

# International Association of Seismology and Physics of the Earth's Interior

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NEWSLETTER NO. 17      SEPTEMBER 1986

To: National Correspondents, Officers and Representatives of the Association, and related organizations.

This is the first year since 1982 that IASPEI has not held an Assembly, and our recent activities have mainly been directed towards planning for next year's General Assembly in Vancouver. This Newsletter gives more details of planned activities; like other recent Assemblies, this one shows every sign of being an outstanding success.

Some important decisions were taken at the recent General Assembly of the European Seismological Commission at Kiel, F.R.G., including the founding of a Federation of Digital Broad-Band Seismograph Networks. Details are given below.

*Robin Adams*

R D Adams  
Secretary-General

## CHANGES OF ADDRESS

Our President, Prof Suzuki retired from Sendai University in June, and is now continuing his seismological activities in the Tokyo area. We wish him continuing success in his work and note his new addresses:

Professor Ziro Suzuki	
9-11-18 Hino	OR Kogakuin University
Konan-ku	2665-1, Nakano-machi
Yokohama 233	Hachioji 192
JAPAN	JAPAN

## IASPEI Secretariat

The International Seismological Centre, and the IASPEI Secretariat, will be moving later this year to new premises at Thatcham, about 6 km to the east of Newbury. Please note the new address and telephone number. The telex number is unaltered. All correspondence for the IASPEI Secretariat should be sent to this address from the beginning of December.

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## IASPEI GENERAL ASSEMBLY, VANCOUVER, 9-22 AUGUST, 1987

The 24th General Assembly of IASPEI will be held in conjunction with the XIX General Assembly of IUGG at the University of British Columbia, 9-22 August 1987.

The Second Circular, with preliminary programme, has already been issued and may be obtained from the Local Organizing Committee at the following address:

IUGG XIX General Assembly  
c/o Venue West, 801-750 Jervis Street  
Vancouver B.C., Canada V6E 2A9

The Third Circular will be issued later in 1986 and will contain full details of scientific and business sessions, the call for papers, instructions for submission of abstracts, and registration forms.

Note the following deadlines:

Abstract submission	1 March 1987
Registration for reduced rate	1 May 1987

Abstracts (original and two copies) should be sent at the appropriate time to the principal convenor of the session concerned, not to the Local Committee, nor to the Secretary-General.

The Registration Fee is likely to be Can\$175 for early registration and Can\$225 for late registration (after 1 May 1987). There will be reduced fees for students and accompanying people. Note that at present 1 Canadian dollar equals about 70 US cents.

All requests for organizational information should be sent to the Canadian address above, and not to the IASPEI Secretariat.

### BUSINESS SESSIONS

The Opening Plenary Session will be held at 0930 on Monday, 10 August, and the Final Plenary Session at 1930 on Wednesday, 19 August. Agendas will be circulated later, but elections will take place, according to our statutes, for officers for the period 1987-1991.

All IASPEI Commissions will hold business meetings, before the Final Plenary Session, and at a time close to the related scientific sessions. Provisional times are given below.

### ASSOCIATION LECTURE

Dr R D Hyndman, Director of the Pacific Geoscience Center, Sidney, B C, will deliver a IASPEI Association Lecture at 1100 on Monday, 10 August, on "The Integrated Geoscience Lithoprobe Program across the Margin of South-western Canada".

### SCIENTIFIC SESSIONS

Preliminary information on scientific sessions of interest to IASPEI was given in Newsletter 16. This information is repeated here, with some additional sessions and provisional dates. For final details, and addresses of convenors, consult the Third Circular.

#### IUGG Symposia led by IASPEI and Principal Convenor

6. Large-Scale Three-Dimensional Earth Structure  
18-19 Aug Prof T H Jordan
7. Lower Crust Properties and Processes  
20-21 Aug Prof St Mueller
8. Hydrogeological Regimes and their Subsurface Thermal Effects  
15 (am), 17 Aug Prof A E Beck



IUGG Symposia with IASPEI participation, and IASPEI contact

1. Quo Vadimus?  
13-14 Aug Prof V I Keilis-Borok
2. Instability within the Earth and Core Dynamics  
20-21 Aug Prof F D Stacey
3. Impact of Global Positioning System on Geophysics  
11-12 Aug Dr A Tsuchiya
4. Variations in Earth Rotation  
18-19 Aug Prof M G Rochester
5. Slow Deformation and Transmission of Stress within the Earth  
15 (am), 17 Aug Prof Xu Shaoxie
9. Evolution of Mid-Oceanic Ridges  
11-12 Aug Dr R B Whitmarsh
10. Comparative Planetology  
14, 15 (am), 17-18 Aug Prof H Waenke
12. Displaced Terranes and Continental Accretion  
15 (am), 17 Aug Prof D L Jones
13. Results of the EMSLAB Project  
20-21 Aug Dr F A Nava
19. Origin and Evolution of Sedimentary Basins and their Energy and Mineral Resources  
19-20 Aug Prof D J Blundell
20. Geochemistry and Geophysics of Transport in the Lithosphere-Asthenosphere System  
13-14 Aug Prof C Froidevaux

IASPEI Symposia and Principal Convenors

1. Earthquake Hazard Assessment and Prediction  
17-19 Aug Dr M J Berry
2. Quantification of Earthquakes and the Determination of Source Parameters  
12-13 Aug Dr D Denham
3. Dynamic Thermal Regimes and the Deformation of the Lithosphere  
13-14 Aug Prof W R Peltier
4. Interpretation of Strong-Motion Waveforms  
11 Aug Dr D H Weichert
5. Computation and Interpretation of Seismic Waveforms in 2-D and 3-D Structures  
14, 15 (am) Aug Prof J H Woodhouse
6. Microseisms Caused by Factors Internal and External to the Earth's Crust  
11 Aug Dr E Hjortenbergh
7. Fine Structure and Anisotropy of the Lithosphere  
12-14 Aug Dr G G R Buchbinder
8. Earthquake Source Processes  
19-21 Aug Dr S Das

9. Physical Properties of Solid and Molten Earth Materials  
17-19 Aug Prof T J Ahrens
10. Seismological Instrumentation and Data Analysis in Developing Countries  
20-21 Aug Dr H K Gupta
11. Tsunamis  
18-19 Aug Dr T S Murty

#### IASPEI Workshops and Working Groups

The following are already planned. Further such meetings may be arranged later. In some cases the dates are still provisional.

- |  |                 |
|--|-----------------|
| Applications of Personal Computers in Geophysics               |                 |
| 18-19 Aug  | Dr W H K Lee    |
| Seismo-Electromagnetic Effects                                 |                 |
| 15 (am) Aug  | Dr M B Gokhberg |
| Hazard Assessment Techniques                                   |                 |
| 14 Aug   | Dr R K McGuire  |
| Time-Variable Earthquake Hazard                                |                 |
| 20 Aug   | Prof F F Evison |
| Effects of Surface Geology on Seismic Motion (Joint with IAEE) |                 |
| 12 Aug   | Dr B E Tucker   |
| Electromagnetic Lithosphere and Asthenosphere Sounding (ELAS)  |                 |
| (Joint with IAGA)  |                 |
| 18 Aug   | Dr L Vanyan     |

#### IASPEI Commission Meetings

- |   |             |
|---|-------------|
| Commission on Controlled Source Seismology                                | 13 Aug 1930 |
| Commission on Earthquake Hazards  | 18 Aug 1930 |
| Committee on Earthquake Hazard Assessment                                 | 17 Aug 1930 |
| Committee on Earthquake Prediction  | 14 Aug 1930 |
| International Heat Flow Commission  | 17 Aug 1930 |
| Commission on Microseisms   | 11 Aug 1600 |
| Commission on Physical Properties of Materials<br>of the Earth's Interior | 18 Aug 1930 |
| Commission on Practice  | 14 Aug 0900 |
| Sub-Commissions   | 11 Aug 0900 |
| Commission on Quantitative Geodynamics                                    | 12 Aug 1930 |
| Commission on Seismological Theory  | 14 Aug 1930 |
| Commission on Strong Motion Seismology                                    | 12 Aug 1930 |
| Commission on Wave Propagation in Real Media                              | 13 Aug 1930 |
| European Seismological Commission   | 15 Aug 0900 |
| IUGG Tsunami Commission   | 19 Aug 1400 |

#### PRE-ASSEMBLY MEETINGS

- Seismic Studies in Laterally Heterogeneous Structures - Interpretation of Deep Refraction and Reflection Profiling  
2-7 Aug, at Whistler, B C Dr R Ellis
- Workshop sponsored by IASPEI Commission on Controlled Source Seismology
- Processing of Seismic Strong Motion Records  
8 Aug Dr D H Weichert
- Sponsored by IASPEI Commission on Strong Motion Seismology

#### SOCIAL EVENTS

- |                                 |             |
|---------------------------------|-------------|
| IASPEI Welcoming Party          | 1930 11 Aug |
| IASPEI Dinner (Salmon Barbeque) | 1930 20 Aug |



## EUROPEAN SEISMOLOGICAL COMMISSION

The ESC held its Twentieth General Assembly in Kiel, FRG, 21-30 August 1986, in conjunction with the European Geophysical Society. Symposia were held on a wide range of topics and all ESC Sub-Commissions held technical sessions. Prof A M Dziewonski gave an EGS Society Lecture on "Studies of Aspherical Earth Structure". Among many important meetings held in conjunction with the Assembly were founding meetings of ORFEUS (Observatories and Research Facilities for European Seismology) and the Federation of Digital Broad Band Seismograph Networks. There was also a further meeting of the joint IASPEI/Unesco Working Group on a Manual of Seismogram Interpretation. These meetings are reported elsewhere in this Newsletter.

New officers were elected for the European Seismological Commission:

President:	Prof C Morelli (Italy)
Vice-Presidents:	Dr P W Burton (UK), Prof I L Nersesov (USSR)
Secretary-General:	Dr D Mayer-Rosa (Switzerland)
Adjoint Secretary-General:	Dr L Christoskov (Bulgaria)

The retiring President, Prof H Stiller, paid tribute to Mr J-M Van Gils who had held the post of Secretary-General for the past 16 years, and had worked tirelessly for the Commission and helped it through some difficult times.

An invitation was accepted from the Bulgarian Academy of Sciences to hold the next Assembly in Bulgaria in late August 1988.

## ORFEUS

ORFEUS (Observatories and Research Facilities for European Seismology) was formally founded at Kiel during the ESC Assembly. According to an "ORFEUS Science Plan" published earlier this year the main purpose of this organization is to coordinate broad-band seismological recording in Europe, and in particular to facilitate direct exchange of digital data among European Countries, and to act as European link with global programmes such as IRIS and GEOSCOPE. Although all institutional matters have not yet been resolved the following officers were elected:-

President:	Dr E Husebye (Norway)
Vice-President:	Dr B Romanowicz (France)
Executive Committee:	Dr M Cara (France), Dr O Kulhanek (Sweden), Dr E Wielandt (Switzerland)

It was further decided to accept an offer from the Institute of Earth Sciences at Utrecht (Netherlands) to host an ORFEUS Data Centre.

## JOINT IASPEI/IAEE WORKING GROUP

A joint Working Group is being set up between IASPEI and the International Association for Earthquake Engineering to study the effects of surface geology on seismic motion. This group was proposed in a resolution at the Tokyo Assembly in 1985, and it is planning its first meeting at the Vancouver Assembly. Joint Chairmen for this preliminary meeting are Dr B E Tucker (USA) for IASPEI and Dr W D Iwan (USA) for IAEE.

### EMSC/CSEM

The Council of the European Mediterranean Seismological Centre, Strasbourg, met at Kiel during the ESC Assembly. The Centre continues to act very efficiently as a collection centre for regional seismological data, and carries out both emergency and routine determinations of earthquake origins in its area. Since the beginning of 1983, 764 stations have supplied 72,740 primary phases actually used in computations, and there have been on the average about 1 emergency determination and more than 100 routine determinations a month.

The council elected the following officers:

President:	Prof H Korhonen (Finland)
Vice-President:	Dr H Aichelle (FRG)
Executive Committee:	Dr P W Burton (UK), Dr D Mayer-Rosa (Switzerland)

Prof J Bonnin was re-appointed as Secretary-General, with responsibility for the operation of the Centre.

### MANUAL OF SEISMOGRAM INTERPRETATION

A further meeting of this Joint IASPEI/Unesco Working Group took place at Kiel in August 1986. Members brought examples of suitably annotated records from a wide variety of instruments, of earthquakes at a wide range of distances. The Group is chaired by Dr O Kulhanek (Sweden) and among those bringing records for discussion were G Choy (USA), D Mayer-Rosa (Switzerland), D Seidl (FRG), R Uhrhammer (USA) and M Yamamoto (Japan). G Payo (Spain) showed the meeting a recently published manual he had prepared (in Spanish) giving examples of various events recorded at Toledo.

The Group will further refine the choice of records for publication, and hopes to complete this work by the end of the Vancouver Assembly. The present intention is to publish the records in two volumes, one giving simple analogue recordings, and the other the records from more advanced recording systems.

### HANDBOOK ON ALGORITHMS

Arrangements have now been made for the publication of a "Handbook on Algorithms" by Academic Press, hopefully in time for the Vancouver Assembly next year. The editor, Prof D Doornbos, is collecting contributions from about 15 authors on behalf of the Sub-Commission on Algorithms, a joint group of the Commission on Practice, and the Commission on Seismological Theory. The Handbook is intended to be of practical use and it is hoped that a tape containing programs detailed in the Handbook will also be available. The Handbook is being prepared with financial help from Unesco.



## FEDERATION OF DIGITAL BROAD BAND SEISMOGRAPH NETWORKS

Following an earlier meeting at Karlsruhe (FRG) in April (EOS, 67 (25), 24 June 1986), the founding meeting of the Federation was held in Kiel on August 27, chaired by Prof H-P Harjes (FRG). The nine founding institutions are US Geological Survey, IRIS, GEOSCOPE, ORFEUS, CANDIS (Canada), Chinese Digital Seismograph Network, Bureau of Mineral Resources (Australia), Global Seismology Sub-Committee (Japan) and the German Research Council (FRG). The meeting adopted the following draft statutes, which include affiliation with IASPEI and ICL. It is hoped that the Federation will work closely with the IASPEI Commission on Practice.

### Draft Statutes

The international seismological community recognizes new opportunities within its field for improved understanding of the internal structure and dynamical properties of the Earth provided by recent developments in seismograph network technology.

It also recognizes that rapid access to seismic data from networks of modern broad-band digital instruments, wherever they might be, is now possible.

The developments include greatly improved broad-band seismographic systems that capture the entire seismic wave field with high fidelity, efficient and economical data communications and storage, and widely available, powerful computing facilities.

The federation is open to all national and international programs committed to the deployment of broad-band seismographs and willing to contribute to the establishment of an optimum global system with timely data exchange.

### I. Goals

In view of the above, and to take advantage of existing developing global and regional networks, the "Federation of Digital Broad-Band Seismograph Networks" (FDSN) is formed to provide a forum for:

- developing common minimum standards in seismographs (e.g. bandwidth) and recording characteristics (e.g. resolution of dynamic range);
- developing standards for quality control and procedures for archiving and exchange of data among component networks.
- coordinating the siting of additional stations in locations that will provide optimum global coverage.

### II. Institutional Frame

The Federation is an independent international association and is affiliated with the two international organizations ICL and IASPEI.

### III. Membership and Organization

- Membership in the FDSN is open to national and international programs committed to both the development and operation of broad-band digital networks and complying with the goals of the federation.
- The activities of the federation will be coordinated by a steering committee whose membership may not exceed one representative from each of any national or international program.
- The members of the steering committee will be appointed or selected from within the country or the organization they represent.
- The steering committee will be headed by a chairman elected for a two year term, assisted by two vice-chairmen.



- The steering committee will form all necessary working groups or special technical committees as required to reach the objectives of the FDSN.
- The steering committee will meet at least once a year. Special meetings may be called by the chairman as appears necessary for the progress of the FDSN.
- Concerning all recommendations made and actions to be taken, each member of the FDSN will have one vote, and an affirmative vote by 2/3 of members present at a steering committee meeting will be required.
- A majority of members of the FDSN will constitute a quorum for the steering committee meetings.
- No fees are imposed but voluntary contributions may be requested to cover costs for communications.
- Any member may resign at any time by giving written notice to the chairman.

The following officers were elected:

Chairman:	Dr M J Berry (Canada)
Vice-Chairmen:	Dr B Romanowicz (France)
	Prof A M Dziewonski (USA)

Further meetings of the Federation will take place as opportunities arise at major seismological gatherings, and it is expected that there will be a meeting during the IUGG Assembly at Vancouver in 1987. Four Working Groups were set up to report quickly on problems of siting, instrumentation, data collection and exchange, and data centres.

#### INTERNATIONAL MEETING ON GEOTHERMICS AND GEOTHERMAL ENERGY

An International Meeting on Geothermics and Geothermal Energy was held in Guarujá, São Paulo State, Brazil 10-14 August 1986. This was the first meeting sponsored by the International Heat Flow Commission to be held in South America. The meeting was designed to bring together people experienced in the various aspects of the field and those with little or no experience, and was a great success. Seventy-five registrants from 21 countries attended sessions on thermophysical properties, conductive heat flow, convective heat flow, regional studies, continental and oceanic heat flow, geothermal maps, thermal structure of the lithosphere, thermal aspects of uplift and subsidence, methods of determining paleoheat flow, geothermal influences in oil genesis, geothermal resources of South America, prospecting and exploration techniques, development of geothermal fields, and technological aspects of exploitation.

Particular attention was paid to methods of estimating the reliability of heat flow density measurements, as it was felt that current methods tend to underestimate inaccuracies. There was also concern at the apparent lack of enthusiasm shown by both the public and politicians for the economic use of geothermal energy for power generation and other commercial applications. A local example is the use of geothermal heat to process coffee into instant coffee.

The meeting was organized through the Instituto de Pesquisas Tecnológicas do Estado de São Paulo, with Dr V.M. Hamza as Chairman of the Local Organizing Committee. Financial support came from many local sources and also from Unesco, the International Council of Scientific Unions, the Commission for the Geological Map of the World, and the International Lithosphere Programme.



## SEISMOLOGY IN AFRICA

Following a resolution at our Tokyo Assembly last year, a Working Group has now been set up on Seismological Recording and Earth Sciences Studies in the African Continent, under the joint sponsorship of IASPEI, Unesco and ICL. A preliminary meeting is being held at Unesco Headquarters in Paris in November 1986, and it is planned to hold a fuller meeting at the time of the Vancouver Assembly in August 1987.

We also note the holding of two geophysical meetings in Nigeria this year, one on "The Stability of the Western Sector of the African Plate" at Ibadan in September, and the other on "Research in Geophysics and Geophysical Exploration in Africa" at Kano in December.

## NEWS FROM SOUTH-EAST ASIA

A further Newsletter has been issued by the Southeast Asia Association of Seismology and Earthquake Engineering, following their seminar on Preparedness for Earthquake Hazard in Southeast Asia, held in Indonesia in March 1986, at which 18 papers were presented. Four volumes of a "Series on Seismology" covering work carried out by SEASEE on the Earthquake Hazard Mitigation Program in SE Asia are now available; for Thailand, Malaysia, Philippines and Indonesia. The summary first volume is still in preparation. The volumes already issued may be obtained from Dr E P Arnold, USGS, Box 25046, Denver, CO 80225, USA, or from the Meteorological Departments in any of the countries concerned.

A Thai National Earthquake Committee was set up in September 1985, and it is hoped to hold a Thai National Earthquake Engineering Conference in Bangkok, 4-6 November 1986.

## SECOND INTERNATIONAL WORKSHOP ON SEISMIC ANISOTROPY

This Workshop took place 20-27 May 1986 at Moscow, supported by IASPEI and Unesco. It was attended by more than 40 participants, including 15 from outside the Soviet Union, representing Canada, Czechoslovakia, FRG, Japan, Netherlands, Norway, UK and USA. Since the previous workshop in 1982, S-wave anisotropy has emerged as an even more powerful tool than P-wave anisotropy. The workshop marked the coming together of much observational evidence, powerful computational methods and efficient field methods for the systematic study of in situ fracture and aligned structures in the crust. More details may be obtained from Dr S Crampin, British Geological Survey, Edinburgh, or from Dr P Leary, University of Southern California, Los Angeles. It is hoped that the next workshop of this series can be held in California in 1988.

## OSLO ASSEMBLY 1989

The Joint IASPEI/IAGA Assembly in Oslo, in 1989 will now definitely be held on 7-19 August.

### FORTHCOMING MEETINGS

The following is a selection of forthcoming meetings in the field of interest of the Association.

- 1986 Oct 30- INTERNATIONAL SYMPOSIUM ON NONLINEAR SEISMOLOGY  
Nov 5 Suzdal, USSR  
Soviet Geophysical Committee, Molodezhnaya 3, Moscow, USSR
- 1986 Dec 1- 5 RESEARCH IN GEOPHYSICS AND GEOPHYSICAL EXPLORATION IN AFRICA  
Kano, Nigeria  
AGERA Conference, Dept of Physics, University of Jos,  
Jos, Nigeria
- 1987 May 28-30 CENTENNIAL ANNIVERSARY SYMPOSIUM ON PERMANENT SEISMOGRAPHIC  
OBSERVATORIES AND NETWORKS  
University of California, Berkeley, Ca, USA  
Prof B A Bolt, Dept of Geology & Geophysics, University of  
California, Berkeley, Ca 94720, USA
- 1987 Jun 1- 6 TERRESTRIAL HEAT FLOW AND STRUCTURE OF THE LITHOSPHERE  
Bechyne, Czechoslovakia  
Dr V Cermak, Geophysical Institute, Bocni II, 14131 Prague 4,  
CZECHOSLOVAKIA
- 1987 Jul 6-10 CRYPTOEXPLOSIONS AND CATASTROPHIES IN THE GEOLOGICAL RECORD  
Parys, South Africa  
Cryptoexplosions Workshop, Bernard Price Institute,  
University of Witwatersrand, 1 Jan Smuts Ave, Johannesburg,  
SOUTH AFRICA
- 1987 Aug 9-22 XIX GENERAL ASSEMBLY, IUGG  
Vancouver, B C, Canada  
IUGG Assembly, c/o Venue West, 801-750 Jervis Street,  
Vancouver BC, V6E 2A9, CANADA
- 1987 Aug 24-28 FIFTH INTERNATIONAL SYMPOSIUM ON ANTARCTIC EARTH SCIENCES  
Cambridge, UK  
Dr M R A Thomson, British Antarctic Survey, Madingley Road,  
Cambridge CB3 0ET, UK
- 1988 Jul 1- 8 SEISMIC PROBING OF THE CONTINENTS AND THEIR MARGINS  
Canberra, Australia  
Dr J H Leven, BMR, Box 378, Canberra ACT 2601,  
AUSTRALIA
- 1988 Aug 2- 9 NINTH WORLD CONFERENCE ON EARTHQUAKE ENGINEERING  
Tokyo/Kyoto, Japan  
9WCEE, Japan Convention Services,  
Nippon Press Center, 2-1, 2 chome  
Uchisaiwa-cho, Chiyoda-ku  
Tokyo 100, JAPAN
- 1989 Jul 9-19 28TH INTERNATIONAL GEOLOGICAL CONGRESS  
Washington DC, USA  
IGC, P O Box 1001  
Herndon, Va, 22070, USA
- 1989 Aug 7-19 IASPEI/IAGA JOINT ASSEMBLY  
Oslo, Norway