

DAN TIBA AT HIS 70th ANNIVERSARY

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Abstract

This issue is dedicated to the 70-th anniversary of *Dan Tiba*, a Romanian mathematician appreciated at the international level for his scientific contributions in the fields of optimization, optimal control for PDEs, shape and topology optimization, nonlinear analysis. His activity was marked by the passion for mathematics and his results were published by many prestigious journals and publishing houses. The colleagues and the collaborators wish him, at this anniversary moment, a long and active life in good health and more achievements in the mathematical research.

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Dan Tiba was born on October 17th, 1953, in the beautiful town of Iași, the historical capital of Moldova. Currently, he is a Senior Researcher of 1st (highest) degree at the Institute of Mathematics of the Romanian Academy, department of Differential Equations, București (where he works since 1980, excepting 1990-2005, when he held positions in Paris, Jyvaskyla, Muenchen, London, Canterbury, Berlin, for periods between six months and six years).

Between 1960 and 1972, at the College "Costache Negruzzi" in Iași, he completed the high school education as the major of his generation. He continued with the undergraduate studies in mathematics at the University "Al. I. Cuza" in Iași, followed by one year of master studies ("specialization") in the same department, both finished as major, with the general score 10, the highest possible. His talent for mathematics was noticed as a school pupil and as a student, when he attended numerous competitions in this direction and obtained many distinctions at regional and national levels. Already as a student, he has started the research activity in the Scientific Seminars lead by Professor Constantin Corduneanu, respectively Professor Viorel Barbu and he has published two papers, [17], [18], in 1977. His Ph.D. studies followed in the period 1978-1982 at the same university, under the supervision of Professor Viorel Barbu (elected at the Romanian Academy in 1991). The fruitful relationship and the scientific influence of Professor Barbu is gratefully acknowledged by Dan Tiba, during all his activity.

After the master degree, in the autumn of 1977, Dan Tiba moved to București, where he was a mathematics teacher for three years, according to the law of that time. He continued his research activity in the setting of the Scientific Seminar at the București University, lead by Professor Aristide Halanay (after 1997, up to today, by Dr. Toader Morozan). In 1980, he became a member of the Institute of Mathematics (in the form it existed at that time). Moreover, in 1984, Dan Tiba was awarded the "G. Țițeica" prize of the Section of Mathematics of the Romanian Academy. In this historical context, we also mention that Dan Tiba published a protest letter against the Ceaușescu policy in "Notices of the American Mathematical Society", January 1990 (reception date, August 1989 - before the revolution). Only after the political changes, in 1990, the Institute was reintegrated by the Romanian Academy and, in 1994, Dan Tiba was promoted as senior researcher, 1st degree. In 1996, Dan Tiba got the position of director of research and supervised three Ph.D. students that defended their theses: Cristian Dăneț (2006), Diana Merlușcă (2014), Roxana Nicolai-Matei (2017).

Dan Tiba is an internationally recognized specialist and, after Romania was free from communism, in 1990, he could start many international collaborations and worked in many prestigious institutions abroad. In 1991, he

was awarded a 12 months postdoctoral fellowship at INRIA Rocquencourt (Paris) and he developed collaborations with J.F. Bonnans, M. Bergounioux, M. Sofonea, C. Murea, M. Barboteu. He was one of the main organizers of the first French-Romanian Conference in Applied Mathematics, Iași 1992, and co-editor (together with V. Barbu and J.F.Bonnans) of the Proceedings volume [3], published by Birkhaeuser. This type of scientific meeting continues up to the present. It had the 15-th edition in 2022, in Toulouse.

In 1993, 1997 and 2000, Dan Tiba obtained Humboldt fellowships at the Technische Univ. Muenchen and the Weierstrass Institut, Berlin. We mention J.Sprekels, F.Troeltzsch, K.-H.Hoffman, H.Langmach, P.Philip, the German mathematicians with whom he wrote mathematical articles during the time. In the period 2001-2005, he became scientific researcher at the Weierstrass Institut, Berlin, that was essential in completing (with J. Sprekels and P. Neittaanmaki) a monograph project, published by Springer in 2006 [12].

He was invited professor for six months at the Westminster University (London) (financed by the Royal Society) and the Canterbury University, where he worked with L. Xanthis, respectively Liu Wenbin. In 1995, Dan Tiba obtained the position of docent at the Univ. of Jyvaskyla, where he had a long cooperation with the group P.Neittaanmaki, T.Tiihonen, R.Makinen, T.Manniko, that includes many articles and three books. Moreover, in 2004, the Univ. of Jyvaskyla offered Dan Tiba the "Honour Medal", in recognition of this successful scientific cooperation.

Other distinctions and awards obtained by Dan Tiba are the "Centenary Jubilee Medal" of "Gazeta Matematică" (1999), the "Excellence in Research" prize of "Societatea Matematicienilor" (2000) and the "Nicolae Teodorescu" prize of the Academy of Romanian Scientists (2008). In the period 2013-2020, Dan Tiba was invited as a member of the Mathematics Panel of the European Research Council, Bruxelles, at the Consolidator Grants level, and contributed with reports, interviews and his vote to the decisions of this important scientific European Agency. He also is a full member of the Academy of Romanian Scientists (since 2011) and a corresponding member of Accademia Peloritana dei Pericolanti, Italy (since 2016). We mention as well that in 1998 and in 2014, at the major "International Congresses of Mathematicians", Berlin and Seoul, he was offered chairs of the special session "Distributed Parameters", respectively of an invited session.

Dan Tiba is member of the editorial board of several ISI journals, "International Journal of Differential Equations" (Hindawi, since 2013), "Mathematical Reports", Romanian Academy (2009-2012), "Scientific Bulletin

UPB" (since 2012), "Bulletin of the South Ural Univ." (since 2017), "Proceedings of the Romanian Academy" (since 2019), "Mathematics", Switzerland (since 2020) and of "Mathematica", Romanian Academy, Cluj (since 2017), "Mathematics and its Applications", Academy of Romanian Scientists (since 2009). He published more than 150 scientific works, alone or with the 34 collaborators from ten countries, including seven books (six published in Germany, Switzerland, Finland, USA and one in Romania), quoted more than 2200 times in international data bases. After 1982, he organized many national and international conferences in București, Constanța, Iași, Timișoara or abroad and, after 2005, he was director or member of the research groups, in many national and international Grants.

Dan Tiba obtained interesting mathematical results in several research directions and we mention just some of them: mathematical analysis (extension of the implicit functions theorem to implicit parametrizations and generalized solutions, in arbitrary finite dimension, [22]), convex analysis (regularization of saddle functions, [19]; subdifferential of composed functions, [18]), mathematical programming (necessity of constraint qualification conditions, [26]; optimality conditions with less Lagrange multipliers, [23]), optimal control (optimality conditions for problems with semilinear elliptic variational inequations, [5]; for general nonsmooth equations, [20]; for constrained problems, case of void interior, [6]; control of mechanical (curved) structures, [12] Ch.6, [4], [1], including the formula for the exact integration of Kirchhoff-Love arches, [10]; error estimates in numerical approaches, [25], [27]; control of free boundaries, [2]; of nonlinear parabolic systems, [13]; bang-bang properties, [16]), shape and topology optimization (existence under the segment property assumption, [21], [12] Ch.2; the penalization approach, [14]; the Hamiltonian approach, [11]; optimality conditions involving a Lagrange multiplier, [24]). Two recent examples of surprising results and their applications are the formula of the derivative for the main period of periodic Hamiltonian systems, with respect to functional variations of the geometry and the equivalence of shape/topology optimization problems with certain constrained control problems, [11], [24].

Finally, we mention some works related to important historical contributions of Romanian mathematicians: the republication [8] of the pioneering journal "Scientific Recreations", that appeared in Iași between 1883-1889; the article devoted to the great mathematician D. Pompeiu [7]; the article devoted to actions of Romanian mathematicians during WWI, including the moving message of Traian Lalescu [9].

Dan Tiba is active as usual, open to new problems and ideas and very thankful to his family, to the colleagues and collaborators for their friendly

and helpful support, for their confidence and interest in new projects.

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