

IASPEI Newsletter

June 2023

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I must inform you with great sadness that one of our colleagues passed away. We remember him with an obituary.

Please do not forget to send me information or corrections about international conferences and workshops with IASPEI related topics. This list can only be complete and correct if I receive information about such events and can update the Meetings Calendar of future Newsletters.

Johannes Schweitzer
Secretary General

Foreword

Dear Readers,

I hope this Newsletter finds you all well.

This is the last Newsletter before the forthcoming General Assemblies (GA) of IUGG and IASPEI in July. We have some final information for the participants.

Then, we publish several meeting announcements, which may be of interest for many of you, the call for submitting bids for next year's General Assembly of the Asian Seismological Commission and information on a new, freely available software package.

28th IUGG & 42nd IASPEI General Assembly Berlin 2023



The 28th IUGG General Assembly (IUGG2023 GA, <https://www.iugg2023berlin.org>) will be

held from 11 to 20 July 2023, at the City Cube, in Berlin, Germany. The IUGG GA is one of the world's most important geoscientific events, with more than 5000 participants. It takes place every four years.

As one of the eight IUGG Associations, IASPEI will be part of this Assembly and hold its 42nd General Assembly. Since some IUGG GAs, IASPEI activities are concentrated in the 2nd half of the conference. So, all IASPEI Symposia and all Joint Symposia with IASPEI participation are scheduled between 14 and 19 July 2023. The whole day-by-day scientific and business meetings program can be found on the [conference website \(https://iugg2023.floq.live/event/IUGG23/program_day_by_day\)](https://iugg2023.floq.live/event/IUGG23/program_day_by_day). All IASPEI related Symposia and business meetings are marked with the IASPEI logo.

IASPEI starts with the IASPEI Opening Plenary at 08:30 on Friday, 14 July 2023. The Opening Plenary includes the IASPEI Medal ceremony and will finish with a lecture by Torsten Dahm titled 'Quaternary volcanic fields in Central Europe - activities and latent hazards'.

The IASPEI General Assembly ends with the elections for the new IASPEI Bureau and the new Executive Committee during the Closing Plenary at 15:30 on Wednesday, 19 July 2023.

IASPEI Dinner During the General Assembly

The traditional IASPEI dinner during our General Assembly will start at 19:00 on Tuesday, 18 July 2023. The dinner will be organized at **Restaurant Neumann's** (Alt – Moabit 126 (Berlin Mitte), near the Berlin main train station, a traditional Berlin restaurant (<https://restaurantneumanns.de/?lang=en>), as buffet with a long list of different dishes, (German, vegetarian, halal, vegan) and includes alcoholic and non-alcoholic drinks. The price per person will be EUR 50.

You can pick up your ticket(s) in the IASPEI room (Room S3) at the conference.

Since the restaurant has only space for an absolute maximum of 150 people, please do not hesitate to reserve your seat(s) as soon as possible by sending an email to iaspei@norsar.no.

International Training Course on Ocean Bottom and Amphibian Experiment Seismological Data

In combination with the IUGG 2023 conference in Berlin, we offer a scientific training course on how to access and use ocean bottom and amphibian pool data, how to apply novel processing techniques, and about the „underwater potentials“ in modern broadband seismology. The course is organized by the scientific advisory board of the German Instrument Pool for Amphibian Seismology (DEPAS, awi.de/depas).

The training course is suited for early career scientists interested to get in touch with new and quickly developing research fields in seismology. The preliminary course program can be downloaded from <https://www.uni-potsdam.de/en/geo/research/arrayseismology>

Contact: Frank Krüger, frank.krueger@uni-potsdam.de

20th WEGENER Assembly – 24 – 27 October 2023 in Sousse, Tunisia

Since more than 40 years ago, WEGENER has brought together geoscientists who want to collaborate on the application of space and terrestrial geodetic techniques to the study of

geodynamics in the Alpine–Mediterranean plate boundary region.

During the past decade, WEGENER has broadened its scopes beyond the Mediterranean and Geodesy. This led to the creation of a new Seismo-Geodesy sub-commission, jointly supported by the International Association of Geodesy (IAG) and International Association of Seismology and Physics of the Earth's Interior (IASPEI).

WEGENER, through meetings organized every two years in and around the Mediterranean, is now an important component, offering a space for collaborative discussion and presentation of research.

The 20th WEGENER Assembly 2023 will be organized by the National Office of Mines (ONM, which is the Geological Survey of Tunisia) from 24 to 27 October 2023 in Sousse, Tunisia.

The 3rd Circular is now available from the new conference website (<https://congress-onm.tn>). Abstracts can be submitted until 15 July 2023.

The Organizing committee WEGENER 2023

Call for Bids to Host the 15th ASC General Assembly

The Asian Seismological Commission (ASC) has organized 14 General Assemblies, which should be held every 2 years. The 15th General Assembly of the Asian Seismological Commission will be held in 2024. ASC is searching for organizations that are interested to host the 15th Assembly.

If you are interested to host this Assembly, please contact the ASC Secretary General Li LI (lilygrace@cea-igp.ac.cn) before July 9, 2023.

CTBTO Meeting on Legacy Data from Nuclear Tests

The CBTO invites to a Technical Meeting on Legacy Data from Nuclear Tests in Vienna, Austria, 27 – 29 September 2023. Further details of the meeting can be found at <https://www.ctbto.org/node/8891>.

ANISOtime software

ANISOtime is a free software for computing seismic travel times in a transversely isotropic, spherically symmetric, Earth. It can be downloaded from

<https://github.com/UT-GlobalSeismology/anisotime>.

Downloadable, executable versions are available for Windows, macOS, and Unix/Linux; the source code can also be downloaded. The program can operate in both graphic user interface (GUI) and command line input (CLI) modes. A user guide can be downloaded from the Github site, and is also embedded in the software.

The following published paper explains the ANISOtime program and underlying theoretical results.

Kensuke Konishi, Anselme F. E. Borgeaud, Kenji Kawai, Robert J. Geller (2021). ANISOtime: Traveltime Computation Software for Laterally Homogeneous, Transversely Isotropic, Spherical Media. SRL, doi: <https://doi.org/10.1785/0220200306> or downloadable from <https://repository.dl.itc.u-tokyo.ac.jp/records/2007475>

Robert (Bob) Geller, University of Tokyo, Japan

Obituary

David Jackson (1943 – 2023)



Professor David Jackson passed away from a heart attack on 30 March 2023 at his home in Pacific Palisades, California. He is survived by his wife Kathy and children Kelly and Morgan.

Professor Jackson graduated in Physics at Caltech in 1965, followed by a PhD in geophysics at MIT in 1969. He was appointed Professor in Residence at UCLA in 1969 and Researcher in Leon Knopoff's group. After three years he was appointed Assistant Professor in 1972. He received tenure in 1975, was appointed to Full Professor in 1981 and Distinguished Professor in 2000. He retired in 2011. He was Chair of his Department 2004-2008 and held a joint appointment in the Institute of the Environment and Sustainability, 2008 – 2011.

Professor Jackson was an iconoclast who challenged conventional wisdom and sought rigorous methods to recognize the truth, refuting and replacing widely held paradigms. As the validity of his work became apparent, his expertise was sought after by numerous government and professional bodies. He was appointed Director of SCEC, the Southern California Earthquake Center (1996 – 1999). He served as Secretary (2003 – 2007) of the U.S. National Committee of the International Union of Geodesy and Geophysics (IUGG) and

on its Finance committee (2003 – 2007) and set up a program for the IUGG General Assembly. He wrote the document used by member nations to request support from their governments. He was elected the U.S. Delegate to the IUGG and Chair of the U.S. National committee for IUGG (1999 – 2003) and continued as a member of the governing body of IUGG (2007 – 2011). He was elected Secretary (1989), then President (1991) of the Seismology Section of the American Geophysical Union (AGU) and AGU Fellow (1993).

Below are listed several of the topics that Professor Jackson addressed.

Inverse Theory. In the 1970s standard least squares methods were used to infer model parameters and their uncertainties from the data. Jackson developed methods to give realistic error bounds based on defining the boundary of the multi-parameter volume with the data called the 'Edgehog' method in contrast to the 'Hedgehog method' that had been developed in Russia by V. Valus. In the latter, all parameters were tested within the volume that fit the data. Jackson's method, extended to a paper titled 'Most Squares' explored the outer edge, and so was much more computer efficient. These methods take into account covariance in the data and model parameters to define more extreme error estimates than standard least squares. This development was followed by his extension of standard least squares to include prior information in a formal manner by augmenting the normal equations with prior data equations normalized by their uncertainties and data equations normalized by their uncertainties. His method has been shown to be the basis of modern simulated annealing methods.

Palmdale Bulge. In the mid-1970s repeated surveying suggested a large bulge in the ground had developed around the section of the San Andreas fault near Palmdale, California, similar to bulges that had been reported before giant earthquakes in China. There was considerable worry that Los Angeles was about to experience a huge earthquake. He applied his analysis to reveal

that the data supporting the bulge could be explained by cumulative, hitherto-hidden, surveying errors. In 1975, the USGS report of the development of the Palmdale Bulge caught the attention of then-Vice President Nelson Rockefeller who directed his science advisor to convene a panel to recommend expanding earthquake studies. This led to funds allocated to NSF and the USGS for earthquake studies, a precursor to the National Earthquake Hazards Reduction Program or NEHRP. Eventually, after this start, and further attempts by others, in 1979 the NEHRP was established. NEHRP funds earthquake research by FEMA, NIST, USGS and NSF. Jackson's paper in *Science: Aseismic uplift in southern California: An alternative interpretation*, coming 2 years after the formation of NEHRP, was seen as a serious challenge. The USGS spokesperson chosen to challenge Jackson was a young, articulate scientist, Ross Stein, who engaged Jackson in debate.

Now, four decades later, recalling his slow reversal of opinion, Ross writes in *Temblor* "*David had been right, the Bulge was gone. I immediately switched sides.*"

But added "*So, while he approached popular ideas with skepticism, he approached their advocates with equanimity.*"

[\(https://temblor.net/temblor/essay-memorium-remembering-david-jackson-13088/\)](https://temblor.net/temblor/essay-memorium-remembering-david-jackson-13088/).

Gap theory. Many thought and still do, that earthquakes would occur in seismic gaps, that is regions along plate boundaries that had experienced no historic earthquakes and so needed to catch up. David Jackson and Yan Kagan analyzed 10 years of data and showed the reverse is true. They found that earthquakes are more likely to occur where previous earthquakes happened. To some this suggests that plate motions in gaps might be happening by aseismic slip, to others, 10 years may be too short a time for a process that happens over millions of years. In either case, on the human timeframe the gap model does not work.

Characteristic earthquakes and periodicity.

The simplest model for earthquake hazard held that they occur on characteristic faults of a given length as determined by geological fault scarps, and therefore had a given size, and that earthquakes repeat quasi-periodically. National hazard maps based on seismic records and paleontological trenching used this model. The California Landers (1992) earthquake showed that motions on different faults could combine to generate a larger event than each alone. The seismic record had shown that perceived periodicity can be an artefact of examining small records in an otherwise chaotic sequence. Jackson led a group of multi-disciplinary collaborators to develop the statistical formalism to take into account trenching results and geological faults, and included non-periodicity, earthquake clustering, and fault cascading. It set up the basis of modern hazard maps.

Pre-earthquake strain increase. An early model of potential precursors to earthquakes, proposed that the development of strain before an earthquake would accelerate over the time leading up to the event, allowing prediction. Jackson showed the opposite is true. After the Landers earthquake, a group led by Professor Jackson installed the newly developed portable GPS instruments to measure the post-earthquake strain in the vicinity of the fault trace. They were the first to continuously measure this strain signal that decayed over months. Other instruments had shown there was no accelerated strain change prior to Landers, or before other events. Professor Jackson and his students then combined historic trilateration records and current GPS measurements to map southern Californian strain as a function of time. They discovered that indeed many of the regions of increased strain rate in southern California are located not where earthquakes are about to occur but where they had occurred in the past. This pattern is now explicable as viscoelastic relaxation in the substrate beneath the fault.

Professor Jackson was one of the leaders of the group that wrote the original proposal to form the Southern California Earthquake Center. His experience of using GPS at

Landers made him a leading figure in establishing the southern California GPS network, over a hundred sites that track the relative plate motion between the Pacific and North American plates, showing where strain is accumulating. Eventually Jackson along with Kagan, led what is regarded as the foremost earthquake-statistics team, guided by a principle espoused in the title of his early article 'Interpretation of Inaccurate, Insufficient, and Inconsistent Data.' His first major demonstration of this philosophy was the afore-mentioned deflation of the Palmdale bulge.

Earthquake forecasting. Earthquake prediction has been a subject rife with anecdotal evidence, optimistic interpretation, and reinterpretation of pre-earthquake events. This set the stage for the statistical likelihood testing methods that were used by Jackson and continue to be used by colleagues today. He encouraged the use of the word 'forecasting' rather than 'prediction' to reflect the uncertainties involved. He was a coauthor on a paper published in Science titled 'Earthquakes Cannot be Predicted.' Based on his rejection of the gap model, he quantified the clustering model in which a forecast is based on the proximity in space and time of recent earthquakes.

He issued a challenge to earthquake forecasters to make prospective rather than retrospective forecasts. Largely, as a result of his input, SCEC set up an earthquake forecasting contest called RELM (Regional Earthquake Likelihood Models) in which different ideas are translated into earthquake probability as a function of space, magnitude, and time, against which null hypotheses can be compared in a formal manner. Different groups across the country, including Professor Jackson's, signed up for RELM and contributed a 5-year forecast. After the 5-years had elapsed, the results were published by the National Academy of Sciences. The HJK forecast, authored by Helmstetter, Jackson and Kagan, is still (Bayona et al., 2022) regarded as one of the most successful methods. The formalism established by Jackson and Kagan was the basis for

expanding RELM to an international forecasting effort, CSEP, the Collaboratory for the Study of Earthquake Predictability and GEAR, Global activity rate.

Professor David Jackson rose to a position of national and international distinction that implicitly recognized the need for his careful statistical approach in assessing the likelihood of natural hazards such as earthquakes. Keiti Aki (1930-2005), first SCEC Director, wrote: *"One of my wishes I had when I left Japan for MIT 33 years ago was to witness in person how the western civilization, finally confronting earthquake hazards in California, would deal with the problem. (Remember the Palmdale Bulge) David has abundant courage to fight an entire government organization and a large segment of the geological community in these endeavors. Not only that, when it became time to integrate earth science information for the benefit of the public, he served unselfishly and patiently for building consensus among scientists of various disciplines and produced a product (SCEC II Phase Report) which became truly useful for the public. I see a genuine spirit in western civilization in what David has accomplished in the past 30 years and feel that my wish was fulfilled by him."*

Professor Jackson's career could be used as a case study of the application of careful objectivity in science. He challenged advocates of various positions, but it never became personal. As a person, Professor Jackson was a kind man, with a wonderful sense of humor and was ever ready to lend a helping hand to all. He is greatly missed.

Paul Davis, UCLA

Meetings Calendar

We report below forthcoming meetings relevant to the interests of IASPEI scientists. If you are aware of events not listed below or changes regarding these events, please inform the Secretary General.

2023

CTBT: Science and Technology (SnT2023)

June 19 – 23, 2023, Vienna, Austria

URL: <https://conferences.ctbto.org/event/23/>

URBASIS-EU Spring School "Urban Seismology and Risk Analysis"

May 15 – 20, 2023, Porquerolles, France

URL: <https://urbasis-eu.osug.fr/URBASIS-Spring-School-2-Urban-Seismology-and-Risk-Analysis>

African Volcanologists Workshop

May 24 – 27, 2023, Malindi in Kenya

URL: <https://www.afrovolcanologists.net>

Glacial isostatic adjustment training school

July 3 – 7, 2023, Gävle, Sweden

URL: <https://polenet.org/2023-gia-training-school/>

International Training Course on Ocean Bottom and Amphibian Experiment Seismological Data

July 12 – 13, 2023, Potsdam, Germany

URL: <https://www.uni-potsdam.de/en/geo/research/arrayseismology>

IUGG 28th General Assembly (IASPEI 42nd General Assembly)

July 11 – 20, 2023, Berlin, Germany

URL: <https://www.iugg2023berlin.org/>

20th Annual Meeting AOGS

July 30 – August 4, 2023, Singapore

URL: <https://www.asiaoceania.org/aogs2023/>

2nd GATHERS Summer School

August 28 – September 1, 2023, Delft, The Netherlands

URL: www.gathers.eu

8th International Colloquium on Historical Earthquakes, Palaeo- Macroseismology and Seismotectonics

September 17 – 20, 2023, Lixouri, Greece

URL: <https://8ichisteq.gr/>

Corinth Rift Laboratory (CRL) School 2023

September 22 – 26, 2023, Nafpaktos-Patras, Greece

URL: <http://crlab.eu/>

CTBTO Technical Meeting on Legacy Data from Nuclear Tests

September 27 – 29, 2023, Vienna, Austria

URL: <https://www.ctbto.org/node/8891>

20th WEGENER Assembly

October 24 – 27, 2023, Sousse, Tunisia

URL: <https://congress-onm.tn>

AGU Fall Meeting

December 11 – 15, 2023, San Francisco, California, USA

URL: <https://www.agu.org/Fall-Meeting>

2024

EGU General Assembly 2024

April 14 – 19, 2024, Vienna, Austria

SSA Annual Meeting 2024

April 29 – May 3, 2024, Anchorage, Alaska, USA

URL: <https://meetings.seismosoc.org/>

SEDI Meeting 2024

June 23 – 28, 2024, Great Barrington, Western Massachusetts, USA

18th World Conference on Earthquake Engineering WCEE2024

June 30 – July 5, 2024, Milan, Italy

URL: <https://www.wcee2024.it/>

ESC General Assembly

September 22 – 27, 2024, Corfu, Greece

EMSEV 2024

September 2024, Crete, Greece

5th LACSC General Assembly

TBD, Costa Rica

15th ASC General Assembly

TBD

4th AfSC General Assembly

TBD

AGU Fall Meeting

December 2024, Washington, USA

URL: <https://www.agu.org/Fall-Meeting>

2025

IASPEI 43rd Scientific Assembly as Joint Assembly with IAGA

August 31 – September 6, 2025, Lisbon, Portugal

AGU Fall Meeting

December 2025, New Orleans, Louisiana, USA

URL: <https://www.agu.org/Fall-Meeting>

2026

AGU Fall Meeting

December 2026, San Francisco, California, USA

URL: <https://www.agu.org/Fall-Meeting>

General Information about IASPEI

The International Association of Seismology and Physics of the Earth's Interior [IASPEI] is one of the eight Associations of the International Union of Geodesy and Geophysics [IUGG].

The other seven IUGG Associations are:

- International Association of Cryospheric Sciences [IACS]
- International Association of Geodesy [IAG]
- International Association of Geomagnetism and Aeronomy [IAGA]
- International Association of Hydrological Sciences [IAHS]
- International Association of Meteorology and Atmospheric Sciences [IAMAS]
- International Association for the Physical Sciences of the Oceans [IAPSO]
- International Association of Volcanology and Chemistry of the Earth's Interior [IAVCEI]

Scientific Assemblies

IASPEI holds an Ordinary General Assembly every four years in conjunction with each Ordinary General Assembly of IUGG. Between the General Assemblies, IASPEI holds a Scientific Assembly, sometimes as joint meeting with one of the other Associations of IUGG.

Participation in IASPEI Activities

Since July 2015, all scientists participating in IASPEI activities are counted as members of IASPEI (see <http://www.iaspei.org/about/statutes-and-by-laws>). IASPEI welcomes all scientists throughout the world to join in seismological research.

IASPEI is subdivided into several Commissions, many of which have working groups for the study of particular subjects in their general areas of interest. On occasion, these internal IASPEI groups issue their own newsletters or circulars, and many maintain their own websites. At the IASPEI Assemblies, the groups organize specialist symposia, invite scholarly reviews and receive contributed papers that present up-to-the-minute results of current research. The IASPEI website gives, or provides links to, information on the range of IASPEI activities

The IASPEI Website

The IASPEI website is hosted by the International Seismological Centre (ISC) in Thatcham, UK and can be found at <http://www.iaspei.org/>.

Contacting IASPEI

The Secretary General is the main point of contact for all matters concerning IASPEI.

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