

**THERMAL RADIATION IN DISPERSE SYSTEMS:
AN ENGINEERING APPROACH**

**LEONID A. DOMBROVSKY
DOMINIQUE BAILLIS**

Leonid A. Dombrovsky and Dominique Baillis

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The monograph provides a systematic consideration of diverse problems of thermal radiation in disperse systems. A set of problems discussed in some details includes the thermal radiation of two-phase combustion products in rocket engines, the spectral radiative properties of advanced thermal insulations, the microwave thermal radiation of disperse systems on the sea surface, and the thermal radiation in a multiphase medium, formed in the case of hypothetic severe accident of a nuclear reactor. The theoretical models developed by the authors are mainly based on the Mie theory for the radiative properties of single particles and approximate methods for the radiation transfer in anisotropically scattering media. The experimental characterization of dispersed materials like foams, porous ceramics, fibrous and nanoporous insulations is based on directional-hemispherical measurements in a wide infrared spectral range and the mathematical identification procedure for the material radiative properties.

A wide use of simplified theoretical models and relatively simple computational and experimental procedures form the so-called engineering approach which appears to be very useful in solving many practical problems. The examples for the solutions of several particular problems are also presented in the book. Therefore, this book can be considered as a manual on applied radiative and combined heat transfer problems. It is destined for students, engineers, and researchers in the field of heat transfer. Numerous references presented in the book enable an interested reader to undertake a further study of specific thermal radiation problems in disperse systems.

Dombrovsky L.A.

Baillis D.

There are only two ways to live your life.

One is as though nothing is a miracle.

The other is as though everything is a miracle.

Albert Einstein

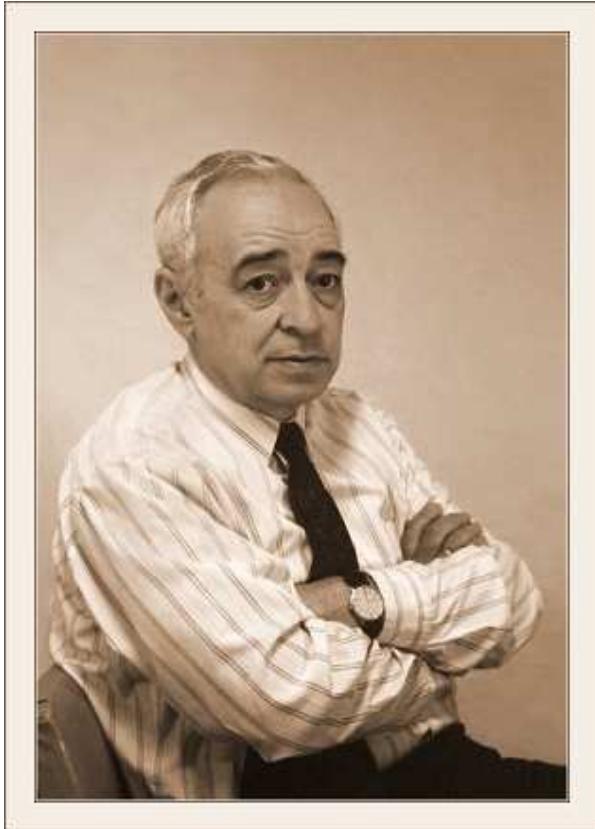


Photo by Sasha Shevelko



Photo by Leonid Dombrovsky

Leonid A. Dombrovsky is a Chief Researcher of the Joint Institute for High Temperatures of the Russian Academy of Sciences. He received the Candidate (PhD) degree in 1974 from the Moscow Institute of Physics and Technology and the Doctor of Science degree in 1990 from the Research Institute of Thermal Processes, Moscow, Russia. His research interests have been focused on theoretical modelling of radiative and combined heat transfer in disperse systems including wide-range spectral properties of particles and fibres, modified differential approximations for radiative transfer, and the problem-oriented computer codes for solving combined heat transfer problems. He has published more than 150 research papers, mainly in refereed journals, and the monograph *Radiation Heat Transfer in Disperse Systems* (Begell House, 1996, New York). The Fifth Radiation Symposium on Radiative Transfer (Bodrum, Turkey, 2007) was dedicated to Leonid Dombrovsky in recognition of his valuable contributions to the radiation research field.

Dominique Baillis is a Professor of the INSA Lyon Thermal Science Centre (CETHIL). She received the PhD degree in 1995 from INSA (National Institute of Applied Sciences) Lyon, France and the Professor degree in 2007 from the same institution. Her research interests have been focused on experimental identification and theoretical modeling of thermal radiative and conductive properties of diverse disperse systems such as advanced thermal insulations, fibrous materials, porous ceramics, foams, and nanoporous materials. She has published more than 50 research papers. Most of Professor Baillis's research has been carried out jointly with students. She has guided the work of more than 13 doctoral and 10 master students coming from many countries of the world, during last 14 years. She has also directed research of 8 postdoctoral researchers.

