Petr E. Tovstik

Professor, Dr. of Science, Head of Department of Theoretical and Applied Mechanics, Mathematics and Mechanics Faculty, Saint-Petersburg State University, Russia

Born in Leningrad (Russia) in 1935.

Graduated from Leningrad State University in 1958
PhD (Physics&Math, Mechanics of Solids) from Leningrad State University in 1963
Dr.Sci. (Physics&Math, Mechanics of Solids) from Leningrad State University in 1968.

PhD thesis "*Asymptotic method of solution of the spring vibration equations*"
Dr.Sci. thesis "*Free vibrations and buckling of thin elastic shells*"

Work at St. Petersburg State University, Department of Theoretical and Applied Mechanics

- Senior Research Associate ()
- Assistant Professor (1968-1971),
- Full Professor (1974-present)
- Head of the Department (1978-present)

Honored Scientist of Russian Federation (1997)
Honored Professor of St.-Petersburg State University (2010)
Awards for Scientific Research from St. Petersburg State University (1971, 2002)
State Prize of Russian Federation for Scientific Research "*Basic problems of the thin-walled constructions theory*" (1998).

Member of the Russian National Committee for Theoretical Mechanics
Member of the American Mathematical Society
Editor of journal "*Vestnik St.-Petersburg University. Mathematics*",
Head of the Thesis Board at St.-Petersburg University (theoretical mechanics, mechanics of solids, mechanics of fluid, gas and plasma).
Supervisor of 32 PhD and 9 Dr. of Sci. theses.
Author of 10 books and 260 journal and conference papers.

Scientific interests - theoretical mechanics, asymptotic methods, theory of thin-walled structures, mechanics of solids, nano-mechanics.

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The main publications

BOOKS in Russian

1. A.L.Goldenweizer, V.B.Lidsky, P.E.Tovstik. *Free vibrations of thin elastic shells.* Moscow. Nauka (1979), 384 p.
2. P.E.Tovstik. *Thin shell buckling. Asymptotic methods*. Moscow. Nauka (1995), 320 p.
3. P.E,.Tovstik, S.M.Bauer, A.L.Smirmov, S.B.Filippov. *Asymptotic methods in mechanics of thin-walled structures*. St. Petersburg Univ. (1995), 188 p.
4. S.M.Bauer, A.L.Smirmov, P.E,.Tovstik, S.B.Filippov. *Asymptotic methods in examples and problems*. St. Petersburg Univ. (1997), 276 p.

5. S.M.Bauer, A.M.Kovalev, M.B.Petrov, B.B.Tikhomirov, P.E,.Tovstik, M.I.Ulitin, S.B.Filippov. *Design and optimization of metal telescope mirrors.* St. Petersburg Univ. (1997), 228 p.
6. S.M.Bauer, B.A.Zimin, P.E,.Tovstik. *The simplest shell and plate models in ophthalmology.* St. Petersburg Univ. (1997), 228 p.
7. S.M.Bauer, A.L.Smirmov, P.E,.Tovstik, S.B.Filippov. *Asymptotic methods in mechanics of rigid body*. Regular and chaotic dynamics. (2007). 356 p.
8. S.A.Kabrits, E.I.Mikhailovsky, P.E.Tovstik, K.F.Chernykh, V.F.Shamina. *General nonlinear shell sheory*. St. Petersburg Univ. (2002). 388 p.
9. G.I.Mikhasev, P.E.Tovstik. *Localized vibrations and waves in elastic thin shells.* Fizmatlit. Nauka. (2009). 260 p.

BOOKS in English
10. P.E.Tovstik, A.L.Smirnov. *Asymptotic methods in the buckling theory of elastic shells*. World Scientific. Series of stability, vibration and control. Singapore. New Jersey. London. Hong Kong. 348 p.

PAPERS (in English)
1. P.E.Tovstik, T.P.Tovstik. *Dynamics of rigid body on the nonlinearly elastic rotating rod.* "Nonlinear Oscillations in Mech. Systems" St. Petersburg. 2000, 173—186.
2. E.M.Haseganu, A.L.Smirnov, P.E.Tovstik. *Buckling of thin anisotropic shells*. Trans CSME, vol. 24, no 18, 2000, pp. 169-178.
3. P.E.Tovstik. *Comparative asymptotic analysis of shells buckling with 3. imperfections*. Euromech-424, 2001, Delft. Buckling predictions of
imperfection sensitive shells. 89-91.
4. P.E.Tovstik. *Constitutive relations for thin flexible shells*. Proc. 18 CAMCAM. St. John's. 2001, 335-336.
5. A.L.Smirnov, P.E.Tovstik. *Thin-walled structures made of materials with variable elastic modules*. Advances in Mechanics of Solids. In memory of prof. E.M. Haseganu. World Scientific Co Ltd, 2006, 69-83.
6. P.E.Tovstik. *Stability of thin elastic shells: Asymptotic method.* Shell structures. Theory and applications. Ggansk. 2002, 35-40.
7. E.M.Haseganu, F.P.J.Rimrott, P.E.Tovstik. *Axially symmetric deformations on thin flexible multi-layered shells of revolution.* Technische Mechanik, 2002, vol. 22, N 4, 191-205.
8. S.M.Bauer, G.A.Lubimov, P.E.Tovstik. *On the Mathematical Simulation of the Measuring of the Intraocular Pressure by Maklakov Method.* Technische Me□hanik, B.24, Heft 3-4, (2004), 231-235.
9. P.E.Tovstik. *On the localized vibration modes of thin elastic shells*. Technische Me□hanik, B.24, Heft 2-3, (2004), 297-310.
10. P.E.Tovstik, T.M.Tovstik, V.F.Shekhovtsov. *On the marine fixed offshore platform dynamics under random wave forces.* Tagungsband. 7 Magdeburger Machinen- bau-Tage. 2005. 118-126
11. P.E.Tovstik. *On the asymptotic character of the approximate models of beams, plates and shells*. Vestnik St. Petersburg Univ. Mathematics. Allerton Press. 2007. No 3. 49--54.
12. P.E.Tovstik, T.P.Tovstik. On *the 2D models of plates and shells including the transversal shear*. ZAMM, 2007, 87, No 2, 160-171.
13. J.D.Kaplunov, G.Rogerson, P.E.Tovstik. *Localized vibration in elastic structures with slowly varying thickness*. Quart. J. Mech. Appl. Math. 2005, 58, pp.645-664.
14. P.E.Tovstik. *Stability of a transversely isotropic cylindrical shell under axial compression*. Mech. of Solids. 2009, 4, 552-564.
15. P.E.Tovstik. *Vibrations and stability of a prestressed plate on an elastic foundation*. Appl. Math. and Mech., 2009. V..73. No 1, 106-120.
16. N.F.Morozov, P.E.Tovstik. *On the buckling modes of plate on an elastic foundation. Mech. of Solids*. 2010, □4, 30-42.

17. P.E.Tovstik, T.P.Tovstik. *One-dimensional models of beam made of anisotropic material in the case of inclined anisotropy*. Mech. of Solids, 2011, □6, 93-103.
18. N.F.Morozov, P.E.Tovstik. *Volume and surface stability of transversely isotropic material.* Advanced Problems in Mechanics. 38 summer school, SPb, 2010. 476-490.
19. N.F.Morozov, P.E.Tovstik. *Bulk and surface stability loss of materials*. Multiscaling of synthetic and natural systems with self-adaptive capacity. Taiwan, 2010, 27-30.
20. N.F.Morozov, P.E.Tovstik. *Surface layer stability under force and Temperature Loading*. Mech. of Solids. 2010, 6, 769-777.
21. Z.G.Ershova, P.E.Tovstik. *A cylindrical plate with a weakly fixed curvilinear edge made of a transversely isotropic material*. Vestnik St. Petersburg Univ. Mathematics. 2011.1. 27-37.
22. N.F.Morozov, P.E.Tovstik. *Initial supercritical behavior of buckled transversely isotropic elastic medium*. Vestnik St.P. Univ. Mathematics. 2011. No 1. 44-50.
23. N.F.Morozov, P.E.Tovstik. *Bending of two-layer beam with non-rigid contact between layers*. Appl. Math. and Mech. 2011, 1, 77-84.)
24. N.F.Morozov, P.E.Tovstik. *Control of surface waviness*. Advanced Dynamics and Model Based Control of Structures and Machines. (H.Irschik, A.K.Belyaev, M.Krommer (eds.), Springer. Wien, NewYork, 2011. pp. 57-64
25. P.E.Tovstik, T.M.Tovstik, V.A.Shekhovtsov. *The Impact of the Shape of the Spectral Density of Random Wave Disturbance on the Vibrations of a Fixed Sea-Based Offshore Platform*. Vestnik of St.-Petersburg Univ. Mathematics. 2012, v.45.no 2,98-105.
26. P.E.Tovstik, T.M.Tovstik, V.A.Shekhovtsov. *Dynamics of marine stationary platform under action of seismic loading*. III ECCOMAS Thematic Conference on Computational Methods in Structural Dynamics and Earthquake Engineering Corfu, Greece, 2011.
27. N.F.Morozov, P.E.Tovstik. *Stabolity of a homogeneous transversely isotropic elastic medium*. Doklady Physics. 2011, V. 438, 3, 1-5.
28. N.F.Morozov, P.E.Tovstik. *On Chessboard of buckling modes in compressed materials*. Acta Mechanica, v.223(8), (2012), 1769-1776.
29. N.F.Morozov, P.E.Tovstik. *Bulk and Surface Stability of Materials*. Taiwan-Rus. Symp. "Deform. & Fracture in Technol. Processes", Trans Tech. Publ. Ltd. Key Engineering Materials. v. 528, 2012, 51-60.
30. S.V.Kashtanova, N.F.Morozov, P.E.Tovstik. *Modes of Stability Loss of Materials*. Taiwan-Rus. Symp."Deform.& Fracture in Technol. Processes", Trans Tech Publ. Ltd. Key Engineering Materials v. 528, 2012, 89-100.
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32. S.A.Zegzhda, P.E.Tovstik, M.P.Yushkov. *The Hamilton-Ostrogradski Generalized Principle and its Application for Damping of Oscillations*. Doklady Physics, 2012. vol. 57, No 11. 447-450.