

ANNIVERSARY

PROF. ZAPRYAN ZAPRYANOV (SCIENTIST AND TEACHER IN FLUID MECHANICS)



We are pleased to say few words about the scientific path of Prof. Zapryan Zapryanov on the occasion of his 80th anniversary. Here we shall confine ourselves only on his contributions to applied mathematics in Fluid mechanics. His detailed biography has been published in JTAM, vol. 33, No. 2, 2003 for his 70th anniversary.

Prof. Zapryanov comes from a small village in the district of Assenovgrad, where he has completed his secondary school education in 1951. During the last three years of school, he has participated in the mathematical circle organized by his math. teacher. At that time, Prof. Zapryanov has felt his first inspirations in mathematics, which has become later his destiny. Afterwards, in the early 1950s, as a student in the Mathematical Faculty of the University of Sofia, he has extended his interests in the field of the mathematical modelling in mechanics and attended the mechanics circle organized by Prof. Bl. Dolapchiev.

In fact, Prof. Zapryanov's real orientation to Fluid Mechanics starts with his Ph.D. studentship in the Moscow State University, in the late 1960s. He has defended his thesis entitled "Hypersonic flows past bodies of different shapes" under the guidance of Acad. G. I. Petrov. The papers published in connection with the thesis have been highly evaluated [7–11] and are well known in the scientific literature.

After the defence of his Ph.D. thesis, for few years, Prof. Zapryanov has directed his scientific interests to the stability theory of ordinary differential equations. Several papers have been published in this period, some of them are [12–14].

In 1972, Prof. Zapryanov has become Associate Professor in Fluid mechanics and head of the department of Fluid Mechanics at the Institute of Mechanics (former part of the Unified Center of Mathematics and Mechanics) until 1990.

The scholarship (postdoc) of Prof. Zapryanov in 1973/74 at the Stanford University, USA, in the group of Prof. Van Dyke, occurs a decisive step for his scientific evolution. He has studied the modern (at that time) technique of asymptotic methods for treating different problems in Fluid mechanics: creeping flows, steady and unsteady boundary layers. After returning to Bulgaria, Prof. Zapryanov has started delivering a new lecture course in "Asymptotic methods for fluid mechanics" intended for master degree students (from Faculty of mathematics and mechanics, the University of Sofia) in mechanics and guided his first Ph.D. students in the same field. The problems have been gradually complicated: differently shaped single body in a stream; the interaction of two bodies or of a body and a solid wall, etc. [15–40]. Parts of these studies have formed his habilitation work for obtaining the Professor position in 1979. Another part has been included in his DSc thesis: "Hydrodynamic study of unsteady viscous flows", which he has defended in 1982.

The next milestone in the scientific activity of Prof. Zapryanov is his visit (as a visiting professor) in 1978/1979 at the Illinois Institute of Technology, Chicago. There he has been working with Prof. Wasan on stability problems of thin films [41].

After that, his research has taken a new direction with main applications in chemical engineering, physico-chemistry and biology connected with: dynamics of single and multiple drops and bubbles, their interaction with solid boundaries or interfaces [42–66]. Several of his PhD students have defended their thesis on these topics.

Prof. Zapryanov has written 2 students' textbooks in Fluid mechanics [1–3]. One of them is with co-author Prof. Shkadov of the Moscow State

University and published in Russian and Bulgarian variants [1–2]; the other is in Bulgarian [3]. Both textbooks are still used by the students in Applied mathematics at the University of Sofia, as well as by many PhD students of other Bulgarian Universities. In collaboration with the group of Prof. Polyanin, he has published also 2 monographs [4–5] on chemical hydrodynamics: one is written in Bulgarian [4] and the other - in Russian [5].

The scientific papers of Prof. Zapryanov are more than 80, from which more than 30 are published in refereed journals with impact factor, which are cited very well by the international scientific community. For example, the paper [41] has been cited more than 90 times.

Finally, the main results obtained by Prof. Zapryanov's group (his former PhD students) have been collected, together with Prof. S. Tabakova, in the monograph "Dynamics of Bubbles, Drops and Rigid Particles" published by Kluwer Academic Publ. in 1998/1999 (hard cover) and by Springer in 2011 (soft cover) [6]. The book can be used both as a graduate textbook for students and as a reference monography. This monography can be regarded as a masterpiece: by the authors' words "there is no other published book to date which reveals these topics in the described manner". This is seen also in the review of the book published in Mathematical review by Pozrikidis: "the book offers a good exposition of classical and modern methods and results, and it is a useful source of information on the various topics considered...The authors' enthusiasm in writing this book is apparent. . ." Indeed, the book has become famous in the years, as it is used as a basic reference book by many research groups all over the world (more than 80 citations).

Prof. Zapryanov possesses an extreme sense for scientific novelty and problem importance, which has helped him to foresee the problem solution and its further implementation. His working capacity and thoroughness is eminent; he is still working as a reviewer of thesis, habilitation works, etc., after his retirement in 2001. Prof. Zapryanov is a word-famous scientist in Fluid mechanics, which is confirmed by the great number of citations and reviews. He is also a famous teacher in Fluid mechanics, as his descendants (he has 14 PhD students) have become well-known researchers and/or professors in Bulgaria and abroad.

The Editorial Board, editors, and readers of the *Journal of Theoretical and Applied Mechanics* cordially congratulate Prof. Zapryan Zapryanov on his 80th birthday and wish him good health, fruitful activity and happiness.

Corr. Member DSc Stefan Radev
Prof. Dr Sonia Tabakova

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