International Union of Theoretical and Applied Mechanics : report 2003

REPORT 2003

INTERNATIONAL UNION OF THEORETICAL AND
APPLIED MECHANICS

REPORT 2003

Eindhoven University of Technology
THE NETHERLANDS

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Professor J. Salencon (France)		(2000)

Secretariat

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Past Officers

Elected	*President*	*Vice-President*	*Treasurer*	*Secretary*
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1952	H.L. Dryden (USA)	J. Péres (France)	G. Temple (UK)	F.A. v. d. Dungen (Belgium)
1956	F.K.G. Odqvist (Sweden)	H.L. Dryden (USA)	G. Temple (UK)	M. Roy (France)
1960	G. Temple (UK)	F.K.G. Odqvist (Sweden)	W.T. Koiter (Netherlands)	M. Roy (France)
1964	M. Roy (France)	G. Temple (UK)	W.T. Koiter (Netherlands)	H. Görtler (Germany)
1968	W.T. Koiter (Netherlands)	M. Roy (France)	H. Görtler (Germany)	F.I. Niordson (Denmark)
1972	H. Görtler (Germany)	W.T. Koiter (Netherlands)	D.C. Drucker (USA)	F.I. Niordson (Denmark)

1976	F.I. Niordson (Denmark)	H. Görtler (Germany)	D.C. Drucker (USA)	J. Hult (Sweden)
1980	D.C. Drucker (USA)	F.I. Niordson (Denmark)	E. Becker (Germany)	J. Hult (Sweden)
1984	J. Lighthill (UK)	D.C. Drucker (USA)	L.v. Wijngaarden (Netherlands)	W. Schiehlen (Germany)
1988	P. Germain (France)	J. Lighthill (UK)	L.v. Wijngaarden (Netherlands)	W. Schiehlen (Germany)
1992	L.v. Wijngaarden (Netherlands)	P. Germain (France)	B.A. Boley (USA)	F. Ziegler (Austria)
1996	W. Schiehlen (Germany)	L.v. Wijngaarden (Netherlands)	L.B. Freund (USA)	M.A. Hayes (Ireland)

Past Congress Presidents

Nr.	*Year*	*Place*	*Congress-President*
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2	1926	Zürich, Switzerland	E. Meissner
3	1930	Stockholm, Sweden	A.F. Enström
4	1934	Cambridge, UK	C.E. Inglis
5	1938	Cambridge, USA	K.T. Compton
6	1946	Paris, France	H. Villat
7	1948	London, UK	R.V. Southwell
8	1952	Istanbul, Turkey	K. Erim
9	1956	Brussels, Belgium	F.H. van den Dungen
10	1960	Stresa, Italy	G. Colonnetti
11	1964	Munich, Germany	H. Görtler
12	1968	Stanford, USA	N.J. Hoff
13	1972	Moscow, USSR	N.I. Muskhelishvili
14	1976	Delft, The Netherlands	W.T. Koiter
15	1980	Toronto, Canada	F.P.J. Rimrott
16	1984	Lyngby, Denmark	F. Niordson
17	1988	Grenoble, France	P. Germain and M. Piau
18	1992	Haifa, Israel	J. Singer
19	1996	Kyoto, Japan	T. Tatsumi
20	2000	Chicago, USA	H. Aref

Adhering Organizations

Argentina (1959)
Asociacion Argentina de Mecanica Computacional
Güemes 3450, 3000 Santa Fe
President/Chair: Dr. S. R. (Sergio) Idelsohn
Contact: Dr. S. R. (Sergio) Idelsohn
Representatives in IUTAM: Dr. S. R. (Sergio) Idelsohn

Australia (1964)
The Australian National Committee for Theoretical and Applied Mechanics
of the Australian Academy of Sciences
GPO Box 783, Canberra City, ACT 260
President/Chair: Prof. N. (Nhan) Phan-Thien
Contact: Prof. N. (Nhan) Phan-Thien
Representatives in IUTAM: Prof. N. (Nhan) Phan-Thien, Prof. R.I. (Roger) Tanner

Austria (1951)
Austrian National Committee for Theoretical and Applied Mechanics
of the Austrian Academy of Sciences
Dr.-Ignaz-Seipel-Platz 2, A-1010 Wien
President/Chair: Prof. H. (Hans) Troger
Contact: Prof. A. (Alfred) Kluwick
Representatives in IUTAM: Prof. A. (Alfred) Kluwick

Belgium (1949)
The National Committee for Theoretical and Applied Mechanics
of the Class of Sciences of the Royal Belgian Academy
Hertogsstraat 1, B-1000 Brussels
President/Chair: Prof. D.V.H. (Dirk) Vandepitte
Secretary (-General): Prof. Roland Decuypere
Contact: Prof. R. (Roland) Keunings
Representatives in IUTAM: Prof. R. (Roland) Keunings, Prof. A.H. (Albert) Cardon,
Prof. D.V.H. (Dirk) Vandepitte

Brazil (1982)
Associação Brasileira de Ciéncias Mecânicas
Avenida Rio Branco 124/18° andar, 20040-001 Rio de Janeiro
President/Chair: Prof. L. (Leonardo) Goldstein Junior
Contact: Prof. L. (Luiz) Bevilacqua
Representatives in IUTAM: Prof. L. (Luiz) Bevilacqua

Bulgaria (1969)
Bulgarian National Committee on Theoretical and Applied Mechanics
of the Bulgarian Academy of Sciences
1, 15 novembre str. BG-1040 Sofia
President/Chair: Prof. A. (Anguel) Baltov
Secretary (-General): Dr. E. (Evtim) Ttoshev
Contact: Prof. A. (Anguel) Baltov
Representatives in IUTAM: Prof. H.N. (Hristo) Kuyumdzhiev

Canada (1963)
The National Research Council of Canada,
Montreal Road, Ottawa, Canada K1A OR6
National Committee for IUTAM
President/Chair: Prof. S.B. (Stuart) Savage
Contact: Prof. S.B. (Stuart) Savage
Representatives in IUTAM: Prof. D. (David) Weaver, Prof. F.P.J. (Friedrich) Rimrott (deceased 25 June, 2003), Prof. S.B. (Stuart) Savage, Prof. J. (Jorn) Hansen

Chile (1996)
The Chile National Committee on Theoretical and Applied Mechanics
Academia Chilena de Ciencias
Almirante Montt 454, Santiago, Chile
President/Chair: Dr. F. (Francisco) Rothhammer Engel
Secretary (-General): Dr. T. (Tito) Ureta Aravena
Contact: Prof. F. (Fernando) Lund
Representatives in IUTAM: Prof. F. (Fernando) Lund

China (1980)
The Chinese Society of Theoretical and Applied Mechanics
15 Zhong Guan Cun Road, Beijing 100080
President/Chair: Prof. E. (Er-jie) Cui
Contact: Prof. W. (Wei) Yang
Representatives in IUTAM: Prof. Y. (Yi-long) Bai, Prof. E. (Er-jie) Cui, Prof. W. (Wei) Yang, Prof. Z. (Zhemin) Zheng

China-Hong Kong (1996)
The Hong Kong Society of Theoretical and Applied Mechanics (HKSTAM)
Department of Building & Construction, City University of Hong Kong Kowloon Tong, Kowloon, HK
President/Chair: Prof. A.Y.T. (Andrew) Leung
Secretary (-General): Dr. J.W.Z. (Jane) Lu
Contact: Dr. J.W.Z. (Jane) Lu
Representatives in IUTAM: Prof. T.X. (Tongxi) Yu

China-Taipei (1980)
The Society of Theoretical and Applied Mechanics
Department of Hydraulic & Ocean Engineering, National Cheng Kung University, Tainan, Taiwan 701
President/Chair: Prof. S.-H. (Shan-Hwei) Ou
Secretary (-General): Prof. T.-W. (Tai-Wen) Hsu
Contact: Prof. T.-W. (Tai-Wen) Hsu
Representatives in IUTAM: Prof. W.-H. (Wen-Hwa) Chen, Prof. C.-S. (Chau-Shioung) Yeh

Croatia (1994)
Croatian Society of Mechanics
Ivana Lucica 5, HR-10000 Zagreb, Croatia.
President/Chair: Prof. F. (Franjo) Matejicek
Contact: Prof. I. (Ivo) Alfirevic
Representatives in IUTAM: Prof. I. (Ivo) Alfirevic

Czech Republic (1993/1949)
The National Committee of Theoretical and Applied Mechanics
Academy of Sciences of the Czech Republic, Institute of Thermomechanics, Dolejškova 5, CZ-18200 Prague 8
President/Chair: Dr. R. (Rudolf) Dvorák
Secretary (-General): Prof. M. (Miloslav) Okrouhlík
Contact: Dr. R. (Rudolf) Dvorák
Representatives in IUTAM: Dr. R. (Rudolf) Dvorák

Denmark (1949)
National Committee for Theoretical & Applied Mechanics,
The Royal Danish Academy of Sciences and Letters, H.C. Andersens Boulevard 35, DK-1553 Copenhagen V.
President/Chair: Prof. B. Munk Olsen
Secretary (-General): Prof. Ole Hansen
Contact: Prof. N. (Niels) Olhoff
Representatives in IUTAM: Prof. N. (Niels) Olhoff, Prof. J.N. (Jens Nørkær) Sørensen

Egypt (1976)
Academy of Scientific Research and Technology
Egyptian Committee of Theoretical and Applied Mechanics 101 Kasr El Eini Street, Cairo, Egypt.
President/Chair: Prof. M.K. (Mohamed) Ismail
Secretary (-General): Prof. Z.Z. Momeh
Contact: Prof. M.K. (Mohamed) Ismail
Representatives in IUTAM: Prof. M.K. (Mohamed) Ismail

Estonia (1992)
Estonian Committee for Mechanics,
Akadeemia tee 21, EE-12618 Tallinn
President/Chair: Prof. J. (Juri) Engelbrecht
Contact: Prof. J. (Juri) Engelbrecht
Representatives in IUTAM: Prof. J. (Juri) Engelbrecht

Finland (1952)
The Finnish National Committee on Mechanics
Helsinki University of Technology, P.O.Box 4100, FIN-02015 HUT, Finland
President/Chair: Prof. M. (Mauri) Määttänen
Secretary (-General): Prof. J. (Juha) Paavola
Contact: Prof. M. (Mauri) Määttänen
Representatives in IUTAM: Prof. M. (Mauri) Määttänen, Prof. J. (Juha) Paavola

France (1949)
Comité National Français de Mécanique, Académie des Sciences
23, quai Conti, F-75006 Paris
President/Chair: Prof. G. (Gérard) Iooss
Secretary (-General): Prof. Olivier Maisonneuve
Contact: Prof. G. (Gérard) Iooss
Representatives in IUTAM: Prof. D. (Dominique) Barthès-Biesel,
Prof. P. (Pierre) Suquet, Prof. S. (Stephane) Zaleski, Prof. A. (Andre) Zaoui

Georgia (2000)
National Committee of Theoretical and Applied Mechanics
I. Vekua Institute of Applied Mathematics of Tbilisi State University, 2 University Str.
Tbilisi 0143
President/Chair: Prof. G. (George) Jaiani
Secretary (-General): Prof. G. Kipiani
Contact: Prof. G. (George) Jaiani
Representatives in IUTAM: Prof. G. (George) Jaiani

Germany (1950)
Deutsches Komitee für Mechanik (DEKOMECH)
Lehrstuhl für Technische Mechanik, Universität Erlangen-Nürnberg, Egerlandstraße 5,
D-91058 Erlangen
President/Chair: Prof. G.R. (Günther) Kuhn
Secretary (-General): Prof. P. (Paul) Steinmann
Contact: Prof. P. (Paul) Steinmann
Representatives in IUTAM: Prof. U. (Ulrich) Gabbert, Prof. C. (Christian) Miehe,
Prof. W. (Wolfgang) Schröder, Prof. A. (André) Thess

Greece (1979)
Hellenic Society for Theoretical and Applied Mechanics
National Technical University of Athens, Laboratory of Steel Structures,
42 Patission street, GR-10682 Athens
President/Chair: Prof. A.N. (Anthony) Kounadis
Secretary (-General): Prof. D.E. (D.) Beskos
Contact: Prof. D.E. (D.) Beskos
Representatives in IUTAM: Prof. A.N. (Anthony) Kounadis

Hungary (1948)
Hungarian National Committee for IUTAM
Department of Structural Mechanics, Budapest University of Technology and Economics, Müegyetem rkp. 3, H-1521 Budapest
President/Chair: Prof. S. (Sandor) Kaliszky
Secretary (-General): Prof. G. (Gábor) Stépán
Contact: Prof. S. (Sandor) Kaliszky
Representatives in IUTAM: Prof. S. (Sandor) Kaliszky

India (1950)
National Committee for Theoretical and Applied Mechanics of the Indian National Science Academy
Bahadur Shah Zafar Marg, New Delhi - 110 002
President/Chair: Prof. N.K. (Narinder) Gupta
Contact: Prof. N.K. (Narinder) Gupta
Representatives in IUTAM: Prof. G. (Gautam) Biswas, Prof. S.M. (Suresh) Deshpande, Prof. N.K. (Narinder) Gupta

Ireland (1984)
Irish National Committee for Theoretical and Applied Mechanics
Royal Irish Academy, 19 Dawson Street, Dublin 2
President/Chair: Prof. P.E. (Padraic) O'Donoghue
Secretary (-General): Dr. J.J. (James) Grannell
Contact: Prof. P.E. (Padraic) O'Donoghue
Representatives in IUTAM: Prof. P.E. (Padraic) O'Donoghue

Israel (1950)
The Israel Society of Theoretical and Applied Mechanics
Dept. of Mechanical Engineering, Technion-Israel Institute of Technology, Haifa 32000
President/Chair: Prof. M.B. (Miles) Rubin
Contact: Prof. S.R. (Sol) Bodner
Representatives in IUTAM: Prof. I. (Isaac) Goldhirsch, Prof. M.B. (Miles) Rubin

Italy (1949)
Associazione Italiana di Meccanica Teorica ed Applicata
Piazza Leonardo da Vinci 32, I-20133 Milano
President/Chair: Prof. A. (Angelo) Morro
Secretary (-General): Prof. C. (Carlo) Cinquini
Contact: Prof. A. (Angelo) Morro
Representatives in IUTAM: Prof. C. (Carlo) Cercignani, Prof. G. (Giulio) Maier, Prof. P. (Paolo) Podio-Guidugli, Prof. F. (Furio) Vatta

Japan (1951)
The National Committee for Theoretical and Applied Mechanics
Science Council of Japan, 7- 22-34 Roppongi, Minato-ku, Tokyo 106-8555
President/Chair: Prof. K. (Koji) Uetani
Contact: Prof. T. (Tsutomu) Kambe
Representatives in IUTAM: Prof. T. (Tsutomu) Kambe, Prof. H. (Hiroshi) Kitagawa, Prof. T. (Toshio) Kobayashi, Prof. E. (Eiichi) Watanabe

Republic of Korea (1989)
Korean Society of Theoretical and Applied Mechanics
Department of Aerospace Engineering, Seoul National University, Seoul 151-742
President/Chair: Prof. J.Y. (Jung Yul) Yoo
Secretary (-General): Prof. S.J. (Seung Jo) Kim
Contact: Prof. J.Y. (Jung Yul) Yoo
Representatives in IUTAM: Prof. J.Y. (Jung Yul) Yoo

Latvia (1992)
Latvian National Committee for Mechanics
Latvian Academy of Sciences, Akademijas laukums 1, Riga LV-1524
President/Chair: Prof. V. (Vitauts) Tamuzs
Contact: Prof. V. (Vitauts) Tamuzs
Representatives in IUTAM: Prof. V. (Vitauts) Tamuzs

Morocco (1998)
Société Marocaine des Sciences Mécaniques
Madinat Al lrfane, Rabat Institut, Rabat
President/Chair: Prof. J.K. (Khalid) Naciri
Contact: Prof. M. (Mohamed) Belhaq
Representatives in IUTAM: Prof. M. (Mohamed) Belhaq

Netherlands (1952)
Netherlands Mechanics Committee
c/o Eindhoven University of Technology, Department of Mechanical Engineering,
P.O. Box 513, NL 5600 MB Eindhoven.
President/Chair: Prof. D.H. (Dick) van Campen
Contact: Prof. D.H. (Dick) van Campen
Representatives in IUTAM: Prof. R (René) de Borst, Prof. D.H. (Dick) van Campen, Prof. A.A. (Anton) van Steenhoven

New Zealand (1979)
The Royal Society of New Zealand, Committee on Mathematical & Information Sciences
P.O. Box 598, Wellington
President/Chair: Dr. Jim Watson
Secretary (-General): Dr. S.C. Thompson
Contact: Dr. G. (Graham) Weir
Representatives in IUTAM: Dr. G. (Graham) Weir

Norway (1949)
National Committee on Theoretical and Applied Mechanics
Norwegian Acad. Sciences and Letters, Dept. of Maths, University of Oslo,
P.O.Box 1053, Blindern, N-0316 Oslo 3
President/Chair: Prof. B.N. (Bjorn) Gjevik
Contact: Prof. B.N. (Bjorn) Gjevik
Representatives in IUTAM: Prof. B.N. (Bjorn) Gjevik

Poland (1952)
Committee for Mechanics of the Polish Academy of Sciences
ul. Swietokrzyska 21, PL-00 049 Warszawa
President/Chair: Prof. A. (Andrzej) Styczek
Contact: Prof. W. (Witold) Gutkowski
Representatives in IUTAM: Prof. W. (Witold) Gutkowski, Prof. G. (Gwidon) Szefer

Portugal (1968)
Portuguese Society of Theoretical, Applied and Computational Mechanics
Laboratorio Nacional de Engenharia Civil, Avenida do Brasil 101, 1700-066 Lisboa
President/Chair: Prof. C.A. (Carlos) Mota Soares
Contact: Prof. J. A. C. (João) Martins
Representatives in IUTAM: Prof. J. A. C. (João) Martins

Romania (1956)
Romanian Academy, Department of Mathematics, Romanian National Committee of Theoretical and Applied Mechanics
Calea Victoriei 125, 71102 Bucharest, Romania
President/Chair: Prof. N.D. (Nicolaie) Cristescu
Secretary (-General): Dr. G. (Gabriela) Marinoschi
Contact: Prof. N.D. (Nicolaie) Cristescu
Representatives in IUTAM: Prof. N.D. (Nicolaie) Cristescu

Russia (1992/1956)
Russian National Committee on Theoretical and Applied Mechanics
Prospekt Vernadskogo 101 : 1 , Moscow 119526
President/Chair: Prof. G.G. (Gorimir) Chernyi
Secretary (-General): Prof. G.K. (Gleb) Mikhailov
Contact: Prof. G.K. (Gleb) Mikhailov
Representatives in IUTAM: Prof. G.G. (Gorimir) Chernyi, Prof. D.M. (Dmitry) Klimov, Prof. G.K. (Gleb) Mikhailov, Prof. N.F. (Nikita) Morozov

Saudi Arabia (1988)
Directorate of Technology and International Cooperation
P.O. Box 6086, Riyadh 11442
President/Chair: Dr. S.A. (Saleh) Al-Athel
Contact: Mr. F.S. (Fahad) Huraib
Representatives in IUTAM: Dr. S.A. (Saleh) Al-Athel

Serbia and Montenegro (2002/1952)
Yugoslav Society of Mechanics
Fac. of Mechanical Engineering, University of Belgrade, 27. Marta 80,
YU-11120 Belgrade
President/Chair: Prof. D.D. (Dobroslav) Ruzic
Secretary (-General): Prof. S.V. (Stanko) Brcic
Contact: Prof. D.D. (Dobroslav) Ruzic
Representatives in IUTAM: Prof. D.D. (Dobroslav) Ruzic

Slovakia (1993)
The Slovak Society for Mechanics
Council of Scientific Societies, Stefánikova 49, SK-811 04 Bratislava
President/Chair: Prof. J. (Jozef) Brilla
Contact: Prof. J. (Jozef) Brilla
Representatives in IUTAM: Prof. J. (Jozef) Brilla

Slovenia (1994)
Slovene Mechanics Society, Faculty of Mechanical Engineering
University of Maribor, Smetanova 17, 2000 Maribor
President/Chair: Prof. L. (Leopold) Skerget
Secretary (-General): Prof. J. (Jure) Marn
Contact: Prof. J. (Jure) Marn
Representatives in IUTAM: Prof. L. (Leopold) Skerget

South Africa (1994)
National Research Foundation (NRF), Association for Theoretical and Applied Mechanics (SAAM)
South African ICSU Secretariat, P.O. Box 2600, Pretoria 0001
President/Chair: Dr. I. (Igle) Gledhill
Contact: Prof. C.G. (Charl) du Toit
Representatives in IUTAM: Prof. C.G. (Charl) du Toit

Spain (1950)
Instituto Nacional de Tecnica Aeroespacial
Carretera de Ajalvir km. 4,00, Torrejón de Ardoz, 28850 Madrid
Contact: Mr. A. (Angel) Moratilla
Representatives in IUTAM: Mr. A. (Angel) Moratilla

Sweden (1950)
Swedish National Committee for Mechanics
Chalmers University of Technology, SE-412 96 Gothenburg
President/Chair: Prof. L (Lennart) Josefson
Secretary (-General): Prof. L. (Lars) Davidson
Contact: Prof. L. (Lars) Davidson
Representatives in IUTAM: Prof. A. (Anders) Boström, Prof. B. (Bengt) Lundberg, Prof. B. (Bertil) Storåkers

Switzerland (1950)
Board of the Federal Institutes of Technology (Rat der Eidgenössischen Technischen Hochschulen)
ETH-Zentrum, CH-8092 Zürich
President/Chair: Prof. F. (Francis) Waldvogel
Secretary (-General): Dr. S. (Sebastian) Brändli
Contact: Prof. P.A. (Peter) Monkewitz
Representatives in IUTAM: Prof. J. (Jürg) Dual, Prof. P.A. (Peter) Monkewitz

Turkey (1977)
Turkish National Committee of Theoretical and Applied Mechanics
Istanbul Teknik Üniversitesi, Fen-Edebiyat Fakültesi, Maslak 80626 Istanbul
President/Chair: Prof. Y. (Yalcin) Aköz
Secretary (-General): Prof. M.A. (Mehmet Ali) Tasdemir
Contact: Prof. M.A. (Mehmet Ali) Tasdemir
Representatives in IUTAM: Prof. E.S. (Erdogan) Suhubi

UK (1948)
The Royal Society, UK Panel for IUTAM
6 Carlton House Terrace, London SW1Y 5AG
President/Chair: Prof. P.W. (Peter) Carpenter
Secretary (-General): Prof. B.L. (Bhushan) Karihaloo
Contact: Prof. B.L. (Bhushan) Karihaloo
Representatives in IUTAM: Prof. P.W. (Peter) Carpenter, Prof. B.L. (Bhushan) Karihaloo, Prof. N. (Nigel) Peake, Prof. T.J. (Timothy) Pedley

Ukraine (1995)
National Committee of Ukraine on Theoretical and Applied Mechanics
S.P.Timoshenko Institute of Mechanics, 3 Nesterov Str. Kyiv 03680
President/Chair: Prof. A.N. (Alexandr) Guz
Secretary (-General): Prof. J.J. (Jeremiah) Rushchitsky
Contact: Prof. J.J. (Jeremiah) Rushchitsky
Representatives in IUTAM: Prof. A.N. (Alexandr) Guz

USA (1949)
The U.S. National Committee on Theoretical and Applied Mechanics
The National Academies, 500 Fifth Street NW, Washington, DC 20001
President/Chair: Prof. W.G. (Wolfgang) Knauss
Secretary (-General): Prof. C.T. (Carl) Herakovich
Contact: Prof. C.T. (Carl) Herakovich
Representatives in IUTAM: Prof. H. (Hassan) Aref, Prof. T. (Ted) Belytschko, Prof. C.T. (Carl) Herakovich, Prof. W.G. (Wolfgang) Knauss, Prof. L.G. (Gary) Leal

Viet Nam (1990)
Vietnamese Association of Mechanics (VAM)
Hoi Co Hoc Vietnam, 264 Doi Can, Hanoi
President/Chair: Prof. N. (Nguyen) Van Dao
Secretary (-General): Prof. Do Sanh
Contact: Prof. N. (Nguyen) Van Dao
Representatives in IUTAM: Prof. N. (Nguyen) Van Dao

Affiliated Organizations

CISM (1970)
International Centre for Mechanical Sciences
Palazzo del Torso, Piazza Garibaldi, I-33100 Udine, Italy
President/Chair: Avv. Vinicio Turello
Secretary (-General): Prof. B. Schrefler
Contact: vacancy
Representative of CISM in IUTAM: vacancy
Representative of IUTAM in CISM: Prof. L. (Leen) van Wijngaarden
Representative of CISM in IUTAM-CC: Prof. M.G. (Manuel) Velarde

ICHMT (1972)
International Centre for Heat and Mass Transfer
Mechanical Engineering Dept. Middle East Technical University, 06531 Ankara, Turkey
President/Chair: Prof. Maurizio Cumo
Secretary (-General): Prof. F. Arinc
Contact: Prof. F. (Faruk) Arinc
Representative of ICHMT in IUTAM: Prof. F. (Faruk) Arinc
Representative of IUTAM in ICHMT: Dr. R. (Rudolf) Dvorák

ICR (1974)
International Committee on Rheology
Prof. D.F. James, Dept. of Mechanical and Industrial Engineering, University of Toronto, Toronto, Ont M5S 3G8, Canada
President/Chair: Prof. K. Walters
Secretary (-General): Prof. D.F. James
Contact: Prof. D.F. (David) James
Representative of ICR in IUTAM: Prof. L.G. (Gary) Leal
Representative of IUTAM in ICR: Prof. F. (Frithiof) Niordson
Representative of ICR in IUTAM-CC: Prof. L.G. (Gary) Leal

IAVSD (1977)
International Association for Vehicle System Dynamics
Prof. Michael Valásek, Department of Mechanics, Faculty of Mechanical Engineering, Czech International University in Prague, Kalovo Nanesti 13, 121 35 Praha 2, Czech Republic
Secretary (-General): Prof. M. Valásek
Contact: Prof. M. (Michael) Valásek
Representative of IAVSD in IUTAM: Prof. P. (Peter) Lugner
Representative of IUTAM in IAVSD: Prof. W. (Werner) Schiehlen
Representative of IAVSD in IUTAM-CC: Prof. P. (Peter) Lugner

EUROMECH (1978)
European Mechanics Society
Institute of Thermomechanics, Dolejskova 5, Prague 8 Czech Republic
President/Chair: Prof. P. Huerre
Secretary (-General): Prof. M. Okrouhlik
Contact: Prof. M. (Miloslav) Okrouhlík
Representative of EUROMECH in IUTAM: Prof. P. (Patrick) Huerre
Representative of IUTAM in EUROMECH: Prof. W. (Werner) Schiehlen

ISIMM (1978)
International Society for the Interaction of Mechanics and Mathematics
Prof. K. Wilmanski, Weierstrass Institute, Berlin, Germany
President/Chair: Prof. M. Pitteri
Secretary (-General): Prof. A. Montanaro
Contact: Prof. K. (Krzysztof) Wilmanski
Representative of ISIMM in IUTAM: Prof. M.A. (Michael) Hayes
Representative of IUTAM in ISIMM: Prof. G. (Gérard) Iooss
Representative of ISIMM in IUTAM-CC: Prof. M.A. (Michael) Hayes

ICF (1978)
International Congress on Fracture
Prof. T. Yokobori, School of Science and Engineering, Teikyo University, Toyosatodai 1-1, Utsunomiya, 320, Japan
Founder President: Prof. T. Yokobori
President/Chair: Prof. Yiu-Wing Mai
Secretary (-General): Prof. A.T. Yokobori, Jr.
Contact: Prof. B.L. (Bhushan) Karihaloo
Representative of ICF in IUTAM: Prof. B.L. (Bhushan) Karihaloo
Representative of IUTAM in ICF: Prof. J.B. (Jean-Baptiste) Leblond
Representative of ICF in IUTAM-CC: Prof. B.L. (Bhushan) Karihaloo

ICM (1982)
International Congress on Mechanical Behaviour of Materials,
Prof. F. Ellyin, Dept. of Mechanical Engineering, University of Alberta, Edmonton, Canada T6G 2G8
President/Chair: Prof. F. Ellyin
Secretary (-General): Dr. J. Wolodko
Contact: Prof. F. (Fernand) Ellyin
Representative of ICM in IUTAM: Prof. F. (Fernand) Ellyin
Representative of IUTAM in ICM: Prof. S.R. (Sol) Bodner
Representative of ICM in IUTAM-CC: Prof. F. (Fernand) Ellyin

AFMC (1982)
Asian Fluid Mechanics Committee
Prof. Masaru Kiya, President Kushiro National College of Technology, Kushiro 084-0916, Japan
President/Chair: Prof. Masaru Kiya
Contact: Prof. M. (Masaru) Kiya
Representative of AFMC in IUTAM: Prof. M. (Masaru) Kiya
Representative of IUTAM in AFMC: Prof. I. (Isao) Imai

IACM (1984)
International Association for Computational Mechanics
Prof. E. Oñate, International Center for Numerical Methods in Engineering, Edificio C-1, Gran Capitán s/n, E-08034 Barcelona, Spain
President/Chair: Prof. E. Oñate
Secretary (-General): Prof. S. Idelsohn
Contact: Dr. S. R. (Sergio) Idelsohn
Representative of IACM in IUTAM: Prof. J.T. (John Tinsley) Oden
Representative of IUTAM in IACM: Prof. E.R. (Eduardo) de Arantes e Oliveira
Representative of IACM in IUTAM-CC: Prof. T. (Ted) Belytschko

CACOFD (1992)
Caribbean Congress of Fluid Dynamics
c/o The Department of Math and Computer Science, The University of the West Indies, St. Augustine, Trinidad, West Indies
President/Chair: Prof. F. Malpica
Secretary (-General): Dr. W. Mellowes
Contact: Prof. H. (Harold) Ramkissoon
Representative of CACOFD in IUTAM: Prof. H. (Harold) Ramkissoon
Representative of IUTAM in CACOFD: Prof. D.D. (Daniel) Joseph

IABEM (1994)
International Association for Boundary Element Methods
Prof. M. Bonnet, CNRS et École Polytechnique, Laboratoire de Mecanique des Solides, École Polytechnique, 91128 Palaiseau cedex, France
President/Chair: Prof. M. Bonnet
Secretary (-General): Prof. R. Callego
Contact: Prof. M. (Marc) Bonnet
Representative of IABEM in IUTAM: Prof. M. (Marc) Bonnet
Representative of IUTAM in IABEM: Prof. G.R. (Günther) Kuhn

ISSMO (1996)
International Society for Structural and Multidisciplinary Optimization
Prof. G. Rozvany, Department of Structural Mechanics, Budapest University of Technology and Economics, Muegyetem rkp. 3, Kmf 35, H-1521 Budapest, Hungary
President/Chair: Prof. M.P. Bendsøe
Secretary (-General): Prof. B.M. Kwak
Contact: Prof. N. (Niels) Olhoff
Representative of ISSMO in IUTAM: Prof. G. (George) Rozvany
Representative of IUTAM in ISSMO: Prof. N. (Niels) Olhoff
Representative of ISSMO in IUTAM-CC: Prof. M.P (Martin) Bendsøe

HYDROMAG (1996)
International Association for Hydromagnetic Phenomena and Applications
Prof. S. Asai, Dept of Mat. Sciences, University of Nagoya, Furo-cho, Chikusa-ku, Nagoya 464-0, Japan
President/Chair: Prof. R. Moreau
Secretary (-General): Prof. A. Thess
Contact: Prof. A. (André) Thess
Representative of HYDROMAG in IUTAM: Prof. R. (René) Moreau
Representative of IUTAM in HYDROMAG: Prof. H.K. (Keith) Moffatt
Representative of HYDROMAG in IUTAM-CC: Prof. R. (René) Moreau

IIAV (1997)
International Institute of Acoustics and Vibration
Prof M. J. Crocker. Dept. of Mechanical Engineering, 201 Ross Hall, Auburn University, Auburn, AL 36849 USA
President/Chair: Prof. C.H. Hansen
Secretary (-General): Prof. J.W. Verheij
Contact: Prof. M.J. (Malcolm) Crocker
Representative of IIAV in IUTAM: Prof. M.J. (Malcolm) Crocker
Representative of IUTAM in IIAV: Prof. J.D. (Jan) Achenbach

ICA (1998)
International Commission for Acoustics
Prof. Suk Wang Yoon, Sung Kyun Kwan University, Department of Physics, 300 Chunchun-dong, Suwon 440-746, Republic of Korea
President/Chair: Dr. Gilles Daigle
Secretary (-General): Prof. Suk Wang Yoon
Contact: Prof. S.W. (Suk Wang) Yoon
Representative of ICA in IUTAM: Prof. S.H. (Stephen) Crandall
Representative of IUTAM in ICA: Prof. A. (Anders) Boström

ICTS (2002)
International Congresses on Thermal Stresses
Prof. Richard B. Hetnarski, St. Raphael, Apt. 1209, 7117 Pelican Bay Blvd. Naples, Fl 34108, USA
President/Chair: Prof. R.B. Hetnarski
Secretary (-General): Prof. T.R. Tauchert
Contact: Prof. R.B. (Richard) Hetnarski
Representative of ICTS in IUTAM: Prof. R.B. (Richard) Hetnarski
Representative of IUTAM in ICTS: Prof. M. (Masato) Abe

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Prof. C.T. (Carl) Herakovich	USA	

Member	*Representative of*	*Remarks*
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Prof. G.K. (Gleb) Mikhailov	Russia	
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Prof. N.F. (Nikita) Morozov	Russia	
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Prof. R. (Roddam) Narasimha		Bureau member
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Prof. S.B. (Stuart) Savage	Canada	
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Prof. L. (Leopold) Skerget	Slovenia	
Prof. B. (Bertil) Storåkers	Sweden	
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Prof. P. (Pierre) Suquet	France	
Prof. G. (Gwidon) Szefer	Poland	
Prof. J.N. (Jens Nørkær) Sørensen	Denmark	
Prof. V. (Vitauts) Tamuzs	Latvia	
Prof. R.I. (Roger) Tanner	Australia	
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Prof. A. (André) Thess	Germany	
Prof. C.G. (Charl) du Toit	South Africa	
Prof. N. (Nguyen) Van Dao	Viet Nam	
Prof. D.V.H. (Dirk) Vandepitte	Belgium	
Prof. F. (Furio) Vatta	Italy	
Prof. E. (Eiichi) Watanabe	Japan	
Prof. D. (David) Weaver	Canada	
Prof. G. (Graham) Weir	New Zealand	
Prof. L. (Leen) van Wijngaarden		Representative in CISM Member-at-Large
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Prof. C.-S. (Chau-Shioung) Yeh	China-Taipei	
Prof. J.Y. (Jung Yul) Yoo	Republic of Korea	
Prof. T.X. (Tongxi) Yu	China-Hong Kong	
Prof. S. (Stephane) Zaleski	France	
Prof. A. (Andre) Zaoui	France	
Prof. Z. (Zhemin) Zheng	China	

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Prof. F. (Faruk) Arinc	Turkey	ICHMT
Prof. G. (Giovanni) Bianchi (deceased 13 November, 2003)	Italy	CISM
Prof. M. (Marc) Bonnet	France	IABEM
Prof. S.H. (Stephen) Crandall	USA	ICA
Prof. M.J. (Malcolm) Crocker	USA	IIAV
Prof. F. (Fernand) Ellyin	Canada	ICM
Prof. R.B. (Richard) Hetnarski	USA	ICTS
Prof. P. (Patrick) Huerre	France	EUROMECH
Prof. M. (Masaru) Kiya	Japan	AFMC
Prof. P. (Peter) Lugner	Austria	IAVSD
Prof. R. (René) Moreau	France	HYDROMAG
Prof. J.T. (John Tinsley) Oden	USA	IACM
Prof. H. (Harold) Ramkissoon	West Indies	CACOFD
Prof. G. (George) Rozvany	Hungary	ISSMO

Members of the Congress Committee

Member	*Country*	*Year**	*Remarks*
Prof. H. (Hassan) Aref	USA	2004	Member of XCCC
Prof. T. (Ted) Belytschko	USA	2006	Representative of IACM
Prof. M.P. (Martin) Bendsøe	Denmark	2004	Representative of ISSMO
Prof. D.E. Beskos	Greece	2006	
Prof. D.B. (David) Bogy	USA	2004	
Prof. D.H. (Dick) van Campen	Netherlands	2004	
Prof. D. (David) Durban	Israel	2004	
Prof. F. (Fernand) Ellyin	Canada	2006	Representative of ICM
Prof. J. (Juri) Engelbrecht	Estonia	2004	
Prof. N.A. (Norman) Fleck	UK	2006	
Prof. L.B. (Ben) Freund	USA	2004	
Prof. G.M.L. (Graham) Gladwell	Canada	2004	
Prof. P. (Peter) Gudmundson	Sweden	2004	
Prof. M.A. (Michael) Hayes	Ireland	2006	Representative of ISIMM
Prof. T. (Tsutomu) Kambe	Japan	2004	
Prof. B.L. (Bhushan) Karihaloo	UK	2004	Representative of ICF
Prof. A. (Alfred) Kluwick	Austria	2006	
Prof. V.V. (Valery) Kozlov	Russia	2006	
Prof. E.J. (Edwin) Kreuzer	Germany	2006	
Prof. Y.H. (Yu) Ku	USA		
Prof. L.G. (Gary) Leal	USA	2004	Representative of ICR
Prof. P. (Peter) Lugner	Austria	2004	Representative of IAVSD
Prof. F. (Fernando) Lund	Chile	2004	
Prof. H.K. (Keith) Moffatt	UK	2004	Chairman Member of XCCC
Prof. P.A. (Peter) Monkewitz	Switzerland	2004	
Prof. R. (René) Moreau	France	2004	Member of XCCC Representative of HYDROMAG
Prof. N. (Niels) Olhoff	Denmark	2004	Member of XCCC
Prof. T.J. (Timothy) Pedley	UK	2004	Secretary Member of XCCC
Prof. B.A. (Bernhard) Schrefler	Italy	2006	Member of XCCC
Prof. K. (Kazimierz) Sobczyk	Poland	2006	
Prof. P. (Pierre) Suquet	France	2004	
Prof. E.O. (Ernie) Tuck	Australia	2006	

Member	*Country*	*Year**	*Remarks*
Prof. M.G. (Manuel) Velarde	Spain	2006	Representative of CISM
Prof. E. (Eiichi) Watanabe	Japan	2006	
Prof. F.-G. (Feng-Gan) Zhuang	China	2004	

*Year where stated, indicates end of term (applies to members elected after 1972)

Members of the Symposia Panels

The Bureau of IUTAM in 1977 set up two panels charged with the duty of scanning proposals made for IUTAM Symposia in the fields of fluid and solid mechanics. In 1992 that duty was extended to include scanning of proposals for IUTAM Summer Schools. The following members have been elected in 2000 for the period up to and including the 2004 meeting of the General Assembly

Fluid Mechanics
Prof. D. (Dan) Henningson
Prof. P. (Patrick) Huerre
Prof. T. (Tsutomu) Kambe
Prof. L.G. (Gary) Leal
Prof. D.H. (Howell) Peregrine

Solid Mechanics
Prof. J.D. (Jan) Achenbach
Prof. F.L. (Felix) Chernousko
Prof. W. (Wolfgang) Ehlers
Prof. V. (Viggo) Tvergaard
Prof. J. (John) Willis

Members of the Working Parties

Based on the assessment of IUTAM, the General Assembly in Cambridge, UK (August 2002) agreed to establish nine Working Parties.

A Working Party in a certain subfield of the mechanics is meant to structure the overlapping activities between IUTAM on the one hand and the relevant Affiliated Organizations and sister International Unions on the other. Also, Working Parties should identify important growth areas of the field.

More detailed background information on Working Parties, including their Terms of Reference, is given in the IUTAM Report on Working Parties, whose latest revision is dated March 2003. A pdf version of the report can be downloaded from the IUTAM website.

A listing of the Working Parties and their current membership is given below.

WP-1 : Non-Newtonian Fluid Mechanics and Rheology
Members: Prof. J. R. A. (Anthony) Pearson, UK (chair); Prof. D.V. (David) Boger, Australia; Prof. R. (Roland) Keunings, Belgium; Prof. L.G. (Gary) Leal, USA

WP-2 : Dynamical Systems and Mechatronics
Members: Prof. R. S. (Robin) Sharp, UK (chair); Prof. F.L. (Felix) Chernousko, Russia; Prof. F. (Friedrich) Pfeiffer, Germany; Prof. M. Tomizuka, USA

WP-3 : Mechanics of Materials
Members: Prof. S. R. (Sol) Bodner, Israel (chair); Prof. C.T. (Carl) Herakovich, USA; Prof. T. (Tatsuo) Inoue, Japan; Prof. J.B. (Jean Baptiste) Leblond, France

WP-4 : Materials Processing
Members: Prof. R. (René) Moreau, France (chair); Prof. S. (Shigeo) Asai, Japan; Prof. C.W. (Christopher) Macosko, USA; Prof. R.M. (Robert) McMeeking, USA

WP-5 : Computational Fluid and Solid Mechanics
(this WP acts as link between IUTAM and IACM)
Members: Prof. E. R. (Eduardo) de Arantes e Oliveira, Portugal (chair); Prof. T. (Ted) Belytschko, USA; Prof. Y.K. Cheung, China-Hong Kong; Dr. S. R. (Sergio) Idelsohn, Argentina; Prof. J. T. (Tinsley) Oden, USA

WP-6 : Biomechanics
Members: Prof. D. (Dominique) Barthès-Biesel, France (chair); Prof. J.E. (Joan) Bechtold, USA; Dr. G.A. (Gerhard) Holzapfel, Austria; Prof. K. (Kazuo) Tanishita, Japan

WP-7 : Nano- and Micro-Scale Phenomena in Mechanics
Members: Prof. W. (Wei) Yang, China (chair); Prof. F. (Fernand) Ellyin, Canada; Prof. Y. (Yonggang) Huang, USA; Dr. M.G. (Grae) Worster, UK

WP-8 : Geophysical and Environmental Mechanics
Membership to be decided in 2004

WP-9 : Education in Mechanics and Capacity Building
Members: Prof. B.L. (Bhushan) Karihaloo, UK (chair); Prof. H. (Hassan) Aref, USA; Prof. Y. (Yi-long) Bai, China; Prof. M.H.A. (Mohammed) Hassan, Sudan

Donations in 2003

Donations given to IUTAM Symposia are recorded under the heading “Financial Support” of the Reports of Symposia and Summer Schools held in 2003.

IUTAM is grateful to ICSU for providing a grant of $ 100.000 for the activity entitled “African Institute for Mathematical Sciences (AIMS).

IUTAM Representation in ICSU and its Scientific Committees

Acronym	*Organization/Scientific Committee*	*Representative of IUTAM*
ICSU	International Council for Science	Prof. H. K. Moffatt
COSPAR	Committee on Space Research	Prof. G. G. Chernyi
SCOPE	Scientific Committee on Problems of the Environment	Prof. J.C.R. Hunt
SCOR	Scientific Committee on Oceanic Research	Prof. W. Fennel

Reports of IUTAM Symposia held in 2003

03-1 IUTAM Symposium on Mechanics of Physicochemical and Electromechanical Interactions in Porous Media Kerkrade, The Netherlands, May 18-23, 2003

a) Scientific Committee

J.M. Huyghe (Chair, The Netherlands), S.C. Cowin (Cochair, USA), M. Murad (Brazil), D.H. van Campen (The Netherlands, IUTAM-representative), O. Coussy (France), W. Ehlers (Germany), Y. Lanir (Israel), P.A.C. Raats (The Netherlands), J.C. Santamarina (USA)

b) Short summary of scientific progress achieved

This IUTAM symposium focused upon bringing together people who deal with the mechanics of interactions in deforming porous media. These interactions include physicochemical (solvation forces, adsorption), electrochemical (streaming potentials, electro-osmosis, electrophoresis), thermal and chemically relative. Generally the visitors were expects from the fields of biomechanics, geomechanics or polymer science. The communication between these fields has been fostered by the organization of this symposium.

The topics chosen for the sessions were typically chosen so as to represent problems common to all three fields of application. For example:

- Micromechanics of Porous Media
- Electromechanical Interactions
- Chemical and Electro-osmosis
- Nuclear Magnetic Resonance in Porous Media
- Dual Porosity

49 oral presentations were done at the symposium and a dozen poster presentations.

c) Countries represented and number of participants

The meeting attracted 60 participants from 15 countries:
Australia, Belgium, Brazil, Canada, Finland, France, Germany, Italy, The Netherlands, Poland, Portugal, Sweden, Switzerland, United Kingdom, United States.

d) Publication of Proceedings of the Symposium

The proceedings of selected papers in the symposium will be published in a Procedings Book by Kluwer Academic Publishers, The Netherlands. Editors are J.M. Huyghe, P.A.C. Raats and S.C. Cowin.

e) Financial supports

The symposium was sponsored by the following organizations:

- International Union of Theoretical and Applied Mechanics.
- Department of Biomedical Engineering, Eindhoven University of Technology.
- Kluwer Academic Publishers

We are grateful for the support of our sponsors.

f) Scientific program

Day 1

S.C. Cowin, *Bones have ears*
V.T. Barocas, *Representative microstructure finite element modeling of tissue equivalents*
J.C. Santamarina, *Non-linear viscous effects on particulate materials*
Smeulders, *Influence of pore roughness on high-frequency permeability*
P. Poesio, *Influence of ultrasonic acoustic waves on the flow through a porous medium: experimental and theoretical investigation*
J.K.F. Suh, *A dynamical mixed finite element method for biphasic poroviscoelastic materials*
W. Ehlers, *Large strain analysis of 3-d viscoelastic swelling of charged tissues and gels*
B.R. Simon, *Theoretical and FEM's for coupled mechano-electro-chemical transport in soft tissues*
K. Hutter, *On flows of granular and porous media*
D. Gawin, *A multiphase approach for the analysis of hygro-thermo-chemo-mechanical interactions in concrete at early age and high temperature*
P.D. Anderson, *Spinodal decomposition in thin films of binary polymeric blends*

Day 2

J.D. Sherwood, *Rate of swelling of a capsule in Donnan equilibrium with its surroundings*
J.J. Telega, *Electro-kinetics in random porous deformable media*
E. Detournay, *Experimental identification of the chemo-poro-elastic parameters of reactive shale*

R.L. Mauck, *Modelling of neutral solute transport in a dynamically loaded porous permeable gel: implications for articular cartilage biosynthesis and tissue engineering*
J.M. Huyghe, *A single model for swelling shale, hydrogel and tissues*
Y. Abousleiman, *Incorporating chemical effects in a poro-thermo-elastic formulation and application to inclined boreholes*
J.G.M. van Mier, *Modelling moisture flow, shrinkage and cracking in concrete by means of lattice type models*
L. Pel, *Ion transport and crystallization in porous materials as stidied by magnetic resonance imaging*
A. Delville, *Numerical and experimental studies of the water and ionic mobilities within suspensions of charged anisotropic colloids*
F. Simoes, *A mechanical model of articular cartilage with intra- and extrafibrillar water.*
R. Larsson, *Modelling of composites processing using two-phase porous media theory*
C. Bouten, *The biomechanical response of single muscle cells under compression*
M.A. Murad, *A dual porosity model for comtaminant transport in expansive clays*

Day 3

P. Giovine, *On adsorption and diffusion in microstructured porous media*
O. Coussy, *Non-linear binding in the ionic diffusion-migration test through porous materials*
W.Y. Gu, *Effect of porosity on electrical conductivity and ion diffusion in agarose gel*
F. Dell'Isola, *A micro-structured model for fluid saturated porous solids*
J. Carmeliet, *Use of microfocusX-raycomputer tomography for determining and modeling microstructural features and fluid flow in porous material with defects*

Day 4

C. Klein, *Towards a better understanding of the electromagnetic properties of soils*
S.R. Pride, *Electroseismic propecting*
P.M. Reppert, *Porous media evaluation using frequency-dependent electro-kinetics*
D.E. Smiles, *Hydrodynamic dispersion and chemical reaction in porous media: the use of space like coordinates*
B.G. Sengers, *An integrated finite element approach to the mechanics, transport and biosynthesis in tissue engineering*
P. Raats, *Transport across single membranes and series arrays of membranes*
L. Bennethum, *Charge neutrality – Does it exist?*
P.H. Groenevelt, *Shrinking and cracking of swelling porous media*
S. Bader, *Modelling of osmosis in groundwater systems*
J.P.G. Loch, *Coupling between chemical and electrical osmosis in clays*
D. Smith, *A theoretical analysis of the influence of a diffuse double layer on Darcy's law*
T.H. Smit, *Fluid flow in the self optimized porous structure of compact bone*
J.C. Benet, *Aqueous solution transport and stress/strain in a porous medium*

Day 5

J. van Meerveld, *About the proper choice of variables to describe flow-induced crystallisation in polymer melts*
L. Dormieux, *A micromechanical analysis of dissolution processes in porous materials*
J. Bluhm, *Modelling of ice formation in porous media with regard to the descrption of frost damage*
M.J. Mikkola, *Thermo-mechanical modeling for freezing of solute saturated soil*
C.J. van Duijn, *Crystal dissolution and precipitation in porous media : from pore to core*
S.J. Kowalski, *Theoretical modeling and experimental monitoring of materials destruction during drying*
T. Ricken, *Two phase flow in capillary porous materials*

Report composed by Jacques Huyghe

03-2 IUTAM Symposium on Integrated Modeling of Fully Coupled Fluid-Structure Interactions
Rutgers, New Jersey, USA, June 02-06, 2003

a) Scientific Committee

P. Bearman (UK), H. Benaroya (USA, Co-Chair), E. Dowell (USA), H. Eckelmann (Germany), H.K. Moffatt (UK, IUTAM representative), P. Monkowitz (Switzerland), M. Païdoussis (Canada), J. Sheridan (Australia), T. Wei (USA, Co-Chair)

b) Short summary of scientific progress achieved

A large body of engineering and engineering science research and development involves fluid-structure interactions. Yet there are many unanswered questions about the underlying physics, so much so that a great deal of empiricism remains. Much of this empiricism can be traced to the relative lack of detailed collaboration between the fluid and structural mechanics communities studying these interactions. Yet, it appears that next-generation breakthroughs in the field can only come from fully coupled models in which the structure and the fluid are modeled at comparable levels of accuracy.

This Symposium, then, provided a forum for the latest thinking in analytical, computational and experimental modeling of structures interacting with fluid environments. The specific objective was to provide a structured format in which meaningful and lasting dialogues could be facilitated between leading researchers in the different component disciplines. And indeed, through these dialogues, multidisciplinary linkages were established leading to integrated approaches to modeling the complex, nonlinear interactions between fluids and structures. An indicator of the success of this Symposium was the formation of a university-industry collaboration involving computational modelers, experimentalists and applied mathematicians to provide science-based advanced to the design and analysis tools for off-shore oil platforms.

The opening invited lecture, by Dr. P. Palo set the tone for the five days of talks and discussions. Using current and future naval systems as a backdrop, he showed how technological advances in system design and analysis are critically tied to fundamental fluid-structure interaction science. Various aspects of this theme were reflected and expanded upon in subsequent invited lectures. Prof. E. Dowell examined non-linear structural dynamics issues while Prof. M. Païdoussis explored problems associated with axial flows. Prof. T. Sarpkaya provided an extensive overview of vortex-induced-vibration modeling. This was reinforced from an applied perspective by Prof. K. Vandiver using full-scale cable experiments. On the following day, Prof. J. Sheridan gave a more fundamental overview of the vortex dynamics associated with VIV and Prof. M. Triantafyllou discussed the problem of cables immersed in shear flows. Finally, Prof. P. Raad spoke on state-of-the-art Eulerian-Lagrangian techniques for modeling complex interfacial dynamics. These invited talks were complemented by over thirty

submitted talks. Unfortunately due to the SARS crises, a number of papers from the Far East were withdrawn at the last minute.

c) Countries represented and number of participants

A total of 55 registered attendees from 12 countries participated in this Symposium: Australia (3), Canada (4), India (2), Japan (1), S. Korea (1) Netherlands (1), Romania (1), Russia (1), Singapore (1), Turkey (2), UK (1), USA (37)

d) Publication of Proceedings of the Symposium

The proceedings will be published by Kluwer Academic Publishers in 2004 (editors: H. Benaroya and T. Wei)

e) Financial supports

The organizers gratefully acknowledge the following for their support of this Symposium:
• International Union of Theoretical and Applied Mechanics
• Kluwer Academic Publishers
• Office of Naval Research
• Rutgers, The State University of New Jersey
Support from IUTAM was used to support travel, registration and expenses for two participants from former Soviet block countries as well as to partially reimburse lodging for junior and international participants.

f) Scientific program

Day 1
Invited talk

P. Palo, *Survey of Naval Computational Needs in Fluid-Structure Interaction*

Oral presentations
F. Trarieux & G. J. Lyons, *Novel Use of a Bandwidth Measure for Vortex Induced Vibrations Case Study: The Foinaven Dynamic Umbilical*
B. I. Epureanu, *Chaotic Vibration-Based Damage Detection in Fluid-Structural Systems*
S. Han & M. Grosenbaugh, *Comparison of Two Seafloor Observatory Mooring Designs*

Invited talk
E. Dowell & D. M. Tang, *Nonlinear Dynamics of Very High Dimensional Fluid-Structural Systems*

Oral presentations
J. M. Jiménez, J. H. J. Buchholz, A. E. Staples, J. J. Allen & A. J. Smits, *Flapping Membranes for Thrust Production*
J. Carberry, K. Ryan & J. Sheridan, *Experimental Study of a Tethered Cylinder in a Free Stream*
K. Ryan, M. C. Thompson & K. Hourigan, *The Effect of Changed Mass Ratio on the Motion of a Tethered Cylinder*
S. Srigrarom & M. Kurosaka, *Self-excited Oscillation of Equilateral Triangular Wedge*

Day 2

Invited talk
T. Sarpkaya, *A Critical Review of the Intrinsic Nature of VIV*

Oral presentations
S.Kocabiyik & Q. Al-Mdallal, *A Numerical Study on the Rectilinear Oscillations of a Circular Cylinder*
Y. Liu, R. M. C. So & C. Zhang, *Three-Dimensional Modeling of Flow-Induced Vibration for an Elastic Cylinder in a Cross Flow*
D. Lucor, J. Foo & G. E. Karniadakis, *Correlation Length and Force Phasing of a Rigid Cylinder Subject to VIV*
D. Rockwell, M. Ozgoren & N. Saelim, *Self-Excited Oscillations of Vertical and Horizontal Cylinders in Presence of a Free-Surface*

Invited talk
J. K. Vandiver & H. Marcollo, *High Mode Number VIV Experiments*

Oral presentation
Y. Modarres-Sadeghi, M. P. Païdoussis, C. Semler & P. Picot, *Nonlinear Dynamics of Slender Cylinders Supported at Both Ends and Subjected to Axial Flow*

Day 3

Invited talk
M. P. Païdoussis & T. Workman, *Some Quandaries and Paradoxes in Fluid-Structure Interactions with Axial Flow*

Oral presentations
M. M. Zhang, L. Cheng, Y. Zhou, *Closed-Loop Control of the Resonant Flow-Structure Interaction Using PID Controllers*
K.Y. Billah, O. Ahmad, *Vortex-Induced Vibration Structural Response under Parametric Excitation*
R. Govardham & C. H. K. Williamson, *Frequency Response and the Existence of a Critical Mass for an Elastically-Mounted Cylinder*

C. M. Leong, H. Benaroya & T. Wei, *Two-Degree of Freedom VIV of a Circular Cylinder Pinned at One End*

Invited talk

M. S. Triantafyllou, F. S. Hover, A. H. Techet & D. K. P. Yue, *Vortex-Induced Vibrations of Slender Structures in Shear Flow: A Review*

Oral presentations

J. B. Frandsen, *A Tuned Liquid Damper Model*

K. Fujita & A. Shintani, *Unstable Phenomena of a Thin Cylindrical Shell Subjected to Axial Leakage Flow*

A. Norris, *Acoustic Scattering from a Coated Elastic Shell: Exact Vs. Approximate Theory*

E. Gavrilova, *A Study of the Vibration of Fluid Coupled Coaxial Cylindrical Shell*

K. N. Karagiozis, M. P. Païdoussis, E. Grinevich, A. K. Misra &M. Amabili, *Stability and Non-Linear Dynamics of Clamped Circular Cylindrical Shells in Contact with Flowing Fluid*

K. Dempsey & I. Vasileva, *Forced Dynamic Uplift of Floating Plates*

Day 4

Invited talks

J. Sheridan, *Vortex Shedding from Oscillating Cylinders*

R. Bidoae, R.M. Ciobotaru & P.E. Raad, *An Eulerian-Lagrangian Marker and Micro-Cell Simultation Method for Fluid Interaction with Solid/Porous Bodies*

Oral presentations

S. Siegel, K. Cohen & T. McLaughlin, *Low-Dimensional Feedback Control of the von Karman Vortex Street at a Reynolds Number of 100*

M. S. Fofana & Z. Hou, *Stochastic Bifurcations of the Duffing-Mathieu Equations with Time Delays*

Z. Guo & Y. Zhou, *Numerical and Experimental Investigation of a Streamwise Oscillating Cylinder Wake in the Presence of a Downstream Cylinder*

S. A. Isaev & Z. L. Zhdanov, *Control of Cylinder Drag and Lift Force Amplitude in Turbulent Crossflow*

F. Cirak & R. Radovitzky, *A New Lagrangian-Eulerian Shell-Fluid Coupling Algorithm Based on Level Sets*

S. van Zuijlen & H. Bijl, *Application of Higher Order Runge-Kutta Time Integrators in Partitioned Fluid-Structure Interaction Simulations*

Day 5

Oral presentations

S. Bhattacharyya, D. K. Maiti, *Vortex Shedding for Flow Over a Square Cylinder Close to a Moving Ground*

H. Benaroya, T. Wei, *Extended Hamilton's Principle for Fluid-Structure Interaction*

M. Krane, P. Dong, T. Wei, *Estimation of Pressure Fields Using Velocity Measurements*

S. Gökaltun, H. Saygin, M. Muradolu, *Implicit Multigrid Computations of Unsteady Multiphase Flows in Varying Cross-Sectional Area Channels*

M. S. Fofana, Y. Yong, *Dynamic Stability of Stochastic Delay Systems*

Report composed by Timothy Wei

03-3 IUTAM Symposium on Chaotic Dynamics and Control of Systems and Processes in Mechanics
Rome, Italy, June 08-13, 2003

a) Scientific Committee

G. Rega (Italy, Chair), F. Vestroni (Italy, Co-Chair), F. L. Chernousko (Russia), E. Kreuzer (Germany), F. C. Moon (USA), G. Stepan (Hungary), J. M. T. Thompson (UK), H. Troger (Austria) and D. H. van Campen (The Netherlands)

b) Short summary of scientific progress achieved

The Symposium continued the tradition of earlier IUTAM Symposia in the field of nonlinear and chaotic dynamics in mechanics (Stuttgart, 1989; London, 1993; Ithaca, NY, 1997), a research area which keeps on engaging a large and active community of scientists. Accounting for the increased interest towards control of chaos and - more generally - of nonlinear dynamics, this fourth Symposium in the series was aimed at diving deep both into theory and applications to mechanics of nonlinear and chaotic dynamics, and into their control.

The Scientific Program included five working days, with presentation of 4 Key Lectures, 35 Lectures and 10 Posters, organized in fifteen sessions.

Scientific progress was achieved within the following main topics addressed in the Symposium:
(i) Complex mechanical systems and processes
(ii) Features of nonlinear interactions in mechanical systems
(iii) Patterns of novel bifurcations, with special emphasis to non-smooth systems
(iv) Dimensionality and reduced-order models of continuous systems
(v) Exploitation of dynamical system properties for application purposes
(vi) Control of spatio-temporal dynamics.

The need to overcome the limitations inherent to the archetypal single- or few-degree-of-freedom systems mostly considered in the past, and to develop more reliable models for the analysis of high-dimensional systems and processes encountered in technical applications, clearly emerged from the presentations and from the very active and fruitful discussion. In particular, the scientific sessions highlighted the role of experimental investigations, the need to generalize dynamical systems techniques to the analysis of new complex behaviours, the implications of chaos in the design and operating conditions of advanced systems, and the needs and features for its overall and local control.

In the meeting held at the end of the Symposium, the Scientific Committee fully agreed on the need to pursue the near future organization of further IUTAM Symposia devoted

to topics of nonlinear/chaotic dynamics, and of their control, in order to mark hopeful advancements in the area and monitor new research achievements.

c) Countries represented and number of participants

63 registered participants from the engineering, physics and applied mathematics communities attended regularly the Technical Sessions of the Symposium, coming from 20 different countries, according to the following geographical distribution: Austria (1), Brazil (1), Canada (1), Czech Republic (1), China (1), Denmark (1), Germany (6), Greece (3), Hungary (2), Israel (1), Italy (13), Japan (1), Morocco (1), Poland (1), Russia (5), Serbia-Montenegro (1), the Netherlands (2), Turkey (1), U.K. (8), U.S.A. (12). A number of Italian Ph. D. students and University scientists also attended some scientific sessions.

d) Publication of Proceedings of the Symposium

Full papers of both lectures and poster presentations are going to be published as Symposium Proceedings by the Kluwer Academic Publishers. For each submitted paper, the review process is being driven by getting two reviews either from members of the Scientific Committee (primarily) or from other participants to the Symposium, with the aim of achieving a standard of the Proceedings comparable to that of refereed journals in the field. At December 2003, nearly two/thirds of the review process has been completed.

e) Financial supports

Some funds were made available by:

- International Union of Theoretical and Applied Mechanics (IUTAM)
- University of Rome “La Sapienza”
- Department of Structural and Geotechnical Engineering
- Banca di Roma
- Iricav
- Italferr
- Italsocotec
- Kluwer Academic Publishers
- Pegaso
- Società Italiana per Condotte d’Acqua
- Società Stretto di Messina

We thank our sponsors for their contribution to the success of the Symposium.

f) Scientific program

Monday 9

Key Lecture I
Pfeiffer F. Sedlmayr M. *Spatial motion of CVT-chains*

Session 1: Mechanical Systems
Stepan G. Szalai R. Hogan S.J. *The chaotic oscillations of high-speed milling*
Schweizer B. **Wauer J.** *Nonlinear interaction in magnetohydrodynamic bearings under oscillating electric fields*
True H. Trzepacs L. *On the dynamics of a railway freight wagon wheelset with dry friction damping*
Virgin L.N. **Plaut R.H.** *Nonlinear oscillations of a buckled strut used as a vibration isolator*

Session 2: Structural Systems
Benedettini F. Alaggio R. *Post-critical finite, planar dynamics of a circular arch: experimental and theoretical characterization of transitions to non-regular motions*
Gonçalves P.B. *The non-linear dynamics of thin walled shell structures*
Gottlieb O. Champneys A.R. *Global bifurcation and chaotic dynamics of nonlinear thermoelastic microbeams subject to electrodynamic actuation*

Session 3: Dynamics and Condition Monitoring
Cusumano J.P. Chelidze D. *Phase space warping: a dynamical systems approach to diagnostics and prognostics*
Giagopulos D. Salpistis C. **Natsiavas S.** *Dynamics and parametric identification of geared rotordynamic systems*

Tuesday 10

Key Lecture II
Moon F. C. *Chaotic clock models: a paradigm for noise in machines*

Session 4: Micro-electro-mechanical Systems
Turner K.L. **Shaw S.W.** *Parametrically excited MEMS-based filters*
Balachandran B. Li H. *Nonlinear phenomena in microelectromechanical resonators*

Session 5: Bifurcation, Chaos, Control
Thompson J.M.T. van der Heijden G.H.M. *Patterns of chaotic bifurcation suppressing internal resonance*
Bajaj A.K. Vyas A. Raman A. *Explorations into the nonlinear dynamics of a single DOF system coupled to a wideband autoparametric vibration absorber*
Lenci S. Rega G. *Bifurcation and chaos in mechanical applications: a dynamical systems approach to their control*

Session 6: Control of Systems/Processes I
Schiehlen W. Guse N. *Control of limit cycle oscillations*
Chernousko F.L. *Controlled motions of multibody systems along a plane*
Steindl A. **Troger H.** *Optimal control of retrieval of tethered subsatellite*

Session 7: Control of Systems/Processes II
Popp K. Rudolph M. *Dynamic vibration absorber for friction induced oscillations*
Vakakis A.F. McFarland D.M. Bergman L. Manevitch L. I. Gendelman O. *Passive vibration control by nonlinear energy pumping: theoretical and experimental results*

Wednesday 11

Session 8: Stochasticity and Imperfections
Ibrahim R.A. Beloiu D. M. Pettit C.L. *Influence of boundary conditions relaxation on flutter of aeroelastic panels*
Hogan S.J. *Dynamics of discontinuous systems with imperfections and noise*

Session 9: Poster Presentation and Discussion
Beletsky V.V. Pivovarov M.L. Savchenko A.A. *Regular and chaotic relative motion of a dumb-bell satellite*
Guennoun Kamar, Belhaq M. **Lakrad F.** *Quasi-periodic oscillations and stability of a two-degree-of-freedom model of a shallow arch under quasi-periodic excitation*
Efimov D.V. **Fradkov A.L.** *Adaptive partial observers for time-varying chaotic systems*
Galvanetto U. Bornemann P.B. *Time integration techniques to investigate the long-term behaviour of dissipative structural systems*
Georgiou I.T. *Identification and construction of reduced models for infinite-dimensional dynamical systems in nonlinear elastodynamics*
Hedrih Stevanovič K. *Fascinating nonlinear dynamics of a heavy material particle(s) along circle(s) with coupled rotations and optimal control*
Kovaleva A. *Stochastic resonance and synchronization of stochastic jump processes in a bistable system driven by a weak periodic signal*
Luo A.C.J. *The mapping dynamics of a three-piecewise linear system under a periodic excitation*
Pavlovskaia E.E. Wiercigroch M. *Two dimensional map for impact oscillator with drift*
Yabuno H. Aoshima N. Goto K. *Motion control of an under-actuated manipulator by using high-frequency excitation*

Thursday 12

Key Lecture III
Nayfeh A.H. Masoud Z.N. Nayfeh N.A. *A smart controller for commercial and military cranes*

Session 10: Delay Systems
Sri Namachchivaya N. Van Roessel H.J. *Delay equations with fluctuating delay: application to regenerative chatter*
Hu H. *Global dynamics of a type of nonlinear system with delayed velocity feedback*

Session 11: Nonsmooth Dynamics I
Wiercigroch M. Pavlovskaia E. Karpenko E.V. *Nonlinear dynamics of non-smooth mechanical systems*
Di Bernardo M. Champneys A.R. Kowalczyk P. *Corner-collision and grazing-sliding: on the occurrence of novel bifurcations in nonsmooth systems*
Casini P. Vestroni F. *Non-smooth dynamics of a double-belt friction oscillator*

Session 12: Nonsmooth Dynamics II
Leine R.I. van Campen D.H. *Experiments and modelling of drillstring vibrations*
Kreuzer E. Struck H. *Active damping of spatio-temporal dynamics of drill-strings*
Peterka F. Dynamics of mechanical systems with soft impacts

Session 13: Random Systems
Davies H.G. *Two coupled modes with modulated excitation and low-level additive noise*
Wedig W.V. *Vertical dynamics of riding cars under harmonic and stochastic base excitations*

Friday 13

Key Lecture IV
Arecchi F.T. *Control and synchronization of homoclinic chaos and its implication for neurodynamics*

Session 14: Chaos Control and Synchronization
Fradkov A. *Methods and examples of controlling chaos in mechanical systems*
Stefanski A. **Kapitaniak T.** *Synchronization of dynamical systems caused by chaotic excitation*

Session 15: Discrete Dynamics
Manevitch L.I. Gendelman O.V. Savin A.V. *Nonlinear normal modes and chaotic motions in oscillatory chains*
Domokos G. Sheuring I. Tèl T. *On the relationship between discrete and continuous interval maps*

Report composed by Giuseppe Rega

03-4 IUTAM Symposium on Mesoscopic Dynamics of Fracture Process and Materials Strength
Osaka, Japan, July 06-11, 2003

a) Scientific Committee

H. Kitagawa (Japan, Co-Chairman), Y. Shibutani (Japan, Co-Chairman), P. Gumbsch (Germany), L.P.Kubin (France), A. Needleman (USA), S. Schmauder (Germany), S. Yip (USA), B. Freund (USA, IUTAM Representative)

b) Short summary of scientific progress achieved

It is essential to tackle dynamical structural change in mesoscopic scale to evaluate the materials strength and damage due to fracture. To take a concrete action toward this viewpoint is the main purpose of the Symposium, a ground of which is built on the following observation.

Deformation of materials involves internal dissipation more or less. Energy dissipation proceeds usually, accompanying with evolution of ordered internal mechanism through which so-called 'dissipative structure' works. This structure behaves dynamically in nature and is set up in a state far from equilibrium. Although the ordered structure varies in scale and phase (pattern) corresponding to the intensity of energy dissipation required, overall deformation still continues as long as it operates as a whole. Appearance of a new phase issues necessarily from an embryo and diffuses or propagates into surrounding. But if it fails to get a certain territory of influence, being unable to overleap the adjoining energy barrier, the energy to be dissipated accumulates locally and the material falls into failure process. This is a general situation around the site in the materials to bear the load.

The points at issue presented through the Symposium were just around the subjects in relation to the above understanding, which include the justification and/or appropriateness of such an understanding for the fracture process, actual methodology to extract the mesoscopic dynamics into the analysis, concrete trials to approach to the reality of simultaneous interaction between microscopic events and macroscopic phenomena and successful results to estimate the material strength and to describe the actuality of fracture process, and others.

The progress achieved is productive and manifold, which may be seen from the titles of presented papers shown in the scientific program. A couple of concrete topics to impress the participants are: For analysis of fracture process and estimation of the materials strength to target at dynamics evolution of the inner structure, hierarchical modeling is essential to catch heterogeneity in mesoscopic scale through which dynamics of atomistic structure and macroscopic mechanical field interact simultaneously. Approach based on continuum mechanics may be still powerful, but simple material model becomes undependable because non-locality due to the inner mesoscale structure is

excluded. Moreover, the traditional approach based on a mathematical or conceptual constitutive formalism itself might not be a strong tool, because expression of the material properties, i.e. formulation of the constitutive equation, is not treated as a problem of the mechanics. As a result, the continuum approach should be sophisticated towards the following ways: the material parameters are not given a priori, but they are evaluated by an evolutional way from microscopic structural dynamics, and mesoscopic material heterogeneity should be treated as an inner boundary value problem.

"Computer changes way of thinking about the nature", this is the actual impression striking the participants of the Symposium.

c) Countries represented and number of participants

The meeting attracted 66 participants from 8 countries:
Denmark (1), France (6), Germany (3), Japan (37), Korea (2), Russia (2), United Kingdom (2), USA (8)

d) Publication of Proceedings of the Symposium

The Proceedings of the Symposium, edited by H. Kitagawa and Y. Shibutani, will be published by Kluwer Academic Publishers, as a monograph in the Series of Solid Mechanics and Its Application.

e) Financial supports

The Symposium was sponsored by the following organizations:
- International Union of Theoretical and Applied Mechanics (IUTAM)
- Graduate School of Engineering, Osaka University
- The Japan Society of Mechanical Engineers (JSME)
- The Society of Materials Science, Japan (LSMS)
- Handai Frontier Research Center (FRC)
- Japan Society for Promotion of Science (JSPS)

We are grateful to our sponsors for their contributions to the success of the symposium

f) Scientific program

Session 1: DDD, Dislocation Patterning
W. Cai, V. V. Bulatov, T. Pierce, M. Hiratani, M. Rhee and M. Bartelt, *Dislocation Patterning and Plasticity*
Y. Kaneko and S. Hashimoto, *Nondestructive Observation of Dislocation Structure Formed at Fatigued Copper and Stainless Steel Crystals*
D. Weygand, *Plasticity in Small Samples: A Discrete Dislocation Dynamics Description*
R. Madec, *A Dislocation Dynamics Study of Some Constitutive Parameters for Plastic Flow*

Session 2: MD, DDD, Crystal Plasticity

E. Bitzek, D. Weygand and P. Gumbsch, *Atomistic and DDD Studies of Inertial Effects on the Dynamics of Dislocations*

K. Yashiro, Y. Tabata and Y.Tomita, *Molecular Dynamics Study on the Characteristics of Edge and Screw Dislocations in Gamma/Gamma-Prime Microstructure in Ni-based Superalloy*

L.P. Kubin, *Multiscale Modeling of fcc Single Crystal Plasticity*

V. S. Deshpande, **A. Needleman** and E. Van der Giessen, *Discrete Dislocation Modeling of Fatigue Crack Growth in Single Crystals*

Y. Aoyagi and **K. Shizawa**, *A Crystal Plasticity Analysis for Accumulations of Geometrically Necessary Dislocations and Dipoles around Shear Band*

T. Ohashi, *A New Model of Scale Dependent Crystal Plasticity Analysis*

Session 3: MD, Amorphous, Silicon, Fracture

K. Nakatani, Y. Sugiyama and H. Kitagawa, *Molecular Dynamics Study on Mechanisms of Deformation and Fracture near a Crack Tip in Amorphous Metal*

S. Izumi, S. Hara, T. Kumagai and S. Sakai, *Elastic Properties of the Surfaces and Interfaces of Crystal and Amorphous Silicon*

S. Brochard, J. Godet, L. Pizzagalli, P. Beauchamp and J. Grilhe, *Atomistic Simulation of Dislocation Generation at Surface Defects in Metals and Silicon*

P. Pirouz, *On the Plasticity and Fracture of Semiconductors*

K. Higashida and M. Tanaka, *HVEM/AFM Studies on Crack Tip Plasticity in Si Crystals*

Session 4: MD, Dislocation, Obstacle, Indentation

D. Rodney, *Atomic and Mesoscopic Modeling of Irradiation Hardening in FCC Crystals*

D.J. Bacon, Yu. N. Osetsky, Z. Rong and K. Tapassa, *Dynamics of an Edge Dislocation Glide in the Presence of Substitutional Solute Atoms and Glissile Interstitial Clusters*

H. M. Zbib, Mu'tasem, A. Shehadeh, Tomas. D. de la Rubia and V. Bulatov, *Modeling the Dynamic Behavior of FCC Single Crystals under Shock Loading: Dislocation Dynamic Plasticity Analysis*

Yu. N. Osetsky and D. J. Bacon, *Atomic-Level Interaction of an Edge Dislocation with Localized Obstacles in Fcc and Bcc Metals*

K. J. Van Vliet, J. Li, T. Zhu, S. Suresh and S. Yip, *Understanding Defect Nucleation through Nanoscale Experiments and Computations*

T. Tsuru and **Y. Shibutani**, *Dislocation Emission and Prismatic Dislocation Loop Formation of Single Crystalline Aluminum under Nanoindentation*

Session 5: Multiscale Modeling

S.Yip, *Multiscale Modeling of Materials Strength and Deformation*

S. Schmauder, U. Weber, P. Binkele and P. Kizler, *Parameter Link as an Approach to Hierarchical Modelling of Toughness Decrease of Steels*

B. Devincre, *Modelling Plasticity at Mesoscale with Dislocation Dynamics and Finite Elements Coupling*

Y. Tomita and M. Uchida, *Computational Evaluation of Micro- to Macroscopic Deformation Behavior of Amorphous Polymer with Slightly Heterogeneous Distribution of Molecular Chains*
Y. Higa, H. Kitagawa and Y. Tomita, *Computational Evaluation of Micro- to Macroscopic Deformation Behavior of Amorphous Polymer with Slightly Heterogeneous Distribution of Molecular Chains*

Session 6: Crack, DB Transition, Transformation
I. L. Maksimov, *Critical Behavior near the Crack/Dislocation Depinning Threshold: Critical Indices and Landau-type Expansion*
S. V. Dmitriev, N. Yoshikawa and A. A. Vasiliev, *Domain wall and dislocation dynamics in media with microscopic rotations*
J. W. Kysar, *Dependence of Ductile and Brittle Response on Initial Energy Dissipation Mechanism at Crack Tip*
K. Kishimoto, *A Cohesive Zone Model and Interfacial Crack Problems*
S. Kubo and M. Misaki, *Molecular Dynamic Simulation of Influence of Crystallographic Orientation and Grain Boundary on Near-Threshold Fatigue Crack Growth in Iron*
Y. Nakasone, S. Kasumi and Y. Iwasaki, *Plasticity-Induced Martensitic Transformation around Semi-elliptical Surface Cracks in Fatigue of an Austenitic Stainless Steel*

Session 7: Nano-crystal, Poly-crystal
Y.-S. Kim, C.-Il Kim and S.-S. Lee, *An atomistic simulation of AFM-based nano lithography process for nano patterning*
K. Saitoh, S. Nagase, H. Kitagawa and N. Shinke, *Molecular Dynamics Study on Morphology and Strength of Copper Atomic-cluster-assembled Structure*
J. Schiotz, *The Strength of Nanocrystalline Metals: An Optimal Grain Size*
A. Nakatani, T. Shimokawa, R. Matsumoto and H. Kitagawa, *An Atomistic Study of Ideal Strength of Polycrystalline Metals*
T. Hasebe, *Continuum Description of Inhomogeneously Deforming Polycrystalline Aggregates based on Field Theory*

Session 8: Ab-initio Calculation, Mutiscale Modeling
Y. Umeno and T. Kitamura, *Study on Strength of Microscopic Material by Simulations with Atom and Electron Models*
S. Ogata, J. Li, Y. Shibutani and S. Yip, *Ab initio Study of Ideal Shear Strength*
C. Domain and A. Legris, *Ab initio Atomic-scale Simulation Investigation of the Plasticity in Zirconium and Titanium – Influence of Hydrogen*
M. Kohyama, S. Tanaka and R. Yang, *Computational Study of the Mechanical Properties of Alumina-Copper Interfaces: Ab initio Calculations and Combination with Mesoscopic Simulations*
S. Ogata, *A Hybrid Electronic-Density-Functional/Molecular-Dynamics Simulation Scheme for Multiscale Simulation of Materials on Parallel Computers*

Report composed by Hiroshi Kitagawa

Report of the IUTAM Summer School held in 2003

Report on the twelfth IUTAM Summer School on Mechanics of Microstructured Materials
Udine, Italy, July 7-11, 2003

a) Organization

The IUTAM summer school on "Mechanics of Microstructured Materials" was held at the International Centre for Mechanical Sciences at Udine, Italy, from July 7 to July 11, 2003.

b) Lecturers

The summer school was taught by the following lecturers:
Professor Helmut J. Böhm, Vienna University of Technology, Austria;
Professor Javier LLorca, Universidad Politècnica de Madrid, Spain;
Professor Peter E. McHugh, National University of Ireland, Galway, Ireland;
Professor Ryszard Pyrz, University of Aalborg, Denmark;
Professor Thomas Siegmund, Purdue University, West Lafayette, USA;
Professor Erik van der Giessen, University of Groningen, The Netherlands.

c) Summer School topics

The topics covered by the lecturers included:
- Introduction to continuum micromechanics; Modeling the behavior of short fiber reinforced composites (H.J. Böhm)
- Deformation and damage in particle reinforced composites (J. LLorca)
- Introduction to crystal plasticity theory (P.E. McHugh)
- Microstructural description of composites, statistical methods (R. Pyrz)
- Thermomechanical cohesive zone models; Processing–microstructure–property relationships in short fiber reinforced composites (T. Siegmund)
- Discrete dislocation plasticity; Creep rupture in polycrystalline materials (E. van der Giessen)

d) Participants

Some 37 participants from 15 countries attended the summer school, the majority of them young researchers.

e) Scientific output

The summer school introduced the attendees to current trends and fields of interest in the mechanics of microstructured materials. Modeling approaches, experimental techniques and statistical methods were covered. The school was structured to provide both overviews and lectures devoted to specific problems. Special points of interest were advanced descriptions of elastoplastic behavior, modeling of damage, and discontinuously reinforced composites.

f) Publication of Proceedings of the Summer School

Publication of the course notes within the CISM Lecture Notes series (Springer Verlag, Vienna) is in an advanced stage of preparation.

g) Financial support

The summer school was sponsored by IUTAM and CISM.

Report composed by Helmut J. Böhm, Vienna, Austria

Reports of the IUTAM Working Parties

WP 1 - Non-Newtonian Fluid Mechanics and Rheology

WP1 has agreed that they have nothing to submit in the 2003 Report, except the administrative issue of the timing of the 2008 ICTAM to avoid conflict with ICR 2008.

WP-2 - Dynamical Systems and Mechatronics

A definition of dynamical systems and mechatronics
The synergetic integration of physical systems, complex decision making and information technology, concerning system dynamics, in the design, manufacture and operation of plant, structure, machine or process.

Characterisation of the subject area
Physical systems of concern are mainly assemblies of subsystems with measurable and predictable behavioural properties, the latter through mathematical models and solutions of the governing differential equations. Mathematical models for components and subsystems are hugely developed but that does not imply a complete absence of new requirements. Multibody systems analysis software has made many analyses of large systems relatively straightforward but distributed flexibility, variable boundaries and time-varying features continue to pose problems. Methods for the analytical solution (sometimes approximate) of the governing equations are mature but, in general, they do not extend to systems of both high order and difficult (general nonlinear) form. The various ways in which systems can behave are known, in principle, the most complicated cases involving extreme sensitivities to parameter values and/or initial conditions and even chaos.

On the other hand, numerical solutions are generally achievable and, as computers become more powerful, they become less costly to obtain. Modelling and simulation are at the core of contemporary studies for systems analysis. Capability in analysis naturally leads to (virtual systems) optimisation and later to optimal system synthesis. First order models of even complex systems may be quite easily obtained and solved but they may not be useful practically. It may be that the differences between competing practical systems are in their secondary features and great care may be needed, in the theoretical world, to tell the differences between one and another. Very detailed and accurate models are likely to be needed for some practical purposes.

The most relevant information technology is from control theory, which is very highly developed. Much contemporary work involves the application of advanced topics in control, optimal control, nonlinear control with constraints, robust control, predictive control etc. to systems of ever increasing complexity. A recurring theme is “how should one deal with such increasing levels of complexity?”. In trying to optimise systems, studies can get out of control and issues of reliability, fault tolerance, failure modes etc. can become almost untreatable. It is not clear whether or not this is a research issue (Professor Schiehlen is convinced that it is). It may simply be an aspect of system design, which will be with us forever. Some systems may require the application of games theory, allowing system parts to account for the behaviour of other parts in deciding on their own behaviour.
Mixed hardware and software systems are of interest. In such cases, devices with more complex and uncertain behaviour are included in system studies as they are, with interfacing to the remaining “virtual” system. An important sub-class of uncertain

systems concerns the human operator. Man-machine interaction problems demand special treatments of the human component.

Research areas with a good future

- Methods for dealing with ever increasing system complexity, integrated control etc. (but see comments above).
- Mathematical advances with application to high order nonlinear systems (including systems of practical significance).
- Non-linear vibration advances and applications.
- Dynamics and control of non-smooth systems, especially those with unilateral constraints.
- Methods for faster, more accurate, more reliable numerical solution of describing equations, parameter optimisation, system synthesis etc. This includes methods for capitalising on problem features like multi-time-scale dynamics.
- Dynamics of multibody systems including distributed flexibilities.
- Advancements in parameter identification and state estimation.
- Advancement of techniques for modelling difficult system features like impacts, energy dissipation in structures and assemblies through friction and hysteresis, hydraulic flows, high frequency effects (waves, rate dependent material properties) etc.
- Simultaneous optimisation of system design and control.
- New methods for control of mechanical and mechatronic systems.
- Man-machine interaction problems – car driving, bike riding, aircraft piloting, pilot induced oscillations, pilot – helicopter interaction failures.
- Application studies in robotics, space exploration, transportation, micro-systems especially medical and computational, mechatronic “smart” structures, power transmission, machine optimisation and synthesis.

Report composed by Robin Sharp

WP-3 - Mechanics of Materials

With reference to the pre-nominated sessions of ICTAM 2004, the interests of WP3 cover about half the number and are central to the field of Mechanics. The organizations affiliated with IUTAM that are primarily related to WP3 are the International Congress on the Mechanical Behaviour of Materials (ICM) and the International Congress on Fracture (ICF). Two members of WP3 are on the governing board of ICM and helped to organize ICM-9, which was held in Geneva in May 2003. A report on that conference was submitted to IUTAM. The Mechanics content of this conference was enhanced compared to earlier ones. The next conference of ICF will be held in Torino, Italy, March 2005.

In response to a request by the Chairman of WP3 to its members to suggest new subjects for possible pre-nominated sessions for future congresses, the following were offered:

* Dynamic fracture mechanics (experiments and models)
* Ductile fracture
* Crack paths in brittle fracture

These suggested topics will be brought to the attention of the Congress Committee.

Discussions are continuing with proposers of IUTAM Symposia in the field of concern to WP3. The members of WP3 will be meeting at ICTAM 2004.

Report composed by Sol Bodner

WP-4 - Materials Processing

The members of this WP are René Moreau (France, metals and semiconductors), Shigeo Asai (Japan, metals), Robert M. MacMeeking (USA, ceramics) and Charles L Tucker III (USA, polymers).

This working party covers four main classes of materials: metals, semi-conductors, ceramics and polymers. In each field, the scientific activity is very impressive and the number of conferences and less formal seminars or colloquia is important. It is also noticeable that nowadays the approach is completely multidisciplinary, so that specialists of materials sciences interact often and deeply with specialists of fluid or solid mechanics. This is a general trend since at least one decade, but in the field of this WP, it is also a consequence of the development of numerical techniques, which make easier than before the integration of knowledge coming from different disciplines into a unique model. One should also notice that international programs oriented towards applications (for instance, in Europe, the Microgravity Application Programs, supported by ESA) play a significant role in establishing networks between complementary research groups and industries. It seems this is a kind of irreversible process which will continue during the coming years.

To be more specific, in the domain of metals and semiconductors, there were a number of important international meetings during the year 2003 where the attendance of scientists coming from the fields of fluid and solid mechanics was quite significant. Let us mention:

- Electromagnetic Processing of Materials 2003, Lyon, France, 14-17 Oct. 2003;
- International workshop on use of magnetic fields in crystal growth, Riga, Latvia, 5-6 Dec. 2003;
- as well as the annual symposium of the European Society of Material Sciences in Strasbourg.

Let us also mention two important meetings scheduled for 2004:

- International Summer School on Crystal growth, Berlin, 2-6 August 2004,
- International Congress on Crystal Growth, to be held in Grenoble, 9-14 August 2004.

The polymer processing area is rich in theoretical and applied mechanics content. Topics such as simulation of non-Newtonian fluid flow, theoretical and applied rheology, and the modeling of structure development during crystallization present significant challenges and research opportunities for mechanicians. Research in polymer processing has traditionally centered on continuum mechanics, its relation to polymer physics, and on numerical simulation methods. However, in recent years other aspects of mechanics have begun to have an impact on the area. For instance, nonlinear dynamics is becoming an important tool for analyzing polymer mixing operations, which are now know to be an important application of chaotic advection. Technical meetings and workshops on polymer processing are sponsored by a number of groups worldwide. Some of these are societies that are dedicated to the subject: The Society of Rheology, the European Society of Rheology, the Japanese Society of Rheology, and the Polymer Processing

Society. A few, less-formal groups sponsor important meetings, e.g. the Workshop on Numerical Methods in Non-Newtonian Flow, and the Gordon Research Conference on Polymer Processing. Finally, polymer processing sessions and symposia, and opportunities to discuss polymer processing research in a broader setting, are provided by societies such as ASME, AIChE, and IUPAC, as well as IUTAM.

Ceramics processing presents many opportunities for work in theoretical and applied mechanics and this field is very active. The production and handling of green bodies provides many challenges to those working in the areas of mixing, rheology, viscoplasticity and shape forming. In sintering, problems related to stress coupled mass transport, viscoelasticity, microstructural evolution and high temperature plastic deformation have been tackled with a theoretical and applied mechanics approach. In addition, production methods such as machining and net shape forming have recently commanded the attention of researchers in the theoretical and applied mechanics field. Thus, the area of ceramics processing in connection with theoretical and applied mechanics is very active in terms meetings and workshops. The theoretical and applied mechanics of the subject is addressed regularly in symposia and conference sessions in the meetings around the world of groups and societies primarily concerned with mechanics, such as the IUTAM itself, EUROMECH, the ASME Applied Mechanics Division, JSME, GAMM and other national organizations. In addition to these activities, organizations with a primary focus on materials science also mount symposia and conference sessions that contain a significant amount of theoretical and applied mechanics addressed towards ceramic processing. These groups include the American Ceramic Society, the European Ceramic Society and the Japanese Ceramic Society plus broadly based organizations such as the Materials Research Society. The wide variety of fora available for theoretical and applied mechanics research in ceramic processing promotes breadth and relevance in the field and ensures effective multidisciplinary approaches. Thus the ceramics area of materials processing in regard to theoretical and applied mechanics has momentum and is in a relatively healthy state.

Report composed by René Moreau

WP-5 - Computational Fluid and Solid Mechanics

1- Introduction

The WP5, as it was established at the meeting of the General Assembly held in Cambridge in 2002, is meant to overlap the activities between IUTAM and the IACM. It is concerned thus with Computational Fluid and Solid Mechanics. It was recognized both by IUTAM and IACM (the International Association for Computational Mechanics) as an official link between both Organizations.

The current membership of the WP5 is indicated in the IUTAM Annual Report for 2002. Prof. Ted Belytschko, who is himself a member of the Congress Committee of IUTAM, accepted to become the personal link between the WP5 and such Committee.

2- 1st Circular Letter from the chairman

In February, 12th, 2003, the chairman addressed the following letter to the remaining members of the WP5:

Dear Colleagues
As you know, the IUTAM Working Party 5 (WP 5) succeeded to the old WP 6. While co-chairing the WP 6, Tinsley Oden and myself felt the need for some improvements that were proposed to IUTAM once the new Working Party was formed with a new composition and a different number.
The two basic needs were:

- ensuring that the Presidency of IACM would recognise the WP 5 as the official link between IUTAM and IACM;
- ensuring the representation of WP 5 at the IUTAM Congress Committee.

IUTAM accepted both propositions.
The President of IUTAM namely wrote to the President of IACM a letter explaining that one of the primary goals of WP 5 will be to strengthen the level of cooperation between IUTAM and IACM… Prof. Oñate quick answer was that he was pleased that a Working Party on Computational Fluid and Solid Mechanics (WP 5) has been created within IUTAM, that a team of highly qualified scientists were chosen to become members of this working group, and that IACM was happy to recognise WP 5 as the official link between the two organisations".
In what concerned the representation of WP 5 at the IUTAM Congress Committee, the solution was found of inviting Prof. Ted Belitschko, who had been appointed as the IACM representative at IUTAM, and, inherently, as a member of the IUTAM Congress Committee, to become a member of the WP 5 (as he had been of the former WP 6).
As our boundary conditions are now settled, we have all the conditions to solve our internal problems. The Terms of Reference provide the equation we are supposed to solve. I allow myself to remember that the Terms of Reference are the following ones…

I cannot say that our task is an easy one.
I remember, however, that the new Working Parties were chosen in such a way that the different parts of the World (North America, Latin America, Asia Pacific Region, Europe) are represented within them. This cannot mean of course that each of us cuts his contacts with regions other than his own, but that each of us should try to cover as perfectly as possible his own region. I intend to do it myself by establishing an informal network with colleagues of European countries.
Speaking about Europe, the next 21st ICTAM that will take place next year in Warsaw needs our support. I allow myself to ask you, and other colleagues you are in contact with, to participate, so that Computational Mechanics is not absent from the Congress. It is my feeling that the Congress will not be successful without a strong Computational Mechanics component. Of course, there is a problem: the IACM World Congress in Beijing. But I think that it will be possible for many people to be present in both. It would be worse if the two meetings were simultaneous.
We shall need to meet during the current year. I suggest you send me a list of the conferences in which you intend to participate and we shall try to select one in which we may all be present…

Unfortunately, it was not possible to find a place in the World where the members of the meeting could all meet. We decided to hold a meeting during the US National Computational Mechanics Congress, which took place by the end of July 2003 in Albuquerque, New Mexico. Prof. Y. K. Cheung was the only member to be absent, but we combined to exchange views with each other during the EPMESC IX International Conference, which took place last November in Macao, China.

3- The Albuquerque meeting

The meeting was scheduled to take place during one of the mornings (July, 20th, at 9h 30m AM) during the Albuquerque Conference. The agenda had been previously proposed. The following Report of the meeting was approved later by all the participants and a copy was sent to Prof. Y. K. Cheung, asking for his eventual comments:

Report on the meeting
1- The Chairman started by remembering the terms of reference of the IUTAM Working Parties, such as they were approved by the IUTAM General Assembly. He called the attention for the list of IUTAM Working Parties included in the IUTAM Newsletter dated May 2003. In such list, the WP 5 is the only IUTAM working party that is mentioned as the link between IUTAM and the corresponding affiliated organisation.
The exchange of e-mails between the IUTAM and IACM Presidents, respectively Professors Keith Moffatt and Eugenio Oñate, was invoked, especially Prof. Oñate's response to Prof. Moffatt, dated November, 13th, 2002.
The Agenda was accepted that had been proposed by the Chairman.
2- 1st point of the accepted Agenda: ICTAM-2004 (Warsaw)

It was confirmed by Prof. Belytschko that two prenominated sessions were approved by the CC of IUTAM to be organised jointly with IACM:

· Computational fluid dynamics:

Chair: Prof. W. Schröder (Germany)

Co-chair: Prof. L. Kleisel (Switzerland)

· Computational solid mechanics (Multiscale Simulation):

Co-chair: Prof. T. Belytschko (USA)

Co-chair: Prof. P. Wriggers (Germany)

Professors T. Belytschko and Wriggers will be co-chairs of the computational mechanics prenominated sessions.

3- 2nd point of the accepted Agenda: ICTAM-2008

It was agreed that, in forthcoming ICTAMs, namely in 2008, more attention should be paid to Computational Mechanics, especially by resorting to IUTAM-IACM initiatives.

According to Prof. Belytschko, among such initiatives, mini-symposia should be preferred to pre-nominated sessions, and potential organisers should be identified for each. Among the possible organisers, names like Professors Oñate, Fish and Farhat were mentioned.

The Chair mentioned that it would be necessary to have such proposals available for discussion at the GA and CC meetings to be held during the ICTAM-2004.

Further discussion on the subject will be maintained by e-mail during the near future.

4- 3rd point of the Agenda: Joint IUTAM-ICTAM Symposia

Stimulating, or even initiating proposals for joint IUTAM-IACM Symposia being considered as one of the best tools for attaining the WP5 goals, the Chairman called the attention of the WP to the most interesting topics covered by the Congress that was still running, namely "Atomistic, Biomechanics, Nanotechnology, Fluid Mechanics, Multiscale Simulation". These topics touch the boundaries of Computational Mechanics with upstream fields included in the area of Mechanics, and require the development of mathematical models, as well as experimental research.

The Chair informed that the call for proposals of IUTAM Symposia will be distributed in the coming fall, and that proposals should be submitted next February to the IUTAM Secretary-General.

Names of possible organisers, like Michael Ortiz (Atomistics), from the Caltech, Pierre Ladevèze (Damage), from Cachan, Bonnacase (Multiphase Flow), from Austin, were mentioned.

Mention was made also to the fact that the experience of the former WP6 was not encouraging. It was to be feared that good proposals from the WP5 were not approved by the General Assembly of IUTAM. The fact that the IUTAM system of approving scientific meetings is much stiffer than the IACM's, makes it difficult launching joint IUTAM-IACM initiatives.

Of course, the WP5 understands that, as a limited amount of resources is available for financing initiatives such as the IUTAM symposia, voting by a body like the IUTAM General Assembly, where all the adhering organisations are represented, has been considered as mandatory.

However, as the financial aspect seems to be less appreciated, nowadays, by potential organisers than the prestige of organising a meeting jointly sponsored by organisations such as IUTAM and IACM, IUTAM could perhaps start the policy of sponsoring scientific meetings in which the financial contribution be almost symbolical. This would make it possible for IUTAM and IACM to promote scientific meetings proposed by the WP5 - working as the official link between IUTAM and IACM - and approved, exclusively, by the IUTAM Bureau and the IACM Executive Council. Further discussion on the subject will be maintained by e-mail in the near future. However, the reaction of IUTAM to suggestions as the one that the WP5 is making in the present report will be crucial for the effectiveness of the WP5 in helping promoting joint initiatives, such as joint IUTAM-IACM symposia.

5- Proposals for the ICSU Grants Programme

The Working Party fully understands the importance of developing Science, namely computational mechanics, in regions, like the African continent, where it badly needs being developed, and feels honoured for being called to contribute to intervene in such a noble design. The WP will wait for the proposals that the Secretary General of IUTAM is expected to distribute to the IUTAM Working Parties, according to what is foreseen in paragraph 2 of the Supplementary IUTAM Procedure for ICSU Grants Applications.

Signatures:

E. R. de Arantes e Oliveira, J. Tinsley Oden, T. Belytschko, Sergio Idelson

4- 2nd Circular Letter from the chairman

On December 9th, 2003, the following 2nd circular letter was sent by the chairman concerning the IUTAM Symposia and Summer Courses to be approved during the 21st ICTAM, that will take place in Warsaw:

Dear Colleagues

About one month ago, the Secretary General of IUTAM sent us an e-mail with the attachments above. In these e-mails, our role as an IUTAM Working Party was clearly described, at least in what concerns IUTAM Symposia and Summer Schools.

Our role is thus twofold:

i) If the topic of a proposed IUTAM Symposium or Summer School is falling within the scope of our Working Party, it is recommended that the proposal be send to me, but the WP is supposed to give its advice as a whole. This means that I am supposed to send to you the proposals and ask for your individual advices, trying to obtain a consensus out of your contributions.

ii) Additionally, the IUTAM Working Parties themselves are invited to stimulate the preparation of proposals for IUTAM Symposia or Summer Schools for the years 2006 and 2007, to which recommendations of the specific Working Parties could be attached. Considering that:

a) The letter was sent, not only to the members of the Working Parties and Representatives of the Affiliated Organizations, but also to the Members of the IUTAM General Assembly, all the latter are supposed, in principle, to be calling for proposals now. In the case of my country, however, I know that the database that has

been used by our only representative to the IUTAM General Assembly is the list of participants in the last national congress on computational methods, which was held already in the current year. As there are rather important potentially interested groups that did not participate in the congress, namely the earthquake engineering people, I addressed myself to this group, which showed itself quite receptive. I am looking around in order to detect other uncovered areas.

b) In what concerns our Working Party and other IUTAM Working Parties, it is important to remember that they were formed is such a way that different Regions (in our own case: Europe, North-America, South America and Asia-Pacific) are represented within each of them. The representative (in the case of North America there are two representatives) of each Region is supposed thus to observe, up to a certain point, its part of the World. In my case, I have already addressed myself to influent colleagues in some European countries, like France, Spain and Austria, and I intend to do more in the next few days. I believe that the targets should be some of those which, being institutionally less connected with IUTAM, have been less acquainted with IUTAM activities, like Symposia and Summer Schools, although they work in the area of Mechanics, namely of Computational Mechanics, since Computational Mechanics (both Solids and Fluids) is the area which we, WP5, are supposed to cover.

These are merely examples taken from my own experience. You certainly know better what to do in your own part of the World.

5- Final remark

Having addressed myself to some key personalities of the Computational Mechanics community who have not been institutionally connected to IUTAM and, therefore, have not received any information from their countries representatives to the IUTAM General Assembly, I strengthened my impression that, in most countries, the Mechanics community and the Computational Mechanics community are separate from each other. The WP5 should try to contribute to improve such communication in the future.

Report composed by E. R. de Arantes e Oliveira

WP-6 – Biomechanics

The Working Party on Biomechanics was established by IUTAM General Assembly at Cambridge in 2002. The members are Dominique Barthes-Biesel, Joan Bechtold, Gerhard Holzapfel, Kasuo Tanishita. WP6 members have worked exclusively by email. The WP has decided to first identify promising areas of Biomechanics leading to exciting multidisciplinary problems where scientists specialized in fluid or solid mechanics can bring a significant contribution.

According to the terms of reference the Working Party on Biomechanics has specific missions listed below.

1. Identify timely subjects for IUTAM Symposia

There is already some IUTAM related activity in the area of Biomechanics:

- IUTAM-Symposium "Flow in collapsible tubes and past other highly deformable boundaries" in Warwick, UK, 2001.
- IUTAM-Symposium "Mechanics of Biological Tissue" in Graz, Austria, June 27-July 2, 2004, organized and chaired by G. Holzapfel and R. W. Ogden
  http://www.cis.TUGraz.at/biomech/IUTAM-2004.htm
  The aims and scope of the Symposium are given in Annex 1. At the moment there are 7 keynote speakers and 34 invited speakers, and over 100 participants are expected.
- IUTAM advanced school “Biomechanical Modelling at the Molecular, Cellular and Tissue Levels” (application made by G. Holzapfel for year 2006). This is a proposal for a course to be held at the International Centre for Mechanical Sciences (CISM) in conjunction with an IUTAM Summer School.

Simultaneously, there are also many other Conferences on Biomechanics organized by different Societies dealing with Biomechanics at large. For example in 2004 and 2005:

- International Symposium on Computer Methods in Biomechanics & Biomedical Engineering, February 25-28 2004, Madrid, Spain
  http://www.uwcm.ac.uk/biomadrid/
- 28th Annual Meeting of the American Society of Biomechanics, September 8 - 11, 2004, Portland, Oregon, USA
  http://www.legacyhealth.org/healthcare/research/asbconf.ssi
- 14th European Society of Biomechanics (ESB2004) July 4 –7, 2004
  's-Hertogenbosch, Netherlands
  http://www.esb2004.tue.nl/
- EUROMECH Colloquium N° 456 Experimental and Computational Biofluid Mechanics, October 4 – 5, 2004, Aachen, Germany
  http://www.aia.rwth-aachen.de/euromech456/Announcement.htm
- 12th International Congress of Biorheology and the 5th International Conference on Clinical Hemorheology May 30 - June 3, 2005 Chongqing, China
  http://www.icbicch.com//

Furthermore, there is also a lot going on in the area of "Biomechanics" at Conferences not primarily devoted to Biomechanics. For example, G. Holzapfel is giving a plenary lecture on "Biomechanics" at the next GAMM-meeting in Luxemburg, in Spring 2005. Another example is a workshop on "Physical Aspects of Multiscale Modeling" in Bled, Slovenia September 13 - 15, 2004, within which one finds a specific subject area on "Biophysics, Biomechanics and Mechanobiology" (http://multiscale.boku.ac.at/).
In conclusion Biomechanics attracts a lot of attention and is presently a popular topic at many general Conferences. Many of those meetings have a very wide scope and a correspondingly large number of participants. They do not correspond to the format of an IUTAM symposium (except for EUROMECH Colloquia). This means that there is not much topical room left for specific IUTAM symposia on Biomechanics and may explain why there are few propositions in this area.

2. Recommendations to IUTAM Congress Committee regarding areas of work covered by WP6.

A Mini Symposium on Biomechanics was held at ICTAM 1992. Two pre-nominated sessions in Bio-fluid and Bio-solid mechanics were first established at ICTAM 1996. They were very successful both in Kyoto (1996) and Chicago (2000) where the lecture room was too small to accommodate the full assistance!

ICTAM 2004

This year there are prenominated sessions on Bio fluid mechanics (with 34 paper submissions) and a Mini Symposium on Tissue, Cellular and Molecular Biomechanics, (with 35 paper submissions and 3 invited lectures).
In the case of the Mini Symposium, sorting the papers by scale, there were about 6 at molecular level, 9 at cell level and 12 at tissue level (plus some miscellaneous). This indicates a stronger interest of IUTAM scientists for macroscopic (cell or tissue scale) studies than for molecular scale studies where the borderline between mechanics and physics becomes fuzzy.

The large number of paper submissions indicates a strong interest for Biomechanics within IUTAM community and we should definitely continue having special sessions devoted to this area of mechanics at ICTAM.

ICTAM 2008: suggestions for a Mini Symposium on Biomechanics.

There are two timely topics that can be suggested. Others can also be chosen from the list of topics in section 3.

Multiscale modeling in Biomechanics

Relation between cell level organization and macroscopic organ properties.
Mechano-transduction, growth and decease.
Tissue engineering: from cell level to organ replacement.
Perfusion in natural or artificial three-dimensional structures
…

3. Identify important growth areas of the field

It is important to stress that Biomechanics is a multidisciplinary science where mechanics are linked to essential biological, biochemical and biophysical processes. The analysis of any Biomechanics problem is thus extremely complex and necessitates cooperation of scientists with different fields of expertise. This research area has attracted a few engineers in the past decades, during which considerable progress has been made. As a result, Bioengineering is now part of the curriculum of most major universities worldwide. However, new and significant progress can be made by applying to living systems some methods of analysis that have been recently developed in classical mechanics. Among them one may cite (without trying to be exhaustive!) multi-scale constitutive models, numerical modeling of complex systems including fluid-structure interactions, analysis and control of large scale systems, micro and nano technologies, ...

The following topics have been identified by WP6 as being particularly important in the near future.

Multiscale modeling – Different constitutive models involving different levels of detail are linked. For various application disciplines in the life sciences, a range of scales and a large number of variables are normally needed since single-scale approaches often lead to inadequate results. Increased knowledge at the level of the cell and molecule leads to improved ability to reconstruct tissue and organ level function.

Cellular mechanics – Introducing the concept of mechanics to conventional biology and to cellular levels. For instance, the mechano-transduction process in the cell plays an important part of cellular function and we need more exact investigations for mechanical aspect for cellular function. Mechano-biology is a promising and important discipline.

Mecanotransduction – Mecanotransduction impacts many areas of basic and applied science, and is not restricted to one particular field (e.g. orthopaedics or cardiovascular, etc.). It can combine cellular mechanics and engineering methods of adaptation and remodeling to understand growth and maintenance of different tissues. Expansion of capabilities of computational methods helps to make possible the large scale computing needed for many of these approaches.

Application of cell based therapies – Practical application of the small (e.g. cellularly based) therapies into medical and health care requires devices or delivery methods. These devices or delivery methods then have to be evaluated (both pre-clinical and clinically). Although the novel and technologically challenging advance are going to be made in smaller and smaller (e.g. cellular) levels, eventually they have to be integrated into something or some method of delivering them or implanting them, etc… The macro-scale cannot be neglected when we focus on micro and nano. Likewise, the practicalities and limitations (regulatory and otherwise) associated with eventually implementing cell-based therapies will need to be addressed.

Bio fluid mechanics and therapies – Recent development of micro catheters has made possible the exploration of different physiological systems (cardiovascular, respiratory, ...), the introduction of repairing devices (e.g. stents, valves, ...) and the

development of weakly invasive surgery. Simultaneously, the analysis of flow in biological vessels profits from the progress of numerical modeling and availability of computer time. This is a fast expanding field where a lot of work has still to be done to master some of its complexity. In this area multiscale approaches are also essential to understand the coupling between complex applied mechanical stresses and cell biochemical and biological responses.

4. Establish contact with the relevant sister International Unions.

There are quite a few International Unions (IUPAP, IUBMB, IUBS, IUPESM, IUPS …) that deal in related areas such as physics or life sciences. No contact has been established yet.

It would be also of interest to establish links with strong national Biomechanics societies (EU, US, Japan, ….). In particular, the WCB (World Council of Biomechanics) has established formal links with IUTAM (D. Barthes-Biesel is the representative of IUTAM at WCB, and J. Bechtold is also a member of WCB).

5. Conclusion

IUTAM has certainly to play a role in showing to more mechanics people the wealth of interesting topics in Biomechanics at all levels. A good way to achieve this aim is through special sessions and mini symposia at ICTAM meetings, where the state of the art in a fast evolving domain can be presented.

Report composed by Dominique Barthes-Biesel

WP-7 - Nano- and Micro-Scale Phenomena in Mechanics

The annual report of WP7 (Nano- and Micro-Scale Phenomena in Mechanics) for the year 2003 is focused on the following issues: (1) an estimate of rapid growth of the subject field; (2) new contents of mechanics encountered in nano- and micro-scale phenomena; (3) current research thrusts; (4) examples of research advances; and (5) proposed activities in the future.

1. Research Trend for the Nano- and Micro-Scale Phenomena in Mechanics

It is fairly apparent that the area of Nano- and Micro-Scale Phenomena in Mechanics is booming. The area continues to grow, and the number of academics involved in this area is increasing. Several indicators are listed as follows. (1) The funding on nanoscale science and technology in the United States, Europe and Asia continues to increase; (2) Almost all universities want to hire new faculties in the nano-technology area. (3) The number of symposia on nanotechnology in major international conference continues to grow.

2. New Mechanics Contents in Nano- and Micro-scale Phenomena

The investigations devoted to the nano- and micro-scale phenomena greatly enrich the contents of theoretical and applied mechanics. These new contents include: (1) combined continuum and atomistic formulation of matters; (2) long range forces in nano- and micro-scales; (3) new avenues of field (mechanical, electric, magnetic, optical and thermal) coupling in the nano- and micro-scales; (4) enriched phenomena of scale effect; (5) multi-scale simulation as the new focus of computational mechanics; (6) a new understanding, in the cell and DNA levels, of biomechanics; (7) new technological issues such as NEMS, nanotubes, nanofluidics, nano-tribology and quantum dots.
These developments also create a stronger association of mechanics with physics, biology and material sciences. In contrast to the trend near the beginning of the 20th century when mechanics was separated from physics and combined to a large extent into engineering, the trend in the beginning of the 21st century is somewhat different.

3. Current Research Thrusts in Nano- and Micro-mechanics

The emphasis on nanoscale science and technology has shifted from fundamental science to technology. When US NSF funded its first centers on nanoscale science and technology in 2001, all five centers (Harvard, Cornell, Rice, RPI, Columbia) are on nanoscale science. When NSF awarded two new centers in 2003, the focus was on nanomanufacturing – to link nanoscale features to macroscopic products. Mechanics will play an important role here in this multiscale linkage.

The active thrusts in Nano- and Micro-mechanics include: (1) multiscale modeling technique to link nanoscale and macroscale; (2) development of continuum theories at the nanoscale (in order to overcome the time constraint of molecular dynamics); (3) technological issues associated with the development, manufacturing and reliability of MEMS and NEMS; (4) experimental technique to measure nanoscale mechanical properties; (5) design and modeling of nanostructured materials such as nano-grained materials, carbon-nanotubes and their composites, bio-inspired and bio-mimic materials, nano-structured smart materials; (6) nano-fluidics; (7) nano-tribology; (8) nano-biology such as the folding and unfolding of proteins, gene dynamics, cell adhesion, and the mechanical behavior of virus; (9) heat transfer and combustion at nano- and micro scale.

4. Examples of Research Advances

There were ample important research progresses in the year 2003 in the field of Nano- and Micro-scale Phenomena in Mechanics. Selected below are 10 examples for a brief illustration:

(1) Mechanics of Nanotubes. Two review articles [1,2] came out to sum up the progress in this subject. The review paper by Qian et al. [1] provides prospectives for a wide spectrum of computational issues concerning carbon nanotubes and their interaction with fluid. The review chapter by Huang and Wang [2] introduced a nanoscale continuum theory from the interatomic potential and the atomic structure of the material. Without any parameter fitting, the nanoscale continuum theory agrees well with molecular dynamics simulations in the study of carbon nanotubes properties, including pre-deformation energy, elastic modulus, fracture nucleation and defect nucleation, coupled electro-mechanical properties, coefficient of thermal expansion, and binding energy. One of the earlier contributions in the same group (Zhang et al. [3]) was the most cited paper in JAM in the year of 2002.

(2) MD simulation for Supersonic Fracture. From both the spatial and time scales, MD simulation suits for the investigation of dynamic fracture. The recent work by Buehler et al. [4] indicated the predictive power of MD simulation. By employing an upturn inter-atomic force potential, they simulated the supersonic crack growth in the mode II case and intersonic crack growth in the mode I case. The same concept was realized in a continuum analysis for supersonic crack growth in the mode III case [5].

(3) Thin Film Mechanics. The long-awaited book by Freund and Suresh [6] was published at the end of the year 2003. This comprehensive book covers most mechanics aspects for thin film materials, including stress, defect formation and surface evolution.

(4) Nanoscale Experimentation. Two types of experimental techniques are developed in UIUC to measure nanoscale mechanical properties. The first was developed by Saif [7] who uses MEMS to measure the properties of nanoscale devices (down to about 100nm or less). The second was developed by Yu who uses AFM to conduct the nanoscale tension, such as the tension test of carbon nanotubes

(5) Deformation of Nano-grained Metals. Understanding for the deformation of nano-grained metals was gained through large scale MD simulation [8] for the case of fast deformation, in which the high strain rate raised the flow stress, and consequently led to the burst of stacking faults. The grain boundary sliding also contributed to the overall deformation. Grain rotation is induced by the movement of disclination dipoles along the grain boundaries [9]. In-situ experimental observation for the deformation of nano-grained nickel is also achieved [10], and that is the most cited work in all papers published in Acta Materialia in the year 2003.

(6) Surface Nanocrystallization. Surface Mechanical Attrition Treatment (SMAT) is a way to induce severe plastic deformation in the surface layer of the material. The mechanics mechanism for such a process is resolved, and there are many applications for their products. For example, utilizing the high density of the grain boundary networks, one may achieve low-temperature (300C) nitriding of surface-nanocrystallized material [11], and that offers an immense opportunity to enhance the strength, as well as the resistance against wear, fatigue and stress corrosion of the machine parts.

(7) Nano-indentation. The size effect of nano-indentation has been a persistent challenge for nanomechanics. Nix and Gao explained the scale dependence of nano-indentation by strain gradient plasticity. Since then, there have been many works endeavored on this subject. We would like to mention an interesting work by Elmustafa and Stone [12] that is the most cited paper published in JMPS in the year of 2003. They pointed out that when the results are fitted to a strain gradient plasticity model, the data at deep indents (microhardness and large nanoindentation) exhibit a straight-line behavior closely identical to literature data; however, for shallow indents (nanoindentation data), the slope of the line severely changes, decreasing by a factor of 10, resulting in a "bilinear behavior".

(8) Reliability and Nanoscale Failure. A reference book “Interface and Nanoscale Failure” [13] came out in the year 2003 that contained a collection of review chapters on different aspects for the structural integrity towards the applications in nanoscale. The issues include: reliability of interconnect structures, reliability of MEMS, crack–dislocation interaction, experimentation at the Micron and Submicron Scale, nano-moiré method and nanoscopic crack tip deformation, combined atomistic and continuum simulation for fracture and corrosion,

nanoindentation, surface nanocrystallization and mechanical behavior of bulk nanocrystalline materials, and mechanics of nanotubes.

(9) Nanoscale Mechanics of Biological Materials
The progresses toward the understanding on the nanoscale mechanics of biological materials have been rewarding in the year of 2003. It is interesting to see that many established experts in solid mechanics (such as LB Freund, S Suresh, HJ Gao and R Phillips) shifted their research focus to the interface between the biological system and the nano-mechanics. The sectional lecture of Gao in the forthcoming ICTAM-2004 Warsaw conference will also be devoted in this topic, with concrete progress [14] in the understanding for the strength for bio-materials organized in specific nano-structures.

(10) Large-scale MD simulation
Large-scale parallel MD simulation has made headway in the past years. Abraham et al. [15] open the era of giga-atoms simulation that depicted in vivid details the generation of dislocation forest and the formation of the dislocation cells for a notched sample. With the help of QSC super-computer at Los Alamos National Lab, USA, the computation involving 19-billion particles [16] has been performed.

5. Expected Activities in the Future

It seems that almost all mechanics meetings/conferences have sessions on nanotechnology. The members of WP7 have been very active to visit different research groups in the world, and to attend and to organize symposia and workshops on nanomechanics-related subjects. In the future, WP7 should work together to organize some workshops or symposia on the topic area. Several future activities are listed below:

February 2004, WP7 endorsement for the proposed IUTAM symposium "Multi-scale plasticity of crystalline materials", at Eindhoven, Netherlands in 2006.
May 30 – June 04, 2004, attending IUTAM Symposium on Size Effects on Material and Structural Behavior at Micron- and Nanometer-Scales, Hong Kong, China.
August 16 – 21, 2004, attending ICTAM 2004, Warsaw, and having a WP7 meeting.
September 1 – 3, 2004, organizing IUTAM Symposium on Mechanics and Reliability of Actuating Materials, Beijing, China.
June 27 - June 30, 2005, participating on the organization of IUTAM Symposium on Mechanical Behavior and Micro-mechanics of Nanostructured Materials, Beijing, China.

Report composed by Wei Yang

WP-9 - Education in Mechanics and Capacity Building

The membership of WP9 was finalised late in May 2003. The first task of WP9 was to define the terms "Education in Mechanics" and "Capacity Building" and the framework within which the WP9 must operate. It was evident that the WP9 could not begin to address the latter without first ascertaining the health of the former in the member countries. Accordingly, it was decided to gather information on Education in Mechanics in the respective regions of the WP9 members from their personal knowledge and contacts in other countries in these regions: Europe (Karihaloo), North and South Americas (Aref), China, Far East and Australasia (Bai), Indian sub-continent and Africa (Hassan). This exercise has helped gather some useful information from the first three regions.

This task will be further assisted by the inclusion of a pre-nominated session on Education in Mechanics at the 21st ICTAM in Warsaw at the instigation of Professor Aref. With this aim in kind, the co-chairs of the pre-nominated session (Professors Engel and Karihaloo) encouraged many educators to make presentations in this session. The response has been very encouraging. Papers have been offered in 4 thematic areas of Education in Mechanics:

(i) Historical and national perspectives to guide the future direction
(ii) Innovations in Mechanics education using technology
(iii) New understandings and approaches
(iv) Selected demonstration topics

WP9 will request authors of all presentations for copies of their visual aids in order to develop a full picture of Education in Mechanics in the IUTAM member countries. WP9 will meet during 21st ICTAM to evaluate this information. Another item for discussion at this meeting will be the welcome initiative by IUTAM and other international scientific unions resulting in the establishment of the African Institute of Mathematical Sciences (AIMS) in Cape Town, South Africa. WP9 will have the benefit of a presentation on AIMS at the 21st ICTAM by the IUTAM President, Professor Moffatt, and of the experience gained at the first workshop of AIMS in Cape Town in April 2004 (Professor Aref will represent WP9 at this Workshop). WP9 believes that AIMS can serve as a model for Capacity Building in Mechanics in other regions where the health of Education in Mechanics is poor.

WP9 is very timely and should be seen as IUTAM's (small) attempt to contribute to the general issue of "Science for All Nations" on which Kofi Annan, the Secretary-General of the UN wrote an editorial in Science, 303, p. 925 (February 13, 2004).

Report composed by Bhushan L Karihaloo

2003 Treasurer's Report

	USD
Balance, 31 December 2002	**363,985.40**
Net revenues minus expenses for 2003	24,999.33
Balance, 31 December 2003	**388,984.73**
Revenues collected during 2003:	
Subscription dues	95,891.34
Interest income	3,672.96
ICSU allocations	0.00
Symposia grant repayment	3,402.29
ICTAM 2000 (Capacity building fund)	10,000.00
Total	**112,966.59**
Expenses paid during 2003:	
Symposia	20,000.00
IUTAM summer course	5,000.00
Other meetings	1,000.00
Travel, Bureau	12,295.52
Travel, Congress Committee Executive Committee	7,938.70
Travel, Other	195.00
Contribution to ICSU	2,734.00
Administration & printing	50,141.89
Web site maintenance	5,068.70
Auditor's fee	2,309.69
Bank fees	896.94
Total	**107,580.44**
Revenues minus expenses for 2003	**5,386.14**
Gain (loss) from exchange of currency	19,613.19
Net revenues minus expenses for 2003	**24,999.33**

Statement of IUTAM Bank Accounts
(1 January 2003 through 31 December 2003)

Bank	Balance 31-Dec-02	Withdrawals 2003	Deposits 2003	Balance 31-Dec-03	Currency
Checking Accounts					
Citizens Bank Providence 1009-367-2	161,538.50	(221,731.26)	96,484.60	36,291.84	USD
Citizens Bank Providence 1597-067-1	0.00	0.00	125,527.62	125,527.62	USD
ABN-AMRO Bank Eindhoven 41.41.42.551	29,446.81	(6,736.16)	14,047.00	36,757.65	USD
ABN-AMRO Bank Eindhoven 41.41.28.311	758.30	(93.68)	1.82	666.44	EUR
Savings Accounts					
Citizens Bank Providence	101,868.09	0.00	1,495.04	103,363.13	USD
ABN-AMRO Bank Eindhoven	71,013.89	0.00	1,611.13	72,625.02	EUR

IUTAM Bank Account Information

Treasurer:
Professor L. B. Freund, Division of Engineering, Brown University, Providence, RI 02912-9104, USA

Assistant Treasurers:
Professor D. H. van Campen, Faculty of Mechanical Engineering, Eindhoven University of Technology, Postbus 315, NL-5600 MB Eindhoven, The Netherlands
Professor Bruno A. Boley, Department of Civil Engineering & Engineering Mechanics, Columbia University, New York, NY 10027

Bank Accounts:
ABN-AMRO Bank, Postbus 515, 5600 AM Eindhoven, The Netherlands, Account 41.41.42.551 (USD)
Citizens Bank, One Citizens Drive, Riverside, RI 02915-3000, Account 1009-367-2 (USD)

Subscription Due Paid in Membership Units
(1 January 2003 through 31 December 2003)

Adhering Organization	1998	1999	2000	2001	2002	2003
Argentina	1	1	1	1	--	--
Australia	3	3	3	3	3	3
Austria	1	1	1	1	1	1
Belgium	5	5	5	5	5	5
Brazil	1	1	1	1	1	1
Bulgaria	1	1	1	--	1	--
Canada	8	8	8	8	8	8
Chile	--	1	1	1	1	1
China/Beijing	8	8	8	8	8	--
China/ Hong Kong	1	1	1	1	1	1

Adhering Organization	1998	1999	2000	2001	2002	2003
China/Taipei	3	3	3	3	3	3
Croatia	1	1	1	1	1	1
Czech Republic	1	1	1	1	1	1
Denmark	3	3	3	3	3	3
Egypt	1	1	1	1	1	1
Estonia	1	1	1	1	1	1
Finland	3	3	3	3	3	3
France	8	8	8	8	8	8
Georgia				--	--	--
Germany	8	8	8	8	8	8
Greece	1	--	--	1	--	--
Hungary	1	1	1	1	1	1
India	5	5	5	5	5	5
Ireland	1	1	1	1	1	1
Israel	3	3	3	3	3	3
Italy	8	8	8	8	8	8
Japan	8	8	8	8	8	8
Korea	1	1	1	1	--	--
Latvia	1	1	1	1	1	--
Morocco		--	--	--	--	--
Netherlands	5	5	5	5	5	--
New Zealand	1	1	1	1	1	1

Adhering Organization	1998	1999	2000	2001	2002	2003
Norway	1	1	1	1	--	--
Poland	3	3	3	3	3	3
Portugal	1	1	1	1	1	--
Romania	1	1	1	1	1	1
Russia	8	8	8	8	8	8
Saudi Arabia	1	1	1	1	1	1
Serbia and Montenegro	1	1	1	1	1	1
Slovakia	1	1	1	1	1	1
Slovenia	1	1	1	1	1	--
South Africa	1	1	1	1	1	1
Spain	1	1	1	1	1	--
Sweden	5	5	5	5	5	5
Switzerland	3	3	3	3	3	--
Turkey	1	1	1	1	1	1
Ukraine				1	1	--
United Kingdom	8	8	8	8	8	8
United States	12	12	12	12	12	12
Vietnam	1	1	1	1	1	1

Note: For any particular year, a dash (--) indicates that dues had not been paid as of 31 December 2003 and a blank space indicates no adhering organization. Dues are expressed in membership units of 1, 3, 5, 8 or 12, corresponding to category of membership from I through V, respectively.

Reports on Affiliated Organizations

AFMC (Asian Fluid Mechanics Committee)

The Tenth Asian Congress of Fluid Mechanics (ACFMX) will be held at the Faculty of Engineering, University of Peradeiya, Sri Lanka from 17-21 May 2004 (see http://acfmx.pdn.ac.lk/index.html). Professor Siva Sivasegaram, the member of the Asian Fluid Mechanics Committee from Sri Lanka is Chairman of the Organising Committee.

Report composed by Office SG

CACOFD (Caribbean Congress on Fluid Dynamics)

The Caribbean Congress of Fluid Dynamics was engaged in the preparation of its Sixth Conference, which is due to take place in Trinidad from January 22-23, 2004.
Among the Speakers invited are K. Moffat, S.H.Davis, H. Stone, H.Kulman, I.A. Eltayeb and R. Dawe. An Executive Meeting will take place during the Conference and a new administrative structure is expected to be put in place.

Report composed by Harold Ramkissoon

CISM (International Centre for Mechanical Sciences)

1. Courses and Seminars

The regular programme of courses and seminars, planned for the Centre for 2003 by the Scientific Council, took place in two Scientific Sessions, the Onicescu Session (June-July 2003) and the Palacios Session (September-October 2003). The topics, always at an advanced level, included different fields of mechanics and related computer sciences, both at a basic and applied level. Several courses and one conference were sponsored by UNESCO.

The Onicescu Session
- Moving Discontinuities in Crystalline Solids
- Effect of Heat on Concrete
- Degradations and Instabilities in Geomaterials
- Chemo-Mechanical Couplings in Porous Media – Geomechanics and Biomechanics
- Bone Cell and Tissue Mechanics
- Mechanics of Solid Polymers: the Kinetics of Irreversible Processes

The Palacios Session

- Microfluidics: History: Theory and Applications
- Walking: Biological and Technological Aspects
- Dynamical Systems, Wave-Based Computation and Neuro-Inspired Robots
- Parameter Identification and Mathematical Modelling in Structural Instabilities
- Phenomenological and Mathematical Modelling in Structural Instabilities

IUTAM International Summer School on Mechanics of Microstructured Materials

2. Other Events

Besides the above courses, the following other meetings were organized or hosted by CISM in 2003

- Finite Element Applications in Geotechnical Engineering (July 9-11, 2003)
- New Perspectives in Thermodynamics: from the Macro to the Nanoscale (October 27-31, 2003)
- CEPET 4th Workshop (Central European Programme in Economic Theory) (June 4-6, 2003)

3. Editorial Activities

The lectures of several courses held at CISM are published in book form and distributed by Springer Verlag Vienna, New York. The following books were published in 2003:

L. Cortellezzi, A.R. Karagozian, *Modelling, Manipulation and Control in Transverse Jets*
D.E. Beskos, *Boundary Element Advances in Solid Mechanics*
G.A. Holzapfel, R.W. Ogden, *Biomechanics of Soft Tissue in Cardiovascular Systems*
F.M. Mazzolani, *Aluminium Structural Design*
G. Pedrizzetti, K. Perktold, *Cardio-Vascular Fluid Mechanics*
H.Altenbach, W. Becker, *Modern Trends in Composite Laminates Mechanics*
V.Bertola, *Modelling and Control of Two-Phase Flow Phenomena*
C.Davini, E. Viola, *Problems in Structural Identification and Diagnostics: General Aspects and Applications*
G. Della Riccia, H.J. Lenz, R. Kruse, *Planning Based on Decision Theory*

The international Journal for rapid communication "Mechanics Research Communications" (bimonthly) created by CISM and Pergamon Press, Oxford, New York in 1973, published in 2003 its thirtieth volume. It contains short communications on research related to a wide domain of both theoretical and applied mechanics.

4. Scholarships

A number of scholarships, including free lodging and board or exemption from registration fee, was offered during the courses to participants who were not supported

by their home institutions, priority being given to young researchers coming from countries that contribute to CISM's operating resources.
Partial travel reimbursements as well as free board and lodging in Udine were granted to several participants from Mediterranean and Central Europeean countries, thanks to a UNESCO contribution.

5. International Participation

In 2003 71 lecturers from 18 countries delivered lectures in the Onicescu and Palacios Sessions. The courses were attended by 379 participants coming from 39 countries.

Report composed by Bernard Schrefler

EUROMECH (European Mechanics Society)

EUROMECH - European Mechanics Society is an international non-governmental non-profit scientific organization.

The objective of the Society is to engage in all activities intended to promote in Europe the development of mechanics as a branch of science and engineering.

The society is governed by the Council whose members are being elected according to rules set in Statutes.

EUROMECH meetings
The EUROMECH Council has overall responsibility for EUROMECH Colloquia and EUROMECH Conferences.

EUROMECH Colloquia are informal meetings on specialized research topics. Participation is restricted to a small number of research workers actively engaged in the field of each Colloquium. The organization of each Colloquium, including the selection of participants for invitation, is entrusted to a Chairman. Proceedings are not normally published. Those who are interested in taking part in a Colloquium should write to the appropriate Chairman (Number, Title, Chairperson or Co-chairperson).

EUROMECH Conferences are broad in scientific scope. They comprise the EUROMECH Solid Mechanics Conference, the EUROMECH Fluid Mechanics Conference, the EUROMECH Turbulence Conference, the EUROMECH Nonlinear Dynamics Conference and the EUROMECH Mechanics of Materials Conference. They are open to all those interested and are expected to have a number of participants between 150 and 600. The general purpose is to provide opportunities for scientists and engineers to meet and discuss current research. The responsibility for each series of Conferences is delegated to a Standing Conference Committee. The organizational work is carried out by Local Organizing Committees (LOC). Those who are interested in

taking part in one of the Conference should write to the Chairman or Secretary of the appropriate LOC.
In 2003 three big EUROMECH Conference were organized. The 5th Euromech Fluid Mechanics Conference, 24 – 28 August 2003, Toulouse, France, the 5th Euromech Solid Mechanics Conference, 17 – 22 August 2003, Thessaloniky, Greece and the 7th European Mechanics of Material Conference (EMMC7), 18 – 23 May 2003, Frejus, France. The EUROMECH Society also initiated and organized 8 Colloquia during 2003.

For more details see www.euromech.cz .

Report composed by Miloslav Okrouhlik

HYDROMAG (International Association for Hydromagnetic Phenomena and Applications)

HYDROMAG is an international association of scientists and engineers active in those fields of research which involve the flow of fluids in the presence of a magnetic fields, namely magnetohydrodynamics (MHD), electromagnetic processing of materials (EPM) an ddynamics of magnetic fluids (MF). HYDROMAG promotes growth and visibility of the field of hydromagnetics and stimulates exchanges between its members throughout the world via conferences, workshops, summer schools and publications. Detailed information on HYDROMAG can be accessed under

http://www.maschinenbau.tu-ilmenau.de/mb/wwwtd/hydromag/home.html

This WWW-site contains information on membership, forthcoming conferences, the electronic HYDROMAG newsletter and a link to the German Ferrofluid Information Server, maintained by Dr. S. Odenbach (University of Bremen).

During the year 2003 several workshops and scientific meetings have been conducted involving the active participation of HYDROMAG and its members including the International Conference on Electromagnetic Processing of Materials in Lyon, France, which was consider as a major highlight.

A group of European Scientists successfully established a network on MHD in frame of the COST-programme of the European Commission called “COST action P6 Magnetofluiddynamics”. The programme supports mutual visits of scientists. Detailed information can be obtained from

http://www.maschinenbau.tu-ilmenau.de/mb/wwwtd/COST/COST_Page01.html

Report composed by André Thess

IABEM (International Association for Boundary Element Methods)

Following the IABEM 2004 symposium (Austin, USA, May 2002), a special issue of Computational Mechanics, gathering extended versions of 23 selected contributions, has been published under the guest editorship of Spyros Kinnas and Marc Bonnet (vol. 32, issues 4-5-6, 2003)

The IABEM 2004 symposium is going to be held on May 24-26, 2004, at the university of Minnesota, Minneapolis, USA (see http://www.iabem2004.org/). It is organized by Prof. Steven L. Crouch. About 60 papers and 80 participants are expected. A special issue of Computational Mechanics gathering selected full-length contributions to IABEM 2004 is planned.

Report composed by Marc Bonnet

IACM (International Association for Computational Mechanics)

The following IACM supported events took place in 2003:
Workshop on Numerical Methods in Computational Mechanics Advances and Challenges, West Lafayette, Indiana, February 20-21, 2003.
Finite Elements in Flow Problems '03 - FEF03, Nagoya, Japan, April 2-4, 2003
International Conference on Computational Plasticity - COMPLAS VII, Barcelona, Spain, April 7 -10, 2003.
CMM 2003 15th International Conference on Computer Methods in Mechanics, Gliwice, Poland, June 3-6, 2003
Structural Membranes 2003, Barcelona, Spain, June 30 - July 3, 2003.
Multibody Dynamics 2003, Lisbon, Portugal, July 1 -4, 2003.
Seventh U.S. National Congress on Computational Mechanics, Albuquerque, New Mexico, USA, July 27 - 31, 2003.
Workshop on Smart Materials and Structures - SMART'03, Jadwisin, Poland, September 2-5, 2003.
EUROGEN 2003, Barcelona, Spain, September 15-17, 2003.
International Conference on Adaptive Modeling and Simulation - ADMOS 2003, Götteborg, Sweden, September 29 - October 1st, 2003.
ENIEF 2003 XII Congress on Numerical Methods and their Applications, Bahía Blanca, Argentina, November 4-7 2003
Workshop on Nano, Continuum, Material, and Computational Mechanics, Klong Luang, Thailand. December 11-12, 2003.

IACM activities for 2004:
WCCM VI - 6th International Association for Computational Mechanics (IACM) World Congress, Bejing, China on September 5 - 10, 2004

Future IACM supported events:
III International Congress on Numerical Methods in Engineering and Applied Sciences, Monterrey, Mexico, January 22-24, 2004
VI International Congress on Numerical Methods in Engineering, Lisbon, Portugal, May 31 – June 2, 2004.
ICCMS 2004
First International Congress on Computational Mechanics and Simulation, Kanpur, India. 9-12 December 2004.
IASS IACM'05
5th International Conference on Computation of Shell & Spatial Structures, Salzburg, Austria, June 1-4, 2005.
VII World Congress on Computational Mechanics, Century City, California, USA, 16-22 July, 2006. USNCCM VIII
8th U.S. National Congress on Computational Mechanics, Austin, Texas, 24-28 July, 2005.
COMPLAS VIII
International Conference on Computational Plasticity, Barcelona, Spain, September, 5 -8, 2005.

For further details on the above events you can contact the IACM Secretariat, iacm@cimne.upc.es . Further information on IACM activities can be found in the web page www.iacm.info

Report composed by Cristina Forace

IAVSD (International Association for Vehicle Systems Dynamics)

The main event organized by IAVSD was the 18th International IAVSD Symposium that took place on August 25-29, 2003 in Kanagawa Institute of Technology, Kanagawa, Atsugi, Japan. There were 208 participants from 26 countries all over the world and there were presented 127 papers (89 orally and 38 as poster). The number of participants, the number of participants from industry and the number of submitted papers were increased compared with previous symposia and it was a great success of the IAVSD Symposium in Kanagawa.
At the symposium the Board of IAVSD has elected the new president and vice-president. The new president of IAVSD became Prof. Hans True from Technical University of Denmark, Denmark. The 1st vice-president remained Prof. Robin Sharp. The 2nd vice-president became Prof. Roger Goodall from Loughborough University, UK. The IAVSD Board has decided that the next 19th International IAVSD Symposium will take place in Politecnico di Milano on August 29- September 2, 2005.
There were finished the preparation of supplement of Vehicle System Dynamics Journal from selected papers from 5th World Congress on Computational Mechanics in Vienna 2002.

The next associated events of IAVSD will be the colloquium on "Tyre Models for Vehicle Dynamic Analysis" in August 2004 in Vienna, Austria and the International Conference on Advanced Vehicle Control AVEC'04 in 2004 in Arnhem, the Netherlands.

Report composed by Michael Valasek

ICA (International Commission for Acoustics)

(http://www.icacommission.org)

The International Commission for Acoustics (ICA) is a worldwide consortium of societies concerned with the field of acoustics. The ICA convenes the triennial International Congress on Acoustics in accordance with the Commission's guidelines. The ICA has also undertaken a number of initiatives to promote international development and collaboration in all fields of acoustics. The ICA currently has 43 Member Societies worldwide.

The ICA held its annual Board meeting in Paris, France on 2003 September 6. The next major event for the ICA is the 18th triennial Congress that be held on 2004 April 4-9 in Kyoto, Japan. The deadline for abstract was set for 2003 September 15 and close to 1300 abstracts were received. An important event during the 18th Congress will be the General Assembly where the new Board will be elected.

The plans to provide travel grant program to provide support for students and early carry scientists to attend the 18th Congress were approved during the Paris Board meeting. An announcement was circulated to the Member Societies and posted on both the ICA web site the 18th Congress web site. The grants were announced late last year and a total of 16 grants of US$ 750 will be given for travel to Kyoto. In addition invitations to nominate candidates for the ICA Early Career Award were also circulated to the Member Societies and posted on both web pages. It is expected that the winner(s) of the award will be announced in March 2004 and the award(s) will be given during the 18th Congress.

The ICA continues to promote its Conference Grant Program for small (< 100 attendance) specialty symposia on acoustics. Support is now provided for a number of symposia each year. Each symposium typically receives up to US$ 2000.
The following two symposia were approved for support in 2003 to provide travel assistance for international participation:

- 7th International Symposium on Transport Noise and Vibration 2004, 8-10 June 2004 in Saint Petersburg, Russia
- 9th Meeting of the European Society of Sonochemistry, 25-30 April 2004 in Badajoz, Spain

This program is funded jointly between the ICA and the Committee for International Research and Education of the Acoustical Society of America.

The ICA continues to maintain an International Calendar of Meetings and Congresses on Acoustics through the ICA Information Services. The Calendar is published simultaneously on the ICA web site and in the J. Acoust. Soc. Am.

During the Board meeting in Paris, the desirability of applying for membership within ICSU was discussed. An information letter was circulated to the Member Societies in preparation for discussion during the next General Assembly in Kyoto.

Report composed by Gilles Daigle and Suk Wang Yoon

ICF (International Congress on Fracture)

In 2003, ICF organised a successful interquadrennial conference on "Scale Interaction in Fracture" in Moscow on June 23 – 26. The conference was held at the Institute for Problems in Mechanics, Russian Academy of Sciences and was very well supported. The theme of this Conference is closely related to the pre-nominated session FSM6 to be held during the 21st ICTAM in Warsaw.

Preparations for the next quadrennial conference of ICF (ICF 11) to be held in Turin, Italy on March 20 – 25, 2005 are in full swing (www.ICF11.com). The scientific programme for ICF11 revolves around 45 selected topics. On each topic there will be one or several technical sessions organised by internationally known researchers. The format is similar to that of the ICTAM minisymposia. The opening and closing lectures at ICF II will be given by Professors Mandelbrot and Barenblatt respectively. The ICF Awards Committee, jointly chaired by Professors Taplin and Karihaloo is currently canvassing the membership of ICF for ICF Honorary Fellowship nominations.

Report composed by Bhushan L Karihaloo in consultation with Yiu-Wing Mai.

ICHMT (International Centre for Heat and Mass Transfer)

ICHMT organized two international symposia and sponsored three in 2003:

- "Mediterranean Combustion Symposium", (Sponsored) June 8-13, 2003, in Kenzi Farah Hotel, Marrakech, Morocco. The symposium was Co-chaired by Dr. Federico Beretta, Istituto di Ricerche sulla Combustione Consiglio Nazionale delle Ricerche, Italy; Professor Nevin Selcuk, Middle East Technical University, Turkey; Prof. Mohy S. Mansour, The American University in Cairo, Egypt.

- "Transient Convective Heat and Mass Transfer in Single and Two-Phase Flows ", August 17-22, 2003 in Golden Dolphin Resort Hotel, Cesme, Izmir, Turkey. The

symposium was chaired by Professor Jacques Padet, UTAP - Laboratoire de Thermomécanique Faculté des Sciences , France; Professor Sadik Kakac, University of Miami, U.S.A.; Proffesor Faruk Arinc, Secretary General, ICHMT, Middle East Technical University, Turkey. Selected papers of the symposium will be published in the International Journal of Thermal Sciences (Revue Générale de Thermique).

· "Turbulence, Heat and Mass Transfer" October 12-17, 2003 in Dedeman Hotel, Antalya, Turkey. The symposium was chaired by Proffesor Kemal Hanjalic, Delft University of Technology, The Netherlands; Proffesor Yasutaka Nagano , (Co-Chairman), Nagoya Institute of Technology, Japan; Proffesor Faruk Arinc, (Symposium Secretary, ICHMT), Middle East Technical University, Turkey. Selected papers will be considered for publication in extended form in the International Journal of Heat and Fluid Flow.

· "A short Course on Passive Thermal Control" (Sponsored) October 22-24, 2003 in Club Hotel Sera, Antalya, Turkey. The latest developments in the theory and applications of Passive Thermal Control and lectures on relevant subjects were presented by international experts who have first hand experience in the design and application of Passive Thermal Control Sytems.

· "ASME Distinguished Lecturer Program Seminer on Constructal Theory and Design: Optimal Flow Architecture, from Engineering to Nature" (Co-Sponsored) December 8, 2003, METU, Ankara; December 9, 2003, ITU, Istanbul by Proffesor Adrian Bejan, Massachusetts Institute of Technology, U.S.A.

Details of these meetings including abstracts of all presentations can be found on the webpage at < http://www.ichmt.org/abstracts/meetings.html >

The organization of several future meetings have continued. These are :

· "Third International Symposium on Advances in Computational Heat Transfer", April 19-24, 2004, on MS Midnatsol, a cruise ship operating between Kirkenes and Bergen, Norway. Detailed information can be found on the symposium Web site: <http://cht04.mech.unsw.edu.au>.

· "Fourth International Symposium on Radiative Transfer", June 20-25, 2004 in The Marmara Hotel, Istanbul, Turkey. Detailed information can be found on the symposium Web site: <http://www.ichmt.org/RAD-04>.

· "Heat and Mass Transfer in Spray Systems", June 5-10, 2005, Antalya, Turkey. Detailed information can be found on the symposium Web site: <http://www.ichmt.org/SPRAY-05>.

Report composed by Ahu Yucesoy

ICM (International Congress on the Mechanical Behaviour of Materials)

During 2003, the ninth International conference on the Mechanical Behaviour of materials (under the auspices of ICM) was held in Geneva Switzerland from May 25-29. There were delegates from various countries, 207 full registration, 35 students and 25 accompanying persons. In this successful conference papers were presented on a variety of traditional and new topics of interest, including fatigue, fracture, novel experimental methods, thin films, mems, interfaces, micro-mechanics, constitutive equations and atomistic simulations. The type of materials encompassed: metals and alloys, composites, cellular, biological, ceramics, polymers and concrete materials.
The ICM Executive Committee met on May 25 and a list of nominations for a new executive committee was prepared. The ICM Board of Governors subsequently ratified this list consisting of 13 members headed by Professor Fernand Ellyin.
In the meeting of the ICM Board of Governors on May 27, 2003, the bid by Korea to host ICM 10, chaired by Professor S.W. Nam, to be held in Busan Korea in 2007, was approved.

Report composed by Fernand Ellyin, President of ICM

ICR (International Committee on Rheology)

The Korean Society of Rheology will host the XIVth International Congress on Rheology, which will take place in Seoul's COEX Convention Center, August 22 to 27, 2004. Details about the Congress can be obtained from the Congress website (http://www.icr2004.or.kr). The Chairman of the Organizing Committee is Professor Jae Chun Hyun of the Korea Science & Technology Center, and the Secretary is Professor Seung Jong Lee of Seoul National University.

The International Committee will meet in Seoul during the Congress to discuss matters pertaining to rheology worldwide and to decide on, or rather to confirm the selection of, the site of the next Congress, in 2008. The meeting will be chaired by Prof. Ken Walters of the University of Wales, co-organizer of the Congress in Cambridge in 2000. It is the turn of the Americas region to host the Congress in 2008 and, since Canada and Mexico have organized the most recent Congresses in America, the United States is given the next opportunity. To this end, the Society of Rheology (US) has proposed that the next site be Monterey, California, and in the summer of 2003 a detailed plan for a Monterey Congress was sent to the 23 Delegates of the Committee (the voting representatives of the member national societies). At this writing, the proposal has been received with general approval and no alternate bid has appeared. Hence the site of the 2008 International Congress will almost surely be Monterey, California.

Report composed by David F. James

ICTS (International Congresses on Thermal Stresses)

International Congresses on Thermal Stresses held their meetings every two years, consecutively on three continents. There were so far five congresses (the first two were called International Symposia):

- The First, Hamamatsu, Japan, 1995;
- The Second, Rochester, NY, U.S.A. 1997;
- The Third, Cracow, Poland, 1999;
- The Fourth, Osaka, Japan, 2001.
- The Fifth, Blacksburg, VA, U.S.A. 2003.

President of ICTS: Richard B. Hetnarski
Secretary General: Theodore R. Tauchert
Representative of ICTS in IUTAM: Richard B. Hetnarski

All past Congresses published extensive Proceedings volumes, containing required four-page abstracts for regular speakers, and six-page abstracts for invited speakers.

The Fifth International Congress on Thermal Stresses, *Thermal Stresses 2003*, was held at Virginia Polytechnic Institute and State University, Blacksburg, VA, U.S.A. on June 8-11, 2003. The Web page of *Thermal Stresses 2003*: www.esm.vt.edu/ts2003/
Chair: Liviu Librescu. Co-Chairs: Richard B. Hetnarski, Edmund G. Henneke, and Naotake Noda. Secretary: Piergiovanni Marzocca. There were 150 participants from 32 countries. Proceedings in two volumes were published, edited by L. Librescu and P. Marzocca.

During the Congress, at a joint meeting of the Executive Committee and the International Committee, some changes in the Statute of ICTS were adopted. Also, the preparations for the Sixth International Congress on Thermal Stresses, *Thermal Stresses 2005,* which will be held at Vienna University of Technology on May 26-29, 2005, were discussed.

Chairs of *Thermal Stresses 2005:* Franz Ziegler, General Chair; Richard B. Hetnarski and Naotake Noda, Co-Chairs; Christoph Adam, Secretary. Liviu Librescu and Yoshinobu Tanigawa, Chairs of International Organizing Committee; Rudolf Heuer, Chair of National Organizing Committee, and Hans Irschik, Chair of the Program Committee. The Web page of *Thermal Stresses 2005:* http://info.tuwien.ac.at/ts2005

The site for the Seventh International Congress on Thermal Stresses, *Thermal Stresses 2007*, has been selected. The Seventh Congress will be held at Iwate University, Morioka, Japan, in June 2007.

Report composed by Richard B. Hetnarski

IIAV (International Institute of Acoustics and Vibration)

The International Institute of Acoustics and Vibration (IIAV) continues to flourish. At present it has 500 individual members in 55 countries. The annual IIAV ballot was held again in 2003 in which all members voted on candidates for five new directors to replace the five directors whose four-year terms had expired. The five directors elected were Jorge P. Arenas, Chile; Hanno Heller, Germany; Hugh Hunt, UK, Nicole Kessissoglou, Australia, and Jan Verheij, Netherlands. In this year of 2004, the seventh annual IIAV election will be held. The 2004 ballot, in which all IIAV members will take part, is for one of an IIAV president, president elect, vice-president and five new directors. The IIAV president and president elect serve two year terms. IIAV vice-presidents and directors serve four-year terms.

A very successful conference was held in Stockholm, Sweden, from July 4-7, 2003. Altogether 667 delegates from 54 countries attended this, the Tenth International Congress on Sound and Vibration (ICSV10). The technical programme included over 600 lectures arranged in 13 parallel technical sessions over a period of three and as half days. Many of the sessions were organized by members of the ICSV10 Scientific Committee. The ICSV10 technical proceedings were available to delegates at the congress itself in CD-ROM and hard copy format totaling 5200 pages. Just after the opening ceremony, Professor Heinrich Kutruff, Germany was awarded the sixth honorary fellow membership of the IIAV and he delivered a special keynote lecture "Room Acoustics: Art or Science." There were altogether six plenary keynote lectures: Ann Dowling, UK, "Singing Flames - The Coupling of Acoustics and Combustion"; Stephen J. Elliott, UK, "Distributed Control of Sound and Vibration"; Yuri Bobrovnitskii, Moscow, Russia, "Measurement of Vibration Energy Characteristics of Structures"; Otto Gartmeir, Germany, "Noise and Vibration in Vehicle Comfort Design"; Jean-Louis Guyader, France, "Energy Residual: A tool to Study the Dispersion of Vibroacoustic Performances of Structures"; and David Burnett, Italy, "Finite- Element Methods for Structural Acoustics: Physics, Mathematics and Modeling". In addition during ceremonies at ICSV10 five IIAV members were elevated to fellow grade in IIAV: J. L. Bento Coehlo, Lisbon, Portugal, Nickolay I. Ivanov, St. Petersburg, Russia, Ignacy Malecki, Warsaw, Poland, and Bob Randall, Sydney, Australia.

The Eleventh International Congress on Sound and Vibration (ICSV11) will be held in St. Petersburg, Russia July 5-8, 2004 and will be hosted by the Noise and Vibration Society of Russia and the International Institute of Acoustics and Vibration in cooperation with the Acoustical Society of Russia and the American Society of Mechanical Engineers. A total of 685 abstracts from authors from 50 countries have been received for the Eleventh Congress. All of the technical papers presented will be published and available on CD-ROM and hard paper format for participants at the Congress. In addition the technical programme including abstracts of all of the papers in hard form will be available at the Congress, and given to all ICSV11 participants. An Exhibition will also be held at the Eleventh Congress. Plans are also well underway for the twelfth congress (ICSV12) to be held in Lisbon, Portugal in July 2005, the thirteenth

congress (ICSV13) to be held in Vienna, Austria in July 2006, and the fourteenth congress ICSV14 to be held in Cairns, Australia in July 2007.

Two more organizations finalised memorandums of agreement with IIAV in 2003-2004: the American Society of Mechanical Engineers International (ASME), and the Centro Interuniversitario di Ricera sull'Inquinamento da Agent Fisica (CIRIAF) (the Inter-University Research Center on Physical Agents and Pollution) of Italy. Currently 32 scientific societies or similar organizations are affiliated to IIAV as cooperating societies.

Publication of the International Journal of Acoustics and Vibration (IJAV), the refereed quarterly journal of IIAV, continues well on schedule. IJAV is receiving a steadily increasing flow of good papers. IJAV is sent to all IIAV members and to a number of libraries all over the world. IIAV recognized one more archival journal in 2003 in the general area of acoustics and vibration: "The Archives of Acoustics", published in Warsaw, Poland. Some years earlier IIAV recognized the "Journal of Sound and Vibration" published by Academic Press as an archival journal.

Report composed by Malcolm J. Crocker

ISIMM (International Society for the Interaction of Mechanics and Mathematics)

In 2003, the elections for a new president and a new secretary of ISIMM as well as the by-elections for the executive committee, as required by the Constitution of ISIMM, were carried. Professor Mario Pitteri (Universit`a degli Studi di Padova, Italy) and Professor Adriano Montanaro (Universit`a degli Studi di Padova, Italy) have received most votes and, consequently, Professor Pitteri will be the President of ISIMM and Prof. Montanaro its Secretary/Treasurer for the next four years.

For completeness below is the effective list of the officers and members of the executive committee together with the dates when their tenure expires.
President: Prof. M. Pitteri, pitteri@dmsa.unipd.it (until 2007),
Vice President: Prof. I. Müller, im@thermodynamik.tu-berlin.de (until 2007),
Secretary/Treasurer: Prof. A. Montanaro, montanaro@dmsa.unipd.it (until 2007)
Members of the Executive Committee:
Prof. Ph. Boulanger, phboul@ulb.ac.be (until 2007), Prof. C.O. Horgan, Coh8p@virginia.edu (until 2005), Prof. A. Mielke, mielke@mathematik.uni-stuttgart.de, (until 2007), Prof. W. Müller, Wolfgang.H.Mueller@tu-berlin.de, (until 2007), Prof. M. Padula, pad@dbs.unife.it, (until 2007), Prof. M. Silhavy, silhavy@mbox.cesnet.cz, (until 2005), Prof. L. Truskinovsky, trusk@lms.polytechnique.fr, (until 2005), Prof. L. Turski, laturski@cft.edu.pl (until 2007), Prof. E.G. Virga, virga@imati.cnr.it, (until 2005), Prof. A. Visintin, visintin@science.unitn.it (until 2007).

Professor Kolumban Hutter from Darmstadt is organizing the STAMM XIV meeting.

News about the symposium may be collected from the web-page http://wegener.mechanik.tu-darmstadt.de/STAMM04.
The dates are chosen so as to cover the week immediately after the IUTAM Congress in Warsaw. That congress is sure to be visited by many scientists from all over the world. Thus ISIMM members who visit the Warsaw event from overseas, may decide to add a week to their stay in Europe and attend the STAMM meeting. The venue will be the Lufthansa training centre in Seeheim-Jugenheim, which is in the close neighbourhood of the Frankfurt airport and connected to it by a regular direct bus ride of approximately ½ hour.

The long-standing plans of the Society for the publication of a series of books has come to fruition. The series will be called "Interaction of Mechanics and Mathematics Series" (IMM) and will be published by Springer Heidelberg. In the publication agreement it says that the series will "cover advanced textbooks and introductory scientific monographs in English language. The authors should be distinguished specialists with international reputation in their field of expertise". Professor Lev Truskinovsky has signed the agreement on behalf of the Society. He is also the editor of the series.

Current activities of the Society are reported in Newsletters which appear on the webpage of the Society: http://www.thermodynamik.tu-berlin.de/isimm/index.html.

Report composed by K. Wilmanski

ISSMO (International Society for Structural and Multidisciplinary Optimization)

ISSMO held its Fifth World Congress on Structural and Multidisciplinary Optimization on May 19-23, 2003 in Lido di Jesolo-Venice, Italy. The Congress was attended by 237 delegates and 37 accompanying persons, and 32 countries were represented. The International Papers Committee had accepted 260 papers (203 for lecture and 57 for poster presentation), and these were presented in four parallel lecture sessions and one poster session. In addition, there was a plenum panel session summarizing status and progress of the following pre-selected areas relevant to ISSMO: Evolutionary methods, Topology and shape design, Probabilistic methods, identification and reliability, Industrial applications and software, and Approximations. The proceedings of the Congress are due to be published on CD-ROM by the University of Pavia, Italy.

ISSMO held two Executive Committee meetings and a General Assembly meeting in conjunction with the Congress. The General Assembly elected a new Executive Committee for the next four year term with office-bearers as follows: M.P. Bendsoe (President), G. Cheng and P. Hajela (Vice-Presidents), B.M. Kwak (Secretary-General), and N. Olhoff (Past-President and Treasurer). The next World Congress will be held in Rio de Janeiro, Brazil in 2005.

ISSMO also co-sponsored a number of scientific specialty meetings in 2003. Please refer to the website http://www.issmo.org for more information about ISSMO.

Report composed by Niels Olhoff

Reports on ICSU and its Scientific Committees

Relations with ICSU (International Council for Science)

It was reported last year that a proposal was submitted by IUTAM (in February 2003), under the ICSU grants programme 2004, with the support of IUGG, IMU, IUPAP, IUPAC, IAU, the Third World Academy of Sciences (TWAS) and five National Scientific members of ICSU, namely South Africa, UK, Netherlands, Brazil and Egypt. This proposal was for the support of the African Institute for Mathematical Sciences (AIMS), recently established in Muizenberg, a suburb of Cape Town, South Africa.

I am glad now to report that the proposal was successful and that a maximal grant of $100K was awarded. This grant, which must be spent during 2004, is to be used for three purposes: the support of African graduate students taking the one-year diploma course offered by AIMS, the support of the web-based AIMS Schools Enrichment Centre, and the support of a Workshop on Capacity Building in the Mathematical Sciences (which of course includes Theoretical and Applied Mechanics) which is to be held at AIMS, 13-17 April 2004. Representatives of IUTAM (the President, the Secretary General and Professors Hassan Aref and Jean Salencon) will attend this workshop, and representatives of most of the above supporting organisations will also participate.

AIMS was launched by a meeting held 18/19 September 2003, at which IUTAM was represented by the President, by Professor C.G.du Toit (South Africa's Representative in IUTAM), and by Professor Anthony Pearson, who presented an invited lecture on "Oil Exploration, Development and Recovery". The opening was attended by the South African Ministers of Education and of Science and Technology. Thirty students from about ten African States are enrolled in the inaugural AIMS diploma course for 2003/4.

See the website www.aimsforafrica.org for further information.

Report composed by Keith Moffatt

COSPAR (Committee on Space Research)

The 35th Scientific Assembly of COSPAR will be held at the Palais des Congres in Paris, France from 18-25 July 2004. (see http://www.copernicus.org/COSPAR).

Report composed by Office SG

SCOR (Scientific Committee on Oceanic Research)

1. SCOR held its 36th Executive Committee Meeting in Moscow, Russia, 15-19 September 2003, chaired by the President, Professor Robert Duce.

2. Current SCOR Working Groups which may be of interest to IUTAM
WG 111—Coupling Winds, Waves and Currents in Coastal Models
This group is still developing a book tentatively entitled Coupled Coastal Wind-Wave-Current Dynamics, and will be disbanded after completing the book.
WG 114—Transport and Reaction in Permeable Marine Sediments
The group convened a Gordon Conference on their topic in June 2003 and will be inactive until the next Gordon Conference on Permeable Marine Sediments in three years.
WG 121—Ocean Mixing
This group is planning a symposium in Canada in October 2004 (see www.jhu.edu/scor/WG121/Symposium.htm). One of their tasks is to try to improve parameterization of mixing in numerical ocean GCMs.

3. New SCOR Working Groups which may be of interest to IUTAM.
SCOR established two new working groups and one planning group, but none have significant modelling or mathematical aspects

4. SCOR continues to be involved in large-scale scientific programs, including
i) Global Ocean Ecosystems Dynamics (GLOBEC) project
The GLOBEC SSC will meet next in April 2004 in Namibia.
ii) Global Ecology and Oceanography of Harmful Algal Blooms (GEOHAB) program
The GEOHAB SSC has published its Implementation Plan, and is holding a series of small open science meetings to create detailed research plans for GEOHAB's Core Research Projects. Modeling is an important aspect of GEOHAB.
iii) Surface Ocean-Lower Atmosphere Study (SOLAS)
The Science Plan/Implementation Strategy for SOLAS will be published in early 2004. Its SSC will need next in Bergen, Norway in June 2004.
iv) Integrated Marine Biogeochemistry and Ecosystem Research (IMBER) project
IMBER's Science Plan/Implementation Strategy is currently in review and will be published later in 2004. The IMBER SSC is being created concurrently.

Scientific Program under Development
SCOR approved at its 2003 Executive Committee meeting a new planning activity for a project called GEOTRACES, which will conduct cross-ocean transects measuring trace element and radioisotope concentrations.

5. The next Meeting of SCOR will be take place in Venice, Italy on 27-30 September 2004.

6. Further information can be found in the SCOR Annual Report for 2003 available in mid-2004 on the SCOR Web site (http://www.jhu.edu/scor) or from Dr. Ed Urban, Executive Director, SCOR, Department of Earth and Planetary Sciences, The Johns Hopkins University, Baltimore, MD 21218, USA; e-mail: scor@jhu.edu.

Report composed by W. Fennel

Agreement by and between IUTAM and Kluwer Academic Publishers B.V.

(hereinafter referred to as the "Publisher")

WHEREAS IUTAM and the Publisher agree that Kluwer Academic Publishers is the official designated publisher of the proceedings of IUTAM Symposia (hereinafter referred to as "Symposia". The organizer or organizers of an IUTAM Symposium, being the chairmen of the Scientific Committee of the Symposium, are hereinafter referred to as the "Organizers");

WHEREAS IUTAM and the Publisher agree that each IUTAM proceedings volume published by the Publisher (hereinafter referred to as "Volume"), providing it is appropriate vis-a-vis subject matter, will be published in the "Solid Mechanics and Its Applications" book series, or the "Fluid Mechanics and Its Applications" book series (hereinafter referred to as the "Series");

WHEREBY, in consideration of the mutual covenants and obligations herein contained, the parties hereto have agreed and do agree as follows:

1. Publication

1. Kluwer Academic Publishers shall be the preferred publisher of the proceedings of all IUTAM Symposia. Each proceedings accepted for publication shall appear as a Volume in the Series. In those cases where it is not appropriate, the Volume will be published out-of-series in the same style and format. Each Volume will appear in a hard bound version.
2. IUTAM will inform the Organizers of IUTAM Symposia of the possibility of publishing a proceedings with the Publisher, and encourage them to contact the Publisher. Further contact between the Organizers and the Publisher will be bilateral. In addition, IUTAM will notify the Publisher sufficiently ahead of time which Symposia are to be organized and shall give the Publisher the names and addresses of the Organizers.
3. The Organizers of each individual Symposium, in accord with the IUTAM Scientific Committee, will remain free to propose to publish the proceedings in a suitable journal. In such case, the Organizers and the Publisher shall first jointly make an effort to investigate the availability of a suitable journal of Kluwer Academic Publications.
4. If the Organizers decide to publish a proceedings with the Publisher, as recommended by IUTAM, a separate contract will be concluded between the Organizers and the Publisher in which all details regarding publication will be settled. The terms and conditions relating to the publication of a given Volume will be a matter of negotiation between the Organizers and the Publisher, where the basic conditions are based on this present Agreement.
5. The Organizers act as the Editors of the Volume.

6. Typescripts for Volumes in the Series shall yield maximally about 450 printed pages. Exemption from this restriction can be agreed on by the Organizers and the Publisher. Further, the typescripts will not contain colour pictures or colour photographs, unless the Organizers and the Publisher agree otherwise.
7. The papers submitted for publication will be preferably in LaTeX format using the Kluwer style file. The style file will be made available by the Publisher, and the Publisher will assist in any questions regarding its use. The papers will be submitted in camera-ready, laser printed, form (with the original figures pasted in the typescript) according to the guidelines given by the Publisher.
8. The proceedings of IUTAM Symposia will be published as Volumes in the Series, having a uniform design and recognisable cover design, including the IUTAM logo (see article 1.2). Proceedings that will be or have been published with other publishers do not form part of the Series.
9. Both the Publisher and the Organizers will do their very best in bringing the Volume out no later than one year after the Symposium has taken place. This requires that the Volume Editors who are responsible of assembling the final typescript should deliver it on time, in consultation with the Publisher.
10. IUTAM grants the Publisher the non-exclusive rights of the use of the IUTAM logo.
11. IUTAM grants the Publisher the use of the brand name "IUTAM Symposium on". This brand name is solely reserved for proceedings Volumes based on the Symposia which have been decided upon by the IUTAM General Assembly and entrusted to the Scientific Committee of the Symposium.
12. The brand name "IUTAM Symposium on" will be an integral part of the title page and the front and back cover of each Volume, and will feature in relevant promotional material.
13. The right to publish the IUTAM Symposium proceedings is not transferable by Kluwer Academic Publishers to any other publisher.
14. The Volumes will be published entirely for the account and risk of the Publisher, who shall be the proprietor of the goodwill and copyrights to each individual Volume.
15. In consideration of the Publisher's obligations hereinafter mentioned, IUTAM grants to the Publisher all of its rights, title, and interest in and to the publication rights to the Volumes in any language throughout the world,including but not limited to the following: the exclusive right to print, publish and sell the Volumes in whole or in part,in book form and in any other form including, without limitation, mechanical, electronic and visual reproduction, electronic storage and retrieval systems, and all other forms of electronic publication not known or herinafter invented.The Publisher also shall have the the exclusive authorization to license the right to translate, print, publish, or sell any no-English language edition of the Volumes, all during the unrestricted period of copyright.
16. IUTAM hereby agrees that the Publisher shall be the copyright holder of each Volume in the Series, and the Publisher shall be responsible for affixing the proper notice of copyright in each copy of each Volume.
17. 12 months after publication each new work shall be made available as a Print-on-Demand paperback edition.

2. Responsibilities

1. The Organizers, will in their role as Editors of the Volume be responsible for ensuring that each Volume satisfies the standards of high scientific quality. This requires that a reviewing procedure should be carried out of each submission to the Volume. This reviewing procedure will in general be performed by the Scientific Committee of each Symposium.
2. The Publisher will provide either directly, either through the Volume Editors, guidelines and instructions to contributing authors so as to ensure that each contribution appearing in the Volume is prepared to a consistent style and format. The Editors of each Volume shall endeavour that the typescripts are prepared in accordance with the Publisher's instructions.
3. All decisions regarding publication, promotion, prices and the sale of Volumes in the Series shall be made by the Publisher. However, at the Publisher's request, IUTAM or the Volume Editors will advise the Publisher on matters pertaining to promotion and advertisement. IUTAM will allow the Publisher the right to use its name in connection with such advertising and promotion of the Series and Volumes in the Series.
4. The Publisher will be responsible for ensuring that the Volumes are produced to a high quality in a consistent style and format.
5. IUTAM and Volume Editors warrant to ensure to the best of their ability that no material in the Series contains anything that is obscene, objectionable, indecent, or of libellous or scandalous character.

3. Payments/Complimentary Copies

1. Royalties shall not be paid to the Organizers.
2. In lieu of royalties, the Organizers will get a minimum of 2 copies of each Volume free of charge.
3. The Publisher will provide the IUTAM Bureau with 9 free copies of each Volume.
4. Participants to the Symposium will be given the opportunity to order the Volume at a special prepublication price. The special Volume price will be included in the Symposium registration fee, so that each registered Participant will automatically receive a copy of the Volume upon publication. The special price includes tax (if applicable) and postage. The special price will depend on the number of participants and the size of the Volume and will be subject to negotiation between the Publisher and the Organizers of the Symposium concerned. The agreed pre-publication prices for 2002 shall be as set forth in the addendum to this contract.
5. The agreed pre-publication prices for 2002 and 2003 shall be as set forth in a separate addendum to this contract.
6. It will be the sole responsibility of the Organizers of a given Symposium to forward the appropriate, one-time payment to the Publisher. The Organizers will also supply the Publisher with adhesive labels with the names and addresses of the relevant participants.

4. Special Conditions

1. Should Kluwer decide to send a representative to a given Symposium, the Organizers will agree to provide display space free of charge for the display of relevant publications and, possibly, the dissemination of relevant promotion material to participants in the conference portfolios.
2. Kluwer will provide the Organizers with a subsidy of 650 Euro towards the costs of organizing the Symposium. This subsidy will be paid upon receipt of the contracts signed by the Organizers.

5. Termination

The Agreement between IUTAM and Kluwer Academic Publishers will remain in force for an initial period of 3 (three) years, starting January 1, 2002. The Agreement will be renewed for additional periods of 3 (three) years subject to confirmation of extension by both parties 12 months before the end of the initial 3-year period or subsequent 3-year periods. Either party may terminate the Agreement with or without cause upon 12 months written notice to the other.

6. Arbitration

All disputes that may arise in connection with this present agreement or the breach thereof shall be settled exclusively by arbitration, to be held in The Netherlands in accordance with Dutch law, and shall be conducted under the Rules of the 'Nederlands Arbitrage Instituut' (Netherlands Institute of Arbitration).

Statutes

Statuts de l´Union Internationale de Mécanique Théorique et Appliquée

I «L'Union Internationale de Mécanique Théorique et Appliquée» ci-après dénommée «l'Union» est une organisation scientifique à la fois internationale et non-gouvernementale.

II Les principaux objectifs de l'Union sont

a) de constituer un lien entre personnes et organisations engagées dans le travail scientifique (théorique ou expérimental) concernant la mécanique ou les sciences associées;

b) d'organiser les congrès internationaux de mécanique théorique et appliquée par l'intermédiaire de son Comité permanent des Congrès (cf. Art. XII ci-après), et d'organiser d'autres réunions internationales sur des sujets relevant de la mécanique théorique et appliquée;

c) de s'engager en d'autres activités visant à promouvoir le développement de la mécanique, aussi bien théorique qu'appliquée, en tant que branche de la science.

III L'autorité suprême de l'Union est son Assemblée Générale.

Cette Assemblée détient le pouvoir de décider sur toute question affectant l'Union, notamment sur toute modification de ses Statuts. Sur des questions spécifiées, elle peut déléguer tout ou partie de ses pouvoirs à un ou à des organismes appropriés.

La composition de l'Assemblée Générale est régie par l'article VI ci-après. Les réunions de l'Assemblée Générale doivent se tenir aux dates fixées par le Bureau de l'Union (cf. Art. XI ci-après) ou sur la demande de 10 Membres au moins de cette Assemblée.

IV Dans toutes ses décisions, l'Assemblée Générale doit être guidée par la tradition de libre coopération scientifique internationale développée par les Congrès Internationaux de Mécanique Théorique et Appliquée. En poursuivant ses objectifs, l'Union respectera le principe général de non-discrimination et reconnaîtra le droit pour tout scientifique, partout dans le monde, d'adhérer ou de s'associer à une activité scientifique internationale sans rencontrer d'opposition pour motif de race, de religion, de philosophie politique, d'origine ethnique, de citoyenneté, de langage ou de sexe.

V Dans les votes de l'Assemblée Générale, chaque membre ne dispose que d'une voix.

Pour une modification des Statuts, la majorité requise est de deux tiers des votes exprimés.
Pour toute autre décision la majorité simple des votes exprimés est requise. Tout membre se trouvant dans l'impossibilité d'être présent à une réunion peut désigner, à l'avance et par lettre adressée au Secrétaire Général, un autre membre qu'il charge de voter en son nom.

Dans l'intervalle entre réunions de l'Assemblée Générale, un vote peut être émis par correspondance sur proposition formulée par le Bureau (cf. Art. XI ci-après). En pareil cas, le résultat du vote n'est valablement obtenu que si le nombre des participants effectifs n'est pas inférieur aux deux tiers du nombre total des membres de l'Assemblée Générale.

VI* L'Assemblée Générale se compose:

a) des représentants des «organisations adhérentes» (cf. art. VIII);

b) des membres du Bureau (cf. art. XI);

c) des membres cooptés par l'Assemblée Générale de l'Union;

d) s'il y a lieu, et sur décision de l'Assemblée Générale, des représentants de comités ou groupes de scientifiques.

La durée de fonction de tout membre élu doit être précisée, lors de son élection, par l'Assemblée Générale. La durée de fonction des membres du Bureau doit coïncider avec celle de leur fonction au Bureau.

*) Adopté par l`Assemblée Générale de l´Union, le 2 Septembre 1990 à Vienne, Autriche

VII L'Assemblée Générale doit veiller à une représentation adéquate de tout groupe de scientifiques poursuivant des recherches en mécanique théorique ou appliquée et non représenté par une organisation adhérente.

VIII Les organisations de scientifiques en mécanique théorique ou appliquée (ou les unions de telles organisations) qui représentent effectivement une activité scientifique indépendante dans un pays ou dans un territoire bien défini peuvent être admises dans l'Union par l'Assemblée Générale comme «organisations adhérentes» pourvu que leur dénomination exclue tout malentendu quant à la qualification du pays ou du territoire en cause.

En principe, une seule organisation pourra être admise pour chaque pays ou chaque territoire.

IX Chaque «organisation adhérente» dispose d'un certain nombre de représentants dans l'Assemblée Générale et doit acquitter une cotisation annuelle à l'Union (cf. Art. XIV ci-après).

X Des organisations internationales dont les domaines principaux d'activité sont en étroite relation avec ceux de l'Union peuvent être admises par l'Assemblée Générale en qualité «d'organisations affiliées» à l'Union.

Chaque organisation affiliée a la faculté de désigner un observateur qui est invité à participer, sans droit de vote, à l'Assemblée Générale de l'Union. Le Bureau de l'Union (Article XI) a réciproquement la faculté de désigner un observateur, sans droit de vote, à l'organe ayant une responsabilité équivalente dans l'organisation affiliée.

L'organisation affiliée et l'Union sont tenues de s'informer mutuellement de toutes leurs activités importantes et des mesures affectant leur fonctionnement.

En préparant les rencontres scientifiques internationales qu'elles organisent, l'Union et chaque organisation affiliée sont tenues de prendre soigneusement en considération toutes les décisions déjà prises par l'Union et les organisations affiliées de manière à assurer la bonne coordination de toutes ces activités scientifiques.

Les organisations affiliées n'ont à payer aucune cotisation annuelle à l'Union.

XI** Pour exécuter les décisions de l'Assemblée Générale et pour assurer entre ses sessions le travail de l'Union, l'Assemblée Générale élit les membres d'un Bureau pour une durée de quatre ans au plus. Le Bureau est composé d'un Comité Directeur (un Président, le précédent Président qui remplit la fonction de Vice-Président, un Secrétaire Général et un Trésorier) et de quatre autres personnes qui ont été membres de l'Assemblée Générale à un moment de la période précédant de quatre ans le moment de l'élection du Bureau.

Les membres, qui ne sont pas au Comité Directeur, ne peuvent recevoir plus de deux mandats consécutifs. Les membres du Bureau nouvellement élus entrent en fonction au premier novembre qui suit l'Assemblée Générale qui a procédé à leur élection.

Le Bureau doit se réunir au moins une fois par an. Tout membre du Bureau empêché de prendre part à une réunion de celui-ci peut désigner, par lettre adressée au Secrétaire Général, un autre membre de l'Assemblée Générale pour le remplacer.

C'est au Secrétaire Général que doivent être adressées toutes les questions concernant le fonctionnement de l'Union y compris ses relations avec les organisations adhérentes, affiliées ou autres.

Le domicile légal de l'Union se situe au domicile du Secrétaire Général.

Le Bureau a le droit de désigner un trésorier-assistant en tout pays où l'Union est titulaire d'un compte bancaire. Les trésoriers-assistants doivent être choisis parmi les membres de l'Assemblée Générale, mais non nécessairement parmi les membres du Bureau.

Le Bureau doit établir un budget prévisionnel pour l'année à venir, administrer les finances de l'Union et soumettre, chaque année, à l'Assemblée Générale un rapport financier.

Le Vice-Président doit normalement remplir les fonctions du Président pendant toute période où celui-ci se trouve empêché de les exercer.

Entre les réunions de l'Assemblée Générale, il incombe au Bureau de désigner un remplaçant temporaire pour remplir les fonctions du Vice-Président, du Secrétaire Général ou du Trésorier si cela s'avère nécessaire.

** Adoptés par l'Assemblée Générale de l'Union, le 2 Septembre 1990 à Vienne, Autriche

XII L'Assemblée Générale désigne un Comité permanent des Congrès chargé d'organiser à intervalles réguliers les Congrès Internationaux de Mécanique Théorique et Appliquée (ICTAM).

a) Le Président de l'Union préside aussi ce Comité des Congrès.

b) Les Membres de ce Comité sont nommés par l'Assemblée Générale; ce sont des scientifiques actifs en mécanique théorique ou appliquée, n'appartenant pas nécessairement à l'Assemblée Générale.

c) Le Comité des Congrès nomme un Secrétaire, sans précision de durée.

d) Les règles de fonctionnement du Comité des Congrès sont soumises à l'approbation de l'Assemblée Générale.

XIII Les ressources financières de l'Union sont constituées par:

a) les cotisations annuelles des «organisations adhérentes»;

b) les dons et subventions que l'Union peut recevoir.

L'Union doit tenir une liste de ses bienfaiteurs où doivent être mentionnés pour chaque année les noms des personnes ou institutions qui ont accordé à l'Union des dons, des legs ou des subventions.

XIV Le nombre des représentants d'une «organisation adhérente» et le montant de la cotisation annuelle qu'elle doit acquitter sont défini dans le tableau suivant, par la catégorie à laquelle elle désire appartenir, et avec l'accord de l'Assemblée Générale.

Catégorie	Nombre de représentants	Nombre d'unités de la cotisation annuelle
I	1	1
II	2	3
III	3	5
IV	4	8
V	5	12

Le montant de l'unité de cotisation annuelle est fixé par l'Assemblée Générale, au moins une année précédente celle à laquelle cette cotisation devient exigible.

XV*** Toute proposition de modification des Statuts, présentée ou par le Bureau ou par le Secrétaire Général, et ayant reçu l'appui d'au moins dix membres de l'Assemblée Générale ayant le droit de vote, devra être envoyée aux membres de l'Assemblée Générale avec l'ordre du jour de la réunion de l'Assemblée Générale. Le débat sur de telles propositions devra s'effectuer au cours de la première session et le vote au cours de la seconde (Article V).

*** Article XV adopté par l'Assemblée Générale de l'Union, le 28 Août 1994 à Amsterdam

Règles de fonctionnement du Comité des Congrès de l´Union

1. Le Comité des Congrès se réunit au moins une fois lors de chaque Congrès.

2. Le Comité des Congrès doit nommer un Comité Exécutif chargé de prendre en son nom toutes les décisions nécessaires pendant la période qui s'écoule entre deux réunions successives, et de lui en faire rapport à sa prochaine réunion. Le Comité Exécutif comprend le président, le secrétaire du Comité des Congrès, et un ou plusieurs membres désignés par le comité des Congrès.

3. L'organisation effective d'un Congrès est confiée à un Comité local d'Organisation, élu par le pays ou l'organisation qui invite, et ce Comité est également responsable de la publication des Comptes rendus du Congrès. Le Comité d'Organisation fera son rapport au Comité des Congrès soit au cours du Congrès qu'il organise, soit avant, s'il le juge préférable.

4. Le Comité d'Organisation devra obtenir l'approbation du Comité des Congrès (normalement par l'intermédiaire du Comité Exécutif) pour toutes les question relevant de la politique générale du Comité des Congrès, en particulier pour celles qui concernent:

4.1. le but du Congrès;

4.2. la sélection des communications pour le Congrès;

4.3. le choix des conférences générales pour le Congrès;

4.4. la désignation des présidents de sessions du Congrès;

4.5. les principes généraux régissant les arrangements financiers du Congrès.

5. Le Comité d'Organisation percevra, de tous les membres du Congrès, une contribution (dont le montant sera proposé par le Comité du Congrès et approuvé par le Bureau) afin de couvrir les dépenses administratives du Comité du Congrès. Ces contributions seront reversées à l'IUTAM immédiatement après le Congrès.

Procédés pour l'élection du Bureau de l'IUTAM ****

1. Lors de l'Assemblée Générale (AG) précédant celle au cours de laquelle le nouveau Bureau doit être élu, un Comité Electoral (CE) doit être élu comprenant le Président de IUTAM (qui assure la présidence de ce Comité) et deux à quatre membres de l'AG, non-membres du Bureau en exercice.

2. A la suite de cette élection, le CE doit inviter les membres de l'AG à faire connaître à son Président, dans des délais fixés, leurs suggestions de candidatures pour le Bureau, c'est-à-dire pour les charges de Président (P) de Secrétaire Général (S), de Trésorier (T) et pour quatre autres postes. Toutes ces suggestions doivent être traitées confidentiellement par le CE.

3. Prenant en compte toutes les suggestions reçues, le CE doit soumettre au Secrétaire Général les noms proposés comme candidats au Bureau: un seul nom pour les charges P,S,T et un ou plusieurs noms pour chacun des quatre autres postes (W,X,Y,Z). Le CE doit s'assurer que tous les candidats ainsi proposés sont prêts à accepter leur élection. Toutes ces propositions sont portées par le Secrétaire Général à la connaissance des membres de l'AG avant la première session de l'AG au cours de laquelle le nouveau Bureau doit être élu.

4. Lors de cette première session d'autres propositions de candidatures peuvent être proposées pour chacun des postes P, S, T, W, X, Y, Z. Aucun candidat ne peut être proposé pour plus d'un seul poste.

5. Avant la seconde session de l'AG au cours de laquelle le nouveau Bureau doit être élu, chaque proposition envisagée au point 4 ci dessus pour pouvoir être acceptée doit recevoir l'appui d'au moins dix membres de l'AG ayant le doit de vote au moyen d'une déclaration écrite et signée et faire l'objet d'un engagement écrit de la personne

proposée indiquant qu'elle est prête à accepter son élection. Toute proposition ne remplissant pas ces conditions sera retirée.

6. Pour chacun des postes P, S, T, W, X, Y, S, l'AG est appelé à désigner le titulaire par un vote mettant en compétition les candidats restants. S'il y a plusieurs candidats pour un poste, le vote doit avoir lieu au scrutin secret.

****Procédure adoptée par l'Assemblée Générale de l'Union, le 28 Août 1994 à Amsterdam

Procédure pour l'élection de membres cooptés par l'Assemblée Générale***

1. La procédure s'applique à l'élection et à la réélection des membres cooptés par l'Assemblée Générale mentionnés à l'article VI c) des Statuts.

2. Les propositions émanant des membres de l'Assemblée Générale ayant le droit de vote en vue de l'élection des membres cooptés, doivent parvenir au Bureau au moins trois mois avant l'Assemblée Générale au cours de laquelle ces propositions sont prises par elle en considération, en règle générale celle qui se tient pendant le Congrès International de Mécanique Théorique et Appliquée. Toutes ces propositions doivent être traitées confidentiellement par le Bureau.

3. Après avoir pris en compte toutes les propositions ainsi reçues le Bureau présente à l'Assemblée Générale une liste de celles qui sont jugées pouvoir recevoir de la part de l'Assemblée Générale un soutien raisonnable, pourvu cependant que le nombre total des membres cooptés n'excède pas 1/8 environ du nombre total des membres ayant le droit de vote. La liste de ces propositions est communiquée à tous les membres de l'Assemblée Générale pendant la première session de la réunion de l´Assemblée au cours de laquelle doit avoir lieu le vote.

4. Une liste de propositions différente de celle présentée par le Bureau n'est recevable que si elle a recueilli le soutien d'au moins dix membres de l'Assemblée Générale avant la seconde session.

5. L´Assemblée Générale vote sur les listes de candidats qui font l'objet des paragraphes 3 et 4.

***** Procédure adoptée par l'Assemblée Générale de l'Union, le 26 Août 1992 à Haïfa, Israël

Statutes of the International Union of Theoretical and Applied Mechanics

I "The International Union of Theoretical and Applied Mechanics" hereinafter called "the Union" is an international non-governmental scientific organization.

II The principal objectives of the Union are

a) to form a link between persons and organizations engaged in scientific work (theoretical or experimental) in mechanics or in related sciences;

b) to organize international congresses of theoretical and applied mechanics through a standing Congress Committee (Article XII), and to organize other international meetings for subjects falling within the field of theoretical and applied mechanics;

c) to engage in other activities meant to promote development of mechanics, both theoretical and applied, as a branch of science.

III The highest authority of the Union is its General Assembly.

The General Assembly has the power to decide all questions affecting the Union, including alterations of the Statutes. On specified questions it may delegate its power to appropriate bodies.

The composition of the General Assembly is regulated in Article VI.

Meeting of the General Assembly will take place at times decided by the Bureau (Article XI) or on the request of at least 10 members of the General Assembly.

IV In all its decisions the General Assembly shall be guided by the tradition of free international scientific cooperation, developed in the International Congresses for Theoretical and Applied Mechanics.

In pursuing its objectives the Union shall observe the basic policy of non-discrimination and affirm the rights of scientists throughout the world to adhere to or to associate with international scientific activity without regard to race, religion, political philosophy, ethnic origin, citizenship, language or sex.

V In voting every member of the General Assembly shall dispose of one vote. For an alteration of the Statutes the majority required is 2/3 of the votes brought forward. For all other decisions a simple majority of the votes brought forward is required.

Any member who is unable to attend a meeting may by a letter to the Secretary General constitute another member of the General Assembly as proxy.

Between meetings of the General Assembly voting may be carried out by correspondence upon proposals made by the Bureau (Article XI); in this case decisions will be valid only provided the number of persons taking part in the vote is not less than 2/3 of the total membership of the General Assembly.

VI* The General Assembly is composed of

a) representatives of the adhering organizations (Article VIII);

b) members of the Bureau (Article XI);

c) members-at-large;

d) representatives of committees and groups of scientists, if so decided by the General Assembly.

The term of an elected member shall be determined by the General Assembly at the time of the election. The term of members of the Bureau shall coincide with their term of service on the Bureau.

* Adopted by the General Assembly on September 2, 1990, in Vienna (Austria)

VII The General Assembly shall provide for an adequate representation of any group of scientists carrying out research in theoretical or applied mechanics and not represented by an adhering organization.

VIII Organizations of scientists in theoretical or applied mechanics (or unions of such organizations) which effectively represent independent scientific activity in a country or in a definite territory can be admitted by the General Assembly as adhering organizations of the Union provided they can be listed under a name that will avoid any misunderstanding about the country or territory represented.

In general only one organization from each country or territory will be admitted.

IX Each adhering organization shall have representatives in the General Assembly of the Union, and pay an annual subscription to the Union in accordance with Article XIV.

X International organizations mainly occupied in fields closely related to that of the Union can be admitted by the General Assembly as affiliated organizations of the Union.

Each affiliated organization has the right to appoint an observer, who is invited to take part in the General Assembly without voting rights. The Bureau of the Union

(Article X) has the reciprocal right to appoint a nonvoting observer to the corresponding council or other executive body of the affiliated organization.

The affiliated organization and the Union are mutually obliged to keep each other informed about all important activities of and organizational measures taken.

In organizing international scientific meetings the Union and each of the affiliated organizations are obliged to consider carefully all measures already taken by the Union and its affiliated organizations in order to coordinate such international scientific activities.

Affiliated organizations pay no annual dues to the Union.

XI** To execute the decisions of the General Assembly and to carry out work between meetings, the General Assembly elects members of a Bureau for a period of at most four years. The Bureau consists of the officers (President, the retiring President who serves as Vice-President, Secretary-General, and Treasurer) and four other persons who shall have been members of the General Assembly at some time within the four years preceding the time of election to the Bureau. The maximum continuous period of service as a member of the Bureau, other than an officer, is limited to eight years. Newly elected members of the Bureau enter into office on the date of November 1, following the General Assembly at which they were elected. The Bureau will meet at least every year. A member of the Bureau who is prevented from attending a meeting may by letter to the Secretary-General designate another member of the General Assembly as a replacement.

The Secretary-General will act as a permanent centre for all matters affecting the Union, including relations with adhering, affiliated and other organizations.

The legal domicile of the Union shall be the place where the Secretary-General lives.

The Bureau is authorized to appoint Assistant-Treasurers in those countries where the Union has a bank account.

The Assistant-Treasurers must be members of the General Assembly but need not to be members of the Bureau.

The Bureau shall draft a budget for each coming year, and shall administer the finances. The Bureau shall submit an annual financial report to the General Assembly.

The Vice-President shall normally fulfil the duties of the President should the President become unable to discharge them.

Between meetings of the General Assembly the Bureau shall decide who shall undertake the duties of the Vice President, Secretary-General, or Treasurer should a temporary replacement be necessary.

**Adopted by the General Assembly on September 2, 1990, in Vienna (Austria)

XII The General Assembly establishes a standing Congress Committee that is responsible for the organization of International Congresses of Theoretical and Applied Mechanics at regular intervals.

a) The President of the Union shall also serve as President of the Congress Committee.

b) The members of the Congress Committee are appointed by the General Assembly as scientists active in theoretical or applied mechanics and need not be members of the General Assembly.

c) The Congress Committee appoints a Secretary, without stated terms of office.

d) The rules of procedure of the Congress Committee shall be approved by the General Assembly.

XIII The financial means of the Union are formed by:

a) the annual subscriptions of the adhering organizations;

b) gifts and grants.

The Union shall maintain a roll of benefactors on which shall be inscribed annually the names of those persons or institutions which have accorded gifts, legacies or other subventions to the Union.

XIV The number of representatives of an adhering organization and the amount of the annual subscription to be paid by that organization will be regulated according to one of the following categories, as proposed by the adhering organization and after approval of the General Assembly of the Union:

Category	Number of Representatives	Units of annual subscription
I	1	1
II	2	3
III	3	5
IV	4	8
V	5	12

Changes in the amount of the unit annual subscription will be decided by the General Assembly not less than one year in advance.

XV*** Any proposal for alteration of the Statutes either prepared by the Bureau or supported by statements to the General-Secretary signed by at least ten voting members of the General Assembly with voting rights, shall be sent to members of the General Assembly with the Agenda for a meeting of the General Assembly. Such proposals shall be discussed during the first session of that meeting and voted upon during the second session (Article V).

*** Article XV adopted by the General Assembly on August 28, 1994, in Amsterdam

Rules of procedure for the Congress Committee of IUTAM

1. The Congress Committee meets at least once at every Congress.

2. The Congress Committee may appoint an Executive Committee to take all necessary actions on its behalf in the period between two successive Congresses, and to report to it at its next meeting. The Executive Committee will consist of the president, the secretary and one or more members appointed by the Congress Committee.

3. The actual organization of a Congress is delegated to a local Organizing Committee, elected by the host-country or host-organization, which is also responsible for publication of its Proceedings. The Organizing Committee will report to the Congress Committee either during or, if it sees fit, before the Congress which it organizes.

4. The Organizing Committee will obtain the approval of the Congress Committee (normally through the Executive Committee) with regard to all matters affecting the general policy of the Congress Committee, in particular with regard to:

   4.1. the scope of the Congress;

   4.2. the screening of papers of the Congress;

   4.3. the selection of general lectures for the Congress;

   4.4. the appointment of chairmen of sessions of the Congress;

   4.5. the broad principles regarding financial arrangements for the Congress.

5. The Organizing Committee will levy a fee (the level to be recommended by the Congress Committee and approved by the Bureau) for administrative expenses of the

Congress Committee, from all Congress members. This fee will be paid over to IUTAM after the Congress.

Procedure for election of the Bureau of IUTAM****

1. At the General Assembly (GA) preceding the one at which the new Bureau is to be elected, an Electoral Committee (EC) shall be elected, consisting of the President of IUTAM (who shall act as Chairman of the EC) and two to four members of the GA who are not members of the current Bureau.

2. Following its election, the EC shall invite from members of the GA, within a specified time-limit, suggestions for candidates for the Bureau, viz. for the Offices of President (P), Secretary-General (S) and Treasurer (T), and for the four non-Officer positions. All suggestions shall be treated confidentially by the EC.

3. Taking account of all suggestions received, the EC shall submit to the Secretary-General nominations for candidates for election to the Bureau: one name for each of the Officer positions (P, S, T) and one or more names for each of the non-Officer positions (W, X, Y, Z). The EC will make sure that the candidates thus nominated are willing to accept an election. These nominations shall be conveyed by the Secretary-General to the GA in advance of the first session of the meeting of the GA at which the new Bureau is to be elected.

4. At this first session, additional candidates may be proposed by members of the GA for each and any of the positions P, S, T, W, X, Y, Z. No candidate may be proposed for more than one position.

5. Before the second session of the GA at which the new Bureau is to be elected, the proposals under clause 4 above shall be accepted if supported by statements to the Secretary-General each signed by at least ten (voting) members of the GA and by written confirmation that each nominee is willing to accept election; otherwise they shall be considered withdrawn.

6. The GA shall vote separately on the surviving nominations for each of the positions P, S, T, W, X, Y, Z. In any case in which there is more than one candidate for a position, the vote shall be by secret ballot.

**** Procedure adopted by the General Assembly on August 28, 1994, in Amsterdam

Procedure for electing Members-at-Large of the General Assembly*****

1. This procedure shall apply for the election and re-election of the Members-at-Large of the General Assembly provided for in Article VI(c) of the Statutes.

2. Proposals, by members of the General Assembly with voting rights, for Members-at-Large must be received by the Bureau at least three months before the meeting of the General Assembly at which proposals are to be considered, normally during the International Congresses of Theoretical and Applied Mechanics (ICTAM). All proposals will be treated confidentially by the Bureau.

3. Taking into account all material received, the Bureau will present to the General Assembly such proposals as it deems will have at least a reasonable support by the General Assembly, provided however that the total number of Members-at-Large is not to exceed approximately one eighth (1/8) of the total General Assembly membership with voting rights. Such proposals will be circulated to all members of the General Assembly during the first session of meeting of the Assembly at which the proposals are to be voted on.

4. Proposals not identical with those presented by the Bureau are considered to be withdrawn, unless they are sustained and supported by at least ten members of the General Assembly before its second session.

5. The General Assembly will vote on those candidates mentioned in the proposals of paragraphs 3 and 4.

***** Procedure adopted by the General Assembly on August 26, 1992, in Haifa, Israel

List of Publications

Five categories of IUTAM publications can be distinguished:

a) Annual Reports

Since 1948, the Union has published a Report every year with detailed information on its activities. These Annual Reports are preserved at the IUTAM Archive at CISM, Udine, Italy.

The IUTAM Annual Reports over the last five years are available upon request from the IUTAM Secretariat.

b) Newsletters

At the meeting of the Bureau of IUTAM held in Warsaw in August 2001 it was agreed that the IUTAM Newsletter should be revived.

A primary purpose of the Newsletter, in conjunction with the IUTAM website, is to provide information concerning future activities of IUTAM, particularly its Symposia and Summer Schools, and concerning the International Congress of Theoretical and Applied Mechanics (ICTAM).

The Newsletter will also serve to keep members of IUTAM informed about any other current developments of concern to IUTAM.

The last IUTAM Newsletter is available from the IUTAM Secretariat. Pdf versions of IUTAM Newsletters are available from the IUTAM website.

c) Proceedings of IUTAM Symposia

These are only available by ordering directly from the publisher.

d) Proceedings of the International Congresses on Theoretical and Applied Mechanics (ICTAM)

These are only available by direct ordering from the publisher.

e) Publications on the history of IUTAM

Proceedings of IUTAM Symposia

The Proceedings of IUTAM Symposia published since 1990 are listed below.
The names of the editors and of the publisher are given in every case.
A complete listing of all published Proceedings can be found at the IUTAM website http://www.iutam.net or http://www.iutam.org or http://www.iutam.info .

1990

90-1 *IUTAM Symposium on Mechanical Modeling of New Electromagnetic Materials*
(Stockholm, Sweden, 2-6 April 1990).
The Proceedings of the Symposium, edited by R.K.T. Hsieh, have been published by Elsevier, Amsterdam, 1990. ISBN 0-444-88518-8.

90-2 *IUTAM Symposium on Dynamical Problems of Rigid-Elastic Systems and Structures*
(Moscow, USSR, 23-27 May 1990).
The Proceedings of the Symposium, edited by N.V. Banichuk, D.M. Klimov and W. Schiehlen, have been published by Springer-Verlag, Berlin, 1991.
ISBN 3-540-53788-0.

90-3 *IUTAM Symposium on Inelastic Deformation of Composite Materials*
(Troy, New York, USA, 29 May-1 June 1990).
The Proceedings of the Symposium, edited by G.J. Dvorák, have been published by Springer-Verlag, New York, 1991. ISBN 0-387-97458-X.

90-4 *IUTAM Symposium on Dynamics of Marine Vehicles and Structures in Waves*
(Uxbridge, UK, 24-17 June 1990).
The Proceedings of the Symposium, edited by W.G. Price, P. Temarel and A.J. Keane, have been published by Elsevier, Amsterdam, 1991.
ISBN 0-444-89020-3.

90-5 *IUTAM Symposium on Separated Flows and Jets*
(Novosibirsk, USSR, 9-13 July 1990).
The Proceedings of the Symposium, edited by V.V. Kozlov and A.V. Dovgal, have been published by Springer-Verlag, Berlin, 1991. ISBN 3-540-53762-7.

90-6 *IUTAM Symposium on Fluid Mechanics of Stirring and Mixing*
(La Jolla, California, USA, 20-24 August 1990).
The Proceedings of the Symposium, edited by A. Acrivos, have been published in the journal "Physics of Fluids A", ISSN 0899-8213, Vol. 3 (1991), pp. 1009-1469.

90-7 *IUTAM Symposium on Nonlinear Hydrodynamic Stability and Transition*
(Sophia-Antipolis, Nice, France, 3-7 September 1990).
The Proceedings of the Symposium, edited by G. Iooss, have been published in the journal "European Journal of Mechanics B/ Fluids", ISSN 0997-7546, Vol. 10 (1991), No. 2-Suppl. 3-334.

90-8 *IUTAM Symposium on Contact Load and Local Effects in Thin-Walled Plates and Shell Structures*
(Prague, CSFR, 4-7 September 1990).
The Proceedings of the Symposium, edited by V. Krupka and M. Drdácky, have been published by Springer-Verlag, Berlin, 1992. ISBN 3-540-53551-9.

90-9 *IUTAM Symposium on Creep in Structures*
(Cracow, Poland, 10-14 September 1990).
The Proceedings of the Symposium, edited by M. Zyczkowski, have been published by Springer-Verlag, Berlin, 1992. ISBN 3-540-53786-4.

1991

91-1 *IUTAM Symposium on Aerothermodynamics in Combustors*
(Taipei, Taiwan, 3-5 June 1991).
The Proceedings of the Symposium, edited by R.S.L. Lee, J.H. Whitelaw and T.S. Wung, have been published by Springer-Verlag, Berlin, 1992.
ISBN 3-540-55404-1.

91-2 *IUTAM Symposium on Mechanical Effects of Welding*
(Lulea, Sweden, 10-14 June 1991).
The Proceedings of the Symposium, edited by L. Karlsson, L.E. Lindgren and M. Jonsson, have been published by Springer-Verlag, Berlin, 1992.
ISBN 3-540-55240-5.

91-3 *IUTAM Symposium on Nonlinear Stochastic Mechanics*
(Torino, Italy, 1-5 July 1991).
The Proceedings of the Symposium, edited by N. Bellomo and F. Casciati, have been published by Springer-Verlag, Berlin, 1992. ISBN 3-540-55545-5.

91-4 *IUTAM Symposium on Mechanics of Fluidized Beds*
(Stanford, California, 1-4 July 1991).
No Proceedings of the Symposium have been published.
The "Report of a Symposium on Mechanics of Fluidized Beds" by G.M. Homsy, R. Jackson and J.R.Grace has been published in the ”Journal of Fluid Mechanics” (1992), Vol. 236, 477-495.

91-5 *IUTAM Symposium on Breaking Waves*
(Sydney, Australia, 15-19 July 1991).
The Proceedings of the Symposium, edited by M.L. Banner and R. Grimshaw, have been published by Springer-Verlag, Berlin, 1992. ISBN 3-540-55944-2.

91-6 *IUTAM Symposium on Constitutive Relations for Finite Deformations of Polycrystalline Metals*
(Beijing, China, 22-25 July 1991).
The Proceedings of the Symposium, edited by Ren Wang and D.C. Drucker, have been published by Springer-Verlag, Berlin, 1992. ISBN 3-540-55128-X.

91-7 *IUTAM Symposium on Finite Inelastic Deformations - Theory and Application*
(Hannover, Germany, 19-23 August 1991).
The Proceedings of the Symposium, edited by D. Besdo and E. Stein, have been published by Springer-Verlag, Berlin, 1992. ISBN 3-540-55849-7.

91-8 *IUTAM Symposium on Interpretation of Time Series from Mechanical Systems*
(Warwick, UK, 26-30 August 1991).
The Proceedings of the Symposium, edited by P.G. Drazin and G.P. King, have been published by North Holland, Elsevier Science Publ, Amsterdam, Physica D Nonlinear Phenomena, Vol. 58, 1992. ISSN 0167-2789.

91-9 *IUTAM Symposium on Microgravity Fluid Mechanics*
(Bremen, Germany, 2-6 September 1991).
The Proceedings of the Symposium, edited by H.J. Rath, have been published by Springer-Verlag, Berlin, 1992. ISBN 3-540-55122-0.

91-10 *IUTAM Symposium on Local Mechanics Concepts for Composite Material Systems*
(Blacksburg, Virginia, 27-31 October 1991).
The Proceedings of the Symposium, edited by J.N. Reddy and K.L. Reifsnider, have been published by Springer-Verlag, Berlin, 1992. ISBN 3-540-55547-1.

1992

92-1 *IUTAM Symposium on Optimal Control of Mechanical Systems*
(Moscow, Russia, 19-25 April 1992).
The Proceedings of the Symposium, co-edited by F.L. Chernousko, have been published in Russian in the form of a (special) issue of the journal "Izvestiya of the Russian Academy of Sciences, Tekhnicheskaya Kibernetika, No. 1, Jan.-Febr. 1993", ISSN 0002-3388; and in the English translation of this journal published by Scripta Technica Inc. A. Wiley Company, New York.

92-2 *IUTAM Symposium on Inverse Problems in Engineering Mechanics*
(Tokyo, Japan, 11-15 May 1992).
The Proceedings of the Symposium, edited by M. Tanaka and H.D. Bui, have been published by Springer-Verlag, Berlin, 1993. ISBN 3-540-56345-8.

92-3 *IUTAM Symposium on Optimal Design with Advanced Materials*
The Frithiof I. Niordson Volume (Lyngby, Denmark, 18-20 August 1992).
The Proceedings of the Symposium, edited by P. Pedersen, have been published by Elsevier Science Publishers, Amsterdam, 1993. ISBN 0444-89869-7.

92-4 *IUTAM Symposium on Aerothermochemistry of Spacecraft and Associated Hypersonic Flows*
(Marseille, France, 1-4 September 1992).
The Proceedings of the Symposium, edited by R. Brun and A.A. Chikhaoui, have been published by Jouve, 18, rue Saint-Denis, F-75001 Paris. Dépôt légal: Janvier, 1994. No. 215515N.

92-5 *IUTAM Symposium on Bluff-Body Wakes, Dynamics and Instabilities*
(Göttingen, Germany, 7-11 September 1992).
The Proceedings of the Symposium, edited by H. Eckelmann, J.M.R. Graham, P. Huerre and P.A. Monkewitz, have been published by Springer-Verlag, Berlin, 1993. ISBN 3-540-56594-9.

92-6 *IUTAM Symposium on Fluid Dynamics of High Angle of Attack*
(Tokyo, Japan, 13-17 September 1992).
The Proceedings of the Symposium, edited by R. Kawamura and Y. Aihara, have been published by Springer-Verlag, Berlin, 1993. ISBN 3-540-56593-0.

92-7 *IUTAM Symposium on Eddy Structure Identification in Free Turbulent Shear Flow*
(Poitiers, France, 12-14 October 1992).
The Proceedings of the Symposium, edited by J.P. Bonnet and M.N. Glauser, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1993. ISBN 0-7923-2449-8.

1993

93-1 *IUTAM Symposium on Probabilistic Structural Mechanics: Advances in Structural Reliability Methods*
(San Antonio, Texas, USA, 7-10 June 1993).
The Proceedings of the Symposium, edited by P.D. Spanos and Y.-T. Wu. have been published by Springer-Verlag, Berlin, 1994. ISBN 3-540-57709-2.

93-2 *IUTAM Symposium on Computational Mechanics and Materials*
(Providence, RI, USA, 15-18 June 1993).
The Proceedings of the Symposium have been published as a special issue in a journal "Modelling and Simulation in Materials Science and Engineering", edited by M. Ortiz and C.F. Shih, Vol 2 No 3A 421-782 May 1994, ISSN: 0965-0393.

93-3 *IUTAM Symposium on Nonlinearity and Chaos in Engineering Dynamics*
(University College, London, 19-23 July 1993).
The Proceedings of the Symposium, edited by J.M.T. Thompson and S.R. Bishop, have been published by John Wiley & Sons, Chichester, UK, 1994. ISBN 0-471-94458-0.

93-4 *IUTAM Symposium on Nonlinear Instability of Nonparallel Flows*
(Potsdam, NY, USA, 26-31 July 1993).
The Proceedings of the Symposium, edited by S.P. Lin, W.R.C. Phillips, D.T. Valentine, have been published by Springer-Verlag, Berlin, 1994. ISBN 3-540-57679-7.

93-5 *IUTAM Symposium on Nonlinear Waves in Solids*
(Victoria, British Columbia, Canada, 15-20 August 1993).
The Proceedings of the Symposium, edited by Joanne L. Wegner and Frederick R. Norwood, have been published by The American Society of Mechanical Engineers, New York, 1995. ISBN 0-7918-0645-6.

93-6 *IUTAM Symposium on Identification of Mechanical Systems*
(Wuppertal, Germany, 23-27 August 1993).
The Proceedings of the Symposium, edited by P.C. Müller, have been announced to be published by Springer-Verlag, Berlin, 1995.

93-7 *IUTAM Symposium on Discrete Structural Optimization*
(Zakopane, Poland, 31 August-3 September 1993).
The Proceedings of the Symposium, edited by W. Gutkowski, have been published by Springer-Verlag, Berlin, 1994. ISBN 3-540-57679-X.

93-8 *IUTAM Symposium on Bubble Dynamics and Interface Phenomena*
(Birmingham, UK, 6-9 September 1993).
The Proceedings of the Symposium, edited by J.R. Blake, J.M. Boulton-Stone and N.H. Thomas, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1994. ISBN 0-7923-3008-0.

93-9 *IUTAM Symposium on Fracture of Brittle, Disordered Materials: Concrete, Rock and Ceramics*
(Brisbane, Australia, 20-24 September 1993).
The Proceedings of the Symposium, edited by G. Baker and B.L. Karihaloo, have been published by E & FN Spon, London, UK, 1995.
ISBN 0-419-19050-3.

93-10 *IUTAM Symposium on Impact Dynamics*
(Beijing, China, 11-15 October 1993).
The Proceedings of the Symposium, edited by Zheng Zhemin (Che-Min Cheng) and Tan Qingming, have been published by Peking University Press, Beijing, China, 1994. ISBN 7-301-02489-4/0 338.

93-11 *IUTAM Symposium on Numerical Simulation of Non-Isothermal Flow of Viscoelastic Liquids*
(Kerkrade, The Netherlands, 1-3 November 1993).
The Proceedings of the Symposium, edited by J.F. Dijksman and G.D.C. Kuiken have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1995. ISBN 0-7923-3262-8.

1994

94-1 *IUTAM Symposium on Liquid-Particle Interactions in Suspension Flow*
(Grenoble, France, 18-22 April 1994).
The chairman G. Cognet has not edited the Proceedings (Oct. 1996).

94-2 *IUTAM Symposium on Waves in Liquid / Gas and Liquid / Vapor Two-Phase Systems*
(Kyoto, Japan, 9-13 May 1994).
The Proceedings of the Symposium, edited by Shigeki Morioka and L. van Wijngaarden, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1995. ISBN 0-7923-3424-8.

94-3 *IUTAM / ISIMM Symposium on Structure and Dynamics of Nonlinear Waves in Fluids*
(Hanover, Germany, 17-20 August 1994).
The Proceedings of the Symposium, edited by A. Mielke and K. Kirchgässner, have been published as Volume 7 of the Advanced Series in Nonlinear Dynamics, by World Scientific Publishing, Singapore, 1995.
ISBN 981-02-2124-X.

94-4 *IUTAM Symposium on Microstructure-Property Interactions in Composite Materials*
(Aalborg, Denmark, 23-25 August 1994).
The Proceedings of the Symposium, edited by R. Pyrz, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1995.
ISBN 0-7923-3427-2.

94-5 *IUTAM / ISIMM Symposium on Anistropy, Inhomogeneity and Nonlinearity in Solid Mechanics*
(Nottingham, UK, 30 August-3 September 1994).
The Proceedings of the Symposium, edited by D.F. Parker and A.H. England, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1995. ISBN 0-7923-3594-5.

94-6 *IUTAM Symposium on Laminar-Turbulent Transition*
(Sendai, Japan, 5-9 September 1994).
The Proceedings of the Symposium, edited by R. Kobayashi, have been published by Springer Verlag, Berlin, 1995. ISBN 3-540-59297-0.

94-7 *IUTAM Symposium on Mechanical Problems in Geodynamics*
(Beijing, China, 5-9 September 1994).
The Proceedings of the Symposium, edited by R. Wang and K. Aki, have been published in the journal "PAGEOPH (Pure and Applied Geophysics)", Part I in vol.145, no.3/4, Dec.1995 (ISSN 0033-4553) , and Part II in vol.146, no.3/4, Feb.1996 (ISBN 3-7643-5412-7). A bound volume has been announced to be published in 1996.

94-8 *IUTAM Symposium on The Active Control of Vibrations*
(Bath, UK, 5-8 September 1994).
The Proceedings of the Symposium, edited by C.R. Burrows and P.S. Keogh have been published by Mechanical Engineering Publications Limited, London, 1994. ISBN 0-85298-916-4.

94-9 *IUTAM Symposium on Size-Scale Effects in the Failure Mechanisms of Materials and Structures*
(Turin, Italy, 3-7 October 1994).
The Proceedings of the Symposium, edited by A. Carpinteri, have been published by E & FN Spon, London, UK, 1995. ISBN 0-419-20520-9.

94-10 *IUTAM Symposium on Mechanics and Combustion of Droplets and Sprays*
(Taipei, Taiwan, 6-10 December 1994).
The Proceedings of the Symposium, edited by H.H. Chiu, have been published by Begell House, Inc. New York, USA, 1995, pp. 396. ISBN 1-56700-051-7.

Selected papers under the title Mechanics and Combustion of Droplets and Sprays have been published by Begell House Publishers at 79 Madison Avenue, New York, NY 10016, Fax (+1) 212-213-8368, edited by N.A. Chigier.

1995

95-1 *IUTAM Symposium on Optimization of Mechanical Systems*
(Stuttgart, Germany, 26-31 March 1995).
The Proceedings of the Symposium, edited by D. Bestle and W. Schiehlen, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1996. ISBN 0-7923-3830-8.

95-2 *IUTAM Symposium on Asymptotic Methods for Turbulent Shear Flows at High Reynolds Numbers*
(Bochum, Germany, 28-30 June 1995).
The Proceedings of the Symposium, edited by K. Gersten, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1996.
ISBN 0-7923-4138-4.

95-3 *IUTAM Symposium on Advances in Nonlinear Stochastic Mechanics*
(Trondheim, Norway, 3 - 7 July 1995).
The Proceedings of the Symposium, edited by A. Naess and S. Krenk, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1996.
ISBN 0-7923-4193-7.

95-4 *IUTAM Symposium on Nonlinear Instability and Transition in Three-Dimensional Boundary Layers*
(Manchester, UK, 17-20 July 1995).
The Proceedings of the Symposium, edited by P.W. Duck and P. Hall, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1996. ISBN 0-7923-4079-5.

95-6 *IUTAM Symposium on Micromechanics of Plasticity and Damage of Multiphase Materials*
(Paris, France, 29 August-1 September 1995).
The Proceedings of the Symposium, edited by A.Pineau and A.Zaoui, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1996.
ISBN 0-7923-41388-0.

95-7 *IUTAM Symposium on Nonlinear Analysis of Fracture*
(Cambridge, UK, 3-7 September 1995).
The Proceedings of the Symposium, edited by J. Willis, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1997.
ISBN 0-7923-4378-6.

95-9 *IUTAM Symposium on Combustion in Supersonic Flows*
(Poitiers, France, 2-6 October 1995).
The Proceedings of the Symposium, edited by M. Champion and B. Deshales, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1997. ISBN 0-7923-4313-1.

1996

96-1 *IUTAM Symposium on Interaction between Dynamics and Control in Advanced Mechanical Systems*
(Eindhoven, The Netherlands, 21-26 April 1996).
The Proceedings of the Symposium, edited by D.H. van Campen have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1997. ISBN 0-7923-4429-4.

96-2 *IUTAM Symposium on Innovative Computational Methods for Fracture and Damage*
(Dublin, Ireland, 30 June-5 July 1996).
The Proceedings of the Symposium, edited by P. E. O' Donoghue, M. D. Gilchrist and K. B. Broberg, have been published in the "Computational Mechanics Journal", 19, 447- 552; 20, 3-198, 1997.

96-3 *IUTAM Symposium on Variable Density Low Speed Turbulent Flows*
(Marseille, France, 7-10 July 1996). Co-sponsored by ICSU.
The Proceedings of the Symposium, edited by Louis Fulachier, John L. Lumley and Fabien Anselmet, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1997. ISBN 0-7923-4602-5.

96-4 *IUTAM Symposium on Mechanics of Granular and Porous Materials*
(Cambridge, UK, 15-17 July 1996).
The Proceedings of the Symposium, edited by N.A. Fleck and A.C.F. Cocks, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1997. ISBN 0-7923-4553-3.

1997

97-1 *IUTAM Symposium on Lubricated Transport of Viscous Materials*
(Tobago, 7-10 January 1997).
The Proceedings of the Symposium, edited by Harold Ramkissoon, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1997. ISBN 0-7923-4897-4.

97-2 *IUTAM Symposium on Transformation Problems in Composite and Active Materials*
(Cairo, Egypt, 9-12 March 1997).
The Proceedings of the Symposium, edited by Y.A. Bahei-El-Din and G.J. Dvorak, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1998. ISBN 0-7923-5122-3.

97-3 *IUTAM Symposium on Non-Linear Singularities in Deformation and Flow*
(Haifa, Israel, 17-21 March 1997).
The Proceedings of the Symposium, edited by D. Durban and J.R.A. Pearson, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands,1998. ISBN 0-7923-5349-8.

97-4 *IUTAM Symposium on Variations of Domains and Free-Boundary Problems in Solid Mechanics*
(Paris, France, 22-25 April 1997).
The Proceedings of the Symposium, edited by P. Argoul, M. Frémond and Q.S. Nguyen, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1998. ISBN 0-7923-5450-8.

97-5 *IUTAM Symposium on Simulation and Identification of Organized Structures in Flows*
(Lyngby, Denmark, 25-29 May 1997).
The Proceedings of the Symposium, edited by J.N. Sørensen, E.J. Hopfinger, and N. Aubry, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1999. ISBN 0-7923-5603-9.

97-6 *IUTAM Symposium on Discretization Methods in Structural Mechanics*
(Vienna, Austria, 1-6 June 1997).
The Proceedings of the Symposium, edited by H.A. Mang and F.G. Rammerstorfer, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands 1999. ISBN 0-7923-5591-1.

97-7 *IUTAM Symposium on Material Instabilities in Solids*
(Delft, The Netherlands, 9-13 June 1997)
The Proceedings of the Symposium, edited by R. de Borst en E. van der Giessen, have been published by John Wiley & Sons, Chichester, UK,1998 . ISBN 0-471-97460-9.

97-8 *IUTAM Symposium on Statistical Energy Analysis*
(Southampton, UK. 8-11 July 1997).
The Proceedings of the Symposium, edited by F.J. Fahy and W.G Price, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1998, ISBN 0-7923-5457-5.

97-9 *IUTAM Symposium on Rheology and Computation*
(Sydney, Australia, 20-25 July 1997).
No formal Proceedings of the Symposium have been published. Selected papers have been published in several 1999-volumes of the "Journal of Non-Newtonian Fluid Mechanics", with a footnote attached to each of those papers.

97-10 *IUTAM Symposium on New Applications of Nonlinear and Chaotic Dynamics in Mechanics*
(Ithaca, NY, USA, 27 July-1 August 1997).
The Proceedings of the Symposium, edited by Francis C. Moon, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1998. ISBN 0-7923-5276-9.

97-11 *IUTAM Symposium on Computational Methods for Unbounded Domains*
(Boulder, USA, 3-7 August 1997).
The Proceedings of the Symposium, edited by Thomas L. Geers, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1998. ISBN 0-7923-5266-1.

97-12 *IUTAM Symposium on Micro- and Macrostructural Aspects of Thermoplasticity*
(Bochum, Germany, 25-29 August 1997).
The Proceedings of the Symposium, edited by O.T. Bruhns and E. Stein, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1998. ISBN 0-7923-5265-3.

97-13 *IUTAM Symposium on Dynamics of Slender Vortices*
(Aachen, Germany, 31 August - 3 September 1997).
The Proceedings of the Symposium, edited by E. Krause and K. Gersten, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1998. ISBN 0-7923-5041-3.

97-14 *IUTAM Symposium on Rheology of Bodies with Defects*
(Beijing, China, 2-6 September 1997).
The Proceedings of the Symposium, edited by Ren Wang, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1998. ISBN 0-7923-5297-1.

1998

98-1 *IUTAM Symposium on Three-Dimensional Aspects of Air-Sea Interaction*
(Nice, France, 17-21 May 1998)
The Proceedings of the Symposium, edited by F. Dias and C. Khariff, have been published as a special issue of the "European Journal of Mechanics B / Fluids", Vol. 18, No. 3 (1999)

98-2 *IUTAM Symposium on Synthesis in Bio Solid Mechanics*
(Lyngby, Denmark, 24-27 May 1998).
The Proceedings of the Symposium, edited by Pauli Pedersen and Martin P. Bendsøe, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1999. ISBN 0-7923-5615-2.

98-3 *IUTAM/IUGG Symposium on Developments in Geophysical Turbulence*
(Boulder, USA, 16-19 June 1998).
The Proceedings of the Symposium, edited by R.M. Kerr and Y. Kimura, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2000 ISBN 0-7923-6673-5.

98-4 *IUTAM Symposium on Viscoelastic Fluid Mechanics*
(Stanford, USA, 21-25 June 1998).
A Report on this Symposium by E.S.G. Shaqfeh and a collection of selected papers have been published in the "Journal of Non-Newtonian Fluid Mechanics", Vol. 82 (1999), pp. 127-457.

98-5 *IUTAM Symposium on Unilateral Multibody Contacts*
(Munchen, Germany, 3-7 August 1998).
The Proceedings of the Symposium, edited by F. Pfeiffer and Ch. Glocker, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1999. ISBN 0-7923-6030-3.

98-6 *IUTAM/IFToMM Symposium on Synthesis of Nonlinear Dynamical Systems*
(Riga, Latvia, 24-28 August 1998).
The Proceedings of the Symposium, edited by E. Lavendelis and M. Zakrzhevsky, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1999. ISBN 0-7923-6106-7.

98-7 *IUTAM Symposium on Advanced Optical Methods and Applications in Solid Mechanics*
(Poitiers, France, 31 August-4 September 1998).
The Proceedings of the Symposium, edited by A. Lagarde, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2000. ISBN 0-7923-6604-2.

98-8 *IUTAM/IASS Symposium on Deployable Structures: Theory and Applications*
(Cambridge, UK, 6-9 September 1998).
The Proceedings of the Symposium, edited by S. Pellegrino and S.D. Guest, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2000. ISBN 0-7923-6516-X.

98-9 *IUTAM Symposium on Mechanics of Passive and Active Flow Control*
(Göttingen, Germany, 7-11 September 1998).
The Proceedings of the Symposium, edited by G.E.A. Meier and P.R. Viswanath, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 1999. ISBN 0-7923-5928-3.

1999

99-1 *IUTAM Symposium on Nonlinearity and Stochastic Structural Dynamics*
(Madras, India, 4-8 January 1999).
The Proceedings of the Symposium, edited by S. Narayanan and R.N. Iyengar, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2000. ISBN 0-7923-6733-2.

99-2 *IUTAM Symposium on Mechanical and Electromagnetic Waves in Structured Media*
(Sydney, NSW, Australia, 18-22 January 1999).
The Proceedings of the Symposium, edited by R.C. McPhedran, L.C. Botten and N.A. Nicorovici, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2001. ISBN 0-7923-7038-4.

99-3 *IUTAM Symposium on Recent Developments in Nonlinear Oscillations of Mechanical Systems*
(Hanoi, Vietnam, 2-5 March 1999).
The Proceedings of the Symposium, edited by N. Van Dao and E.J. Kreuzer, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2000. ISBN 0-7923-6470-8.

99-4 *IUTAM/IACM/IABEM Symposium on Advanced Mathematical and Computational Mechanics Aspects of the Boundary Element Method*
(Cracow, Poland, 31 May-3 June 1999).
The Proceedings of the Symposium, edited by T. Burczynski, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2001. ISBN 0-7923-7081-3.

99-5 *IUTAM Symposium on Segregation in Granular Flows*
(Cape May, New Jersey, USA, 5-10 June 1999).
The Proceedings of the Symposium, edited by A.D. Rosato and D.L. Blackmore, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2000. ISBN 0-7923-6547-X.

99-6 *IUTAM Symposium on Nonlinear Wave Behaviour in Multi Phase Flow*
(Notre Dame, Indiana, USA, 7-9 July 1999)
The Proceedings of the Symposium edited by H.C. Chang, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2000. ISBN 0-7923-6454-6.

99-7 *IUTAM Symposium on Theoretical and Numerical Methods in Continuum Mechanics of Porous Materials*
(Stuttgart, Germany, 5-10 September 1999).
The Proceedings of the Symposium, edited by W. Ehlers, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2001.
ISBN 0-7923-6766-9.

99-8 *IUTAM Symposium on Laminar-Turbulent Transition*
(Sedona, Arizona, USA, 12-18 September 1999).
The Proceedings of the Symposium, edited by H. Fasel and W.S. Saric, have been published by Springer-Verlag, Berlin/Heideberg/New York, 2000.
ISBN 3-540-67947-2.

99-9 *IUTAM Symposium on Geometry and Statistics of Turbulence*
(Hayama, Japan, 1-5 November 1999).
The Proceedings of the Symposium edited by T. Kambe, T. Nakano and T. Miyauchi, have been plublished by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2001. ISBN 0-7923-6711-1.

2000

00-1 *IUTAM Szymposium on Creep in Structures*
(Nagoa, Japan, 3-7 April 2000).
The Proceedings of the Symposium, edited by S. Murakami and N. Ohno, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2000. ISBN 0-7923-6737-5.

00-2 *IUTAM Symposium on Bluff Body Wakes and Vortex-induced Vibration*
(Marseille, France, 13-16 June 2000).
The Proceedings of the Symposium edited by T. Leweke, P.W. Bearman and C.H.K. Williamson, have been published by Academic Press in the Journal of Fluids and Structures, Special Issue on Bluff Body Wakes and Vortex-Induced Vibrations, London, 2001. ISSN 0889-9746, Vol. 15, nos. 3/4.

00-2a *IUTAM Symposium on Scaling Laws in Ice Mechanics and Ice Dynamics*
(Fairbanks, Alaska, USA, 13-16 June 2000).
The Proceedings of the Symposium, edited by J.P. Dempsey and H.H. Shen, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2001. ISBN 1-4020-0171-1.

00-3 *IUTAM Symposium on Mechanical Waves for Composite Structures Characterization*
(Chania, Crete, Greece, 14-17 June 2000).
The Proceedings of the Symposium, edited by D.A. Sotiropoulos, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2001. ISBN 0-7923-7164-X.

00-4 *IUTAM Symposium on Advances in Mathematical Modelling of Atmosphere and Ocean Dynamics*
(Limerick, Ireland, 2-7 July 2000).
The Proceedings of the Symposium, edited by P.F. Hodnett, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2001. ISBN 0-7923-7075-9.

00-5 *IUTAM Symposium on Free Surface Flows*
(Birmingham, United Kingdom, 10-14 July 2000).
The Proceedings of the Symposium, edited by A.C. King and Y.D. Shikhmurzaev , have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2001. ISBN 0-7923-7085-6.

00-6 *IUTAM Symposium on Diffraction and Scattering in Fluid Mechanics and Elasticity*
(Manchester, England, 17-20 July 2000).
The Proceedings of the Symposium, edited by I.D. Abrahams, P.A. Martin and M.J. Simon, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2002. ISBN 1-4020-0590-3.

00-7 *IUTAM Symposium on Field Analyses for Determination of Material Parameters-Experimental and Numerical Aspects*
(Kiruna, Sweden, 31 July-4 August 2000).
The Proceedings of the Symposium, will be published by Kluwer Academic Publishers, Dordrecht, The Netherlands, in 2002.

00-8 *IUTAM Symposium on Smart Structures and Structronic Systems*
(Magdeburg, Germany, 26-29 September 2000).
The Proceedings of the Symposium, edited by U. Gabbert and H.S. Tzou, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2001. ISBN 0-7923-6968-8.

00-9 *IUTAM Symposium on Designing for Quietness*
(Bangalore, India, 12-14 December 2000).
The Proceedings of the Symposium, edited by M.L. Munjal, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2002. ISBN 1-4020-0765-5.

2001

01-1 *IUTAM Symposium on Flow in Collapsible Tubes and Past Other Highly Compliant Boundaries*
(Warwick, Coventry, March 26-30, 2001).
The Proceedings of the Symposium, edited by P.W. Carpenter and T.J. Pedley, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2003. ISBN 1-4020-1161-X.

01-2 *IUTAM Symposium on Material Instabilities and the Effect of Microstructure*
(Austin, Texas, USA, 7-11 May 2001).
The Proceedings of the Symposium, edited by S. Kyriakides and N. Triantafyllidis, have been published by Elsevier Science ltd.
as a special issue of the International Journal of Solids and Structures, number 39, 2002.

01-3 *IUTAM Symposium on Turbulent Mixing and Combustion*
(Kingston, Ontario, Canada, 3-6 June 2001).
The Proceedings of the Symposium, edited by A. Pollard and S. Candel, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2002. ISBN 1-4020-0747-7.

01-4 *IUTAM Symposium on Micromechanics of Martensitic Phase Transformation in Solids*
Hong Kong, 11-15 June 2001).
The Proceedings of the Symposium, edited by Q.P. Sun, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2002.
ISBN 1-4020-0741-8

01-5 *IUTAM Symposium on Analytical and Computational Fracture Mechanics of Non-Homogeneous Materials*
(Cardiff, England, 18-22 June 2001).
The Proceedings of the Symposium, edited by B.L. Karihaloo, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2002.
ISBN 1-4020-0510-5

01-6 *IUTAM Symposium on Computational Mechanics of Solid Materials at Large Strains*
(Stuttgart, Germany, 20-24 August 2001).
The Proceedings of the Symposium, edited by C. Miehe, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2003.
ISBN 1-4020-1170-9

01-7 *IUTAM Symposium on Tubes, Sheets and Singularities In Fluid Dynamics*
(Zakopane, Poland, 2-7 September 2001).
The Proceedings of the Symposium, edited by K. Bajer and H.K. Moffatt, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2002. ISBN 1-4020-0980-1

2002

02-2 *IUTAM Symposium on Unsteady Separated Flows*
(Toulouse, France, 8-12 April 2002).
The Proceedings of the Symposium edited by M. Braza, Ch. Hirsch and F. Hussain, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, in a special issue of Flow, Turbulence and Combustion, Volume 71, Nos 1-4, 2003. ISSN 1386-6184.

02-3 *IUTAM Symposium on Dynamics of Advanced Materials and Smart Structures*
(Yamagata, Japan, 20-24 May 2002).
The Proceedings of the Symposium edited by K. Watanabe and F. Ziegler, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2003. ISBN 1-4020-1061-3.

02-4 *IUTAM Symposium on Asymptotics, Singularities and Homogenisation in Problems of Mechanics*
(Liverpool, UK, 8-11 July 2002).
The Proceedings of the Symposium edited by A.B. Movchan, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2003. ISBN 1-4020-1780-4.

02-6 *IUTAM Symposium on Nonlinear Stochastic Systems*
(Urbana-Champaign, Illinois, USA, 25-31 August 2002).
The Proceedings of the Symposium edited by N. Sri Namachchivaya and Y.K. Lin, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2003. ISBN 1-4020-1471-6.

02-7 *IUTAM Symposium Transsonicum IV*
(Göttingen, Germany, 02-06 September 2002).
The Proceedings of the Symposium edited by H. Sobieczky, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2003. ISBN 1-4020-1608-5.

02-8 *IUTAM Symposium on Reynolds Number Scaling in Turbulent Flow*
(Princeton, N.J. USA, 11-13 September 2002).
The Proceedings of the Symposium edited by A.J. Smits, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2003. ISBN 1-4020-1775-8.

02-10 *IUTAM Symposium on Multiscale Modeling and Characterization of Elastic-Ineleastic Behavior of Engineering Materials*
(Marrakech, Morocco, 20-25 October 2002).
The Proceedings of the Symposium edited by S. Ahzi, M. Charkaoui, M.A. Khaleel, H.M. Zbib, M.A. Zikry, and B. LaMatina, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2003. ISBN 1-4020-1861-4.

2003

03-2 *IUTAM Symposium on Integrated Modeling of Fully Coupled Fluid-Structure Interactions*
(Rutgers, N.J. USA 02-06 June 2003).
The Proceedings of the Symposium edited by Haym Benaroya and Thomothy Wei, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2003. ISBN 1-4020-1806-1.

Proceedings of the International Congresses on Theoretical and Applied Mechanics (ICTAM)

Until September 4, 1964 the organization of the International Congresses for Applied Mechanics was supervised by the "International Committee for the Congresses of Applied Mechanics" and for each Congress the organization was separately entrusted to a local Organizing Committee who also undertook the publication of the Proceedings. Consequently, there is no central point from which Proceedings may be ordered, and for each volume, application must be made to the publishers who took care of that particular volume.

Since September 4, 1964 the same task will be fulfilled by the Standing Congress Committee of IUTAM, and local Organizing Committees to be established.
The titles of the volumes and the names of the publishing firms are given below.

1st Congress, Delft (Netherlands), 22–26 April 1924.
Proceedings of the First International Congress for Applied Mechanics, Delft 1924, edited by C.B. Biezeno and J.M. Burgers (one vol.). Technische Boekhandel en Drukkerij J.Waltman Jr.
Delft, 1925. No more copies are available for sale at Delft.

2nd Congress, Zürich (Switzerland), 12–17 September 1926.
Verhandlungen - Comptes rendus - Proceedings of the 2nd International Congress for Applied Mechanics, Zürich, 12–17 September 1926, herausgegeben von E. Meissner (one vol.). Orell Füssli Verlag, Zürich und Leipzig, 1927.

3rd Congress, Stockholm (Sweden), 24–29 August 1930.
Verhandlungen - Compte rendus - Proceedings of the 3rd International Congress for Applied Mechanics, herausgegeben von A.C.W. Oseen und W. Weibull (3 vol.). AB. Sveriges Litografiska Tryckerier, Stockholm, 1931.

4th Congress, Cambridge (UK), 3–9 July 1934.
Proceedings of the Fourth International Congress for Applied Mechanics, Cambridge, UK, 3–9 July, 1934 (one vol.). University Press, Cambridge (UK), 1935.

5th Congress, Cambridge (Massachusetts, USA), 12–16 September 1938.
Proceedings of the Fifth International Congress for Applied Mechanics, held at Harvard University and the Massachusetts Institute of Technology, Cambridge, Massachusetts, September 12–16, 1938, edited by J.P. den Hartog and H. Peters (one vol.), John Wiley and Sons, Inc.
New York (USA), and Chapman and Hall Ltd.
London (UK), 1939.

6th Congress, Paris (France), 22–29 September 1946.
Proceedings not published (was given in the hands of Gauthier-Villars, Paris).

7th Congress, London (UK), 5–11 September 1948.
Proceedings of the Seventh International Congress for Applied Mechanics, 1948, published by the Organizing Committee (Introduction, Vol. I, Vol. II - Parts 1 and 2, Vol. III, Vol. IV).

8th Congress, Istanbul (Turkey), 20–28 August 1952.
Proceedings published by the Organizing Committee (Vol. I, Vol. II). Faculty of Sciences, University of Istanbul, P.O. Box 245, Istanbul (Turkey), 1953.

9th Congress, Brussels (Belgium), 5–13 September 1956.
Proceedings published by the Organizing Committee (Vol. I to Vol. VIII). Free University of Brussels, 50, avenue Franklin-Roosevelt, Brussels (Belgium), 1957.

10th Congress, Stresa (Italy), 31 August–7 September 1960.
Proceedings published by the Consiglio Nazionale delle Ricerche, Piazelle delle Science 7, Roma (Italia), printed by Elsevier Publishing Company, Amsterdam–New York, 1962.

11th International Congress on Theoretical and Applied Mechanics (ICTAM),
Munich (Germany), 30 August–5 September 1964.
The Proceedings, edited by H. Görtler, have been published by Springer–Verlag, Heidelberger Platz 3, Berlin (Germany), 1966.

12th International Congress on Theoretical and Applied Mechanics (ICTAM),
Stanford, Cal. (USA), 26–31 August 1968.
The Proceedings, edited by M. Hetényi and W.G. Vincenti, have been published by Springer–Verlag, Berlin (Germany), 1969.

13th International Congress on Theoretical and Applied Mechanics (ICTAM),
Moscow (USSR), 21–26 August 1972.
The Proceedings, edited by E. Becker and G.K. Mikhailov, have been published by Springer–Verlag, Berlin (Germany), 1973.

14th International Congress on Theoretical and Applied Mechanics (ICTAM),
Delft (Netherlands), 30 August–4 September 1976.
The Proceedings, edited by W.T. Koiter, have been published by North–Holland Publishing Company, Amsterdam–New York–Oxford, 1976, 1977.

15th International Congress on Theoretical and Applied Mechanics (ICTAM),
Toronto (Canada), 17–23 August 1980
The Proceedings, edited by F.P.J. Rimrott and B. Tabarrok, have been published by North–Holland Publishing Company, Amsterdam–New York–Oxford 1980.

16th International Congress on Theoretical and Applied Mechanics (ICTAM),
Lyngby (Denmark), 19–25 August 1984.
The Proceedings, edited by F.I. Niordson and N. Olhoff, have been published by Elsevier Science Publishers (North–Holland), Amsterdam, 1985.

17th International Congress on Theoretical and Applied Mechanics (ICTAM),
Grenoble (France), 21–27 August 1988.
The Proceedings, edited by P. Germain, M. Piau and D. Caillerie, have been published by North–Holland, Elsevier Science Publishers, Amsterdam, 1989. ISBN 0-444-87302-3.

18th International Congress on Theoretical and Applied Mechanics (ICTAM),
Haifa (Israel), 22–28 August 1992.
The Proceedings, edited by S.R. Bodner, J. Singer, A. Solan and Z. Hashin, have been published by Elsevier Science Publishers, Amsterdam, 1993.
ISBN 0-444-88889-6.

19th International Congress on Theoretical and Applied Mechanics (ICTAM),
Kyoto (Japan), 25-31 August 1996.
The Proceedings, edited by T. Tatsumi, E. Watanabe, T. Kambe, have been published by Elsevier Science Publishers, Amsterdam, 1997.
ISBN 0-444-82446-4.

20th International Congress on Theoretical and Applied Mechanics (ICTAM),
Chicago (USA), 27 August-2 September 2000.
The Proceedings, entitled “Mechanics for a new Millenium and edited by H.Aref and J.W.Phillips, have been published by Kluwer Academic Publishers, Dordrecht, The Netherlands, 2001. ISBN 0-7923-7156-9.

Publications on the history of IUTAM

IUTAM – A Short History,
edited by S. Juhasz, has been published by Springer– Verlag, Berlin, Germany, 1988. ISBN 3–540–50043–X.
The short history is dedicated to the memory of Professor Theodore von Karman who had an essential role in the formation of IUTAM. Contributions by S. Juhasz, Sir James Lighthill, G. Battimelli, J. Hult, N.J. Hoff, D.C. Drucker and F.I. Niordson are included in the book.

Mechanics at the Turn of the Century,
edited by W. Schiehlen and L. van Wijngaarden, has been published by Shaker Verlag, Aachen, Germany, 2000. ISBN 3-8265-7714-0.
This Report is the result of an initiative of the Bureau of IUTAM to provide some landmarks on the developments in Mechanics during the 20th Century, to report on the 50 years of impulse to Mechanics by the International Union of Theoretical and Applied Mechanics (IUTAM), to visualize by a poster Meters of Motion on the occasion of the 20th International Congress of Theoretical and Applied Mechanics (ICTAM), to look ahead on a very personal basis and to show the broad international involvement of scientists in IUTAM in recent years.

The booklet "Mechanics at the Turn of the Century" is accessible free of charge on the website of Shaker Verlag. The internet address is www.shaker.de and search for Schiehlen as the author. Moreover, this booklet is available upon request at the IUTAM Secretariat

Please note again:
The publications listed above, with the exception of the Annual Reports over the last five years and the booklet "Mechanics at the Turn of the Century", are not available at the IUTAM Secretariat. Please order directly from the publisher.

Details of all IUTAM publications may be found at
http://www.iutam.net or http://www.iutam.org or http://www.iutam.info .

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