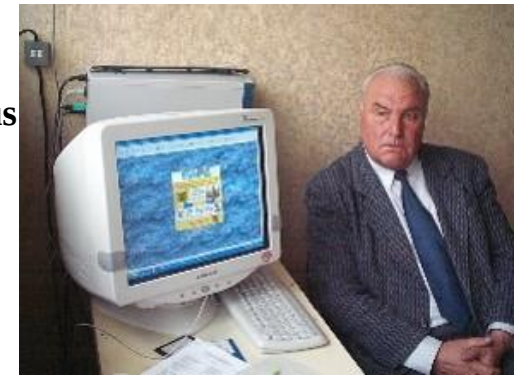
Professor
Christo Boyanov Boyadjiev
Dr. Tach. Sci., Professor Emeritus
85^{th} birthday



85 years are the main part of human life. Of them: 65 from the first scientific paper, 60 at Bulgarian Academy of Sciences and 40 as a Professor in the field of the chemical engineering.

The path in science is a sequence of nine stages.

- Third year student - first scientific paper 1957.
- Graduate (1960 first model) - Optical model of textile fabric, published as "Analogue of Beer's law of reflected light from textile fabric" in K. Dimov, Chr. Boyadjiev, Ein Analogon zum Gesetz von Beer uber das reflektierte Licht von gefarbten Textilmaterialien, Zeitschr. fur Physikalische Chemie, 219, 106-113, 1962.
- First research in the field of chemical engineering (1963) - Hydrodynamics and mass transfer in a Venturi tube. Patent for simultaneous capture of dust and sulfur dioxide in waste gases, introduced in 1965 at the Copper Plant in Eliseina.
- Beginning of theoretical research in the field of chemical engineering (1965) - Hydrodynamics and mass transfer in flowing films. Successful cooperation with V. Beshkov, V. Krylov, V. Levich. The results are published in the monographs Chr. Boyadjiev, V. Beschkov, "Mass Transfer in Liquid Film Flows", Publ. House Bulg. Acad. Sci., Sofia, 1984, 128 pp. and Chr. Boyadjiev, V. Beschkov, "Mass transfer in moving fluid films", Ed. Mir, Moscow, 1988, 137 p.
- Process Systems Engineering (1976), as modeling of the set of processes in technological schemes (technologies) is an interesting direction with its own mathematical (matrix) methods. Large-scale research was conducted in the field of modeling and optimization of chemical-technological systems (HTS):
  - Areas of impact and program for structural analysis of HTS.
  - Decomposition method for optimization and software system for optimization of multi-range HTS.
  - Optimal thermal integration and optimal synthesis of a system of heat exchangers.
  - Optimal schedules of multi-assortment HTS.
  - Automated optimal design of multi-product HTS.
  - Renovation of HTS.
- Beginning of theoretical research in the field of non-linear mass transfer and hydrodynamic stability (1983). The results are published in the monographs V. S. Krylov, Chr. Boyadjiev, "Non-Linear Mass Transfer", Institute of Thermophysics, Novsosibirsk, 1996, 232 pp. and

Chr. Boyadjiev, V. N. Babak, “Non-Linear Mass Transfer and Hydrodynamic Stability”, Elsevier, Amsterdam, 2000, 500 pp.

- The wide base of theoretical techniques used became the basis of the monographs Хр. Бояджиев, "Основи на моделирането и симулирането в инженерната химия и химичната технология", ИИХ-БАН, София, 1993, 253 с. (Modeling and Simulation in Chemical Engineering and Chemical Technology - Bulgarian), Chr. Boyadjiev, “Theoretical Chemical Engineering. Modeling and simulation”, Springer-Verlag, Berlin Heidelberg, 2010, 594 pp. and Хр. Бояджиев, „Основи на моделирането и симулирането в химичната промишленост“, Изд. БАН „Проф. Марин Дринов“, София, 2017, 120 с. (Modeling and Simulation in Chemical Industry - Bulgarian).
- A new approach for modeling and simulation of mass transfer in column apparatus (2006). Creation of convective-diffusion and average-concentration models of processes in column apparatuses (chemical reactions, absorption, adsorption and heterogeneous catalysis). The results are published in the monographs Chr. Boyadjiev, M. Doichinova, B. Boyadjiev, P. Popova-Krumova, “Modeling of Column Apparatus Processes”, Springer-Verlag, Berlin Heidelberg, 2016, 313 pp. and Chr. Boyadjiev, M. Doichinova, B. Boyadjiev, P. Popova-Krumova, “Modeling of Column Apparatus Processes” (Second edition), Springer-Verlag, Berlin Heidelberg, 2018, 456 pp.
- A new approach for modeling and simulation of processes with unknown mechanism (2020). In one of the last works (Chr. Boyadjiev, A New Approach to Modeling and Simulation of Industrial Processes, J. Eng. Thermophysics, 2021, 30 (2), 1-6) was formulated the axiom “Quantitative descriptions of industrial processes are invariant by with regard to the measurement systems of quantities (of metric transformations). According to Guchman's terminology, "metric transformations" are equivalent to "similar transformations", which he uses in proving his theorem "If the quantitative description of the process is invariant with respect to similar transformations, it can be represented as a power complex", i.e. product of the quantities on which the process depends, raised to degrees, which are determined by experimental data. From the above axiom and theorem follows the formulation and proof of the theorem "Quantitative descriptions of industrial processes can be represented as power complexes." This theorem opens unlimited possibilities for modeling and simulating industrial processes with insufficient information about their mechanism.

Guest editor

Jordan Hristov, Ph. D., DSc
Professor of Chemical Engineering
Department of Chemical Engineering
University of Chemical Technology and Metallurgy,
Sofia, Bulgaria