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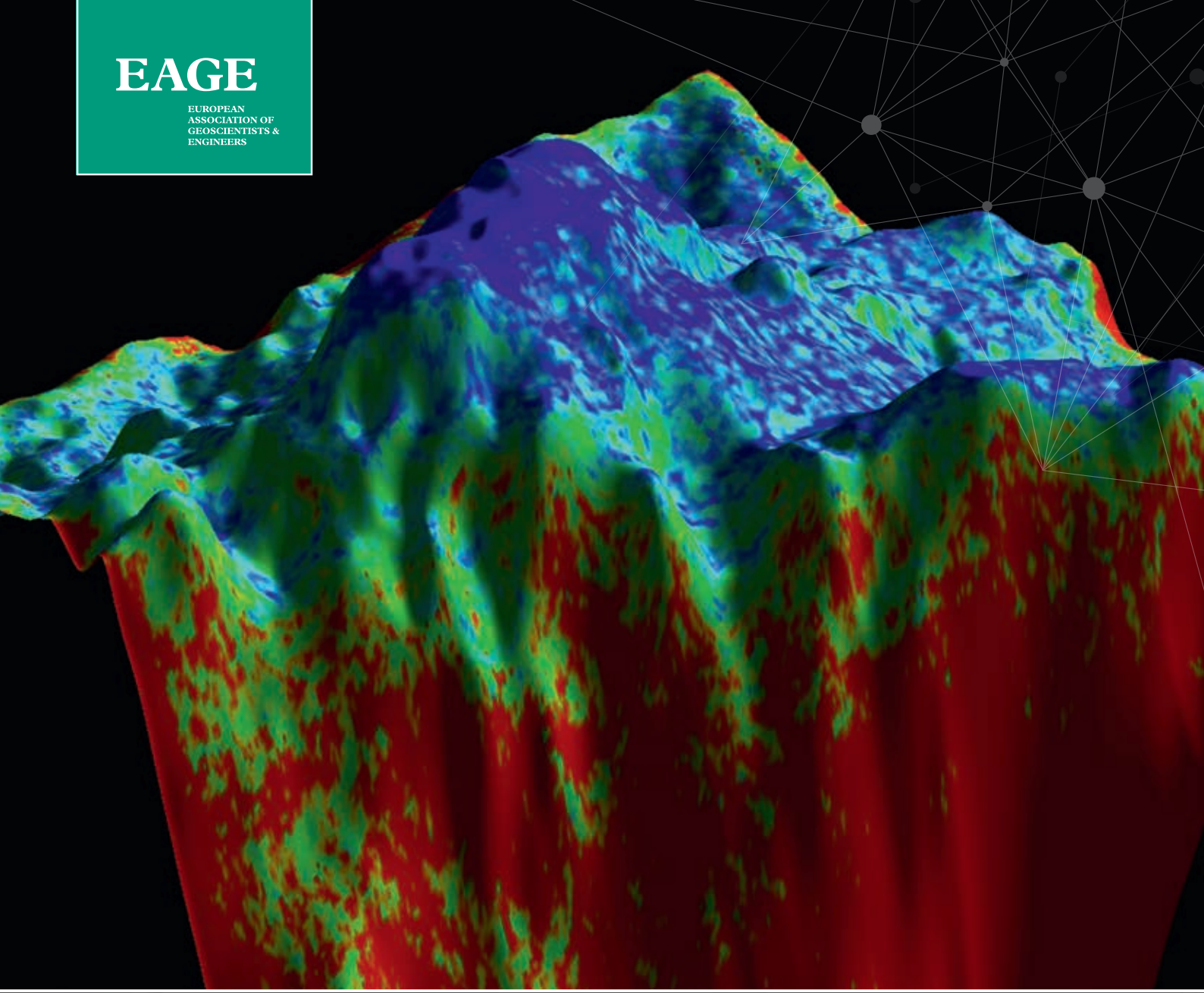

EAGE Workshop on Quantifying Uncertainty in Depth Imaging

12-13 APRIL 2021 • ONLINE

- **Technical Programme**

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MAIN SPONSOR

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WORKSHOP OVERVIEW

The goal of this workshop is to discuss where we stand as an industry on calculating, providing and using information regarding the reliability of the seismic products. The intention is to improve our shared understanding of what we can do today and where our ambition should be for the future. The workshop should explore the impact of the methods we use throughout the life of the seismic project and how we use the results to make decisions.

Images of seismic data form the foundation for understanding the nature of structures and subsurface properties everywhere away from existing wells. The industry has largely moved to depth images which have the potential to accurately position the reflectivity even under a complex overburden. However, it is well understood that the resulting images will have various sources of inaccuracy. Some of the causes include inaccuracies in the velocity model, the methods and assumptions during the processing of the data, incomplete sampling of the data, incomplete modelling of all the physical phenomenon affecting the propagation of seismic energy and signal to noise. Despite the known challenges and the multi million-dollar decisions that are made on the basis of this information, the industry does not deliver information on the reliability of these images and a mechanism to use this information in the process of risking decisions.

KEYNOTE SESSIONS

Quantifying Uncertainty in Depth Imaging: Issues and Challenges
Luc Sandjivy (Seisquare)

Quantifying Uncertainty in Depth Imaging: From Rays to Waves
Konstantin Osypov (Aramco Americas Research Center)

Imaging Depth Uncertainty from an Interpreters Perspective: Implications from Processing to Assessment
Alecia Wawrzynski (ExxonMobil Upstream Integrated Solutions)

Embedding Uncertainty from Velocity Model Building into the Exploration Workflow
Christopher Lee Slind (PETRONAS Carigali Sdn Bhd)

How Do We Begin to Have a Proper Conversation about Uncertainty
John T. Etgen (BP)

TECHNICAL PROGRAMME

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SHEARWATER

Oral Presentations | Monday 12 April 2021

Opening	
07:30	**Welcome Remarks**
Keynote & Session 1 - How Should We Characterize Depth Imaging Uncertainties at Each Stage of the Exploration and Development Cycle Chaired by R. Bloor (Schlumberger), K. Osypov (Aramco Americas Research Center)	
07:40	**Keynote 1: Quantifying Uncertainty in Depth Imaging : Issues and Challenges** - L. Sandjivy[1]* [1]SEISQUARE
08:10	**Keynote 2: Quantifying Uncertainty in Depth Imaging: From Rays to Waves** - K. Osypov[1]* [1]Aramco Americas Research Center
08:40	**7. Quantifying Depth Uncertainty in Regional Scale – A Probabilistic Approach** - A.I. Yusof[1]*, L.K. Yeap[1], A. Khalil[1] [1]PETRONAS Carigali Sdn Bhd
09:05	**Break**
09:35	**14. Quantifying Depth Uncertainties below Complex Overburden of Low Velocity Channels** - W.L. Liew[1]*, P.A. Adriani[2], V. Pradhana[2], A. Khalil[1] [1]EGPS, Exploration, PCSB PETRONAS; [2]PC Indonesia, PETRONAS
10:00	**28. Quantifying Depth Uncertainty in Exploration to Development Cycle through Evolving Imaging Technology** - G. Balakrishnan[1]* [1]Sarawak Shell Bhd
10:25	**Wrap Up Session**
Keynote & Session 2 - Use Cases Where Uncertainty Impacts Decisions Chaired by A. B. Muhamad (PETRONAS Carigali Sdn Bhd), F. Mancini (Woodside)	
15:00	**Keynote 3. Embedding Uncertainty from Velocity Model Building into the Exploration Workflow** - C. Lee Slind[1]* [1]PETRONAS Carigali Sdn Bhd
15:30	**17. Structural Depth Uncertainties in Producing Oil Fields** - A. Tarang[1]*, A.M. Mawarni[1], A. Khalil[1] [1]PETRONAS Carigali Sdn Bhd
15:55	**18. Depth Prognosis in a Brown Field: When 6m Certainty is Inadequate** - S.A. Ahmad Hawari[1]*, M.A. M Diah[1], A.T. Patrick Panting[1] [1]PETRONAS Carigali Sdn Bhd
16:20	**11. Quantifying Uncertainty in Depth Imaging : Case Histories** - L. Sandjivy[1]* [1]ERM.S
16:45	**Break**
17:15	**21. A Decade of Seismic Uncertainty and the Opportunities of the Next Decade** - R. Bloor[1]*, D. Nichols[1] [1]Schlumberger
17:40	**32. Multi-azimuth Q Inverted Full Waveform Inversion: A Data-driven Approach For Quantifying Structural Uncertainties Beneath Gas Cloud** - W.Y. Ham[1]*, K. Mohamed[1], C. K. Luk[1] [1]Sarawak Shell Berhad
18.05	**10. Minimizing Depth Error through Robust Velocity Model Building – A Case Study** - M.S. Sulaiman[1]*, S.F. Mohd Zohdi[1], C.L. Slind[1], P. Gabrielli[2], G. James[2] [1]PETRONAS Carigali Sdn Bhd; [2] CGG (M) Sdn Bhd
18:30	**Wrap Up Session**

Oral Presentations | Tuesday 13 April 2021

Keynote & Session 3 - Uncertainty Resulting from Model Building Practices - Chaired by G. Cumaran (DUG), S. Maitra (CGG (M) Sdn Bhd)	
07:30	**Keynote 4: Imaging Depth Uncertainty from an Interpreters Perspective: Implications from Processing to Assessment** - A. Wawrzynski[1]* [1]ExxonMobil
08:00	**22. Improving the Resolution and Confidence of Elastic Waveform Inversion using Deep Neural Network Aided a Prior from a Well** - T. Alkhalifah[1]*, Y. Li[1] [1]KAUST
08:25	**16. Quantifying Depth Imaging Uncertainty of a FWI, Q-KDM and Q-RTM Seismic Volume** - N. A. B. M. Radzi[1]*, F. Zohdi[1], A. Muhamad[1], N. Isa[1], M. Ghazali[1], W. L. Liew[1] [1]PETRONAS Carigali Sdn Bhd
08:50	**34. A 3D Pseudo-Spectral Method for QP-wave Simulation in TTI Media and Its Application in RTM** - J. Li[1]*, K. Xin[1], A.R.B. Ghazali[1], F. Syazana[1] [1]PETRONAS Carigali Sdn Bhd
09:15	**Break**
09:45	**12. Quantify Velocity Model Uncertainty and Its Relationship with Geobodies** - M.H. Pua[1]*, C. Lee Slind[1], I.S. Mohammad[1], A. Widyanita[1], S. Maitra[2], F. F Basir[2] [1]PETRONAS Carigali Sdn Bhd.; [2]CGG (M) Sdn Bhd
10:10	**25. A Robust Self-Supervised Learning System for Low Frequency Seismic Data Extrapolation to Reduce Model Building Uncertainty** - W. Hu[1]*, Y. Jin[2], X. Wu[2], J. Chen[2] [1]Advanced Geophysical Technology; [2]University of Houston
10:35	**27. Analyzing and Quantifying Uncertainty in Time-Depth Conversion** - J. Chautru[1]*, H. Binet[1], P. Masoudi[1], S. Rodriguez[2], M. Papouin[2] [1]Geovariances; [2]Neptune Energy International S.A.
11:00	**Wrap Up Session**
Keynote & Session 4 - Comparing Uncertainty from the Results of Key Algorithms Chaired by C. Lee Slind (PETRONAS Carigali Sdn Bhd), C. K. Luk (Sarawak Shell Berhad)	
15:00	**Keynote 5: How Do We Begin to Have a Proper Conversation about Uncertainty** - J.Etgen[1]* [1]BP
15:30	**9. Re-Imaging through Multi-Level, Highly Saturated Gas Bodies in a Carbonate Regime – A Case Study** - M. Supardy[1]*, C. Lee Slind[1], T. Wai Hoong[1], P. Ming Heng[1], L. Kien Kok[1], A. Widyanita[1], A. R L Desplanques[1], K. Xin[1], W. Chan[1], A. Azmi[1], S. Maitra[2], F. F Basir[2], A. Lip Hun[2] [1]PETRONAS Carigali Sdn Bhd; [2]CGG (M) Sdn Bhd
15:55	**24. Efficiently Measuring the Uncertainty of FWI Models and Integration with Tomography and Geology** - Y. Zhai[1], X. Cheng[1], Y. You[1], K. Jiao[1], R. Bloor[1]* [1]Schlumberger
16:20	**Break**
16:50	**20. Inherited Uncertainties of Advanced Depth Migrated Images** - R. Alai[1]*, A. Mokhtar[1], C.L. Slind[1], Y. Guo[3], J. Wang[3], P. Wardaya[4], R.K. Pratama[2], P. Monalia[2] [1]PETRONAS Carigali Sdn Bhd; [2]PETRONAS Carigali Indonesia Operation; [3]CGG (M) Sdn Bhd ; [4]CGG
17:15	**5. Quantifying The Uncertainty Of The Depth Where Imaging Is** - H. Bolt[1]* [1]Depth Solutions, DwpD Ltd.
17:40	**Wrap Up Session**
18:00	**Closing Remarks**

ACCESSING THE VIRTUAL WORKSHOP

The virtual workshop will be hosted on the Event OnAir platform. A few days prior to the event day, all registered attendees will receive an Attendee Pack via email which will consist of the event guidelines and virtual lobby login link to join the event. All attendees are advised to follow the event guidelines for optimal event experience. This virtual conference will be held in the local timezone (Kuala Lumpur, UTC +8).

REGISTRATION

EAGE Member	€200
Non-Member	€300
EAGE Student Member	€125
Student Non-Member	€150

Members please note:

- To qualify for the member registration fee, your EAGE membership dues for 2021 must have been paid and confirmed. The processing time for membership applications or renewals is 10 working days.
- To qualify for the reduced student registration fee:
  - Students must be enrolled in a full time study programme at a recognized university or institute
  - The registration must be accompanied by a copy of a student ID card and/or official proof of enrolment
- TThe non-member fee includes EAGE membership for the remainder of 2021. This membership will be activated shortly after the event.
- TStudent non-members cannot be older than 34 years of age (when registering).
- TEAGE registration fees differentiate between EAGE members and non-members. In the table above you can see what the different fees are.
- TAll fees are in Euros (€). One Euro of your total registration fee is donated to the EAGE Green Fund.

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