

# Geo-soundings

NEWSLETTER – MARCH 2012

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## WELCOME

Welcome to the first edition of Geo-soundings for 2012. Semester 1 is well underway as the enrolment numbers below indicate. Over the summer both academic staff and senior students have been enthusiastically engaged in presenting and publishing their research work as summarised.

Many geophysics graduates and colleagues from the earlier years will be saddened to have heard of the passing of Stewart Gunson on the 2<sup>nd</sup> March. Included in this newsletter is a tribute to Stewart, kindly provided by Norm Uren.

We look forward to again keeping our readers informed of our activities during 2012 and hope that the year ahead is rewarding and productive for all.

## ENROLMENTS 2012

### Total enrolments for 2012 are:

BSc (Geophysics) Undergraduate	67
BSc (Geophysics) Honours	4
Graduate Diploma in Geophysics	14
MSc (Geophysics) – Coursework	7
MPhil (Geophysics) – Research	2
PhD – Research	24

### 2011 Graduates were:

#### *Doctor of Philosophy*

Yousuf AlJabri

Dina Makarynska

#### *Master of Philosophy*

Margarita Norvill

#### *Master of Science (Geophysics) by Coursework*

Saif A S Al Azri

Hisham Al Hashem

Mohammad Alshamry

Ekaterina Baglay

Daniel Eden

Hayan Nasreddin

Caroline Pimentel Guerra

### *Graduate Diploma in Geophysics*

David Anderson

William Keket

Andrew Strazds

### *BSc (Geophysics) Honours*

Kieran Brennan

Abenezier Feleke

Rafael Fernandez

Sean Herbert

Courtney Jenner

Jie Jian Leong

Robert Martin

Jemal Mohammed-Nour

Ruan Swanepoel

Stephanie Tressler

Jason Valuri

Alicia York

### *BSc (Geophysics)*

Qais A M Al Siyabi

John Ellison

Grant Fryer

Yen-Fung Lee

Sharna Riley

Michael Wenz

## JOURNAL PUBLICATIONS

**Pevzner, R., B. Gurevich, and M. Urosevic**, 2011, *Estimation of azimuthal anisotropy from VSP data using multicomponent S-wave velocity analysis*. Published in *Geophysics*, Vol 76, (5), D1-D9, Sept-Oct 2011.

Josh, M., M. J. Lintern, **A. W. Kopic**, and M. Verrall, 2011, *Impact of grain-coating iron minerals on dielectric response of quartz sand and implications for ground-penetrating radar*. Published in *Geophysics*, Vol 76, (5), J27-J34, Sept-Oct 2011.

Carcione, J.M., and **B. Gurevich**, 2011, *Differential form and numerical implementation of Biot's poroelasticity equations with squirt dissipation*. Published in *Geophysics*, Vol 76, (6), N55-N64, Nov-Dec 2011.

## CONFERENCE PRESENTATIONS

**Lebedev, M., A. Bona, R. Pevzner, and B. Gurevich**, 2011, *3 component laboratory experiments by laser interferometry: Anisotropy estimations using polarization of quasi P-waves and S-waves*. Presented at 9th Euroconference on Rock Physics and Geomechanics, Trondheim, Norway, October 2011.

**Lebedev, M., V. Mikhaltsevitch, and B. Gurevich**, 2011, *An experimental study of wave dispersion and attenuation in water saturated sandstone at seismic and teleseismic frequencies*. Presented at 9th Euroconference

on Rock Physics and Geomechanics, Trondheim, Norway, October 2011.

**Pevzner, R., M. Urosevic, B. Gurevich, V. Shulakova, A. Bona, E. Caspari, F. Alonaizi and A. Kopic**, 2012, *Seismic monitoring of CO<sub>2</sub> geosequestration: CO<sub>2</sub>CRC Otway project experience*. KACST-JCCP 1st Joint International Workshop for the Earth's Surface and-Subsurface 4D Monitoring, Riyadh, Saudi Arabia, January 2012.

**Pevzner, R., M. Asgharzadeh, A. Bona, and B. Gurevich**, 2012, *Estimation of Seismic Anisotropy from Borehole Seismic data*. Presented at AAPG-EAGE Joint Geosciences Technology Workshop: Fractured Carbonate Reservoirs, Bali, Indonesia, February 2012.

**Gurevich, B.**, 2012, *Effect of Fluid Properties on Seismic Properties of Fractured Reservoirs*. Presented at AAPG-EAGE Joint Geosciences Technology Workshop: Fractured Carbonate Reservoirs, Bali, Indonesia, February 2012.

**ASEG 22nd International Geophysical  
Conference & Exhibition, Brisbane,  
February 2012**

**Al Malki, M., B Harris, and C. Dupuis** , 2012, *Numerical and Field Experiments for Virtual Source Tomography, Perth Basin, Western Australia*.

**Caspari, E., J. Ennis-King, R. Pevzner, and B. Gurevich** , 2012, *Prediction of the Seismic Time-Lapse Signal of CO<sub>2</sub>/CH<sub>4</sub> Injection into a Depleted Gas Reservoir - Otway Project*.

**Harris, B.**, 2012, *Geophysical Technologies for Geothermal Well Field Development in Sedimentary Basins*.

**Lebedev, M., A. Bona, R. Pevzner, M. Lebedeva, V. Mikhlatchevich, N. Gale, and B. Gurevich** , 2012, *3C Laboratory Measurement Using Laser Interferometer: Estimations of Stress Induced Anisotropy*.

**Lopes, S., and M. Lebedev** , 2012, *Laboratory Study of the Influence of Changing the Injection Rate on P-wave Velocities and Water Saturation in a Limestone*.

**Pethick, A., and B Harris** , 2012, *Understanding the Effect of Bathymetry on the Marine Controlled Source Electromagnetic Method using Electromagnetic Streamlines*.

**Strobach, E., B Harris, C. Dupuis, A Kopic, and M. W. Martin** , 2012, *Cross Well Radar and Vertical Radar Profiling Methods for Time Lapse Monitoring of Rainfall Infiltration*.

**Swanepoel, R., B. Harris, and A. Pethick** , 2012, *3D Modeling for Time Lapse Cross Well CSEM Monitoring of CO<sub>2</sub> Injection into Brine Filled Reservoirs*.

**Tertyshnikov, K., A. Bona, and R. Pevzner** , 2012, *Velocity-Less Time Migration in Application to Hard Rock Environments*.

## **POSTERS**

**Al Malki, M., B. Harris, and C. Dupuis** , 2012, *Stoneley Wave Dispersion in a High Permeability Sandstone: Perth Basin, Western Australia*.

**Leong, J., B. Harris, and L. Reid** , 2012, *Numerical Modelling for Flow, Solute Transport and Heat Transfer in a High-Permeability Sandstone*

**Martin, R., B. Harris, and D. Schafter** , 2012, *Airborne TEM for the recovery of basin scale solute distribution; Perth, Basin, WA*.

**Mikhaltsevitch, V., M. Lebedev, and B. Gurevich**, 2012, *Low-Frequency Measurements of the Mechanical Parameters of the Sandstone with Low Permeability*.

**Squelch, A., B. Harris, and M. AlMalki** , 2012, *Estimating Porosity from CT Scans of High Permeability Core Plugs*.

**Sun, B., B. Zhou, A. Bona, and R. Pevzner** , 2012, *Feasibility Analysis of Drill Bit Tracking Using Seismic while Drilling Technique*.

## **HONOURS/AWARDS**

We congratulate Ms Margarita Norvill on being awarded her Master of Philosophy degree, officially approved on the 9<sup>th</sup> December 2011. Her thesis entitled *“The use of distributed sensor arrays in electrical and electromagnetic imaging”* was supervised by Anton Kopic, Jayson Meyers, Brett Harris and Christian Dupuis.

## **RESEARCH ACTIVITIES**

**Dominic Howman** was contacted by a member of the Centenary Committee at Darlington Primary School to assist them in locating and digging up a buried time capsule. The capsule was buried in 1982 and as part of the school centenary celebrations this year they needed help to find the capsule. Some of the children had seen Dominic on *Who's Been Sleeping In My House?* which was aired on the ABC last year.

## **NEW STAFF AND VISITORS**



**Dr Liliya Malovichko** arrived on Monday 12<sup>th</sup> March to commence her 3 year appointment as a Research Fellow attached to the Deep Exploration Technologies CRC Project 3.1 **‘Hard rock seismic exploration’** program. She has completed a Masters and a PhD, both at Perm State

University in Russia. Her PhD thesis was awarded in 2011, entitled *“Estimation of the parameters of heterogeneous oil-bearing formations using AVO-inversion”*. Liliya has worked as a geophysicist since April 2000 in Russia and South Africa. She has published 4 papers (3 in Russian, 1 in English). Her main expertise is associated with 2D and 3D seismic data processing; azimuthal AVO-analysis for prediction of fractured zones in carbonate reservoirs using 3D seismic data; fluid saturation investigation based on the Biot-Gassman technique; and development and implementation of variant of AVO-analysis for thin-layered structures. She also has experience in a wide range of geophysical software and techniques.

**Miss Julie Ditkof** from The University of Texas-Austin, has been visiting the Department as a Research Associate since late January. As part of her PhD research she is analysing industrial scale CO<sub>2</sub> injection tests at Cranfield, Mississippi, USA. Our Curtin CO<sub>2</sub> team are collaborating with Julie to establish a 4D seismic signature strength, the data repeatability level and devise strategies for monitoring CO<sub>2</sub> plume. The Cranfield project is led by Dr Susan Havorka from the Jackson School of Geosciences at The University of Texas at Austin.

## VALE – STEWART GUNSON

By: Norm Uren

Stewart Gunson, formerly of the Bureau of Mineral Resources in Canberra, joined the Western Australian Institute of Technology (WAIT) as a Senior Lecturer in 1967. He devised the Associateship in Exploration Geophysics within the Department of Applied Physics, and produced the first Geophysics graduate in 1968. The program was strongly based in Physics, Mathematics and Geology. Practical field competence was stressed, and graduates were strongly sought after by the Exploration Industry as they required little further training. The Associateship was subsequently accredited degree status in 1972 and satisfied the entry requirements for the Australian Institute of Physics. Stewart supervised the project component of the first Postgraduate award given by WAIT in Applied Physics in 1972, and supervised the first Master of Applied Science in Geophysics in 1974. Stewart was renowned for his high standard of classroom teaching. He would carefully rehearse every lecture before its presentation, and was well known for the high quality of the lecture notes that his students were able to take. Text books on the subject were not common in those early days.

Stewart strongly contributed to the building of the corporate spirit at WAIT, and was well known for organizing wine and cheese gatherings in the Department of Applied Physics to which he hosted other Departments on the Bentley Campus. During his time at WAIT, Stewart took two sabbaticals. One was to Fiji, and the other was to Ethiopia where he participated in a United Nations program. While in Ethiopia, he received a US Presidential citation for playing squash.

Stewart also took an active role in the Australian Society of Exploration Geophysicists. He was a foundation Committee Member of the WA Branch of the ASEG, and was a Branch Committee Member most years until his retirement in 1983.

Stewart passed away peacefully while taking a nap on the 2<sup>nd</sup> March 2012 aged 86. He is survived by his wife Anne, five children and numerous grandchildren.

## UPCOMING EVENTS

**Third EAGE CO<sub>2</sub> Geological Storage Workshop**  
26<sup>th</sup> – 27<sup>th</sup> March, Edinburgh, UK

**Saint Petersburg International Conference & Exhibition,**  
2<sup>nd</sup> – 5<sup>th</sup> April, Saint Petersburg, Russia

**15th International Workshop on Seismic Anisotropy (15IWSA),**  
14<sup>th</sup> – 19<sup>th</sup> April, Bahrain

**China Australia Geological Storage Project (CAGS) Symposium,**  
16<sup>th</sup> – 20<sup>th</sup> April, Beijing

**EGU General Assembly,**  
22<sup>nd</sup> – 27<sup>th</sup> April, Vienna, Austria

**11th Annual Conference on Carbon Capture Utilization & Sequestration,**  
30<sup>th</sup> April – 3<sup>rd</sup> May, Pittsburgh, Pennsylvania

**DET CRC Project Review & Science Steering Committee Meeting,**  
29<sup>th</sup> – 30<sup>th</sup> May, Brisbane

**74th EAGE Conference & Exhibition incorporating SPE EUROPEC,**  
4<sup>th</sup> - 7<sup>th</sup> June, Copenhagen, Denmark

**14th International Conference on Ground Penetrating Radar GPR 2012,**  
4<sup>th</sup> – 8<sup>th</sup> June, Shanghai, China