

국제암반역학회

INTERNATIONAL SOCIETY FOR ROCK MECHANICS

Società Internazionale di Meccanica delle Rocce

NEWS JOURNAL

www.isrm.net

The 2013 ISRM Year, the ISRM Board and Council meetings,
SINOROCK2013, EUROCK2013, EUROCK Field Trip,
ISRM Vice-Presidents' regional reports and
overview of ISRM Commissions' progress



This year's EUROCK Symposium was held in Wrocław, Poland in September 2013. A feature of the town is the presence of many small gnome sculptures (< 0.5 m tall) in the streets. Here two gnomes are pushing on a rock ball—Newton's 3rd Law in action!

Annual Review 2013

Activities of the ISRM Board,
Secretary-General's Report,
ISRM Information, Vice-Presidents'
and Technical Oversight Committee reports

Profile of the next
ISRM President-Elect 2015–2019
Dr Eda Quadros
Pages 8–9

Rock Mechanics and Rock Engineering: Structures on and in rock masses
The 2014 ISRM European Rock Mechanics Symposium (EUROCK 2014)
 Vigo, Spain, 27-29th May 2014

Organized by:



www.eurock2014.com/

EUROCK
VIGO 2014



I am delighted to invite you to participate in the
2014 ISRM European Rock Mechanics Symposium (EUROCK 2014)
 to be held in Vigo, Spain, on May 27-29, 2014.

This Symposium is a common endeavour of the University of Vigo
 and the SEMR (Spanish National Group of the ISRM).

We have prepared an appealing programme, with a good number of keynote lectures by some of the world's leading experts on rock mechanics. Two short courses and a Workshop (on EUROCODE7 facilitated by John Harrison) will also take place before the Symposium and some interesting visits to different mine and civil engineering works are in preparation for the aftermath. You will also have the privilege to visit our town and region. Lively and dynamic, Vigo is a young and modern city, very famous for the beauty of its bay and the quality of their fish and shellfish delicacies.

Leandro R. Alejano, Chairman of the Organising Committee



Nick Barton - Norway, Brazil

Shear strength of rock, rock joints and rock masses: some problems and solutions



Anna Maria Ferrero - Italy

Rock mass characterization by means of advanced survey methods



Xia-Ting Feng - China

Case histories of rock engineering projects in China



Claudio Olalla - Spain

Foundations on rock masses



Derek Martin - Canada

The impact of brittle behaviour of rocks on excavation design



José Lemos - Portugal

Representation of rock discontinuities in safety analysis of large dams



Carlos Carranza-Torres - USA

Numerical modelling in rock engineering

One-day Short Course on
 "Rock Mechanics Solutions for
 Ornamental Rock Protection &
 Archaeological Site Conservation"
 given by José Delgado Rodrigues

Two-day Short Course on
 "Numerical Modelling in
 Rock Engineering"
 using 2-D and 3-D finite element tools:
 Phase2 and RS3

Three technical visits,
 including one to a slate mine



Underground roofing slate mine.



Underground roofing slate mine.



Roofing slate transformation plant.



Las Médulas: old roman gold mine.





ARMS8 - 2014 ISRM International Symposium - 8th Asian Rock Mechanics Symposium - Rock Mechanics for Global Issues - Natural Disasters, Environment and Energy -

www.rocknet-japan.org/ARMS8

The Japanese Committee for Rock Mechanics (JCRM) — Japan National Group for ISRM — is pleased to extend an invitation to you to the 8th Asian Rock Mechanics Symposium “ARMS8”, the 2014 ISRM International Symposium. The Symposium will be held on 14–16 October, 2014 in Sapporo, a modern and beautiful city in Hokkaido, the northern island of Japan. The theme of the Symposium is “Rock Mechanics for Global Issues: Natural Disasters, Environment and Energy”. The goal of the Symposium is to respond to those issues and to promote the exchange of knowledge and experiences in various areas of rock mechanics and rock engineering. On behalf of JCRM, we invite all of you to join ARMS8 in Sapporo.



Prof. Norikazu Shimizu,
Prof. Katsuhiko Kaneko

Symposium Hall:
Royton Sapporo,
Hotel and Convention Centre



The Royton Sapporo Hotel is located in the heart of Sapporo City. It is conveniently accessible from New Chitose Airport. The journey takes about 40 minutes to Sapporo City by the Rapid Airport Express railway. There are several direct flights from Eastern Asian countries to New Chitose Airport; it takes ~ 90 minutes from the Tokyo area airports.

Mitigation of Geo-hazards

Earthquakes and Rock Dynamics, Risk and Hazard Management, Disaster Mitigation, and Slope Stability

Environmental Issues

Global Warming, Carbon Dioxide Capture and Storage, Radioactive Waste Disposal, and THMC Coupling

Energy Resources

Mining Engineering, Petroleum Engineering, Geothermal Power Generation, and Reservoir Engineering

New Technologies and Fundamental Aspects

Rock Properties and Site Characterization, Geophysical Prospecting and Testing Methods, Tunnels and Underground Spaces, Maintenance and Life Cycle Costs, and Field Measurements and Back Analysis

ORGANIZED BY



A variety of Short Courses will be given
On 12 & 13 October 2014,
see the ARMS8 website

CO-SPONSORED BY



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Editor's Introduction to this Volume



John A Hudson

Under the leadership of our President, Professor Xia-Ting Feng, the ISRM continues to thrive—with the individual membership now over 7000. There has been a steady increase in membership every year since 2003 when there were fewer than 5000 members, see the Secretary-General's report on page 16+.

Another indicator of the ISRM's increased activities is the quantity of ISRM Commissions, which now number 17; these operate for the four-year duration of each President's tenure and produce reports in their last year. They are now under the guidance of the Technical Overseeing Committee (TOC) run by Professor Yuzo Ohnishi (ISRM Vice-President at Large), and cover a wide range of rock mechanics and rock engineering subjects, see the TOC overview report starting on page 46.

There have been successful ISRM symposia this year:

- **SINOROCK2013**, a specialised conference held in Shanghai, China, 18–20 June 2013 (see page 26+);
- **EUROCK2013**, the ISRM International Symposium, 21–26 September 2013 (see page 28+); and

- **In Situ Rock Stress**, a specialised conference held in Sendai, Japan, 20–22 August 2013.

The report on a EUROCK2013 Technical Field Trip to a granite quarry is presented on pages 32–33 and describes how the microstructural strength of the granite determines the macrostructural quarry geometry.

At the EUROCK2013 Symposium held in Poland (which was also the ISRM's international Symposium for 2013) the ISRM Council meeting approved by acclamation the appointment of Dr Eda Quadros as the next ISRM President for the period 2015–2019 (see page 8–9). I know Dr Quadros well and can assure readers that she will be determined to continue to promote and increase the Society's health and activities. Moreover, in addition to her rock mechanics and rock engineering knowledge, she is also an expert in hydrogeology, a valuable additional talent—given that our approaches to practical rock engineering should include analyses of hydrogeological effects.

The ISRM 'Orange Book', the second compilation volume of ISRM Suggested Methods (i.e., following the ISRM 'Blue Book' published in 2007) is now approaching completion—see page 35.

John A Hudson, Imperial College, London, UK

Table of Contents

The Gnomes of Wrocław	Cover	EUROCK Memories	34
Invitation to EUROCK2014, Spain	2	ISRM Orange Book	35
Invitation to ARMS8, Japan	3	2013 Activity Report by ISRM Vice-President for Africa	36
Editorial, John A. Hudson	4	2013 Activity Report by ISRM Vice-President for Asia	38
The 2011–2015 ISRM Board	6	2013 Activity Report by ISRM Vice-President for Australasia	39
The ISRM President-Elect 2015–2019	8	2013 Activity Report by ISRM Vice-President for Europe	41
2013 ISRM Year	10	2013 Activity Report by ISRM Vice-President for N. America	42
2013 ISRM Membership Distribution	11	2013 Activity Report by ISRM Vice-President for S. America	43
ISRM Board and Council Meetings 2013	12	2013 Activity Reports by ISRM Vice-Presidents at Large, 1, 2 & 3	44
Activities of the ISRM Board in 2013	14	ISRM Commissions: Technical Oversight Committee Report	46
Young Members' Presidential Group	15	The ISRM Digital Library	53
ISRM Secretary-General's Report 2013	16	ISRM Corporate Members 2013	54
2013 ISRM Advisory Board	20	Invitation to 13 th ISRM Congress 2015	
Remembering Dr Don Banks	22		Back Cover
ISRM Membership Benefits	23		
2015 Müller Award	24		
2015 Rocha Medal	25		
SINOROCK2013	26		
EUROCK2013	28		
EUROCK2013 Photos	30		
EUROCK Field Trip	32		

The 2011–2015 ISRM Board



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**Get to know our next ISRM President (2015–
2019) — see her profile on the next page**

The ISRM President-Elect for 2015–2019: Dr Eda Quadros

John A. Hudson, UK, (john.a.hudson@gmail.com)



At the EUROCK2013 ISRM Council Meeting held in Poland on 22 September 2013, **Dr Eda F. de Quadros** of the BGTECH Soil and Rock Engineering Ltd company in Brazil was elected by acclamation as President-Elect of the ISRM for the period 2015–2019.

Eda obtained her **degrees** as follows: a BSc in civil engineering from the University of Pernambuco, Recife in 1968 and an MSc (Hons.) from São Paulo University Polytechnical School, Dept. of Civil Engineering, in 1982 and a DSc in 1992. Her MSc thesis was titled ‘Study of the flow characteristics in rock fractures’, and her DSc ‘The directional hydraulic conductivity of rock masses’.

She belongs to the following **scientific societies**:

- Brazilian Societies:
ABMS, ABGE, CBMR, CBT, CBDB.
- International Societies:
ISSMGE, ISRM, IAEG, ITA.

She is a member of the ISRM Technical Commission on Testing Methods—since 1985, and has been a Council Member of the ABMS National Council (Brazilian Society for Soil Mechanics and Geotechnical Engineering). Dr Quadros was President of the Brazilian Committee for Rock Mechanics (1989–1991), Secretary and Vice-President (1985–1989 & 1991–1997), and Vice-President of the ISRM for South America (2003–2007).

In terms of **language capabilities**, Eda has Portuguese as her mother tongue, but is also fluent in both Spanish and English—speaking, reading and writing. She is also fluent in French reading with reasonable speaking and writing) and can read German.

Her **career** has been as follows:

- 2011 to present: Technical Director of BGTech Soil and Rock Engineering Ltd. (São Paulo, Brazil) which is an international consultancy in rock mechanics testing and rock hydraulics for dam sites and mines;
- 1975–2011: Institute of Technological Research of São Paulo (IPT), São Paulo, Brazil;
- 1996–2011: Chief, Rock Mechanics and Hydraulics Laboratory, IPT;
- 1994–1996: Chief Engineer: Rock Engineering Group, IPT;
- 1983–1994: Engineering Researcher in the Geological Engineering Group, IPT.

Her **academic experience** has been as follows:

- Doctoral training and research at National Laboratory of Civil Engineering, Lisbon, Portugal from 1982 to 1984.
- Pre-doctoral visits to BRGM, Orleans La Source, France (April, 1983); Imperial College of Science and Technology, Royal School of Mines (May, 1983), University of Karlsruhe, Germany, Rock Mechanics Department (October, 1991).

Her **teaching experience** is as follows.

“Engineering rock mechanics and hydraulics in rock joints and rock masses”: two-day courses in collaboration with Dr. Nick Barton at the

- Polytechnical School of Hong Kong, Dept. Civil Engineering (2000);
- University of Singapore, Dept. Civil Engineering (2000);
- Sinotech, Taipei, Taiwan (2001);
- Madeira/Eurock (2002); and
- Sinorock/Three Gorges Dam Site (2004).

Technical Experience (1976–2012)

- 2008–2011: Development of equipment for hydraulic fracturing rock stress testing. FINEP/IPT/FIPT.
- 2007–2011: Co-ordinator of Petrobras/IPT/FIPT Brazilian Inter-Laboratory Arquimedes Net, for study of off-shore pre-salt cap rocks. Manager for advanced equipment development and for long-term elevated temperature creep and hollow cylinder tests of salt rocks.
- 2003–2007: Manager for development of equipment, test methods and techniques to study salt rocks in Brazil, for Petrobras.
- 1976–2003: Development of methods and techniques for rock mechanics and hydraulic testing

both in the field and in the laboratory. Permeability tests through rock matrix, and flow tests through rock joints with variable aperture and roughness while under stress. 3D rock mass permeability, also before and after grouting 2D and 3D permeability testing.

- 1989–1992: Development of method and techniques to characterise the anisotropic permeability tensors and the storage coefficient of jointed rock masses (quadruple-packer hydraulic probe) as part of D.Sc. studies. This 3D simultaneous multiple-boreholes, multiple test-stages hydro-tomography technique was then utilised at some Brazilian dam sites and in some Brazilian mines.

Publications and Reports

Eda is the author of approximately 30 publications in international and national conferences and international journals, including papers in the 6th, 7th, 8th, 9th and 10th ISRM congresses in Montréal, Aachen,

Tokyo, Paris and Sandton, and in five South American Rock Mechanics conferences since 1986. Duties while working in the rock mechanics and rock hydraulics laboratory, and as field testing manager, resulted in more than 60 major contract reports (as first author) while working for 35 years in South America's largest research and testing institute (IPT) in São Paulo, Brazil. This included work for foreign clients in several countries.

Quadros, E. F. (2012–2014). *Applied Rock Hydraulics for Engineers*: in preparation (In Portuguese).

If you have any suggestions for directions that the ISRM should take in the years 2015–2019, Dr Quadros will be delighted to hear from you:
edafquadros@gmail.com



President-Elect, Dr Eda Quadros (right) with the current President Professor Xia-Ting Feng at the ISRM Council Meeting on 22 September 2013 held in association with EUROCK2013 in Wroclaw, Poland

The 2013 ISRM Year

Prepared by Luis Lamas, Portugal, ISRM Secretary-General (secretariat.isrm@lnec.pt)

2013	ISRM Sponsored Events	Key Events
January		Publication of the 2012 issue of the ISRM News Journal
February		Approval of the ISRM Suggested Method on the mode I static fracture toughness using SCB specimen Launching of the ISRM Online Lecture series. 1 st ISRM online Lecture by Prof. Wulf Schubert
March		Approval of the Commission on Underground Nuclear Power Plants Publication of the digital Newsletter No. 21
April		
May	ISRM Specialized Conference “Effective and Sustainable Hydraulic Fracturing”, in Brisbane, Australia	Approval of two new ISRM Suggested Methods: SM for Determining Sound Velocity by Ultrasonic Transmission Technique SM for Reporting Rock Laboratory Test Data in Electronic Format Approval of the NG of Tunisia 2 nd ISRM Online Lecture by Prof. John A. Hudson
June	ISRM Specialized Conference “SINOROCK 2013 - Rock Characterization, Modelling and Engineering Design Methods”, in Shanghai, China	Approval the NG of Vietnam Meeting of the YMPG, in Shanghai Publication of the digital Newsletter No. 22
July	Approval of the VI Brazilian Rock Mechanics Symposium 2014 as an ISRM Specialized Conference	Revision of By-law No. 8 on the Müller Award
August	ISRM Specialized Conference 6th International Symposium on In Situ Rock Stress-RS2013, in Sendai, Japan	
September	The 2013 ISRM International Symposium “EUROCK 2013 - Rock Mechanics for Resources, Energy, and Environment” Dr Matthew Pierce delivered the Rocha Medal Lecture 2013 Andreas Goricki delivered the ISRM Franklin Lecture 2013 Approval of the conferences: Workshop on Volcanic Rocks and Soils, in September 2015, in Ischia, Italy, as an ISRM Specialized Conference The Southern African Rock Engineering Symposium, in May 2016, in Cape Town, South Africa, an ISRM Regional Symposium EUROCK 2016, in August 2016, in Cappadocia, Turkey, an ISRM regional Symposium ARMS9, in October 2016, in Bali, Indonesia, an ISRM Regional Symposium	Approval of the NG of Hungary Meeting of the Federation of International Geo-Engineering Societies (FedIGS), in Paris Dr Mandadige Samintha Anne Perera, from Australia was selected as recipient of Rocha Medal 2014 Dr. Masahiko Osada, from Japan was selected as the 2014 ISRM Franklin Lecturer Dr Eda F. Quadros was elected President of the ISRM for the term 2015-2019 Meeting of the ISRM Advisory Forum, in Wroclaw Meeting of the YMPG, in Wroclaw 3 rd ISRM Online Lecture by Prof. Pierre Duffaut Publication of the digital Newsletter No. 23
October		Approval of two new ISRM Suggested Methods: SM for Determining Creep Characteristics of Rock SM for Laboratory Determination of the Shear Strength of Rock Joints Revised Version
November		Approval of three new ISRM Suggested Methods: SM for Determining the Abrasivity of Rock by the Cerchar Abrasivity Test SM for Step-Rate Injection Method for Fracture <i>In-Situ</i> Properties (SIMFIP): Using a 3-Components borehole deformation SM for Monitoring Rock Displacements Using Global Positioning System
December		Approval of the ISRM SM on the Needle Penetration Test 4 th ISRM Online Lecture by Prof. Eduardo Alonso Approval of the NG Mexico Publication of the digital Newsletter No. 24

2013 ISRM Membership Distribution

Prepared by Luis Lamas, Portugal, ISRM Secretary-General (secretariat.isrm@lnec.pt)

MEMBERSHIP IN SEPTEMBER 2013										53 National Groups										
Ordinary - Corresponding - Corporate																				
AFRICA			ASIA			AUSTRALASIA			COUNTRIES			EUROPE			N AMERICA			S AMERICA		
0	1	0							ALBANIA	8	0	0								
									Algeria											
						306	22	2	ARGENTINA								14	0	1	
									AUSTRALIA											
									AUSTRIA	380	1	0								
			0	1	0				Bahrain											
			0	1	0				Bhutan											
									BELGIUM	38	1	0								
									BOLIVIA								22	2	0	
									BOSNIA AND HERZEGOVINA	9	0	0								
									BRAZIL								194	2	0	
									Bulgaria	0	7	0								
									CANADA				224	4	1					
									CHILE								38	4	1	
			872	10	19				CHINA											
									COLOMBIA								21	3	0	
0	1	0							Congo											
									COSTA RICA								27	0	0	
									CROATIA	124	0	0								
									CZECH REP.	26	0	0								
									DENMARK	6	0	0								
									Ecuador								0	2	0	
0	0	1							Egypt											
									FINLAND	78	0	1								
									FRANCE	143	2	13								
0	1	0							Ghana											
									GERMANY	318	3	6								
									GREECE	89	1	0								
									Guatemala								0	1	0	
									HUNGARY	16	0	0								
			309	4	2				INDIA											
			17	2	0				INDONESIA											
			130	2	0				IRAN											
			0	2	0				Iraq											
									Ireland	0	5	1								
			14	0	0				ISRAEL											
									ITALY	216	7	2								
			348	1	33				JAPAN											
			47	0	2				KOREA R											
			0	3	0				Malaysia											
									Malta	0	1	0								
									Mexico				0	3	0					
			8	0	0				MIDDLE EAST ASIA											
			6	0	0				NEPAL											
									NETHERLANDS	33	1	0								
						150	0	0	NEW ZEALAND											
0	1	0							Nigeria											
									NORWAY	229	1	18								
			0	1	0				Pakistan											
									PARAGUAY								9	0	0	
									PERU								25	19	1	
									POLAND	76	0	0								
									PORTUGAL	150	1	6								
									Rep. of Macedonia	0	2	0								
									Romania	0	1	0								
									RUSSIA	33	1	0								
									SERBIA	9	0	0								
			74	2	0				SINGAPORE											
									SLOVAKIA	10	0	0								
									SLOVENIA	33	0	0								
468	0	2							SOUTH AFRICA											
			21	0	0				SOUTH EAST ASIA											
									SPAIN	252	3	0								
									SWEDEN	121	1	19								
			0	1	0				Sri Lanka											
									SWITZERLAND	137	1	3								
			0	4	0				Thailand											
10	0	0							TUNISIA											
									TURKEY	122	2	0								
			0	1	0				United Arab Emirates											
									UNITED KINGDOM	327	6	7								
									USA				693	10	3					
									VENEZUELA								11	0	0	
			29	0	0				VIETNAM											
0	3	0							Zambia											
478	6	3	1875	35	56	456	22	2		2975	48	76	917	17	4	361	33	3		
2 NGs			12 NGs			2 NGs				26 NGs			2 NGs			9 NGs				
TOTALS:			Members -			7062	Ordinary			National Groups -			53							
						161	Corresponding													
						144	Corporate													

Luis Lamas, Portugal, ISRM Secretary-General (secretariat.isrm@lnec.pt)

ISRM BOARD MEETING, Wrocław, Poland September 2013

This meeting was held in conjunction with the 2013 ISRM International Symposium EUROCK 2013 “*Rock Mechanics for Resources, Energy and Environment*” in Wrocław, Poland, on 21 September 2013. The meeting was chaired by the President of the ISRM, Prof. Xia-Ting Feng, and was attended by the Vice-Presidents of the regions, by the three Vice-Presidents at Large, and by the Secretary-General.

The subjects covered were as follows:

- Report on the main decisions taken after the last Board meeting
- Brief presentation of the President, the Vice-Presidents and the Secretary-General
- Accounts of 2012 and the Budget for 2014
- Formal Minutes and administration of the ISRM in Portugal, where the Society is registered
- Rocha Medal 2014: selection of the winner
- ISRM Franklin Lecturer: selection procedure and selection of the 2014 Lecturer
- ISRM Online Lectures: suggestions for 2014
- Issues for the 2013 meeting of the Advisory Forum
- FedIGS and co-operation with other Societies
- Report on the progress of EUROCK2013 (Wrocław, Poland, September 2013); EUROCK 2014 (Vigo, Spain, May 2014); ARMS8 (Sapporo, Japan, October 2014); 13th ISRM Congress (Montréal, Canada, May 2015)
- Presentation by the candidates for the 2016 Regional Conferences
- Selection of the Regional Conference Eurock 2016
- Modernisation initiatives

ISRM COUNCIL MEETING, Wrocław, Poland September 2013

The ISRM held its Council meeting in conjunction with the 2013 ISRM International Symposium, EUROCK 2013—“*Rock Mechanics for Resources, Energy and Environment*”, in Wrocław, on 22 September 2013. 40 of the 53 National Groups were represented and two Past Presidents were present. Representatives from IAEG, ISSMGE and ITA were also present, and most of the ISRM Commission Chairmen attended the meeting.

Report of the President

The President referred to the focus of the current Board, which is the modernisation and growth of the Society and he highlighted the multi-lingual glossary in rock mechanics to be completed soon. The first draft of the English-Chinese version is to be completed by mid-December 2013 and reviewed by Chinese and English experts in June 2014. By December 2014, the National Groups will have it translated into their own language; a software will be developed so that the glossary can be on the ISRM website by May 2015.

The President informed the meeting about the new subjects discussed by the Board: namely, the ISRM Foundation for Education, a new Award Committee and a new Committee to stimulate interaction within the NGs.

For the imminent launching of the ISRM Book Series, an advantageous agreement with CRC Press/Balkema was signed; this will enable a discount to be offered to ISRM members.

Reports of the Vice-Presidents

Each Vice-President presented a report on the activities carried out in the past year (these reports are included in this Issue of the News Journal, see pages 36–45)

Report of the Secretary-General

The Secretary-General presented his report, informing the meeting, in addition to other issues, about the evolution of membership, the National Groups’ growth, the Rocha Medal winner, the News Journal, Newsletter and ISRM website, the Digital Library that is continuous and steadily being enlarged. The report of the Secretary-General is included in this issue of the News Journal, see pages 16–19.

Accounts for 2012 and the Budget for 2014

The ISRM accounts for 2012 and the Budget for 2014 were approved.

ISRM Commissions

A report on the activities of the Commissions was presented by Prof. Yuzo Ohnishi, Chairman of the Technical Oversight Committee. The following 17 Commissions are now active:

- Application of Geophysics to Rock Engineering
- Coupled THMC Processes in Geological Materials and Systems
- Crustal Stress and Earthquakes
- Discontinuous Deformation Analysis—DDA
- Education
- Grouting
- Hard Rock Excavation
- Petroleum Geomechanics
- Preservation of Ancient Sites
- Radioactive Waste Disposal
- Rock Dynamics
- Rock Engineering Design Methodology
- Soft Rocks
- Spall Prediction
- Testing Methods
- Underground Nuclear Power Plant
- Underground Research Laboratories Networking

Announcement of the Rocha Medal 2014 winner

The Council was informed that the Board awarded the Rocha Medal 2014 to

- Dr Mandadige Samintha Anne Perera, from Australia for the thesis entitled “Investigation of the Effect of Carbon Dioxide Sequestration on Coal Seams: Coupled Hydro-Mechanical Behaviour”. Dr Perera will be awarded her Rocha Medal at the ARMS8 conference, to be held in October 2014 in Sapporo, Japan.

The Committee also awarded two *Proxime Accessit* certificates to

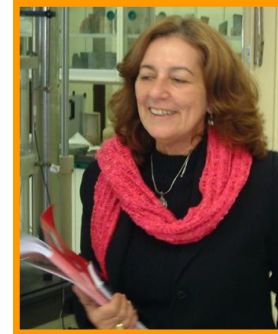
- Dr José Ricardo P. Resende from Portugal, for the thesis “An Investigation of Stress Wave Propagation Through Rock Joints and Rock Masses”; and
- Dr Sevda Dehkhoda, from Iran, for the thesis “Experimental and Numerical Study of Rock Breakage by Pulsed Water Jets”.

ISRM sponsored meetings

Sapporo, Japan was confirmed as the venue for the 2014 ISRM annual meetings, to be held on 14 October 2014, in conjunction with the ARMS 8 Symposium. The organisers of the ISRM sponsored events presented the progress of their arrangements.

Election of the ISRM President for the term 2015–2019

One nomination for President of the ISRM was received for the term 2015–2019: Dr Eda Quadros, from Brazil. Dr Quadros was elected by acclamation as the next ISRM President, her term of office starts after the 13th International Congress of the Society, to be held in Montréal, Canada, in 2015.



Dr Eda Quadros
(see pages 8–9)

Activities of the ISRM Board in 2013

Xia-Ting Feng (ISRM President) and Luis Lamas, (ISRM Secretary-General)

Many actions were taken by the current Board to accomplish the tasks for its term of office—which are focused on the modernisation/growth of the ISRM.

As a major benefit to our members and to the rock mechanics community, the ISRM Online Lecture programme was launched in February and, every three months, experts in different fields of rock mechanics were invited to give a lecture on a specific topic. The inaugural lecture was presented by Prof. Wulf Schubert on the theme “50 Years of NATM—from a construction method to a system”. It was followed by three other lectures delivered respectively by Prof. John A. Hudson on “Solving the Unsolved Problems in Rock Mechanics and Rock Engineering”, by Prof. Pierre Duffaut on “Rock Mechanics Lessons from Dams” and by Prof. Eduardo Alonso on “Catastrophic Landslides; the Legacy of Vajont”, to mark the 50th anniversary of the large landslide. The lectures were broadcast from the ISRM website and, during the subsequent 48 hours, the attendees were able to ask questions to the lecturer by e-mail on the topic of the lecture. The four lectures for 2014 are being planned.

The ISRM Online Lectures are available on the ISRM website

www.isrm.net

Several decisions were taken by the Board during 2013, among them, the approval of four new National Groups: Tunisia, Vietnam, Hungary and Mexico. The Society reached 54 National Groups and an all-time record of individual members, now over 7,000.

Technically the Society’s activities are also in expansion. The number of ISRM Commissions was enlarged to the current number of 17 by the formation and approval of two new Commissions on Underground Nuclear Power Plants and on Grouting. The number of Commissions justified the recent creation of the Technical Oversight Committee, presided over by the Vice-President at Large, Prof. Yuzo Ohnishi, whose task is to interact with the Commissions, summarise their activities and report to the Board and Council (see pages 46–52).

The Blue book containing all the ISRM Suggested Methods published in 2007 continues to be in great demand. As a result of the activity of the Commission on Testing Methods, during the year the Board approved nine new Suggested Methods. A new book compiling all the new and upgraded Suggested Methods is being prepared and will be published in 2014.

An agreement with CRC Press/Balkema was signed for the launching of the ISRM Book Series that will offer a 30% discount to ISRM members.

Three ISRM Specialised Conferences took place: “Effective and Sustainable Hydraulic Fracturing”, in May, in Brisbane, Australia; “SINOROCK 2013—

Rock Characterisation, Modelling and Engineering Design Methods”, in June, in Shanghai, China; and the “6th International Symposium on *In Situ* Rock Stress—RS2013”, in August, in Sendai, Japan.

The 2013 ISRM International Symposium was held in September, in Wrocław, as EUROCK2013. The Rocha Lecture was given by Dr Matthew Pierce, from Canada, and the ISRM Franklin Lecture by Dr Andreas Goricki, from Austria.

Furthermore, the Board approved the sponsorship of one Specialised Conference and three Regional Symposia: the Workshop on Volcanic Rocks and Soils, in September 2015, in Ischia, Italy; the Southern African Rock Engineering Symposium, in May 2016, in Cape Town, South Africa; EUROCK 2016, in August 2016, in Cappadocia, Turkey; and the ARMS9 Symposium, in October 2016, in Bali, Indonesia.

A meeting of the ISRM Advisory Forum was held during EUROCK2013, with the participation of several Fellows of the Society, together with past, present and future Board members, see page 20.

A meeting of the Young Members’ Presidential Group took place in June, during the SINOROCK 2013 Symposium, in Shanghai, China, and another was held during the EUROCK2013 Symposium, which was attended by the Board members, together with active young participants and representatives from Brazil, China, Japan and South Africa.

Steps are being taken towards the creation of the ISRM Foundation for Education to promote rock mechanics and rock engineering to the ISRM community by providing financial assistance to education activities organised or approved by the ISRM and supporting ISRM members to foster their education.

A multi-lingual glossary for rock mechanics is being prepared. The first draft of the English-Chinese version is to be completed by mid-December 2013 and will be reviewed by Chinese and English experts in June 2014. Software will be developed and the glossary will be on the ISRM website in May 2015.

The policy of improving communication was kept and the website was continuously updated. We published the 2012 issue of the ISRM News Journal in January, 2013, and four quarterly Newsletters. The ISRM Digital Library is constantly being updated and now contains the proceedings of 29 past conferences available for download—totalling ~ 6,000 papers.

The Board of the Federation of International Geo-Engineering Societies (FedIGS), of which the ISRM is a member, met in September, in Paris, where inter-Society co-operation was debated. The President and the Vice-President for Europe also took part in a Workshop organised to present the activities of the FedIGS participating Societies.

The ISRM Young Members' Presidential Group

David Beck (dbeck@beckengineering.com.au)

OCTOBER 2013 REPORT ON ACTIVITIES OF THE ISRM YOUNG MEMBERS' PRESIDENTIAL GROUP

The YMPG is a special ISRM group, comprising young members nominated and supported by each National Group for a 4-year term, formed for the following purposes.

- To provide a liaison between young members and the ISRM board, in order to ensure the perspectives of the Young Members are properly appreciated.
- To enhance development of future leaders for the ISRM, by encouraging participation in the organisation, tasks and leadership of the ISRM.
- From time to time to address in a practical manner the special needs of young members that might not otherwise be addressed by the larger role of the ISRM.
- To foster relationships between young future leaders across National Groups.

The objective of each YMPG cohort is to ensure these essential tasks are met.

In August 2012, a draft road map for the current ISRM Young Members' Presidential Group was circulated, and, in September 2012, three regional meetings were held online to discuss tasks and goals for the group. These meetings were facilitated by Drs Ricardo Resende, Olivier Buzzi and Kazim Zaki of the YMPG, and Dr Beck representing the ISRM 2011–2015 Board.

A number of excellent suggestions for tasks for this term were developed and the organisational team presented these to the President in November 2012 for an initial discussion. The possible initiatives include projects covering the following.

- Education initiatives, such as webinars on rock mechanics issues, and advertising for scholarly positions and courses on the ISRM website

- A number of ways younger members can be assisted and encouraged to contribute to the ISRM publications, including the newsletter
- Means of facilitating younger members participation in ISRM Commissions
- Close collaboration with the Regional Vice Presidents

These suggestions were developed into proposals, and will be discussed by the ISRM Board for consideration.

In the meantime, if any YMPG members or interested ISRM members would like more information on the work of the YMPG, or would like to suggest YMPG tasks, please contact

David Beck at
dbeck@beckengineering.com.au

In the summer of 2013, there were two YMPG meetings: one in association with SINOROCK2013; and the other in association with EUROCK2013.

At SINOROCK2013 in Shanghai, China, the YMPG meeting was held on Monday 17th of June, i.e., the day before SINOROCK began and immediately after the Short Course given by Profs. Hudson, Cosgrove and Feng.

At EUROCK2013 in Wrocław, Poland, the YMPG meeting included significant talks by Jacques Lucas and David Beck—which were greatly appreciated by the audience and stimulated useful discussion.



**Talk by Jacques Lucas to the
ISRM Young Members Presidential Group at
the EUROCK2013 Symposium**

ISRM Secretary-General's Report for 2013 (May 2012–Sept 2013)

1. National Groups and membership

The current number of ISRM National Groups is 53 following the recent joining of Tunisia and Hungary in September 2013. The table (see page 11) presents the situation regarding ISRM membership, per country and per region, in September 2013. The present number of individual members (ordinary and corresponding) and of corporate members is as follows:

	Individual Members	Corporate Members
Africa	484	3
Asia	1,910	56
Australasia	478	2
Europe	3,023	76
N America	934	4
S America	394	3
TOTAL	7,223	144

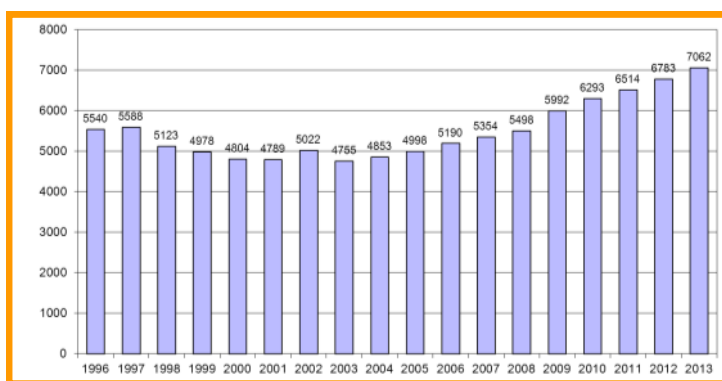
When compared with the figures presented at the previous Council meeting, in May 2012, this corresponds to an increase of 440 individual members (6.5%). Major changes observed are the significant increase in number of individual members

- in the USA, from 500 to 693,
- in China, from 720 to 872, and
- in South Africa, from 407 to 468.

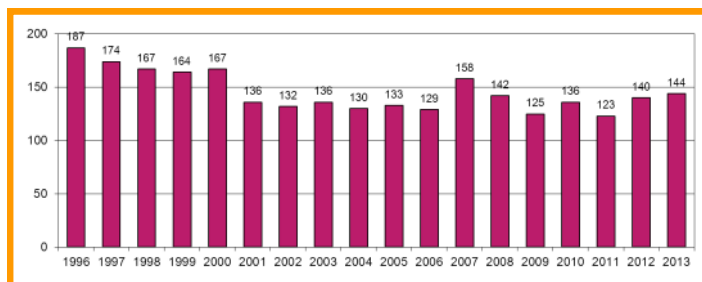
A slight increase in the total number of corporate members was observed, from 140 to 144.

The graphics below present the evolution of the ISRM members and National Groups since 1996.

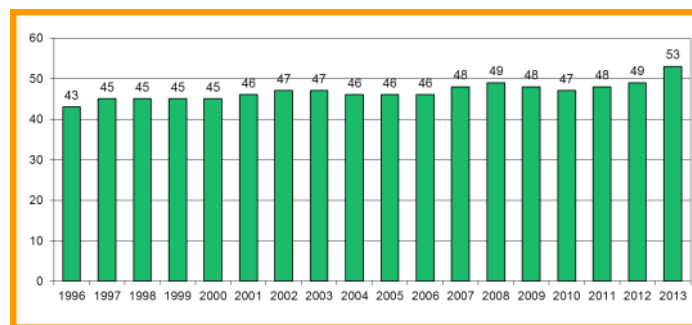
Individual members



Corporate Members

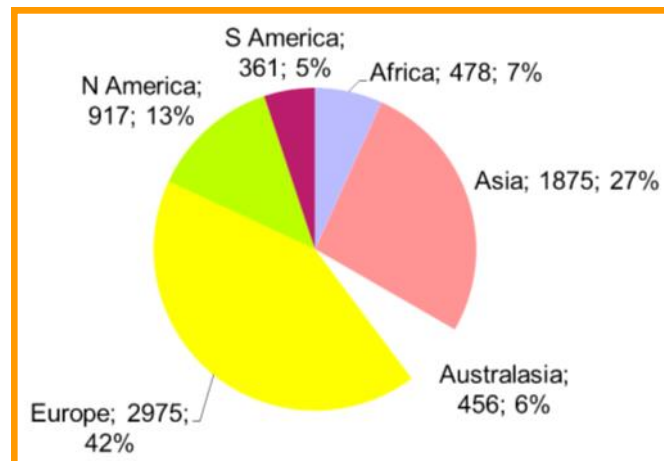


National Groups

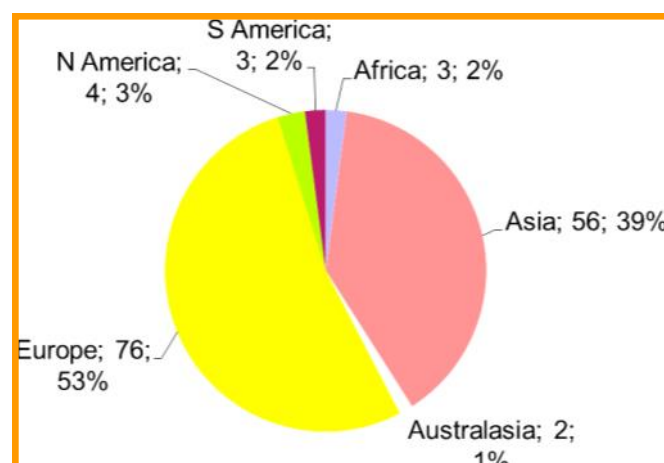


The distributions of individual and corporate members in each geographic region are shown below.

Individual Members

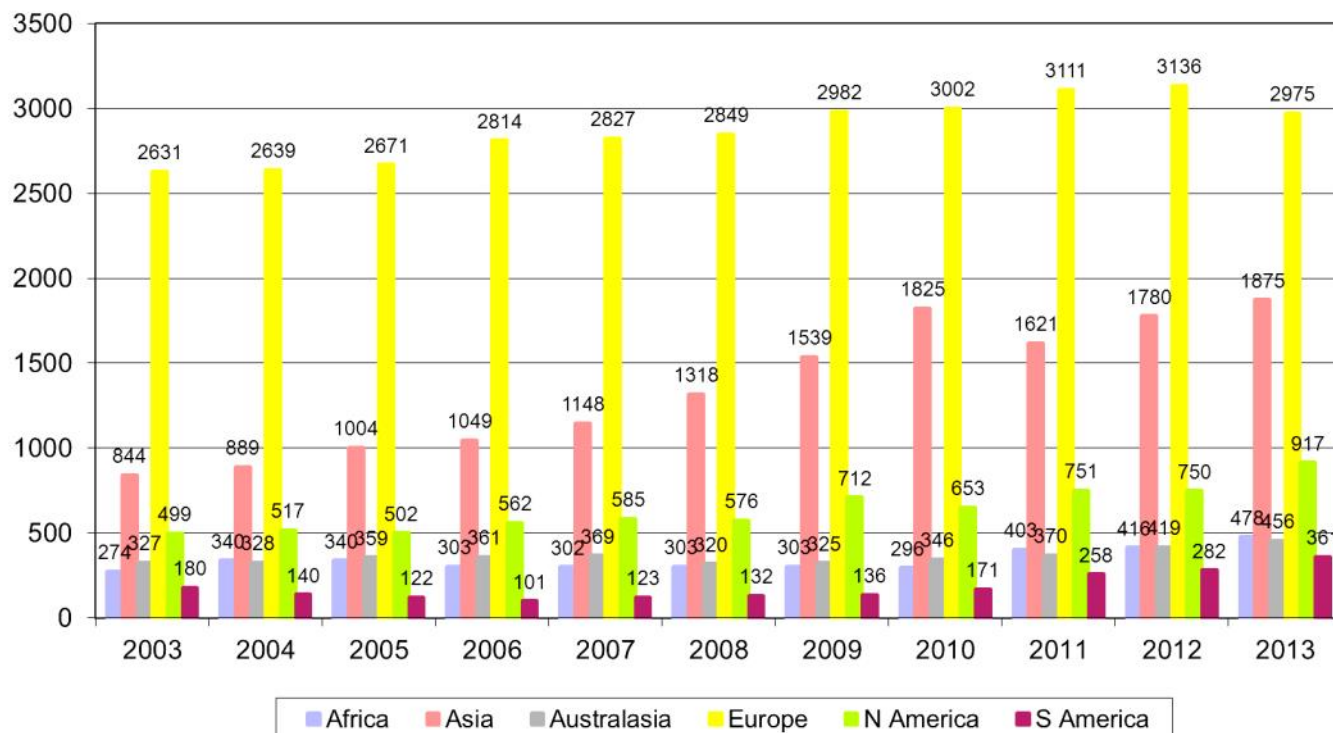


Corporate Members



The following graphic shows the evolution of the number of individual members in each geographic region since 2003.

Individual Members per Region



2. Payment of fees

The situation of the National Groups as regards payments of fees (up to 17 September 2013) is as follows:

Unpaid 2011 fees: Iran

Unpaid 2012 fees: Bolivia, Iran and Venezuela.

Paid 2013 fees: Argentina, Australia, Austria, Bosnia and Herzegovina, China, Colombia, Costa Rica, Croatia, Finland, France, Germany, Greece, Hungary, India, Indonesia, Israel, Italy, Japan, Korea, ME Asia, Netherlands, New Zealand, Peru, Russia, Serbia, Slovenia, Spain, Sweden, Switzerland, Turkey, UK, Vietnam, Czech Republic, Poland, Portugal, Slovakia, South Africa, Tunisia.

3. ISRM sponsored meetings

Since the last ISRM Council meeting in Sweden, in May 2012, and up to the preparation of this report, no ISRM-sponsored conferences were approved.

4. Rocha Medal

During the EUROCK 2012, the Rocha Medal Award Committee selected as the winner of the 32nd prize (Rocha Medal 2013) the thesis submitted by Dr Matthew E. Pierce, from Canada. Two runner-up certificates (*Proxime Accessit*) were also awarded to Dr He Lei, from China, and Dr Andrea Perino, from Italy. The awards will be conferred in September 2013. This

will be during the ISRM International Symposium in Wrocław, Poland, where Dr Pierce will deliver the Rocha Lecture.

During the 2013 International Symposium, the Rocha Medal Award Committee will select and announce the winner and runners-up of the Rocha Medal 2014. The award will be conferred during the 2014 ISRM International Symposium in Sapporo, Japan.

Submission of applications for the Rocha Medal 2015 is open until 31 December 2013, see page 25.

5. ISRM News Journal

The electronic version of the ISRM News Journal, Vol. 15, December 2012, edited by Prof. John Hudson and Prof. Xia-Ting Feng, has been included on the ISRM website where it can be downloaded, and the Secretariat has sent info-mails to all members, advertising it. 400 hard copies were printed, for select distribution. This 60-page issue of the 2012 News Journal contains the annual review of the Society's activity along 2012 and a technical article.

6. ISRM Newsletter

Since the previous Council meeting, five issues of the electronic Newsletter, prepared by the Secretary General, were published: three in 2012 (June, September and December), and two in 2013 (March and June).

As usual, all members and all those who subscribed to the Newsletter on the website received them by email. The Newsletters are also freely available on the website. ISRM National Groups and individual members are welcome to submit to the Secretariat contributions on Rock Mechanics topics of interest to our technical community.

7. ISRM 50th Anniversary Commemorations

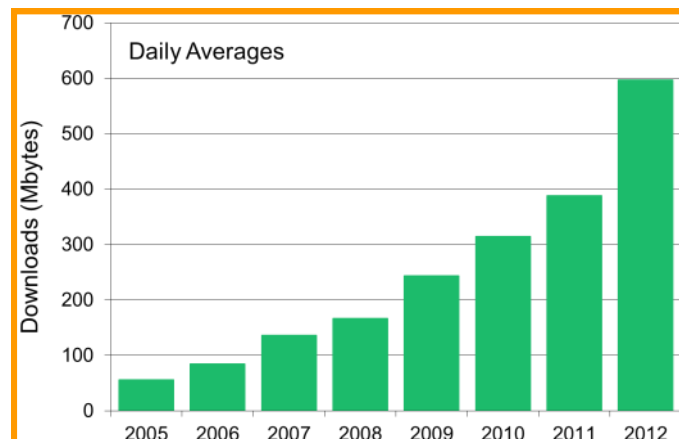
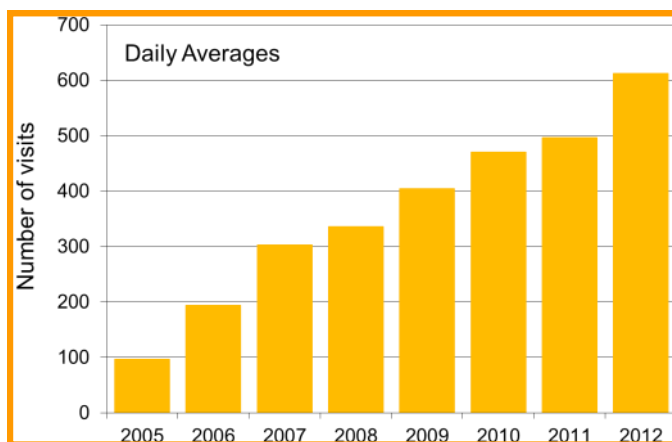
The commemorations of the 50th Anniversary of the ISRM were completed in Salzburg, Austria, in October 2012, at the occasion of the 61st Geomechanics Colloquy. This venue was chosen symbolically—because Salzburg is the city where the ISRM was founded, in 1962, by Prof. Leopold Müller.

The President, the European Vice-Presidents and the Secretary General represented the Society at the ceremony, and Dr Nuno Grossmann, former V-P Europe, gave a presentation on the 50 years of the ISRM. The ceremony was attended by Dr Franz Pacher, one of the founders of the ISRM, who gave an interview that was broadcast during the session and which can be watched on the ISRM website.

8. ISRM Website

The website of the ISRM (<http://isrm.net>), launched on 1 April 2005, is the main means of information about the ISRM and is the main channel for communication with the members. Most benefits being offered to the members are available in a password protected members' area.

Statistics relating to the daily number of visits and the quantity of downloads since the website started are summarised in the following graphics. A 50% increase in downloads and a 20% increase in the number of visits in 2012 are clear indicators of the importance of the website.



9. Digital Library (also see page 53)

The ISRM Digital Library started in October 2010 and is part of *OnePetro.org*, a large online library managed by the Society of Petroleum Engineers. ISRM individual members are allowed to download, at no cost, up to 100 papers per year from the ISRM conferences. ISRM corporate members can download 250 papers yearly.

To register on the OnePetro website (www.onepetro.org) as an ISRM member, the only necessary information is the username and the password used to access the members' area of the ISRM website. Non-members can, however, purchase the ISRM papers online. A presentation about how to register and download papers is available on the website.

Papers from the ISRM Congresses and sponsored Symposia have been gradually introduced in the Library. Currently, the papers from 29 ISRM sponsored events are available, totalling over 42,000 pages.

Several other ISRM sponsored conferences, for which the ISRM has the copyright or the right for distribution, are ready for inclusion in the database and will be online soon. The ISRM is still negotiating with copyright issues regarding a few sponsored conferences.

10. Educational and promotional items

As in previous years, the ISRM educational material has been in demand, and most of it is nowadays available from the ISRM website, for free download by ISRM members. The 'Blue Book' *The Complete ISRM Suggested Methods for Rock Characterization, Testing and Monitoring: 1974-2006*, continues to represent, by far, the main item supplied during this period. This is to be followed soon by the 'Orange Book' — see page 35.

11. Support provided

As usual, the Secretariat has made ample use, at no charge, of a number of facilities available at the Portu-

guesse National Laboratory for Civil Engineering—LNEC. This has included the use of office rooms and other facilities offered to the Secretariat, telephone and fax, as well as use of LNEC's computer network, namely for internet access and e-mails. This support has long been instrumental to the well-being of the Society and is very much appreciated.

12. Final remarks

The life of the Society and the activity of the Secretariat during the period corresponding to this report were marked by:

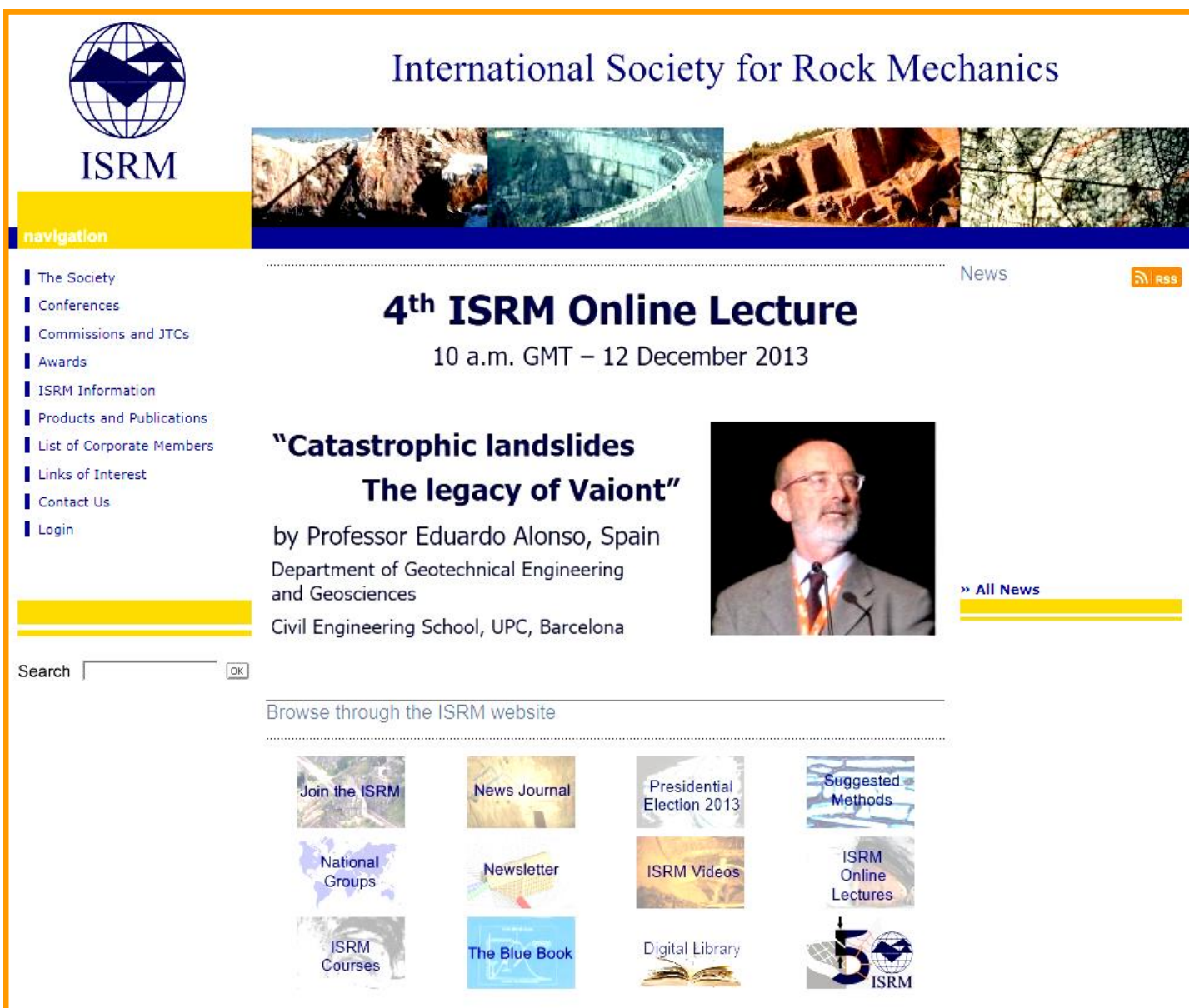
- continuation of the increase in the number of members of the Society;

- a sharp increase in the downloads and visits to the website; and
- closing of the 50th anniversary celebrations.

Lisbon, September 2013



Luís M. N. Lamas
Secretary General, ISRM



The screenshot shows the ISRM website homepage. At the top left is the ISRM logo, a globe with a mountain range. To its right is the text "International Society for Rock Mechanics". Below the logo is a navigation menu with links: The Society, Conferences, Commissions and JTCs, Awards, ISRM Information, Products and Publications, List of Corporate Members, Links of Interest, Contact Us, and Login. To the right of the navigation menu is a banner for the "4th ISRM Online Lecture" on 10 a.m. GMT – 12 December 2013, titled "Catastrophic landslides The legacy of Vaiont" by Professor Eduardo Alonso, Spain. A photo of Professor Alonso is shown next to the text. Below the banner is a search bar and a "Browse through the ISRM website" section with various links: Join the ISRM, News Journal, Presidential Election 2013, Suggested Methods, National Groups, Newsletter, ISRM Videos, ISRM Online Lectures, ISRM Courses, The Blue Book, Digital Library, and a 50th ISRM anniversary logo.

The ISRM website
www.isrm.net

Luis Lamas, Portugal, ISRM Secretary-General (secretariat.isrm@lnec.pt)

MINUTES OF THE 2nd MEETING OF THE ISRM ADVISORY FORUM

**Sofitel Wroclaw Old Town Hotel, Wroclaw, Poland
Saturday, 24 September 2013**

The President, Prof. Xia-Ting Feng, opened the meeting at 15h30 with the attendance of the following ISRM Fellows, and previous/present Board Members: Prof. Yuzo Ohnishi, Prof. Yingxin Zhou, Dr Pierre Berest, Prof. Frederic Pellet, Prof. Shunsuke Sakurai, Prof. Wulf Schubert, Prof. Ivan Vrkljan, Dr. Eda F. Quadros, Mr Jacques Lucas, Prof. Qian Qihu, Prof. Chung-In Lee, Prof. Dick Stacey, Prof. Giovanni Barla, Prof. John A. Hudson, Prof. Ove Stephansson, Prof. Xia-Ting Feng, Dr Luis Lamas.

Mrs Sofia Meess acted as Secretary.

1. Welcome to ISRM Fellows, previous and present Board Members

The President welcomed all the meeting attendants reminding them that the initiative of having an Advisory Forum had started under the Presidency of Prof. John A. Hudson, who presented the next item.

2. Explanation of the purpose of the ISRM Advisory Forum

Prof. Hudson informed the meeting that the ISRM Advisory Forum programme started in 2011, during the ISRM Congress in Beijing, with the intention of creating a group of experts in rock mechanics and engineering, as well as for the purposes and operation of the Society. This group is composed of the ISRM Fellows, together with ISRM past, present and future Board members. He also highlighted the most relevant items of the minutes of the 1st Advisory Forum:

- the reduction of costs for the ISRM News Journal now that there was mainly electronic distribution and
- the commemorations of the 50th Anniversary of the ISRM.

Prof. Sakurai referred to his own suggestion, the creation of a gallery of photos, and wondered whether it had been compiled. Dr Lamas informed the meeting that, for the commemoration of the 50th Anniversary of the Society, an historical exhibition composed of six panels had been prepared and displayed at several conferences of the Society. The first panel includes about 30 photos. But he noted that now it is possible to further organise the photo gallery. Dr Eda Quadros, who possesses many photos from past events, offered to collect further material.

3. Discussion of current issues

3.1 The Young Members' Presidential Group

On behalf of Dr David Beck, Mr Jacques Lucas made a presentation on the need for the ISRM to incorporate young people by explaining that, according to the 2008 survey, young members represented 10% of the

ISRM members. However, he noted that, analysing the age of the world population in segments, the 25–35 years segment represents 40%. Thus, there is an ISRM membership resource that is being excluded from the Society and so the creation of the YMPG was amply justified and the ISRM is now creating a platform for international collaboration among the Board, NGs and the Young Members. As a first step for the creation of the Group, each NG was asked to nominate a young representative, not over 35 years of age. If possible, the candidate should have leadership characteristics and the will to become involved in group work and education.

The YMPG then becomes a “special” ISRM group, comprising Young Members nominated and supported by each National Group for a 4-year term, and formed for the following objectives.

- To provide a liaison between Young Members and the ISRM Board, in order to ensure that the perspectives of the Young Members are properly appreciated.
- To develop future leaders for the ISRM, by encouraging participation in the organisation, tasks and leadership of the ISRM.
- From time to time to address, in a practical manner, the special needs of Young Members that might not otherwise be addressed by the larger ISRM.
- To foster relationships between young future leaders across National Groups.

Mr Lucas further informed the meeting that ballots for the election of a Chair, Deputy Chair and Newsletter contributor of the YMPG had been received. The results will be announced in a few weeks.

The tasks for the Group during the term 2011–2015 have already been approved and are described below.

- **Education:** Organisation of webinars or online lectures on rock mechanics on the ISRM website; using the ISRM website for advertisement of academic related rock mechanics positions.
- **Increase the participation of YMPG in activities:** A larger contribution to the Newsletter and the ISRM Journal.; increasing the participation of Young Members in the ISRM Commissions; the election of YMPG members in each region to liaise with the Regional Vice-President in running the ISRM locally.

YMPG events at ISRM Symposia

So far, three events involving Young Members have taken place in Seoul (ARMS7, 2012), Shanghai (SINOROCK 2013), and Stockholm (EUROCK 2013); two more events are being prepared for EUROCK 2014 in Vigo, Spain, and for ARMS8 in Sapporo, Japan.

Mr Lucas mentioned that the approved YMPG tasks should energise the Group and provide a service to Young Members in general, but the limited resources and opportunities for assembly cannot be easily overcome. He considered that NGs are better equipped to deal with and help the group and, hopefully, the forthcoming ISRM Foundation for Education would be able to assist with funding in future.

Mr Lucas questioned the Advisory Forum members whether the Board is moving in the right direction with the YMPG and if there were any other suggestions. Dr Eda Quadros suggested that conference organisers could schedule one day dedicated to young people, where they could give lectures among themselves. She added that young people like to meet renowned people and famous practitioners. The idea was shared by Prof. Pellet, Prof. Hudson and Prof. Sakurai, who noted that the younger generation should be provided the opportunity to meet important Professors in different fields. Prof. Sakurai underlined that students are often isolated from field experience and need to communicate with experienced practitioners. Prof. Hudson suggested that, in the future, during the conferences, an announcement could be made that renowned members would be glad to talk to young people.

Prof. Barla informed the meeting that the NG Italy has the tradition to organise events for Young Members and that the interplay with experienced practitioners is important. One of the questions young people have is how to prepare to apply for a job.

Prof. Lee made a presentation depicting the example of Korea on how to encourage young members. ARMS 7 proved to be an excellent networking opportunity, with good communication, where full and partial scholarships were given to students from countries with good rock mechanics potential. He noted that there is the need to set a specific target for the scholarships, e.g., maybe countries with NGs that are not active.

Prof. Zhou informed the meeting that the Organising Committees in Asia are encouraged to give a certain percentage of the budget to fund young people; and Prof. Stacey reported that in South Africa there is an annual Geotechnical Engineering Conference where students and companies are welcome and where there is a competition for the best paper.

Both Prof. Pellet and Dr Lamas mentioned the example of the ISSMGE, which organises a Young Geotechnical Engineers Conference. Dr Lamas reported that fees and accommodation at university campuses are usually inexpensive and that the opportunity for young people to make contacts is valuable. He further informed the meeting that participation is often

financed by the NG, something that the ISRM could also try.

Dr Quadros noted that young people need to be more pro-active. She suggested that they could write papers for conferences and, if one paper is selected, then it will be easier to ask for financing from research agencies.

3.2 Education and the ISRM

Prof. Frederic Pellet pointed out that this subject was closely related to what had been discussed in the previous item and informed the meeting that, currently, lectures and a slide collection are available on the ISRM website. The possible linkage to EduMine for the access to online courses is being analysed, as it is not without costs. He wondered if the members of the Advisory Forum could contribute to the educational material available on the site, as most of them had already published books.

Prof. Schubert commented that the slide display on the website should be structured and reorganised. Prof. Hudson noted that the presentations made during the past ISRM Lecture Tours could also be included in the website. A group composed by Prof. Barla, Prof. Hudson and Prof. Schubert volunteered to work with Prof. Pellet in the reorganisation of the slide collection. Prof. Pellet will follow up on this work.

3.3 ISRM links with Industry

Prof. Yingxin Zhou informed the meeting that Dr Manoj Verman is in charge of this topic in the ISRM Board, but unfortunately he could not be present to introduce the topic, and had asked him to do it on his behalf. Prof. Zhou pointed out that the ISRM is sometimes seen as too academic and reluctant to change its identity. Most of the ISRM current research is independent of the needs of industry. However, to improve revenues, the Society will have to comprise industry and address the needs of the companies. He also noted that the ISRM has Corporate Members that are companies that could be directly involved with the future ISRM Foundation for Education by donating funds.

He further highlighted the need for ISRM to cooperate with other societies, and cited the collaboration with CIM for the ISRM 2015 Congress. Prof. Sakurai advised caution in asking industry for donations because they will expect something in return.

4. Any other business

No further items were presented for discussion.

5. Arrangements for the next meeting

The next meeting will take place in May 2015, during the 13th ISRM Congress, in Montréal, Canada.

In fond remembrance of Dr Don Charles Banks

John A. Hudson (UK) john.a.hudson@gmail.com



Sadly, Don Banks, an excellent researcher and engineer, passed away in 2013. He was a strong supporter of the ISRM and its activities, especially through attending ISRM Symposia and as a member of the ISRM Testing Methods Commission.

Don Charles Banks, Ph.D., died on Sunday, Aug. 11, 2013, at home in his library in the USA. He was 73.

Dr. Banks was preceded in death by his parents, Vernon Earl and Lorraine Mae Waid Banks, and a stepson, Kerry Diggs. He is survived by his wife, Millie Banks; his sister, Jerry Banks Williams of Nashville, Tenn.; his daughter, Kelle Jo Banks Barfield of Vicksburg; two sons, Eric Charles Banks of New York City and John Gregory Banks of Liberty Township, Ohio; a stepson Kenneth Edwin Sharp Jr. of Vicksburg; and ten grandchildren, A.D. Barfield IV, Allie Barfield, Waid Barfield, Brayden Banks, Hall Banks, Kathryn Banks, John Banks, Maggie Banks, Olivia Sharp and Jacob Diggs.

Dr. Banks was born on March 17, 1940, in Dardenne, Ark., USA, and graduated valedictorian and class president of Russellville High School. He earned bachelor's and master's degrees in civil engineering, Georgia Institute of Technology, and a doctorate of philosophy in civil engineering, University of Illinois.

He began a 35-year career at the U.S. Army Corps Waterways Experiment Station in Vicksburg in 1962, where he went on to become chief of the Engineering Geology and Rock Mechanics Division and later chief of the Soil and Rock Mechanics Division, Geotechnical and Structures Laboratory.

Dr. Banks was named a Fellow in the American Society of Civil Engineers and the American Rock Mechanics Association. In 2012, he was admitted to the WES Gallery of Distinguished Civilian Employees for projects including Panama Canal stability surveillance, development of computer codes capable of predicting the behaviour of soil, rock and groundwater, discontinuous deformation analysis via computer modelling, and a study of the U.S. Army Corps of Engineers' ability to build a permanent moon habitat.

After retirement, he continued his civil service to the United States as a contractor to the U.S. Department of Defence, specialising in military applications of rock

mechanics. He was also an international contributor to the field of rock mechanics, including co-authoring a book on rock-based construction and offering global instruction and mentoring for Engineers Without Borders. He authored or co-authored some 40 reports and papers throughout his career, the last in 2011, which he presented at the Hindu Kush Geoscience Conference at Kabul University, Afghanistan. His leadership resulted in the Corps being recognised as pre-eminent in the field of rock mechanics.

One of Dr. Banks' greatest joys was having lengthy debates about all things possible. Every subject was worthy of his passion, and every theory deserved greater exploration; he was always mid-sentence. While humble, Dr. Banks inspired greatness through his own achievements and keen, insatiable curiosity. He instilled a drive for educational excellence, especially in his children and grandchildren. To him, no part of the world was inaccessible and no idea was unachievable.

Memorials may be made to an endowed Dr. Don C. Banks Civil Engineering Scholarship by making gifts to the Georgia Tech Foundation Inc., 760 Spring Street NW., Suite 400, Atlanta, GA 30308, noting in memory of Dr. Don C. Banks.

* * * * *

On a personal note, some years ago in London, UK, I received a research contract from the European Research Office of the US Army. This was monitored by Don Banks via the US Army Corps Waterways Experiment Station in Vicksburg. Through the arrangement I came to know Don well.

As the obituary above highlights, conversations with Don were wide-ranging and informative. Also, both Don and his wife, Millie, were most gracious and hospitable when I visited his work and his home. Don will be sorely missed by his family, the many colleagues he has worked with, and our Society.

ISRM Membership: Joining, Benefits, Fees and Organisation

How to become an ISRM Member

Membership of the Society consists of Individual Members within the approved National Groups, Corresponding Members & Corporate Members:

For Individual Membership apply for membership of the ISRM through your National Group, this being the recommended type of membership for the development of the Society. However, because some countries do not have a National Group, or due to the preference shown by a candidate for membership directly to the Society through its Secretariat, the category of **Corresponding Member** was created. The amount of the annual membership fee to be paid, depending on the existence of an approved National Group in the respective country is as stated in the Membership Table of Fees.

For Corporate Membership (Companies or Organisations) apply directly to the Secretariat or through your National Group.

For a national organisation to be recognised as an **ISRM National Group**, it is necessary to formally apply to the President through the Secretary-General for recognition according to the ISRM statutes. This should be an organisation, such as a Society or a Committee that represents Rock Mechanics in that country, either solely concerned with Rock Mechanics, or as part of a broader field of scientific or engineering interest. Each country should have no more than one National Group.

Benefits for ISRM Members

The current benefits for **ISRM members** (Individual and Corresponding Members) are:

- Copy of the ISRM News Journal (now being sent electronically),
- ISRM Newsletters,
- Members' area access in the ISRM website (download of Suggested Methods & Reports),
- Participation in Discussion Forums, etc.,
- Ability to download up to 100 papers per year from the OnePetro website which contains all the papers from previous ISRM sponsored symposia,
- Right to participate in the ISRM Commissions and FedIGS Joint Technical Commissions
- Registration at an advantageous rate at the ISRM Congress and International and Regional ISRM Symposia,
- Personal subscription to the International Journal of Rock Mechanics and Mining Sciences at a

discounted price, and

- Personal subscription to Rock Mechanics and Rock Engineering at a discounted price.

The current benefits for **Corporate Members** are:

- Listed in the ISRM website, with a link to the Company's website
- Listed in the ISRM News Journal
- Access to the ISRM website Members' area
- ISRM Newsletters
- Copy of the ISRM News Journal
- One registration at an advantageous rate as an ISRM member at the ISRM Congress and International and Regional Symposia.
- Free download of up to 250 papers/year from the ISRM digital library at OnePetro.org

Annual Fees

1. National Groups

National Groups shall pay to the Society a basic fee, this amount depending on the number of Members, plus a fixed amount for each Individual and Corporate Member, according to the scale below (in Euros, €).

National Group Fee:

with 10 individual members or less: €33.00;
with more than 10 and less than 40 individual members: €3 x no. of members + € 3;
with 40+ individual members: €120.00.

Individual Member Fee: €8.00

Corporate Member Fee: €160.00

2. Corresponding Members

Corresponding Members shall pay to the Society an annual fee. In order to encourage membership of individuals through the ISRM National Groups, this annual fee is different for Corresponding Members from countries with or without a National Group:

Fee for Corresponding Members from countries without a National Group: €20;

Fee for Corresponding Members from countries with a National Group: €20 in the first year; €40 in the subsequent years.

Organisation of ISRM-sponsored meetings

The Society sponsors a co-ordinated programme of National, Regional and International Symposia, and Specialised Conferences.

7TH ISRM MÜLLER AWARD

Application Deadline: 13 April 2014



The Award honours the memory of Professor Dr Leopold Müller, the Founder and first President of the International Society for Rock Mechanics.

The award is made once every four years at the ISRM Congress, in recognition of distinguished contributions to the profession of rock mechanics and rock engineering.

Past Recipients

1991	E. Hoek	CANADA
1995	N. Cook	USA
1999	H. Einstein	USA
2003	C. Fairhurst	USA
2007	E.T. Brown	AUSTRALIA
2011	N.R. Barton	UNITED KINGDOM

Candidates are to be nominated by the ISRM National Groups.

Each National Group may propose one candidate, with no restrictions on who is nominated.

Nominations are to be addressed to the ISRM Secretary General, and shall include the name and address of the nominee and of the nominating National Group plus a summary of up to 1,000 words describing the nominee's achievements and contributions together with a list of the nominee's publications.

The nominations must reach the ISRM Secretary General not later than 13 April 2014.

The nominations will be voted by secret ballot at the next Council meeting to be held in Sapporo, Japan in October 2014. The selected nominee will receive the award and deliver the Müller Lecture at the 13th ISRM International Congress in Montréal, Canada, in May 2015. All relevant information on the Müller Award, namely regarding the nomination procedure, can be obtained from the ISRM By-law No. 8 on the ISRM website:

<http://www.isrm.net>



International Society for Rock Mechanics

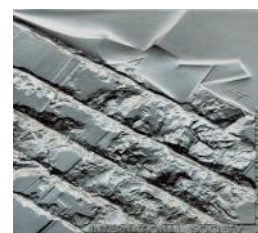
ROCHA MEDAL 2015

Since 1982 a bronze medal and a cash prize have been awarded annually by the ISRM for an outstanding doctoral thesis in rock mechanics or rock engineering, to honour the memory of Past President Manuel Rocha while stimulating young researchers.

In addition to the Rocha Medal award to the winning submission, one or two runner-up certificates may also be awarded.

An invitation is now extended to the rock mechanics community for nominations for the Rocha Medal 2015.

Full details on the Rocha Medal are provided in ISRM By-law No. 7.



Application

To be considered for an award the candidate must be nominated within two years of the date of the official doctorate degree certification.

Nominations shall be by the nominee, or by the nominee's National Group, or by some other person or organization acquainted with the nominee's work.

Nominations shall be sent electronically, addressed to the Secretary General, and shall contain:

- a one page curriculum vitae;
- a written confirmation by the candidate's National Group that he/she is a member of the ISRM;
- a thesis summary, written in English, with between 5,000 and 10,000 words, detailed enough to convey the full impact of the thesis and accompanied by selected tables and figures;
- one copy of the complete thesis;
- one copy of the doctorate degree certificate;
- a letter of copyright release, allowing the ISRM to copy the thesis for purposes of review and selection only;
- an undertaking by the nominee to submit an article describing the work, for publication in the ISRM News Journal.

Application Deadline

The nomination must reach the ISRM Secretary General by 31 December 2014.

Past Recipients

1982	A.P. Cunha	PORTUGAL
1983	S. Bandis	GREECE
1984	B. Amadei	FRANCE
1985	P.M. Dight	AUSTRALIA
1986	W. Purrer	AUSTRIA
1987	D. Elsworth	UK
1988	S. Gentier	FRANCE
1989	B. Fröhlich	GERMANY
1990	R.K. Brummer	SOUTH AFRICA
1991	T.H. Kleine	AUSTRALIA
1992	A. Ghosh	INDIA
1993	O. Reyes W.	PHILIPPINES
1994	S. Akutagawa	JAPAN
1995	C. Derek Martin	CANADA
1996	M.P. Board	USA
1997	M. Brudy	GERMANY
1998	F. Mac Gregor	AUSTRALIA
1999	A. Daehnke	SOUTH AFRICA
2000	P. Cosenza	FRANCE
2001	D.F. Malan	SOUTH AFRICA
2002	M.S. Diederichs	CANADA
2003	L. M. Andersen	SOUTH AFRICA
2004	G. Grasselli	ITALY
2005	M. Hildyard	UK
2006	D. Ask	SWEDEN
2007	H. Yasuhara	JAPAN
2008	Z.Z. Liang	CHINA
2009	G. Li	CHINA
2010	J.C. Andersson	SWEDEN
2011	D. Park	REP. OF KOREA
2012	M.T. Zandarin	ARGENTINA
2013	M. Pierce	CANADA
2014	M.S.A. Perera	AUSTRALIA

All relevant information can be obtained from the ISRM website, at <http://isrm.net>.

John A Hudson (UK) john.a.hudson@gmail.com



The SINOROCK2013 Symposium (a specialised conference of the International Society for Rock Mechanics, ISRM) was held at Tongji University, Shanghai, China, on 18–20 June, 2013 and was the third SINOROCK Symposium: the first was held at the Three Gorges Project Dam Site in 2004; and the second was held at the University of Hong Kong in 2009. All three Symposia have been outputs of the ISRM Commission on Design Methodology and have been organised by Xia-Ting Feng and John A. Hudson, together with the assistance of Professor Hehua Zhu, Dr Fei Tan, Dr Xiaoying Zhuang and many co-organisers and assistants at the three Symposia venues. The 915 page Symposium proceedings were prepared and published by CRC Press of the Taylor & Francis Group.

The purpose of the SINOROCK symposia is to contribute to the further development of the overall rock engineering design process through the sequential linkage of the three themes of rock characterisation, modelling and engineering design methods, including feedback from the construction process itself. This SINOROCK2013 Symposium began with the SINOROCK Lecture given by Professor E.T. Brown of Australia on “Technical Reviews in Rock Engineering: Experience in a Consulting practice”, and the Honorable Lecture given by Professor Qian Qihu of China.



SINOROCK2013 Theme photograph—illustrating the importance of the structural geology characterisation of rock masses, in particular fracture terminations



The Symposium was immediately preceded by a Short Course on “Structural Geology and Rock Mechanics Input to Rock Mechanics Analyses and Modelling” given by John A. Hudson, John Cosgrove and Xia-Ting Feng, plus an Underground Research Laboratory Workshop held by Joe Wang of Lawrence Berkeley National Laboratory in the USA, and an ISRM Young Members’ Presidential Group Meeting.

Over the three days of the Symposium, one day was allocated to each of the major themes, with two Key-note papers being presented for each theme. The Key-note lecturers were from China, Germany, Peru, Sweden, Turkey, and the UK: George Tham and Xia-Ting Feng, Olaf Kolditz, Antonio Samaniego, Lanru Jing, , Resat Ulusay and John A. Hudson, respectively. Luis Lamas (Secretary-General of the ISRM) also gave a presentation on the nature and current status of the ISRM.

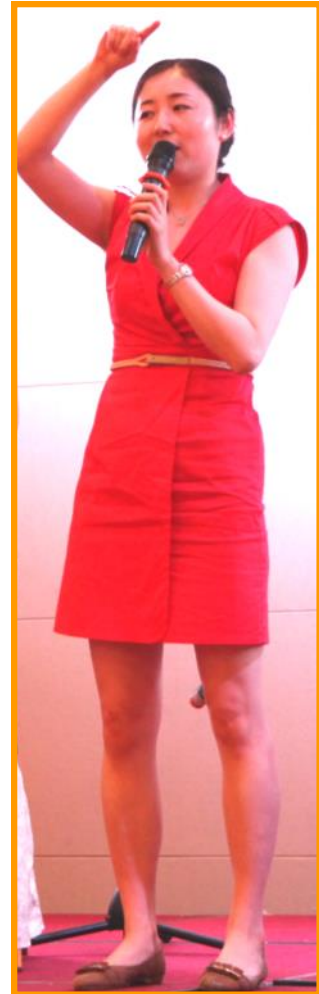
During the Closing Ceremony, the following prizes were awarded:

- Young Person’s Prize for a Paper from China: **Y.D. Zhou**, for the paper “Numerical identification of roll compression induced disintegration modes of a coal prism within a roller mill”;
- Young Person’s Prize for a Paper from Outside China: **Lauri Uotinen**, for the paper “Design of sprayed concrete as hard rock reinforcement using yield line theory”;
- Best Paper from China: **Xingping Lai**, for the paper “Large 3-D physical simulation experiments for the high and steep slope stability of open pit mines”; and
- Best Paper from Outside China: **Christophe Vibert** for the paper “Design methods for pressure tunnels”.

The Field Trip was held to Area B of the 2010 Shanghai Expo Site: i.e., the Enterprise Headquarters Cluster, which was under Construction. Area B is located along the west side of the one-axis-four-pavilion area of the Expo Site, being part of its planning exhibition and commercial district. Full reverse construction is applied in the excavation of the foundation pit, where 2 or 3 (determined by the number of underground storeys) steel concrete floor slabs serve as the support structures, and a diaphragm wall as the enveloping structure. Some of the participants took the opportunity to visit the China Art Museum which was located nearby.



**Tongji Architectural Design Building
SINOROCK2013 Symposium venue**



**Dr Xiaoying Zhuang
of Tongji University
who was the main
organiser of all the
Symposium details**



The SINOROCK2013 Symposium



The SINOROCK2013 Banquet

The ISRM EUROCK2013 Symposium held in Wrocław, Poland

John A. Hudson, UK (john.a.hudson@gmail.com)



EUROCK2013 was organised by Marek Kwaśniewski and Dariusz Lydzba, together with many Committee members and supported by the ISRM with the Polish Society for Rock Mechanics, which is the ISRM Polish National Group, and the Wrocław University of Technology. The principal sponsors were MTS and Geobrugg. The Symposium was held in the Sofitel Wrocław Old Town hotel.

The Symposium was preceded by two Short Courses: one on Saturday 21 September (Discontinuum Modelling in Rock Mechanics: from Micro to Macroscale given by Heinz Konietzky, Lothar te Kamp, Wenjie Shiu, Daniel Billaux and Matthew Pierce); and another given on Sunday 22 September (*In Situ* Rock Stress given by Ove Stephansson and Arno Zang). On Saturday, there was also a meeting of the ISRM Board. On Sunday, there were meetings of the ISRM Commissions and the Asian Council, followed by the ISRM Council meeting and reception.

During the Council Meeting, the next President of the ISRM, Dr Eda Quadros, was elected by acclamation. She will start her four-year term after the 13th Congress of the ISRM to be held in Montréal in 2015.

On the following three days of the main Symposium, six Keynote Lectures were given, as follows:

- “The Mechanical Behaviour of Salt and Salt Caverns” by Pierre Bérest;
- “Mechanisms and Consequences of Strong Mining Tremors that occur in Polish Hard Coal and Copper Mines” by Józef Dubinski;

- “Geomechanical Aspects of Shale Gas Development” by Maurice Dusseault;
- “An Overview of Underground Rock Engineering Risk” by John A. Hudson;
- “Optimisation, Sensitivity and Robustness Analysis” by Heinz Konietzky; and
- “Geomechanical Modelling of CO₂ Storage in Deep Saline Aquifers” by Xiaochun Li.

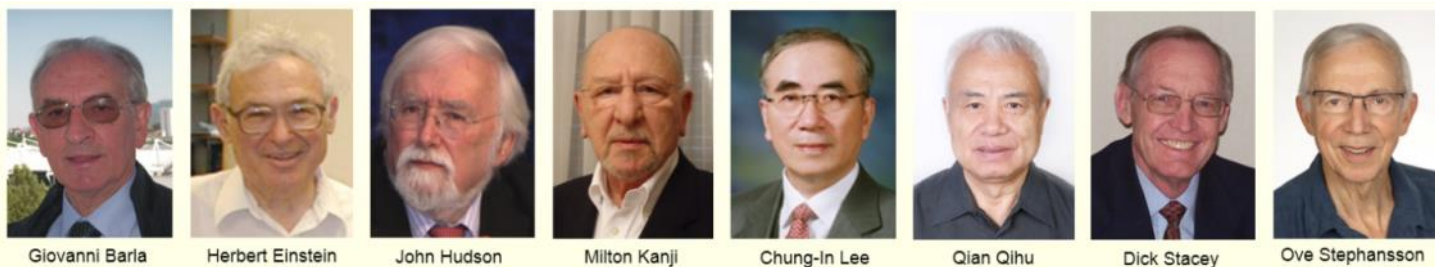
In addition, the 2013 Rocha Medal Lecture was given by Matthew Pierce on “A Model for Gravity Flow of Fragmented Rock in Block Caving Mines” and the 2013 ISRM Franklin Lecture by Andreas Gorički on “Engineering Aspects of Geotechnical Tunnel Design”.

Following the many paper presentations during 23–25 September, the Closing Ceremony was held in the late afternoon of 25 September and included presentations of the future ISRM Symposia. This was followed by the Symposium Banquet and the 2013 ISRM Fellows Induction Ceremony, see opposite page.

During the Symposium, there were also meetings of the ISRM Advisory Forum, The European Council Meeting and the ISRM Young Members’ Presidential Group. After the Symposium, there were several Field Trips, one of which is written up on pages 32–33.



The current ISRM President, Xia-Ting Feng, and the next ISRM President, Eda Quadros



New ISRM Fellows inducted in 2013



The ISRM Council decided at its New Delhi meeting in October 2010 to create the status of Fellow, as the highest and most senior grade of membership of the ISRM. It is conferred on individuals affiliated with the ISRM who have achieved outstanding accomplishment in the field of rock mechanics and/or rock engineering and who have contributed to the professional community through the ISRM.

An ISRM Fellowship is a lifetime position. It is intended that the title of ISRM Fellow will carry a clear recognition of his or her achievements. Thus, the induction of ISRM Fellows creates a group of experts that can provide strong support and advice to the ISRM, and can be called upon as appropriate for ISRM activities. The first group of Fellows was inducted in Beijing, in 2011, during the 12th International Congress on Rock Mechanics. The second group has now been inducted in Wrocław, Poland, during the EUROCK2013 banquet on 25 September.



Symposium banquet



Gnomes like these are a feature in the town of Wrocław



The ISRM Board at the ISRM Council Meeting held in association with EUROCK2013

Images from EUROCK2013, Wrocław, Poland

John A. Hudson, UK (john.a.hudson@gmail.com)



Wrocław, Poland



The young EUROCK2013 Symposium helpers



Meeting of the Testing Methods Commission



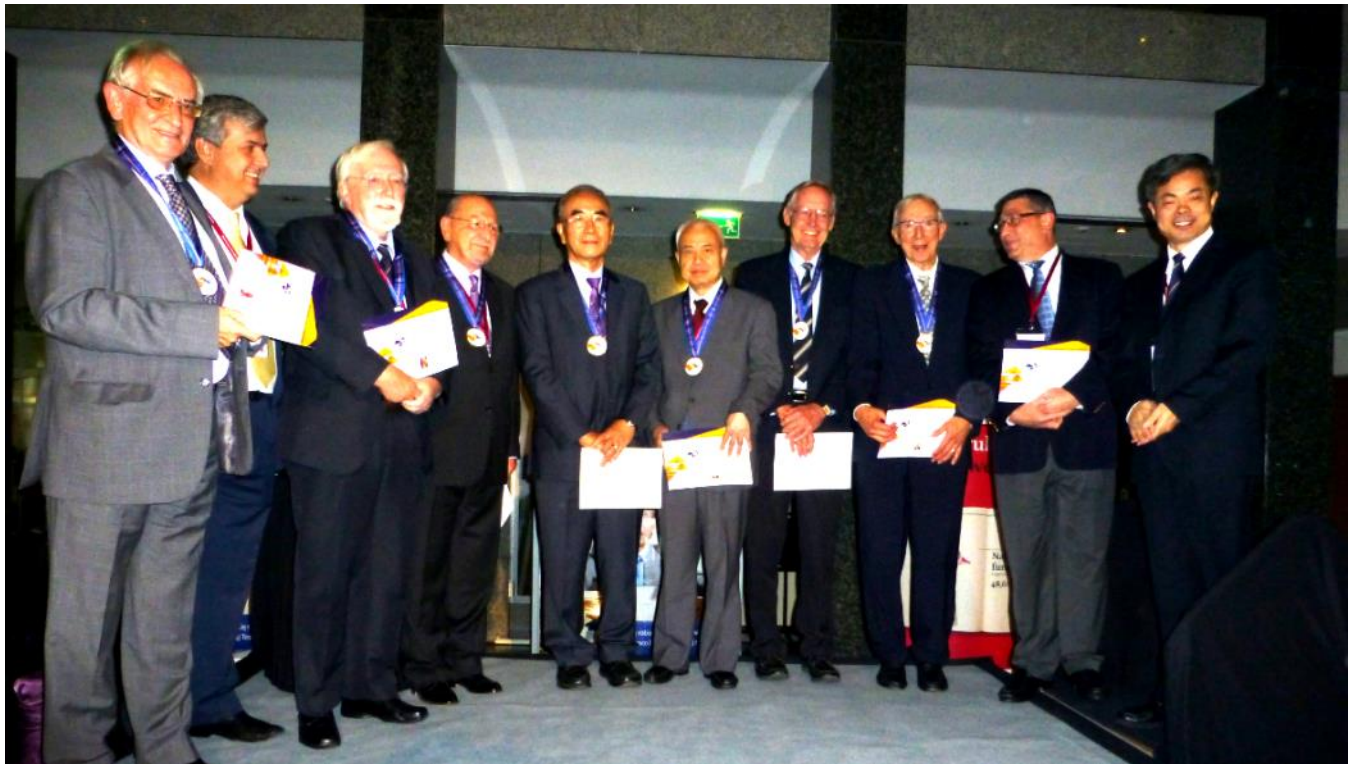
ISRM President, Prof Xia-Ting Feng



The ISRM Board dinner



The ISRM Council Meeting



The newly inducted 2013 ISRM Fellows

EUROCK2013 Technical Field Trip: Grabinex granite quarry

John A. Hudson, UK (john.a.hudson@gmail.com)

There were four Technical Trips following EUROCK2013 to:

- the Polkowice–Sieroszowice salt mine;
- the Rudna underground copper mine;
- **the Grabinex granite quarry;** and
- The Sośnica–Makoszowy coal mine.

This article describes the visit on the third trip to the Grabinex granite quarry

The participants, led by Professor Marek Kwaśniewski, travelled by bus to the Grabinex granite quarry in Strzegom which is located to the west of the Symposium location in Wrocław. The quarry is in the company's own 'Grabina Silesia' deposit. The Grabinex quarry has been operating for 16 years and produces 'clear grey' and 'grey yellow' granite mainly for construction purposes, especially setts (rectangular blocks used for paving roads), cobblestones (similar but more rounded) and road base material, amounting to 100,000 tonnes annually. The compressive strength of the granite varies between 70 and 240 MPa. A view of a portion of the quarry is shown below. Typical granite products are shown in the column opposite.

Note the linear portions of the quarry walls in the photograph below which reflect the mining method that takes advantage of preferential splitting planes in the granite.



Portion of the Grabinex quarry in Strzegom



Setts (left) and kerbstones (right) used for road construction

Quarrying has been in operation in the area since the Middle Ages. The quarrying procedure is significantly helped by the fact that the granite is anisotropic—having three characteristic orthogonal splitting directions: the 'rift', the 'grain' and the 'hardway', see Figure below. The granite splits most easily in the rift direction, a vertical plane; the granite will also split in the grain direction, the horizontal plane. In the other vertical direction, the hardway, as the name implies, it is more difficult to split the granite.

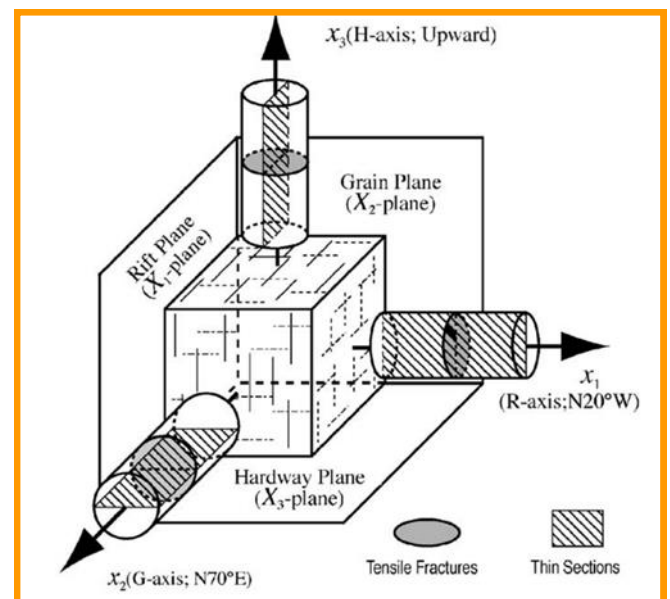
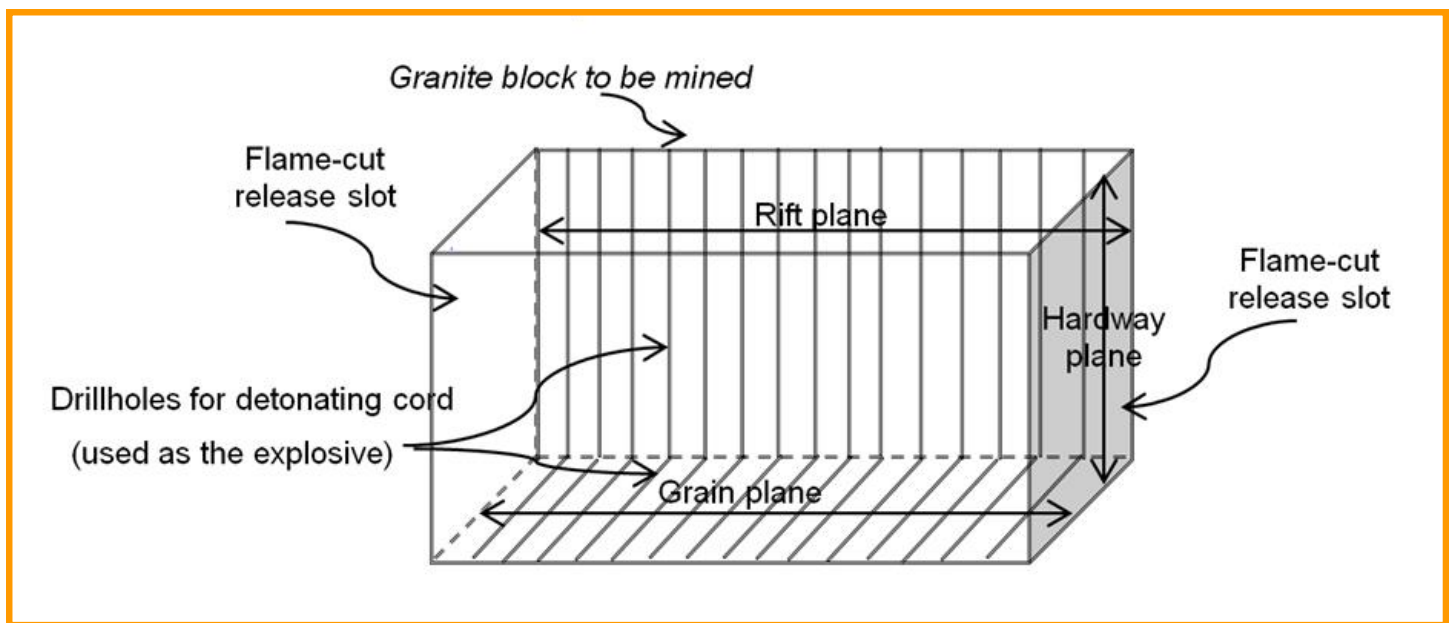


Illustration of the grain, rift and hardway planes in granite. This diagram is from Fujii *et al.* (2007) and also shows orthogonal cores taken for their testing.

The quarry takes advantage of the preferential splitting planes in the mining technique by releasing the granite blocks along the rift, grain and hardway planes, as shown in the sketch at the top of the next page. Flame-cut slots are created at each end of the block (hardway plane), then closely spaced, small diameter boreholes are drilled vertically in the rift plane and horizontally in the grain plane. Detonating cord is



The mining technique involving blasting boreholes drilled in the vertical rift and horizontal grain planes and flame-cut release slots in the vertical hardway plane at each end of the block.

used to create essentially simultaneous explosions in these boreholes, thus releasing the block and causing it to move forwards slightly. The high velocity detonating cord is a thin, flexible plastic tube filled with PETN, i.e., pentaerythritol tetranitrate.

Once the block is released from the granite mass, further spitting of the block is achieved by applying repeated blows to a line of wedges that cause a tensile stress perpendicular to the rift plane., i.e., the wedge and feathering system, see photo opposite

Thus, by repeatedly taking advantage of the preferential splitting planes in the granite during extraction of the blocks, the macro geometry of the quarry takes on an orthogonal form.

The trip participants are very grateful to the Grabinex company and especially the President,



The orthogonal nature of the quarry geometry which directly reflects the orthotropic micro-structural granite anisotropy.

Ryszard Chęciński, and the Mine Manager, Mr Stanisław Paluch, (second from the left in the photo to the left) and Translator Mr Janusz Kurc (on the right in the photo) for their kindness in explaining the quarry operation, for allowing photographs to be taken at the site, and for an excellent lunch.

Reference

Yukiyasu Fujii, Takato Takemura, Manabu Takahashi, Weiren Lin (2007). Surface features of uniaxial tensile fractures and their relation to rock anisotropy in Inada granite. *International Journal of Rock Mechanics & Mining Sciences* 44 (2007), 98–107.



Professor Marek Kwaśniewski (organiser of EUROCK2013) is third from the left.

More Memories of EUROCK2013



Prof. Qian Qihu receiving his ISRM Fellowship from Prof. Xia-Ting Feng at the EUROCK2013 banquet



Dr Andreas Goricki gave the 2013 ISRM Franklin Lecture



The ISRM Board at the Council Meeting, EUROCK2013



EUROCK2013 Plenary Session

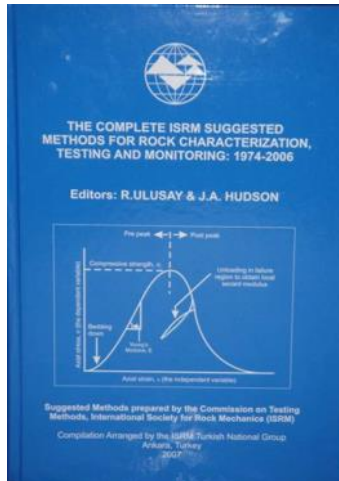


Left to right: the ISRM Vice-President, Dr Antonio Samaniego, the ISRM President, Prof. Xia-Ting Feng, and the ISRM Secretary-General, Dr Luis Lamas, at the head table, ISRM Council Meeting

The ISRM ‘Orange Book’

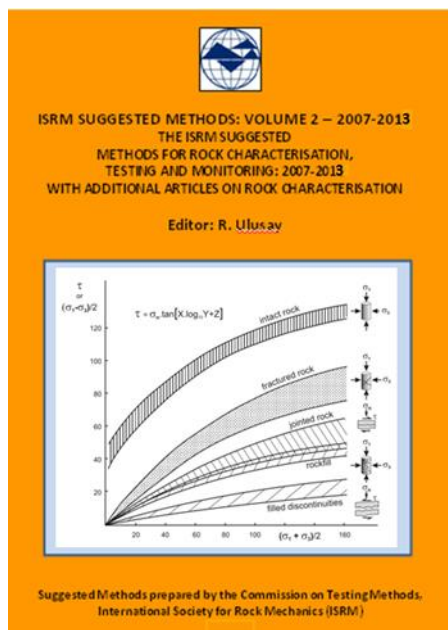
Resat Ulusay (Turkey) (resat@hacettepe.edu.tr)

Readers will be familiar with the ISRM ‘Blue Book’ which contains all the ISRM Suggested Methods (SMs) generated by the ISRM Commission on Testing Methods during the period 1974–2006 (Copies can be obtained at a reasonable price from the ISRM Secretariat or Turkish Society for Rock Mechanics).



The ISRM ‘Blue Book’

A follow-on book, the ISRM ‘Orange Book’, is currently being prepared which will contain all the recent SMs, i.e., those generated between 2007–2013. In addition to these SMs, the book will contain articles relating to rock characterisation.



The ISRM ‘Orange Book’

The ISRM Suggested Methods for Rock Characterisation, Testing and Monitoring: Volume 2: 2007-2013 with Additional Articles on Rock Characterisation (The ‘Orange Book’—Due out in 2014)

Contents

Preface (by Profs. J.A. Hudson and Xia-Ting Feng)
Introduction (by the Editor, Prof. R. Ulusay)

New and Upgraded Suggested Methods

- ISRM Suggested Method for Determination of the Schmidt Hammer Rebound Hardness: Revised Version
- ISRM Suggested Methods for Determining the Dynamic Strength Parameters and Mode-I Fracture Toughness of Rock Materials
- ISRM Suggested Method for Rock Stress Estimation—Part 5: Establishing a Model for the *In Situ* Stress at a Given Site
- ISRM Suggested Method for the Determination of Mode II Fracture Toughness
- ISRM Suggested Methods for Failure Criteria
- ISRM Suggested Method for Determining the Mode-I Static Fracture Toughness Using Semi-Circular Bend Specimen
- ISRM Suggested Method for Measuring Rock Mass Displacement Using a Sliding Micrometer
- ISRM Suggested Method for Rock Fracture Observations Using a Borehole Digital Optical Televiewer
- ISRM Suggested Method for Reporting Rock Laboratory Test Data in Electronic Format
- Upgraded ISRM Suggested Method for Determining Sound Velocity by Ultrasonic Pulse Transmission Technique
- ISRM Suggested Methods for Determining the Creep Characteristics of Rock Materials
- ISRM Suggested Method for Monitoring Rock Displacements Using Global Positioning System
- ISRM Suggested Method for Laboratory Determination of the Shear Strength of Rock Joints: Revised Version
- ISRM Suggested Method for Step-Rate Injection Method for Fracture *In Situ* Properties (SIMFIP): Using a 3-Component Borehole Deformation Gauge
- ISRM Suggested Method for Determining the Abrasivity of Rock by the Cerchar Abrasivity Test
- ISRM Suggested Method for the Needle Penetration Test

Several others may be included if they are available before the Orange Book goes to press.

Supplementary Documents

- A survey of 3D Laser Scanning Techniques for Application to Rock Mechanics and Rock Engineering
- Rock Properties and Their Role in Rock Characterisation, Modelling and Design
- The Present and Future of Rock Testing: Highlighting the ISRM Suggested Methods

2013 Activity Report by ISRM Vice-President for Africa

Jacques Lucas, S. Africa (jacques.lucas@harmony.co.za)

1. Introduction

The report below summarises the ISRM activities for the Africa region for the year preceding the EUROCK 2013 Symposium. With the region mainly being a mining region, most the structured activities were attributed to the SANIRE branch in South Africa, although some strides have been made to increase the participation and formation of other National Groups.

2. Activities of the South African National Group (SANIRE)

The South African National Group (SANIRE) recently had elections and a new President and Council have been elected. The Council consists of a good spread of practitioners and academics in the field on Rock Engineering in Southern Africa and includes various mining representatives. The newly elected President and Council members are as follows:

- Mr William Joughin (President and RE Consultant —Partner at SRK South Africa)



- Michael du Plessis (Vice President and Platinum Industry Expert)
- Friedemann Essrich (Seismologist)
- Yolande Jooste (Seismologist and Gold Mining Industry Expert)
- Jannie Maritz (Educational Institution and RE Consulting)
- Dave Neal (Coal Industry Expert)
- Jaco Le Roux (Gold Mining Industry and Numerical Modelling Consulting)
- Robert Armstrong (RE Consulting)
- Jody Thompson (RE Consulting).

Membership in the SANIRE National Group has steadily increased over the last few years mainly due to the influx of new practitioners into the Southern African mining industry and a huge focus on safety in the mining environment.

The South African National group is currently the 3rd largest National Group in the ISRM with only China and the USA having larger membership numbers. It is expected that in 2014 the SANIRE membership will surpass 500.

CATEGORY	2012-2013
Associate Members	281
Members	164
Fellow Members	16
Retired Members	6
Correspondence Members	2
Honorary Life Fellow Members	19
Student Members	3
TOTAL MEMBERS:	491

SANIRE also provides an up-to-date website (www.sanire.co.za), membership, email interaction and a quarterly newsletter, the Rock Talk, for its members.



Example: SANIRE “Rock Talk” newsletter

SANIRE also had an awards function during the Annual General Meeting (AGM) in November 2012 and various Rock Engineering related Awards were issued during the event. At the top of the facing page are Dr François Malan and Dr J Napier receiving the Salamon Award for the best published paper for the year 2012.

The 2013 SANIRE Symposium attracted delegates from diverse backgrounds—rock engineers, seismologists, scientists and product suppliers from all over South Africa—who gathered at the Meropa Conference Centre in Polokwane, Limpopo. It was hosted by the SANIRE Eastern Bushveld Branch on 7 and 8 November.

The guest speaker, Koos Bosman, opened proceedings with a trip through the history of underground stope support design, from the very early days, when



**Salamon Award recipients at the
SANIRE AGM**



**The South African and Tunisian
National Groups**

support design was intuitive, through to present-day established practices. A common challenge, as he highlighted, is the lack of geotechnical data for design purposes. In concluding, he suggested that the way around this handicap, and thus a way of catering for unknowns, is to use probabilities of failure and a risk/consequence approach to slope design.

The best paper and presenter award went to Naomi Aryes of Impala Platinum for “Investigation into performance capability of hydro pre-stressed tendon support”. This paper demonstrated an investigation into the performance of hydro pre-stressed tendons under combinational loading (tensile and shear) at varying installation angles while taking the influence of geological features into account.



**Best Speaker Naomi Ayres
at the SANIRE Symposium 2013**



SANIRE Symposium 2013

3. Activities of the Tunisian National Group (TSRM)

It is with great pleasure that we can announce that Tunisia has joined the ISRM as a National Group and started with a membership of 10 individuals. As only the second National Group in Africa and, from a geographic point of view, very well positioned in North Africa, the joining of Tunisia is of utmost importance for the growth of the ISRM and its members in Africa.

The Tunisian NG will be led by Dr. Essaieb Hamdi as President. Due to the late approval of Tunisia as a National Group, no time was available to include the activities of Tunisia in this report. The TSRM is however in the process of organising a one-day Seminar on blast-induced vibrations in quarries and mines in Tunisia during December of this year. The next activities report will include more detail on the Tunisian NG.

2013 Activity Report by ISRM Vice-President for Asia

Yingxin Zhou, Singapore (zyingxin@dsta.gov.sg)

National Groups Highlights of Asian Activities

Membership in Asia increased from 1700 in 2012 to 1913 in 2013, accounting for more than 75% of the total membership increase in the ISRM.

Asia welcomed back the Vietnam NG to the ISRM Family. In Oct. 2012, the Korea NG organised the first Young Presidential Members Group event at the 7th Asian Rock Mechanics Symposium, with scholarships for students and a Students' Night attended by more than 30 students and several ISRM Board Members. There were three nominations from Asia for the Rocha Medal 2014. The India NG submitted a proposal to host the 14th ISRM Congress on Rock Mechanics in 2019, while the Indonesia NG submitted an application to host the 2016 ISRM International Symposium in Bali, in connection with the 9th Asian Rock Mechanics Symposium. A new Commission on Underground Nuclear Power Plants was set up with Prof. S. Sakurai as Commission President.

China

China had 872 Individual Members and 16 Corporate Members. The main activities included: SINOROCK 2013 held in Shanghai, June 2013, together with the 2nd YMPG activities; 4th Int'l Conference on "New Development in Rock Mechanics and Engineering" in Shenyang, Sept 2013, and Publication of the Journal of Rock Mechanics and Geotechnical Engineering in its 5th year.

India

India had 352 members. The main activities included: Seminar on "Ground Control and Improvement", 20–21 September 2012; International Seminar on "Minimising Geological Uncertainties and Their Effect on Hydroelectric Projects", 27–28 September 2012; Seminar on "Slope Stabilisation Challenges in Infrastructure Projects", 29–30 November 2012; Seminar on "Geotechnical Challenges in Infrastructure Projects", 25–26 April 2013; Invitation to host the 14th ISRM Congress in India in 2019; and continued publication of the ISRM (India) Journal.

Indonesia

Indonesia had 34 members. The Indonesia NG was a Co-organizer of 1st National Seminar on Geomechanics in June 2012, in Yogyakarta; and the main Organizer of the 2nd National Seminar on Geomechanics in Aug. 2013, in Bandung with more than 170 participants. It was chosen by the Asian Council to organise the 9th Asian Rock Mechanics Symposium in 2016, and submitted an application to host the ISRM International Symposium for 2016 in Bali, Indonesia.

Iran

Iran had 133 members. The Iran NG contributed to the holding of two seminars presented by experts on abrasion in mechanized tunnelling and excavation supports, both held in January 2013, and completed a project "Comparative Evaluation of the Rock Mechanics Science in Iran" in conjunction with the Ministry of Science and Research & Technology in July 2012.

Israel

Israel had 15 members. It conducted its annual professional meeting during the annual Israel Geological Society symposium in April 2013 and organised two professional rock mechanics sessions, with 12 lectures delivered on various aspects of underground excavations, shale mechanics and petro-physics, numerical modelling, slope stability, novel ground improvement methods, and earthquake engineering. The President of IRMA has continued as President of the ISRM DDA Commission and as a member of ISRM Commission on "Preservation of Ancient Sites".

Japan

The Japan NG had 348 individual members and 39 corporate members. The main activities included: 13th Japan Symposium on Rock Mechanics & 6th Japan–Korea Joint Sym; 11th ICADD Conference in Fukuoka; Organised the 6th Int'l Symp. on *In Situ* Rock Stress; Newsletters (Nos. 104–107), Rock Net mail (Nos. 366–412) distributed to Japanese members and other recipients; and produced "Rock Mechanics '11 CD-ROM" containing all publications on Rock Mechanics in Japan in 2011; and the International Journal of JCRM Vol. 8 No.1.

Korea

Korea had 47 members. KSRM publishes an official bi-monthly journal, "Journal of Korean Society for Rock Mechanics", and a bi-monthly electronic newsletter, 'U-Space'. It organised the 7th Asian Rock Mechanics Symposium in Oct 2012 (ARMS7), with a total of 314 participants from 32 countries and organised the First Students' Night sponsored by the ISRM Young Members' Presidential Group with more than 30 students—in connection with the ARMS7.

Middle East

Middle East Asia had eight members from the UAE and Saudi Arabia, mostly in petroleum engineering. Members participate in major rock mechanics conferences and meetings but membership tends to fluctuate due to company rotation of employees in the region.

Nepal

With the support of Prof Krishna Panthi of the Norwegian University of Technology, Nepal registered a new Society, the Nepal Society for Rock Mechanics (to replace the previous Nepal Geotechnical Society) which is expected to formalise and revive the ISRM NG Nepal by 2014.

Singapore

Singapore had 77 ISRM members. The main activities included: 13th World Conference of the Associated Research Centres for Urban Underground Space on 7–9 Nov 2012; a 2-day seminar on UG Space Planning and Design on 5–6 Nov 2012; a one-day Workshop on Underground Safety on 6 Nov 2012; a 2-day Short Course on Geological Investigations in Jan. 2013; a 2-day Short Course on Safe and Efficient Blasting in Mar 2013; and a 1-day Workshop on Engineering Geology in May 2013.

Southeast Asia

No report was submitted from Southeast Asia.

Vietnam

Vietnam rejoined the ISRM in 2013 with 29 members.

2013 Activity Report by ISRM Vice-President for Australasia

David Beck, Australia (dbeck@beckengineering.com.au)

ISRM AUSTRALASIA REPORT JUNE 2012–JUNE 2013

1. Rock mechanics in Australasia

1.1 Situation

2012 and 2013 brought opportunities and challenges for Australasian members.

In late 2012, demand for rock mechanics in Australia and New Zealand was still experiencing a period of unprecedented growth. This was driven by the long boom in mining, a trend towards mining of more complex deposits and the tunnelling and construction projects.

The effect was mostly positive but there were negatives: rock mechanics engineers and geotechnical engineers were in very strong demand, but there were acute shortages of people. An informal survey of industry leaders suggests a reduction in focused R&D activity and some reported a lack of available rock mechanics engineers affected their worldwide operations. Some projects reported delays caused by trouble sourcing rock mechanics engineering input.

In response, the mining industry sponsored Chairs in Rock Mechanics and related areas at The University of Queensland and The University of New South Wales and there was continued support of Course Work Masters Programmes in Australia and New Zealand. There was also a significant increase in salaries for our members and a number of rock mechanics engineers also immigrated to the region. A larger number of professionals in related areas—geology, mining and civil engineering—were recruited to geotechnical positions in both countries. This is a traditional path to rock mechanics and geotechnical engineering in Australasia as, although most Universities have strong coursework and research programmes, there have been few opportunities for rock mechanics training as a first degree. The Bachelor of Engineering (Geotechnical) at the University of Tasmania in 2012 became Australia's first geotechnical engineering course that is fully accredited by Engineers Australia.

In 2013, the positive trends and resulting challenges have not continued on the same trajectory. Education growth and efforts are as strong, but there has been a slowing in other sectors of the rock mechanics industry:

- Large service firms report major falls in work. Most have laid off staff;
- Mining companies of all sizes have down-sized, laying off a large number of our members;
- A number of major tunnelling projects came to an end;
- There has been a contraction in participation by rock mechanics engineers at conferences;
- R&D activity has showed some signs of slowing after next year—most major companies have slowed investment in in-house rock mechanics R&D and technical services and this could eventually flow through to demand for University R&D as well.

In 2013/2014, we expect the industry contraction to stabilise, and traditionally this will lead to positives and negatives:

- renewed interest in post-graduate courses for recently graduated engineers; and
- a number of members will leave the industry.

The general effect is likely to be a contraction in ISRM membership in Australasia in 2013/2014. While this is unfortunate, it is a consequence of the cyclic nature of the industries in which our members work in Australia and New Zealand.

One step to address the contraction is outlined below (See National Group in Australia).

2. Major events in Australasia in 2012–2013

2.1 The International Conference for Effective and Sustainable Hydraulic Fracturing (HF2013)

The International Conference for Effective and Sustainable Hydraulic Fracturing (HF2013) was held 20–22 May 2013 in Brisbane, Australia. HF2013 was a Specialised Conference supported by the International Society for Rock Mechanics (ISRM) via the Australian Geomechanics Society and hosted by Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO). Organisational support was also provided by the University of Utah's Energy and Geoscience Institute (EGI) and the American Rock Mechanics Association (ARMA).

The goal of HF2013 was to advance hydraulic fracturing technology that is effective in its purpose and sustainable in its impacts on communities and environments by bringing together hydraulic fracturing experts, not only from the oil and gas industry, but also from other application areas of hydraulic fracturing such as mining and geothermal energy production.

HF2013 was attended by 120 delegates and provided a unique mix of mainstream topics with emerging topics, complementary areas, and input from sources that are often not tapped by oil and gas industry targeted conferences. Keynotes and technical presentations included contributions from both academics and practicing engineers. The resulting discussions, which included an 'open microphone' session, were dynamic and the subject of extensive positive feedback from the participants.

The proceedings can be downloaded for free from OnePetro or at:

<http://www.intechopen.com/books/effective-and-sustainable-hydraulic-fracturing>

2.2 The Australian Geomechanics Society hosted the 11th Australia–New Zealand Conference on Geomechanics in July 2012, "Ground Engineering in a Changing World"

This conference is the main geotechnical conference in Australasia and is held every 4 years. It is sponsored by the ISSMGE. It was well attended by rock mechanics professionals from all the related International Societies.

2.3 International Symposium on Ground Support in Mining and Underground Construction

Following on from previous symposia held in Sweden, 1983; Canada, 1992; Norway, 1997; Kalgoorlie, Australia, 1999; Perth, Australia 2004; South Africa, 2008, the 7th International Symposium on Ground Support in Mining and Underground Construction was held in Perth, Australia in 2013.

2013 Activity Report ISRM Vice-President for Australasia (cont.)

David Beck, Australia (dbeck@beckengineering.com.au)

2.4 AGS Young Professionals' Night 2012

The Young Geotechnical Professionals' Night is an annual event. Four selected presentations by young geotechnical professionals discussing interesting and challenging aspects of their work are highlighted.

2.5 9YGPC – 9th ANZ Young Geotechnical Professionals' Conference 2012

The Australian Geomechanics Society (AGS) and the New Zealand Geotechnical Society Inc. (NZGS) hold this conference biannually. The conference aims to promote the professional development of delegates through sharing experience and ideas, and by presenting a paper to senior professionals and peers. The conference was well attended and very successful. Planning for the 10YGPC is underway.

3. Upcoming Major Events IN Australasia

- AGS is bidding for the 19th International Conference on Soil Mechanics and Geotechnical Engineering, Sydney 2017.
- The Third Australasian Ground Control in Mining Conference 2014, Sydney, Australia. This conference has applied to be an ISRM specialised conference.
- ANZ 2015 The Changing Face of the Earth: Geomechanics & Human Influence, Wellington, New Zealand.

4. ISRM Membership

Approximate as at August 2013 (please refer to AGS and NZGS secretariat for most up-to-date membership data):

Australia	307
Corresponding Members	23
New Zealand	150
Total	480

4.1 National Group in Australia

Australasia has the highest rate of corresponding membership in the world. This arises from the composition of rock mechanics engineering professionals in Australia, which has a high number of mining professionals. The Australian National Group (the Australian Geomechanics Society) is largely focused on civil engineering, and mining Rock Mechanics Professionals (RMPs) rarely join.

This poses no issue for potential or existing ISRM members in New Zealand, or existing ISRM members in Australia who are served extremely well by the AGS, which is the most successful technical society within Engineers Australia. The problem is only for the 'miners':

- They are 'friendly' and have great respect for the AGS, but: many work remote from capital cities where regular AGS meetings take place; have no activity in 'civil' geotechnical work; are already satisfied members of other geotechnical groups: the Eastern Australian Ground Control Group (EAGCG) and to a much lesser extent, the Western Australian Ground Control Group (WAGCG);
- They regularly use ISRM's products and have participated in ISRM activities in the past. Mining RMPs

almost exclusively use the ISRM Suggested Methods as 'standards' in their day-to-day testing work.

- They are aware of and have loyalty to the ISRM products over a long period.
- Most would join the ISRM if it were not via the AGS, but they want the EAGCG and WAGCG to collaborate with the AGS wherever possible. A good example was the recent Nick Barton Lecture held by EAGCG but attended by members of all three groups.

To the ISRM, mining rock mechanics practitioners are a core constituency. We want them to join their AGS counterparts in becoming members of the ISRM and they want to join the ISRM.

4.1.1 Options

At this stage, the ISRM's effort has only been to bring this issue (the lost mining RMPs) to the attention of the AGS and NZGS committees, so that options can be discussed. At this stage, discussions between EAGCG and AGS are under way, and discussions with the WAGCG will begin soon.

The VP Australasia has proposed that in the first stage, AGS and EAGCG will find a model for working together to act as the National Group for Australia, with WAGCG joining later if their members choose to do so. The co-operation would only be a collaboration for the purposes of ISRM business, not a merger.

5. New NZGS ISRM Representative

In April, the NZGS board appointed Mr Stuart Read as the new ISRM representative, replacing Marc Andre Brideau, who has returned to Vancouver. We wish Marc-Andre the best in his new role.

Stuart's roles as ISRM representative will include:

- Liaising with the NZGS members affiliated with ISRM;
- Attending NZGS Management Committee meetings (expenses will be reimbursed for travel);
- Representing NZGS matters to the wider ISRM community at conferences or other international meetings as required;
- Liaising with the current ISRM Vice-President for Australasia, Dr David Beck; and
- Preparing quarterly reports for the Management Committee meetings and reports for Geomechanics News.

The next term of the Vice-Presidency in Australasia will be held by a member from the NZGS.

6. Recommendations

2012/2013 was a successful year for both the NZGS and AGS. Both societies grew, and both are the strongest technical societies in the engineering fraternity in their respective countries. They actively recruit and retain young members and serve the needs of members very well. The ISRM should commend these national groups for their efforts.

In 2013/2014, though we expect contraction arising from the cyclic downturn in mining, the renewed focus on the sharing of NG status between EAGCG and AGS could stem the decline.

2013 Activity Report ISRM Vice-President for Europe

Frederic L. Pellet, France (frederic.pellet@insa-lyon.fr)

From May 2012 to September 2013, I attended five international conferences held in Europe. They were:

- The Geomechanik Kolloquium (Salzburg–Austria),
- The EUROTUN Ecomas Conference (Bochum–Germany),
- The World Tunnelling Congress (Geneva–Switzerland),
- The First International Conference on Rock Dynamics and Applications (Lausanne–Switzerland), and
- The Congress of ISSMGE (Paris–France).

Each of these meetings provided me with the opportunity to meet members of the European Rock Mechanics Community.

Additionally, I was invited to participate in the Bergmekanikdaggen Conference (Stockholm–Sweden), held in March 2013. I also had the pleasure of attending the Swedish National Group's yearly meeting.

Growth of the ISRM

This year, Hungary joined the ISRM. There are now 26 National Groups in the European Region. Moreover, both Iceland and Ireland have expressed a keen interest in joining the ISRM and significant contacts have already been established.

Enhance communication with Members and National Groups

The ISRM European Region is not easy to manage—for obvious reasons: 26 countries with many languages, cultural differences and the lack of cheap and convenient transportation facilities between the member countries. In addition, the current economic situation does not make it easy to foster personal exchanges.

Currently, the communication between the European National Groups is not encouraging; one possible solution to this problem could be the establishment of a dedicated website for an ISRM European Club or a LinkedIn Discussion Group.

EUROCK Symposia

In the context of communication and exchange of ideas, the EUROCK Symposia are currently *the best opportunity* for members of the European rock mechanics community to gather on a yearly basis. Therefore, everything should be done to involve as many European countries as possible in the organisation. This also concerns the International Advisory Board with their choice of keynote speakers and lecturers. The aim is to improve communication and strengthen the relationships between the East and the West, the North and the South of Europe. The next

EUROCK Symposia will be held in Vigo–Spain (2014), Salzburg–Austria (2015) and Cappadocia–Turkey (2016).

Awards

In 2013, the Franklin Lecture was awarded to Dr Andreas Goricki from Austria. Dr Goricki received his PhD from Graz University of Technology in 2003. During the last EUROCK symposium, held in Wrocław Poland, he presented a lecture entitled “Engineering Aspects of Geotechnical Design”.

The Eurock 2013 Outstanding Paper Award for Young Scientists and Engineers was given to Dr Martin Entacher from Montanuniversität Leoben in Austria. His paper was entitled “A new small scale rock cutting test”.

Evolution of Eurocode 7

The ISRM expressed the will to commit to the evolution process of the Eurocode 7 (European Standards for Geotechnical Engineering). The decision was made to convene a Commission on this matter in order that rock mechanics will be given greater consideration in engineering design standards.

ISRM Online Lectures

This year, the ISRM Online Lecture was launched. The European Rock Mechanics Community actively participated to this endeavour. Three well-known professors and experts gave lectures, namely Professor Schubert from Austria, Professor Hudson from the United Kingdom and Dr Duffaut from France.



2012 Geomechanik Kolloquium (Salzburg–Austria)

From left to right:

**Prof. I. Vrkljan, Dr L. Lamas, Prof. X-T Feng,
Prof. F. Pächner, Prof. F. Pellet,
Dr N. Grossman, Prof. W. Schubert**

2013 Activity Report ISRM Vice-President for North America

John Tinucci, USA (jtinucci@srk.com)

Growth

ARMA: 693 (+193), CARMA: 250 (+26), Mexico: re-joining ISRM, membership unknown, Total:943.

ARMA

Leadership

Antonio Bobet, President; John McLennan, V-P; Peter Smeallie, Executive Director.

C. Fairhurst, French Legionnaire

On 15 July, 2013, Charles Fairhurst was notified that he had been named an officer in the National Order of the Legion of Honor by the French government. He was cited for his “exemplary personal commitment to French-American relations as symbolised by (his) exceptional co-operation with French companies and contribution to many public-private partnerships in the field of rock mechanics.” Further, it was recognised that his “commitment to training the next generation of engineers in this field is also a valuable contribution to a sustainable approach to geology.” They stated that this decoration was a source of deep joy for those who admire (his) scientific leadership.

47th US Rock Mechanics/Geomechanics Symposium

This was held in San Francisco, California on June 23–26, 2013. It was one of the most successful Symposia to date, with more than 350 papers, four Keynote Speakers, 44 Technical Sessions, two Poster Sessions, four Short Courses, three Workshops, 15 Exhibitors, three Technical Tours and a large number of exciting Special Activities.

This multidisciplinary international annual meeting is the focal event for the Rock Mechanics and Geomechanics community, bringing together professionals and students from civil, geological, mining, geophysical and petroleum engineering. The Symposium focused on new and exciting advances in rock mechanics and geomechanics that cut across disciplines and span the globe—with more than half of the papers from 38 countries outside the US. The Keynote speakers provided insights into pore pressure in deep water, a perspective on current and future directions in carbon sequestration, a fascinating description of the technical, political and socio-aspects of constructing a water tunnel from the Mediterranean Sea to restore the Dead Sea and the current state of the art in monitoring landslides and other large-scale ground movements.

Next US RMSym Event in Minneapolis

The 48th Symposium of the American Rock Mechanics Association will be held in Minneapolis, 1–4 June, 2014. The Organising Committee, led by Joseph La-

buz and Emmanuel Detournay, is already working to ensure an exciting and quality program for ARMA members. The theme they have selected will be “Rock Mechanics Across Length and Time Scales.” They have issued the Call for Papers, with a deadline for submission of abstracts on 1 November, 2013. For further information or to submit your abstract, see www.ARMAsymposium.org

Planning Joint Brazilian Symposium of Rock Mechanics (SBMR)

ARMA is pleased to announce that the Brazilian Rock Mechanics Committee and ARMA are co-hosting the 6th Brazilian Symposium of Rock Mechanics (VI SBMR) to be held in Goiania, Brazil, on 9–13 September 2014. This Symposium represents an important forum for discussing and presenting scientific research and technology, geotechnical design and engineering work related to rock mechanics. The Symposium will be held with the Brazilian Congress of Soil Mechanics & Geotechnical Engineering.

Planning Joint ARMA/CARMA Discrete Fracture Network Engineering Conference

The International Conference on Discrete Fracture Network Engineering will be the first meeting of engineers and geoscientists from around the world who use discrete fracture network engineering in the characterisation of rock masses and practical solution of engineering problems. Sponsors invite all engineers and geoscientists in this new and rapidly growing field to Vancouver, Canada in October 2014 to share their ideas and experiences in the increased development and practical use of this technology under the theme Engineering Characterisation of Fractured Rock Masses: Applications of Discrete Fracture Network Engineering. The DFNE 2014 website is now in place at www.dfne2014.ca

Future Leaders Program

The ARMA Future Leaders group was organised with a number of purposes in mind. Primary goals were to provide for continued relevance to rock mechanics and geo-engineering issues as they emerge over time, and to ensure that the organisation has an enduring foundation as it evolves to be representative and useful to its members. These purposes are demonstrated in recent activities by members of the program. Future Leaders have been fully engaged in supporting ARMA annual Symposia through participating in the organising committee, developing and chairing sessions, reviewing papers, and making awards for papers and posters. At the recent San Francisco Symposium, members of

Future Leaders were active in a number of other ways. Many of these activities were summarised in a preceding article (e.g. Career Corner, Trivial Pursuit contest). But, in addition, at the annual luncheon meeting, they agreed to set up a Linked-In and email site to facilitate communications. A number of attendees were elected as additional members to the group and will be expected to help serve in future events and activities. Finally, another activity has been to expand the reach of rock mechanics/geomechanics professionals and academics by collaborating with external societies. Future Leaders initiated an ARMA co-sponsorship of the AAPG Geosciences Technology Workshop on Geomechanics and Reservoir Characterisation of Shales and Carbonates, held 16–17 July 2013 in Baltimore, MD.

CARMA Leadership

John Hadjigeorgiou, Jim Hazzard, Chris Hawkes, Denis Thibodeau and Luc Beauchamp as Secretary/Treasurer.

Revised Website

The full transition to our standalone website was made www.carma-rocks.ca

We are happy to report that members will now have access to past proceedings of CARMA events for which we hold the copyright. The technical library already includes the proceedings of RockEng 2012 and Slope Stability 2011.

Hosted RockEng2012

RockEng12, the 21st Canadian Rock Mechanics Symposium was a technical success. It was also very rewarding to see so many younger rock engineers attending and presenting at the conference.

Revised Governance

A major initiative of CARMA was towards improved governance and financial transparency.

Co-sponsors of DFNE

CARMA, along with ARMA, are co-sponsors of the International Discrete Fracture Network Engineering Conference (DFNE) 2014 in Vancouver 19–23 October, Vancouver, BC.

Planning ISRM 13th International Congress

In 2015, CARMA is sponsoring the ISRM 13th International Congress on Rock Mechanics in Montréal.

Antonio Samaniego, Peru
(asamaniego@svs.com.pe)

The Mexican Society of Geotechnical Engineering (MSEG) has recently joined the ISRM as the Mexican National Group. As agreed with the North American VP, the South America region will co-ordinate with Mexico—mainly due to language facility. This means that now 10 national groups belong to the South America region. During 2013, co-ordination with institutions from Ecuador led to the expectation that it will become an ISRM National group in the near future.

2013 was a quiet year for our region in terms of symposia and conferences but, from next year, the main activities planned are as follows:

- 1st International Conference on Applied Empirical Design Methods in Mining to be held in Lima Peru from 9 to 11 June 2014.
- The VI Brazilian Rock Mechanics Symposium to be held in Goiania, Brazil from 10 to 13 of September 2014.
- The 8th South American Rock Mechanics Congress to be held in Buenos Aires, Argentina, from 15 to 18 of November 2015.

The main activity of our region was to encourage our National Groups to be active in recruiting more members: that is why the total number has increased, especially in Brazil, Chile and Mexico. Also, an effort was made to actualise their email addresses in order that members will receive all benefits to which they are entitled, such as receiving the ISRM bulletins and having connection to the OnePetro website. Also, many members of the NG groups of our region are invited to participate in the Applied Empirical Design Methods for Underground Mines that is a sub-Commission of the ISRM Rock Engineering Design Methodology Commission.

Finally our region is delighted with the election of Dr Eda Quadros as ISRM President for the period 2015–2019 (see pages 8–9). This will put the attention for the first time in our region and all National Groups are encouraged to actively participate in the ISRM activities.

2013 Activity Report Vice-President at Large 1

Yuzo Ohnishi, Japan (yohnishi@hq.kyoto-u.ac.jp)

For the Period June 2012–September 2013

Collaboration with National Groups of Japan and other Asian countries

After the 3/11, 2011 East Japan Great earthquake, we have been continuously discussing about the present and future of the Japanese National Group, also rock mechanics and engineering in Japan. Research interest in rock mechanics subjects is related to disaster prevention, energy resource development and nuclear hazard. However, we have to innovate new technologies with the co-operation of other fields and researchers in neighbouring countries. We established some Committees to encourage rock mechanics people to accelerate rejuvenation in rock mechanics.

In addition to our domestic activities, international collaboration continues, such as the joint rock mechanics annual Symposium with Korea, and with other neighbouring country's research groups.

Support Innovation activities in Japanese rock mechanics fields

The Japanese economic condition has been poor and stagnating for the last 20–25 years. But last year a new regime was established and some interesting projects were proposed to strengthen aged infrastructures in Japan with the help of civil and rock mechanics engineers. I try to organise strong rock mechanics groups to be involved in these projects, that are the

- New Linear Superconductive Shinkansen construction project (See Photo 1),
- ILC (International Linear Corridor) project,
- Fukushima nuclear power plant contaminated groundwater problems in soft layered rocks.

Maintenance and rehabilitation of aged infrastructures is the viewpoint from rock engineering all over Japan (See Photo 2). The 2020 Tokyo Olympic related projects will soon come up. All those projects are challenging to us and require innovative work in our field.

Support ARMS8 Public-Relations Activities

ARMS-8 will be held by the Japanese National Group next year, 2014, and we wish to have strong support from Japanese industries. As a Vice-President of ISRM, I have tried to meet some company executives to explain how ARMS8 is important and what we can do for them.

Internationally, during the last year, I was at the 47th US Rock Mechanics Symposium in San Francisco, Indonesia (Surabaya) and Thailand (Bangkok) to deliver some talks about ARMS8 and asked them to support the Symposium.

Encourage ISRM Commission activity

The ISRM DDA Commission started in 2011 and every year a Workshop and related Symposium take place. This year, we held the ICADD-11 meeting at Fukuoka, Japan (27–29 August 2013). I was deeply involved in organising the Symposium.

Technical Oversight Committee: Review of ISRM Commission activities

The ISRM Board decided in 2012 to create a Technical Oversight Committee (T.O.C.) for the ISRM Commissions. Creation of such a Committee enables the oversight and co-ordination of the Commissions' work and production of a yearly report on the ISRM Commissions' activities. We have been working to review reports prepared by every Commission and the result of the oversight assessment was reported at the Board and Council meetings in Wrocław, Poland (see page 46 for the TOC report).



Photo 1. New Super-conductive 500 km/hr Bullet Train
(Courtesy of JR Tokai, Japan)



Photo 2. Mobile Imaging Vehicle for tunnel inspection and maintenance

Manoj Verman, India
(mvr@geodata.it)

The focus continued to be on three issues: new country members from Asia; linkages with industry; and rock mechanics education. Pakistan and Nepal are regarded as countries with huge potential for rock mechanics related activities. With a number of current and planned projects in the challenging ground conditions offered by the Himalayas, there is a need for ISRM to establish a firm foothold in these countries to provide a common platform for rock mechanics related activities and to offer help in dissemination of knowledge.

Unfortunately, despite several attempts, no individual or organisation in Pakistan has come forward to show an initiative to champion the cause of securing ISRM membership for Pakistan. The efforts will continue nevertheless.

Nepal, on the other hand, has ISRM membership which is 'fragile', as it is led by a 'one-man army' of a non-resident Nepali: Dr. Krishna Panthi of Norway. Clearly, this is not sustainable because, despite his best efforts and generous personal contributions, it is unfair to expect Dr. Panthi to continue to shoulder the burden all by himself. Unfortunately, despite several attempts, there has so far not been a strong response from any organisation in Nepal to lead this initiative. The efforts will continue.

Because the industry was grappling with a bit of gloom on the economic front, a strong linkage with ISRM was not on its priority list. Currently, the industry regards ISRM as a body of academicians and researchers and the time has perhaps come for some bold changes in the ISRM in order to send the right signals to the industry and to appear more industry-friendly. The possible changes could be renaming of the ISRM to ISRM & RE, with 'RE' standing for 'Rock Engineering'. Other initiatives, such as creating awards like "Best Project Award", may be considered. Some big industry players, such as the NHPC of India, have shown interest in joint organisation of events with ISRM.

In the area of Rock Mechanics education, the initial enthusiasm from top Institutes gave way to disappointment—as there is a significant shortage of faculty across disciplines. Very few Institutes, therefore, have the capacity to focus on augmenting their Rock Mechanics education. ISRM needs to have an ITA-like initiative to have its own lecturers who could present Special Courses, both for the industry as well for the Universities.

Ivan Vrkljan
(ivan.vrkljan@igh.hr)

My main activity was to establish contact with countries from the region who are not ISRM members. Also, I organised an historical exhibition with six large posters on the occasion of the 50th anniversary of the ISRM.

With great pleasure I can report that Hungary became a member of the ISRM. The Hungarian National Group (HNG) will represent Hungary. Its President is Professor Ákos Török (torokakos@mail.bme.hu). The secretary of the Society is Ildikó Buocz (ildikobuocz@yahoo.com).



President, HNG



Secretary, HNG

Professor Ákos Török **Ildikó Buocz**
Head of Engineering Geology
Division at the Budapest University
of Technology and Economics

Regarding the extension of ISRM with new countries in the region, I contacted colleagues from Romania, Bulgaria and Belarus.

The ISRM historical exhibitions were organised in Bosnia and Herzegovina, Slovenia and Croatia.



BOSNIA AND HERZEGOVINA
2nd International Scientific Meeting GTZ 2012,
Tuzla, June 7–9, 2012,
State and Trends in Geotechnics

Report of Technical Oversight Committee (TOC) of ISRM, 2013

**Yuzo Ohnishi, Japan (yohnishi@hq.kyoto-u.ac.jp) &
David Beck, Australia (dbeck@beckengineering.com.au)**

At its last meeting in Stockholm, the ISRM Board decided on the creation of a Technical Oversight Committee (TOC) for the ISRM Commissions.

This resulted from the recognition that the outputs of the ISRM Commissions should be the most important products of the Society, be they in the form of high quality reports or in other form. These should be made available to the members and the community.

Creation of the TOC will enable the oversight and co-ordination of the Commissions' work, and production of a yearly report on the ISRM Commissions' activities. This is the first such report

- Commission on Testing Methods
- Commission on Underground Nuclear Power Plants
- Commission on Underground Research Laboratory (URL) Networking

A total of 14 ISRM Commissions reported their activities. This article is a simple summary of the full reports of the Commissions, and draws directly on their content.

Participation in various activities by each of the Commissions is summarised in the Table on the opposite page.

**A Summary of each of the
16 Commissions' activities follows**

Introduction

The purpose of ISRM Commissions is to study scientific and technical matters of interest to the Society. ISRM Commissions can only be approved if it is clear that the Commission is well organised and that there will be a significant product—which is both useful to the ISRM and produced on time. Note this means that, in terms of the current Presidential four-yearly tenure, the Commission's full report should be prepared in the year before the 2015 Montréal Congress.

It was thus expected that Commission meetings would be held at least in association with the ISRM International Symposia, i.e., the EUROCK2012 in Stockholm, Sweden in May 2012, the EUROCK2013 in Wrocław, Poland in September 2013, the ARMS8 to be held in Sapporo, Japan in October 2014, and of course the 2015 ISRM Congress in Montréal, Canada.

The current list of ISRM Commissions is as follows: (One Commission was approved to start at the Board Meeting in 2013, but it is not included here.)

- Commission on Application of Geophysics to Rock Engineering
- Commission on Coupled THMC processes in Geological Materials and Systems
- Commission on Crustal Stress and Earthquakes
- Commission on Design Methodology
- Commission on Discontinuous Deformation Analysis—DDA
- Commission on Education
- Commission on Hard Rock Excavation
- Commission on Petroleum Geomechanics
- Commission on Preservation of Ancient Sites
- Commission on Radioactive Waste Disposal
- Commission on Rock Dynamics
- Commission on Spall Prediction
- Commission on Soft Rocks

1. Application of Geophysics to Rock Engineering

The objectives of this Commission are to promote geophysical techniques in rock engineering. The method is to organise international Workshops on the application of geophysics to rock engineering, and the establishment of closer relations between ISRM members and exploration geophysicists who are interested in the application of geophysics to rock engineering.

Past activities of the commission include: A special session in the ISRM Congress in Beijing 2011 ("Rock Physics and Geophysics for CO₂ Sequestration").

The Commission will hold the 10th International Workshop on the Application of Geophysics to Rock Engineering at Sapporo, Japan, in 2014, in association with the 8th ARMS (Asian Rock Mechanics Symposium).

2. Coupled Thermo-Hydro-Mechanical-Chemical (Coupled THMC)

The goal of this Commission is to co-ordinate and promote global efforts to address research, education and industrial applications of scientific issues related to the coupled THMC processes in geological materials and systems.

Past activities of the Commission include the organisation of GeoProc 2011.

The Commission plans the following activities in 2013, 2014 and beyond.

- A full committee meeting has been planned during the 2014 ISRM International Symposium/8th Asian Rock Mechanics Symposium (Sapporo, October 2014).
- A special Workshop on Unconventional THMC Processes has been proposed during the 2014

Table 1. ISRM Commission activities to date (i.e., as at summer 2013)

	Commission name	Chairperson	No. of mem be	2013 Report Wroclaw	Books, monograph, specificatio	Social Activities	Activities after Beijing 2012	Organize symposium, workshops	meetings at various ISRM symposiur	World Wide Web communicat
1	Application of Geophysics to Rock Engineering	T. Matsuoka	16	●	x	—	▲	●	●	▲
2	Coupled THMC Processes in Geological Materials and Systems	Jishan Liu	10	●	x	—	▲	▲	▲	▲
3	Crustal Stress and Earthquake	Furen Xie	15	●	●	●	●	●	▲	▲
4	Design Methodology	J.A. Hudson	18	●	●	—	●	●	●	●
5	Discontinuous Deformation Analysis – DDA	Y. Hatzor Guowei Ma	26	●	▲	—	●	●	●	●
6	Education	Meifeng Cai	20	●	x	—	●	●	▲	▲
7	Hard Rock Excavation	M. Verman	13	●	x	—	●	x	●	▲
8	Petroleum Geomechanics	M.B. Dusseault	12	X	X	X	X	X	X	X
9	Preservation of Ancient Sites	Wang Xudong	23	●	x	●	●	▲	●	●
10	Radioactive Waste Disposal	Ju Wang	17	●	x	—	●	●	●	●
11	Rock Dynamics (Suggested methods)	Kaiwen Xia	20	●	▲	—	●	●	▲	●
12	Spall Prediction (Suggested methods)	M. Diederichs	13	X	X	X	X	X	X	X
13	Soft Rocks	M.A. Kanji	28	●	x	—	●	▲	●	●
14	Testing Methods	R. Ulusay	12	●	●	●	●	●	●	●
15	Underground Nuclear Power Plant (started April 2013)	S. Sakurai	14	●	x	—	●	x	x	●
16	Underground Research Laboratory (URL) Networking	J.S.Y. Wang	18	●	x	▲	●	x	●	●

●: Good(done) ▲: Fair (planned) x: not done —: No Information

ISRM International Symposium/8th Asian Rock Mechanics Symposium (Sapporo, 13:00~17:00 October 13, 2014).

- A special Workshop on Coupled THMC Processes will be organised during the ISRM 13th International Congress on Rock Mechanics, Montréal, Canada, in May 2015.
- An International Conference on Coupled THMC Processes for Unconventional Resources Extraction has been proposed to be held in Beijing, China, in October 2015.

3. Crustal stress and earthquakes

The purpose of this Commission is to develop and improve the methods and techniques of dynamic borehole-based stress–strain observation, by promoting experimental studies on deep-borehole stress measurement. The Commission also aims to foster collaboration amongst researchers investigating crustal stress, seismicity, seismogenesis, and rock failure.

Past activities of the commission include:

- The First Workshop on Crustal Stress and Earthquakes, 2011.
- The Second Workshop on Crustal Stress and Earthquakes, 2011.

- Borehole-based Stress–Strain Course, 2012 in Beijing.
- In 2012/13, organisation of the session “Stress Measurement and Applications in Near Surface Geophysics–Asia Pacific” Conference for July 2014.
- A Working Group was set up to collect all data from present dynamic borehole-based stress–strain observations in China. Two technical specifications are now being drafted or revised, including the borehole strain observation method and the construction of a borehole strain observation system.

The Commission plans the following activities in 2013, 2014 and beyond.

- The Commission will promote research on crustal stress field on a global scale.
- In 2014, the Commission will hold the 3rd Workshop for Crustal Stress and Earthquakes during the 2014 ISRM International Symposium/8th Asian Rock Mechanics Symposium to be held in Sapporo, Japan.
- In 2015, the Commission will organise the 4th Workshop for Crustal Stress and Earthquakes during the ISRM 13th International Congress on Rock Mechanics to be held in Montréal, Canada.

4. Design Methodology

The purpose of this Commission is to improve methods of rock engineering design. The methods for the Commission include the organisation of symposia, a book and Workshops at ISRM conferences.

Past activities of the Commission include:

- The ISRM Design Methodology Commission has organised three Symposia: the first was held at the Three Gorges Dam Project site in 2004; the second was held at the University of Hong Kong, as the main ISRM Symposium for 2009; the third was the SINOROCK2013 Symposium held in Shanghai in June 2013.
- The work resulted in the book “Rock Engineering Design” which was published in 2011.
- A Special Session on rock engineering design was held in association with the 2011 ISRM Congress.
- A meeting of the Commission was held in Wuhan, China, 2012 and also at EUROCK2013.

The Commission plans the following activities in 2013, 2014 and beyond:

- It is anticipated that a report will be produced covering subjects related to risk in rock engineering design, including risk assessment, analysis and uncertainty, with examples.
- Further meetings of the Design Methodology Commission will be held at the forthcoming Japanese ISRM meeting, together with a Short Course.

5. Discontinuous Deformation Analysis (DDA)

The purpose of the DDA Commission is to jointly promote block theory, the Discontinuous Deformation Analysis (DDA) method and Numerical Manifold Method (NMM) research for diverse rock mechanics and engineering applications.

The Commission’s method is to:

- provide a forum for exchanging ideas and research outputs on DDA;
- more effectively and harmoniously organise ICADD Conferences, Workshops and Training Courses;
- develop systematic learning materials on DDA;
- stimulate research interests and attract young generations to further develop DDA;
- enhance international collaborations on DDA;
- publish an up-to-date and authoritative text book/s on the theory and application of Block Theory, DDA, and NMM in the context of the newly established ISRM professional book series.

Past activities of the commission include:

- ICADD10 at Hawaii: 2011;
- DDA Workshop during ARMS7 at Seoul, Korea, 2012;

- International Workshop on Dynamic Stability of Rock Masses, 2012;
- DDA Commission website, including a DDA publication library, DDA PhD theses, DDA learning version software, DDA activities, and DDA relevant links;
- DDA training course, conducted at Beijing University of Technology, Beijing, China, 20–24 Aug. 2012;
- DDA session at the SINOROCK Symposium, Shanghai, 18–20 June 2013;
- DDA training course 2013; and
- The 11th International Conference on Analysis of Discontinuous Deformation (ICADD11), August 2013.

The Commission plans the following activities in 2013, 2014 and beyond:

- Short Course on key block theory and practices during the 8th Asian Rock Mechanics Symposium (ARMS8) at Sapporo, Japan, 14–16 Oct 2014. A committee meeting of the DDA Commission will also be organised during ARMS8.
- A special DDA session will be organised for EUROCK2014 in Vigo, Spain.
- DDA training course in 2014. Details to be announced.
- DDA Committee Meeting at 13th ISRM Congress, Montréal, Canada.
- Expected long term products:
 - “Student versions” of basic DDA packages including: Block Theory, DDA, and NMM. Basic versions will be downloadable from the ISRM website for individual ISRM members.
 - A book on Discontinuous Deformation Analysis in the framework of the ISRM Book Series.

6. Education

The purpose of this Commission is to promote rock mechanics education and fostering best practice teaching. The methods of the Commission include symposia and lectures, and the Commission itself is an opportunity for networking and closer collaboration between educators.

Past activities of the commission include:

- 3 ISRM lecture tours in China
- The 1st and the 2nd ISRM International Young Scholars’ Symposium on Rock Mechanics in 2008 and 2011
- Proceedings of the 2nd ISRM International Young Scholars’ Symposium on Rock Mechanics made available in EI databases.

The Commission plans the following activities in 2013, 2014 and beyond:

- The 3rd ISRM International Young Scholars' Symposium on Rock Mechanics will be held in October of 2014. The Xi'an University of Science and Technology has applied to hold this Symposium.
- A 4th ISRM Lecture Tour which is expected to be held in South American or Asian countries besides China.
- Proposed for discussion: A collection of abstracts of PhD theses on rock mechanics and engineering, worldwide over the last three years.

7. Excavation of Hard Rocks: the Himalayas, the Alps and the Andes

The purpose of the Commission is to document educational case histories of hard rock excavation projects, especially those from the Himalayas, the Alps and the Andes. The Commission's product will be a report highlighting the lessons learnt from these studies.

Past activities of the commission include:

- A meeting at the ISRM Congress, Beijing in 2011.
- The second meeting of the Commission was held at EUROCK, Stockholm 2012.
- The Commission has so far compiled hydropower case histories from 17 projects in India and 1 case history from Nepal.

The Commission plans the following activities in 2013, 2014 and beyond:

- The next meeting of the Commission is scheduled for September 22, 2013 in Wrocław (Poland).
- The proposed plan till 2015 is as follows:
 - Compilation of case-histories: till January 2014
 - Analysis of case-histories: February 2014 to June 2014
 - Writing of Lessons Learnt document: July 2014 to December 2014
 - Writing of Best Practice Guide: September 2014 to February 2015

8. Commission on Petroleum Geomechanics

At the time of preparation of this summary, no report had been received from this Commission—because of the illness of Prof. Maurice Dusseault. We do note, however, that this Commission was active, and co-ordinated several meetings during the period.

9. Preservation of Ancient Sites (CPAS)

The purpose of this Commission is to investigate and promote best practice in the preservation of ancient relics, sites of human activity and artwork in rock. It does this primarily by using the network of members to develop training opportunities and resources for researchers and workers in this field.

Past activities of the Commission include:

- Meetings for the Commission have been held in Tehran 2008, Hong Kong 2009, New Delhi 2010, Beijing 2011, Stockholm 2012.
- The Commission has provided advice on preservation and monitoring for the following.
 - Five ancient sites along the Silk Road. These sites are pending a review for admission as a UNESCO World Cultural Heritage site.
 - Great Wall and Beijing ancient city sites in Northwest China.
 - Jointly with the National Research Centre for the Conservation of Ancient Wall Paintings and Earthen Sites, China, a training course on ancient mural painting conservation was hosted.
 - On-going joint research programme on the preservation of the Mogao Grottoes, Dunhuang, with different Institutes, i.e., the Getty Conservation Institute, U.S.A., the National Institute for Cultural Properties, Tokyo, Japan, the International Institute for Advanced Studies, Japan, and I+B Baechi Foundation, Switzerland.

The Commission plans the following activities in 2013, 2014 and beyond:

- The Second International Symposium on Conservation of Ancient Sites (ISCAS-2014). China, a 2014 ISRM-Sponsored Regional Symposium.
- Development of an ISRM Suggested Method(s): Terminology for Geological Engineering related to the Conservation of Ancient Sites.
- Lecture tour(s): A training course for graduate students on the preservation of Ancient Sites will be organised by CPAS jointly with the Getty Conservation Institute, U.S.A., and London University, U.K.
- Continued collaboration with the Getty Conservation Institute U.S.A., the National Institute for Cultural Properties, Tokyo, Japan, and the International Institute for Advanced Studies, Japan.
- A glossary of rock mechanics terms related to preservation of ancient sites is being developed as a part of the Comprehensive English-Chinese and Chinese-English Dictionary of Rock Mechanics and Rock Engineering.

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10. Radioactive Waste Disposal

The purpose of this Commission is to promote collaboration in rock mechanics research into the disposal of radioactive waste in geological materials.

Past activities of the Commission include:

- Commission meetings. The last meeting was in Beijing, 2012.
- The International Workshop on Radioactive Waste Disposal and a Special Session on Radioactive Waste Disposal: Progress and Challenges, held in Beijing 2011, in conjunction with the 12th ISRM International Congress on Rock Mechanics.
- Participation in the 3rd Brazilian Congress on Tunnels and Underground Structures and the International Seminar “South American Tunneling-SAT-2012”.
- Participation of members in China’s 4th National Conference on Underground Waste Disposal was held in Nanchang, Jiangxi Province, China, on 23–26 September 2012.

The Commission plans the following activities in 2013, 2014 and beyond:

- Growth in the membership of the Commission.
- Workshop during the 13th International Congress of Rock Mechanics in Montréal, Canada, in 2015.
- Development of a Suggested Method for borehole televiwer measurement.
- Facilitation of common research to strengthen the network of researchers in this field.

11. Rock Dynamics (CRD)

This Commission is a continuation of the Commission on Rock Dynamics 2007–2011. The purpose of the Commission is to develop new rock dynamic testing methods and produce related Suggested Methods (SMs) for the ISRM.

Past activities of the Commission include:

- CRD 2007–2011 successfully produced the first set of ISRM suggested methods for rock dynamic tests, including dynamic compression, dynamic tension method and dynamic fracture.
- Co-sponsoring the International Workshop on Dynamic Stability of Rock Masses in Perth, Australia, August 6–8, 2012.
- Co-sponsoring the First International Conference on Rock Dynamics and Applications (RocDyn–1) in Lausanne, Switzerland, June 6–8, 2013.
- A Commission meeting was held during RocDyn–1, and identified a number of testing methods as candidates for new ISRM suggested methods, including Rock Dynamic Compression with Confinement, Fracture Test Using Cracked Chevron Notched Semi-Circular Bend (CCNSCB) Specimens

(Static and dynamic), Shear Test Using Punch Shear Method (Static and dynamic), Semi-Circular Bend (SCB) Test for Flexural Tensile Strength (Static and dynamic), Field Test for Determining the Empirical Peak Particle Velocity (PPV) Equations.

The Commission plans the following activities in 2013, 2014 and beyond:

- A Workshop titled: “ISRM Suggested Methods on Rock Dynamic Tests” will be held at the 2014 ISRM International Symposium/8th Asian Rock Mechanics Symposium in Sapporo, 2014.
- A monograph on rock dynamic testing will be published by 2015.
- A Rock Dynamics Workshop will be held at the ISRM 13th International Congress on Rock Mechanics in Montréal, Canada, May 10–13, 2015.
- The newly drafted ISRM Suggested Methods for rock dynamics tests will be finalised for submission to ISRM by 2015.

12. Commission on Spall Prediction

At the time of preparation of this summary, no report had been received from this Commission. We do note that this Commission was active, and co-ordinated several meetings during the period.

13. Soft Rocks

The purpose of this Commission is to promote and table scientific papers on soft rock mechanics. The method for this Commission involves proactively approaching workers in the field to contribute technical papers for a compilation representing the state-of-the-art in the mechanics of soft rocks. Pending the success of this task and approval by the ISRM Board, a book sponsored by ISRM may be commissioned.

Past activities of the Commission include compilation of papers on specimen preparation and laboratory testing (1 paper), properties of soft rocks (3), regional occurrence and properties of soft rocks (4), soft rocks in coal mining (3), soft rocks and properties related to petroleum (1), slope stability and behaviour (2), tunnelling (1).

The Commission planned a meeting at Wrocław 2013 to discuss the next phase of the work.

14. Testing Methods

The purpose of this very important Commission is to maintain and advance the ISRM Suggested Methods (SMs). The Commission was very active this year, holding a number of meetings and recommending a large number of new SMs for approval.

The Commission's historic activity is well known. Most readers will have seen the 'Blue Book' which was published in 2007 and contains all the ISRM Suggested methods generated from 1974 to 2006. Since then, new SMs have been published and some are under preparation, so the Commission on Testing Methods and ISRM decided to publish the Supplementary Volume (Volume 2) of the Blue Book which is called the "Orange Book: ISRM Suggested Methods for Rock Characterisation, Testing and Monitoring: 2007–2013 with Additional Articles on Rock Characterisation".

Activities in 2012/2013 alone include:

- Preparation of the Supplementary Volume of SMs—as described above, and on page 35.
- The 2012 annual meeting of the Commission was held before EUROCK2012 in Stockholm.
- An additional meeting of the Commission was also held during the 7th Asian Rock Mechanics Symposium (ARMS7) 2012.
- A mini-Commission meeting was also held at SINOROCK2013 in Shanghai, China.
- The 2013 annual meeting of the Commission was held at EUROCK2013, Wrocław, Poland.
- In 2012, the ISRM and the Commission on Testing Methods submitted the Suggested Methods approved by the ISRM Board to the journal "Rock Mechanics and Rock Engineering (RMRE)" for publication. These were subsequently accepted for publication by RMRE.
- The ISRM published a number of new SMs in the IJRMMS and RMRE journals in 2012 and 2013:
 - Suggested Methods for determining the dynamic strength parameters and mode-I fracture toughness of rock materials (IJRMMS, 2012; Zhou *et al.*)
 - ISRM Suggested Methods for failure criteria (RMRE, 2012): Mohr-Coulomb failure criterion, J.F. Labuz & A. Zang; Drucker-Prager criterion, R.L. Alejano & A. Bobet; The Hoek-Brown failure criterion, E. Eberhardt; Three-dimensional failure criteria based on the Hoek-Brown criterion, S. Priest; Lade and modified Lade 3D rock strength criteria, S. Fontoura; A failure criterion for rocks based on true triaxial testing, C. Chang & B. Haimson
 - ISRM Suggested Method for rock stress estimation—Part 5: Establishing a model for the *in situ* stress at a given site (RMRE, 2012; O. Stephansson & A. Zang)
 - ISRM Suggested Method for the Determination of Mode II Fracture Toughness (RMRE, 2012; T. Backers & O. Stephansson)
 - ISRM Suggested Method for determining the Mode I static fracture toughness using semi-circular bend specimen (RMRE, 2013; M.D. Kruppu, Y. Obara, M.R. Ayatollahi, K.P. Chong, T. Funatsu)
 - ISRM Suggested Method for measuring rock mass displacement using a sliding micrometer (RMRE, 2013; S.J. Li, X.-T. Feng, J.A. Hudson)
 - ISRM Suggested Method for rock fractures observations using a borehole digital optical televiewer (RMRE, 2013; S.J. Li, X.-T. Feng, C.Y. Wang, J.A. Hudson)
 - ISRM Suggested Method for reporting rock laboratory test data in electronic format (Submitted to RMRE in May 2013 and will be available online soon; H. Zheng, X.-T. Feng, Z. Chen, J.A. Hudson, Y. Wang)
- SMs accepted by the Commission and submitted to the ISRM Board for their approval:
 - "Upgraded ISRM Suggested Method for determining sound velocity by ultrasonic pulse transmission technique"
 - "ISRM Suggested Methods for determining the creep characteristics of rock"
 - "ISRM Suggested Method for monitoring rock displacements using Global Positioning System"
- The SMs under review and/or revision by the Commission based on review comments are:
 - Upgraded Suggested Method for laboratory determination of the shear strength of rock discontinuities
 - Suggested Method for estimation of permeability, elastic and friction properties of fractured rock masses from *in situ* hydromechanical testing: The high-frequency pulse poroelasticity protocol (HPPP) testing method
 - Suggested Method for determining the abrasivity of rock by the Cerchar abrasivity index test
- SMs under preparation by WGs
 - Suggested Method for needle penetration test
 - Upgraded Suggested Method for the quantitative description of discontinuities in rock masses
 - SM for the thermal property measurements (The WG submitted the proposal on May 15, 2013 and it was accepted by the Commission)

Report of Technical Oversight Committee (TOC) of ISRM (cont.)

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- A number of new Working Groups (WGs) have also been established by the Commission during 2012/2013:
- SM for Rock Fractures Observation Using a Borehole Digital Optical Televiewer
- SM for Rock Mass Displacement Using a Sliding Micrometer
- SM for Estimation of Permeability, Elastic and Friction Properties of Fractured Rock Masses from *In Situ* Hydromechanical Testing: The High-frequency Pulse Poroelasticity Protocol (HPPP) Testing Method
- SM for Needle Penetration Test
- A new WG for the SM for Determining the Abrasivity of Rock by Use of the Cerchar Abrasivity Index Test
- A new WG for the SM for the Thermal Property Measurements
- SM for Acoustic Emission Laboratory Method
- SM for Lugeon Test
- SM for Petroleum Geomechanics (*This WG was established by the efforts of the ISRM Petroleum Geomechanics Commission, in 2013 and will co-operate with the Commission on Testing Methods*)

In 2013, 2014 and beyond, the Commission will continue to establish new Working Groups to develop new and upgraded ISRM Suggested Methods.

15. Underground Nuclear Power

The purpose of this Commission is to conduct a generic study into the feasibility of underground nuclear power plants. A design methodology for underground nuclear power plants will be discussed and a report produced. The Commission was approved in April 2013. The Commission planned the first meeting at EUROCK2013.

16. Underground Research Laboratories (URL)

The purpose of this Commission is to provide networking opportunities for practitioners working in rock engineering, geoscience, and physics in URLs.

Past activities of the commission include:

- Session at the 2012 AGU (American Geophysical Union) meeting,
- review and participation in the ASPERA-2 meeting, 2012,
- DURA and Cosmic Frontier Workshops in March 2013,
- a COST meeting at LSBB in March 2013, and
- a session at SINOROCK2013 held in Shanghai.

The Commission plans to participate in various upcoming ISRM, ARMA, AGU, APS and other meetings in years to come.

Conclusions and Recommendations

According to the reports from the 16 ISRM Commissions which we have summarised in the previous Sections, we make conclusions as follows:

- 2012/2013 was generally a successful year for the ISRM Commissions.
- We enthusiastically recommend that the ISRM Board commend all the Commission Presidents and Members for their important work and progress.
- The TOC especially recommends that the Board congratulates the Suggested Methods, DDA, RD, CPAS and Design Methodology Commissions for their continued strong efforts in the current year.
- Two Commissions failed to send us their reports this time.

At the end of this TOC report, we would promote the following constructive proposals.

- Commissions are requested to follow a standard template (goal, activities, outcome, etc.) which will be provided by the TOC.
- In future, inactive Commissions, i.e., Commissions that do not report, or which do not follow the recommended improved methods will be asked to justify the continuation of their Commissions.
- The Board, subject to the recommendations of the TOC, may terminate non-complying Commissions.
- Many Commissions include young ISRM members. In future, when appropriate to the situation, the Board could especially favour applications for Special Commissions that specifically target the involvement and development of mid- and early-career practitioners

*ISRM Vice-Presidents
Yuzo Ohnishi and David Beck
2013*

The ISRM Digital Library is a project that was launched in October 2010. Its main objective consists of making available to the Rock Mechanics community worldwide the materials published in the ISRM Congresses and sponsored Symposia, and in this way giving them a greater visibility and accessibility.

The ISRM Digital Library is part of OnePetro, a large online library managed by the Society of Petroleum Engineers. ISRM individual members registered on the ISRM website are allowed to download, at no cost, up to 100 papers per year from the ISRM conferences. ISRM corporate members can download 250 papers.

To register on the OnePetro website (www.onepetro.org) as an ISRM member, the only necessary information is your username and password used to access the members' area of the ISRM website. Non-members can purchase the ISRM papers online.

[Click here to download a presentation on how to register and download papers.](#)

Papers from the ISRM Congresses and sponsored Symposia have been gradually introduced in the Library. The following are already available online.

- 2013 Specialized Conference - Effective and Sustainable Hydraulic Fracturing, Brisbane, Australia.
- 2012 International Symposium, EUROCK 2012 - Rock Engineering and Technology for Sustainable Underground Construction, Stockholm, Sweden.
- 2010 Specialized Conference - International Symposium on *In Situ* Rock Stress: Rock Stress and Earthquakes, Beijing, China.
- 2010 Regional Symposium, EUROCK 2010 - Rock Mechanics in Civil and Environmental Engineering, Lausanne, Switzerland.
- 2010 International Symposium, ARMS 6 - Advances in Rock Engineering, New Delhi, India.
- 2009 International Symposium, SINOROCK - Rock Characterisation, Modelling and Engineering Design Methods, Hong Kong, China.
- 2008 International Symposium, ARMS 5 - New Horizons in Rock Mechanics: Developments and Applications, Tehran, Iran.
- 2007 - 11th ISRM Congress, The Second Half Century of Rock Mechanics, Lisbon, Portugal.
- 2005 International Symposium, EUROCK 2005 - Impact of Human Activity on the Geological Environment, Brno, Czech Republic.
- 2003 - 10th ISRM Congress, Technology Roadmap for Rock Mechanics, Sandton, S Africa.
- 2002 International Symposium, EUROCK 2002 - Rock Engineering for Mountainous Region, Madeira, Portugal.



International Society for Rock Mechanics

Access to the Digital Library

- The ISRM Digital Library is hosted by the OnePetro platform (www.OnePetro.org) and ISRM members can download up to 100 papers per year free of charge.
- To download the ISRM papers free of charge, ISRM members must perform a two-step registration on the OnePetro website:
 1. Register in the OnePetro website, using any username/password they choose.
 2. Enter their current ISRM username/password in the OnePetro Membership page. The OnePetro site automatically checks the status of ISRM membership with ISRM.

- 2001 International Symposium, ARMS 2 - Frontiers of Rock Mechanics & Sustainable Development in the 21st Century, Beijing, China.
- 2000 International Symposium, GeoEng 2000 - Geotechnical and Geological Engineering, Melbourne, Australia.
- 1999 - 9th ISRM Congress, Paris, France.
- 1996 International Symposium, EUROCK 96 - Prediction and Performance in Rock Mechanics and Rock Engineering, Turin, Italy.
- 1995 - 8th ISRM Congress, Tokyo, Japan.
- 1993 International Symposium, EUROCK 93 - Safety and Environmental Issues in Rock Mechanics, Lisbon, Portugal.
- 1991 - 7th ISRM Congress, Aachen, Germany.
- 1990 International Symposium, Static and Dynamic Considerations in Rock Engineering, Mbabane, Swaziland.
- 1989 International Symposium, Rock at Great Depth, Pau, France.
- 1988 International Symposium, Rock Mechanics and Power Plants, Madrid, Spain.
- 1987 - 6th ISRM Congress, Montréal, Canada.
- 1986 International Symposium, Rock Stress and Rock Stress Measurements, Stockholm, Sweden.
- 1983 - 5th ISRM Congress, Melbourne, Australia.
- 1982 International Symposium, Rock Mechanics Related to Caverns and Pressure Shafts, Aachen, Germany.
- 1981 International Symposium, Weak Rock - Soft, Fractured and Weathered Rock, Tokyo, Japan.
- 1980 International Symposium, Rockstore 80 - Subsurface Space for Environmental Protection, Low Cost Storage and Energy Savings, Stockholm, Sweden.
- 1979 - 4th ISRM Congress, Montreux, Switz.
- 1966 - 1st ISRM Congress, Lisbon, Portugal.

ISRM Corporate Members 2013

A - SUPPLIERS OF ROCK MECHANICS EQUIPMENT AND MATERIALS

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GCTS Testing Systems, Tempe AZ, USA
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GEOS Ingénieurs Conseils, Courbevoie, France
Geotechnical Systems Australia Pty Ltd., Bayswater, Australia
Glöztz, Rheinstetten, Germany
Golder Associates, Montréal, Canada
Guangdong Hongda Blasting Engineering Co. Ltd., China
Lehrstuhl für Ingenieurgeologie und Hydrogeologie, Aachen, Germany
LNEC—Laboratório Nacional de Engenharia Civil, Lisbon, Portugal
Oyo Corporation, Tokyo, Japan
Solexperts Ag., Mönchaltorf, Switzerland
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Bleikvassli Gruber AS, Bleikvasslia, Norway
Boliden Mineral, Boliden, Sweden
BRGM, Orleans, France
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China Railway 16th Group Co., Ltd., Beijing, China
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China Three Gorges University, Yichang, China
Elletipi S.R.L., Ferrara, Italy
Entreprenørservice AS, Rud, Norway
Fondasol, Avignon, France
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Hokuriku Electric Power Co., Toyama City, Japan
Hydrogeotechnique, Fontaines, France
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