IFIP newsletter
International Federation for Information Processing

Editor:
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IFIP CONGRESS '94 WAS A HUGE SUCCESS

Opened by President of Germany

***IFIP** president Rolstadås greeting Congress*

The opening of **IFIP** Congress '94 was illuminated by hundreds of press-camera flashes as the president of Germany, *Prof. Dr. Roman Herzog,* ascended the stage of the Hamburg Congress Center to welcome the delegates Monday morning, 29 August. This is believed to be the first **IFIP** Congress addressed by a head of state. (Long-time **IFIP** Congress attendees recall, however, that King Carl Gustaf of Sweden addressed the opening ceremony of the 1974 Congress in Stockholm, and (then) Crown Prince Akihito of Japan addressed the opening of the 1980 Congress in Tokyo.) *Prof. Herzog* spoke of how information technology can contribute to the global spread of democracy, of the increasing responsibility for the content of information transmitted on information highways, of the danger that multimedia might lead to an Orwellian age, and of the desirability for creativity in the use of telematics. This address and other aspects of the Congress were widely covered by the German press and TV.

Following this address, came welcoming remarks by *Dr. Heinrich von Pierer,* chairman of the National Honour Committee, *Prof. Dr. Erhard Rittershaus,* Mayor of Hamburg, *Dr. Jaakko Kivinen,* president of CEPIS (Council of European Professional Informatics Societies), and *Prof. Asbjørn Rolstadås (N),* president of **IFIP.** *Prof. Dr. Wolfgang Glatthaar,* president of GI (Gesellschaft für Informatik e.V.), the German member society of **IFIP,** introduced the dignitaries. *Prof. Dr. Wilfried Brauer (D),* Congress chair, later commented on the significance of the presence of all these notables as follows: "Because of the very broad resonance in the media, the importance of informatics, as well as the two organizations, **IFIP** and GI, became more widely known. Thus, one may hope that for future **IFIP** and GI events, industry will be much more willing to give support and that informaticians will realize how important it is to come to **IFIP** events."

In his remarks, President *Rolstadås* noted that this Congress assembled the world's most prominent information-technology professionals. He recalled reading the book *The Machine that Changed the World,* which — to his surprise — was about the automobile rather than the computer. He predicted, however, that the computer will eventually have an even greater impact. He noted the duty that the Congress delegates have to advance the ethical, responsible use of the computer. In addition, **IFIP** has special responsibility in the developing countries and Eastern Europe. *Prof. Rolstadås* also congratulated GI on its 25th anniversary.

The first of the major speeches in the Opening Ceremony was delivered by *Dr.*

German president Herzog greeting Congress

Martin Bangemann, vice-president of the European Commission, who advocated the abolition of public monopolies in the communication area. He noted a recent experiment in which it took 3 days for a letter to travel from Augsburg to Brussels — the same time it took when mail service was instituted. He said that there is

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Please send the following **IFIP** information directly to the Secretariat: announcements of conferences, workshops, and other meetings; calls for papers; appointments to committees and other positions; and changes of address. The Secretariat is the clearinghouse for all such information, which it will forward to the *Newsletter.*

On-Line IFIP Database
A database of **IFIP** information (including this *Newsletter) is* available through international computer networks. Access is possible via ftp from the repository at
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repository. In addition, the database can be accessed through GOPHER. Details of how to access the database can be obtained from the Secretariat.

GREETINGS

At this time of holidays and the new year, we send greetings to all our **IFIP** friends and wish all of you joyful holidays and a year of health, happiness, and peace.

Professor Gotlieb and Mrs. Auerbach

CONGRESS '94 continued from page 1

no alternative to the information society; therefore, we must use it for the creation of jobs and for other public benefits. The second speaker, *Dr.* **Tyll** *Necker (D),* president of the Federation of German Industries, predicted that the information superhighway will have greater influence than the railway, telephone, and other major communication innovations. **He** pointed out that the unbounded flow of television and news led to the collapse of Communism; thus, information becomes an ally of freedom. Information must be available at reasonable rates. **He** too indicated that deregulation is necessary.

Auerbach Award

The opening session was followed by the presentation of the first *Isaac L. Auerbach* Award to *Prof. Calvin Gotlieb (CDN)* by *Mrs. Carol Auerbach (USA),* widow of the key founder of **IFIP. (A** biography of *Prof. Gotlieb* is in the September 1994 ***IFIP*** *Newsletter,* page 3.) She said that after **IFIP** Congresses, the best minds in information processing go home and work harder. *Prof. Gotlieb* expressed his gratitude to the University of Toronto for the freedom given him to pursue his professional activities. **The** presentation was introduced by *Mr. Howard Funk (USA),* an **IFIP** vice-president, who had initiated the Award and organized the ceremony.

During an intermission, as well as prior to the opening session, the audience was entertained by jazz played by *Mr. Gottfried Böttger* on a piano instrumented to detect what notes were being played and the velocity of the key motion. This information was fed into a computer that determined what part of the score the pianist was playing and then displayed **it** on a large screen.

Three keynote addresses followed the Award ceremony. *Governor Morihiko Hiramatsu (J)* discussed transforming the GNP (gross national product) into GNS (gross national satisfaction), reflecting the quality of life. He mentioned an experimental computer network in Japan for connecting all citizens into the Internet system. *Dr. Vinton Cerf (USA),* president of the Internet Society, described the size and amazing rate of growth of Internet. He discussed both the role of the U.S. government in sponsoring the precursor system and the important role of the private sector today. **Finally,** *Dr. Albert Strub* of the European Union asserted that information and communication technology are beginning to underpin all production and service industries, as well as the public sector. In the future, network usage will be primarily by businesses rather than individuals.

Technical Sessions

During the technical sessions, which began Monday afternoon, as many as 15 talks were given in parallel, plus three GI workshops. Since we were not able to attend more than one at a time, our coverage is spotty and restricted to aspects we hope our readers will find interesting.

An "Invited Expert" presentation by *Prof. Tom van Weert (NL)* expressed the opinion that the delivery of education must be re-engineered. The computer is presently being used in education to automate the old teaching processes; instead, it should be used to empower the student to learn. A listener asked how scientific experiments can be conducted to determine the efficacy of the computer in education.

The sessions on theoretical computer science, sometimes six in parallel, attracted many delegates. A session we attended on cryptography, "an old art form but a new science," had a large audience including many young people. In his intro-

duction, one of the Invited Experts, *Prof. Avi Shamir (IL),* pointed out a danger of "strong" cryptography: if the owner of critical encrypted files forgets the password or is otherwise unable to furnish it, valuable information may be lost irretrievably.

Computer Music

In a fascinating session on computers and music, three renowned composers demonstrated their work. *Prof. Tod Machover (USA)* discussed three innovations that occurred approximately ten years ago and revolutionized the field of computer music: the PC, the Yamaha synthesizer, and the standard Musical Instrument Digital Interface (MIDI). He described his evolution from producing "hyperinstruments" (which augment the sounds produced by the human player) for musical virtuosos to producing instruments for the masses. His talk was accompanied by a multimedia presentation. *Prof. Jean-Claude Risset (F)* persevered — despite such technical problems as a missing cable and a blown fuse — to demonstrate techniques for musical sound production. He bemoaned the possibility that musical pieces written for new instruments may die when those instruments become obsolete or no longer functional. *Prof. György Ligeti (D)* described how his knowledge of computer systems has affected his work. Musical composition by computer, he said, should be an interactive process with a human composer. He uses his brain to the maximum and the computer to the minimum, he said.

Tuesday evening, a University of Hamburg lecture hall overflowing with Congress delegates and Hamburgers was the site of a delightful concert of computer music created by the three aforementioned lecturers. The *Machover* composition "Bounce" was played on an electronic keyboard and a "hyperpiano" by pianist *Robert Shannon (USA).* The program notes said

> At times, the computer accompaniment (played both on electronic sound devices and on the Disklavier [the hyperpiano] itself, like a wild version of piano four- or eight-hands) shapes itself to the nuance of the live performance; at other times, embellishments and elaborations are generated "on the fly" by the computer in reaction to the pianist's playing; at yet other times, the pianist uses the electronic keyboard to "shepherd" and shape a mass of rapid, textural passages rippling through the octaves of the Disklavier.

In addition to seeing the pianist's hands on the keyboard, one could see untouched keys being depressed by the computer partner.

Next, *Risset* played three of his own compositions on the hyperpiano. The program notes for one of these illustrate the type of effect that can be achieved:

> *Fractals.* To each note played, the computer adds five notes spaced approximately, but not exactly, one octave apart. Thus the pitch patterns played by the pianist are distorted in strange ways; an octave jump is heard as a semitone descent.

Finally, *Ligeti* gave a brief, entertaining talk about his human-computer collaboration in composition, which was followed by pianist *Prof. Volker Banfield* playing "Selected Etudes pour Piano" in a virtuosic performance of very difficult music.

Computer Pioneers

Sessions on computer history, featuring luminaries *Prof. Konrad Zuse (D), Prof. Dr. Heinz Zemanek (A),* and *Prof. Maurice Wilkes (GB),* also attracted large crowds. *Prof. Zuse,* who designed the Z1, "the first working programmable computer," in 1935-6, described his fears concerning the wire from the arithmetic-logic unit that allowed the program sequence to be controlled by the computational results: "I felt Mephisto standing behind me when I developed that."

In a session on Ethics and Social Responsibility, *Prof. David Parnas (CDN)* described his personal experience with a pacemaker that failed because of a flaw in the software. He said, "The hardware and its manufacturing process had been subject to careful documentation and scrutiny. The programming was viewed as a trivial task and had not been subject to the same discipline." During the session, some discussion concerned the value of a code of ethics or conduct that does not include sanctions such as loss of professional license. *Prof. Jacques Berleur (B)* discussed **IFIP's** study of codes of ethics and conduct for information processing professionals and recommended that **IFIP** "create spaces for discussion" of these matters, including case studies. This issue was also taken up in the **IFIP** General Assembly, which followed the Congress (see page 4).

Wednesday afternoon, **IFIP** held a luncheon for the presidents of its Member societies. At this elegant affair, organized by Vice-President *Funk,* the 21 presidents were able to discuss issues of mutual interest with each other and **IFIP** officers.

The final two days of the Congress were devoted to the Issues program, which is described in an article on page 7.

In a session on safety in large, complex systems, *Prof.. Yoshihiro Tohma (J)* asserted that the mean time between failures of such systems has not improved over the past decade. *Dr. Carl Landwehr (USA),* among other matters, presented anecdotes concerning failures of systems because they were not operated under the conditions for which they were designed. For example, Patriot missile batteries were not designed to be operated continuously for more than 14 hours at a time. When one that had been run continuously for 100 hours failed, it led do disastrous results: "A SCUD missile struck a U.S. barracks in Dahran on February 25, 1991, killing 28 and injuring 98." In a subsequent panel session on safety-sensitive applications, *Prof. Dr. Hermann Kopetz (A),* describing complex automotive systems, noted that a typical 1994 automobile has approximately 1500 wires, but that the cost of such large conventional "wiring harnesses" has now reached the point at which they will be replaced by computer networks. He also said that 10% of the cost of current cars is due to computers, but 10 years from now, that number will be 20-25%. A major problem is to ensure that the entire system operates properly once all independently developed subsystems work correctly.

A workshop organized by students of the University of Hamburg was also part of the Congress and covered topics they considered very important, like Separation of Academic and Professional Education,

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IFIP COUNCIL

Executive Board

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M. Gottlieb	IL	94-95

GENERAL ASSEMBLY MEETS IN HAMBURG

Bauknecht Chosen as President-Elect

During four busy days in Hamburg, Germany, from 2 to 5 September, participants in the **IFIP** General Assembly (GA) and related meetings debated many significant issues and made decisions that will direct the future course of **IFIP.** Among the more important topics considered were the nature of future **IFIP** Congresses (reported in an article on page 10), 'adjustments to the structure of Technical Committees and Specialist Groups (to be discussed in the next ***IFIP*** *Newsletter),* finances, "**IFIP** Supporters," plans for moving the Secretariat, appointment of an Administrative Manager for the Laxenburg Secretariat, admission of new Member societies, and election of new officers and trustees.

Technical Activities

All 13 Technical Committee (TC) and Specialist Group (SG) chairmen were present for the TA and part of the GA. This was the first time since 1989 that all have attended. Three new Working Groups (WGs) were approved by the Technical Assembly: WG6.2 on Broadband Communication, WG6.3 on Performance of Communication Systems (these WG numbers are being "recycled"), and WG14.5 on Cellular Automata. The Aims and Scopes will be printed in a future *Newsletter.* WG10.2 on System Description and Design Tools and WG10.5 on Very Large Scale Integration have agreed to merge their activities. WG11.9 on IT-Related Crime Investigation was dissolved.

Prof. Martti Tienari (SF), chairman of the Activity Management Board, reported a high level of technical activity for the twelve-month period ending 30 June 1994. Seventy-six conferences and similar events were held, five more than last year, with **IFIP** assuming primary responsibility for the technical program of 56 of these (four more than last year). Publication of 42 proceedings is planned. The numbers might have been even larger had several TCs not taken responsibility for organizing some of the sessions of **IFIP** Congress '94 instead of their own conferences. A disturbing passage from the AMB report reads, "Financial proceeds to **IFIP** from the event organizers have been received so far from only 4 of the 56 core events." Since **IFIP** depends upon these proceeds to finance a wide range of activities, including events in developing countries and events requiring **IFIP** grants in order to be held at all, this is a distressing situation. Part of the 1994 **IFIP** deficit is due to this shortfall.

The following are among the more unusual of the technical activities discussed:

- TC3 on Education is planning a journal, *Education and Informatics,* which is expected to be published by the new **IFIP** publisher Chapman & Hall (C&H), with the first issue printed by July 1995. All TCs are encouraged to consider publishing journals.
- TC3 also cooperated in the 1994 International Olympiad for Informatics, held in Stockholm, Sweden, and presented the **IFIP** Trophy to the winners of that event.
- Two instances of Arab-Israeli cooperation were reported: A TC12 conference planned in Cairo, Egypt, with the assistance of IPA, the Israeli Member society of **IFIP;** and participation by the Arab sector in Israel and the Autonomous areas as well as delegations from other Arab countries in the next IPA convention, in Jerusalem.
- WG9.4 on Social Implications of Computers in Developing Countries has over 300 members. An effort is being made to divide the activity into regions.
- WG11.8 on Information Security Education has developed a proposed curriculum for a Master's degree program in computer security that has attracted attention.

Other issues raised included the following:

- Outstanding Service Awards (see the article on page 11)
- In order that **IFIP** maintain a closer relationship with its Affiliate Members (AMs), it was proposed by the Executive Board that each year **IFIP** hold at least one event jointly with each AM. In response to that suggestion, *Dr. Pramode Verma (USA),* representing the International Council for Computer Communication, an AM, reported that ICCC is planning a joint conference with **IFIP's** TC6 (Communication Systems) on Information and Communication Technology (ICT) and Job Creation. This would be one of several joint activities to encourage the formation of *new* ICT enterprises and jobs.
- A proposal that AMs be charged dues, along with Full and Corresponding Members, was defeated by the GA.
- A discussion of how to make TC meetings more interesting and worthwhile for the participants included reports by chairmen of TCs 8 and 10. Each TC8 meeting includes reports by two people on their personal professional activities; in addition, TC strategy is discussed. The second day of each TC10 meeting includes either a technical visit, if the meeting is held in a "high-tech" country, or a public seminar by TC members, if the meeting is held in a developing country.
- A task force was appointed "to develop harmonized international information-technology–professional standards" and "to gain international acceptance of these standards." This group will report its results to the March 1995 Council in New York.
- *Prof. Egon Hörbst (A),* chairman of TC10, suggested that IFIP's terminology regarding **IFIP's** participation in the organization of events be revised to conform with common usage. The terms include "sponsorship," "cosponsorship," "participation," and "cooperation." The revised definitions will be published in the *Newsletter* when they have been formally approved. *(Prof. Hörbst* was very involved in many discussions during the GA: this terminology issue, plans for IFIP Congress '96, and restructuring TCs and SGs, in addition to his TC10 reports.)
- TC chairmen discussed problems associated with conferences outside of Europe and North America. In particular, it is sometimes the case that planning for an event held in a developing country is almost entirely in the hands of local personnel — this includes membership in the International Program Committee. Consequently, the event may have little participation from outside the country or region, either on the part of authors of papers or ordinary participants. As a result, it does little to forward **IFIP's** goal of bringing external expertise to developing countries.
- A situation has arisen with regard to the fourth IFIP/IEEE International Symposium on Integrated Network Management — ISINM'95, to be held next May in Santa Barbara, CA, U.S.A., in which the ownership of the initials "ISINM" has been disputed. The GA resolved to defend **IFIP's** ownership of the trademark by having the **IFIP** attorney file an opposition with the U.S. Patent and Trademark Office.

Ethics Activity

The ethics study (see the June 1994 *Newsletter,* page 9) reached a milestone at the TA. *Prof. Jacques Berleur (B)* reported for the Task Group on Ethics, which had gathered 30 codes of ethics or

codes of conduct from computer societies and similar organizations around the world and compared and analyzed them in an ***IFIP*** *Ethics Reader.* They are negotiating with Chapman & Hall concerning publication of the *Reader.* The TA expressed its appreciation of the Task Group effort and resolved that "an ongoing discussion process both in **IFIP** Member societies and in the international community is essential to understand and further develop the **IFIP** Framework on Ethics' in more detail, which is also a prerequisite to adapt it to new developments. ... TA welcomes and accepts the suggestion of TC9 [Relationship between Computers and Society] to continue the Task Group under its umbrella [within WG9.2 on Social Accountability]. ... It asks a new TC9 Special Interest Group (SIG9.3 on **IFIP** Framework on Ethics) to develop a set of case studies which may enlighten essential problems and issues related to codes of ethics."

Publications

Chapman & Hall is beginning its activity for **IFIP.** The proceedings of virtually all **IFIP** conferences held in 1995 and later, as well as other **IFIP** books, will be published by C&H. In addition, proceedings of some 1994 **IFIP** events that could not be included in the ***IFIP*** *Transactions* series will be published by C&H.

The Publications Committee (PC) is concerned with maintaining the high quality of **IFIP** scientific publications and the possible electronic publication of **IFIP** books. These matters were raised at the March 1994 Council meeting in Brussels, but no action has been taken yet. (An ad hoc committee formed by the TA in March to pursue the general subject of electronic publishing — especially to consider whether **IFIP** should take a leadership role in this area on the international stage — has not taken any action either.)

Other publications issues discussed are as follows:

- In order that conference proceedings be published in a timely manner, the PC encourages every proceedings editor to have the final version of her or his book printed and available at the time of the conference. Delaying publication until the book can be made more attractive or improved in minor ways is generally not advisable.
- To prevent an author from submitting a paper, having it printed in the proceedings, but not attending the conference, the PC recommends that each author be required to register for the conference and pay the registration fee before the paper is included in the proceedings.
- The question was raised about the permissibility of publishing a paper simultaneously in **IFIP** conference proceedings and a journal, since some authors wish more exposure for their papers than is offered by publication in proceedings. The answer was that it is improper to do so, unless the two papers are substantially different.

Elections

Prof. Kurt Bauknecht (CH), who is at present a vice-president, was voted president-elect, to assume the presidency next September, *Mr. Howard Funk (USA)* was re-elected vice-president, to serve a three-year term, and *Prof. Wilfried Brauer (D),* at present a trustee, was elected vice-president for a one-year term. *Mr. Dudley Dolan* ***(IRO*** and *Mr. Geoff Fairall (ZW)* were re-elected trustees for three-year terms. *Mrs. Patricia Glenn (CDN),* the only woman representative in the GA, was elected trustee for a three-year term, and *Mr. Moshe Gottlieb (IL)* was elected for a one-year term.

Moving the Secretariat

As reported previously in the *Newsletter,* the Secretariat will move to Laxenburg, Austria, early in 1995. The *new* premises are reported to be very spacious and attractive. It was announced at the GA that **IFIP's** Contracts Officer, *Mr. Plamen Nedkov (BG),* had been engaged as the Administrative Manager of the Secretariat in Laxenburg, beginning 1 September. New personnel have been hired in Laxenburg, operations will be transferred during December 1994 and January 1995, and the Laxenburg office should be functional by the end of January, at which time the Geneva office will be closed. The final activity of *Mme. Gwyneth Roberts,* Administrative Manager of the Geneva Secretariat, will be to arrange the March 1995 Council meeting in New York. **IFIP's** treasurer, *Mr. Aage Melbye (DK),* was pleased to announce that he had just received confirmation from the Austrian government that the agreement would be signed. This provides **IFIP** with an annual subsidy of more than 40 000 Swiss francs (CHF) and an additional subsidy that will pay for rental of the office space, for at least 15 years, and a grant of more than 70 000 CHF to help with development of telecommunications facilities and office systems. The Austrian Computer Society was thanked for its role in the negotiations.

A related matter is the part-time position of **IFIP** Secretary General, which was authorized by the 1993 GA in Tokyo. This individual is to promote **IFIP** externally, direct the Secretariat and make its operation more efficient, and facilitate the implementation, "on a continuous basis," of decisions made by various **IFIP** bodies. As an interim measure, *Mr. Melbye* has been hired as a management consultant to **IFIP,** initially concentrating on the move of the Secretariat to Laxenburg and the efficiencies to be achieved therefrom. His consulting contact will last until the 1995 GA, when the Executive Board will review the situation.

Finances

Treasurer *Melbye* painted a gloomy picture of the 1994 financial situation of **IFIP,** although 1993 was satisfactory. The worst-case outcome for 1994 may be a loss of nearly 200 000 CHF, compared to a budgeted negative result of 60 000. The loss is due primarily to an unexpected drop in returns from bank-managed investments, disappointingly low proceeds from events, the inability of some Member organizations to fulfill promises to settle their outstanding dues, a failure to acquire anticipated contributions, expenses for moving the Secretariat, expenses for an additional Secretariat staff member, and management consultant costs. On the other hand, the 1994 loss may be only 50 000 CHF if the Organizing Committee for **IFIP** Congress '94 is prompt in paying the 100 000 CHF that is called for in the Congress contract, and if funds from **IFIP's** Technical Committee 10 are transferred to the **IFIP** treasury as expected.

The GA voted to increase the dues for 1995 by 4%. (The dues have not been increased since 1992.) The 1995 budget approved by the GA anticipates a loss of 75 000 CHF, due in part to expenses for the move to Laxenburg and management consultant costs. IFIP's assets are approximately 1 300 000 CHF, so **IFIP** remains financially healthy. Once the move is complete, savings associated with locating the Secretariat in Laxenburg should help **IFIP's** finances.

IFIP "Supporters"

A plan to initiate a new class of member, **"IFIP** Supporter," was recommended by **IFIP's** president, *Prof. Asbjørn Rolstadås (N),* at the March 1994 Council meeting. Called "Institutional Partners" at that time, these members were to be acknowledged by **IFIP in** return for an annual contribution. An entry of 30 000 CHF was placed in the 1994 budget for the anticipated contributions. (No income from contributions is budgeted for 1995.)

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FAREWELL TO ELSEVIER/NORTH-HOLLAND

When the ***IFIP*** *Newsletter* was started, eleven years ago, the North-Holland Publishing Co. (now known as Elsevier/North-Holland), **IFIP's** primary publisher, agreed to print the *Newsletter* at no cost to **IFIP.** This arrangement has served us well all these years. Especially satisfying has been the assistance of *Mrs. Stephanie Smit (NL),* the Elsevier Administrative Editor responsible for **IFIP's** books, who has undertaken to manage the printing process and in so doing greatly simplified the *Newsletter* Editor's work.

Since the publishing contract between **IFIP** and Elsevier ceases at the end of 1994, after a 32-year relationship, the printing agreement for the *Newsletter* ends too. Beginning with the next issue, the *Newsletter* will be printed by **IFIP's** new publisher, Chapman & Hall. We are grateful for the eleven years of Elsevier's service to the *Newsletter* and especially sorry to be ending our collaboration with *Mrs. Smit.*

CHANGES IN IFIP continued from p. 15

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GENERAL ASSEMBLY cont. from page 5

In September, the Marketing Committee decided upon a package of benefits to Supporters, including prominent recognition in the *Information Bulletin,* the ***IFIP*** *Newsletter,* and elsewhere, free copies of **IFIP** books and other publications, discounts on the purchase of **IFIP** books and on advertising in **IFIP** publications, and participation in a proposed "Supporters' Council." No other active role in **IFIP** affairs would be entailed. It was pointed out that affiliation with **IFIP,** an international, apolitical organization with high standards, would be the most important benefit. Debate during the GA concerned the fee(s) to be charged Supporters, and the name of the membership category. "**IFIP** Supporter" seemed to have the fewest drawbacks. The GA urged the Marketing Committee to speedily prepare a package to be sent by the **IFIP** president to the CEOs of potential Supporter organizations.

Membership

The GA voted to admit the Academy of Sciences of Belarus, and the National Academy of Sciences of the Republic of Armenia as full Members. The Brazilian Computer Society (Sociedade Brasileira de Computação) was also admitted as a full Member, representing Brazil. Membership of the previous Member society, SUCCESU/NACIONAL, was terminated in 1993 for failure to pay dues. These new Members will be described in the *Newsletter* once their memberships are formally in effect (the society sends a representative to a GA and pays its annual dues). A representative of the Brazilian Society attended the GA; unfortunately, the other two petitioners were not represented. In addition, the Council of European Professional Informatics Societies (CEPIS) was admitted as an Affiliate Member. CEPIS was described in the September 1991 issue of the *Newsletter* (page 6).

The matter of **IFIP's** role in the International Council of Scientific Unions (ICSU) was discussed at great length. ICSU is "an international non-governmental scientific organization, established in 1931 to promote international co-operation in science for the benefit of humankind." At present, **IFIP** is an International Scientific Associate of ICSU, which is determining whether to admit any organization from the information processing field as a member on an equal footing with its approximately 20 members representing mathematics, physics, chemistry, and other sciences. If ICSU does accept information processing, it will decide what organization best represents the field internationally. **IFIP** officers have engaged in discussions with ICSU officers, and a task force was appointed by President *Rolstadås* to take necessary measures to have **IFIP** represented in ICSU.

NEW ADDRESS INFORMATION FOR SECRETARIAT and TELEPHONE NUMBERS FOR NEWSLETTER EDITOR

Please consult the masthead on page 2 for the new address information for the Secretariat and new telephone numbers for the ***IFIP*** *Newsletter* Editor.

Other Matters

The GA bid farewell to *Prof. Angel Alvarez,* who has represented Spain in the GA for 8 years and served as a trustee for the past 6 years. He announced that he will no longer represent Spain. His invaluable service to **IFIP** and his friendship will be missed. In addition, *Prof. Peter Poole (AUS),* chairman of TC2, and *Prof. William Caeffi (AUS),* chairman of TC11, have completed two terms in office and cannot be reappointed. President *Rolstadås* thanked them for their contributions to **IFIP.** *Prof. Reino Kurki-Suonio (SF)* will assume the TC2 chairmanship on 1 January, and *Prof. Basie von Solms (ZA)* has become acting chairman of TC11 until a permanent chairman is chosen. After the GA, *Maj. Gen. A. Balasubrahmanian* announced his resignation. He has served as the Indian representative to **IFIP** for 11 years and as vice-president since 1990. He too will be missed.

A proposal to make it possible to amend the **IFIP** Statutes and Bylaws more speedily was rejected. The feeling was expressed that it should remain difficult to change the statutes but easier to amend the bylaws.

The pressure of the 4-day schedule was felt in the TA, where several items of the agenda were unable to be considered because of time limitations.

The GA was adjourned with many thanks to the host society (Gesellschaft für Informatik e.V.) for excellent arrangements. The facilities for the meetings and the office support were extraordinary, and the hospitality that was provided stretched the new rules calling for a minimum amount. *Prof. Klaus Brunnstein (D)* was especially thanked for his efforts in organizing the GA and hosting a party for the GA in his home, while he was playing a major role in **IFIP** Congress '94 and satisfying his responsibilities as chairman of TC9.

"ISSUE PROCESS" FEATURED AT IFIP CONGRESS '94

The "Issue Process," a key and pervasive component of **IFIP** Congress '94, (see the article on page **1)** was designed to generate a "Congress Message." Delegates to the Congress received, at registration time, a 75-page Issue Workbook that contained instructions for preparing to engage in the Issue work that lay ahead. Seven Issues were described, considered to be significant problems associated with the linkages between the five technical tracks of the Congress. It was recommended that each delegate select one of the Issues and attend as many of the relevant sessions as possible during the first 21/2 days of the Congress (Monday to Wednesday). This part of the Congress was denoted the "Learning Phase."

The next phase took place Wednesday afternoon and Thursday. Designated the "Assessment Phase," it consisted of technical paper presentations and panel sessions specifically related to the seven Issues, and culminated with seven sessions Thursday afternoon, during which delegates were asked to use what they had absorbed during the Congress to generate Action Agendas for the Issues: recommendations to the computer and communication communities, to industry and governments, and to **IFIP.** The Action Agenda development process did not consist of discussion groups; rather, it was an "egalitarian" process that allowed all participants to contribute their best conclusions and recommendations, to be voted on by their peers. The Action Agendas were presented by the "Issue Champions" (leaders for the Issues) in a plenary session, the "Feedback Phase," that preceded the Friday morning closing session of the Congress. The collection of Action Agendas constitutes the Congress Message.

Approximately 200 delegates (of the 1150 registered for the Congress) participated in the seven Action Agenda sessions, and over 300 attended the Feedback Phase session.

The Issue Process was adapted and implemented by *Dr. Karen Duncan (USA),* a member of the Congress International Program Committee and a long-time worker for **IFIP.** She and the Issue Champions worked industriously before, during, and after the Congress.

Congress Message

Following is the Congress Message, integrated and edited by *Dr. Duncan.* (In this section, **boldface type** is used to designate problems, and *italic type* to designate solutions.)

Issue 1: What to Build and What Controls Whom?

Issue Champions: *Roger Clarke (AUS), Gerald Maguire (S),* Facilitator: *John Karat (USA)*

One price of success in rapidly spreading computer applications and communications technology is that technology use will have broad (and sometimes unexpected) impacts on the lives of all of us. Concerns range from the appropriateness of interaction of single individuals with specific applications to the interplay of technology with whole societies. Further, societies increasingly face questions as to when it is appropriate to give to technology the authority to make decisions and take action on their behalf. A general concern is that among the various parties impacted by new systems (governments, employers, users, technology), we do not have an understanding who "controls" or ought to control the development process.

Participants identified these key problems:

- **The impact of technology in non-office settings is not generally known.**
- **Application design is done with little knowledge of essential human characteristics, such as human communication processes, or social and psychological needs.**
- **The benefits and safety of technology are being oversold to ordinary people.**

Specific recommended actions focus on

- the **need for a vision,** which should be developed by professional societies, concerning *"control" of the technology development expected in a 5-10—year time frame, including consideration of the impacts on people*
- the **need for multidisciplinary technology design,** in that *researchers must develop concepts of human activity that are useful in design, designers must involve consideration of human communication and empowerment from the earliest stages of design,* and *professional groups like IFIP should encourage the systematic study of how technology impacts people*
- the **need for expanded education about application development,** in that *professional societies should develop model curricula that articulate a multidisciplinary view including "human issues" as a major component,* and then should *foster system development training for people in non-computer disciplines*

Other specific recommendations are that **IFIP** recognize formally **the critical need for a priori consideration of impact in technology-design projects.** Two ways **IFIP** could do this are to *form a Working Group for multidisciplinary studies of publicly available services* such as Internet, and to *support projects that show how technology impacts the daily lives of people in all parts of society*.

(There was no Issue 2.)

Issue 3: When Virtual Reality Becomes Real...

Issue Champion: *Bernd Neumann (D)*

Virtual Reality (VR) is the use of real-time interactive graphics and 3D models to allow user immersion and manipulation in a model world. VR has far-reaching applications potential in areas as diverse as education, telemedicine, and entertainment. Since VR development is still **in** its infancy, the technologies that will come out of VR research, the impact of VR capabilities, and the task of achieving maximum benefits are all critical issues.

Regarding basic VR technology, **serious open problems remain in the areas of software and hardware support for 3D image generation, and user interaction.** In applications arenas, **significant psychological, social, and ethical effects of VR are probable but unknown.**

VR is most likely to achieve its potential if systematic efforts are made to develop the field as a science in its own right. Participants recommended that

- *VR experts should develop and publish a comprehensive definition of VR and its potential*
- *The scientific research community should formulate and publish an agenda for empirical VR research.*
- *Funding agencies should place high priority on VR technology development, psychological and social studies of impact, and comparative studies in the history of technology*.
- *Funding agencies should consider funding not only for industrial but also for socially beneficial applications* such as those relating to the environment, helping the handicapped, and the arts.

Participants specifically recommended that *IFIP establish a Task Force to study and report on the ethical and legal aspects of VR.*

continued on page 8

CONGRESS ISSUES continued from p. 7

Issue 4: Utopia? or Chaos? How Should We Control Technology Development?

Issue Champion: *Jacques Berleur (B)*

Technology development is leading us toward chaos. Market forces are creating an indiscriminate technology push that has little real counterbalance from users and usees. The explosion of information that is too often meaningless has numbed our senses and our reason. But controlled technology development and information flow could lead us to a Utopia of sustainable development for citizens and workers.

Barriers to achieving that Utopia exist in several arenas. Economic barriers include **structural unemployment, social polarization between the information rich and poor,** and **technology diffusion in developing countries that does not effectively assist economic development.**

Social/societal barriers to achieving an information-based Utopia include **deskilling of jobs, loss of privacy, lack of relevance to the needs of societies,** and **the largely unknown effects of technology and information on social behavior.**

Cultural barriers to achieving a Utopia include **the impoverishment of cultural diversity** and **the unknown effects of technology and information on ethics and human relationships.**

Participants recommended these actions:

- *The public and private sectors should fund research and technology assessment relating to impacts, with feedback to system designers.*
- *System designers should improve their own systems analysis skills and increase participation of users, the public, and cultural minorities in the design of socially significant systems.*
- *Legislatures and professional groups should work together to establish "information rights" in such areas as access, copyright, and "property rights" to one's own personal information.*
- *The public and private sectors should create public information networks accessible by all.*
- *Industries need to change work patterns and distribution in place and time,* and *they need to undertake intensive vocational training and retraining of the work force.*
- *The scientific community should research and develop new economic models that incorporate information and technology.*
- *Educators need to invest in reducing polarization due to information and technology,* and *they need to teach people to be responsible users of information technology, through an awareness of human values and relations.*
- *IFIP's Member societies should make the public aware of impacts at all levels and assist disadvantaged people to gain access to information technology.*
- *IFIP should facilitate improved regional cooperation on projects and should work with local users to identify needs, so that developing countries can be partners in the Utopia.*
- *IFIP should create an Ethics Advisory Board.*

Issue 5: How Much Is Safety Worth?

Issue Champion: *Jean-Claude Laprie (F)*

Increasing numbers of safety-critical computerized systems (SCCS) are currently being deployed in areas such as transportation, nuclear power production, and medicine. Software has been identified statistically as the bottleneck in our ability to make these applications dependable, and software reliability at a level commensurate with specific safety requirements is currently out of reach. As a consequence, development of safety-critical software is labor-intensive and very costly. At the same time, nationwide failures of large computing and communication systems, which cannot be built at such a high cost, can have indirect safety-related consequences.

Participants identified the following key factors in advancing SCCS development and use, in terms of the following needs. The first four actions relate to research, and the remaining five to education and public policy.

- **a taxonomy and quantification of SCCS with respect to factors such as complexity, risks, and costs**
- **adequate methods for design, development, and assessment of** classes **of SCCS**
- **knowledge of what can be achieved and assessed in terms of limits of dependability**
- **system-based methods for dealing with composability of properties exhibited by a system's constituents**
- **appropriate curricula and training for SCCS users**
- **criteria for qualification of people who produce SCCS**
- **unified certification of SCCS across countries, disciplines, and application domains**
- **public awareness of the limits of** system **safety engineering**
- **public disclosure of safety evaluations**

Participants recommended that *IFIP establish an inter—Working-Group Task Force to elaborate on the identified key factors. The Task Force should then report to the IFIP Member societies, which in turn would be responsible for informing their governments, industry, professional associations, and the general public.*

Issue 6: Should We Invest in Intellectual Elegance or Computer Power?

Issue Champion: *Otthein Herzog (D)*

How do we decide whether to invest in fundamental research or in technology development? Are there known, but untapped, areas of research with high potential value in technology development? How are developers made aware of new discoveries in theoretical foundations? Are researchers and developers communicating?

Key problems were defined in the process of managing technology transfer from researchers to developers:

- **Researchers and developers interpret common R&D agendas differently.**
- **Differences in their working modes (e.g., risk tolerance, competition) need to be reconciled.**
- **Researchers need to observe firsthand the phenomena and problems of industrial information handling.**
- **Developers need to learn about progress in information technology,** such as **parallel computing.**

Additional key problems were identified in working with information technology methods and tools:

- **Methods are needed for the management of continual change in specifications and design.**
- **Software-development processes need further refinement** in such areas as formal and semi-formal methods, development in-the-large (of large software systems), and integration of general programming with domain-specific techniques/frameworks.
- **Current measures of software quality are inadequate.**

Participants made these recommendations for the management of technology transfer:

- *IFIP should organize multidisciplinary seminars on the transfer process for researchers and practitioners in industry and at universities.*
- *IFIP should help to initiate programs for personnel exchange between academia and industry over a significant period.*
- *IFIP, its national societies, and chambers of commerce should establish forums that would identify and recommend research projects and applied projects that would meet real needs.*

- *Industry federations should motivate developers to experiment with innovative alternatives.*
- ***IFIP,*** *its national societies, and/or trade groups such as the European Community should sponsor the review of a large number of commercial projects, to identify and solve common problems.*
- ***IFIP*** *should develop mechanisms to create decision-maker awareness of outstanding research results.*

Recommendations to improve information technology methods and tools are the following:

- ***IFIP*** *should organize a conference on innovation in describing system requirements and designs,* with emphasis on allowing for continual change.
- ***IFIP*** *should facilitate programs of industry support for research on real-world complexities.*
- ***IFIP*** *should initiate activities that would lead to rigid measures of software quality and compliance with respect to function, user interfaces, marketing, and execution performance.*
- *Trade groups such as the European Community should find ways to increase mutual scientific cooperation.*

(There was no Issue 7.)

Issue 8: Is Application Development Focused on Real Problems?

Issue Champion: *Roland Traunmüller* ***(A),*** Reporter: *Sandra Slaughter (USA)*

Information technology applications are extensive for offices and administration, but are the applications appropriate? Have we created and sold systems for the wrong problems? What are the real problems in these and other more complex environments such as education and health care? How should we refocus application development on these real problems?

Critical problem areas follow, along with participants' recommendations, which are directed primarily to application developers.

- **A poor understanding of the application domain, which can often be attributed in part to an intrinsically complex domain,** can be helped specifically by *multidisciplinary team selection, matching solutions to business strategy and critical success factors, rather than to processes,* and *the use of techniques such as prototyping.*
- **Applications that continue to evolve during development** require *information technology solutions that can also evolve. Researchers need to develop methods that support the design of evolvable information systems.*
- **Information systems lead to social change; at the same time they are unresponsive to social change.** *Tools and processes for identifying and managing the social aspects of change should be part of the requirements analysis and design.*
- **Application developers lack domain-process knowledge, team experience, and socio-political tools, methods, and skills. Too narrow a focus on an application can cause infrastructural needs and opportunities for integration to be overlooked.** ***IFIP*** *should facilitate specification of training needs and the allocation of responsibility for training and skill up-grading among universities, vendors, employers, and individuals.*

Issue 9: Is Technology Transfer the Answer?

Issue Champion: *Subhash Bhatnagar* ***(IND),*** Facilitator: *Prem Gupta (IND)*

Technology transfer to developing countries can mean providing hardware and software for specific purposes, creating a manufacturing/development capability, and/or initiating a dynamic process that encompasses problem solving and technology/society integration. What are the factors that contribute to successful adoption of information technology, and its diffusion throughout a national culture?

These key factors in technology transfer were identified:

- **a strategic vision of appropriate applications, systems, and technologies**
- **a defined government role in coordination and investment**
- **awareness of the value of information technology**
- **ability to connect to information resources and services such as the Internet**
- **availability of information-technology—related education and training.**

Participants recommended these actions:

- *Each government and its consultants should develop a policy framework for information technology and include it in their respective national policies and plans; such plans should be communicated to the people.*
- *Governments and consultants should establish mechanisms whereby appropriate systems can be developed that focus on national needs, developments, and quality of life.*
- *Aid agencies should continue support for technology transfer, and must also focus on utilization of aid.*
- *Local and international voluntary agencies and professional societies need to help establish gateways to the Internet, regional nodes, and national networks.*
- ***IFIP*** *Technical Committees should use networks as a tool for education, knowledge dissemination, and information sharing.*
- *Developers and vendors should use technology tools such as multimedia and distance learning to teach trainers; training materials must be prepared in the language of the target country.*
- *Developers and vendors should sponsor real-life information technology demonstrations, case studies, seminars, and workshops in target countries.*
- *Developing countries should promote technical cooperation with each other to support the deployment of information technology, by making available public domain software, databases, catalogues, contents, and abstracts, and low-cost technical books.* ***The IFIP*** *Working Group on Social Implications of Computers in Developing Countries (WG9.4) should facilitate this cooperation.*

The Next Step

In November, **IFIP** and Congress officials discussed possible future actions, in an "audioconference" with the Issue Champions. The group decided how **IFIP** might encourage, facilitate, and coordinate a response to the Congress Message. Since the audioconference was held after this issue of the ***IFIP*** *Newsletter* went to press, the outcome will be reported in a future issue.

In the coming months, Issue Champions, Congress delegates, and others who are interested are encouraged to develop proposals and activities based on the Congress Message. Proposals are especially encouraged among **IFIP** groups. They may be offered to, and carried out by, any appropriate body such as educational institutions, corporations, professional societies, or governments.

ZEMANEK HONORED

Elected to Russian Academy of Science

In March 1994, the Russian Academy of Science elected as a Foreign Member *Prof. Heinz Zemanek (A),* an Honorary Member and past president of **IFIP.** Nominating *Prof. Zemanek* was one of the last activities of the late *Acad. Anatol Dorodnicyn (RUS),* a founding father of **IFIP.**

IFIP CONGRESSES PAST AND FUTURE

We Strive for Excellence

The September 1994 **IFIP** General Assembly (GA) and Technical Assembly (TA), meeting in Hamburg, Germany, struggled to analyze the just-completed Congress '94 (see the article on page 1), to plan Congress '96, and to decide whether **IFIP** should continue to hold Congresses, whether there should be a Congress in 2000, and whether the biennial Congress cycle should be retained.

Congress '94

Surprisingly, there was little discussion of the Congress '94 program in the TA and GA. The main deliberation concerned the attendance and the prospects for future Congresses. The attendance figures were disappointing: approximately 1150 delegates attended, but only half of them paid the full registration fee for the Congress. Of course, the registration fee was rather high — in the neighborhood of 800 Swiss francs (CHF). On the other hand, close to 270 students attended, which was viewed as very encouraging and an affirmation that the Congress program had substantial scientific content. It was also noted that attendance is not the most important measure of the success of a Congress, and all who attended agreed that the technical program was excellent.

A huge subsidy from various German governmental bodies, approximately ¾ million CHF, was all that prevented this from being a financial disaster for the host society, Gesellschaft far Informatik e.V. Despite the problems, GI subsidized participants from Eastern Europe and Third World countries.

Congress '96

Much discussion was devoted to plans for the program of the next Congress, to be held in Canberra, Australia, in September 1996. The chairman of the International Program Committee (IPC), *Dr. Prem Gupta (IND),* and the co-chairman, *Dr. Egon Hörbst (A),* presented details that were worked out before and during the GA. The key aspects are as follows:

- The Congress will consist of three simultaneous conferences, each with a narrow theme, designed for specialists, and at most three tracks.
- Opening and closing ceremonies, panel discussions, tutorials, special sessions, and social events will be common to all three conferences.
- Congress delegates will be allowed to attend sessions of all of the individual conferences.
- A single registration fee will be charged.
- Each individual conference is expected to have at least 300 participants.
- Each of the component conferences will have its own IPC, publicity, and proceedings; there will also be an overall Congress IPC.
- At least 50% of the papers will be invited.
- The Congress will last four days.

The titles of the three conferences and of their individual tracks are

Education
chair: Mrs. Sandra Wills (AUS)
Mobile Communication
chair: Prof. José Encamaçâo (D)
  Mobile Visualization
  Smart Cards
  Trusting in Technology
Application of Advanced Tools
chair: Dr. Nobuyoshi Terashima (J)
  In the Public Sector
  Innovative Applications
  Intelligent Systems

Prof. Robert Meersman (NL) will be chair of the tutorials program.

The Calls for Papers will be available in March 1995; to receive copies, or for other information, please contact

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Congress '98

Congress '98 will be held in Vienna, Austria, and Budapest, Hungary. Its technical program, which will last three days, will be similar to that of Congress '96 — an umbrella for several parallel specialist conferences. *Dr. Walter Grafendorfer (A),* an **IFIP** trustee, and *Mrs. Maria Toth (H)* have been named co-chairmen of the Organizing Committee (OC).

Congress 2000

A debate in the GA concerned whether **IFIP** should retain the biennial cycle for Congresses that it recently adopted (the Congresses through 1992 were held triennially). Some GA members argued that every two years is too frequent and imposes a heavy burden on those people involved in program organization (e.g., Technical Committee chairmen). Furthermore, the biennial cycle creates interference with **IFIP's** sister Federations and other groups. (An Affiliate Member of **IFIP,** International Council for Computer Communication, has adjusted its Congresses in order not to interfere with **IFIP's** Congresses.) Some discussants even advocated a 4-year cycle.

Prof. Angel Alvarez (E) reported the following for the Congress Committee:

> On the point of whether to continue with World Computer Congresses (WCCs) or not, there is a consensus within the Committee that WCCs should continue. And this is so in spite of the poor economic turnout of recent Congresses. It is clear that WCCs will not attract in the future the large volumes of delegates they once did, for the field of Computer Science and Technology has widened so tremendously that general-spectrum congresses like WCCs are now of less interest to computer professionals. However, WCCs still provide a forum for the **IFIP** community at large to meet. In addition, even though their interest has lowered in the industrialized world, general-spectrum congresses still serve a useful function in other geographical areas that are less developed. And we should remember the global nature of **IFIP,** with its special interest in developing countries.

A handful of the GA members recommended that **IFIP** discontinue holding Congresses. Their arguments were

- Large, broad Congresses are "dinosaurs."
- An inordinate amount of volunteer effort is spent by the members of the IPCs and OCs, by committees of **IFIP** Member societies who support the Congresses, even in other countries, and by GA members, who spend a significant amount of time at GA and Council meetings discussing plans for the Congresses. This effort is too large when one considers the number of delegates to the last four Congresses.
- Tremendous financial support is provided to the Congresses by host country governments, industry, and **IFIP** Member societies. This expense is too great for the benefits gained.

Nevertheless, the GA agreed, nearly unanimously, that IFIP should continue to hold Congresses.

Although no firm decision was reached whether to retain the biennial cycle, the GA voted, by a large majority, to hold a Congress in 2000. In September 1995, the GA will select the site. Bids from inter-

ested **IFIP** Member societies should be submitted to the **IFIP** Secretariat by 28 February 1995.

Other Discussion

Other discussion concerning **IFIP** Congresses included the following viewpoints:

- Management of Congresses should be left to a permanent group within **IFIP,** perhaps the Congress Committee, and the GA and Council should not engage in endless debate over Congress programs and organization. (The job charter of the Congress Committee is currently being modified.) There should be continuity of program philosophy from Congress to Congress, in order to build a reputation for excellence. This is difficult to achieve if each IPC is independent of its predecessors.
- An alternative to a Congress with a broad scope is one with a narrow scope and notable speakers. Industry seems to be willing to pay large fees for employees to attend the latter type of conference. On the other hand, some expressed the opinion that Congresses for technical specialists are no longer viable; there is too much competition.
- If **IFIP** Technical Committees work to organize major components of the Congresses, should some of the proceeds go into their funds?
- Congresses should be devoted to the latest developments. Programs should be settled rather late, in order to permit inclusion of new, "hot" topics.
- **IFIP** must decide what it wants of its Congresses, establish goals, and conduct market research concerning the Congresses. ■

WE WANT YOUR SUGGESTIONS

It has been suggested that the ***IFIP*** *Newsletter* looks old-fashioned and should be redesigned. We appeal to you, our readers, to recommend how the appearance of the *Newsletter* might be changed. Please send your ideas to the Editor, whose address is given in the masthead on page 2. You need not restrict yourselves to the physical design — we shall welcome your thoughts about the contents as well. It would be good to hear from as many of you as possible. ▬

CONGRESS '94 continued from page 3

Informatics and Environment, and Perspectives of Informatics. It was very well attended, not only by students.

Closing Session

Congress Chair *Brauer* opened the closing session with a quotation from Goethe: "Science is only a handle and a lever by which the real world shall be grasped and moved." He then introduced three speakers, who discussed the "infobahn" and the "information society." *Mr. Hans Geyer (D)* asserted that "the mainframe is dead." He also said that more PCs were shipped than automobiles in 1993. Before the end of the century, he predicted, more PCs will be shipped than television sets. *Mr. Jerry Held (USA)* predicted that the information superhighway will change society in a fundamental way. On the other hand, he said that in the home, the PC has been the greatest investment with the least return. The average individual, he said, doesn't like computers. Despite current thought, he predicted that home shopping will result in more business than for-fee movies. *Mr. Bill Lee (USA)* also predicted that business, rather than individual users, will drive the evolution of the infobahn. Despite some commercialism in one or two of the talks, inappropriate to **IFIP** Congresses, the delegates found the views of these industry spokesmen very interesting.

American gospel songs provided *an* entertaining interlude during the closing session. They were sung by South African singer *Audrey Montang,* who referred to us as "computer freaks," but got us to stand and clap, with feeling, in time with the music.

Prof. Ashley Goldsworthy (AUS), chairman of the Organizing Committee for **IFIP** Congress '96, invited all delegates to Australia in September 1996 (see the article on page 10).

Finally, President *Rolstadås* closed the Congress. He talked of the thousands of hours invested by dozens of volunteers. He noted the tremendous contributions of the University of Hamburg, in facilities, personnel, and other areas. He thanked *Prof. Brauer, Prof. Karl Kaiser (D),* chairman of the Organizing Committee, who was indefatigable and who had enlisted his entire family to work for the Congress, *Dr. Ronald Uhlig (USA),* chairman of the International Program Committee, who had planned the very innovative program, *Dr. Karen Duncan (USA),* who organized the Issues program, *Prof. Klaus Brunnstein* ***(D),*** who had organized several components of the program, and *Dr. Hermann Rampacher (D),* general manager of GI, for their roles in the success of the 13th World Computer Congress.

The Congress was especially notable for its excellent organization — from the welcome booth prominently located at the Hamburg airport to the large number of efficient and smiling students behind the registration desks.

Attendance

The final attendance figures show that approximately 1150 delegates from 65 nations participated. Countries sending the greatest number were

Germany	608
U.S.A.	87
Japan	62
France	25
U.K.	25

The Congress proceedings, edited by *Prof. Bjorn Pehrson (S), Prof. Dr. Imre Simon (BR), Prof. Brunnstein, Dr. Eckart Raubold (D), Dr. Duncan,* and *Mr. Karl Krueger* (World Bank) and published by Elsevier/North-Holland in three volumes, are now available.

The preceding has been an uneven overview of the Congress. We have not mentioned the social events, tutorial program, or technical visits. We hope, nevertheless, that this article has conveyed the flavor of a varied and interesting Congress. ▬

OUTSTANDING SERVICE AWARDS

Outstanding Service Awards, for services rendered to **IFIP** by Technical Committee (TC) and Working Group (WG) members, were recently made to the following TC3 workers:

Prof. Gordon Davies (GB)
Mr. Dennis Harkins (USA)
Prof. Raymond Morel (CH)

The Awards were granted by the September 1994 General Assembly (GA), on recommendation of the TC3 chairman, after approval by the Internal Awards Committee. Eligible for nomination are TC and WG members not normally eligible for the Silver Core Award.

The Silver Core Awards are made triennially; the next Awards will be made by the 1995 GA. ▬

PROFESSOR RICHARD A. BUCKINGHAM

We regret to report the death, in August, of *Professor Richard A. Buckingham (GB),* an early chairman of TC3. An obituary will appear in a future issue of the ***IFIP*** *Newsletter.*

GREETINGS

At this time of holidays and the new year, we send greetings to all our **IFIP** friends and wish all of you joyful holidays and a year of health, happiness, and peace.

National Abbreviations Used in Newsletter

A	Austria	F	France	PL	Poland
AUS	Australia	GB	United Kingdom	PRC	China
B	Belgium		Hungary	ROK	Republic of Korea
BG	Bulgaria		Italy	RUS	Russia
BR	Brazil	IL	Israel	S	Sweden
CDN	Canada	IND	India	SF	Finland
CH	Switzerland	IQ	Iraq	SK	Slovakia
CZ	The Czech Republic	IRL	Ireland	USA	U.S.A.
D	Germany	J	Japan	ZA	South Africa
DK	Denmark	N	Norway	ZW	Zimbabwe
E	Spain	NL	The Netherlands		

FUTURE IFIP MEETINGS

GENERAL ASSEMBLY AND COUNCIL (and related meetings)

Council	5-9 Mar 95 (Sun.-Thurs.)	New York, NY, U.S.A.
GA	6-10 Sep 95 (Wed.-Sun.)	Calgary, Canada
Council	3-7 Mar 96 (Sun.-Thurs.)	South Africa
GA	(contiguous to **IFIP** Congress '96)	Canberra, Australia
GA	(contiguous to **IFIP** Congress '98)	Vienna, Austria, or Budapest, Hungary

TECHNICAL COMMITTEE AND WORKING GROUP MEETINGS

WG2.1	9-13 Jan 95	Hong Kong
	23-27 Sep 95	Ulm, Germany
WG2.2	13-17 Jun 95	Amsterdam, The Netherlands
WG2.3	24–28 Jul 95	Ithaca, NY, U.S.A.
WG2.4	6-10 Jun 95	near Pittsburgh, **PA,** U.S.A.
	Apr 96	The Netherlands
	97	North erica
WG2.6	9-11 Jan 95	Karlsruhe, Germany
WG2.8	16–20 Jan 95	Singapore
WG2.9	23-25 Mar 95	Hampshire, U.K.
TC3	14 Jan 95	Geneva, Switzerland
	29-30 Jul 95 (with WCCE'95)	Birmingham, U.K.
	Aug-Sep 96	Australia (Canberra?)
WG3.6	26 Jul 95 (during WCCE'95)	Birmingham, U.K.
TC5	15 May 95	Beijing, China
WG5.11	18-19 Apr 95 (with WG5.7 conf.)	Galway, Ireland
	Nov-Dec 95 (with IFIP/IFAC conf.)	Queensland, Australia
	95	U.S.A. ?
TC6	30 Mar-1 Apr 95 (after TELKOM conf.)	Johannesburg, South Africa
	Sep–Oct 95	Cambridge, U.K., or Palma, Spain
	96	Montreal, Canada
TC7	17 Dec 94	Prague, The Czech Republic
TC8	24–25 Aug 95	Trondheim, Norway
	12-13 Apr 96	Tucson, AZ, U.S.A.
WG8.2	17 Dec 94 (following ICIS'94 conf.)	Vancouver, B.C., Canada
	7-9 Dec 95	Cambridge, U.K.
	Dec 96	Cleveland, **OH,** U.S.A.
WG8.3	end Jan 95 (with conf., joint mtg.)	Delft, The Netherlands
WG8.5	end Jan 95 (with conf., joint mtg.)	Delft, The Netherlands
TC9	19-20 Aug 95	Copenhagen, Denmark
WG9.2	14–16 Jan 95	Namur, Belgium
	Sep 96 (with *IFIP* Congress '96)	Canberra, Australia
WG9.6	10–12 Mar 95	France
TC10	14–15 Mar 95	Munich, Germany
WG10.2	95 (with conf.)	U.S.A.
WG10.4	Jan or Feb 95	Melbourne, Australia
	Jun 95	California, U.S.A.
WG10.5	Apr 95	Japan
TC12	95	Wroclaw, Poland
TC13	25 Jun 95 (during INTERACT'95)	Lillehammer, Norway
SG14	Apr 95 (with Latin 95?)	Sao Paulo, Chile
SG15	7-10 Feb 95 (with Fractal'95 conf.)	Marseilles, France

This information is furnished to the *Newsletter* by the Secretariat. Will TC and WG chairmen kindly keep the Secretariat advised of the dates and locations of their future administrative meetings and also send a copy of the minutes to the Secretariat. Some meetings are scheduled in conjunction with Working Conferences, for which the conference dates are listed.

CALLS FOR PAPERS

Third IFIP WG5.4 Intl. Conf. on **Achieving Quality in Software — AQuIS'96**
24-26 Jan 96, Florence, Italy
abstracts due: 2 Jan 95
contact: Rosella Cortesi - CESVIT
Palazzina Lorenese, Viale Strozzi 1
50129, Firenze, Italy
tel: +39 55 485333, fax: +39 55 485345
e-mail: aquis96@aguirre.ing.unifi.it

Intl. Conf. on **Intellectual Property Rights for Specialized Information, Knowledge, and New Technologies — KnowRight'95**
21-25 Aug 95, Vienna, Austria
papers due: 13 Jan 95
contact: W. Grafendorfer
Austrian Computer Society
Wollzeile 1-3,
A-1010 Vienna, Austria
tel: +43/1/512 02 35, +43/1/512 02 35-9
e-mail: ocg@vm.univie.ac.at

IFIP WG8.1 Work. Conf. on **Information System Development for Decentralized Organizations**
21-23 Aug 95, Trondheim, Norway
papers due: 10 Feb 95
contact: John Krogstie,
IDT, NTH, University of Trondheim
N-7034 Trondheim, Norway
tel: +47 73 593671, fax: +47 73 594466
e-mail: joh og@idt.unit.no

Asia and South Pacific Design Automation Conference (ASP-DAC'95) and **IFIP** WG10.2/10.5 Intl. Conf. on **Computer Hardware Description Languages and Their Applications (C L'95)** and eighth **IFIP** WG10.5 Intl. Conf. on **Very Large Scale Integration (VLSI'95)**
29 Aug - 1 Sep 95, Chiba, Japan
papers due: 24 Feb 95
contact: Noriko Uehara
ASP-DAC'95/CHDL'95/VLSI'95 Secretariat
Business Center for Academic Societies Japan
2-4-16 Yayoi, Bunkyo-ku
Tokyo, 113 Japan
tel. and fax: +81-3-3817-5860
or
tel: +81-3-5814-5800, fax: +81-3-5814-5823

Fifth *IFIP* Work. Conf. on **Dependable Computing for Critical Applications — DCCA-5**
27-29 Sep 95, Urbana-Champaign, IL, U.S.A.
papers due: 17 Mar 95
contact: Dr. Michele Morganti
ITALTEL - Central Research Labs
Via Reiss Romoli
1-20019 SETTIMO MILANESE (MI), ITALY
tel: +(39) 2-4388-7353, fax: +(39) 2-4388-7962
e-mail: morganti@settimo.italtel.it

TECHNICAL COMMITTEE and SPECIALIST GROUP CHAIRMEN

TC2:	R. Kurki-Suonio (effective 1 January 1995)	SF	95-98
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TC6:	0. Spaniol	D	92-95
TC7:	P. Thoft-Christensen	DK	89-95
TC8:	G.B. Davis	USA	89-95
TC9:	K. Brunnstein	D	89-95
TC10:	E. Hörbst	A	93-96
TC11:	S.H. von Solms (acting)	ZA	94-95
TC12:	R.A. Meersman	NL	89-95
TC13:	B. Shackel	GB	89-95
SG14:	J. Gruska	SK	89-95
SG15:	M. Novak	GB	93-96

NEW IFIP PUBLICATIONS FROM NORTH-HOLLAND

Women, Work and Computerization: Breaking Old Boundaries - Building New Forms

Proceedings of the IFIP TC9/WG9.1 Fifth International Conference, Manchester, UK, 2-5 July 1994

Edited by **A. Adam, J. Emms, E. Green** and **J. Owen**

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High Performance Networking, V

Proceedings of the IFIP TC6/WG6.4 5th Conference, Grenoble, France, 27 June - 1 July 1994

Edited by **S. Fdida**

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Formal Design Methods for CAD

Proceedings of the IFIP TC5/WG5.2 Workshop, Tallinn, Estonia, 16-19 June 1994

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Business Process Re-Engineering: Information Systems Opportunities and Challenges

Proceedings of the IFIP TC8 Open Conference, Queensland Gold Coast, Australia, 8-11 May 1994

Edited by **B.C. Glasson, I.T. Hawryszkiewycz, B.A. Underwood** and **R.A.** Weber

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Proceedings of the IFIP WG6.5 International Working Conference, Barcelona, Spain, 1-3 June 1994

Edited by **M. Medina** and **N. Borenstein**

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Programming Concepts, Methods and Calculi

Proceedings of the IFIP WG2.1/WG2.2/WG2.3 Working Conference, San Miniato, Italy, 6-10 June 1994

Edited by **E.-R. Olderog**

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Information Processing 94

Proceedings of the 13th World Computer Congress - IFIP Congress '94, Hamburg, Germany, 28 August-2 September 1994

Edited by **B. Pehrson, I. Simon, K. Brunnstein, E. Raubold, K. Duncan** and **K. Krueger**

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Broadband Communications, II

Proceedings of the IFIP TC6 Second International Conference, Paris, France, 2-4 March 1994

Edited by **S. Tohmé** and **A. Casaca**

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Methods and Associated Tools for the Information Systems Life Cycle

Proceedings of the IFIP WG8.1 Working Conference, Maastricht, The Netherlands, 26-28 September 1994

Edited by **A.A. Verrijn-Stuart** and **T.W. 011e**

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Proceedings of the IFIP WG3.5 International Working Conference, Rosemont College, Philadelphia, PA, USA, 26 June - 1 July 1994

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DECEMBER 1994

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GA rep. of Nigeria: Mr. T. Njoku
(succeeding Mr. T. Odegbami)
do Computer Assoc. of Nigeria

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WG3.5 vice-chairman: Mr. A. Knierzinger
Paedagogische Akademie
Salesian weg 3
A-4020 LINZ, Austria

WG10.3 vice-chairmen:
Prof. J.-L. Gaudiot
Dept. of Electrical Engineering
University of Southern California
Salvatori Computer Science Center
Los Angeles, CA 90089-0781, U.S.A.

and

Dr. N.P. Topham
Dept. of Computer Science
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EDINBURGH EH9 3JZ, U.K.

WG10.6 chairman: Mr. M. Verleysen
(succeeding Prof. J. Herault)
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TC11 acting chairman: Prof. S.H. von Solms
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WG12.4 vice-chairman: Dr. M. Palmer (USA)
(succeeding Mr. J. Sowa)

WG13.3 vice-chairmen:
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e-mail: c.a.nicolle@lut.ac.uk

COMMITTEE CHAIRMEN and OFFICER:

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(succeeding Prof. A. Alvarez)

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Nominations for Trustees: Mr. D. Dolan (IRL)
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Unesco Liaison Officer: Mr. Plamen Nedkov (BG)
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J. Stoer **(D)** (succeeding J. Zowe)

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A. DeSantis **(I)**

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WG7.3:
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A. Greenberg (USA) N.M. van Dijk (NL)
P.G. Harrison (GB) M.K. Vernon (USA)
G. Latouche (B) W. Whitt (USA)
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WG7.6: G. Guardabassi (I)

TC8:
G. Kalyanasundaram (IND) (succeeding S.Ch. Pani)

WG8.1:
W. Hesse (D) H. Oei (NL)

WG8.6: A new membership list will be printed in the next ***IFIP** Information Bulletin.*

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N. Fristacky (SK)

WG10.3
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A. Bode (D) E. Maehle (D)
H. Burkhart (CH) N.N. Mirenkov (RUS)
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F. Blayo (F) D.T. Southwell (GB)
J. Cabestany (E) E. Valderrama (E)

TC11: W.H. Ware (USA)

WG11.3:
V. Atluri (USA) N.B. Idris (GB)
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W.R. Herndon (USA) D. Thomsen (USA)

WG11.7 and WG11.9: disbanded

Scientific Advisor Group of TC12: disbanded

WG13.3:
E. Ballabio (B) (observer) K. Nordby (N)
C. Buhler (D) C. Thoren (S)
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SG14.4: The membership list will be printed in the next ***IFIP** Information Bulletin.*

SG15:
A. Coniglio (I) N. Frankel (AUS)
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ADDRESS and OTHER CHANGES

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GA rep. of the U.K.: Dr. R.G. Johnson
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School of Mgt. Inf. System
Deakin Univ. (remainder of address unchanged)

WG **5.11 chairman:** Prof. G. Guariso
e-mail: GUARISO@IPMEL2.ELET.POLIMI.IT

WG7.1 chairman: Prof. Dr. A.V. Balakrishnan
tel: +1 310 825 2180/8254, fax: +I 310 206 8495

* furnished to the *Newsletter* by the Secretariat

continued on page 6

CALENDAR OF EVENTS

Event	Date	Location	Sponsored by
First Conf. on *Software Quality and Productivity: Theory, Practice, Education and Training — ICSQP'94*	*5-7* Dec 94	Hong Kong	**IFIP** TC3 SQI HKCS
Fourth Intl. Conf. on *Local and Metropolitan Communication Systems: IAN & MAN — LAN&MAN'94*	7-9 Dec 94	Kyoto, Japan	**IFIP WG6.4**
Fifteenth Intl. Conf. on *Information Systems — ICIS '94*	15-17 Dec 94	Vancouver, B.C., Canada	**ICIS IFIP TC8**
Intl. Conf. *NETWORKS'94*	30 Dec 94-2 Jan 95	Madras, India	**IFIP TC6**
Work. Conf. on *Information Technology and Socio-Economic Development: Challenges, Opportunities, and Actions*	9-11 Jan 95	Cairo, Egypt	**IFIP** WG9.4 et al.
Third Intl. Work. Conf. on *Fractals — FRACTAL 95*	7-10 Feb 95	Marseilles, France	**IFIP** SG15
Third Intl. Conf. on *Open Distributed Processing — ICODP'95*	21-24 Feb 95	Brisbane, Australia	**IFIP** TC6 DSCT
Third Intl. Conf. *TELKOM/AFRICOM '95*	27-29 Mar 95	Johannesburg, S. Africa	**IFIP** TC6 CSSA
Third Work. Conf. on *Information System Concepts — Towards a Consolidation of Views — ISCO-3*	28-30 Mar 95	Marburg, Germany	**IFIP** WG8.1 GI-FG 2.5.1 **(EMISA)**
Third Work. Conf. on *Visual Database Systems — VDB.3*	29-31 Mar 95	Lausanne, Switzerland	**IFIP** WG2.6
Second Intl. Symp. on *Latin-American Theoretical Informatics — LATIN'95*	3-7 Apr 95	Valpraiso/Vina del Mar, U. of Chile	**IFIP** SG14 SCCC SBC EATCS
Work. Conf. on *Re-engineering the Enterprise*	20-21 Apr 95	Galway, Ireland	**IFIP** WG5.7 WG5.8
Workshop on *Personal Wireless Communications*	24-25 Apr 95	Prague, Czech Republic	**IFIP TC6**
Fourth Intl. Symp. on *Integrated Network Management — ISINM'95*	1-5 May 95	Santa Barbara, CA, U.S.A.	**IFIP WG6 6 IEEE** Comm. Soc.
Eleventh Intl. Open Conf. on *Computer Security — IFIP/SEC'95*	9-12 May 95	Cape Town, South Africa	**IFIP** TC11 CSSA
Fifth Intl. Conf. on *Computer Applications in Production and Engineering — CAPE'95*	16-18 May 95	Beijing, China	**IFIP** TC5 et al.
Workshop on *Stochastic Methods and Global Optimization*	12-15 **Jun** 95	Vilnius, Lithuania	**IFIP** WG7.7
Workshop on *Formal Design Methods for Computer-Aided Design*	12-15 **Jun** 95	Berkeley, CA, U.S.A.	**IFIP WG5.2**
Fifteenth Intl. Symp. on *Protocol Specification, Testing, and Verification — PSTV'95*	13-17 **Jun** 95	Warsaw, Poland	**IFIP** TC6/WG6.1
Fifth Intl. Conf. on *Human-Computer Interaction — INTERACT'95*	25-30 Jun 95	Lillehammer, Norway	**IFIP** TC13 NCS
Symp. on *Modelling and Control of National and Regional Economics*	2-5 Jul 95	Brisbane, Australia	IFAC **IE IFIP** WG7.6
Seventeenth Conf. on *System Modelling and Optimization*	10-14 Jul 95	Prague, Czech Republic	**IFIP TC7 IFAC IFORS CSCI**
Work. Conf. on *Modeling and Optimization of Distributed Parameter Systems with Applications to Engineering*	17-21 Jul 95	Warsaw, Poland	**IFIP** TC7/WG7.2 PAS
World Conf. on *Computers in Education — WCCE '95*	23-28 Jul 95	Birmingham, **U.K.**	**IFIP TC3 Aston Univ.**
Eighth **IMIA** World Congress on *Medical Informatics — MEDINFO'95*	23-27 Jul 95	Vancouver, B.C., Canada	**IMIA**
Ninth Work. Conf. on *Database Security*	13-15 Aug 95	Avery Point, CT, **U.S.A.**	**IFIP WG11.3**
Work. Conf. on *Engineering for Human-Computer Interaction — ECHI'95*	14-18 Aug 95	Grand Targham, WY, U.S.A.	**IFIP** WG2.7 WG13.4
Workshop on *Information Systems Development for Decentralized Organizations*	21-23 Aug 95	Trondheim, Norway	IFIP WG8.1 et al.
Intl. Conf. on *Intellectual Property Rights for Specialized Information, Knowledge, and New Technologies — KnowRight'95*	21-25 Aug 95	Vienna, Austria	Austrian Comp. Soc. **IFIP** et al.
Eighth Intl. Conf. on *Very Large Scale Integration — VLSI'95*	29 Aug – 1 Sep 95	Makuhari, Chiba, Japan	**IFIP** WG10.5
Intl. Conf. on *Computer Hardware Description Languages and Their Applications — CHDL'95*	29 Aug – 1 Sep 95	Makuhari, Chiba, Japan	**IFIP** WG10.2/10.5 et al.
Fifth Work. Conf. on *Dependable Computing for Critical Applications — DCCA-5*	27-29 Sep 95	Urbana, IL, U.S.A.	**IFIP WG10.4, TC11 IEE TC-FTC EWICS U. Ill.**
Eighth Symp. on *Information Control Problems in Manufacturing — INCOM'95*	4-8 Oct 95	Beijing, China	**IFAC IMACS IFORS ISPE IFIP**
First Workshop on *Knowledge-Intensive CAD — KIC-1*	Oct 95	Helsinki, Finland	**IFIP** WG5.2
Work. Conf. on *Information Technology and Changes in Organizational Work*	7-9 Dec 95	Cambridge, U.K.	**IFIP** WG8.2
Third Intl. Conf. on *Achieving Quality in Software — AQuIS'96*	24-26 Jan 96	Florence, Italy	**IFIP WG5.4**
Work. Conf. on *International Office of the Future: Design Options and Solution Strategies*	9-11 Apr 96	Tucson, AZ, U.S.A.	**IFIP** WG8.4 U. **of** Arizona
Work. Conf. on *Impact of Information Technology from Practice to Curriculum*	Apr 96	Neve-Ilan, Israel	**HIP WG3.2 WG9.5** et al.
Work. Conf. on *Domain Analysis and Modelling for Interactive Systems*	9-12 May 96	Geneva, Switzerland	**IFIP WG13.2 WG8.1**
Thirteenth *IFAC World Congress '96*	1-5 Jul 96	San Francisco, CA, U.S.A.	**IFAC**
Work. Conf. on *Place of Information Technology in Management Education*	8-12 Jul 96	Melbourne, Australia	**IFIP WG3.4 Deakin U.**
Fourteenth *IFORS World Congress*	8-13 Jul 96	Vancouver, B.C., Canada	**IFORS**
IFIP Congress '96 — Fourteenth World Computer Congress	**2-6 Sep 96**	**Canberra, Australia**	**IFIP**
Fourteenth *IMEKO World Congress*	2-6 Jun 97	Tempaere/Helsinki, Fin.	**IMEKO**
IFIP Congress '98 — Fifteenth World Computer Congress	**23-29 Aug 98**	**Vienna, Austria, and Budapest, Hungary**	**IFIP**

IFIP Congress '96 — 14th World Computer Congress	2-6 Sep 96	Canberra, Australia	**IFIP**
IFIP Congress '98 — 15th World Computer Congress	23-29 Aug 98	Vienna, Austria and Budapest, Hungary	**IFIP**

This calendar information is furnished to the *Newsletter* by the Secretariat. It contains only approved **IFIP** events, arranged by local Organizing Committees. **IFIP** does not assume any financial or legal liability. The Secretariat can furnish details for most of the events listed. Please see page 12 for a schedule of IFIP administrative meetings.