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PERSONAGE IN SCIENCE

Academician A.A. Martynyuk

to the 80th Birthday Anniversary

March 6, 2021 marked the 80th anniversary of the birth and 57 years of scientific activity of the famous Ukrainian scientist, Head of the Department of Process Stability of the S.P. Tymoshenko Institute of Mechanics of the National Academy of Sciences of Ukraine (NAS of Ukraine), Doctor of Physical and Mathematical Sciences, Professor Anatoliy Andriyovych Martynyuk.

A.A. Martynyuk was born in 1941 in the village of Ganzhalivka, Cherkasy region, in the family of a railway worker. He graduated from the Faculty of Physics and Mathematics of Cherkasy State Pedagogical Institute.

He has been working at the Institute of Mechanics of the National Academy of Sciences of Ukraine as the Head of the Department of Process Stability from 1978 to the present (in 1973 - 1977 A.A. Martyniuk worked at the Institute of Mathematics of the National Academy of Sciences of Ukraine).

He defended his Ph.D. (1967) and doctoral (1973) theses and was awarded the title of professor (1985).

He was elected a Corresponding Member of the National Academy of Sciences of Ukraine (1988), and then Academician of the National Academy of Sciences of Ukraine (2009).

Detailed biographical data are given in article [1] and book [2].

During 2011 – 2020, A.A. Martynyuk was carrying out significant work related to the preparation for publication of generalized monographs and books. Namely:

* Books XXVI, XXVII present the results of the development of the direct Lyapunov method - the stability study of systems with uncertain values of parameters, which are described by continuous, pulse and singularly perturbed equations, as well as dynamic equations on a time scale;

* Book XXVIII describes the methods of qualitative analysis of the perturbed motion of systems, the behavior of which is described by equations containing a small parameter;

* In book XXIX, on the basis of the matrix-valued Lyapunov function, a direct method for studying the motion stability of systems described by nonlinear equations under structural perturbations of parameters has been developed;

* Book XXX is the second edition of the book of the same name, published in 1989 by Marcel Dekker Inc., USA. The second edition is supplemented by the estimation of solutions to nonlinear systems on the basis of nonlinear integral inequalities, the criterion

[1] *Academician A.A. Martynyuk (to the seventieth anniversary of his birth) // Nonlinear Dynamics and Systems Theory. — 2011. — **11**, 1. — P. 1 – 5.*

[2] *A.A. Martynyuk. Revisiting the Past with Neither Indifference nor Resentment. — Kiev: Phoenix, 2014. — 139 p.*

of asymptotic stability for nonlinear autonomous comparison systems and the replacement of Chapter 5, which is devoted to the application of general methods described in the book;

* Monograph XXXI is the first in the world mathematical literature, which deals with the development of methods for studying the stability of solutions of dynamic equations on a time scale;

* In monograph XXXII, the equations of perturbed motion with multivalued right-hand parts are considered. To study the stability of the set of solutions of such systems, a new variant of the direct Lyapunov method was developed on the basis of a matrix-valued auxiliary function;

* Book XXXIII presents the results of the stability analysis of hybrid systems: on a time scale, with aftereffect, in metric space. The dynamics of shock systems is studied on the basis of new qualitative methods of analysis of such systems;

* Book XXXIV is an educational and encyclopedic edition, 12 chapters of which contain a summary of classical and modern results of the theory of motion stability and their application in mechanics. The book is based on the original results of the authors, which were published in 1969 - 2019.

Along with his intensive scientific research (A.A. Martynyuk is the author (co-author) of more than 450 journal publications and 34 monographs and books in English, Chinese and Russian), he is active in publishing. He did a great job as the editor of the International Series of Scientific Monographs "Stability and Control: Theory, Methods and Applications" at Gordon and Breach Science Publishers (UK). Between 1992 and 2002, 22 volumes of scientific monographs by the scientists from 10 countries were published in this series.

In 2001, A.A. Martynyuk founded the International Scientific Journal "Nonlinear Dynamics and Systems Theory" and is its editor.

In 2006, he founded a new International series of scientific monographs, textbooks and lecture courses entitled "Stability, Oscillation and Optimization of Systems" at Cambridge Scientific Publishers (UK) and is its editor together with Professor P. Borne (France)) and Professor C. Cruz-Hernandez (USA). So far, 11 volumes of this series have been published.

A.A. Martynyuk is a member of the editorial boards of three Ukrainian journals: "Applied Mechanics", "Nonlinear Oscillations" and "Electronic Modeling" and two English-language journals: "Journal of Applied Mathematics and Stochastic Analysis" (USA) and "Differential Equations and Dynamical Systems" (Germany).

A.A. Martynyuk prepared 28 candidates and 4 doctors of physical and mathematical sciences. He is the Deputy Chairman of the National Committee for Theoretical and Applied Mechanics of Ukraine.

In 2008, A.A. Martynyuk was awarded the State Prize of Ukraine in the field of science and technology.

The editorial board of the Journal "Nonlinear Dynamics and Systems Theory" sincerely congratulates Anatoliy Andriyovych on his jubilee, wishes him health and new successes in his multifaceted activity.

List of Monographs and Books by A.A. Martynyuk (Continued)[3]

[3] The titles I-XXV were published in the Journal *Nonlinear Dynamics and Systems Theory, Vol. 11, issue 1, 2011.*

XXVI. Uncertain Dynamical Systems. Stability and Motion Control, (with Yu.A. Martynyuk-Chernienko and Sun Zhen qi), Bending: Science Press, 2011. – 237 p. (translation from Russian into Chinese).

XXVII. Uncertain Dynamical Systems. Stability and Motion Control, (with Yu.A. Martynyuk-Chernienko), Boca Raton: CRC Press, 2012. — 296 p.

XXVIII. Weakly Connected Nonlinear Systems. Boundedness and Stability of Motion, (with L. Chernetskaya, and V.Martynyuk), Boca Raton: CRC Press, 2013. — 212 p.

XXIX. Stability Analysis of Nonlinear Systems under Structural Perturbations, (with V.G. Miladzhanov), Cambridge: Cambridge Scientific Publishers, 2014. — 253 p.

XXX. Stability Analysis of Nonlinear Systems, Second Edition (with, V. Lakshmikantham and S. Leela), Cham: Springer International Publishing Switzerland, 2015. — 329 p.

XXXI. Stability Theory for Dynamic Equations on Time Scales, Cham: Springer International Publishing Switzerland, 2016. — 223 p.

XXXII. Qualitative Analysis of Set-Valued Differential Equations, Cham: Springer Nature Switzerland, 2019. — 198 p.

XXXIII. Dynamics and Stability of Motion of Shock and Hybrid Systems, (with B. Radziszewski and A. Szadkowski), Warsaw: de Gruyter/SCIENDO, 2019. — 193 p.

XXXIV. Stability: Elements of the Theory and Applications with Examples, (with B. Radziszewski and A. Szadkowski), Warsaw: de Gruyter/SCIENDO, 2020. — 328 p.

List of Papers by A.A. Martynyuk (Continued)[4]

146. Asymptotic stability criterion for nonlinear monotonic systems and its applications (Review). Int. Appl. Mech., vol. 47, No. 5, 2011. — pp. 475–534.

147. On stabilization of systems with aftereffect by impulse disturbances. Dopov. Nat. Acad. Nauk Ukr. — 2012, No. 9. — pp. 62–65.

148. Instability of motion under interval initial conditions. Dopov. Nat. Acad. Nauk Ukr. — 2013, No. 11. — pp. 55–60.

149. On the stability of motion under interval initial conditions. Dopov. Nat. Acad. Nauk Ukr. — 2013, No. 1. — pp. 47–52.

150. On the stability of an impulse system with aftereffect with respect to two measures. Nonlinear Oscillations. — 2013. — 16, No. 4. — pp. 538–556.

151. On the stability of the trajectories of the set of difference equations. Dopov. Nat. Acad. Nauk. — 2014, No. 5. — pp. 65–69.

152. Direct Lyapunov method on time scales. Communications in Applied Analysis. — 2013, 17, No. 3 and 4. — pp. 483–502.

153. Novel bounds for solutions of nonlinear differential equations. Appl. Math. — 2015, No. 6. pp. 182–194.

154. On stability with respect to two measures of a system of equations with fractional derivatives. Nonlinear Oscillations. — 2015. — 18, No. 2. — pp. 238–244.

155. Elements of the theory of stability of hybrid systems (Review). Int. Appl. Mech., vol. 51, No. 3, 2015. — pp. 243–302.

[4]The titles 1–129 were published in the Journal *Nonlinear Dynamics and Systems Theory, Vol. 6, issue 1, 2006*, and the titles 130–145 were published in the Journal *Nonlinear Dynamics and Systems Theory, Vol. 11, issue 1, 2011.*

156. Analysis of a set of trajectories of generalized standard systems: Averaging technique. Nonlinear Dynamics and Systems Theory. — 2017 — 17, No. 1. — pp. 29–41.

156. Constructive estimates of Lyapunov V-function for perturbed equations of motion. Int. Appl. Mech., vol. 53, No. 5, 2017 — pp. 588–594.

157. Deviation of a set of trajectories from a state of equilibrium. Dopov. Nat. Acad. Nauk Ukr. — 2017, No. 10. — pp. 10–15.

158. Invariance of solutions to a family of regularized equations. Dopov. Nat. Acad. Nauk Ukr. — 2017, No. 12. — pp. 3–7.

159. Fractional-like derivative of Hukuhara and its properties. Dopov. Nat. Acad. Nauk Ukr. — 2019, No. 4. — pp. 10–16.

160. On application of mixed Minkowski volumes in qualitative theory of set differential equations. Global and Stochastic Analysis. — 2018. Vol. 5. No. 1. — pp. 39–44.

161. Hyers-Ulam-Rassias-stability conditions for families of equations. Dopov. Nat. Acad. Nauk Ukr. — 2017, No. 8. — pp. 11–16.

162. Comparison principle and estimates of Lyapunov functions for nonlinear systems. Dopov. Nat. Acad. Nauk Ukr. — 2018, No. 9. — pp. 3–11.

163. Dynamic analysis of the set trajectories of a family of equations of motion based on Minkowski mixed volumes. Int. Appl. Mech., vol. 54, No. 4, 2018 — pp. 418–430.

164. Estimation of the Lyapunov function on solutions of quasilinear fractional-like systems. Dopov. Nat. Acad. Nauk Ukr. — 2020, No. 11. — pp. 3–8.

165. A.M. Lyapunov's direct method based on matrix auxiliary functions: 40 years of development (review). Int. Appl. Mech. — 2020, No. 3, vol. 56, — pp. 3–75.

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