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Disaster in Japan: Messages from IASPEI and IUGG

IASPEI shares the deep sympathy of IUGG for the loss of life and property caused by the devastating M8.9 earthquake and tsunami. IASPEI would like to share the burden with you, one of the best seismological teams in the world, in the related scientific works and international cooperation.

With warm regards,
Zhongliang Wu, IASPEI President (2007-2011)
Peter Suhadolc, IASPEI Secretary General

FROM IUGG:

Dear Members of the Japanese National Committee for Geodesy and Geophysics, dear Colleagues and Friends, At this dramatic and most difficult time for your country, when Japan was struck by the most powerful earthquake and devastating tsunami (ever recorded for the last century in Japan), the IUGG Bureau expresses its deep sympathy to the Japanese nation and those who lost their life for these disasters.

Because of preventive management of natural disasters by the Japanese government and proper science education of the population living with risk by Japanese scientists, the country met the great release of the Earth's stress somehow well prepared, even though the event was unexpected in such a huge magnitude. We appreciate the efforts of all of you and many other geoscientists in your country who worked with the government on mitigation of natural disasters. Japan has been a great supporter of international efforts and the knowledge of tsunami behavior that has been gained by Japanese scientists, and implemented through tsunami warning systems, has helped to minimize the effects of the disaster in other parts of the Pacific and elsewhere.

IUGG and IASPEI are discussing with the Local Organizing Committee of the XXVth General Assembly of IUGG to hold a special ("last minute") session on the 11th March M8.9 earthquake in Japan.

Moreover, IUGG will hold a Union symposium on natural hazards and disasters organized by Kuni Takeuchi and several other IUGG experts in the framework of the ICSU project "Extreme Natural

Foreword

Dear readers,

We are very happy with the submission of abstracts for the IUGG2011 General Assembly in Melbourne; 5873 have been received which is a fantastic result.

This issue contains a short update on the preparations for the IUGG 2011 General Assembly, the announcement of IASPEI's 2013 Scientific Assembly venue, a short report on the recent 2011 Christchurch event and obituaries of two prominent seismologists who have left us in January.

Peter Suhadolc
Secretary General

Please note:

I am sending out the Newsletter as an attachment to an e-mail, trying to limit its size. It can also be downloaded from the IASPEI website:

<http://www.iaspei.org/newsletters/newsletters.html>

The IASPEI Newsletter is distributed to National Correspondents and other national representatives we know of, to all IASPEI officers, to IASPEI scientists who attended recent IASPEI Assemblies, and to various research organisations in countries around the world.

Events and Societal Implications". The last earthquake and tsunami are those belonging to extreme natural events, and we hope to discuss these extremes at this symposium as well as at the Open Forum which follows.

We wish you, your families, colleagues, and the Japanese nation a speedy recovery from these disasters. We are with you at this difficult time.

On behalf of the IUGG Bureau,
Tom Beer, IUGG President
Alik Ismail-Zadeh, IUGG Secretary-General



The XXVth General Assembly of the IUGG Melbourne, Australia, 2011 (See www.iugg2011.com)

A short update

IASPEI at IUGG2011

Earth on the Edge: Science for a Sustainable Planet

Melbourne Convention and Exhibition Centre, Australia
28th June - 7th July, 2011

With 5873 submitted abstracts, the conference is now well underway! By the end of March, the Conveners will prepare the program of their symposia and the grant applications will be sorted out. All grant applicants will be notified by the end of the month, so that everybody can take advantage of the Early Bird Registration rate. The final schedule of all symposia will be discussed at a meeting of the Secretaries General in Vienna early April.

I would like to remind you of two important dates:

- * **Early Bird Registration Deadline 11 April 2011**
- * **Standard Registration Deadline 24 June 2011**

The list of IASPEI Scientific Symposia has been published in the January issue of the IASPEI Newsletter and is available on the website at the following address:

<http://www.iugg2011.com/program-iaspei.asp>

The 37th IASPEI Scientific Assembly to be held in Göteborg, Sweden July 22-26, 2013

Following the decision of the IASPEI Executive in Cape Town in January 2009 to let the IASPEI Bureau decide on the IASPEI 2013 Scientific Assembly venue, the IASPEI Bureau has accepted, with pleasure, the proposal from the sister Associations of IAPSO and IAHS to hold a

Joint IAPSO/IAHS/IASPEI scientific assembly in Göteborg (Gothenburg), Sweden

The selected venue is the modern Göteborg Convention Centre and the official hotel will be Hotel Gothia Towers, part of the same complex. The three Secretaries General have already visited the venue in December and found it to be extremely convenient. A LOC, under the presidency of Prof. David Turner, Gothenburg University, has been already set up and is working towards a very successful meeting. Dr. Roland Roberts, IASPEI National correspondent from Sweden is member of the LOC.

A note on the 22 February 2011 Christchurch aftershock

M6.3 aftershock devastates Christchurch, New Zealand

On 22 February 2011 at 12:53 am (New Zealand daylight time) a magnitude 6.3 earthquake occurred about 10 km southeast of Christchurch city (population 350,000) at a depth of 5km. This is the largest aftershock so far of the M7.1 Darfield earthquake of 4 September 2010, which was centred about 40 km west of the city. It caused severe damage to the central business district (CBD) of Christchurch and the port town of Lyttleton, less severe damage to houses in the suburbs, but major disruption to infrastructure, including electricity, water and sewage services. Two weeks after the quake, the confirmed death toll is 166 and is expected to eventually reach 200; the CBD is still closed down; electricity has been restored to 95% and water supply to 80% of the city; but only half of the city has a functioning sewage connection. Up to 20% of residents have reportedly evacuated to other towns. The total economic losses are estimated to be US\$11 billion. Forty percent of buildings in the CBD are damaged beyond repair.

The September main shock occurred on the previously unmapped east-west-trending Greendale fault, situated to the east of the northeast-southwest-trending main seismic belt. This aftershock is on a sub-surface fault, which is located to the south of the eastern projection of the Greendale fault. The

mechanism of both events included elements of thrust and strike-slip.

The damage from this aftershock is much greater than that from the mainshock. Also, no lives were lost in the mainshock, which occurred early on a Saturday morning when most residents were safely asleep in their homes, whereas the aftershock occurred during the lunch hour on a business day when many people occupied the streets and buildings of the CBD. A number of people were trapped under falling masonry. However, most of the fatalities are due to the complete collapse of two concrete buildings, one built in the 1960s and the other in the 1980s. An enquiry has been launched into the design of these buildings and the assessment of their serviceability following the September main shock.

The ground motions were much higher than expected for an M6.3 earthquake. Vertical accelerations of more than 2g and horizontal accelerations of more than 1g were recorded in parts of the city. Well-designed modern buildings performed well, even though they were probably subjected to shaking in excess of their design levels. The Christchurch area is particularly susceptible to liquefaction, which was a major cause of damage to infrastructure. Liquefaction was more widespread than in the main shock, and resulted in more than 200,000 tonnes of silt being deposited on the surface after the earthquake.

Further information can be found at <http://www.geonet.org.nz/canterbury-quakes/>.

David Rhoades

Obituaries

John H. Hodgson, 1913 – 2011



John Hodgson, born in Toronto on 24 September 1913, died peacefully in Ottawa on 8 January 2011 at the Garry J. Armstrong Long Term Care Facility. He was married to Helen Baines Hodgson (1916 - 2006), and had three children.

John received, from the University of Toronto, a B.A. in Applied Mathematics in 1940, an M.A. in Geophysics in 1946, and a Ph.D in Geophysics in 1951. He worked for the Root Petroleum Company and Magnolia Petroleum Company from 1936 to 1938 in Arkansas and Illinois; for Schlumberger Well Surveying Corporation in California and Louisiana from 1940 to 1944; as Assistant Professor of Geophysics at the University of Toronto from 1945 to 1949; as Seismologist at the Dominion Observatory in Ottawa from 1949 to 1952; as Chief of Seismology at the Dominion Observatory from 1952 to 1964; as Director of the Dominion Observatories Branch at Energy, Mines, and Resources (EMR) from 1964 to 1970; as Director of the Earth Physics Branch at EMR from 1970 to 1973; and as Chief Seismologist with the UNESCO Seismological Project in Southeast Asia from 1973 to 1979. He was elected a Fellow of the Royal Society of Canada in 1958 and **was the President of the International Association of Seismology and Physics of the Earth's Interior from 1963 to 1967**. As well as his involvement in IASPEI, John was also instrumental in founding the International Seismological Centre in 1964 and establishing its funding model. In 1953 he produced the first seismic zoning map of Canada, and in 1979, produced a two-volume history of the Dominion Observatory.

John was a true seismologist, one of the early people to think on a larger scale about motions (now called slip vectors) associated with earthquakes. He was Dominion Astronomer (in the days when federal astronomy and geophysics were combined) for a while following Beales and then Director of the Earth Physics branch before it was combined with the GSC. A sturdily built energetic sociable man always full of new positive plans for doing things. In the days when Canada had a very high profile in international geophysics, he loved big international events and being involved on international committees.

John and Helen travelled extensively, both for business and pleasure and enjoyed exploring the world. John loved to sing and did so often and spontaneously. He could quote vast tracts of poetry and verse and, for years, he and Helen attended the Stratford and Shaw Festivals. John and Helen enjoyed entertaining, and welcomed guests into their home with great warmth and hospitality. John will be remembered for his vast repertoire of song and verse, for his wit, and for his gracious and kind demeanour.

To send condolences, tributes or donations please visit www.tubmanfuneralhomes.com .

John Adams and Ted Irving

Leon Knopoff, 1925 - 2011



Leon Knopoff, an internationally renowned scientist who advanced the fields of physics, seismology and music, died at home on Jan. 20 surrounded by his wife and three children.

He earned his Ph.D. in physics and mathematics from the California Institute of Technology in 1949 and joined the UCLA faculty the following year. He became a research musicologist in the UCLA Institute of Ethnomusicology shortly after its creation in 1960.

His numerous honors included election as a member or fellow of the National Academy of Sciences (1963), the American Association for the Advancement of Science (1964), the American Academy of Arts and Sciences (1965), the Guggenheim Foundation (1976) and the American Philosophical Society (1992). He earned the Gold Medal of the Royal Astronomical Society (U.K., 1979), the H. F. Reid Medal of the Seismological Society of America (1990), the Emil Wiechert medal of the German Geophysical Society (1978), and a Docteur Honoris Causa from Université Louis Pasteur, Strasbourg (2004). Knopoff visited China in the 1970s, returning often to collaborate. He was named the first honorary professor of the Institute of Geophysics of the China Earthquake Administration (2004).

He supervised 39 Ph.D. students and 40 postdoctoral scholars from 17 countries. Known for his exceptional clarity in teaching, he presented the complex simply with an infectious enthusiasm and a caring empathy for his students. They have been recognized for their rigorous training in fundamentals and have gone on to successful academic and industrial careers. Four outstanding teaching awards earned from UCLA's Physics Department were among his treasures.

His exemplary career was replete with outstanding contributions to fundamental geophysics, and by applying ideas from mathematical physics to seismology he contributed to both fields. Knopoff was extremely creative, unusually prolific and elegant in his choice of research topics. The hallmarks of his research were extreme rigor and thorough consideration of alternate interpretations.

Knopoff's theoretical advances cover nearly everything seismological, including diffraction, attenuation, creep, equations of state, scattering, cracked media, and dynamic crack propagation. He was one of the first to recognize that modern developments in nonlinear science such as chaos, strange attractors, fractality, and self-organized criticality also applied to earthquakes.

In 1956, Knopoff published the basis for the "double couple" earthquake source model, so-named in a 1960 article he wrote with Freeman Gilbert. Knopoff showed that discontinuous displacement across a fault results in seismic waves identical, in the far field, to those from two pairs of opposing body forces. This development enabled rapid computation and later evolved into the moment tensor representation of seismic sources. He showed how motion on a boundary, such as a seismic fault, is linked to displacements in a medium, such as the Earth's crust, and demonstrated that such displacements are proportional to the slip velocity across a fault plane. In the 1960s, Knopoff and his colleagues developed computational approaches for fault plane dynamics and the propagation of seismic waves. These developments underpinned methods to invert seismic waves so that focal mechanisms and velocity along the ray path could be inferred. Another milestone, recognized as a first principle in seismology, is the 1964 representation theorem by Robert Burridge and Knopoff. Their continued collaboration included the highly cited 1967 model of interacting springs and blocks: a basis for simulating self-organization and chaos in the earthquake dynamical system. It predated by two decades such developments in physics.

Knopoff pioneered the installation of temporary long-period seismograph stations throughout the European Alps. In 1966, he and colleagues Stephan Mueller and Walter Pilant were the first to process long-period seismograms digitally. He also helped to develop ultra-long period seismometers for the South Pole. Always a pioneer, he was first in measuring solid Earth polar tides and vibrational modes there, important because they are unaffected by Earth's rotation and elliptical shape. He used global seismographic data to define the main structures of tectonic plates and showed that the oceanic lithosphere thins at mid-ocean ridges and lies above a decoupling zone between plates and the mantle below. In 1972, Knopoff demonstrated first that as stable continental shields plough through the mantle, they are slowed by their deep roots or 'keels.'

With Yan Kagan, Knopoff developed the stochastic branching model of faulting that displays the clustering properties of earthquake catalogs, including foreshocks, aftershocks, and weak clustering of mainshocks. This model anticipated by years the popular Epidemic Type Aftershock Model (ETAS).

Knopoff had a talent for setting large-scale projects into motion. In 1963 he became the first Chair of a

National Academy of Sciences Committee to coordinate US participation in the International Upper Mantle Project. The Project was proposed by the International Union of Geodesy and Geophysics and adopted by the International Council of Scientific Unions as a complement to the International Geophysical Year. The US Committee organized the first transcontinental geophysical survey of North America, started a project of scientific deep-earth drilling, and produced crucial data supporting the then-controversial hypothesis of global plate tectonics. Knopoff was an ardent supporter of UCLA's Institute of Geophysics and Planetary Physics, serving as its Director from 1972 to 1986. In 1991 he joined a small group including Lynn Sykes, Rob Wesson, and Kei-iti Aki who successfully pursued the creation of the still-vigorous Southern California Earthquake Center.

His creative contributions far surpassed seismology. With UCLA's George Kennedy he developed thermoluminescence dating, a method now practiced by archaeologists and art historians. It works because rocks and pottery contain traces of radioactive elements whose decay products become trapped in a sample. Its age can then be inferred from the amount of light emitted when the sample is heated. But the light which music gives also interested him. Knopoff applied pattern recognition and time-series analysis to quantify the information content of music and writing, asking what makes them distinctive and pleasant. In all fields he took delight in the marriage of discovery and rigor.

Leon Knopoff was a warm-hearted and adventurous man with an endearing humor evident in his elegant writing. He was very much at home climbing glaciers, hiking in the Sierras, advancing theoretical physics, and delighting in his family. A remarkable polymath, he effectively spanned the "two cultures," leaving an extraordinarily rich record of achievement. His cadre of students and colleagues will continue his work as they miss him.

David D. Jackson and Paul M. Davis

Meetings Calendar

A calendar of scientific meetings relevant to the interests of IASPEI scientists is maintained at:

<http://www.iaspei.org/meetings/forthcoming.html>

where more details can be found. We report below just the titles, dates, places and websites of the forthcoming meetings.

2011

European Geosciences Union General Assembly 2011

April 03 – 08, 2011, Vienna, Austria

Website: <http://meetings.copernicus.org/egu2011/>

Sixth International Conference on Seismology and Earthquake Engineering (SEE6)

May 16-18, 2011, Tehran, Iran

Papers due: January 31, 2011

Pre-registration: February 28, 2011

Website: www.see6.ir

7th International Workshop in Statistical Seismology

May 25-27, 2011, Thera Is. (Santorini), Greece

Contact person: Dr Gerassimos A. Papadopoulos, statsei7@gein.noa.gr.

Web site:

<http://www.gein.noa.gr/statsei7/back/index.html>.

CTBT: Science and Technology 2011 (S&T2011) scientific conference

June 8-10 June, 2011, Hofburg Palace, Vienna, Austria.

Website: <http://www.ctbto.org/specials/ctbt-science-and-technology-20118-10-june-2011-vienna-austria/>

XXV IUGG2011 GENERAL ASSEMBLY

"Earth on the Edge: Science for a Sustainable Planet"

June 27 - July 8, 2011, Melbourne, Australia

Website: <http://www.iugg2011.com>

International Symposium on

Geophysical Imaging with Localized Waves

July 24-28, 2011, Sanya, Hainan Island, China.

Contact person: Wu Ru-Shan (wrs@pmc.ucsc.edu)

12th International Workshop on Modeling of Mantle Convection and Lithosphere Dynamics

August 20-25, 2011, Hotel Döllnsee-Schorfheide, Germany (about 80 km from Berlin)

Contact person: Bernhard Steinberger, bstein@gfz-potsdam.de

Website: http://www.gfz-potsdam.de/events/2011/Mantle_Lithospheric_Dynamics_Workshop

4th IASPEI International Symposium:

Effects of Surface Geology on Seismic Motion

August 23-26, 2011, University of California, Santa Barbara, USA

Contact persons: Ralph Archuleta

ralph@crustal.ucsb.edu

or Jamie Steidl, steidl@crustal.ucsb.edu

Website: <http://esg.eri.ucsb.edu/>

INTERNATIONAL CONFERENCE "EARTHQUAKE FORECASTING-2011"

September 12-15, 2011, Çanakkale, Turkey

Website: www.efc2011.org.

UGI2011 – Regional Geographic Conference

November 14-18, 2011, Santiago, Chile

Contact: kbecker@fisa.cl

Website: www.ugi2011.cl

General Information about IASPEI

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

The other IUGG Associations are:

International Association of Cryospheric Sciences
[\(IACS\)](#)

International Association of Geodesy [[IAG](#)]

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 Geomagnetism and Aeronomy ([IAGA](#))

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 meeting with one of the other Associations of IUGG.

Participation in IASPEI Activities

IASPEI welcomes all scientists throughout the world to join in research into Seismology. IASPEI is subdivided into a number of 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 web sites. 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 web site gives, or provides links to, information on the range of IASPEI activities.

The IASPEI Web site

Information on IASPEI 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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