

SOM NAIMPALLY AND UNIFORM MATHEMATICS .

By

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In this article we will have a glimpse of the life and work of Professor Somashekhar Amrith Naimpally – a remarkable man, a towering mathematician, a major topologist and a strong advocate of Advait philosophy, i.e., the theory of one-ness. Som, the ocean of generosity has inspired and helped many students, teachers and colleagues to accept multidimensional challenges of physical reality. It is a modest tribute at the time of his retirement from regular teaching at the age of 62.

Life and Struggle

Somashekhar Amrith Naimpally was born on 31 August 1931 in Bombay. He passed the matriculation examination of the Bombay University in 1948 getting top marks in Mathematics in his school. With equal interest in Mathematics and Physics, he chose Mathematics, mainly, due to poor eyesight, which made Physics laboratory work difficult. He passed the B.Sc. (with Mathematics principal and Physics subsidiary) in first class with distinction in 1952, M.Sc. 'A' Pure Mathematics (with special papers in Complex Analysis) in first class in 1954 and M.Sc. 'B' Applied Mathematics (with special papers in Analytical Dynamics) in first class in 1958. In each of the above examinations of the Bombay University, he got first rank and in M.Sc. 'B' he broke all previous records.

He began his teaching career in Ruparel College, Bombay as a tutor in 1952 and became a lecturer in 1954. From the very beginning he had reports with mathematics students and loved teaching as a profession. Fortunately, he had the benefit of association with great teachers such as Professors N. H. Phadke, M. L. Chandratreya and D. P. Patravali who were colleagues at Ruparel College. Moreover, Professor Phadke had taught him the first two years' college Mathematics and was a major influence in his life. In spite of his deep love for and good success in teaching, he was quite dissatisfied in not being able to do research. This led him to an 8-month stint as a Senior Research Assistant in Mechanical Engineering at IIT, Kharagpur (October 1958 to May 1959). The red tape and rigid attitude of the then head of the Mechanical Engg. Department did not allow him to pursue research in Turbulence Theory under Professor S.D. Nigam, who was at that time in the Department of Naval Architecture. Reluctantly he returned to Bombay as the head of Mathematics Department at Kirti College. Up to this point, he had

no intention to go abroad. Out of sheer frustration in finding himself without research opportunities, he started applying to American universities.

In 1961, he went to Michigan State University as a Teaching Assistant working for the Ph.D. He was fortunate in getting a Fulbright Travel Grant. In 1964, he got his Ph.D. under the well known topologist Professor J. G. Hocking. For an year, he worked at Iowa State University, where he had the benefit of advice from Professor D. E. Sanderson; earlier Professor Sanderson was a visiting professor at Michigan State and had a major influence on him. In 1965, he went to University of Alberta. He returned to India as Professor of Mathematics at IIT, Kanpur in 1969. Due to educational problems of his children, he returned to Canada -- Lakehead University as a professor, where he worked from 1971 to 1988. In 1988, he went to Kuwait to work with Professor C. M. Pareek, whom he knew from his student days at Alberta. He intends to retire and devote himself to full time research/study in July/August 1993.

He is fortunate in having Sudha (Karnad), a gracious and ethical lady, as his life partner. They were married in 1955 and have two sons and a daughter, who have a good appreciation for the finer aspect of life. Both sons play excellent tabla and the daughter is a Bharat Natyam dancer. Sudha is an occupational therapist as well as an accomplished bhajan (devotional songs) singer. In addition, she is adept in several art forms such as painting, sculpturing, sewing etc.

Work

His special interests are in Analysis and Topology in which subject he has over 90 publications -- some of them have appeared in well known journals such as Transactions of Amer. Math. Soc., Proceedings of Amer. Mathe. Soc., Pacific J. Math., Fund. Math., Bull. Austral. Math Soc., Jour. London Math. Soc. etc. He has written a text book of Trigonometry [91] and co-authored three research-level monographs [92-94] one of which is Proximity Spaces published in the famous series of Cambridge Tracts [93]. His foresight in co-authoring a monographs [92]-on Quasi-uniform Spaces in 1965 was recently Justified (in 1991) when a special conference was held in this subject in Berne, Switzerland. This subject has become very important in theoretical computing.

In his Ph.D. Thesis "Essential fixed points and almost continuous functions" (1964), he discussed a new function space topology called Graph Topology (see [5]). This topology is not only useful in Topology but also in Approximation Theory, Analysis and Differential Topology. Several mathematicians have worked on it, e.g., Beer Poppe, Hansart, Pareek. Then he worked on quasi- uniform spaces on which he wrote a monograph [92] with Murdeshwar (1966). This gave a boost to

research on this topic, which has now become remarkably important due to its applications to theoretical computing. His monograph [93] published in collaboration with his master's student Warrack appears to be the only book and a standard reference on Proximity Spaces.

Subsequently, most of his research was in proximity spaces, nearness spaces and applications [17, 18, 21-25, 27 and others].

He also worked on open mapping theorem [38], convexity (solving a major problem) [40].

Recently he has been working on Hyperspaces in which he has brought in proximity [82]. He has also combined proximity and graph topology in [90].

In addition to the above, he has interest in contractive and anti-contractive mappings, fixed point theorems [2, 3, 47-55, 65], non-continuous functions etc. Hybrid contractive and hybrid nonexpansive mappings are studied for the first time in [65]. Quite recently, fixed point theorems for such mappings have been found useful in Pareto type optimization study. He has studied ancient Indian Mathematics, contributed a few papers in this area, and has been the main architect behind the English rendering of Bhāskārāchārya's *Līlavatī* [95]. He, also assisted by his gracious better-half, devoted a lot of time and spent a good amount of his personal money to complete this monumental work, and has very humbly declined its royalties.

Talks, visits and

He has given invited talks at the Indian Mathematical Society at Gorakhpur in 1970; Spring Topology Conferences in Oklahoma 1972, Memphis 1975, Wisconsin 1991; Italian Topology Conferences in Taormina 1984, Sorrento 1988; Top. Conf. in Paola, Brazil 1988; Top. Conf. in Madison, Wisconsin, 1992; and several others. He has been a member of American Math. Soc., Indian Math. Soc. Italian Math. Soc., Canadian Math. Soc., Indian Math. Soc., Italian Math. Soc., Canadian Math. Soc. and Mathematical Association of America. He has given colloquium talks at several universities in India, U.S.A., Canada, Italy, Japan and Kuwait.

Som was a visiting professor at Southern Illinois University, IIT, Bombay, Universities of Salerno, Napoli, Torino; Meerut University, etc. He has been a distinguished visitor at California State University (1988) and Univ. of Saugar (1971).

Besides Mathematics, he is interested in sports, music, philosophy, biographies and organizing, classical dances. He played cricket for his school and was a champion in Table Tennis in Ismail College in 1950. He was a badminton champion in Michigan State University, 1964 (in mixed doubles with his life partner Sudha as partner) and at Iowa State University in 1965. He plays a little tabla

and has listened to a large number of top Hindustani classical musicians, many of whom have been his guests at home. He started a Music Circle at IIT, Kanpur which became a great success and he has helped very generously several musicians and dancers during their visits to Canada / U.S.A.

Postretirement Plans

Som's on - going research centres around hyperspaces, function spaces and extensions of functions. In his April 10, 1993 communication, he writes: "During the year 1990-91 when Kuwait was occupied, I received an honorary appointment from Carleton University. There are no teaching duties and [after retirement from Kuwait University] I hope to be able to move freely on research and lecturing assignments."

RESEARCH AND PUBLICATIONS

Papers

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2. A note on contractive mappings, *Indag. Math.* **26** (1964), 275-279.
3. Contractive mappings in uniform spaces, *Indag. Math.* **27** (1965), 477-481.
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6. Function spaces of invertible spaces, *Amer. Math Monthly* **73** (1966), 513-515.
7. On strongly continuous functions, *Amer. Math. Monthly* **74** (1967), 166-168.
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