PERSONAGE IN SCIENCE

Academician A.A. Martynyuk

to the 70th Birthday Anniversary

J.H. Dshalalow [1*], N.A. Izobov [2] and S.N. Vassilyev [3]

[1] *Department of Applied Mathematics Florida Institute of Technology,*
Melbourne, Fl, 32901, USA
[2] *Institute of Mathematics NAS of Byelorussia, Surganova Str., 11, Minsk, Byelorussia*
[3] *Institute of Control Problems Russian Academy of Sciences,*
Profsoyuznaja Str., 65, Moscow, 117997, Russia

On March 6, 2011, a Member of the National Academy of Sciences of Ukraine, Habilitation Doctor and Ph.D. of physical and mathematical sciences, Professor Anatoly Andreevich Martynyuk turns 70. The Editorial Board of the International Scientific Journal "Nonlinear Dynamics and Systems Theory" congratulates him on this occasion and wishes him a great health and new significant achievements in his scientific endeavors.

1 Brief Outline of Martynyuk's Life

March 6, 2011 marked the 70th Birthday of the very prominent scientist in area of theoretical mechanics and mathematics Anatoliy Andreyevich Martynyuk who made a significant contribution to the development of motion stability theories and their applications.

A.A. Martynyuk was born in the family of a railway mechanics, Andrey Gerasimovich Martynyuk, who lived in the Cherkassky region of UkrSSR (since 1991 Ukraine). After graduating from Physical and Mathematical Department of B. Khmelnitsky State University of Cherkassy he entered the post-graduate school supervised by Professor A.N. Golubentsev at the Institute of Mechanics of Academy of Science of Ukr.SSR (now the S.P. Timoshenko Institute of Mechanics of National Academy of Sciences of Ukraine) and focused on problems of finite stability on a given time interval. Three years later Martynyuk conducted research and published several papers with a new approach for an estimation of finite stability of motion on a given time interval (practical stability). The above problems were treated by such renowned scientists as N.D. Moiseyev, N.G. Chetayev and others. In spite of this challenge, Martynyuk obtained new qualitative results.

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* Corresponding author: `mailto:eugene@fit.edu`

Along with these investigations and those included in his Doctoral Thesis (which he defended in 1973), Martynyuk developed foundations of motion stability theory for large scale dynamical systems with non-asymptotically stable subsystems. In 1978, he founded the Department of Processes Stability at the Institute of Mechanics of Academy of Sciences of Ukr.SSR, and he has been its Head ever since. Among other activities at the Department of Processes Stability, Martynyuk chaired the Seminar "Stability Theory and its Applications" during which various new results obtained by Ukrainian and European scholars were discussed. In 2009, Martynyuk was elected the Full Member of the National Academy of Science of Ukraine. In 2008, he was awarded a National Prize in the field of Science and Technology.

The main scientific results obtained by Martynyuk were as follows:

- nonclassical motion stability theories (technical and practical stability in the whole);

- applications of integral inequalities in qualitative theory of differential equations;

- the development of a comparison method in nonlinear mechanics;

- stability analysis of large scale systems under structural perturbations;

- topological dynamics (the method of limiting equations);

- the development of matrix-valued Lyapunov functions;

- stability of uncertain and fuzzy dynamical systems;

- stability theory of dynamical equations on a time scale;

- mathematical problems of population dynamics.

Alongside his prolific scientific research, Martynyuk has been involved in very intense scientific-organizational and publishing activities. In 1982, he organized publication of the book "Lectures on Theoretical Mechanics" by A.M. Lyapunov. He also made an ample amount of work as the editor of the International Series of Scientific Monographs "Stability and Control: Theory, Methods and Applications" copyrighted by the Gordon and Breach Science Publishers (Great Britain). From 1992 to 2002 they published 22 volumes in the Series which gained in a worldwide recognition.

In 2001 Martynyuk founded the International Academic Journal of "Nonlinear Dynamics and Systems Theory" and its online version at `http://e-ndst.kiev.ua` and he has been its chief editor.

In 2006 he established a new International Series of Scientific Monographs, Textbooks and Lecture Courses entitled "Stability, Oscillations and Optimization of Systems" at the Cambridge Scientific Publishers and is serving as its chief editor. By now, 4 volumes of the Series have appeared.

Martynyuk is an editorial board member of three Russian-language journals: the International Journals of "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" (India).

Martynyuk has been a major advisor to 23 Candidates (Ph.D.) and 3 Doctors (Habilitation) in Physical and Mathematical Sciences who are now employed and are being

successful workers in various countries of the former Soviet Union. He is a member of several Scientific Councils on awarding scientific degrees of Candidate (Ph.D.) and Doctor (Habilitation) of Physical and Mathematical Sciences. Martynyuk is a vice-president of the National Committee on Theoretical and Applied Mechanics of Ukraine.

2 List of Monographs and Books by A.A. Martynyuk

I. *Technical Stability in Dynamics.* Tekhnika, Kiev, 1973. [Russian]

II. *Motion Stability of Composite Systems.* Naukova Dumka, Kiev, 1975. [Russian]

III. *Integral Inequalities and Stability of Motion.* Naukova Dumka, Kiev, 1979. (with R. Gutowski). [Russian]

IV. *Dynamics and Motion Stability of Wheeled Transporting Vehicles.* Tekhnika, Kiev, 1981. (with L.G. Lobas and N.V. Nikitina). [Russian]

V. *Practical Stability of Motion.* Naukova Dumka, Kiev, 1983. [Russian]

VI. *Large Scale Systems Stability under Structural and Singular Perturbations.* Naukova Dumka, Kiev, 1984. (with Ly.T. Grujić and M. Ribbens-Pavella). [Russian]

VII. *Large-Scale Systems Stability under Structural and Singular Perturbations.* Springer-Verlag, Berlin, 1987. (with Ly.T. Grujić and M. Ribbens–Pavella).

VIII. *Stability Analysis of Nonlinear Systems.* Marcel Dekker, New York, 1989. (with V. Lakshmikantham and S. Leela).

IX. *Stability of Motion: Method of Integral Inequalities.* Naukova Dumka, Kiev, 1989. (with V. Lakshmikantham and S. Leela). [Russian]

X. *Practical Stability of Nonlinear Systems.* World Scientific, Singapore, 1990. (with V. Lakshmikantham and S. Leela).

XI. *Stability of Motion: Method of Limiting Equations.* Naukova Dumka, Kiev, 1990. (with J. Kato and A.A. Shestakov). [Russian]

XII. *Stability of Motion: Method of Comparison.* Naukova Dumka, Kiev, 1991. (with V. Lakshmikantham and S. Leela). [Russian]

XIII. *Some Problems of Mechanics of Nonautonomous Systems.* Mathematical Institute of SANU, Beograd–Kiev, 1992. (with V.A. Vujicić). [Russian]

XIV. *Stability Analysis: Nonlinear Mechanics Equations.* Gordon and Breach Science Publishers, Amsterdam, 1995.

XV. *Stability of Motion of Nonautonomous Systems: Method of Limiting Equations.* Gordon and Breach Science Publishers, Amsterdam, 1996. (with J. Kato and A.A. Shestakov).

XVI. *Advances in Nonlinear Dynamics.* Gordon and Breach Science Publishers, Amsterdam, 1997. (with S. Sivasundaram).

XVII.   *Stability by Liapunov's Matrix Function Method with Applications.* Marcel Dekker, New York, 1998.

XVIII. *Theory of Practical Stability with Applications.* Harbin Institute of Technology, Harbin, 1999. (with Sun Zhen qi). [Chinese]

XIX.   *Qualitative Methods in Nonlinear Dynamics: Novel Approaches to Liapunov's Matrix Function.* Marcel Dekker, New York, 2002.

XX.   *Stability and Stabilization of Nonlinear Systems with Random Structures.* Taylor & Francis, London and New York, 2002. (with I.Ya. Kats).

XXI.   *Advances in Stability Theory at the End of the 20th Century.* (Ed.: A.A. Martynyuk). Taylor & Francis, London and New York, 2003.

XXII.   *Theory of Practical Stability with Applications.* Second Edition, Revised and Expanded. Chinese Academy of Sciences Publishing Company, Beijing, 2003. (with Sun Zhen qi). [Chinese]

XXIII. *Qualitative Analysis of Nonlinear Systems with Small Parameter.* Chinese Academy of Sciences Publishing Company, Beijing, 2006 (with Sun Zhen qi). [Chinese]

XXIV.   *Stability of Motion: The Role of Multicomponent Liapunov's Functions*, Cambridge Scientific Publishers, London, 2007.

XXV.   *Advances in Chaotic Dynamics and Applications.* (Eds.: C. Cruz–Hernndez and A.A. Martynyuk). Cambridge: Cambridge Scientific Publishers, 2010.

3   List of Personal Papers by A.A. Martynyuk (Continued)*

130. To the theory of direct Liapunov's method. *Dokl. Acad. Nauk* **406** (3) (2006) 309–312. [Russian]

131. On stability of set trajectories of nonlinear dynamics. *Dokl. Acad. Nauk* **414** (3) (2007) 299–303. [Russian]

132. On polydynamics of nonlinear systems on time scales. *Dokl. Acad. Nauk* **414** (4) (2007) 455–458. [Russian]

133. Stability analysis of large-scale functional differential systems. *Ukr. Math. Journ.* **59** (3) (2007) 87–98. [Russian]

134. General problem on polydynamics on time scales *Dokl. Nats. Acad. Nauk Ukr.* (1) (2008) 7–13. [Russian]

135. On comparison principle for matrix differential equations. *Dokl. Nats. Acad. Nauk Ukr.* (12) (2008) 28–33. [Russian]

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* The titles 1–129 were published in the Journal *Nonlinear Dynamics and Systems Theory*, Vol. 6, issue 1, 2006.

136. On exponential stability dynamic systems on time scales. *Dokl. Acad. Nauk* **421** (4) (2008) 312–317. [Russian]

137. An exploration of polydynamics on nonlinear equations on time scales. *ICIC Express Letters* **2** (2) (2008) 155–160.

138. Novel trends in the theory of direct Liapunov method. In: *Advances in Nonlinear Analysis: Theory, Methods and Applications* (Eds.: S. Sivasundaram at al.). Cambridge Scientific Publishers, Cambridge, 2008, 221–232.

139. Criterion of uniform stability of nonlinear systems in the hole. *Dokl. Nats. Acad. Nauk Ukr.* (1) (2009) 35–39. [Russian]

140. Comparison principle for a set differential equation with robust causal operator. *Dokl. Acad. Nauk* **427** (6) (2009) 750-753. [Russian]

141. On instability solutions of dynamic equations on time scales. *Dokl. Nats. Acad. Nauk of Ukraine* (10) (2009) 21–26. [Russian]

142. On direct Liapunov method for equations with fractional derivative. *Dokl. Nats. Acad. Nauk Ukr.* (3) (2010) 33–34. [Russian]

143. On a mathematical model of world dynamics and sustainable development. *Dokl. Nats. Acad. Nauk Ukr.* (7) (2010) 16–21. [Russian]

144. Exponential stability on time scales under structural perturbations. *Dokl. Nats. Acad. Nauk of Ukraine* (9) (2010) 24–29. [Russian]

145. On stability of the set impulsive equations. *Dokl. Acad. Nauk* **436** (5) (2011) 593–596. [Russian]