

## Workshop II: Full Waveform Inversion and Velocity Analysis

### Monday May 1, 2017

- 8:00–8:50 *Check-In/Breakfast (Hosted by IPAM)*
- 8:50–9:00 *Welcome and Opening Remarks*
- 9:00 *Session 1: Inversion Physics - Chair: William W. Symes*
- 9:00–9:40 **Jean Virieux** (Université de Grenoble I (Joseph Fourier))  
*Tutorial: Hierarchical FWI: multiscale approach*
- 9:50–10:05 *Break*
- 10:05–10:35 **Rene-Edouard Plessix** (Shell)  
*Multi-parameter waveform inversion in complex terrains*
- 10:50–11:20 **Maarten De Hoop** (Rice University)  
*Scattering control and inverse problem for the wave equation with piecewise smooth wave speeds*
- 11:30–11:45 *Break*
- 11:45–12:15 **Andreas Fichtner** (ETH Zurich)  
*The Collaborative Seismic Earth Model*
- 12:30–2:00 *Lunch (on your own)*
- 2:00–2:30 **Denis Vigh** (Schlumberger-Doll Research)  
*Utilizing full waveform inversion from shallow to deep*
- 2:45–3:15 **Frank Natterer** (Westfälische Wilhelms Universität Münster)  
*Wave equation imaging by the Kaczmarz method*
- 3:25–3:40 *Break*
- 3:40–4:45 *Discussion Session*
- 4:45–6:15 *Poster Session & Reception (Hosted by IPAM)*

### Tuesday May 2, 2017

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *Session 2: Resolution and Uncertainty - Chair: Jean Virieux*
- 9:00–9:40 **Romain Brossier** (Université de Grenoble I (Joseph Fourier))  
*Tutorial: Uncertainty Quantification in FWI using Ensemble method*
- 9:50–10:05 *Break*

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- 10:05–10:35 **Yann Capdeville** (Université de Nantes)  
*Homogenized Full waveform inversion*
- 10:50–11:20 **Laurent Demanet** (Massachusetts Institute of Technology)  
*Bandwidth extension for wave-based imaging*
- 11:30–11:45 *Break*
- 11:45–12:15 **Kris Innanen** (University of Calgary)  
*Elastic full waveform inversion in the P- and S-wave domain*
- 12:30–2:00 *Lunch (on your own)*
- 2:00–2:30 **Felix Herrmann** (University of British Columbia)  
*Constrained FWI*
- 2:40–3:00 *Break*
- 2:59–4:30 *Contributed Talks Session*
- 3:00–3:20 **Yunan Yang** (University of Texas at Austin)  
*(Contributed Talks Session) Optimal transport and the quadratic Wasserstein metric for seismic inversion*
- 3:30–3:50 **Nabil Masmoudi** (King Abdullah Univ. of Science and Technology (KAUST))  
*(Contributed Talks Session) Multi-parameter waveform inversion in acoustic orthorhombic media*
- 4:00–4:30 *Contributed Talks Open Discussion*

### **Wednesday May 3, 2017**

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *Session 3: Velocity Estimation - Chair: Florence Delprat-Jannaud*
- 9:00–9:40 **William W. Symes** (Rice University)  
*Velocity Estimation Tutorial: The search for a cycle-skipping cure: an overview*
- 9:50–10:05 *Break*
- 10:05–10:35 **Tariq Alkhalifah** (King Abdullah Univ. of Science and Technology (KAUST))  
*A recipe for waveform inversion of the appropriate model wavelength scales*
- 10:50–11:20 **Ludovic Metivier** (Centre National de la Recherche Scientifique (CNRS))  
*Optimal transport for full waveform inversion: how to deal with oscillatory signals?*
- 11:30–11:45 *Break*

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- 11:45–12:15 **Alexander Mamonov** (University of Houston)  
*Seismic inversion and imaging via model order reduction*
- 12:30–2:00 *Lunch (on your own)*
- 2:00–2:30 **Biondi Biondo** (Stanford University)  
*Robust convergence of full waveform inversion by methods based on physical intuition and geologic constraints: challenges ahead*
- 2:45–3:15 **Michael Warner** (Imperial College)  
*Adaptive waveform inversion*
- 3:25–3:40 *Break*
- 3:40–4:10 **Chao Wang** (ION Geophysical)  
*(David Yingst, co-presenter) Reconstructed Full Waveform Inversion with the Extended Source*
- 4:20–4:30 *Break*
- 4:30–5:30 *Discussion Session*

### **Thursday May 4, 2017**

- 8:00–9:00 *Check-In/Breakfast (Hosted by IPAM)*
- 9:00 *Session 4: Multi-Physics and Time Lapse - Chair: Sue Minkoff*
- 9:00–9:40 **David Lumley** (University of Texas at Dallas)  
*Tutorial: Advanced concepts in active and passive time-lapse 4D seismic monitoring*
- 9:50–10:05 *Break*
- 10:05–10:35 **Aria Abubakar** (Schlumberger-Doll Research)  
*Multi-physics inversion approaches for reservoir characterization and monitoring*
- 10:50–11:20 **Irina Filina** (University of Nebraska-Lincoln)  
*Gravity modeling as guidance for salt interpretation: a case study from the Western Gulf of Mexico*
- 11:30–11:45 *Break*
- 11:45–12:15 **Rune Mittet** (Norwegian University of Science and Technology (NTNU))  
*Comparing inversion of marine CSEM and seismic data*
- 12:30–2:00 *Lunch (on your own)*
- 2:00–2:30 **Daniele Colombo** (EXPEC Advanced Research Center, Saudi Aramco)  
*Multi-physics joint inversion applications to oil and gas exploration and field development*
- 2:40–3:00 *Break*

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- 2:59–4:30      *Contributed Talks Session*
- 3:00–3:20      **Stéphanie Chaillat-Loseille** (ENSTA ParisTech)  
*(Contributed Talks Session) A fast direct solver based on the boundary element method to model 3-D elastic waves in large domains*
- 3:30–3:50      **Marie Graff-Kray** (University of British Columbia)  
*Adaptive Eigenspace Method for Inverse Scattering Problems in the Frequency Domain*
- 4:00–4:30      *Contributed Talks Open Discussion*

## Friday May 5, 2017

- 8:00–9:00      *Check-In/Breakfast (Hosted by IPAM)*
- 9:00              *Session 5: Microseismicity and Complex Sources - Chair: Tariq Alkhalifah*
- 9:00–9:40      **Carl Tape** (University of Alaska Fairbanks)  
*Tutorial: Seismic source characterization and estimation of uncertainties*
- 9:40–10:05      *Break*
- 10:05–10:35   **Rie Kamei** (University of Western Australia)  
*Source mechanism and wavelet for elastic full waveform inversion*
- 10:50–11:20   **Sue Minkoff** (University of Texas at Dallas)  
*Modeling and Inversion of Microseismic Sources*
- 11:30–11:45      *Break*
- 11:45–12:15   **Anne Obermann** (ETH Zurich)  
*Potential of ambient seismic noise techniques to monitor injection induced subsurface changes*
- 12:30–2:00      *Lunch (on your own)*
- 2:00–2:30      **Jean Virieux** (Université de Grenoble I (Joseph Fourier))  
*The adjoint-state method applied to the kinematic source inversion: from a benchmark to a real earthquake*
- 2:40–3:00      *Break*
- 3:00–4:30      *Wrap-up Panel and Discussion*
- 4:30–5:30      *Conclusion*

