

## IN MEMORIAM



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Our dear colleague, mentor and friend Prof. Christo I. Christov passed away on March 16, 2012. He was a world-class scientist working on nonlinear wave mechanics of continuous media, a leading applied mathematician, and a true Universalist in the physical sciences. His extensive CV highlights his distinguished career. He graduated from St. Kliment Ohridski University of Sofia in 1973, received his PhD degree in 1980 from the renowned Institute of Theoretical and Applied Mechanics of the Siberian Division of the Russian Academy of Sciences, and was awarded a DSci degree in 1987 by the Council on Applied Mathematics and Mechanics of the Bulgarian Academy of Sciences. Before settling down at the University of Louisiana at Lafayette in 1998, Prof. Christov held permanent, sabbatical and visiting faculty positions at many world-class institutions, including (in chronological order) the Institute of Mathematics and Mechanics, the Institute of Mechanics and Biomechanics, the Institute of Hydrology and Meteorology, all of them at the Bulgarian Academy of Sciences, the Illinois Institute of Technology in Chicago (USA), the Université Pierre et Marie Curie in Paris (France), the Universidad Complutense de Madrid (Spain), the Université Libre de Bruxelles (Belgium), the Université de Caen (France), Stanford University in California (USA), University of California at Santa Barbara (USA), the US Naval Research Laboratory

at the Stennis Space Center (USA), the University of Victoria (Canada), and many others. During the last 30 years, he established contacts and developed active scientific collaboration with eminent specialists in applied mathematics and the physical sciences, and took part in many conferences and workshops in the USA, Canada, France, the UK, Cyprus, Bulgaria, Poland, Russia, Germany, and Italy, amongst others. Everywhere he was a sought-after lecturer and an energetic and engaging speaker. One could say that while studying the attractor of the Lorenz system, he became an attractor. Prof. Christov's legacy includes thirteen PhD students – in the USA and around the world. The number of those who he advised informally is even higher. He directed us and inspired us to believe in ourselves. I speak for all his students and colleagues, when I say that we are all much obliged for his devotion. He authored or co-authored about two hundred and fifty articles, many of which appeared in professional journals, including those published by SIAM, the eminent *Journal of Fluid Mechanics*, the *Journal of Computational Physics*, the leading physics journal *Physical Review Letters*, the international journal *Wave Motion*, etc. His publication record is complemented by one research monograph and five edited volumes. A check of the ISI database reveals an impressive 760 citations. Prof. Christov's dedication to teaching and research is made clear by the fact that he continued lecturing until a week before his death, and finished his last scientific paper on that very day. This is a real act of heroism and devotion to science! Once many years ago he said to me: "A scientist must keep on working even if they know they have only two more hours left to live." And so did he. During the last month of his life, he succeeded in finalizing a paper that opens an entirely new field of research.

Last year Prof. Christov got the well-deserved professional recognition of having two mini-symposia dedicated to his 60th birthday, each with more than 30 contributors from across the world. One was held at the reputed 7th IMACS Conference on Nonlinear Evolution Equations and Wave Phenomena in Athens, Georgia (USA), and the other at the 3rd AMiTaNS conference in Albena (Bulgaria). In addition, a special issue of the international journal *Wave Motion* (volume 48, 8) was guest edited by Prof. Gérard Maugin and dedicated to Prof. Christov's anniversary. In March 2012, The Ray P. Authement College of Sciences at UL Lafayette proudly recognized Prof. Christov as one of its 2012 Outstanding Professor Award recipients.

It is difficult to summarize the diverse list of research activities of Prof. Christov. All of them, however, have equally profound wide-ranging implications. They can be grouped into the following topics: nonlinear continuum mechanics of space as material continuum with application to electrody-

ics; dynamics of solitons, localized waves, and dissipative coherent structures; nonlinear acoustics and shock propagation; numerical (difference and spectral) operator-splitting methods for PDEs with application to viscous, thermoconvective, free-surface, and capillary flows; Variational Imbedding for ill-posed and/or inverse problems; Random Point Functions with application to continua with random microstructure, to nonlinear dynamical systems and to turbulence; elastic beams and shells; algorithmization and coding of implicit schemes for generalized wave equations and nonlinear evolution equations; spectral and pseudo-spectral methods. During the past two decades, Prof. Christov's goal was to develop a complete description of electrodynamics as corollary of the equations of the so-called metacontinuum. Along the way, he proposed a new complete set of orthogonal functions (named "Christov functions" by Prof. John Boyd), applied the variational coarse-grain description to the physics of quasi-particles, used Euler-Lagrange equations as a tool for solving ill-posed equations, developed a fast multidagonal implementation of Gaussian elimination with pivoting, championed inner iterations as a tool for resolving nonlinearity in fully-implicit difference schemes, discovered dissipative solitons (with Prof. M.G. Velarde), realized Boussinesq's paradigm of solitary-waves stability and generalized it to the so-called Energy Consistent Wave Equation, formulated a frame-indifferent Maxwell-Cataneo law of finite-speed heat conduction, and (in his last work) extended the notion of "soliton" by showing that pseudolocalized wave solutions of a model metacontinuum field equation behave as quasi-particles with gravitational attraction. A list of selected representative research publications can be found in the references.

Prof. Christov's death is not only a sore loss for all of us – his colleagues, collaborators, students, friends and family – but also a blow to the world's scientific community. He was a unique man with a bright and discerning mind, incredibly creative character and vivid personality. It is very difficult to accept that he is no longer among us. Many of us still wish it were not true. Indeed, they are probably right since his scientific achievements and work are alive and will remain forever in our hearts and minds. Let us try our best to work on science in Prof. Christov's way.

His scientific legacy will be celebrated at the 4th AMiTaNS conference in June in Varna (Bulgaria) and at the 2012 Lloyd Roeling UL Lafayette Mathematics Conference in November in Lafayette (USA).

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