mother) and extraordinary intellectual abilities enabled him to pick up and process many things very rapidly, and as the result of this, Lakshmikantham progressed extremely expedient whatever he studied or worked on. After a very strenuous period of his life he successfully completed his Bachelor's and Master's degrees and started his work on his doctoral thesis. Some time later, inspired by a series of papers by Wintner, Hartman, Bellman, Coddington and Levinson, Lakshmikantham picked out differential equations as his primary area of interest.

A crucial moment in this direction was his discovery of a new phenomenon in convergence for differential equations. He established convergence under general Kamke's uniqueness condition utilizing differential (instead of commonly used integral) inequalities with no restrictive monotony assumption used by all of his predecessors. He read one of the Auriel Wintner's articles (in 1946) who first stated this as a conjecture. His direct communication with Professor Wintner regarding this problem encouraged Lakshmikantham and lead him to his first and very important paper [A2] that appeared in the Proceedings of American Mathematical Society, in 1957. In this paper a truly significant progress on convergence criteria has been made. The reader is referred to much more details and discussions on this and other issues in a very informative 2000 article [A1] about Lakshmikantham by R.P. Agarwal and S.G. Leela.

After that Lakshmikantham went back and forth to the US, Canada, and India spending several years at UCLA, University of Wisconsin at Madison, RIAS, Baltimore, and University of Calgary (among other schools). Then he returned to India by joining Marathawada University in the capacity of a department Head of mathematics. In 1966 he finally resided in the US having held appointments at three schools.

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In summary, over the past 41 years, Lakshmikantham held mathematics department Head positions at four universities:

* Marathawada University, Aurangabad, India (1964 – 1965);
* University of Rhode Island, Kingston, Rhode Island, USA (1966 – 1972);
* The University of Texas at Arlington, Texas, USA (1973 – 1986);
* Florida Institute of Technology, Melbourne, Florida, USA (1989 – Present).

The presently acknowledged prominence of the University of Rhode Island, University of Texas at Arlington, and Florida Institute of Technology (FIT) is due to his leadership and his phenomenal academic and scholarly activities. In all named schools, Lakshmikantham (in contrast with the efforts by his predecessors) created doctoral programs and produced a record number of gifted doctoral students. Some of them have become internationally known.

While Lakshmikantham had established himself as a world leading mathematician prior to 1989, a lion portion of his contributions fell into the period of time during which Lakshmikantham served as the Division and Department Head of Mathematical Sciences at FIT. Indeed, in 1991 he established the International Federation of Nonlinear Analysts (IFNA) that has become a central organization of world activities in the area of Nonlinear Analysis and interdisciplinary mathematics. In 1992, under the auspices of IFNA, Lakshmikantham established the Journal of Nonlinear World (later on renamed as Nonlinear Studies) and organized the first World Congress of Nonlinear Analysts held in Tampa, Fl, USA, followed by three more congresses in Athens, Greece (1996), Sicily, Italy (2000), and Orlando, FL, USA (2004). All four congresses have become major events in the world mathematical community where not only mathematics people from all over the world have assembled, but also representatives of science, technology, physics, biology and chemistry. It has been a unique gathering of seemingly diverse sciences separated by many decades and even centuries and brought and resurrected by Lakshmikantham in one huge group.

While at University of Texas at Arlington, Lakshmikantham founded in 1976 what has now become a chief academic journal in Nonlinear Analysis: Nonlinear Analysis, Theory Methods and Applications (copyrighted by Pergamon Press), followed by Nonlinear Analysis, Real World Applications, in 2000 (by Pergamon Press). He also founded and has been a chief editor of Stochastic Analysis and Its Applications (copyrighted by Marcel Dekker), Mathematical Problems in Engineering (copyrighted by Gordon and Breach and now by Hindawi), and Nonlinear Studies (initially copyrighted by Gordon and Breach and presently, by I&S Publishers). Through his academic and scholarly efforts, Nonlinear Analysis has spread throughout the world (including non-mathematical communities) and it has become one of the principal mathematical disciplines. We cannot help noticing that through his tireless efforts the world of mathematics, physics, and engineering has changed as the result of an almost unprecedented influence of just one person (not to mention a huge army of his followers).

Lakshmikantham's mathematics interests extended far beyond differential equations. His almost unique versatility encompassed fairly broad topics shown in his numerous publications. We singled out some major areas of his research activities reflected in his books:

* Differential and Integral Inequalities [1,2,11,24]
* Differential Equations in Abstract Spaces [3,23]
* Boundary-Value Problems [4]
* Stochastic Differential Equations [5]

* Monotone Iterative Technique [7,19]
* Stability Analysis [1,2,11 - 17]
* Systems with Finite and Infinite Delays [8,12,21]
* Nonlinear Problems in Abstract Cones [10,26]
* Dynamic of Systems on Time Scale [22]
* Impulsive Differential Equations [11,12,14,17]
* Uniqueness and Nonuniqueness [18]
* Method of Variation of Parameters [25]
* Method of Quasilinearization [26]
* History of Mathematics [27]
* Stochastic Analysis [28]
* Difference Equations and Numerical Analysis [29]
* Fuzzy Differential Equations [31]
* Computational Error and Complexity [32]

Lakshmikantham authored or co-authored over 400 books, monographs and research articles, all of which are widely referred to. In addition, Lakshmikantham, along with Martynyuk, edited an International series of Scientific Monographs in "Stability and Control: Theory, Methods and Applications", initially by Gordon and Breach and now by Taylor and Francis, London. Under their joint editorship, the series produced 22 volumes in various areas of stability and control theory. Lakshmikantham's mathematical results has now become essential in various applications to physics, engineering and mechanical engineering, and technology.

Besides his phenomenal involvement in mathematics, editorship, teaching, administrative activities, and supervising students, Lakshmikantham is a down-to-earth person. Among his auxiliary interests, he enjoys world history. In 1999 he even published a very interesting and informative book, "The Origin of Human Past, Children of Immortal Bliss." In this book, Lakshmikantham investigated many aspects of the origin of civilizations, both from Western points of view and from various old and ancient Indian sources, among them he discussed the origins of the theory of Aryan invasion and reasons for its dismissal. He also went on to rectify some errors in chronology of the world history and analyzed Vedic literature.

As a consequence of his passion to the world history, Lakshmikantham is also seriously interested in the history of mathematics. Year after the "Origin of Human Past" has appeared, he published the book "The Origin of Mathematics" [27] (jointly with Leela) where the authors outline major events in the history of ancient mathematics and shed new light on its chronology.

Through his enormous contributions to academia and mathematical sciences, Lakshmikantham is highly revered throughout the scientific world. He has become an honorary editor of many internationally renowned journals and associate and advisory editor of a few dozens more. It is without any doubt that Lakshmikantham is among the most influential people in the second half of the twentieth century, and he continues to enrich the mathematics world throughout the twenty first century having a tremendous impact on the lives of each and everyone who has ever come in contact with him.

We would like to finish our article with words of one Indian teacher: "*The one who is not afraid of revising the principles of a doctrine to refine the knowledge is already right. The one who is not afraid of remaining misunderstood stands with us. The one who is not afraid of putting together the beds of large streams is our friend.*" We are certain that Professor Lakshmikantham is "the one who is not afraid" of any endeavor and we wish him to be mightily blessed.

Monographs and Books of Professor V. Lakshmikantham

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