President's Introduction

In this Newsletter you will find details of all EUROMECH Colloquia and Conferences organized for 1998, and of some for which approval has already been given for 1999. I hope you will agree that the EUROMECH Council has provided an interesting, topical and varied set of scientific themes for its programme; my own feeling is that the topics on which Colloquia have been held in the past few years have been at least as novel, interesting and varied as at any time in the past.

We want to keep things that way, and I appeal to Members of EUROMECH to write in with suggestions for topics for future Colloquia and with suggestions of possible Chairmen (preferably themselves). 1998 will see a complete change of Officers. Bengt Lundberg, Ernst-August Müller and I all come to the end of our current periods of Membership of the Council, and we have all indicated that we do not wish to stand for election again, believing that the time has come for new faces. The Council at its meeting in 1997 in Liverpool decided to elect as President for 1998 Professor Hans Fernholz, as Secretary-General Dr Miroslav Okrouhlík, and as Treasurer Professor E.J. Hopfinger. All have accepted, and have obtained the agreement of their institutions to provide some measure of support for their activities.

Hans Fernholz has been a key figure in EUROMECH right from the beginning. He was the Secretary for EUROMECH Colloquium No. 1 "Boundary Layers and Jets along highly curved walls - Coanda effect", held in Berlin in April 1965 under the Chairmanship of Professor R. Wille; he was the Secretary of the EUROMECH Committee (as it then was) from 1972 to 1989. Chairman of the Fluid Mechanics Conference Committee from 1993 to the present, and a Member of the EUROMECH Committee or Council for almost the whole of the last thirty years. In that time he has also organized several EUROMECH Colloquia and presented papers at innumerable others. His tenure of the Presidency will fittingly mark more than thirty years of selfless and highly effective work for EUROMECH.

Dr Miroslav Okrouhlík is also no stranger to EUROMECH, as he has organized one very successful Colloquium, taken part in several others, provided a uniquely informative report to the Council on a EUROMECH Colloquium held in Nizhnii Novgorod in difficult circumstances, and has been one of the several Czech scientists who have made such vigorous efforts to develop EUROMECH activities in their own country and in Eastern Europe generally.
位:你会想在你所拥有的诺贝尔奖的基础上再添加哪些？

请认真填写以下申请表，并将您所有的资料寄至:

领导人:

申请日期:

邮编:

地址:

诺贝尔奖的组织:

申请人:

申请日期:

请附上您的简历和所有相关文件。
Reynolds Number Dependent Scaling vs. the Logarithmic Profile in Wall Turbulence: a Possible Resolution

G.I. Barenblatt and A.J. Chorin, University of California, Berkeley

Despite sixty years of active research in the theory of turbulent shear flow (including flow in a pipe), two conflicting "laws" for the distribution of the mean velocity \( \bar{u} \) coexist in the literature (see, e.g., Schlichting, 1960). The first is the scaling law,

\[ \phi = A \eta^\alpha \]  \hspace{1cm} (1)

where \( \phi \) is the dimensionless velocity, \( \eta \) is the dimensionless distance from the wall and \( A, \alpha \) are constants that are known to depend slightly on the Reynolds number \( Re \). The second is the "universal" Kármán-Prandtl law of the wall,

\[ \phi = \frac{1}{k} \ln \eta + B \]  \hspace{1cm} (2)

where \( k \) and \( B \) should be universal constants.

It used to be thought that the universal logarithmic profile (2) had a well-motivated theoretical derivation while the scaling law (1) was only an empirical correlation. More recently it was shwon in Barenblatt (1993) that both can be derived from equally well-defined though different assumptions. The difference between the laws (1) and (2) is fundamental: according to (2) the experimental points in the \( \phi = \ln \eta \) plane cluster on a single line, while if (1) holds the data lie on a family of curves parameterized by Reynolds number, thus filling an area in that plane.

In Barenblatt (1993) and Barenblatt & Prostokishin (1993) the following specific form of the scaling law was proposed:

\[ \phi = \left( \frac{1}{\sqrt{3}} \ln Re + \frac{5}{2} \right) \eta \left( \frac{3}{2 \eta \ln Re} \right) \]  \hspace{1cm} (3)

and an instructive correspondence to the data of Nikuradshe (1932) was found. The family of laws (3) has an envelope, and the data published by Nikuradshe happen to be very close to that envelope, so that the area-filling property of the scaling law could not be seen fully. In Barenblatt & Goldenfeld (1995) it was shown that only the logarithm of \( Re \) can enter the scaling law, as a consequence of the deep physical principle of asymptotic covariance.

The family of curves (3) was further analysed in Barenblatt & Chorin (1996) with the help of small viscosity asymptotics, originating from recent work on the statistical theory of turbulence which showed that the zero-viscosity limit is well-defined and that finite \( Re \) turbulence can be studied by expansion about the limit (Chorin, 1994). It was found that at large \( Re \) the curves described by (3) start near the envelope of the family, then veer off into a well-marked linear part.
I apologize for any inconvenience caused by these errors.

The contact address for ENSC 3 should be: 123 Main St, Anytown, USA

The telephone numbers and e-mail address for Prof. E. Walter should be as on
next page.

John, please send me a copy of the ACNS text without charge.

Can I ask you to forward my copy of the summary of the week's reading? I am interested in what you see as the main points of the paper. I have read the paper in full, but I think I could benefit from a second copy.

It is important to understand the following points. The proposed solution is to send a second, backed up copy of the paper to the correct address.

Figure 2: Velocity profile

Figure 3: Graph of velocity profile

Figure 4: Graph of velocity profile

Figure 5: Graph of velocity profile

By performing the appropriate calculations, the paper on 1996 advanced research.

The result is the following:

I: The equation for the...
Report of the Treasurer
(January 1st. to December 31st. 1996)

i) Income and Expenses

<table>
<thead>
<tr>
<th>Description</th>
<th>DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td></td>
</tr>
<tr>
<td>Membership fees (Treasurer)</td>
<td>25,824.97</td>
</tr>
<tr>
<td>Membership fees (Regional Treasurer, UK)</td>
<td>347.71</td>
</tr>
<tr>
<td>Interest on the current account (Treasurer)</td>
<td>48.51</td>
</tr>
<tr>
<td>Interest on the deposit account (Treasurer)</td>
<td>1,122.03</td>
</tr>
<tr>
<td>EUROMECH Colloquia (Treasurer)</td>
<td>15,123.05</td>
</tr>
<tr>
<td>EUROMECH Colloquia (Regional Treasurer, UK)</td>
<td>2,348.37</td>
</tr>
<tr>
<td>Expenses</td>
<td></td>
</tr>
<tr>
<td>Bank account charges and transfer charges</td>
<td>207.05</td>
</tr>
<tr>
<td>Postage stamps and office supplies (Treasurer)</td>
<td>2,808.31</td>
</tr>
<tr>
<td>Travelling costs (Council member from an Eastern country to Council meeting)</td>
<td>750.00</td>
</tr>
<tr>
<td>Administrative expenses (General Secretary)</td>
<td></td>
</tr>
<tr>
<td>(Council decision, Uppsala)</td>
<td>10,000.00</td>
</tr>
<tr>
<td>Bank charges, secretarial help and stamps (Regional Treasurer, Poland, 1994, 1995, 1996)</td>
<td>1235.05</td>
</tr>
<tr>
<td>Final balance for 2nd. European Fluid and Solid Mechanics Conferences (Warsaw and Genoa)</td>
<td>23,473.95</td>
</tr>
<tr>
<td>Support for Polish participants in EUROMECH Colloquia and Conferences (Regional Treasurer, Poland)</td>
<td>2,503.71</td>
</tr>
<tr>
<td>Into reserve</td>
<td>3,836.57</td>
</tr>
<tr>
<td></td>
<td>44,814.64</td>
</tr>
</tbody>
</table>

ii) Balance sheet

<table>
<thead>
<tr>
<th>Description</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Balances at January 1st., 1996</td>
<td></td>
</tr>
<tr>
<td>Treasurer</td>
<td>52,972.25</td>
</tr>
<tr>
<td>Regional Treasurer (UK)</td>
<td>199.03</td>
</tr>
<tr>
<td>Regional Treasurer (Poland)</td>
<td>6,774.41</td>
</tr>
<tr>
<td>Transferred to reserve 1996</td>
<td>3,836.57</td>
</tr>
<tr>
<td>Balances at December 31st., 1996</td>
<td>63,782.57</td>
</tr>
<tr>
<td>Treasurer</td>
<td>57,851.50</td>
</tr>
<tr>
<td>Regional Treasurer (UK)</td>
<td>2,895.11</td>
</tr>
<tr>
<td>Regional Treasurer (Poland)</td>
<td>3,038.65</td>
</tr>
<tr>
<td></td>
<td>63,782.57</td>
</tr>
</tbody>
</table>

Acknowledgements: The authors wish to thank Dr M.V.Zagarola for his kind permission to reproduce Figure 2. The first author also thanks the Miller Institute for Basic Research at Berkeley for its generous hospitality.

References:

---

**EUROMECH CONTACTS**

President: Prof. David G.Crighton,
Department of Applied Mathematics and Theoretical Physics (DAMTP),
University of Cambridge, Silver Street, Cambridge CB3 9EW, England.
e-mail: dgc@damtp.cam.ac.uk
Telephone: +44 1223 337 860. Fax: +44 1223 337 918 and 312 984

Secretary-General: Prof. Bengt Lundberg,
School of Engineering, Uppsala University,
Box 534, S-751 21 Uppsala, Sweden.
e-mail: bengt.lundberg@iuknium.uu.se
Telephone: +46 18 183 125. Fax: +46 18 183 122

Treasurer: Prof. Ernst-August Müller,
Direktor em. am Max-Planck-Institut für Stromungsforschung,
Bunsenstraße 10, D-37073 Göttingen, Germany.
e-mail: knueger@MSFD1.dnet.gwdg.de
Telephone: +49 551 5176 500. Fax: +49 551 5176 595

Journal Editor: Dr. John Finley,
Department of Aeronautics,
Imperial College of Science, Technology and Medicine,
Prince Consort Road, London SW7 2BY, UK.
e-mail: j.finley@ae.ic.ac.uk
Telephone: +44 171 594 5063. Fax: +44 171 584 8120
Instability, bifurcation and localisation in fracture of materials
Dr. G. Rousselier, Electricité de France, Dept MTCC, Site des Renardieres,
F-77818 Moret-sur-Loing Cédex, France
E-mail: gilles.rousselier@der.edf.gd.fr
Dr. A. Benallal, Cachan
10-12 May 1999, Paris, France

Strain localisation can be a precursor to fracture of materials. A great amount of work has been devoted to the description of this phenomenon. Depending on the constitutive behaviour, bifurcation and/or perturbation approaches can be used. Recent advances in the field and the links between the two approaches will be discussed. The effects of damage, thermal conduction, inertia, mesh size and non-local constitutive relations can be discussed, from a theoretical and physical as well as numerical point of view.

Coupled phenomena will also be considered: diffusion, stress corrosion, chemical reactions, porous solids. Contributions may concern metallic materials, concrete, soils, polymers etc.

Wind tunnel modelling of dispersion in environmental flows
Dr. Z. Janour, Institute of Thermomechanics, Dolejskova 5, CZ-182 00
Prague 8, Czech Republic
E-mail: janour@bivoj.it.cas.cz
Prof. A. Robins, Surrey, and Prof. M. Schatzmann, Hamburg
13-15 September 1999, Prague, the Czech Republic

A powerful source of information about the physics of all the phenomena and processes in the atmospheric boundary layer is provided by wind tunnel experiments. Experimental results are only then reliable if both the physical model and the measuring techniques used are adequate. The objective of the Colloquium is to bring together the community active in relevant experimental work and to discuss, assess and report on the state of the art in this field, define directions of future research and encourage wider collaboration between research institutions. The Colloquium will concentrate on the physical modelling of flow and dispersion in the natural environment. The topic includes flow and dispersion around buildings and structures (but excludes wind loading which is well catered for elsewhere), flow over complex terrain, etc., techniques and equipment used in their simulation and the means by which such simulations are tested and evaluated.

This colloquium will concentrate on recent developments and extensions in calculations of the hydrodynamic flows around a ship's hull, in calm water and in regular or irregular waves. The aim of the meeting will be to compare the various approaches available today and to show the more promising trends for the future. Engineers and researchers working in this domain will have the opportunity to encounter a range of varied approaches. The meeting will provide a fruitful opportunity for them to meet each other and exchange their experience of current research activities in the computation of hydrodynamic flows.

Biology and technology of walking
Prof. F. Pfeiffer, Lehrstuhl B für Mechanik, TU-München, D-80290
Munich, Germany
E-mail: Pfeiffer@ibm.mw.tu-muenchen.de
Prof. H. Cruse, Bielefeld
23-25 March 1998, Munich, Germany

Walking technologies are in rapid development, in part due to the fact that these technologies are increasingly influenced by biological findings. Nature has provided perfect models of walking kinematics and dynamics, walking control, adaptive and intelligent walking behaviour. Likewise, natural structures have evolved towards perfection. Engineers can learn from biology, which offers convincing solutions adapted to the tools of nature. Engineering also possesses a wide range of powerful design tools. An optimal combination of both approaches should result in new solutions and structures.

Scientists from both sides, biology and engineering, will be invited to discuss new findings and the possibility of transfers between the two disciplines.

Waves in two-phase flows
Prof. C. F. Delale, Department of Mechanical Engineering, Istanbul University, Avcilar Kampusu, 34850 Avcilar, Istanbul, Turkey
E-mail: gokcol@sariyer.cc.iitu.edu.tr
Prof. D. G. Crighton, Cambridge
27-30 April 1998, Istanbul, Turkey

The colloquium aims to bring together working specialists and active research groups from all over Europe to discuss advances made in recent years in wave characteristics in two-phase and/or two-component flows. Contributions describing waves in bulk media as well as surface waves will be considered. Selected topics include:

Waves in two-phase dispersed flow with non-equilibrium condensation and evaporation.
Waves in bubbly fluids.
Waves in dusty gases.
Waves in films or stratified systems.
Field in orthogonal spaces and applications. Photochemical reaction and bioisosterism.

Global fielding processes, multiphase reactions, and other issues in biology, biochemistry, and analytical chemistry. Biological mass transport, diffusion, and reactive transport in systems, including dynamic processes, enzymatic processes, and other finite static interactions. Development of efficient, accurate, and reliable dynamic interaction models. Techniques to show new expectations. Possible scope includes extensions to include new approaches and developments in chemical, physical, and biological processes and mechanisms. The emphasis will be placed on dynamic effects in the region of the measurement. The main purpose of this study is to employ advanced techniques to perform certain functions in a model system with orthogonal spaces and multidimensional interactions. The model will have a combination of a discrete orthogonal column decorated.

April 1994, Eger, Austria
Poster 1, Kerner, Ernst
E-mail: egg@egerg.cz

389. Physiologic flow and flow-through interactions
Residual stress effects on myocardial and collagen
Interactions on collagen and protein content of plasma
Nitrogen content in the heart and the support of collagen, electrolyte transfer
Are the myocardial interactions due to support of collagen, electrolyte transfer?
Process modeling

Notes to address the limitations of the model:
Production of abstract and application will be discussed. Specific points to be addressed are the limitations of the model in the development of specific models of tissue processes. The role of the model will be to identify the scope of the model in the development of fielding processes and applications. Photochemical reaction and bioisosterism.
386. *Dynamics of vibro-impact systems*
Prof. V. I. Babitsky, Department of Mechanical Engineering,
Loughborough University, Loughborough, Leicestershire LE11 3TU, UK
E-mail: V.I.Babitsky@lboro.ac.uk
15-18 September 1998, Loughborough, UK

Mechanical systems with multiple impact interactions have wide applications in engineering as the most intensive sources of mechanical influence on materials, structures and processes. At the same time, vibro-impact systems are used widely for the analysis of unfavourable processes in machine dynamics, vibration protection and structural mechanics.

Analysis of vibro-impact systems leads to the investigation of mathematical models with discontinuities and reveals their behaviour as strongly nonlinear. It includes combined resonances, synchronisation and pulling, bifurcations and chaos, excitation and interaction of space-coherent structure, shock waves and solitons.

The aim of the colloquium is to exchange information about up-to-date analytical, experimental and numerical approaches to the investigation of vibro-impact systems, new tendencies in vibro-impact excitation with the use of combined drive, electronic control, ultrasounds, opportunities of vibration control and protection with smart nonlinear structures, and to bring together the efforts of research and development specialists in applications of strongly nonlinear phenomena in engineering.

387. *Surface slicks and remote sensing of air-sea interactions*
Dr. N. H. Thomas, c/o Fluid Dynamics Research Centre,
Mathematics Institute, University of Warwick, Coventry CV4 7AL, UK
E-mail: nhFred@AOL.com
Dr. J. C. Scott, Winfrith
6-8 April 1998, Warwick, UK

Slicks are ubiquitous features of low-wind seascapes, amply manifested in EM remotely sensed images by passive and active methods at visible, microwave and radar wavelengths. Predominantly from biogenic sources in open oceans, supplemented by anthropogenic contamination in coastal waters, they play an important role in air-sea interactions. In virtue of elasticity associated with film pressure dependence on concentration, slicks amplify viscous dissipation in the surface microlayer and can thereby effectively inhibit waves up to cm scale or so. Localised reductions in roughness as patches and streaks provide the contrast features seen in remotely sensed images whilst extended regions of interest for their attenuation of momentum and gas exchange. Interest here focusses on image interpretation for hydrodynamic inferences, on wind-wave couplings in the presence of films, especially with nonlinear waves, and on surface constitutive formulations for nonlinear deformations and non-classical behaviour such as clathrate induction and persistence. Contributions offered on aspects such as environmental and climate implications will also be considered.

Nonlocal plasticity and non-local damage / fracture mechanics.
Internal length in physics - micromechanical aspects in geomaterials, metals and polymers.
Mathematical and computational models.
Nonlocal formulation of contact and friction problems.

379. *Aerodynamics and aeroacoustics of tracked high-speed ground transportation*
Prof. G. E. A. Meier, DLR, Bunsenstraße 10, D-37073 Göttingen, Germany
E-mail: G.E.A.Meier@dlr.de
Prof. H. Sockel, Vienna, and Prof. S. Loose, Göttingen
8-10 June 1998, Göttingen, Germany

The requirements for the next generation of high-speed trains, and the accelerating development of maglev vehicles, will demand much more understanding of aerodynamics and aero-acoustics than is required for present configurations. The cruising speed will rise into a range where additional aerodynamic problems will occur (e.g. compressibility), and the level of aerodynamically induced acoustic emissions will grow to critical values, well above those resulting from wheel/rail noise. In particular, unsteady phenomena must be taken into account. Rapid development of measurement techniques and numerical simulations over the last decade offers new possibilities for flow field analysis of non-stationary flows. The colloquium should therefore deal with the following main topics:

Effects of non-stationary flow fields on high-speed ground transportation (e.g. vortex separation, lift and side-forces, tunnel entrance and passage effects).
Numerical and experimental simulation methods, measurement techniques and facilities for non-stationary flow field analysis (e.g. particle image velocimetry, pressure sensitive paint, non-stationary numerical codes).
The possibility of active and passive flow control for reduction of non-stationary aerodynamic loads (e.g. shaping, passive ventilation).

380. *Laminar-turbulent transition mechanisms and prediction*
Dr. U. Ch. Dallmann, DLR, Institute of Fluid Mechanics, Bunsenstraße 10,
D-37073, Göttingen, Germany
E-mail: uwe.dallmann@dlr.de
Prof. D. S. Henningsson, Stockholm, and Dr. H. Bippes, Göttingen
14-17 September 1998, Göttingen, Germany

Laminar-turbulent transition is one of the key problems in fluid dynamics. Transition prediction tools are still far from being non-empirical due to the lack of understanding of many nonlinear characteristics of the breakdown to turbulence and the boundary layers' receptivity to external disturbances such as
changes and new effects. For advanced computing models, simulation and data analysis techniques will be on exhibit. The conference will focus on recent developments in the field of simulation and data analysis, with particular emphasis on the integration of these techniques in various application domains. The conference also aims to foster research development in these areas through the exchange of ideas and the presentation of new research findings.

The conference will feature a range of keynote speeches, panel discussions, and workshops on the latest developments in simulation and data analysis. Attendees will have the opportunity to network with experts from various fields and to discuss the latest research and developments in the field.

For further information and to register, please visit the conference website. We look forward to seeing you at the conference and to sharing the latest advancements in simulation and data analysis.