INTERNATIONAL WORKSHOP & SYMPOSIUM
SIESMIC PROBING OF CONTINENTS & THEIR MARGINS

BMR PUBLICATIONS COMPACTUS
(LENDING SECTION)

Australia
1788-1988
International Workshop and Symposium

SEISMIC PROBING OF CONTINENTS AND THEIR MARGINS

1 - 8 JULY, 1988, Canberra, Australia.

PROGRAM AND INFORMATION

Bureau of Mineral Resources, Geology & Geophysics, Canberra, Australia.
ORGANIZING INSTITUTIONS

The International Workshop and Symposium "Seismic Probing of Continents and their Margins" has been jointly organized by the following institutions in Australia:


-- The Bureau of Mineral Resources, Geology and Geophysics of the Australian Department of Primary Industry and Resources.

-- The Research School of Earth Sciences of the Institute of Advanced Studies, Australian National University.

The conference is sponsored internationally by:

-- Working Group 6 of the Inter-Union Commission on the Lithosphere (ICL).

-- The Commission on Controlled Source Seismology of the International Association of Seismology and Physics of the Earth's Interior (IASPEI).

FINANCIAL SUPPORTERS

The organisers wish to acknowledge and thank the following financial contributors to the conference without whom it would not have been possible to organise such a meeting in Australia.

-- The International Association of Seismology and Physics of the Earth's Interior.

-- The Inter-Union Commission on the Lithosphere.

-- The Australian Academy of Science.

-- The Canberra Community Development Fund

-- Qantas Airways Ltd

-- Australian Airlines

-- CSR Oil & Gas Div.

ACKNOWLEDGEMENTS

The Organizing Committee wish to acknowledge the help and assistance from staff in the Bureau of Mineral Resources, Geology and Geophysics in the organization of office services, typing, vehicle support, and drawing office services. Also, the co-operation of the staff of the Research School of Physical Sciences, John Curtin School of Medical Research, Melville Hall, Computer Services Centre, and the Research School of Earth Sciences at the Australian National University is gratefully acknowledged.
ORGANIZING COMMITTEE

Chairman       D. M. Finlayson
Secretary      J. H. Leven
Treasurer      C. D. N. Collins
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   F. J. Moss
   P. Wellman
   P. E. Williamson
   C. Wright

Abstracts editor  J. C. Dooley
Poster manager   B. R. Goleby
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Field excursion organisation  -  P. Stuart-Smith
                             K.A.W. Crook
                             M. Rickard
                             J.H. Leven
                             H. Basden
                             B. Franklin
### WORKSHOP TIMETABLE

#### FORENOON, FRIDAY 1 JULY

**Huxley Lecture Theatre**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.00</td>
<td>Opening - <strong>Prof. K. Fuchs</strong>, Chairman, Inter-Union Commission on the Lithosphere.</td>
</tr>
<tr>
<td>09.20</td>
<td>Matthews, D.H. &amp; the BIRPS Group, 12000 km of BIRPS: highlights and plans.</td>
</tr>
<tr>
<td>10.35</td>
<td>Morning tea/coffee</td>
</tr>
<tr>
<td>11.10</td>
<td>Damotte, B., ECORS experience on explosive versus vibrators multi-offset seismic recording, - a few examples.</td>
</tr>
<tr>
<td>12.00</td>
<td>Goleby, B.R., &amp; B.L.N. Kennett, Methods for improving the resolution of deep seismic reflections.</td>
</tr>
<tr>
<td>12.25</td>
<td>Lunch</td>
</tr>
</tbody>
</table>

#### AFTERNOON, FRIDAY 1 JULY

**Huxley Lecture Theatre**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.55</td>
<td>Marthelot, J-M., &amp; M. Bano, Signal separation by coherence estimation: application to the ECORS data.</td>
</tr>
<tr>
<td>14.20</td>
<td>Peddy C., Amplitude-with-offset studies of the lower crust on BIRPS synthetic-aperture deep seismic reflection data.</td>
</tr>
<tr>
<td>15.10</td>
<td>Afternoon tea/coffee</td>
</tr>
<tr>
<td>15.35</td>
<td>Luschen, E., P. Hubral, &amp; K. Fuchs, Shear wave exploration of the crust beneath the Black Forest, Southwest Germany.</td>
</tr>
<tr>
<td>16.00</td>
<td>Dahl-Jensen, T., Static corrections on crystalline bedrock.</td>
</tr>
<tr>
<td>16.25</td>
<td>Fuchs, K., K.-J. Sandmeier, &amp; B. Nolte, Anisotropy in crust and upper mantle - observations and models.</td>
</tr>
<tr>
<td>16.50</td>
<td>Discussion Period</td>
</tr>
<tr>
<td>17.20</td>
<td>End of day's proceedings</td>
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<tr>
<td>17.30</td>
<td>Drinks at Burgmann College</td>
</tr>
</tbody>
</table>
FORENOON, SATURDAY 2 JULY

Huxley Lecture Theatre

09.00  Hardy, R.J.J., Continental margins and multiple reflections.
09.25  Mutter, J.C., P. Buhl, Deep seismic reflection imaging of continental margins developed from wide-aperture CDP profiling.
09.50  Enachescu, M.E., & N. Baker, Acquisition and processing of marine deep seismic reflection data collected offshore Newfoundland, east coast Canada.
10.15  Hajnal, Z., I. Kesmarky & A. Overton, Reflection survey on Hobson's Choice Ice Island, Arctic Ocean.
10.40  Morning tea/coffee

11.10  Kravis, S., M.F. Coffin & R. Whitworth, Deep seismic studies of the Tasman Sea Basin - technical aspects.
12.00  Mereu, R.F. & D. Epili, Pq Shingles: Results from the GLIMPCE onshore refraction data.
12.25  Lunch

AFTERNOON, SATURDAY 2 JULY.

Huxley Lecture Theatre

13.55  Totterdell, I.J., & M.R. Warner, Determining lower crustal seismic velocities from long-offset reflection data.
14.20  Fluh, E.R., Piggy-back recording of Vibroseis signals during the BELCORP/DEKORP survey through the Rhenish Massif.
14.45  Bock, G., Converted waves: examples from the crust and upper mantle.
15.10  Afternoon tea/coffee

16.25  Discussion Period
16.50  End of presentations for the day
SUNDAY 3 JULY

There is no formal scientific programme on this day.

It is suggested that those who are so inclined gather for lunch at some convivial location and if there is enough interest, an informal afternoon tour of the Canberra region can be arranged. This would take in some of the places where Australian wildlife can be viewed, etc.

An announcement will be made at the scientific sessions on Saturday 2 July regarding the details of arrangements.
FORENOON. MONDAY 4 JULY

Huxley Lecture Theatre

09.00  **Cook, F.A.,** & **K.C. Coiffin**, Three-dimensional imaging of crustal structure in the northwestern Canadian Arctic.
09.25  **Milkereit, B.,** A.G. Green, M.W. Lee, W.F. Agena, & C. Spencer, Pre- and post-stack migration and image enhancement techniques: application to GLIMPCE reflection data.
09.50  **Mooney, W.D.,** K.F. Priestly, C.A. Thompson, R.B. Smith, & the PASSCAL Basin and Range Working Group, PASSCAL Basin and Range lithospheric seismic experiment, northwestern Nevada, U.S.A.
10.15  **Gibson, B.** & A. Levander, CMP stacked images of randomly heterogeneous targets.
10.40  **Morning tea/coffee**
11.10  **Cao, S-H.,** & B.L.N. Kennett, Modelling reflections from the deep crust in three dimensions.
12.00  **Liu, Q.** & H. Fan, The ray-matrix method of synthetic seismograms for different source and receiver structures.
12.25  **Lunch**

AFTERNOON. MONDAY 4 JULY

13.30  **Sambridge, M.S.,** & B.L.N. Kennett, 3-D structure of southeastern Australia - a nonlinear inversion of regional travel times.
14.20  **Minshull, T.A.,** & **R.S. White**, Imaging fluids on seismic profiles across the Makran accretionary prism.
15.10  **Afternoon tea/coffee**
15.35  **Gibson, B.** & A. Levander, Seismic reflections from randomly heterogeneous targets and the interpretation of wide-angle common shot gathers.
16.00  **Roy-Chowdhury, K.,** R.A. Phinney, & J. Pan, Consequences of multiple scales of layering for the crustal seismic response.
16.25  **Hobbs, R.W.,** & the BIRPS Group, Determining the physical properties of the crust.
16.50  **Summing up**
17.20  **End of Workshop.**
TUESDAY 5 JULY

07.30 Field Excursion to the Tumut Trough departs.

FORENOON

Melville Hall
10.00 - 12.30 Posters may be set up and viewed.

AFTERNOON

Melville Hall
14.00 - 16.30 Posters may be set up and viewed.

EVENING

22.00 Return of Excursion bus to Canberra.
**SYMPOSIUM TIMETABLE**

**FORENOON, WEDNESDAY 6 JULY**

**Huxley Lecture Theatre**

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
</tr>
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<tbody>
<tr>
<td>09.00</td>
<td><strong>Opening</strong> - Prof. R. W. R. Rutland, Director, Bureau of Mineral Resources, Geology and Geophysics, Canberra.</td>
</tr>
<tr>
<td>09.20</td>
<td>Brown, L., Expanding frontiers for deep reflection profiling: deeper, faster, older, brighter, farther.</td>
</tr>
<tr>
<td>10.35</td>
<td>Morning tea/coffee</td>
</tr>
</tbody>
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**Interior Convergent Terranes and Fold Belts.**

**Huxley Lecture Theatre**

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>11.00</td>
<td>Hall, J., G. Quinlan, Deep crustal fabrics and deformation styles from reflection profiles of the Appalachian/Caledonide system.</td>
</tr>
<tr>
<td>11.20</td>
<td>Bois, C., P. Choukroune, A. Nicolas, B. Pinet &amp; M. Cazes, Contribution of deep seismic profiling to the study of major geodynamic problems in France and adjacent areas.</td>
</tr>
<tr>
<td>11.40</td>
<td>Reichert, G. &amp; DEKORP Research Group, Results of deep-seismic reflection investigations in the Rhenish Massif.</td>
</tr>
<tr>
<td>12.00</td>
<td>Pharaoh, T. &amp; R.A. Chadwick, Lower crustal heterogeneity beneath Britain from deep seismic reflection data.</td>
</tr>
<tr>
<td>12.20</td>
<td>Mueller, St., Lithospheric structure and deep-reaching processes beneath the Alps.</td>
</tr>
<tr>
<td>12.40</td>
<td>Lunch</td>
</tr>
</tbody>
</table>

**Active and Passive Margins**

**Florey Lecture Theatre**

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker(s)</th>
</tr>
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<tbody>
<tr>
<td>11.00</td>
<td>Davey, F.J. &amp; T. Stern, Crustal seismic measurements across the convergent plate boundary, North Island, New Zealand.</td>
</tr>
<tr>
<td>12.40</td>
<td>Lunch</td>
</tr>
</tbody>
</table>
AFTERNOON, WEDNESDAY 6 JULY

Interior Convergent Terranes and Fold Belts.

Huxley Lecture Theatre

14.45 Polino, R., and the ECORS/CROP Group, The CROP/ECORS Western Alps seismic geotraverse.
15.05 Pongay, K., C. Hegedus, & Z. Timar, Deep seismic investigations of the lithosphere in Hungary.
15.25 Afternoon tea/coffee

Active and Passive Margins

Florey Lecture Theatre

14.45 De Voogd, B., C.E. Keen & W. Kay, Inherited structures, deep fault geometry, and basin structural styles in eastern offshore Canada.
15.05 Teysier, C., J. Pershing, & K. Kleinspehn, Stratotectonic palaeo-stress analysis of Spitsbergen Central Basin: implications for basin development and relative plate motion.
15.25 Afternoon tea/coffee
AFTERNOON, WEDNESDAY 6 JULY

Interior Convergent Terranes and Fold Belts.

Huxley Lecture Theatre

16.05 Leven, J.H. & D.M. Finlayson, Mid-crustal dynamics controlling basin formation: examples from the Devonian sub-basins in western Queensland.
17.25 End of session for the day

Active and Passive Margins

Florey Lecture Theatre

15.45 Enachescu, M.E., Seismic probing of the Newfoundland continental margin (east coast Canada): extent of the Mesozoic rift system.
16.05 Stern, T., & F.J. Davey, Lithospheric flexure as seen in seismic reflection data: examples from plate boundaries within New Zealand and Antarctica.
16.25 Shimamura, H., & T. Iwasaki, Different subduction structures in active margins near Japan revealed by OBS detailed refraction studies.
16.45 Moriya, T., Recent studies for upper crustal structure as derived from explosion seismic observations in Japan.
17.05 Zehnder, C.M., & J.C. Mutter, Deep seismic and geochemical evidence for rift-induced magmatism during breakup of the N. Atlantic.
17.25 End of session for the day

EVENING, WEDNESDAY 6 JULY

19.00-21.30 Drinks and view posters at Melville Hall
FORENOON, THURSDAY, 7 JULY

Huxley Lecture Theatre

08.30  Warner, M.R., Basalts, water or shear zones in the lower crust?
08.55  Fountain, D.M., Seismic properties of lower continental crust based on laboratory measurements: The Kapuskasing Uplift example.
09.20  Etheridge, M.A., Crustal fluids and their role in interpreting deep seismic data.
09.45  Sobolev, S., & A.Y. Babeiko, Theoretical predictions of the seismic structure for the lower crust of different chemical compositions.
10.10  Morning tea/coffee

Extensional Terranes and Rifts

Huxley Lecture Theatre

10.30  Hauser, E.C. Reflection Moho at 50 km (16 s) beneath the Colorado Plateau on COCORP deep reflection data.
10.50  Catchings, R. Crustal and upper mantle structure beneath large basalt-covered plateaus and extensional areas of the north-western United States: implications for lithospheric extensional processes.
11.10  Klemperer, S.L., & the BIRPS Group, Reflection signatures of Palaeozoic terrane accretion on BIRPS data.
11.30  Smith, C.A., & the BIRPS Group, GRID - 3-dimensional mapping of crust and mantle reflections, north of Scotland.
11.50  Pinet, B. & B. Colletta, Probing into extensional sedimentary basins.
12.10  Stein, A.M., & D.J. Blundell, Basement control upon the structural styles of sedimentary basins, NW Scotland, U.K.
12.30  Lunch

Crustal Compositions and Processes

Florey Lecture Theatre

10.50  Chrastno P.N., Seismic characteristics of two exhumed sections of the continental crust: the Kohistan Volcanic Arc (N. Pakistan), and the Lofoten Archaean suite (N. Norway).
11.10  Sandmeier, K-J., F. Wenzel, & K. Fuchs, Constraints on the petrological composition of the lower crust from modelling compressional and shear-waves.
11.50  Reston, T.J., Modelling lower crustal structure.
12.10  Roots, W.D., A correlation between seismic reflection, magnetic anomaly and basement structural patterns in the chaotic areas of spreading-formed basins.
12.30  Lunch
AFTERNOON, THURSDAY 7 JULY

13.45 Posters displays at Melville Hall

Authors of poster papers will be at their posters throughout the afternoon to explain posters and answer questions.

Titles of Poster Papers

Bock, G., S-wave usage in shallow refraction seismics.
Call, J.F., C.D.N.Collins & G.S.Lister, Digital recording and seismic profiles in Bass Strait.
Davies, G.F., Mantle upwelling, lithospheric thinning and rifting.
Dawson, P.B. & H.M. Iver, Velocity structure of the crust and upper mantle beneath the Long Valley Caldera, California.
Dyment, J., J.C.Sibuet & B.Pinet, Deep structure of the Celtic Sea and Western Approaches: a discussion about the formation of basins.
Enachescu, M.E., The tectonic and structural framework of the eastern Newfoundland continental margin.
Green, A.G., and others, Deep reflection profiling across high grade metamorphic terranes.
Green, R.W.E., J. Borchers, & Theron, W., A PC based, portable, continuous seismic recording system.
Hardy, R.J.J., R.W. Hobbs, & M.R. Warner, Seismic event labelling.
Hearn, S.J., Network computing concepts in seismic data analysis.
Henvey, T.L., P.C. Leary & T.V. McEvilly, VSP and CDP profiles of the upper crust from the Cajon Pass deep scientific borehole site - a joint DOSECC/CALCRUST experiment.

Hobbs, R.W., D. Scheirer, & the BIRPS Group, How near surface geology affects the imaging of the lower crust.

Hurich, C.A., & the Norwegian Lithosphere Group, Norwegian Deep Seismic Project; deep seismic profiling in Norway.

Juhlin, C., G. Rissler-Akesson, & D. Dyrelius, Results from surface and borehole investigations during the Deep Gas Drilling Project in the Siljan impact structure.


Kaufman, S., & the COCORP staff, The COCORP transects.


Keen, C.E., Marillier, F., P. Durling, & W.A. Kay, Deep seismic reflection lines from the Canadian Appalachians.


Klemperer, S.L., & the BIRPS Group, Six parallel crossings of the Iapetus suture, Palaeozoic lower crustal reflectors traced for 900 km along strike.


Levander, A., & A. Meltzer, Wide angle and vertical incidence seismic data in the central California margin.

Leven, J.H., P. Stuart-Smith, M. Rickard, & K.A.W. Crook, A deep seismic survey across the Tumut Trough, southeastern Australia.

Liu, Q. & Y. Lu, A procedure for determining the velocity structure of the lithosphere from broadband teleseismic P waveforms.

Mereu, R.F., B. Dunn & J. Brunet, An efficient method for sending a large seismic section from a mainframe computer to a dot matrix printer located at a remote site.

Moriya, T., Recent studies for upper crustal structure as derived from explosion seismic observations in Japan.


Peddy, C., & D. Scheirer, How much do background noise levels affect what we see on deep seismic reflection profiles.


Reichert, G. & the DEKORP Research Group, Results of DEKORP investigations.

Roy-Chowdhury, K., & R.A. Phinney, Reprocessed seismic sections: a tour through eastern U.S.A.

Scott-Robinson, R.A., & D.J. Blundell, Mobil Survey, southern North Sea, for BIRPS.


Shaw, R.D., B.R. Goleby, K. Lambeck, B.L.N. Kennett, & C. Wright, Tectonic evolution of the central Australian region.

Smith, C.A., & the BIRPS Group, Mantle reflections mapped in 3-dimensions.


Sugiharto, S., S.A. Greenhalgh, & C. Wright, Tomographic reconstruction of upper crustal velocity variations in the Arunta Block, central Australia.


Warner, M.R., Absolute reflection coefficients from deep reflectors.

White, N., & the BIRPS Group, Extension and subsidence of the continental lithosphere using regional seismic reflection profiles from the North Sea.

17.30 Finish poster presentations at Melville Hall

EVENING, THURSDAY 7 JULY

Canberra Club, West Row, Civic.

19.00 Pre-dinner drinks.
19.30 Conference dinner.
FORENOON, FRIDAY 8 JULY

Huxley Lecture Theatre


08.55 White, R.S., Magmatism at continental rifts and margins.

09.20 Keen, C.E., Marillier, F. and the Lithoprobe East Working Group, Three dimensional geometry of the Canadian Appalachians from deep seismic reflection data.

09.45 Jackson, I., R.L. Rudnick, S.Y. O'Reilly & C. Bezant. Laboratory wave velocity measurements and the constitution of the continental lithosphere.

10.10 Morning tea/coffee

Extensional Terranes and Rifts

Huxley Lecture Theatre


11.10 Holbrook, W.S., R. Catchings, W.D. Mooney, C. Jarchow, & G. Thompson, Combined wide-angle and near-vertical incidence seismic profiling of the lithosphere in the northwestern Basin and Range province, Nevada, U.S.A.


12.10 Wright, J.A., & J. Hall, Anomalous crustal structure from deep seismic profiling in the Karoo Basin, Botswana.

12.30 Lunch

Precambrian Terranes

Florey Lecture Theatre

10.30 Korsch, R.J., The tectonics of central Australia: the 1985 BMR seismic experiments.


11.10 Goleby, B.R., B.L.N. Kennett, R.D. Shaw, C. Wright, & K. Lambeck, Results from deep seismic reflection profiling in the Precambrian Arunta Block of central Australia.


12.10 Fluh, E.R., Ch. Walther, & U. Luosto, Crustal structure along the POLAR profile in northern Finland.

12.30 Lunch

AFTERNOON, FRIDAY 8 JULY

Extensional Terranes and Rifts

Huxley Lecture Theatre

13.45 Goodwin, E., D. Okaya, & G. Thompson, Piggyback seismic reflection data from the Basin and Range - Colorado Plateau transition zone, western USA.


14.45 Enachescu, M.E., Seismic probing of the eastern Newfoundland continental margin (east coast Canada): continental - ocean transition zone.

15.05 Afternoon tea/coffee

Precambrian Terranes

Florey Lecture Theatre


14.25 Juhlin, C., Interpretation of the reflections in the Siljan Ring area based on the results from the Gravberg-1 borehole.


15.05 Afternoon tea/coffee

Huxley Lecture Theatre

15.25 Fountain, D.M., Controls of underplating and metamorphism in extensional terrains.

15.50 Clowes, R.M., Canadian Lithoprobe, a scientific update: new images of the continental crust.


16.40 Discussion Period

17.30 End of Symposium