IUTAM Symposium on Elastohydrodynamics
and Micro-elastohydrodynamics
Aims and Scope of the Series

The fundamental questions arising in mechanics are: Why?, How?, and How much? The aim of this series is to provide lucid accounts written by authoritative researchers giving vision and insight in answering these questions on the subject of mechanics as it relates to solids.

The scope of the series covers the entire spectrum of solid mechanics. Thus it includes the foundation of mechanics; variational formulations; computational mechanics; statics, kinematics and dynamics of rigid and elastic bodies; vibrations of solids and structures; dynamical systems and chaos; the theories of elasticity, plasticity and viscoelasticity; composite materials; rods, beams, shells and membranes; structural control and stability; soils, rocks and geomechanics; fracture; tribology; experimental mechanics; biomechanics and machine design.

The median level of presentation is the first year graduate student. Some texts are monographs defining the current state of the field; others are accessible to final year undergraduates; but essentially the emphasis is on readability and clarity.

For a list of related mechanics titles, see final pages.
IUTAM Symposium on Elastohydrodynamics and Micro-elastohydrodynamics
Proceedings of the IUTAM Symposium held in Cardiff, UK, 1–3 September 2004

Edited by
R. W. SNIDLE
*University of Cardiff, U.K.*
and
H. P. EVANS
*University of Cardiff, U.K.*
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This volume contains the proceedings of the IUTAM Symposium on Elasto-
hydrodynamics and Microelastohydrodynamics held in Cardiff from 1st to
3rd September 2004. The symposium focused on theoretical, experimental and
computational issues in elastohydrodynamic lubrication (EHL) both in relation
to smooth surfaces and in situations where the film is of the same order or thin-
ner than the surface roughness (micro-EHL). The last IUTAM Symposium in
this general area of contact of deformable bodies was in 1974. The emphasis
in the Symposium was upon fundamental issues such as: solution methods;
lubricant rheological models, thermal effects; both low and high elastic mod-
ulus situations; human and replacement joints; fluid traction; dynamic effects,
asperity lubrication and the failure of lubrication; surface fatigue and thermal
distress under EHL conditions.

Delegates were welcomed to Wales and the Cardiff School of Engineer-
ing by the head of the School, Professor Hywel Thomas. The opening lec-
ture was given jointly by Professor Duncan Dowson, FRS and Sir Gordon
Higginson, the distinguished partnership which produced some of the most
important numerical solutions to the fundamental EHL problem which led to
the first reliable film thickness formula for isothermal, Newtonian conditions.
Their presentation reviewed the early developments in the subject and included
some fascinating details of the difficulties overcome and the scientific person-
alities involved.

A total of 33 presentations were given over a period of three days. A par-
ticularly thought-provoking presentation was that by Dr Scott Bair (Georgia
Institute of Technology, USA) on the ongoing challenges posed by lubricant
rheology. If we are to understand lubricant behaviour under the very severe
conditions of a real EHL contact we need to draw upon sources outside con-
ventional tribology such as molecular dynamics simulations, and pursue im-
proved techniques for high pressure measurements. Other papers were on state
of the art developments in rough surface lubrication, journal bearing solution
techniques, and natural and replacement human joints. The importance of ex-
perimental validation techniques was emphasised in a number of papers on thin
film methods.
This Symposium on the specialised topic of EHL was attended by leading experts in the field and was judged by the delegates to have succeeded in: attracting stimulating presentations on basic EHL research, encouraging lively and informative discussion, and identifying future goals for the subject. We hope that the Symposium has renewed interest in basic EHL and that a further IUTAM gathering in this field will be held in the future.

The meeting attracted 45 participants from ten countries (China, Czech Republic, Egypt, France, Germany, Italy, Japan, The Netherlands, USA, UK).

The International Scientific Committee responsible for the Symposium comprised the following:

R.W. Snidle (Chair, UK), L. Chang (USA), H.P. Evans (UK), M. Kaneta (Japan), T. Knudsen (Denmark), A.A. Lubrecht (France), F. Sadeghi (USA), C.H. Venner (The Netherlands), K. Walters, FRS (UK) and D.H. van Campen (The Netherlands).

The Committee gratefully acknowledges financial support for the Symposium from the International Union of Theoretical and Applied Mechanics, and the School of Engineering, Cardiff University. The smooth running of the Symposium owes much to the efforts of Cherrie Summers, Aderyn Reid, Chris Davies, Ajay Dhulipalla, Mark Holmes and Kayri Sharif. To all of them our sincere thanks.

R.W. Snidle
H.P. Evans
Cardiff, March 2005
IN MEMORIAM

Ian Lee-Prudhoe
1970–2003

Ian had infectious enthusiasm that came across as soon as people met him – his patience with people was remarkable. He was always a very hard worker and really loved his job at PCS Instruments. Everyone who came into contact with him, found him very approachable, and nothing was too much trouble for him.

His love of everything in his life, his family, friends, his work, his house, his numerous cars and bikes. He loved music, socialising, running (he ran two marathons and numerous half-marathons), helping others whenever possible, whether it be helping someone to move house, fixing a computer problem or just having a quiet chat over a pint. Somehow you got energy from him when he was around.

He was never sad, well he never showed it anyway, never argued with people, always let them have their say, but he was always honest.

Our thoughts are still with his family and close friends – you should all be very proud of what he achieved in such a short time.

He lived, he laughed, he loved, he left.