

# **NEWSLETTER**

## **IMEKO Technical Committee 12**

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### **TO THE MEMBERS OF IMEKO TC12**

Dear Colleagues,

this issue of the Newsletter presents a complete report on our most important event, the Symposium TEMPMEKO 2001 that took place last June in Berlin, Germany. The temperature and thermal measurements community has responded again very positively to our efforts and the event has continued its upward trend with 325 participants and 212 scientific contributions, covering all aspects of temperature and thermal measurements. Both from the number of attendees and of contributions this was the largest TEMPMEKO Symposium ever held. It was an important international event: the participants came from 44 countries and included people from national metrology institutes, from academia and from industry, further indications that we have been able to reach all the different areas of our scientific community. Our German colleagues have done an excellent work both from a scientific and an organizational point of view. I would like to take this occasion to thank again all of them, from the main organizers to the people that worked behind the scenes, for their great and successful effort. We are all looking forward to the fully refereed Proceedings that are being printed and will be available in a few weeks. Complete details and statistics of the event can be found in the following article.

Other topics of interest concerning recent changes in TC12 are reported in the Section on TC12 News.

I am taking this occasion to send to all of you and to your families my best wishes for your work and for the coming Holiday Season.

*Francesco Righini*

### **TEMPMEKO 2001**

The IMEKO Technical Committee 12 on Temperature and Thermal Measurements (TC12) in early spring 1999 delegated the organisation of the eighth International Symposium on Temperature and Thermal Measurements in Industry and Science (TEMPMEKO) to the German Member Organisation of IMEKO, with the Symposium to be held in June 2001 in Berlin, Germany. Some months later all relevant bodies had agreed with this decision. The preparation for TEMPMEKO 2001 started immediately after the end of the previous Symposium, TEMPMEKO '99 held in Delft.

Joint organisers of the eighth TEMPMEKO Symposium were the Physikalisch-Technische Bundesanstalt (PTB), which was responsible for the scientific programme, and the German Member Organisation of IMEKO, the VDI/VDE Society for Measurement and Automatic Control, which was in charge of the conference organisation. A National Organising Committee was formed, which made the most basic decisions on its first meeting in October 1999. The Call for Papers was sent in March 2000 to about 2500 potentially interested persons.

The international community responded positively to the Call for Papers and to personal contacts by members of the International Programme Committee and 241 abstracts were received by the organisers. A pool of referees was nominated, consisting basically of the members of the International Programme Committee and other well-known experts. Each abstract was evaluated by 3 referees, who provided a review report form. Based on the opinion of the referees, 230 contributions were accepted in the scientific programme, which was distributed in March 2001.

The Symposium programme included all aspects of temperature, humidity and thermal measurements and intended to cater to the needs of participants from very different working fields. The large number of 325 attendees from 44 countries and the mixture of interest areas demonstrate that this aim has been reached successfully: one half of the participants came from national metrology institutes, about 30 % came from industry and 20 % from universities and research facilities (details in Table 1).

Table 1. Institutional origin of participants (total 325).

Institutions	Number	
<b>World-wide participants</b>		
National Metrology Institutes	167	51%
Universities, Research Centers	69	21%
Industry	89	28%
<b>Participants from Germany</b>		
PTB	35	40%
Universities, Research Centers	13	15%
Industry	40	45%

Many participants from Central and Eastern Europe were able to attend the conference sponsored by generous grants from the German Research Society (DFG), from the WE-Heraeus Foundation, and from the fund of the German Ministry for Economy and Technology (BMW) to support metrology institutions. The distribution of participants among geographical regions is shown in Figure 1; a detailed list with the number of participants by country is given in Table 2.

The importance and attraction of the Symposium is also shown by the fact that 18 different working groups, most of them with an international membership, took the opportunity to convene for working meetings. In particular, all the seven working groups of the Comité Consultatif de Thermométrie (CCT) had meetings with nearly all members present.

The TEMPMEKO Symposium took place from 19 to 21 June 2001 in the conference centre „Haus am Köllnischen Park“ in the busy city of Berlin.

The get-together party was organised in the evening of 18 June in the buildings of PTB, where also most of the meetings of the working groups

Table 2. Detailed geographical distribution of participants by country (total 325).

<b>Western Europe: 177</b>			
Germany	88	Austria	5
France	17	Finland	5
Italy	13	Norway	5
Netherlands	11	Spain	3
UK	11	Belgium	2
Denmark	8	Portugal	2
Switzerland	6	Sweden	1
<b>Central and Eastern Europe: 54</b>			
Poland	16	Croatia	3
Russia	10	Slovak Republic	3
Ukraine	6	Hungary	2
Turkey	7	Lithuania	2
Slovenia	4	Czech Republic	1
<b>Asia and Australia: 46</b>			
Japan	15	New Zealand	3
China	10	Australia	1
Thailand	6	Malaysia	1
Korea	5	Singapore	1
Israel	3	Tajikistan	1
<b>Americas: 45</b>			
USA	26	Argentina	1
Canada	7	Bolivia	1
Mexico	5	Chile	1
Brazil	3	Uruguay	1
<b>Africa: 3</b>			
Egypt	2	South Africa	1

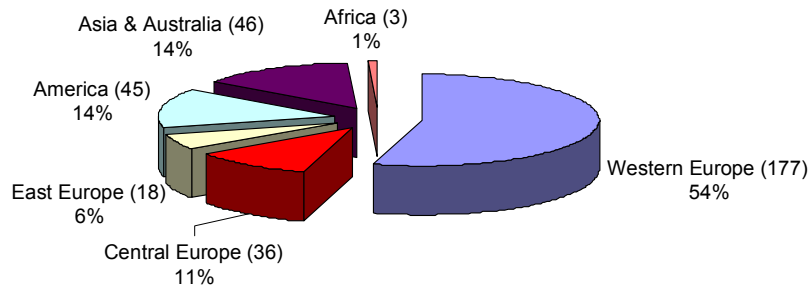


Figure 1. Geographical distribution of participants.

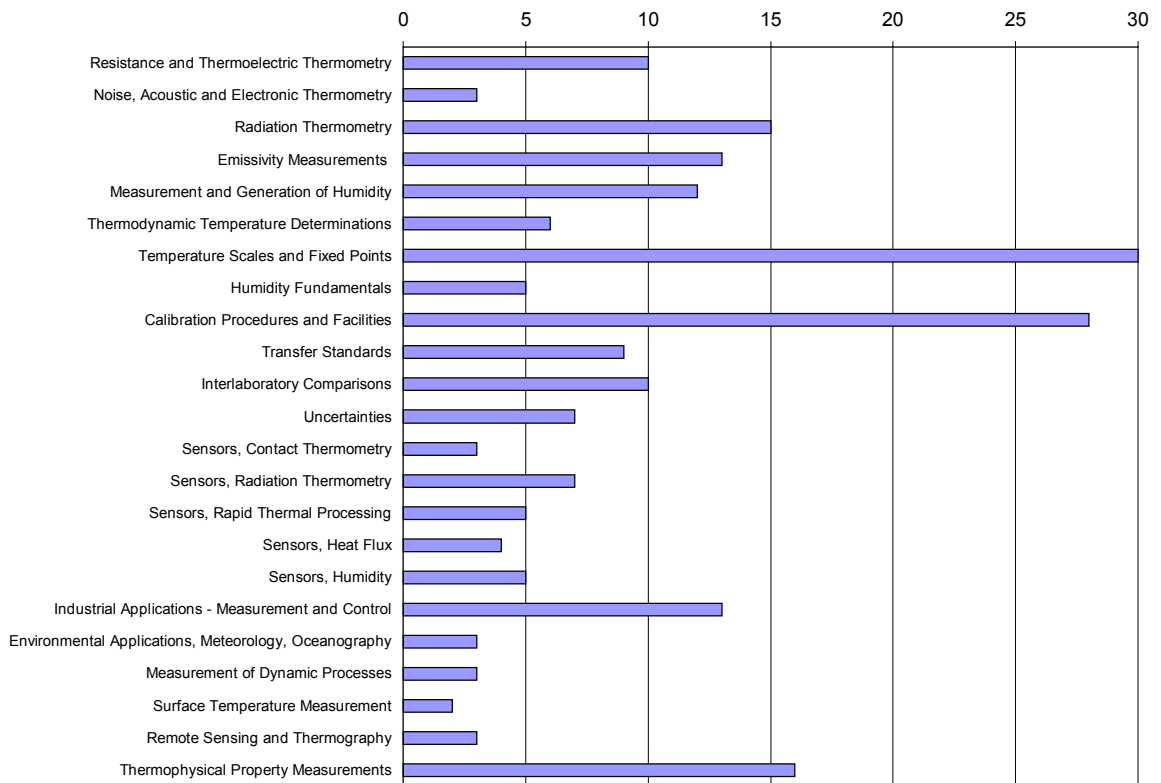


Figure 2. Number of contributions by topic.

were held on 18 and 22 June. The main Symposium social event was a boat trip with dinner on the river Spree with impressive views of the old and new Berlin.

The Symposium consisted of 6 invited talks, 96 oral presentations and 110 poster presentations. The invited talks were presented in plenary sessions, the oral presentations in 3 parallel sessions. Two poster sessions (on 19 and 20 June) allowed discussions with the authors all day, but above all during the 2-hour lunch break. A complementary instrument exhibition was organised parallel to the conference in the same building. The contributions to the Symposium covered different aspects of temperature and humidity measurements as well as determination of thermophysical properties. A detailed subdivision by topics is presented in Figure 2.

Regarding the scientific content, the development of the temperature scale is - after the adoption of the Provisional Low-Temperature Scale PLTS-2000 by the CIPM - now focussed on the high-temperature range. A topic of main interest treated in 8 contributions was the development of eutectic fixed points, which should enable an improved approximation of the temperature scale up to temperatures of 3000 K and will facilitate the development and calibration of advanced high-temperature thermocouples. In this area, the close co-operation of contact thermometry and radiation thermometry should result in rapid progress.

Radiation thermometry is also gaining importance in different areas. For the determination of thermodynamic temperatures, methods based on the absolute measurement of spectral radiant power were considered particularly promising. Several contributions dealt with the improvement of uncertainties in radiation thermometry under reference conditions as well as the determination of the emissivity of practical surfaces. But it was recognised that in this field there are quite a lot of unresolved problems.

Optical methods are more and more developing into areas which in the past were dominated by contact thermometry. For example, fibre optic techniques are in use for the leakage detection of pipelines. Up to now, the evaluation of the measurement methods and the traceability to the temperature scale are not sufficiently solved. It is remarkable that the national metrology institutes are going to consider also such application-oriented problems, which require more inter-disciplinary activities.

For the third time the field of humidity measurement was part of the TEMPMEKO Symposium topics. The interest in this area is large, with 15 % of contributions dealing with humidity. The extreme upper and lower ends of the range are gaining increasing importance, especially the trace moisture measurements.

The international equivalence of the realisation and dissemination of the temperature scale was a topic of main interest due to the large participation of the national metrology institutes. A major point was the progress of the key comparisons of the metrology institutes performed in the framework of the Mutual Recognition Arrangement (MRA). Smaller institutions are also taking part in key comparisons intensively. This is accompanied by a harmonisation of the methods for uncertainty estimation, which should lead to increasingly reliable values for uncertainty claims.

Full papers for the Symposium were submitted by 1 April 2001. All papers were refereed by at least one technical expert, and the comments of the referees were given to the authors during the Symposium or in some cases afterwards. Often essential improvements were suggested by the referees, which then led to manuscript revisions and to a second round of refereeing. Unfortunately it was noticed in some cases that mandatory comments of referees were not taken adequately into consideration by the authors. For these papers, a third round of refereeing was necessary using PTB experts. About 20 papers will be rejected from the Proceedings, mainly because they failed to meet the scientific standards of an international event like TEMPMEKO. The editorial work will be finished in early December 2001 and the Proceedings with the fully refereed papers will be published as a monograph by the VDE Verlag with an ISBN number. The copies will be shipped to the participants at the end of January 2002. That the proceedings appear on time is mainly due to the great effort of the authors, referees, and the editorial team. We would like to express our gratitude to all of them.

We wish our colleagues of the University of Zagreb, Croatia good luck in organising TEMPMEKO 2004 in Dubrovnik.

*Joachim Fischer*

*Bernd Fellmuth*

*Erich Tegeler*

*Joachim Seidel*

## ***TC 12 NEWS***

### ***Some words of Thanks.***

*Prof. Frank Bernhard*, TU Ilmenau, Germany left TC12 in June after 22 years of service. He was one of the founders of TC12 in 1979 and chaired the Committee in the period 1979-1993. He also organized the 2<sup>nd</sup> Symposium on Temperature Measurements in Industry and Science in Suhl, DDR in 1984. But Frank Bernhard was more than a chairman and an organizer: in the initial years of TC12 he was the person to whom we all referred to for any problem. He provided leadership and guidance in difficult times, steering the Committee work in the correct direction and establishing the appropriate scientific base for future developments. I had the privilege of working with him from the early years and in recent times his sound and experienced advice has been important for the continuing TC12 work. I am sure of expressing the will of all TC12 members in thanking very much Frank Bernhard for a job very well done in hard and difficult times and for his many excellent contributions to TC12 activities.

*Francesco Righini*

### ***Changes in TC12.***

Some changes in the membership of TC12 occurred since the last Newsletter.

- Dr. Duan Yuning, National Institute of Metrology, People's Republic of China, has joined the Committee.
- Dr. Erich Tegeler, PTB, Germany and organizer of TEMPMEKO 2001 has joined the Committee. In the meeting last June he was elected Scientific Secretary of TC12.

A cordial welcome is extended to the new members and many thanks are due to the persons that they replaced, for their work in previous years on behalf of the TC12 Committee.