Institute of Acoustics

Acoustic & Environmental Variability, Fluctuations and Coherence

12-13 December 2016 – The Möller Centre, Cambridge University, Cambridge CB3 0DE

SUNDAY 11 DECEMBER

19:00 Registration
Welcome Reception, Möller Centre

MONDAY 12 DECEMBER

08:30 Registration and Refreshments

09:25 Welcome

Session 1 - Acoustic Variability - Measured

09:30 Measurements of high-frequency acoustic propagation in a highly-stratified and dynamic littoral environment

Andone C Lavery, Woods Hole Oceanographic Institution, USA

09:45 Sea ice effect on long-range transmitted and modelled acoustic communication signals

Gaute Hope, hanne Sagen, Espen Storheim, Halvor Hobaek
Nansen Environmental and Remote Sensing Center, Norway

10:00 The impact of internal waves on geoacoustics inversion of broadband airgun data

Hefeng Dong (a), Mohsen Badiey (b), Ross Chapman (c)
(a) Norwegian University of Science and Technology, Norway,
(b) University of Delaware, USA, (c) University of Victoria, Canada

10:15 Seismic surveys in complex environments – effects of environmental variability on sound propagation and mitigation practice

Philippe Blondel (a), Giuillermo Jimenez (a), B Heath (b), R Wyatt (b)
(a) University of Bath, (b) Seiche Ltd, UK

10:30 Refreshments

Session 2 - Acoustic Variability - Modelled

11:00 Acoustic tomography and ocean models in Fram Strait

Brian Dushaw, Hanne Sagen, Nansen Environmental and Remote Sensing Center, Norway

11:15 Modeling acoustic scattering by internal waves using random matrix theory

Lora J. Van Uffelen (a), Kathleen E. Wage (b)
(a) University of Rhode Island, USA,
(b) George Mason University, USA

11:30 Modelling of particle motions in underwater sound fields

Jens M Hovem, Norwegian University of Science and Technology, Norway

11:45 Multi mode method solution for acoustic propagation in a strongly range-dependent ocean waveguide

Wang Bin, Fan Jun, Shanghai Jiao Tong University, PR of China

12:00 Lunch

13:00 AB WOOD MEDAL LECTURE
The underated phase

Yan Pailhas, Heriot Watt University

Session 3 - Acoustic Variability - Modelled

14:00 Ocean acoustic tomography: a missing element of the ocean observing systems

Brian Dushaw, Nansen Environmental and Remote Sensing Center, Norway

14:15 Quantifying acoustic field horizontal variability and acoustic system performance in a canyon with internal tides

Timothy F Duda (a), Bruce D Cornuelle (b), Ying-Tsong Lin (c)
(a) Woods Hole Oceanographic Institution, (b) Scripps Institution of Oceanography, (c) Woods Hole Oceanographic Institution

14:30 Refreshments

15:00 Seasonal variability of ambient noise and acoustic propagation in Indian Seas

Nimmi R Nair (a), Mohan Kumar (a), K Amilkumar (a),
Golla Nageswara Rao (b)
(a) Naval Physical and Oceanographic Laboratory, India,
(b) Centre for High Energy Systems & Sciences, India

15:15 Sensitivity analysis of underwater sound propagation in three-dimensional oceanic environments

Ying-Tsong Lin, Woods Hole Oceanographic Institution, USA

Session 4 - Acoustic Variability - Modelled

15:30 Simulation-based assessment of the variability of pulse time spreading and correlation loss in shallow water environments

Zhi Yong Zhang, David Bartel, Deference Science and Technology Group, Australia

15:45 Twinkling in sonar systems

Peter Dobbins, Consultant, UK

16:00 In-situ performance assessment for high frequency seabed imaging sidescan sonar

Roy E Hansen, Marc Geilhufe, Øivind Midtgaard, Stig A V Synnes, Torstein O Sæbø, Norwegian Defence Research Establishment (FFI), Norway

16:15 Normal-mode statistics of sound scattering by a rough sea surface, elastic bottom, ice

Andrey K Morozov (a), John A Colosi (b)
(a) Woods Hole Oceanographic Institution, USA,
(b) Naval Postgraduate School, USA

16:30 Spatio-temporal fluctuations of the sound signals in shallow water in the presence of variable bathymetry

Boris Katsnelson (a), Andrej Malykhin (b)
(a) University of Haifa, Israel, (b) Voronezh University, Russia

16:45 The influence on correlation loss of reflection from rough sea surface

Mark K Prior (a), Michael Ainslie (a), Mathieu Colin (a), Peter Dahl (b), David Dall'Osto (b), Dale Ellis, Paul Hines, Sean Pecknold (c), Robbert van Vossen (a)
(a) TNO, Netherlands, (b) APL, Washington, (c) DRDC-RDDC, USA

17:00 Close

19:00 Drinks Reception

19:30 Conference Dinner

The Conference Dinner will be held in the Combination Room, Peterhouse College.

Peterhouse is the oldest of Cambridge Colleges, founded in 1284. The Combination Room is a fully panelled room with impressive stained glass windows.

TUESDAY 13 DECEMBER

Session 5 - Sonar Performance

09:00 Spatio-temporal weightings for underwater source localization from an array subject to coherence loss

Riwal Lefort, Angélique Dremeau ENSTA, France

09:15 An investigation into optimal acquisition geometrics for repeat-pass synthetic aperture sonar bathymetric mapping

Benjamin Thomas, Alan Hunter, University of Bath, UK

09:30 An l_1 regularized sparse representation classifier for underwater target recognition

Satheesh Chandran, Suraj Kamal, A Mujeeb, M H Supriya CUSAT, India

09:45 Coherence estimates from synthetic aperture sonar data

James L. Prater, Naval Surface Warfare Center Panama City Division

10:00 Refreshments

Session 6 - Environmental Variability

10:30 Floor to ceiling: field validation of seabed and sea surface parameters in a shallow water propagation model

Adrian Farcas, Nathan D Merchant, Centre for Environment, Fisheries and Aquaculture Science, UK

10:45 Incorporating environmental uncertainty into sonar performance modelling

Kevin D Heanery, Richard L Campbell, OASIS, USA

11:00 Investigating the effect of oceanographic variability on aspects of sonar performance: a simple approach

Marcus Donnelly, Systems Engineering & Assessment, UK

11:15 Quantifying the effect of random seafloor roughness on high-frequency synthetic aperture sonar image statistics

Anthony Lyons (a), Derek R Olson (b), Roy E Hansen (c)
(a) University of New Hampshire, USA, (b) Pennsylvania State University USA, (c) Norwegian Defence Research Establishment, (FFI) Norway

TUESDAY 13 DECEMBER

11:30 **Research of corrective processing techniques using an ultrasonic testbench emulating the degradation of sonar performance in random oceans**

Gaultier Real (a), Xavier Cristol (a), Dominique Habault (b), Dominique Fattaccioli (c), (a) Thales Underwater Systems, France, (b) LMA, CNRS, France, (c) DGA Naval Techniques, France

12:30 **Lunch**

13:30 **KEYNOTE LECTURE**
Is acoustic noise and variability a nuisance or a potential tool?

Chris Harrison, Emeritus, Centre for Marine Research and Experimentation, La Spezia, Italy

Session 7 - Soundscapes

14:30 **Impact of long distance propagated seismic signals on the soundscape in the Fram Strait. Use of ACOBAR data and PE modelling**

Espen Storheim (a), Asuka Yamakawa (a), Hanne Sagen (a), Geir Pedersen (b), (a) The Nansen Environmental and Remote Sensing Center, Norway, (b) Christian Michelsen Research, Norway

14:45 **Soundscape characterization and the impact of environmental factors in the central part of the fram strait**

Asuka Yamakawa (a), Hanne Sagen (a), Mohamed Babiker (a), Brian Dushaw (a), Peter F. Worcester (b), Birgitte Furevik (c), (a) Nansen Environmental and Remote Sensing Center, Norway, (b) Scripps Institution of Oceanography, University of California, USA, (c) Norwegian Meteorological Institute, University in Bergen, Norway

15:00 **Soundscape components in the marginal ice zone: identification and quantification**

Florian Geyer (a), Gaute Hope (a), Mohamed Babiker (a), Asuka Yamakawa (a), Peter F Worcester (b) (a) Nansen Environmental and remote Sensing Centre, Norway, (b) Scripps Institution of Oceanography, USA

15:15 **Refreshments**

Session 8 - Underwater Noise

15:45 **360M: The Future of Underwater Noise Modelling**

Samantha Tufano, Gardline Environmental, UK

16:00 **Extended monitoring of underwater and airborne noise during installation of the first offshore windfarm in the US**

Tim Mason, Subacoustech Environmental, UK

16:15 **Statistical ambient noise maps from traffic at world and basin scales**

Florent Le Courtois (a), Bazile Kinda (a), Jean-Michel Boutonnier (a), Yann Stephan (a), Olivier Sarzeaud (b) (a) SHOM, France, (b) ECTIA, France

16:30 **The depth dependence of ambient noise coherence in the deep ocean**

David Barclay, Woods Hole Oceanographic Institution, USA

16:45 **Underwater sound radiation patterns of contemporary merchant ships**

Martin Gassmann, Sean M. Wiggins, John A. Hildebrand, Scripps Institution of Oceanography, USA

17:00 **Close**