



Daniel B. Peter

Assistant Professor of Geophysics

King Abdullah University of Science & Technology (KAUST)
Physical Sciences and Engineering Division
Building 1 (Al-Khwarizmi), Office #0146
Thuwal 23955-6900, Kingdom of Saudi Arabia

tel: +966 (54) 470 0405

e-mail: daniel.peter@kaust.edu.sa

ORCID iD: orcid.org/0000-0002-3397-5379

- Research Interests
- COMPUTATIONAL SEISMOLOGY**
Numerical methods for seismic wave propagation, applications to High-Performance Computing
 - GEOPHYSICAL INVERSE PROBLEMS**
Waveform-based seismic adjoint tomography, validation of global and regional seismic models
 - EARTHQUAKE SEISMOLOGY**
Seismic source verification and 3D source inversions

- Education
- Swiss Federal Institute of Technology, ETH Zurich, Switzerland**
 - Ph.D., Geophysics, Department of Earth Sciences, Institute of Geophysics, May 2008
 - Thesis: *Finite-frequency effects in global seismology: forward modeling and implications on tomographic imaging*, Advisor: Prof. Domenico Giardini
 - Diploma, Physics, Institute for Atmospheric and Climate Science, August 1998
 - Thesis: *Strategies for ensemble predictions*, Advisor: Prof. Huw C. Davies

- Academic experience
- King Abdullah University of Science & Technology (KAUST), Saudi Arabia**
 - Assistant Professor, *July 2015 – today*
 - Assistant Professor of Geophysics in the Earth Sciences & Engineering (ErSE) Program within the Physical Sciences & Engineering (PSE) Division.
 - Affiliated to the Extreme Computing Research Center (ECRC).

- Università della Svizzera italiana, USI Lugano, Switzerland**
- Swiss Federal Institute of Technology, ETH Zurich, Switzerland**
 - Senior scientist, *September 2013 – June 2015*
 - research activities at the the Department of Computer Science, USI, and Institute of Geophysics, ETH Zurich:
 - High-performance computing (HPC) application support for geophysics network "Solid Earth Dynamics"
 - 3D multi-scale adjoint tomography
 - Implementation of hardware-accelerated computing
 - teaching activities:
 - Lecturer, "Seismology of the spherical Earth", bachelor & master level

Swiss Federal Institute of Technology, ETH Zurich, Switzerland

Research associate, *January 2013 – August 2013*

research activities at the Institute of Geophysics ETH Zurich:

- 3D adjoint tomography
- Implementation of hardware-accelerated computing

teaching activities:

- Lecturer, "Seismology of the spherical Earth", bachelor & master level

Princeton University, Princeton NJ, USA

Associate research scholar, *2011 – 2012*

Post-doctoral research associate, *2008 – 2011*

research activities accomplished at the Department of Geosciences, Princeton University:

- 3D seismic source inversion and adjoint tomography for regional events in the Middle East
- Seismic model validation for the Middle East
- Implementation of a finite-element ray tracing code for optical rays in deformable media

teaching activities accomplished:

- Assistant, "Computational geophysics", graduate level
- Assistant, "Quantitative seismology", graduate level

Seminar organizer, *2008 – 2010*

for the Department of Geosciences, Princeton University:

- Organization of the Solid-Earth brownbag seminar, weekly cycle

Swiss Federal Institute of Technology, ETH Zurich, Switzerland

Ph.D work, *2004 – 2008*

research activities accomplished at the Institute of Geophysics ETH Zurich:

- Implementation of a finite-difference software package to model the propagation of membrane waves on a spherical shell as an analogue to surface waves
- 2D and 3D sensitivity kernel computations for phase anomaly measurements of surface waves
- Administration of a Linux Beowulf research cluster and an Apple Xgrid supercomputer

Teaching activities, *2004 – 2007*

activities accomplished at the Institute of Geophysics ETH Zurich:

- Assistant, "Introduction to seismic networks", undergraduate level
- Assistant, "Geothermics", field work for undergraduate level

activities accomplished at the Kantonsschule Zug for the certificate of teaching ability:

- College teacher, "Physics", classes taught August 2006 – May 2007, college level

Diploma work, *May 1998 – October 1998*

research activities accomplished at the IACETH (Institute for Atmospheric and Climate Science, ETH Zurich):

- Implementation of a Lorenz-63 model with non-linear dynamics approaches for short- and medium range weather predictions, 6-month research work

Publications

Articles in refereed journals:

2018 |

O. Ovcharenko, V. Kazei, **D. Peter**, T Alkhalifah, 2018. *Variance-based model interpolation for improved full-waveform inversion in the presence of salt bodies*, *Geophysics*, 83 (5), R541-R551

Q. Liu, **D. Peter**, 2018 *One-step data-domain least-squares reverse time migration*, *Geophysics*, 83 (4), R361-R368

2017 |

Lefebvre, M., Y. Chen, W. Lei, D. Luet, Y. Ruan, J. Tromp, E. Bozdag, J. Hill, D. Komatitsch, L. Krischer, **D. Peter**, N. Podhorszki, J. Smith, 2017. *Data and Workflow Management for Exascale Global Adjoint Tomography*, *Exascale Scientific Applications: Programming Approaches for Scalability, Performance, and Portability*, Ed. T. Straatsma, K. Antypas and T. Williams, CRC Press

Miyoshi, T., M. Obayashi, **D. Peter**, Y. Tono and S. Tsuboi, 2017. *Adjoint tomography of the crust and upper mantle structure beneath the Kanto region using broadband seismograms*, *Progress in Earth and Planetary Science*, 4 (1). doi:10.1186/s40645-017-0143-8

2016 |

Rietmann, M., M. Grote, **D. Peter** and O. Schenk, 2016. *Newmark local time stepping on high-performance computing architectures*, *J. Comput. Phys*, 334, 308 - 326. doi:10.1016/j.jcp.2016.11.012.

Bozdag, E., **D. Peter**, M. Lefebvre, D. Komatitsch, J. Tromp, J. Hill, N. Podhorszki and D. Pugmire, 2016. *Global adjoint tomography: first-generation model*, *Geophys. J. Int.*, 207 (3), 1739 - 1766. doi:10.1093/gji/ggw356

Komatitsch, D. Z. Xie, E. Bozdag, E. Sales de Andrade, **D. Peter**, Q. Liu and J. Tromp, 2016. *Anelastic sensitivity kernels with parsimonious storage for adjoint tomography and full waveform inversion*, *Geophys. J. Int.*, 206 (3), 1467 - 1478. doi:10.1093/gji/ggw224

Tsuboi, S., K. Ando, T. Miyoshi, **D. Peter**, D. Komatitsch, and J. Tromp, 2016. *A 1.8 trillion degrees-of-freedom, 1.24 petaflops global seismic wave simulation on the K computer*, *Int. J. of High Performance Computing Applications (IJHPCA)*, 30 (4), 411 - 422. doi:10.1177/1094342016632596.

Afanasiev, M., **D. Peter**, K. Sager, S. Simutè, L. Ermert, L. Krischer, and A. Fichtner, 2016. *Foundations for a multiscale collaborative global Earth model*, *Geophys. J. Int.*, 204 (1), 39 - 58. doi:10.1093/gji/ggv439

2015 |

Rietmann, M., **D. Peter**, O. Schenk, B. Ucar, and M. Grote, 2015. *Load-Balanced Local Time Stepping for Large-Scale Wave Propagation*, *IEEE CPS*. in 29th IEEE International Parallel & Distributed Processing Symposium (IPDPS), May 2015, Hyderabad, India. pp. 925 – 935.

2014 |

Holtzman, B., J. Candler, M. Turk, and **D. Peter**, 2014. *Seismic Sound Lab: Sights, Sounds and Perception of the Earth as an Acoustic Space*, in *Lecture Notes in Computer Science, Sound, Music, and Motion: 10th International Symposium, CMMR 2013*. Volume 8905, 2014, pp. 161 – 174.

Magnoni, F., E. Casarotti, A. Michelini, A. Piersanti, D. Komatitsch, **D. Peter**, and J. Tromp, 2014. *Spectral-Element Simulations of Seismic Waves Generated by the 2009 L'Aquila Earthquake*, *Bull. Seismol. Soc. Am.*, 104 (1), doi:10.1785/0120130106

2012 |

Rietmann, M., P. Messmer, T. Nissen-Meyer, **D. Peter**, P. Basini, D. Komatitsch, O. Schenk, J. Tromp, L. Boschi and D. Giardini, 2012. *Forward and adjoint simulations of seismic wave propagation on emerging large-scale GPU architectures*, SC '12 Proceedings of the International Conference on High Performance Computing, Networking, Storage and Analysis, Article No. 38.

Zhu, H.J., E. Bozdag, **D. Peter** and J. Tromp, 2012. *Seismic wavespeed images across the Iapetus and Tornquist suture zones*, Geophys. Res. Lett., 39 (18), doi:10.1029/2012GL053053.

Zhu, H.J., E. Bozdag, **D. Peter** and J. Tromp, 2012. *Structure of the European upper mantle revealed by adjoint tomography*, Nature Geoscience, 5, 493-498, doi:10.1038/NGEO1501.

Epstein, M., **D. Peter** and M.A. Slawinski, 2012. *Combining ray-tracing techniques and finite-element modelling in deformable media*, QJMAM, 65 (1), 87-112.

2011 |

Peter, D., D. Komatitsch, Y. Luo, R. Martin, N. Le Goff, E. Casarotti, P. Le Loher, F. Magnoni, Q. Liu, C. Blitz, T. Nissen-Meyer, P. Basini and J. Tromp, 2011. *Forward and adjoint simulations of seismic wave propagation on unstructured hexahedral meshes*, Geophys. J. Int., 186 (2), 721-739.

Savage, B., **D. Peter**, B.M. Covellone, A.J. Rodgers and J. Tromp, 2011. *Next Generation, Waveform Based Three-Dimensional Models and Metrics to Improve Nuclear Explosion Monitoring in the Middle East*, in Proceedings: 33rd Monitoring Research Review (MRR 2011), 1-17, p. 161-167.

2010 |

Tromp, J., Y. Luo, S. Hanasoge and **D. Peter**, 2010. *Noise Cross-Correlation Sensitivity Kernels*, Geophys. J. Int., 183 (2), 791-819.

Tromp, J., D. Komatitsch, V. Hjörleifsdóttir, Q. Liu, H. Zhu, **D. Peter**, E. Bozdag, D. McRitchie, P. Friberg, C. Trabant and A. Hutko, 2010. *Near real-time simulations of global CMT earthquakes*, Geophys. J. Int., 183 (1), 381-389.

Savage, B., **D. Peter**, B. Covellone, A. Rodgers and J. Tromp, 2010. *Next Generation, Waveform Based Three-Dimensional Models and Metrics to Improve Nuclear Explosion Monitoring in the Middle East*, in Proceedings: 32nd Monitoring Research Review (MRR 2010), 2-20, p. 207-213.

2009 |

Savage, B., **D. Peter**, B. Covellone, A. Rodgers and J. Tromp, 2009. *Progress towards next generation, waveform based three-dimensional models and metrics to improve nuclear explosion monitoring in the Middle East*, in Proceedings: 31th Monitoring Research Review of Ground-Based Nuclear Explosion Monitoring Technologies (MRR 2009), LLNL-PROC-414451, 1-21, p. 194-200.

Peter, D., L. Boschi and J.H. Woodhouse, 2009. *Tomographic resolution of ray and finite-frequency methods: a membrane-wave investigation*, Geophys. J. Int., 177, 624-638.

2008 |

Peter, D., L. Boschi, F. Deschamps, B. Fry, G. Ekström and D. Giardini, 2008. *A new finite-frequency shear-velocity model of the European-Mediterranean region*, Geophys. Res. Lett., 35, L16315, doi:10.1029/2008GL034769.

2007 |

Peter, D., C. Tape, L. Boschi and J.H. Woodhouse, 2007. *Surface wave tomography: global membrane waves and adjoint methods*, Geophys. J. Int., 171, 1098-1117.

Boschi, L., J.-P. Ampuero, **D. Peter**, P.M. Mai, G. Soldati and D. Giardini, 2007. *Petascale computing and resolution in global seismic tomography*, Phys. Earth planet. Inter., doi:10.1016/j.pepi.2007.02. 011

Articles in non-refereed journals, non-refereed reports, abstracts, posters:

- Peter, D.**, V. Monteiller, D. Komatitsch, M. Schirwon, M. Lefebvre, E. Bachmann, Y. Ruan, J. Tromp, E. Bozdog, Y. Chen, J. Vincent, 2018. *Assessing spectral-element seismic wave propagation on current HPC architectures*, AGU, e-poster presented in Washington, USA.
- Chen, F., **D. Peter**. 2018. *A misfit function based on entropy regularized optimal transport for full-waveform inversion*, SEG Technical Program Expanded Abstracts 2018, 1314 - 1318.
- Ovcharenko, O., V. Kazei, **D. Peter**, X. Zhang, T. Alkhalifah, 2018. *Low-Frequency Data Extrapolation Using a Feed-Forward ANN*, 80th EAGE Conference and Exhibition 2018, Copenhagen, Denmark
- Chen, F., **D. Peter**, 2018. *Constructing Misfit Function for Full Waveform Inversion Based on Sliced Wasserstein Distance*, 80th EAGE Conference and Exhibition 2018, Copenhagen, Denmark
- Liu, Q., **D. Peter**, 2018. *Square-Root Variable Metric Based Elastic Full Waveform Inversion and Its Uncertainty Estimation*, 80th EAGE Conference and Exhibition 2018, Copenhagen, Denmark
- Akram, J., **D. Peter**, and D. Eaton, 2018. *A k-mean characteristic function to improve STA/LTA detection*, GeoConvention 2018, Calgary, Canada.
- Ovcharenko, O., J. Akram, **D. Peter**, 2018. *Feasibility of moment tensor inversion for a single-well microseismic data using neural networks*, Geo 2018, 13th Middle East Geosciences Conference and Exhibition, Bahrain.

- Tromp, J., E. Bozdog, W. Lei, Y. Ruan, M. Lefebvre, R. Modrak, R. Orsvuran, J. Smith, D. Komatitsch, **D. Peter**, 2017. *Advances in Global Full Waveform Inversion*, AGU, Fall Meeting Abstracts, New Orleans, USA.
- Ovcharenko, O., V. Kazei, **D. Peter** and T. Alkhalifah, 2017. *Neural network based low-frequency data extrapolation*, SEG Workshop on FWI, extended abstract, Manama, Bahrain.
- Akram, J., O. Ovcharenko and **D. Peter**, 2017. *A robust neural network-based approach for microseismic event detection*, SEG Technical Program Expanded Abstracts 2017, Houston, USA, pp. 2929 - 2933, doi:10.1190/segam2017-17761195.1
- Liu, Q., **D. Peter** and Y. Lu, 2017. *A fast pointwise strategy for anisotropic wave-mode separation in TI media*, SEG Technical Program Expanded Abstracts 2017, Houston, USA, pp. 447-451, doi:10.1190/segam2017-17795796.1
- Ovcharenko, O., V. Kazei, **D. Peter** and T. Alkhalifah, 2017. *Variance-based Salt Body Reconstruction*, 79th EAGE Conference and Exhibition 2017 extended abstract, Paris, France. doi:10.3997/2214-4609.201700832

Pugmire, D., E. Bozdogan, M. Lefebvre, J. Tromp, D. Komatitsch, **D. Peter**, N. Podhorszki, J. Hill, 2017. *Pillars of the Mantle: Imaging the Interior of the Earth with Adjoint Tomography*, Proceedings of the Practice and Experience in Advanced Research Computing (PEARC) 2017, Article No. 75, New Orleans, USA. doi:10.1145/3093338.3104170

Peter, D., M. Rietmann, P. Galvez, J.P. Ampuero, 2017. *High-resolution seismic wave propagation using local time stepping*, High Performance Computing Saudi Arabia (HPC Saudi), poster presented at KAUST, Saudi Arabia.

Peter, D., Q. Liu, D. Komatitsch, 2017. *Seismic wave propagation on emerging HPC architectures*, PASC17, invited talk in Lugano, Switzerland.

Peter, D., Q. Liu, D. Komatitsch, 2017. *Spectral-element seismic wave propagation on emerging HPC architectures*, EGU, poster presented in Vienna, Austria.

2016 | **Peter, D.**, M. Rietmann, P. Galvez, J.P. Ampuero. 2016. *High-resolution dynamic rupture simulations using local time stepping*, AGU, poster presented in San Francisco, USA.

Peter, D., B. Videau, K. Pouget, D. Komatitsch. 2016. *Seismic wave propagation and structural inversion on emerging HPC architectures*, Perspectives of GPU Computing in Science conference, poster presented in Rome, Italy.

2015 | **Peter, D.**, B. Videau, K. Pouget, D. Komatitsch. 2015. *Spectral-element Seismic Wave Propagation on CUDA/OpenCL Hardware Accelerators*, AGU, poster presented in San Francisco, USA.

Peter, D., B. Videau, K. Pouget, D. Komatitsch. 2015. *Forward and adjoint spectral-element simulations of seismic wave propagation using hardware accelerators*, PASC15, poster presented at ETH Zurich, Switzerland.

Peter, D., B. Videau, K. Pouget, D. Komatitsch. 2015. *Forward and adjoint spectral-element simulations of seismic wave propagation using hardware accelerators*, EGU, poster presented in Vienna, Austria.

2014 | **Peter, D.**, M. Rietmann, J. Charles, P. Messmer, D. Komatitsch, D. Göddeke, O. Schenk, J. Tromp, 2014. *High-performance computing of seismic wave propagation on graphic cards*, Woodhouse conference, invited poster presented at Oxford University, UK.

2013 | **Peter, D.**, M. Rietmann, P. Galvez, T. Nissen-Meyer, M. Grote, O. Schenk, 2013. *Accelerating spectral-element simulations of seismic wave propagation using local time stepping*, AGU, poster presented in San Francisco, USA.

Zhu, H., Y. Luo, E. Bozdogan, **D. Peter** and J. Tromp, 2013. *Imaging Earth's interior based on adjoint methods: seismic inverse problems from continental to exploration scales*, in Proceedings of the International Petroleum Technology Conference (IPTC 2013), Vol. 3, 1774-1777.

- 2012 | **Peter, D.**, M. Rietmann, J. Charles, P. Messmer, D. Komatitsch, O. Schenk, J. Tromp, 2012. *Accelerating forward and adjoint simulations of seismic wave propagation on large GPU-clusters*, AGU, poster presented in San Francisco, USA.
- 2011 | **Peter, D.**, B. Savage, A. Rodgers, C. Morency and J. Tromp, 2011. *Adjoint tomography of the Middle East*, AGU, invited presentation, San Francisco, USA.
- Peter, D.**, M. Rietmann, D. Komatitsch and J. Tromp, 2011. *Advances in high-performance spectral-element solvers for seismic tomography*, AGU, invited presentation, San Francisco, USA.
- 2010 | **Peter, D.**, B. Savage, A. Rodgers and J. Tromp, 2010. *Adjoint tomography of the Middle East*, AGU, paper presented in San Francisco, USA.
- Luo, Y., H. Zhu, T. Nissen-Meyer, C. Morency, **D. Peter**, and J. Tromp, 2010. *Modeling and imaging based upon spectral-element and adjoint methods*, SEG Technical Program Expanded Abstracts 2010, 3231 - 3236, Denver, USA.
- Peter, D.**, B. Savage, B. Covellone, A. Rodgers and J. Tromp, 2010. *Adjoint tomography of the Middle East for nuclear explosion monitoring*, QUEST workshop, poster presented in Alghero, Italy.
- Peter, D.**, 2010. *Toward seismic adjoint tomography for local to global scale problems*, IPRPI Workshop, invited presentation, Troy, USA.
- 2008 | **Peter, D.**, A. Rodgers, B. Savage and J. Tromp, 2008. *Adjoint tomography for the Middle East*, AGU, paper presented in San Francisco, USA.
- Savage, B., B. Covellone, **D. Peter**, A. Rodgers, and J. Tromp, 2008. *Initial steps towards next-generation, waveform-based, three-dimensional Models and Metrics to Improve Nuclear Explosion Monitoring in the Middle East*, Proceedings of the 30th Monitoring Research Review of Ground-Based Nuclear Explosion Monitoring Technologies, poster presented in Portsmouth, USA.
- 2007 | **Peter, D.**, L. Boschi and J.H. Woodhouse, 2007. *Surface wave tomography: where does ray theory break down on a global scale?*, AGU, paper presented in San Francisco, USA.
- Peter, D.**, L. Boschi and Y. Capdeville, 2007. *Finite-frequency kernels for surface waves based upon adjoint methods*, SPICE workshop, paper presented in Cargèse, France.
- 2006 | **Peter, D.** and L. Boschi, 2006. *Surface wave tomography: membrane waves and adjoint methods*, SPICE workshop, paper presented in Kinsale, Ireland.

CRG, *Waveform and Tomographic Inversion for Natural and Induced Seismic events*, 2017 – 2020.

PI: T. Alkhalifah, Co-PI: **D. Peter**, J. Tromp, F. Simons, H. Zhang
Research grant \$1,200,000, King Abdullah University of Science & Technology (KAUST)

Saudi Aramco, *Artificially intelligent 4D waveform inversion for reservoir monitoring*, 2019 – 2020.

PI: T. Alkhalifah, Co-PI: X. Zhang, **D. Peter**
Research grant \$627,000, Saudi Aramco.

INCITE, *Global adjoint tomography*, 2019.

PI: J. Tromp, Co-PI: E. Bozdogan, D. Komatitsch, **D. Peter**
HPC award: 700k node-hours Summit system, DOE Leadership computing, Oak Ridge National Laboratory (ORNL)

KSL, *HPC for large physics-based earthquake simulations*, 2018 – 2020.

PI: **D. Peter**, Co-PI: P. Galvez, A. Espindola Carmona, J.P. Ampuero
HPC award: 14M core-hours Shaheen system, KAUST Supercomputing Laboratory (KSL)

INCITE, *Global adjoint tomography*, 2018.

PI: J. Tromp, Co-PI: E. Bozdogan, D. Komatitsch, M. Lefebvre, **D. Peter**
HPC award: 80M core-hours Titan system, DOE Leadership computing, Oak Ridge National Laboratory (ORNL)

CAAR, *Towards Exascale Seismic Imaging & Inversion*, 2018.

PI: J. Tromp, Co-PI: D. Komatitsch, **D. Peter**, M. Lefebvre, E. Bozdogan, Y. Ruan
HPC award: access to Pre-Summit system, Center for Accelerated Application Readiness (CAAR), Oak Ridge National Laboratory (ORNL)

KSL, *Robust objective function and resolution investigations for seismic full-waveform inversions in complex media*, 2017–2018.

PI: **D. Peter**, Co-PI: Q. Liu, F. Chen, O. Ovcharenko
HPC award: 2M core-hours Shaheen system, KAUST Supercomputing Laboratory (KSL)

CRG, *Improving resolution and reliability analysis of seismic models of the Saudi Arabian peninsula*, 2016 – 2018.

PI: **D. Peter**
Research grant \$163,000, King Abdullah University of Science & Technology (KAUST)

CHRONOS, *Global Waveform Inversion Across the Scales*, 2014 – 2017.

PI: A. Fichtner, Co-PI: **D. Peter**, O. Schenk
HPC award: 144M allocation-units Piz Daint system, Swiss National Supercomputing Centre (CSCS)

INCITE, *Global adjoint tomography*, 2017.

PI: J. Tromp, Co-PI: E. Bozdogan, D. Komatitsch, M. Lefebvre, **D. Peter**
HPC award: 80M core-hours Titan system, DOE Leadership computing, Oak Ridge National Laboratory (ORNL)

KSL, *HPC for large physics-based earthquake simulations: 3D dynamic ruptures, strong ground motion and earthquakes cycles for giant earthquakes*, 2016.

PI: **D. Peter**, Co-PI: P. Galvez, J.P. Ampuero

HPC award: 2M core-hours Shaheen system, KAUST Supercomputing Laboratory (KSL)

KAUST, *Portable seismic broadband stations*, 2016.

PI: M. Mai, **D. Peter**

Hardware grant \$300,000, King Abdullah University of Science & Technology (KAUST)

INCITE, *Global adjoint tomography*, 2016.

PI: J. Tromp, Co-PI: E. Bozdag, D. Komatitsch, M. Lefebvre, **D. Peter**

HPC award: 80M core-hours Titan system, DOE Leadership computing, Oak Ridge National Laboratory (ORNL)

PASC, *GeoScale: A framework for multi-scale seismic modelling and inversion*, 2013 – 2016.

PI: A. Fichtner, Co-PI: **D. Peter**, O. Schenk, T. Nissen-Meyer, M. Grote, D. Giardini

Research grant CHF 690,000, Platform for Advanced Scientific Computing (PASC), Swiss University Conference (SUC)

INCITE, *Global adjoint tomography*, 2015.

PI: J. Tromp, Co-PI: E. Bozdag, D. Komatitsch, M. Lefebvre, **D. Peter**

HPC award: 50M core-hours Titan system, DOE Leadership computing, Oak Ridge National Laboratory (ORNL)

INCITE, *Global Seismic Tomography based on Spectral-Element and Adjoint Methods*, 2014.

PI: J. Tromp, Co-PI: O. Schenk, Project Collaborators: E. Bozdag, D. Komatitsch, **D. Peter**

HPC award: 100M core-hours Titan system, DOE Leadership computing, Oak Ridge National Laboratory (ORNL)

INCITE, *Global Seismic Tomography based on Spectral-Element and Adjoint Methods*, 2013.

PI: J. Tromp, Co-PI: O. Schenk, Project Collaborators: E. Bozdag, D. Komatitsch, **D. Peter**

HPC award: 100M core-hours Titan system, DOE Leadership computing, Oak Ridge National Laboratory (ORNL)

NCAR, *Community Computational Platforms for Developing Three-Dimensional Models of Earth Structure*, 2012 – 2013.

PI: T. Jordan, Co-PI: P. Chen, Y. Cui, J. Tromp, Project Collaborators: E. Bozdag, E. Lee, P. Maechling, K. Olson, **D. Peter**, J. Shaw, C. Tape

HPC award: 7.3M core-hours Yellowstone system, Accelerated Scientific Discovery (ASD), NCAR Computational and Information Systems Laboratory (CISL).

Supervision	<p>Yan Yang, Post-doctoral research, 2018 – today Percy Galvez Barron, Post-doctoral research, 2017 – today Jubran Akram, Post-doctoral research, 2016 – today Qiancheng Liu, Post-doctoral research, 2016 – today</p> <p>Dias Urozayev, Ph.D. KAUST, 2019 – today. Armando Espindola Carmona, Ph.D. KAUST, 2017 – today. Muhammad Izzatullah, Ph.D. KAUST, 2017 – today. Oleg Ovcharenko, Ph.D. KAUST, 2016 – today. Fuqiang Chen, Ph.D. KAUST, 2016 – today.</p> <p>Eduardo Valero Cano, MS KAUST, 2018 – today. Kimberley Ponce Munoz, MS KAUST, 2018 – today. Mamoun Alghaslan, MS KAUST, 2018, Saudi Aramco.</p>
Teaching	<p>KAUST, <i>Seismology II</i>, Lecturer, 2017, 2018 KAUST, <i>Computational Geophysics</i>, Lecturer, 2016, 2017, 2018 ETH Zurich, <i>Seismology of the Spherical Earth</i>, Lecturer, 2013, 2014, 2015 Princeton University, <i>Computational Geophysics</i>, Teaching Assistant, 2011, 2012 Princeton University, <i>Quantitative Seismology</i>, Teaching Assistant, 2009 ETH Zurich, <i>Introduction to seismic networks</i>, Teaching Assistant, 2005,2006,2007 ETH Zurich, <i>Geothermics</i>, Teaching Assistant, 2004, 2005, 2006, 2007 Kantonsschule Zug, <i>Physik</i>, College Teacher, 2006</p>
Awards	<p>Platform for Advanced Scientific Computing (PASC) <i>Best Poster Award</i>, Solid Earth Dynamics, Conference 2015</p> <p>American Geophysical Union (AGU) <i>Outstanding Student Paper Award</i>, Fall meeting 2007</p>
Memberships	<p>American Geophysical Union (AGU) European Geosciences Union (EGU) Society of Exploration Geophysicists (SEG)</p>
Professional Profile	<p>Independent programmer with training and expertise in feed-forward backpropagation networks and genetic algorithms, 3D-visualisations of complex user interfaces and Computer Telephony Integration</p> <p>Possess solid understanding of non-linear dynamics with Runge-Kutta and finite-difference solving algorithms and Monte Carlo ensemble generation especially with consideration of probabilistic densities and singular vectors</p> <p>Experienced in international projects of software development, strong team worker with troubleshooting and problem-solving skills</p>

Professional
experience

Petersvild, St.Gallen, Switzerland

Software Programmer, *2001 – 2004*

- Implemented genetic algorithms for optimisation of feed-forward backpropagation neural networks in Econophysics,
- 3D-visualisation applications for corporate communication.

Enterprise Communications AG / Ansid AG, Winterthur, Switzerland

Software Programmer, *2000 – 2001*

- Performed trouble shooting in the development of Computer Telephony Integration (CTI) software products, mainly in system-analysis and program design.
- Implemented core components and test environments.

Enterprise Communications AG, Zurich, Switzerland

Software Programmer, *1999 – 2000*

- Researched system-analysis and modelled telephony interfaces of Microsoft (TAPI) and ECMA (TSAPI).
- Analyzed and designed core modules of the application package within outsourcing projects, studied technical feasibility and controlled the implementation in collaboration with the quality management.

Additional
Information

Languages:

German (mother language), English (fluent), French (fluent)

Programming & Scripting Languages:

Fortran, C/C++, CUDA, Python, Perl, Matlab, Ruby, Bash