

INSTITUTE OF FLUID-FLOW MACHINERY
POLISH ACADEMY OF SCIENCES

TRANSACTIONS
OF THE INSTITUTE OF
FLUID-FLOW MACHINERY

111



GDAŃSK 2002

EDITORIAL AND PUBLISHING OFFICE

IFFM Publishers (Wydawnictwo IMP), Institute of Fluid Flow Machinery, Fiszerza 14, 80-952 Gdańsk, Poland, Tel.: +48(58)3411271 ext. 141, Fax: +48(58)3416144, E-mail: esli@imp.gda.pl

© Copyright by Institute of Fluid-Flow Machinery, Polish Academy of Sciences, Gdańsk

Financial support of publication of this journal is provided by the State Committee for Scientific Research, Warsaw, Poland

Terms of subscription

Subscription order and payment should be directly sent to the Publishing Office

Warunki prenumeraty w Polsce

Wydawnictwo ukazuje się przeciętnie dwa lub trzy razy w roku. Cena numeru wynosi 20,- zł + 5,- zł koszty wysyłki. Zamówienia z określeniem okresu prenumeraty, nazwiskiem i adresem odbiorcy należy kierować bezpośrednio do Wydawcy (Wydawnictwo IMP, Instytut Maszyn Przepływowych PAN, ul. Gen. Fiszerza 14, 80-952 Gdańsk). Osiągalne są również wydania poprzednie. Prenumerata jest również realizowana przez jednostki kolportażowe RUCH S.A. właściwe dla miejsca zamieszkania lub siedziby prenumeratora. W takim przypadku dostawa następuje w uzgodniony sposób.

TRANSACTIONS OF THE INSTITUTE OF FLUID-FLOW MACHINERY

Appears since 1960

Aims and Scope

Transactions of the Institute of Fluid-Flow Machinery have primarily been established to publish papers from four disciplines represented at the Institute of Fluid-Flow Machinery of Polish Academy of Sciences, such as:

- Liquid flows in hydraulic machinery including exploitation problems,
- Gas and liquid flows with heat transport, particularly two-phase flows,
- Various aspects of development of plasma and laser engineering,
- Solid mechanics, machine mechanics including exploitation problems.

The periodical, where originally were published papers describing the research conducted at the Institute, has now appeared to be the place for publication of works by authors both from Poland and abroad. A traditional scope of topics has been preserved.

Only original and written in English works are published, which represent both theoretical and applied sciences. All papers are reviewed by two independent referees.

EDITORIAL COMMITTEE

Jarosław Mikielewicz(Editor-in-Chief), Zbigniew Bilicki, Jan Kiciński, Edward Śliwicki (Managing Editor)

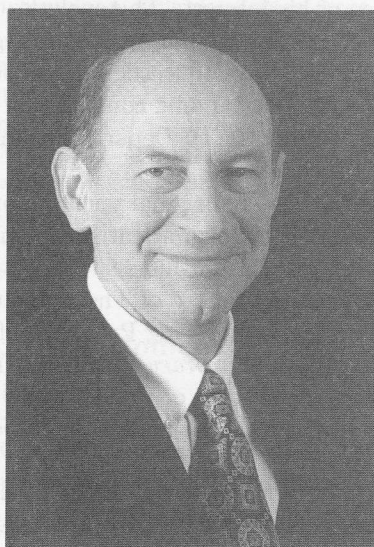
EDITORIAL BOARD

Zbigniew Bilicki, Brunon Grochal, Jan Kiciński, Jarosław Mikielewicz (Chairman), Jerzy Mizeraczyk, Wiesław Ostachowicz, Wojciech Pietraszkiewicz, Zenon Zakrzewski

INTERNATIONAL ADVISORY BOARD

M. P. Cartmell, *University of Glasgow, Glasgow, Scotland, UK*
G. P. Celata, *ENEA, Rome, Italy*
J.-S. Chang, *McMaster University, Hamilton, Canada*
L. Kullmann, *Technische Universität Budapest, Budapest, Hungary*
R. T. Lahey Jr., *Rensselaer Polytechnic Institute (RPI), Troy, USA*
A. Lichtarowicz, *Nottingham, UK*
H.-B. Matthias, *Technische Universität Wien, Wien, Austria*
U. Mueller, *Forschungszentrum Karlsruhe, Karlsruhe, Germany*
T. Ohkubo, *Oita University, Oita, Japan*
N. V. Sabotinov, *Institute of Solid State Physics, Sofia, Bulgaria*
V. E. Verijenko, *University of Natal, Durban, South Africa*
D. Weichert, *Rhein.-Westf. Techn. Hochschule Aachen, Aachen, Germany*

In Memoriam



Professor Zbigniew Bilicki (1944-2002)

On the 9th of June 2002 a Member of the Editorial Committee of the Journal passed away; an eminent and leading scientist, a great character – Professor Zbigniew Bilicki.

Zbigniew Bilicki was born on the 1st of April 1944 in Cracow. He has completed his elementary and secondary education in Bydgoszcz. He graduated with a BSc and MSc in Mechanical Engineering from the Marine Construction Department at the Technical

University of Gdańsk in 1968. He started his professional carrier at the Centre for Marine Technology in Gdańsk. In 1979 he joined the Institute of Fluid-Flow Machinery of the Polish Academy of Sciences in Gdańsk. Since then his main area of research interest was: thermodynamics, heat transfer and two-phase vapour-liquid flows.

He received the PhD degree in Mechanical Engineering from the Institute of Fluid-Flow Machinery in 1980. His PhD thesis was on the *Analysis of Heat Transfer During Nucleate Boiling in Channels*. In 1978-80 and 1985-87 he spent about five years at the Brown University, Providence, RI, USA, working on two-phase flow problems under the supervision of Professor J. Kestin. He was awarded the DSc by the Institute of Fluid-Flow Machinery in 1985 for his work on *Map of Two-Phase Flow Structures*. He became a professor of thermodynamics in 1985. He was also a visiting professor at the Tulane University, New Orleans, LA, USA, in 1995.

Since 1985 Professor Bilicki served as a member of the Institute of Fluid-Flow Machinery Scientific Board and the Head of the Gas Dynamics Department. He became the Head of the Centre for Thermomechanics of Fluid in 1999, after the reorganization of the Institute.

The list of his scientific achievements is impressive and includes studies of irreversible thermodynamics, modelling of two-phase flows, non-equilibrium between phases, energy conversion and the theory of onset of evaporation in forced boiling flows. Industrial problems and applications were also of his interest. This includes a mathematical model for simulating dynamic behaviour of boilers used for automatic regulation of water level and pressure in drums. He was an internationally recognized expert in the area of thermodynamics and multiphase flows. His outstanding contribution was awarded twice by the Polish Academy of Sciences: in 1982 by the IV Department and in 1986 by the Secretary of the Academy.

Prof. Bilicki was the author of over 110 original scientific publications. He supervised several PhDs and DScs. He founded his own scientific school. As part of his commitment of high-quality research he contributed his energy to a vast array of professional activities. He was a member of the Committee of Thermodynamics and Combustion as well as the Committee of the Power Engineering Problems of PAS. In 2001 he was the principal editor of the expertise on *Contemporary Trends in Thermodynamics*, which has been acknowledged by not only the members of PAS but also members of the society of Polish thermodynamicists. He managed to gather in Poland both societies of mechanical and chemical engineers.

Professor Bilicki was a talented scientist and a great intellect. He was a caring colleague with open mind and heart, always ready to help others. Above all he was a true friend. His sudden death came as a shock to his Family, Friends, Colleagues and the entire society of Polish thermodynamicists. His loss is absolutely incalculable; we miss him very much. We will try to be worthy of his memory.

Jarosław Mikielewicz
Editor-in Chief