FROM THE EDITOR

The problems of solids' and fluids' behavior undergoing complex mechanical, thermal and chemical loading are in many aspects similar. In both media fluxes of mass, momentum and energy occur and the material is displaced, heated and chemically transformed. There is, however, one major difference connected with their modes of energy conversion, as fluids cannot store elastic deviatoric stress and strain when at rest. Thus, only pressure and specific volume may receive, convert and release the elastic energy usually measured via enthalpy. Other differences between solids and fluids are of secondary importance and have their origin in tradition and common teaching.

Therefore, Computational Thermo-Mechanics develops quite similarly within the twin frameworks of CFD, or Computational Fluid Dynamics, and CSD, Computational Solid Dynamics. These two disciplines, recently appearing as one in solid-fluid interactions, have to develop two complementary techniques of spatial discretization of partial differential equations, viz. the Finite Element Method (FEM) and the Finite Volume Method (FVM).

In this issue of TASK Quarterly we introduce our readers to advanced implementations and numerical treatment of motion, energy conversion and chemical reactions. The common idea of the presented original articles is to develop the knowledge and implementations of the author's models into commercial solvers. It is my great pleasure to present achievements of young Polish researches, who have made an important step towards full understanding and simulation of reality: Michał Karcz, Robert Kucharski and Adam Wiśniewski (Institute of Fluid Flow Machinery of Polish Academy of Sciences), Jerzy Bobiński and Andrzej Ambroziak (Gdańsk University of Technology), Leon Kukiełka, Łukasz Bohdal and Paweł Kałduński (Koszalin University of Technology), and Wojciech Sobieski and Waldemar Dudda (University of Warmia and Masury in Olsztyn).

Guest Editor
Janusz Badur