

Romanian Academy The „Aurel Vlaicu” Prize awarded in 2018 Remus-Daniel ENE, PhD, Vasile MARINCA, PhD & Valentin-Bogdan MARINCA, PhD

The Romanian Academy “Aurel Vlaicu” prize for Technical Sciences for 2016 was awarded to the group of papers “Optimal approximate analytical methods in the dynamic study of non-Newtonian fluids”, authors Ene Remus-Daniel, Marınca Vasile and Marınca Bogdan, affiliated to University Politehnica of Timisoara. The award ceremony took place in the high hall for science and culture at the General Assembly of the Romanian Academy on 13th December 2018.

The prize regards the papers:

- Remus-Daniel Ene, Vasile Marınca, and Valentin Bogdan Marınca, Viscous flow and heat transfer over an unsteady stretching surface, *Open Phys.*, 2016, vol. 14, pp. 371–381, DOI 10.1515/phys-2016-0042.
- Remus-Daniel Ene, Vasile Marınca, and Valentin Bogdan Marınca, Thin film flow of an Oldroyd 6-constant fluid over a moving belt: an analytic approximate solution, *Open Phys.*, 2016, vol. 14, pag. 44–64, DOI 10.1515/phys-2016-0005.
- Remus-Daniel Ene, Vasile Marınca, and Valentin Bogdan Marınca, Analytic Approximate Solutions to the Boundary Layer Flow Equation over a Stretching Wall with Partial Slip at the Boundary, *PLOS ONE*, 2016, vol. 11(3), 24 pages, DOI:10.1371/journal.pone.0149334.

These articles apply the methods of Optimal Homotopy Asymptotic Method (OHAM) and Optimal Homotopy Perturbation Method (OHPM) for finding the approximate analytical solutions for dynamical nonlinear systems from fluid mechanics. The important applications of this field describe heat and mass transfer, for example: microchip production, the linings of mammalian lungs, crystal growing, extrusion of plastic sheet, drawing plastic films, paper production, performance of lubricants, continuous casting, polymer extrusion, manufacture and drawing of plastics and rubber sheets, wire drawing and so on.

The aforementioned methods present some advantages compared to the classical one, among them we recall: there are not necessary small or large parameters in the equations or in the boundary/initial conditions, the construction is based on determination of the linear operators and of the auxiliary functions, which are combined in a convenient way to optimally control the convergence of the approximate solutions. The efficiency of the proposed procedure is proven, while an accurate solution is explicitly analytically obtained in an iterative way after one iteration only. The validity of this method is demonstrated by comparing the results obtained with the numerical solution.

Prof. dr. Vasile Marınca is member of the Center for Advanced and Fundamental Technical Research, Romanian Academy, Timișoara Branch. His field of research is Applied Mathematics in engineering.

Dr. Remus-Daniel Ene is Assistant Professor within the Department of Mathematics, UPT since 2002. He is the author of 26 ISI papers, in the field of Applied Mathematics.

Dr. Bogdan Marınca is Associate Professor within the Department of Applied Electronics, UPT. He works in the field of Applied Electronics.

