



1991
No. 1
Feb.

Newsletter

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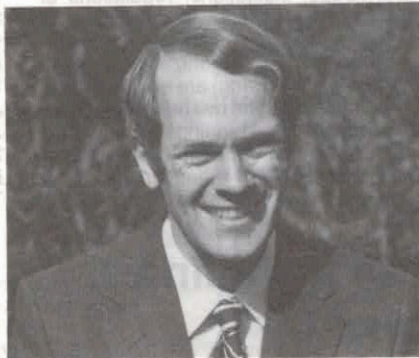
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Brian D.O. Anderson
IFAC President

IFAC is standing at a crossroads today, for several reasons. This has led us to evaluate much of what we are doing. We have given particular consideration to finding a means whereby individuals could have a closer identification with IFAC, while at the same time retaining the legal form of membership via National Member Organizations. We have concluded that there are many good things about IFAC, including our publications, functioning of the Secretariat, and our finances.

We believe our meeting program has required much attention, to ensure timeliness in approvals of events, quality control of individual meetings, coverage of new ideas in control engineering in a timely manner, and securing the right pattern of meetings. We do not yet have unconditional endorsement of the quality of our meetings from all the key consumers, and in particular, I believe we still have a problem with fee levels. We do have absolutely outstanding coverage of applied areas. The Technical Board of IFAC under the chairmanship of Lennart Ljung will be working very hard to address the remaining problems, and I want

to stress that the NMO inputs we have had on this matter have been very helpful in the evaluation process.

Our publications, that is Automatica, the Proceedings Series and the Newsletter are achieving a high standard. Nevertheless we are planning a major evaluation in the forthcoming triennium which will probably result in some finetuning.

The Secretariat and our financial state are in excellent shape, and I would like to thank the NMO representatives today for supporting a fee increase, which allows continuation of this situation.

The Secretariat will be heavily involved in the administration of the IFAC Affiliate program, though I want to stress again that it is well understood that National Member Organizations are and will be the legal members of IFAC.

We have decided to review the way we meet the needs of developing countries. The newly elected Vice-President has been asked to make a study of measures we might adopt. There are a number of major challenges for the future. These include the appropriate use of communications technology, particularly as it relates to our information dissemination. We are looking, for example, at publishing the Newsletter by E-mail. But one can ask what the meetings of the future and our publications like Automatica will look like. What will become of our language rules if we can get automatic on-line translations? And then we need to respond to the political and social changes, particularly the changes in the socialist countries. So it is also clear that we may have to change the way we do business. It is also clear that issues such as the environment and greenhouse effect, robots and the like may change the very business we do. At the least then, we have to be flexible, and in all our activities, I must stress again the great value of inputs from National Member Organizations.

Newsletter Survey

Page 5 and 6 of this Newsletter contain the IFAC Affiliate Registration Card. If you want to continue receiving the IFAC Newsletter send the card to the Secretariat until

1 March, 1991

Those who have already sent us the Affiliate Registration Card are automatically listed as Newsletter recipients for the coming triennium.

Information Brochure

The 1990 Edition of the IFAC Information Brochure is now available at the IFAC Secretariat.

If you wish to receive a free copy, and have not already requested it on the IFAC Affiliate Registration Card, please write to

IFAC Secretariat
Schlossplatz 12
A-2361 Laxenburg
Austria

IFAC Congratulates



Harold Chestnut

Dr. Harold Chestnut, IFAC Advisor and one of the "founding fathers" of our Federation, received the Richard M. Emberson Award of the IEEE on October 6, 1990. This award is being bestowed for "leadership and dedication to the Institute's technical growth and service worldwide, and for the development of systems engineering concepts."

Economics and Artificial Intelligence

IFORS/IFAC/IFIP/IFSR International Conference

Paris, France, July 2-6, 1990

About twenty delegate countries and many speakers known as much in the field of social sciences (economy, management, organization) as in the field of new cognitive sciences (artificial intelligence, cognitive psychology, computer engineering) were represented: since social sciences agree that they have to take into account representations built up from their behaviour and relations by agents, one and the same question gathers together many fields of research up till now distinct. This leads to the question how to effectively lead one's own reasoning in human relations. The various forms of rationality that may be known, by economists (optimizing behaviour, game theory, rational anticipation and specularity, common knowledge, institutions, regulations or conventions) and by knowledge engineers (reasoning, formalization, knowledge representation, learning, self-organization, problem understanding and solving) are entangled and mutually stimulating. The two hundred researchers who met at the beginning of July 1990 in the Paris Convention Centre have given proof of this stimulation: North-American and Japanese delegations as well as the European one

were particularly active.

In view of the quality of the papers, the International Scientific Committee has decided to organize a "CECOIA 1990 Prize" (members of the jury were president and past-presidents of IFORS). Six papers were pre-selected and the prize was awarded to three American researchers: B.A. Huberman, T. Hogg and J.O. Kephart for their particularly original study: "Can Predictive Agents Predict Chaos?" As a mark of the vitality of these researches and the quality of the papers that were developed along this international conference, the Japanese delegation, headed by Prof. T. Matsuda, has proposed to organize CECOIA III in 1993, probably in Tokyo. A provisional kernel of the International Scientific Committee has been formed. It includes specialists renowned as much in the field of economics as in artificial intelligence.

P. Bourguin

J.L. Le Moigne

J. Mathieu

S. Pinson

B. Walliser

The CECOIA Steering Committee

IFAC World Congress in Tallinn

Facts and Figures

Looking at the data of the past World Congress in Tallinn leads to some interesting considerations.

About 2500 control engineers contacted the organizers to get information about the Congress and more than 1500 papers were submitted. The final data show that 1109 participants attended the Congress and 499 papers of the accepted 612 were presented. The high number of accompanying persons (233) shows the great interest of people worldwide in the Estonian past, present and future.

The 1109 participants came from 40 different countries and the authors of accepted papers from 39. The tables given below show characteristic values for the countries with the highest attendance and highest number of accepted papers.

Table 1			Table 2		
Country		Attending	Country		Accepted Papers
1.	USSR	369	1.	USA	97
2.	USA	94	2.	Japan	62
3.	Japan	87	3.	China, P.R.	60
4.	Germany	71	4.	Germany	59
5.	Sweden	66	5.	USSR	40
6.	China, P.R.	46	6.	France	29
7.	Finland	43	7.	Italy	23
8.	France	34	8.	Australia	20
9.	Italy	28	9.	Poland	20
10.	UK	28	10.	Sweden	19
11.	Australia	24	11.	UK	18
12.	Austria	23	12.	Canada	16
13.	Hungary	23	13.	Netherlands	14
14.	Netherl.	22	14.	Finland	14
15.	Norway	17	15.	Austria	13

Several countries, among them also some having National Member Organizations in IFAC were unfortunately not represented at the Congress. Among them were e.g. Chile, Cuba, Egypt, Kuwait, Morocco, Pakistan and Singapore. The reasons for this are mainly of an economic or political nature, in some cases both. We do hope that the control engineers of these countries will be in the position to attend the next IFAC World Congress in Australia in 1993.

Professional congress organizers like to forecast meeting attendance by determining the coefficient of attendance (K), which is the quotient of the number of participants (N) and the number of accepted papers (P). $K = \frac{N}{P}$. The value of this coefficient is usually between 1 and 2. If $K < 1.5$ we can speak of "underattendance", if $K > 1.5$ we speak of "overattendance". The underattendance in Tallinn of persons from Australia, Canada, Israel and the USA can be explained by the distance and the high travel costs. China, Turkey and Poland were underrepresented most probably due to the economic problems in these countries. There was a significant overattendance from Scandinavian countries due to, among others, the geographical location and the historical situation in this part of the world. The South Korean overattendance at the IFAC Congress can probably be interpreted as a signal of the increasing interest of this country in Europe.

Offenlegung:

Das Medienwerk "IFAC Newsletter" wird als Organ der "International Federation of Automatic Control (IFAC)" verlegt und ist Eigentum dieser Internationalen Föderation, deren Tätigkeit der Förderung von Wissenschaft und Technik automatischer Regelung und Steuerung dient. Die Föderation hat ihren Sitz in Zürich und ist nach Schweizer Recht als gemeinnütziger Verein angemeldet. Sie verfolgt weder wirtschaftliche noch praktische Ziele.

Das Sekretariat der IFAC befindet sich seit 1978 aufgrund eines Übereinkommens mit der Österreichischen Bundesregierung und der Österreichischen Akademie der Wissenschaften in Laxenburg.

Der "IFAC Newsletter" erscheint sechsmal jährlich in englischer Sprache unter der Redaktion des Generalsekretärs der IFAC, Dr. Gusztáv Hencsey. Die Zeitschrift dient der Information über die Aktivitäten der IFAC. Sie wird kostenlos an Abonnenten in 48 Ländern versandt, die Kosten werden von der IFAC aus Beiträgen der derzeit 46 Mitgliedsländer getragen.

Präsident der IFAC ist für 1990/93 Prof. Dr. B.D.O. Anderson (Australia). Vizepräsidenten sind Prof. Dr. L. Ljung (Schweden) und Prof. Dr. Yong-Zai LU (China). Alle Funktionen werden ehrenamtlich ausgeübt.

(To our readers: To comply with the Austrian "Media Act" every publication must contain a declaration once a year concerning ownership and purpose as above.)

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IFAC Working Groups and their Chairmen

TC on AEROSPACE/MAN.TECH. Intelligent Autonomous Vehicles	C.J.. Harris	TC on EDUCATION Laboratory Projects and Experiments Teachware in Control Education	K. Furuta W. Schaufelberger
TC on APPLICATIONS Chemical Process Control Electrical Generating Plants and Power Systems Automatic Control Applications in Agriculture Automatic Control Applications in Marine Systems Mining, Mineral and Metal Processing Control and Instrumentation of Biotechnological Processes	T. McAvoy E. Welfonder Y. Hashimoto M. Blanke G. Sommer A. Halme	TC on MANUFACTURING TECHNOLOGY Control Architectures for Integrating Manufacturing Activities and Enterprises Intelligent Systems in Manufacturing	T.J. Williams J.L. Nevins
TC on BIOMEDICAL ENGINEERING AND CONTROL Decision Support Systems for Control of Physiological Variables Control of Voluntary Movements Control of Drug Delivery	L. Sheppard W. S. Levine E.R. Carson	TC on MATHEMATICS OF CONTROL Game Theory and Multicriteria Optimization Asymptotic Analysis and Singular Perturbations Control Applications of Optimization Stochastic Analysis and Control Nonlinear Control Systems	W. Grimm D. Visser F.M. Kirillova G. Picci A. Isidori
TC on COMPONENTS & INSTRUMENTS Low Cost Automation Intelligent Components and Instruments Electromechanical Components for Motion Control Hydraulic and Pneumatic Components and Systems	P. Kopacek A. Ollero A. de Carl K. Reid	TC on SOCIAL EFFECTS OF AUTOMATION Cultural Aspects of Automation	J. Forslin
TC on COMPUTERS Artificial Intelligence in Real-Time Control Real Time Programming Management of Software Projects Distributed Computer Control Systems Real Time Distributed Databases	G.J. Suski J.A. de la Puente P. Elzer A. Inamoto E. Knuth	TC on SYSTEMS ENGINEERING Computer Aided Systems Analysis and Design Industrial Systems Large Scale Systems Engineering Methodology and Applications Man-Machine Systems Supplemental Ways for Improving International Stability - SWISS Water Resources Systems Large Scale Agricultural, Forest and Environmental Systems Transportation Systems	I.O. Gray R. Tavast J. Bernoussou H. Stassen J. Scrimgeour V. Tavares J. P. Perrin
TC on ECONOMIC AND MANAGEMENT SYSTEMS Infrastructure Systems, Management and Economics Modelling and Control of National and Regional Economic Systems	Y. Nishikawa B. Rustem	TC on THEORY Adaptive Systems in Control and Signal Processing Robust Control Theory Actuator and Sensor Placement Problems Control Theory and Signal Processing Theory of Robots	M.J. Grimble E. Zeheb A. El Jai A. Benveniste M. Vidyasagar

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IFAC Secretariat

Schlossplatz 12
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Papers

- A Petri Net Model for Evaluation of Expert Systems in Organizations (D.M. Perdu, A.H. Levis)
 A New Technique for Fault Detection Using Petri Nets (J. Prock)
 An Extended Direct Scheme for Robust Adaptive Nonlinear Control (I. Kannelakopoulos, P. V. Kokotovic, R. Marino)
 A New Stable Compensator Design for Exact and Approximate Loop Transfer Recovery (B.M. Chen, A. Saberi, P. Sannuti)
 Trade-Offs in Linear Control System Design (R.H. Middleton)
 On the Structure of Suboptimal H^∞ Controllers in the Sensitivity Minimization Problem for Distributed Stable Plants (H. Ozbay, A. Tannenbaum)
 H^2 -Optimal Control with an H^∞ Constraint, the State Feedback Case (M.A. Rotea, P.P. Khargoneker)
 $e^{-\lambda t}$ -Optimal Control of Multivariable Systems with Output Norm Constraints (J.S. McDonald, J.B. Pearson)
 Minimal Structure in the Block Decoupling Problem with Stability (C. Commaut, J.M. Dion, J.A. Torres)
 Estimation of the Control Period for Self-Tuners (M. Kárny)
 A Geometric Approach to Proportional-Plus-Derivative Feedback Using Quotient and Partitioned Subspaces (V.L. Syrmos, F.L. Lewis)

Brief Papers

- Kalman Smoothing via Auxiliary Outputs (J. Kornylo)
 Numerical Computation of Decentralized Fixed Modes (R.V. Patel, P. Misra)
 Qualitative Analysis and Decentralized Controller Synthesis for a Class of Large-Scale Systems with Symmetrically Interconnected Subsystems (M.K. Sundareshan, R.M. Elbanne)
 On Practical Stability of Linear Multivariable Feedback Systems with Time-Delays (W. Feng)
 Implied Polynomial Matrix Equations in Multivariable Stochastic Optimal Control (K.J. Hung, M. Sebek)
 Parameter Estimation Aspects in Adaptive Control (F. Giri, J.M. Dion, L. Dugard, M.M'Saad)
 Estimation Theory for Nonlinear Models and Set Membership Uncertainty (M. Milanese, A. Vicino)
 Linear Time-Invariant Distributed Parameter System Identification via Orthogonal Functions (B.M. Mohan, K.B. Datta)
 Identification and Rational L^2 Approximation: A Gradient Algorithm (L. Baratchart, M. Cardelli, M. Olivi)

Book Reviews

- Real Time Computer Control: An Introduction, by Stuart Bennett (L. Motus)
 Computer Control of Machines and Processes, by J.G. Bollinger & N.A. Duffei (Chr. Schmid)
 Industrial Control Electronics: Applications and Design, by J.M. Jacob (H. Rake)
 Power Hydraulics, by M. Pinches & J.G. Ashby (H. Ramon)
 Random Signals and Systems, by Richard E. Mortenson (J.F. Barrett)

WHO IS WHO IN IFAC



Dr. Jürgen Ackermann

Jürgen Ackermann studied control engineering under the guidance of Prof. Oppelt in Darmstadt, Germany, and Prof. Jury in Berkeley, California. He has a long association with DLR, the German Aerospace Establishment in Oberpfaffenhofen, Germany, where he is currently director of the Institute for Flight Systems Dynamics. He has initiated and guided many applied research projects which include robust autopilots and jet engine control systems for aircraft; trajectory optimization of aircraft, missiles and spacecraft; control of large flexible structures; robotics for space and manufacturing applications, modelling and control of trains, maglev vehicles and automobiles. He is well known for his contributions to the theory of control systems. Perhaps his best known result is Ackermann's formula for pole placement. He has made significant contributions in sampled-data control and analysis and design of robust control systems. His present research interests are in exploiting structures in models and feedback systems for robustness analysis and in robust car steering. Professor Ackermann has served in numerous functions for IFAC, and for IEEE. He is active in the editorial boards of Automatica, IEEE Transactions on Automatic Control and C-TAT. Recently he has been elected chief reviewer for control engineering for the Deutsche Forschungsgemeinschaft, member of the senate of DLR and member of the IFAC Council.

Keywords:

- | | |
|---|--|
| 1 <input type="checkbox"/> Adaptive Control and Systems | 14 <input type="checkbox"/> Economic and Management Systems |
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| 9 <input type="checkbox"/> Computer Aided Design | 22 <input type="checkbox"/> Metallurgy, Mining and Mineral Processing |
| 10 <input type="checkbox"/> Computers in Control | 23 <input type="checkbox"/> Modelling & Control of Non-Technical Systems |
| 11 <input type="checkbox"/> Control Design | 24 <input type="checkbox"/> Nonlinear Systems |
| 12 <input type="checkbox"/> Distributed Parameter Systems | 25 <input type="checkbox"/> Social Effects of Automation |
| 13 <input type="checkbox"/> Distributed Systems | 26 <input type="checkbox"/> Other Fields of Interest |



FORTHCOMING EVENTS

1991
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Title	1991	Place	Deadlines	Further Information
IMACS/IFAC Workshop Decision Support Systems and Qualitative Reasoning	March 13-15	Toulouse France	-	Mme M.Th. Ippolito DSSOR-IMACS Workshop LAAS/CNRS 7, Ave. du Colonel Roche F-31077 Toulouse Cedex, France
LAK/IFAC Intl. Workshop Computer Aided Systems Theory	April 15-19	Krems Austria	20 Jan. 1991	Prof. Franz Pichler Institute of Systems Science Johannes Kepler Universität A-4040 Linz, Austria
IFAC Workshop Modelling and Experimental Verification of Dynamics and Control of Flexible Aerospace Structures	April 2 - 4	Huntsville AL, USA	-	Dr.S.M. Seltzer, Control Dynam. Company, Office Park South Suite 304, 600 Blvd South Huntsville, AL 35802, USA
IMACS/IFAC Symposium Modelling and Control of Technological Systems	May 7-10	Casablanca Morocco	-	IMACS-MCTS Symp., LAIC Faculté Hassan II, Faculté des Sciences I, BP 5366 MAARIF Casablanca, Morocco
IFAC/IFIP Workshop Real Time Programming	May 15-17	Atlanta, GA USA	15 Jan. 1991	Prof. K. Ramamritham Univ. of Mass., Computer & Information Science Dept. Lederle Graduate Res. Center Amherst, MA 01003, USA
IFIP/IFAC/EWICS Working Conference Dependability of Artificial Intelligence Systems, DAISY '90	May 27-29	Vienna Austria	-	Prof.G.H. Schildt Inst.f.Technische Informatik Treitlstraße 3, 1040 Vienna, A
IFAC/(IFIP) Workshop Computer Software Structures Integrating AI/K BS Systems	May 29-31	Bergen Norway	-	N.P. Sundby, Norwegian Soc. of Automatic Control POB 2312, Solli N-0251 Oslo, Norway
IFAC Workshop Electric Power Systems Control Centers	June 17-20	Semmering Austria	-	K. Schenk, IFAC Control Centre WS, Siemens AG Austria Gudrunstr. 11, A.1101 Vienna, Austria
IMACS/IFAC Symposium Parallel and Distributed Computing in Engineering Systems	June 23-28	Corfu Greece	15 Feb. 1991	Prof. S. Tzafestas, P.C.COM '91 IRCU, Computer Science Div. NTU Athens, Zografu 15773 Athens, Greece
IFAC Conference Advances in Control Education	June 24-25	Boston, MA USA	-	Prof.M.Rabins, Mech.Engg.Dept Texas A&M Univ. College Station, TX 77843-3123, USA
IFAC Workshop Discrete Event System Theory and Applications in Manufacturing and Social Phenomena	June 25-27	Shenyang China, P.R.	-	Prof. Xu Xinh, DES '91 Dept. of Automatic Control Northeast Univ.of Technology Shenyang 110006, PRC
IFAC/IFORS Symposium Identification & System Parameter Estimation	July 8-12	Budapest Hungary	-	Ms. Eva Sos, Computer&Autom. Inst., HAS, POB 63 H-1518 Budapest, Hungary
IFAC/IFIP/IMACS Symposium (5th) Computer Aided Design in Control & Engineering Systems	July 15-17	Swansea UK	-	Ms. F. McEwen, Dept. of Elect. Electronic Engg., Univ. College of Swansea, Singleton Park Swansea SA2 8PP, UK
IFAC Symposium Distributed Intelligent Systems DIS '91	Aug. 13-15	Washington DC USA	-	Prof. A.H. Levis LIDS 35-410, M.I.T Cambridge, MA 02139, USA

FORTHCOMING EVENTS (ctd.)

Title	1991	Place	Deadlines	Further Information
EFMI/IIASA/IFAC Intl. Conference Medical Information Systems and Expert Systems	Aug. 19-22	Vienna Austria	7 Jan. 1991	K.P.Adlassnig, MIE'91 Secr. c/o Inst. f. Medizin. Computerwissenschaften Garnisong. 13, 8.Hof A-1090 Vienna, Austria
IFAC Workshop Expert Systems in Mineral and Metal Processing	Aug. 26-28	Espoo Finland	31 Jan. 1991	Fin.Soc. of Autom.Control Hämeentie 6 A 15 SF-00530 Helsinki, Finland
IFIP/IFAC Conference (15th) System Modelling and Optimization	Sept. 2-6	Zurich Switzerland	10 Jan. 1991	Dr. K. Fraundorfer Institute for OR, Univ. Zurich Moussonstrasse 15 CH-8044 Zurich, Switzerland
IFAC Symposium Design Methods of Control Systems	Sept. 4-6	Zurich Switzerland	-	IFAC Symposium Zurich '91 Att. Ms. B. von Känel, ETH Zentrum CH-8092 Zurich, Switzerland
IFAC Workshop Distributed Computer Control Systems DCCS '91	Sept. 9-11	Semmering Austria	15 March 1991	Prof. H. Kopetz TU Wien, Inst. f. Technische Informatik, Treitlstr. 3 A-1040 Vienna, Austria
IFIP/IFAC Conference Computer Applications in Production Engineering	Sept. 10-12	Bordeaux France	-	CAPE '91 Conference Secr. Lab. GRAI, Cours de la Liberation F-33405 Talence Cedex, France
IFAC Symposium Fault Detection, Supervision and Safety for Technical Processes SAFEPROCESS '91	Sept. 10-13	Baden-Baden FRG	-	VDI/VDE GMA SAFEPROCESS '91 POB 1139 D-W-Düsseldorf, FRG
IFAC Workshop Algorithms and Architectures for Real-Time Control	Sept. 11-13	Bangor UK	15 Feb. 1991	Prof.D.I.Jones, School of Electronic Engg. Science, UCNW Dean Street, Bangor Gwynedd LL57 1UT, UK
IMEKO/IFAC Symposium Artificial Intelligence Based Measurement and Control	Sept. 12-14	Kyoto Japan	-	Prof. K. Kariya, Dept. of EE Fac. of Science and Engg. Ritsumeikan University 56-1, Tojiin-kita, Kita-ku Kyoto 603, Japan
IFAC/(IFIP)/IMACS Symposium Robot Control SYROCO '91	Sept. 16-18	Vienna Austria	-	ÖPWZ, Att. Ms. J. Hähnel Rockgasse 6 A-1014 Vienna, Austria
IFAC Workshop (3rd) Artificial Intelligence in Real Time Control	Sept. 23-25	Napa, CA USA	22 Jan. 1991	Prof.G.J. Suski, Lawrence Livermore Nat.Lab., POB 808, L 550 Livermore, CA-94550, USA
IFAC/ISHS Workshop Mathematical and Control Applications in Agriculture and Horticulture	Sept. 30 Oct. 3	Matsuyama Japan	-	Prof. H. Nonami, Dept. of Bio- mechanical Systems, Ehime University, Tarumi Matsuyama 790, Japan
IFAC/IFIP Workshop Distributed Databases in Real-Time Control	Oct. 8-11	Rydzyzna Poland	1 Feb. 1991	Prof. J. Korbicz Higher College of Engg. ul. Podgórna 50, PL-65246 Zielona Góra Poland
IFAC Symposium Advanced Control of Chemical Processes - ADCHEM '91	Oct. 14-16	Toulouse France	-	ADCHEM '91, LAAS/CNRS 7, ave. du Colonel Roche F-31077 Toulouse Cedex, France
IFAC Workshop Cultural Aspects of Automation	Oct. 16-18	Krems Austria	*	ÖPWZ, Ms. J. Hähnel Rockgasse 6 A-1014 Vienna, Austria
IFAC/IFIP Conference Safety, Security, Reliability SAFECOMP '91	Oct. 30 - Nov. 1	Trondheim Norway	*	Mr. N.P. Sundby, NFA POB 2312 Sollin, N-0201 Oslo Norway

The forthcoming events for the year 1992 will be published in the next issue of the Newsletter

* not yet known
- deadline past