Tribute to Prof. Katica R. (Stevanovic) Hedrih

Andjelka Hedrih[1] and Fotios Georgiades[2]

Katica R. (Stevanović) Hedrih was born on August 28th 1944 in a small village named Bobovište, near the town of Aleksinac in what is now Serbia, to Vukosava and Radomir. She finished the "Stevan Sremac" grammar school, at the time, the first Grammar School in Niš. Her mathematical teacher Mrs. Draginja Nikolić conveyed to her the love for mathematics. Katica's first international experience was in 1963 when she was a member of the first Yugoslav team that took part in the Fifth Mathematical Olympics in Vroclav, Poland. She graduated on September 30th, 1967, at the Faculty of Mechanical Engineering, University of Niš, as the first graduate of her generation (and was the best graduated student of both the Faculty and the University of Niš in 1966/67). In 1974, she married Otmar Hedrih (1944-2010), an electronics engineer, with whom she gave birth to a son. She has three grandchildren.

Here we would like to emphasize something that is her peculiarity, by which everyone will remember her: inexhaustible energy, striving for knowledge, numerous international scientific conferences in almost all countries worldwide, selfless support for young scientists and sharing of knowledge with them, the transfer of personal experiences and advice. She used to say "*You have to feel the special spirit and rhythm of the big international conferences and to find your place there.*"

A selection of the "inventory" of her scientific biography can be read in the following lines or at http://www.mi.sanu.ac.rs/novi_sajt/research/conferences/ksh/ABOUT%20HEDRIH.htm.

At the very beginning of her professional career, she learned mathematics from: Mrs. Draginja Nikolić, her grammar school professor of mathematics; Prof. dr. Danilo P. Rašković; Academician Yuriy Alekseevich Mitropoljskiy; Academician Tatomir P. Andjelić; Prof. dr Dragoslav Mitrinović; Prof. dr Jurij Korobov; Academician Nikola Obradović; Academician Volislav Djurić and others. Her "Candidate minimum" (1971) in Theoretical and Mathematical Physics, the area of Nonlinear Oscillations and Nonlinear Differential Equations at the Institute of Mathematics of the Ukrainian National Academy of Science in Kiev was evaluated by a commission headed by academician Y. A. Mitropolskiy.

The most significant contributions in the field of theoretical and applied mechanics, nonlinear dynamics and mathematical physics of Katica (Stevanović) Hedrih are: introduction and definition of the concept of mass moment vectors with their properties and applications in rotor and gyro rotor dynamics; contribution to asymptotic methods of nonlinear mechanics by application to multi-frequent nonlinear oscillations of deformable bodies; extension of the theory of kinematics and dynamics of body collisions in rolling; contribution to the establishment of an integral theory of analytical dynamics of discrete hereditary systems (in co-authorship with Oleg Alexandrovich Goroshko); contribution to the analytical theory of oscillations of discrete and hybrid discrete-continuous systems of fractional type; theory of body rolling, contribution in history of mechanics with series of bibliographies for the edition of the Serbian Academy of Science and Arts "Life and scientific work of Serbian Scientists.

Professional career

Prof. Katica R. (Stevanovic) Hedrih is a full Professor of the Faculty of Mechanical Engineering, University of Niš, since 1986 and a full Professor – Principal research fellow at Mathematical Institute of Serbian Academy of Science and Arts since 2009. During her professional career she was working as a full professor at Technical Faculty in Bor, University of Belgrade, Mechanical Engineering University of Priština and Faculty of Technical Academy of Yugoslav Army. She was a head of the Chair for Mechanics of the Faculty of Mechanical Engineering of the University of Niš for twenty-two years. Her most important professional positions are: head of Centre of Nonlinear Dynamics and Active Structures (2005-2009-2014), head of Department of Mechanics (2010-2012) in the Mathematical Institute SANU, Belgrade, vice-dean of the Faculty of Mechanical Engineering of the University of Niš (1978-1980); a member of the first founding Council of the University of Niš in 1965 and seminar Leader: Seminar in Theoretical and Applied Mechanics at the Faculty of Mechanical Engineering of the University of Niš (1976-2005) and the Seminar on Nonlinear Dynamics – Milutin Milanković (2005-2009) in Niš under the branch of the Mathematical Institute of the Serbian Academy of Sciences and Arts – Belgrade.

She is an author of numerous scientific papers, and of university study books and textbooks in the areas of linear

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Figure 1. (a) Participants of the Symposium "Nonlinear Dynamics – Scientific work of Prof. Dr Katica (Stevanović) Hedrih", Belgrade September 4th-6th 2019 organized by researchers from her project team from her latest national project. (b) Prof. Katica (Stevanovic) Hedrih with plaque and Medal "Ярослав мудри", and academician Oleksandar Nakonechnyi president of the Ukrainian Higher School Academy of Sciences.

and non-linear oscillations theory, theory of elasticity, strength of materials, mechanics, mathematical physics, philosophy of natural sciences, and history of mechanics. Her most important monographs are: Vectors of Mass Moments (1998), Analytical Dynamics of Discrete Hereditary Systems (co-author O. A. Goroshko, 2001) and Vibroimpact dynamics (2016) and co-author of The Life and Work of Serbian Scientists with fifth published bibliographies.

Awards: In her scientific carrier prof. Katica R. (Stevanovic) Hedrih was honored with many national and international honors and awards of which we emphasize: Plaque medal "Ярослав мудри" (2019) of the Ukrainian Higher School Academy of Sciences and The Charter "Academician Ljubomir Klerić" (2020) from the Academy of Engineering Sciences of Serbia for many years of research work and contribution to the historiography of Serbian mining in the second half of the XIX and the beginning of the XX century – by researching the life and work of one of the most important Serbian mining engineers, academician Ljubomir Klerić who was the founder of the Serbian School of Mechanics and Mechanical Engineering; Plaque and Medal "Saint Volodimir" (Nagrada Svatoga Volodimira) (2010), Plaques by Cankaya University, Ankara, Turkey for scientific advances in IFAC FDA Workshop (2008) and for Scientific advances in Nonlinear Dynamics Workshop (2010); Plaque "Archimedes" ("Arhimed") (2008) from the Military Technical Institute of Serbia for scientific contribution to the journal Scientific-Technical Review and Plaque - Best graduate student of generation 1966/67 at the University of Niš and Best Thesis of Bachelor's (Master) degree at the Yugoslav Faculties of Engineering and Natural-Mathematical Sciences.

Projects: She was a project leader in 9 project cycles of national scientific projects, between 1976 and 2019 in the area of Mechanical Engineering and Mechanics at the Faculty of Mechanical Engineering of the University of Niš; and in multiple project cycles at the Mathematical Institute of Serbian Academy of Science and Arts (1996-2019).

Member of editorial boards and reviewer: Editor-in-chief of multiple national scientific journals and editorial board member of multiple international journals. We distinguish: Editor-in-chief of the University of Niš scientific journal "FACTA UNIVERSITATIS" - 13 Series (since 1989-2004) and Editor-in-Chief of the Series Mechanics, Automatic Control and Robotics (1990-2008); Associated Editor of journal Tensor (Japan), previously J. Mathematical Problems in Engineering, Hindawi Publishing (2004-2017), Member of the editorial board of Journal Scientific Technical Review founded 50 years ago by the Military Technical institute of Serbia, Vestnik Moskovskogo aviacionoga instituta, Int. Journal Nonlinear Sciences and Numerical Simulations, Freund Publishing House LTD (1999-2010), Journal of Serbian Society of Computational Mechanics and other. Reviewer and referee of numerous university scientific publications and papers published by Elsevier, Springer, Hindawi Press, SAGE, ASME, Freund Publishing House and other. She is a reviewer of Zentralblatt with more than 100 reviews.

She was a supervisor of a number of magisterium of sciences and doctoral dissertations in the area of technical sciences – nonlinear oscillations and deformable body mechanics and a large number of member of numerous committees for evaluation of dissertations.

During scientific and teaching activity of Prof. Dr Katica (Stevanović) Hedrih taught 42 generations of future mechanical engineers conveying knowledge in theoretical and applied mechanics: on strength of materials, elastodynamics, theory of oscillations, theory of elasticity and nonlinear dynamics.

Organizer of national, international conferences, and mini-symposia in mechanics among which are two Yugoslav Congresses on Theoretical and Applied Mechanics, (1983 and 1991) and following Mini-symposia: IFNA, WCNA, Orlando, 2004; EU FC16-Greece 2006 , APM Saint Petersburg 2007; ESMC Lisbon 2009 , ICDVC Hangzhou 2010, Series of Classical and Celestial Mechanics at CASTR Sedlice Poland (2013, 2015, 2017) and other.

She was the president of the organizing committees of Yugoslav Congress of Theoretical and Applied Mechanics, and member of numerous scientific committees on national and international level (member of the scientific committee of DSTA, NODYCON 2021 Steering Committee and others).

Membership: Prof. Katica R. (Stevanovic) Hedrih is a member of GAMM, EuroMech; Tensor Society (Japan) Academician of the Ukrainian High School Academy of Sciences, Academician of the National Higher Education Academy of Sciences of Ukraine, Academician of the Academy of Nonlinear Sciences in Moscow, SouthSlavic Academy of Nonlinear Sciences in Serbia (JANN), Scientific Secretary of JANN, Int. ASME, Serbian Scientific Society, M. C.Chaki Centre for Mathematics and Mathematical Sciences – Calcutta, India; SSM-JDM; Member of Serbian Society of Computational Mechanics; Society of Nonlinear dynamics in Human Factors – Adelaide, Australia, Honored Member of Nonlinear Dynamic Society (NODYS) and other.

In Figure 1 are some photos from the symposium organized for the 75th birthday of Professor Hedrih in Belgrade and medal "Ярослав мудри" (2019) (Figure 1(a)) of the Ukrainian Higher School Academy of Sciences which was handed by president of the Ukrainian Higher School Academy of Sciences himself- academician prof. dr Oleksandar Nakonechnyi. (Figure 1(b)).

Acknowledgment