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Personal Information

Full Name: Hatice Ebru Bozdağ
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Education

PhD in Geophysics (2005 - 2009). Utrecht University, Utrecht, the Netherlands
SPICE (**S**eismic wave **P**ropagation and **I**maging in **C**omplex media: a **E**uropean network) Marie Curie Early-Career Researcher
Thesis: Assessing and improving seismic tomography models using 3-D numerical wave simulations
Supervisor: Jeannot Trampert

MSc in Geophysics (2000 - 2002). Istanbul Technical University, Istanbul, Turkey
Thesis: Estimation of site amplification by array processing of microtremors in Yesilyurt and Avcilar, Istanbul
Supervisor: Argun Kocaoğlu

BSc in Geophysics (1996 - 2000). Istanbul Technical University, Istanbul, Turkey
Graduation Project: SASW (Spectral Analysis of Surface Waves) method and its applications

Professional Positions

Associate Professor with tenure (April 1, 2022, -); Colorado School of Mines, Golden, CO, USA

Assistant Professor (April 1, 2017, March 31, 2022); Colorado School of Mines, Golden, CO, USA

Maître de Conférence (Assistant/Associate Professor - tenured position) (December 2013-April 2017); Université Côte d'Azur (*formerly Université Nice*), CNRS-OCA-IRD-Géoazur, Sophia Antipolis, France

Chaire d'Excellence[3] (Dec. 2013, April 2017); Université Côte d'Azur (*formerly Université Nice*), CNRS-Géoazur, Sophia Antipolis, France

Associate Research Scholar (Sept. 2012 - Dec. 2013). Princeton University, Princeton, NJ, USA

Postdoctoral Research Associate (Sept. 2009 - Sept. 2012). Princeton University, Princeton, NJ, USA (*primarily worked with Jeroen Tromp*)

Research Assistant (2005 - 2009). Utrecht University, Utrecht, the Netherlands

Research Assistant (2002 - 2005). Istanbul Technical University, Istanbul, Turkey

[3] A chaired position supported by the French Scientific Council CNRS which was for five years until 2019.

Publications and Presentations

*student, **student collaborator, †my postdoc, ††postdoc collaborator

- **Book chapter:**

  - Lefebvre, M., Chen, Y., Lei, W., Luet, D., Ruan, Y., **Bozdağ, E.,** Hill, J., Komatitsch, D., Krischer, L., Peter, D., Podhorszki, N., Smith, J., and Tromp, J., 2017. Data & Workflow Management for Exascale Global Adjoint Tomography, in Exascale Scientific Applications: Programming Approaches for Scalability, Performance and Portability, Editors Straatsma, T., & Antypas, K., https://doi.org/10.1201/b21930, 608 pages, Chapman and Hall/CRC, New York.

- **Refereed Journals**

  Submitted / In revision

  (1) Creasy, N.†, **Bozdağ, E.**, Frost, D., Snieder, R., 2021. Body Wave Polarization Anomalies due to Earth's Coriolis Effect, *Geophysical Research Letters*, in revision.

  (2) Huang,Q.†, Schmerr,N.C., King, S., Kim, D., Rivoldini, A., Plesa, A., Samuel, H., Maguire, R., Karakostas, F., Lekić, V., Charalambous, C., Collinet, M., Myhill, R., Antonangeli, D., Drilleau, M., Bystricky, M., Bollinger, C., Michaut, C., Gudkova, T., Irving, J., Horleston, A., Fernando, B., Leng,, K., Nissen-Meyer, T., Bejina, F., **Bozdağ, E.**, Beghein, C., Waszek, L., Siersch, N., Scholz, J-R., Davis, P., Lognonné, P., Pinot, B., Widmer-Schnidrig, R., Panning, M., Smrekar, S., Spohn, T., Pike, W., Giardini, D., Banerdt, W. B. Seismic detection of a deep mantle discontinuity within Mars by InSight, PNAS, in revision.

  (3) D. Kim, W. B. Banerdt , S. Ceylan , D. Giardini , V. Lekic , P. Lognonné , C. Beghein , É. Beucler , S. Carrasco , C. Charalambous , J. Clinton , M. Drilleau , C. Durán , M. Golombek , R. Joshi , A. Khan , B. Knapmeyer-Endrun , J. Li , R. Maguire , W. T. Pike , H. Samuel , M. Schimmel , N. Schmerr , S. C. Stähler , E. Stutzmann , M. Wieczorek , Z. Xu , A. Batov , **Bozdağ, E.**, N. Dahmen , P. Davis , T. Gudkova , A. Horleston , Q. Huang , T. Kawamura, S. King , S. M. McLennan , F. Nimmo , M. Plasman, A. C. Plesa , I. E. Stepanova , E. Weidner , G. Zenhäusern , I. J. Daubar , B. Fernando , R. Garcia , L. V. Posiolova , M. P. Panning Surface waves and crustal structure on Mars, Science, in revision.

  (4) Li, J., Beghein, C., McLennan, S., Horleston, A., Huang, Q., **Bozdağ, E.** Golombek, M., Lekic, V., Lognonné, P., Banerdt. W. Second Seismic Anchor Point of the Martian Crustal Structure Away From the InSight Landing Site, Nature Communications, submitted.

  Published / Accepted:

  (1) Ciardelli, C*., Assumpção, M., **Bozdağ, E.**,, van der Lee, S., 2022. Adjoint Waveform Tomography of South America based on 3D Spectral-Element Seismic Wave Simulations, *Journal of Geophysical Research-Solid Earth*, 127(2), e2021JB022575, https://doi.org/10.1029/2021JB022575.

  (2) Ciardelli, C*., **Bozdağ, E.**, Peter, D., van der Lee, S., 2022. SphGLLTools: A toolbox for visualization of large seismic models of spectral-element simulations based on their spherical harmonic expansions, *Computers & Geosciences*, 159, 105007, https://doi.org/10.1016/j.cageo.2021.105007.

(3) Knapmeyer-Endrun, B., Panning, M. P., Bissig, F., Joshi, R., Khan, A., Kim, D., Lekić, V., Tauzin, B., Tharimena, S., Plasman, M., Compaire, N., Garcia, R. F., Margerin, L., Schimmel, M., Stutzmann, E., Schmerr, N., **Bozdağ, E.,**, Plesa, A.-C., Wieczorek, M. A., Samuel, H., Michaut, C., Pan, L., Smrekar, S. E., Johnson, C. L., Brinkman, N., Mittelholz, A., Rivoldini, A., Davis, P. M., Lognonné, P., Pinot, B., Scholz, J. R., Stähler, S., Knapmeyer, M., van Driel, M., Giardini, D., Banerdt, W. B., 2021, Thickness and structure of the Martian crust from InSight seismic data, *Science*, 6553(373), 438-443,
DOI: 10.1126/science.abf8966, **hot paper - Web of Science**.

(4) A.-C. Plesa, **Bozdağ, E.**, A. Rivoldini, S. Padovan, M. Wieczorek, N. Tosi, D. Peter, M. Knapmeyer, D. Breuer, S. McLennan, T. Spohn, 2021. Seismic Velocities predicted by Large-scale Numerical Simulations of Thermal Evolution of Martian Interior, *Journal of Geophysical Research – Planet*,
https://doi.org/10.1029/2020JE006755.

(5) Sens-Schönfelder, C., **Bozdağ, E.**, Snieder, R., 2021. Coupling of surface waves due to Earth's rotation Part 2: Numerical examples, *Geophys. J. Int.*, 225(1), 176-185,
https://doi.org/10.1093/gji/ggaa588.

(6) Luo, B.[†]., Trainor-Guitton, W., **Bozdağ, E.**, LaFlame, L., Cole, S., Karrenbach, M., 2020. Horizontally Orthogonal Distributed Acoustic Sensing Array for Earthquake- and Ambient-Noise-Based Multichannel Analysis of Surface Waves, *Geophys. J. Int.*,
https://doi.org/10.1093/gji/ggaa293.

(7) Lei, W.[**]., Ruan, Y., **Bozdağ, E.**, Peter, D., Lefebvre, M., Komatitsch, D., Tromp, J., Hill, J., Podhorszki, N., Pugmire, D., 2020. Global adjoint tomography - Model GLAD-M25, *Geophy. J. Int.*,
https://doi.org/10.1093/gji/ggaa253.

(8) W. B. Banerdt, S. E. Smrekar, D. Banfield, D. Giardini, M. Golombek, C. L. Johnson, P. Lognonné, A. Spiga, T. Spohn, C. Perrin, S. C. Stähler, D. Antonangeli, S. Asmar, C. Beghein, N. Bowles, **Bozdağ, E.**, P. Chi, U. Christensen, J. Clinton, G. S. Collins, I. Daubar, V. Dehant, M. Drilleau, M. Fillingim, W. Folkner, R. F. Garcia, J. Garvin, J. Grant, M. Grott, J. Grygorczuk, T. Hudson, J. C. E. Irving, G. Kargl, T. Kawamura, S. Kedar, S. King, B. Knapmeyer-Endrun, M. Knapmeyer, M. Lemmon, R. Lorenz, J. N. Maki, L. Margerin, S. M. McLennan, C. Michaut, D. Mimoun, A. Mittelholz, A. Mocquet, P. Morgan, N. T. Mueller, N. Murdoch, S. Nagihara, C. Newman, F. Nimmo, M. Panning, W. T. Pike, A-C. Plesa, S. Rodriguez, J. A. Rodriguez-Manfredi, C. T. Russell, N. Schmerr, M. Siegler, S. Stanley, E. Stutzmann, N. Teanby, J. Tromp, M. van Driel, N. Warner, R. Weber, M. Wieczorek, 2020. Early Results from the InSight Mission: Mission Overview and Global Seismic Activity, *Nature Geoscience*,
https://doi.org/110.1038/s41561-020-0544-y, **highly-cited paper - Web of Science**.

(9) Lognonné, P., W.B. Banerdt, W.T.Pike, D.Giardini, U.Christensen, R.F.Garcia,T.Kawamura, S.Kedar, B. Knapmeyer-Endrun, L.Margerin, F.Nimmo, M.Panning, B.Tauzin, J.-R.Scholz, D.Antonangeli, S.Barkaoui, E.Beucler, F. Bissig, N. Brinkman, M. Calvet, S,Ceylan, C. Charalambous, P.Davis, M. van Driel, M.Drilleau, L.Fayon, R. Joshi, B.Kenda, A. Khan, M. Knapmeyer, V. Lekic, J.McClean, D.Mimoun, N.Murdoch, L. Pan, C.Perrin, B.Pinot, L.Pou, S. Menina, S.Rodriguez, C. Schmelzbach, N. Schmerr, D. Sollberger, A.Spiga, S.Stähler, A.Stott, E. Stutzmann, S.Tharimena, R.Widmer-Schnidrig, F. Andersson, V.Ansan, C. Beghein, M.Böse), **Bozdağ, E.**, J. Clinton, I.Daubar, P.Delage, N. Fuji, M. Golombek, M. Grott, A. Horleston, K. Hurst, J. Irving, A. Jacob, J. Knollenberg, S.Krasner, C. Krause, R. Lorenz, C. Michaut, B.Myhill, T. Nissen-Meyer, J. ten Pierick, A.-C..Plesa, C.Quantin-Nataf, J.Robertsson, L. Rochas, M.Schimmel, S.Smrekar,

T.Spohn, N.Teanby, J.Tromp, J.Vallade, N.Verdier, C.Vrettos, R. Web!er, D.Banfield, E. Barrett, M.Bierwirth, S.Calcutt, N.Compaire, C.Johnson, D.Mance, F. Euchner, L.Kerjean, G.Mainsant, A.Mocquet, J.Antonio Rodriguez Manfredi, G.Pont, P.Laudet, T.Nebut, S. de Raucourt, O. Robert, C.T. Russell, A.Sylvestre-Baron, S.Tillier, T.Warren, M.Wieczorek, C.Yana, P.Zweifel, 2020. Constraints on the shallow elastic and anelastic structure of Mars from InSight seismic data, *Nature Geoscience*,
https://doi.org/10.1038/s41561-020-0536-y, **highly-cited paper - Web of Science**.

(10) Yuan, Y**., **Bozdağ, E.**, Ciardelli, C*., Simons, F. J., Gua, F. 2020. Exponentiated phase measurements and objective-function hybridization for adjoint waveform tomography, *Geophy. J. Int.*, 221(2), 1145–1164,
https://doi.org/10.1093/gji/ggaa063.

(11) Örsvuran, R*., **Bozdağ, E.**, Modrak, R., Lei, W., Ruan, Y., 2020. Double-difference measurements in full-waveform inversion, *Geophy. J. Int.*, 20(1), 661–680,
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(12) Ruan, Y††., Lei, W**., Modrak, R., Orsvuran, R*., **Bozdağ, E.**, Tromp, J., 2019. Balancing Unevenly Distributed Data in Seismic Tomography: A Global Adjoint Tomography Example, *Geophy. J. Int.*, 219(2), 1225-1236,
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(13) **Bozdağ, E.,** Ruan, Y., Metthez, N., Khan, A., Leng, K., van Driel, M., Larmat, C., Giardini, D., Tromp, J., Lognonne, P. & Banerdt, B., 2017. Simulations of seismic wave propagation on Mars, *Space Science Reviews*,
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https://doi.org/10.1093/gji/ggx286.

(15) Panning, P., Lognonne, P., Banerdt, B. W., Garcia, R., Golombek, M., Kedar, S., Knapmeyer-Endrun, B., Mocquet, A., Teanby, N. A., Tromp, J., Weber, R., Beucler, E., Blanchette-Guertin, J-F., **Bozdağ, E.**, Drilleau, M., Gudkova, T., Hempel, S., Khan, A., Lekic, V., Murdoch, N., Plesa, A-C., Rivoldini, A., Schmerr, N., Ruan, Y., Verhoeven, O., Gao, C., Christensen, U., Clinton, J., Dehant, V., Giardini, D., Mimoun, D., Pike, W. T., Smrekar, S., Wieczorek, M., Knapmeyer, M., Wookey, J., 2016. Planned products of the Mars Structure Service for the mission to Mars, *Space Science Reviews*,
https://doi.org/10.1007/s11214-016-0317-5.

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(17) Krischer, L., Smith, J., Lei, W., Lefebvre, M., Ruan, Y., Sales de Andrade, E., Podhorszki, N., **Bozdağ, E.** & Tromp, J., 2016. An Adaptable Seismic Data Format, *Geophys. J. Int.*, 207 (2), 1003-1011,
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(18) Komatitsch, D., Xie, Z., **Bozdağ, E.**, Peter, D., Sales de Andrade, E., Liu, Q. & Tromp, J., 2016. Anelastic sensitivity kernels with parsimonious storage for adjoint tomography and full waveform inversion, *Geophys. J. Int.*, 206 (3), 1467-1478,
https://doi.org/10.1093/gji/ggw224.

(19) Yuan, Y.**, Simons, F. J. & **Bozdağ, E.**, 2015. Multiscale adjoint waveform tomography for surface and body waves, *Geophysics*, 2015, 80 (5), https://doi.org/10.1190/GEO2014-0461.1.

(20) Zhu, H.**, **Bozdağ, E.** & Tromp, J., 2015. Seismic structure of the European crust and upper mantle based on adjoint tomography, *Geophy. J. Int.*, 201 (1), 18-52, https://doi.org/10.1093/gji/ggu492.

(21) Zhu, H.**, **Bozdağ, E.**, Duffy, T. & Tromp, J., 2013. Seismic attenuation beneath Europe and the North Atlantic: Implications for water in the mantle, *Earth and Planetary Science Letters*, 381, 1-11, https://doi.org/10.1016/j.epsl.2013.08.030.

(22) Zhu, H.**, **Bozdağ, E.**, Peter, D. & Tromp, J., 2012. Seismic wavespeed images across the Iapetus and Tornquist Suture Zones, *Geophys. Res. Lett.*, 39, L18304, https://doi.org/10.1029/2012GL053053.

(23) Zhu, H.**, **Bozdağ, E.**, Peter, D. & Tromp, J., 2012. Structure of the European upper-mantle revealed by adjoint tomography, *Nature Geosciences*, https://doi.org/10.1038/NGEO1501.

(24) **Bozdağ, E.**, Trampert, J. & Tromp, J., 2011. Misfit functions for full waveform inversion based on instantaneous phase and envelope measurements. *Geophy. J. Int.*, 185, 845-870, https://doi.org/10.1111/j.1365-246X.2011.04970.x.

(25) Tromp, J., Komatitsch, D., Hjörleifsdóttir, V., Liu, Q., Zhu, H., Peter, D., **Bozdağ, E.**, McRitchie, D., Friberg, P., Trabant C. & Hutko, A., 2010. Near real-time simulations of global CMT earthquakes, *Geophy. J. Int.*, 183, 381-389, https://doi.org/10.1111/j.1365-246X.2010.04734.x.

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(27) **Bozdağ, E**. & Trampert, J., 2008. On crustal corrections in surface wave tomography, *Geophy. J. Int.*, 72(3), 1066-1082, https://doi.org/10.1111/j.1365-246X.2007.03690.x.

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- **Articles published in non-refereed journals/bound research proceedings**

(1) Morra, G., **Bozdağ, E.,** Knepley, M., Raäs, L., Vesselinov, V., 2021. A Tectonic Shift in Analytics and Computing Is Coming, *EOS*, 102, https://doi.org/10.1029/2021EO159258.

- Research highlights:

(1) **Bozdağ, E.**, Tape, C., Denolle, M., Waldhauser, F., Wang, I., February 2022. SCOPED: Seismic COmputational Platform for Empowering Discovery, our NSF SCOPED project was in the research highlight of CIG (Computational Infrastructure for Geodynamics).

(2) **Bozdağ, E.** & Peter, D., February 2019. SPECFEM: Probing Mars interior with 3D seismic wave simulations, a short article about the Mars InSight and 3D numerical simulations we perform with the SPECFEM3D_GLOBE package was the research highlight by the CIG (Computational Infrastructure for Geodynamics).

- **Published in conference proceedings**

(1) Bozdağ, E., A.-C. Plesa, Q. Huang, D. Peter, C. Ciardelli, N. Brinkman, M. Knapmeyer, S. Ceylan, M. Wieczorek, B. Knapmeyer-Endrun, A. Rivoldini, A. Khan, B. Fernando, T. Nissen-Meyer, P. Lognonné, 2022. Effects of 3D structure on Martian seismic waves, Europlanet Science Congress, September 18-23, Granada, Spain (accepted).

(2) J Daubar, S Stanley, J Irving, AG Marusiak, P Morgan, B Fernando, A Mittelholz, MP Golombek, CL Johnson, C Newman, M Baker, C Beghein, E Bozdag, 2022. InSightSeers: Early Career Opportunity to Observe the InSight Science Team at Work, 53rd Lunar and Planetary Science Conference, held 7-11 March, 2022 at The Woodlands, Texas. LPI Contribution No. 2678, 2022, id.2146.

(3) P Lognonne, WB Banerdt, D Giardini, M Panning, WT Pike, S Barkaoui, M Böse, N Brinkman, C Charalambous, N Compaire, N Dahmen, M Drilleau, B Fernando, R Garcia, M Hobiger, Q Huang, K Hurst, A Jacob, F Karakostas, T Kawamura, S Kedar, A Khan, D Kim, B Knapmeyer-Endrun, M Knapmeyer, J Li, S Menina, N Murdoch, K Onodera, C Perrin, L Pou, A Rajsic, H Samuel, D Savoie, M Schimmer, D Sollberger, S Stähler, A Stott, G Szilar, M van Driel, N Wojcicka, P Zweifel, C Beghein, E Beucler, D Antonangeli, D Banfield, N Bowles, E Bozdag, U Christensen, J Clinto, G Collins, I Daubard, J Irving, R Lorenz, L Margerin, C Michaut, D Mimoun, F Nimmo, AC Plesa, N Schmerr, S Smrekar, A Spiga, N Teanby, J Tromp, R Weber, M Wieczorek, C Agard, E Barret, JL Berenguer, S Ceylan, V Conajero, C Duran, N Dahmen, M Froment, A Horleston, C Perrier, N Fuji, T Gabsi, E Gaudin, B Jaillant, A Julien, F Meunier, C Pardo, J ten Pierick, M Plasman, L Rochas, G Sainton, E Stutzmann, Z Xu, C Yana, G Zenhäusern, SEIS InSight, 2022. SEIS Achievement for Mars Seismology After 1000 Sols of Seismic Monitoring, 53rd Lunar and Planetary Science Conference, held 7-11 March, 2022 at The Woodlands, Texas. LPI Contribution No. 2678, 2022, id.2279.

(4) Q Huang, NC Schmerr, SD King, A Rivoldini, A-C Plesa, H Samuel, D Kim, RR Maguire, F Karakostas, V Lekić, M Collinet, R Myhill, D Antonangeli, M Drilleau, M Bystricky, C Bollinger, C Michaut, T Gudkova, JCE Irving, B Fernando, K Leng, T Nissen-Meyer, F Bejina, E Bozdag, C Beghein, L Waszek, NC Siersch, J-R Scholz, PM Davis, P Lognonné, B Pinot, R Widmer-Schnidrig, MP Panning, SE Smrekar, T Spohn, D Giardini, WB Banerdt, 2022. Constraints on the Depth of Martian Mantle Transition Zone from Triplicated Waveforms, 53rd Lunar and Planetary Science Conference, held 7-11 March, 2022 at The Woodlands, Texas. LPI Contribution No. 2678, 2022, id.1673.

(5) M Panning, B Banerdt, S Smrekar, D Antonangeli, Sami Asmar, D Banfield, C Beghein, E Beucler, Neil Bowles, **Bozdağ, E.**, S Ceylan, PJ Chi, U Christensen, J Clinton, G Collins, I Daubar, V Dehant, Matthew Fillingim, W Folkner, R Garcia, J Garvin, D Giardini, M Golombek, JA Grant, Matthias Grott, J Grygorczuk, TL Hudson, J Irving, CL Johnson, G Kargl, T Kawamura, S Kedar, S King, Martin Knapmeyer, B Knapmeyer-Endrun, M Lemmon, P Lognonne, R Lorenz, J Maki, L Margerin, SM McLennan, C Michaut, D Mimoun, P Morgan, Nils Müller, S Nagihara, C Newman, F Nimmo, T Pike, Ana-Catalina Plesa, J-A Rodriguez-Manfredi, N Schmerr, MA Siegler, A Spiga, Tilman Spohn, S Stanley, N Teanby, J Tromp, N Warner, R Weber, M Wieczorek, 2021. Results from InSight's First Full Martian Year, 52nd Lunar and Planetary Science Conference (LPI Contrib. No. 2548(1533)), (virtual seminar).

(6) M Panning, B Knapmeyer-Endrun, Felix Bissig, Rakshit Joshi, A Khan, Doyeon Kim, V Lekic, B Tauzin, S Tharimena, Matthieu Plasman, Nicolas Compaire, R Garcia, L Margerin, M Schimmel, Éléonore Stutzmann, N Schmerr, **Bozdağ, E.**, Ana-Catalina Plesa, M Wieczorek, A Broquet, D Antonangeli, SM McLennan, H Samuel, C Michaut, Lu Pan, C Perrin, S Smrekar, CL Johnson, Nienke Brinkmann, A Mittelholz, A Rivoldini, P Davis, P Lognonne, Baptiste Pinot, J-R Scholz, S Stähler, Martin Knapmeyer, M van Driel, D Giardini, B Banerdt, 2021. Seismic Constraints on the Thickness and Structure of the Martian Crust from InSight, 52nd Lunar and Planetary Science Conference (LPI Contrib. No. 2548(1590)), (virtual seminar).

(7) P Lognonné, WB Banerdt, D Giardini, M Panning, WT Pike, D Antonangeli, J Ballestra, D Banfield, C Beghein, E Beucler, Neil Bowles, **Bozdağ, E.**, S Ceylan, C Charalambous, U Christensen, J Clinton, Nicolas Compaire, G Collins, N Dahmen, I Daubar, M van Driel, M Drilleau, B Fernando, M Froment, R Garcia, J Irving, A Khan, T Kawamura, S Kedar, B Kenda, B Knapmeyer-Endrun, R Lorenz, L Margerin, L Martire, C Michaut, D Mimoun, N Murdoch, F Nimmo, C Perrin, Ana-Catalina Plesa, N Schmerr, JR Scholz, S Smrekar, D Sollberger, A Spiga, S Stähler, E Stutzmann, N Teanby, J Tromp, R Weber, M Wieczorek, N Wójcicka, H Xu, C Agard, Elizabeth Barrett, JL Berenguer, Maren Böse, V Conejero, A Horleston, K Hurst, C Ferrier, N Fuji, T Gabsi, E Gaudin, B Jaillant, A Jullien, F Karakostas, P Labrot, F Meunier, C Pardo, J ten Pierick, Matthieu Plasman, L Rochas, A Sauron, G Sainton, Z Xu, Charles Yana, 2021. One Martian Year of Seismic Monitoring of Mars by InSight: SEIS Results and Perspectives for the Extended Mission, 52nd Lunar and Planetary Science Conference (LPI Contrib. No. 2548), (virtual seminar).

(8) B. Knapmeyer-Endrun, F. Bissig , N. Compaire, R. Joshi, R. Garcia, A. Khan , D. Kim, V., Lekić, L. Margerine, M. Panning, M. Schimmel, N. Schmerr, E. Stutzmann , B. Tauzin , S. Tharimena, **Bozdağ, E.**, D. Peter, A.-C. Plesa, P. Lognonné, S. Smrekar, W. B. Banerdt and the InSight Crustal Working Group, 2020. Seismic Constraints on the Crustal Structure of Mars from InSight Receiver Functions, 51st Lunar and Planetary Science Conference, March 16-20, The Woodlands, TX, USA.

(9) W. B. Banerdt, S. Smrekar, D. Antonangeli, S. Asmar, D. Banfield, C. Beghein, N.Bowles, **Bozdağ, E.**, P. Chi, U. Christensen, J. Clinton, G. Collins, I. Daubar, V. Dehant, M. Fillingim, B. Folkner, R. Garcia, J. Garvin, D. Giardini, M. Golombek, J. Grant, M. Grott, J. Grygorczuk, T. Hudson, J. Irving, C. Johnson, G. Kargl, T. Kawamura, S. Kedar, S. King, B. Knapmeyer-Endrun, M. Lemmon, P. Lognonné, R. Lorenz, J. Maki, L. Margerin, S. McLennan, C. Michaut, D. Mimoun, A. Mocquet, P. Morgan, N. Müller, S. Nagihara, C. Newman, F. Nimmo, M. Panning, T. Pike, A.-C. Plesa, J.A. Rodriguez-Manfredi, C. Russell, N. Schmerr, M. Siegler, A. Spiga, T. Spohn, S. Stanley, N. Teanby, J. Tromp, N. Warner, R. Weber, M. Wieczorek, 2019. InSight - Early Results from a Half (Earth)-Year on Mars, Ninth International Conference on Mars (LPI Contrib. No. 2089), July 22-25, Pasadena, CA, USA.

(10) Luo, B., Trainor-Guitton, W., **Bozdağ, E.**, LaFlame, L., Karrenbach, M., Cole, S., 2019. The Value of Distributed Acoustic Sensing (DAS) for Urban Geophysics: Measurements from the Kafadar Geophysical Laboratory, SEG - ICEG (Society of Exploration Geophysicists - Fifth International Conference on Engineering Geophysics), 21-24 October, Al Ain, UAE, https://doi.org/10.1190/iceg2019-062.1.

(11) Plesa, A.-C., **Bozdağ, E.**, Padovan, S., Tosi, N., Peter, D., Knapmeyer, M., Breuer, D., Spohn, T., 2019. Combining Large-Scale Numerical Simulations of Thermal Evolution and Seismic Wave Propagation to Model the Interior of Mars, Lunar and Planetary Science Conference, Volume: 50, The Woodlands, TX, USA.

(12) Saadé, M., Lognonné, P., Clévédé, E., Drilleau, M., Fernando, B., Leng, K., van Driel, M., **Bozdağ, E.**, Nissen-Meyer, T., Plesa, A., Wieczorek, M., Gudkova, T., 2019. Benchmark Between HOPT/AxiSEM3D/SPECFEM3D with 3D Structure of Mars: Focused on Ellipticity and Dichotomy, 50th Lunar and Planetary Science Conference, (LPI Contrib. No. 2132), The Woodlands, TX, USA.

(13) Banerdt, W. B., Smrekar, S., Antonangeli, D., Asmar, S., Banfield, D., Beghein, C., Bowles, N., **Bozdağ, E.**, Chi, P., Christensen, U., Clinton, J., Collins, G., Daubar, I., Dehant, V., Fillingim, M., Folkner, W., Garcia, R., Garvin, J., Giardini, D., Golombek, M., Grant, J., Grott, M., Grygorczuk, J., Hudson, T., Irving, J., Johnson, C., Kargl, G., Kawamura, T., S Kedar, S King, B Knapmeyer-Endrun, M Lemmon, P Lognonné, R Lorenz, J Maki, L Margerin, S McLennan, C Michaut, D Mimoun, A Mocquet, P Morgan, N Mueller, S Nagihara, C Newman, F Nimmo, M Panning, WT Pike, A-C Plesa, JA Rodriguez-Manfredi, C Russell, N Schmerr, M Siegler, A Spiga, T Spohn, S Stanley, N Teanby, J Tromp, N Warner, R Weber, M Wieczoreket al., 2019. InSight: the First Three Months on Mars, 50th Lunar and Planetary Science Conference, (LPI Contrib. No. 2132), The Woodlands, TX, USA.

(14) Pugmire, D, **Bozdağ, E.**, Lefebvre, M., Tromp, J., Komatitsch, D., Peter, D., Podhorszki, N. & Hill, J., 2017. Pillars of the Mantle: Imaging the interior of the Earth with adjoint tomography, Proceedings of the Practice and Experience in Advanced Research Computing 2017 on Sustainability, Success and Impact (PEARC17), Article No: 75, doi:10.1145/3093338.3104170.

(15) Chen, Y., Hill, J., Lei, W., Lefebvre, M., **Bozdağ, E.**, Komatitcsh, D. & Tromp, J., 2017. Fully automatic window selection based on machine learning for full waveform inversion, Society of Exploration Geophysicists (SEG) Technical Program Expanded Abstracts, https://doi.org/10.1190/segam2017-17734162.1.

(16) Yuan, Y†., Simons, F. J. & **Bozdağ, E.**, 2014. Full-waveform adjoint tomography in a multiscale perspective, Society of Exploration Geophysicists (SEG) Technical Program Expanded Abstracts: pp. 1194-1199, doi: 10.1190/segam2014-0816.1.

(17) Lefebvre, M., **Bozdağ, E.**, Calandra, H., Hill, J., Lei, W., Peter, D., Podhorszki, N., Pugmire, D., Rusmanugroho, H., Smith, J. and Tromp, J., 2013. A Data Centric View of Large-Scale Seismic Imaging Workflows, Big Data Analytics: Challenges and Opportunities(BDAC-13). In Cooperation with ACM/IEEE SC13. November 17, Denver, CO, USA (*INVITED*).

- **Reports**

  dear colleague letters

  (1) Ford, H. A., Floyd, M., Stamps, D. S., Mendoza, M., **Bozdağ, E.**, Bowden, D., et al. 2020. An Early Career Investigator Community Vision for the Future NSF Geophysical Facility: Data Services Needs. https://doi.org/10.6084/m9.figshare.12398321.v1.

- **Invited Presentations** *(first-author only)*

  (1) **Bozdağ, E.**, 2023. *title TBD*, Workshop on Rich and Nonlinear Tomography in Radar, Astronomy and Geophysics, 30th January - 3rd February, the Isaac Newton Institute, Cambridge, UK.

  (2) **Bozdağ, E.**, Orsvuran, R., Carmona, A., Peter, D. 2022. Towards a global mantle attenuation model based on full-waveform inversion, the PASC22 (Platform for Advanced Scientific Computing 2022) Conference, June 27-29, Basel, Switzerland.

(3) **Bozdağ, E.** and the SCOPED Team, 2022. The SCOPED project, University of Munich, Skience Winter School 2022 – Community Software and Platforms in Seismology, 14-18 March, Berghotel Sudelfeld, Germany *(postponed due to Covid)*.

(4) **Bozdağ, E.**, 2022. Journey to the center of the Earth and Mars: Seismology with big small data and high-performance computing, Colorado School of Mines the Applied Mathematics and Statistics Department Colloquium, February 11, Golden, CO.

(5) **Bozdağ, E.**, 2021. Earth Mars seismology with big small data, University of Memphis Center for Earthquake Research and Information Department Seminar, November 19 (Zoom seminar).

(6) **Bozdağ, E.**, 2021. Probing Earth's and planetary interiors from crust to core with seismic waves, Colorado School of Mines Center for Wave Phenomena Seminars, November 1, Golden, CO.

(7) **Bozdağ, E.**, 2021. Exploring Earth's mantle & outer core with high-performance simulations of 3D wave propagation, July 6, PASC21 (The Platform for Advanced Scientific Computing) organized by Swiss National Computing Center, (Zoom seminar).

(8) **Bozdağ, E.**, 2021. Probing Earth's interior with 3D wave simulations and full-waveform inversion, The State University of New York at Buffalo, Geohazards, Volcanology, and Geodynamics Seminars, April 16 (Zoom seminar).

(9) **Bozdağ, E.**, 2020. Exploring Earth's Mantle and Outer Core with 3D Seismic Wave Simulations, Colorado University Boulder Geology Colloquium, November 11, Boulder, CO (Zoom seminar).

(10) **Bozdağ, E.**, 2020. Investigation of Earth's mantle & outer core with 3D wave simulations, University of California Berkeley Seismo Lab seminars, October 20, Berkeley, CA (Zoom seminar).

(11) **Bozdağ, E.**, Desilva, S., Orsvuran, R., Gok, R., Nolet, G., 2020. Full-waveform inversion: From global to Middle East with multiple data types, LLNL & Saudi-Arabian Geological Survey seminar series, July 8, Zoom seminar.

(12) **Bozdağ, E.**, 2020. Exploring Earth's interior with seismic waves: Combining HPC with IRIS archive, NSF Geophysics, Early Career Investigator Virtual Workshop on a Community Vision for the Future Geophysical Facility, April 23-24, Zoom meeting.

(13) **Bozdağ, E.**, 2020. The 17th symposium of SEDI (Study of the Earth's Deep Interior), 6-10 July, Taipei, Taiwan (postponed due to Covid-19).

(14) **Bozdağ, E.**, 2019/2020. National Computing Meeting of Australia, Canberra, Australia (postponed twice because of visa issues and Covid-19).

(15) **Bozdağ, E.**, 2020 Exploring the interior of the Earth & Mars: Seismology with big & small data on HPC systems, Tectonics & Seismology seminar, University of California Los Angeles, February 12, Los Angeles, CA.

(16) **Bozdağ, E.**, de Silva, S., Orsvuran, R., Gök, R., Nolet, G., 2020. High-Resolution Full-Waveform Model of the Middle East from Multiple Data Types, Air Force Research Laboratory Nuclear Explosion Monitoring Technical Interchange Meeting, 28-30 January, Melbourne, FL, USA.

(17) **Bozdağ, E.**, 2020. Global Full-Waveform Inversion of the Earth's Interior, TACC (Texas Advanced Computer Center) workshop on "Future Directions in Extreme Scale Computing for Scientific Grand Challenges", January 9-10, Austin, TX.

(18) **Bozdağ, E.**, 2019. Global full-waveform inversion: Combining big data with high-performance computing to image the solid Earth, Pre-AGU workshop on Applications of Big Data and High-Performance Computing in Earth Sciences, December 8, San Francisco, CA.

(19) **Bozdağ, E.**, 2019. Exploring the interior of the Earth and Mars: Seismology with big & small data on HPC systems, Heiland Lecture, Colorado School of Mines, December 4, Golden, CO.

(20) **Bozdağ, E.** 2019. Exploring the Earth with global adjoint tomography, University of California Davis, November 13, Davis, CA.

(21) **Bozdağ, E.**, 2019. Global Full-Waveform Inversion: Exploring the Earth from Crust to Core Based on 3D Numerical Simulations, Washington University St. Louis, October 3, St. Louis, MO.

(22) **Bozdağ, E.**, 2019. Imaging Earth's mantle with adjoint tomography: From measurements to interpretation, University of California Berkeley, March 19, San Francisco, CA.

(23) **Bozdağ, E.**, 2019. Imaging Earth's mantle with full-waveform inversion from regional to global scales, Lawrence Livermore National Laboratory, March 21, San Francisco, CA.

(24) **Bozdağ, E.** et al., 2019. A 3D visual tour of Earth's interior based on global adjoint tomography, SIAM Conference in Computational Science and Engineering (CSE19) February 25 - March 1, 2019 in Spokane, WA.

(25) **Bozdağ, E.**, 2018. Journey to the centre of the Earth and Mars, public lecture at the Jefferson Unitarian Church, November 9, Golden, CO.

(26) **Bozdağ, E.**, 2018. Investigation of Mars Interior based on 3D Simulations of Seismic Wave Propagation, 13th InSight Science Team Meeting, September 24-28, Graz, Austria.

(27) **Bozdağ, E.**, 2018, Computational Seismology, CIDER Summer Program on "Relating Geophysical and Geochemical Heterogeneity in the Deep Earth", July 9-August 3, the Kavli Institute for Theoretical Physics, Santa Barbara, CA.

(28) **Bozdağ, E.**, Lefebvre, M., Lei, W., Orsvuran, R., Peter, D., Ruan, Y., Smith, J.,Komatitsch, D., Tromp, J., 2018. Full-waveform inversion of the solid Earth from crust to core, The Platform for Advanced Scientific Computing (PASC) Conference, July 2-4, Basel, Switzerland.

(29) **Bozdağ, E.**, 2018. Full-waveform inversion from crust to core, Geophysics Department Seminars, Ludwig-Maximilians University Munich, June 26, Munich, Germany.

(30) **Bozdağ, E.**, 2018. Imaging the Earth from crust to core, Mini workshop on "Imaging the Earth and beyond", Geophysics Department, Utrecht University, June 21, Utrecht, the Netherlands.

(31) **Bozdağ, E.** et al., 2018, Global Full-Waveform Inversion: Towards Exascale Imaging of Earth's Interior, IRIS Workshop 2018: Foundations, Frontiers, and Future Facilities for Seismology, June 12-14, Albuquerque, NM, USA.

(32) **Bozdağ, E.**, 2018, Imaging Earth's Interior from Crust to Core by Global Full-Waveform Inversion, April 24, Department Seminar at King Abdullah University Science & Technology, Thuwal, Saudi Arabia.

(33) **Bozdağ, E.** et al., 2018, Imaging Earth's Mantle: Global Full-Waveform Inversion based on Spectral-Element Simulations & Adjoint Methods, Minisymposium on Scientific Accomplishments on Massively Parallel Computing of Solid Earth Geosciences, SIAM Conference on Parallel Processing for Scientific Computing, March 7-10 at Wasoeda University, Tokyo, Japan.

(34) **Bozdağ, E.**, David Pugmire, Matthieu Philippe Lefebvre, Judith Hill, Dimitri Komatitsch, Daniel Peter, Norbert Podhorszki and Jeroen Tromp, 2017, Visualizing Earth's mantle based on global adjoint tomography, AGU Fall Meeting, December 11-15, New Orleans, LA, USA.

(35) **Bozdağ, E.**, et al., 2018, SPECFEM3D_GLOBE on OpenPOWER: Towards Exascale Seismic Imaging & Inversion, OpenPOWER Academic Discussion Group workshop prior to Super Computing Conference SC17, Denver, CO, USA.

(36) **Bozdağ, E.**, 2017, Global Full-Waveform Inversion: Towards Exascale Imaging of Earth's Interior, Computational Infrastructure for Geodynamics (CIG)-Lawrence Livermore National Laboratory (LLNL) Computational Seismology Workshop, September 18-22, at LLNL, Livermore, CA, USA (keynote lecturer).

(37) **Bozdağ, E.**, 2017, Big data problem in seismology, Workshop on Emerging Applications of Data Assimilation in the Geosciences, March 13-17, Lorentz Center at Oort – Leiden, the Netherlands.

(38) **Bozdağ, E.**, 2016. Global Adjoint Tomography: Combining Data with 3D Wave Simulations on HPC systems, Colorado School of Mines, Graduate Lecture Series of Geophysics, April 27, Golden, CO, USA.

(39) **Bozdağ, E.**, 2016. Imaging Earth's Interior: Seismology with Wave Simulations in a 3D Earth, Colorado School of Mines, Undergraduate Lecture Series of Geophysics, April 26, Golden, CO, USA.

(40) **Bozdağ, E.**, 2016. Global Adjoint Tomography with 3D Wave Simulations: Plumes, Hotspots & Slabs, Utrecht University Geophysics Seminars, January 13, Utrecht, the Netherlands.

(41) **Bozdağ, E.**, 2015. Global Adjoint Tomography: Combining 3D Wave Simulations with Data on HPC Systems, Hamburg University Geophysics Seminars, September 21, Hamburg, Germany.

(42) **Bozdağ, E.**, 2015. Global seismic imaging based on 3D spectral-element and adjoint methods, 2015 OLCF Users Meeting: Reaching for the Summit Together, June 23-25, Oak Ridge, TN, USA.

(43) **Bozdağ, E.**, 2015. SPECFEM3D: Seismic wave simulations in a 3D Earth from local to global scales, First Training School, June 1-5, Bertinoro, Italy (lecturer-trainer).

(44) **Bozdağ, E.**, 2015. Global full-waveform tomography with 3D wave simulations and adjoint methods, Geophysics weekly seminars, April 28, University of Munich, Munich, Germany.

(45) **Bozdağ, E.**, 2015. Global seismic tomography with 3D wave simulations and adjoint methods, Fête Nolet: Three decades of development in seismic tomography beneath land and oceans, April 19-21, Geoazur, Sophia Antipolis, France.

(46) **Bozdağ, E.**, 2015. Towards global full-waveform tomography, Bogazici University Kandilli Observatory, Weekly Seismology Seminars, January 6, Istanbul, Turkey.

(47) **Bozdağ, E.**, Lefebvre, M., Lei, W., Peter, D., Smith, J., Komatitsch, D. & Tromp, J., 2014. Global Adjoint Tomography: Combining big data with HPC simulations, AGU Fall Meeting, December 15-19, San Francisco, CA, USA.

(48) **Bozdağ, E.**, 2014. ETH Zurich, Global adjoint tomography, Friday seminars of Geophysics, October 3, Zurich, Switzerland.

(49) **Bozdağ, E.**, 2014. Global seismic tomography based on 3D wave simulations and adjoint methods, University of Cambridge, Bullard Laboratories Colloquia, June 4, Cambridgeshire, UK.

(50) **Bozdağ, E.**, 2013. Global seismology with wave simulations in a 3D Earth and adjoint methods, University of Nice, Geoazur Department Seminars, May 16, Sophia Antipolis, Nice, France.

(51) **Bozdağ, E.**, Tromp, J., Komatitsch, D., Hjorleifsdottir, V., Liu, Q., Zhu, H., Peter, D., McRitchie, D., Friberg, P., Trabant, C., & Hutko, A., 2013. Near real-time simulations of global CMT earthquakes, Annual meeting of Seismological Society of America (SSA), 17-19 April, Salt Lake City, Utah, USA.

(52) **Bozdağ, E.**, Zhu, H., Peter, D. & Tromp, J., 2012. Towards global adjoint tomography, 3-7 December, AGU Fall Meeting, San Francisco, CA, USA.

(53) **Bozdağ, E.**, 2012. Global seismic tomography based on 3D numerical wave simulations and adjoint methods, Istanbul Technical University, Geophysics Seminars, October 19, Istanbul, Turkey.

(54) **Bozdağ, E.**, Zhu, H., Peter, D., & Tromp, J., 2012. Towards global adjoint tomography, Smoky Mountains Computational Sciences and Engineering Conference, September 5-7, Gatlinburg, Tennessee, USA.

(55) **Bozdağ, E.**, 2012. Towards global scale full-waveform inversion, 3rd QUEST Research and Training Workshop, May 20-26, Tatranska Lomnica, Slovakia (keynote speaker).

(56) **Bozdağ, E.**, Zhu, H., Peter, D. & Tromp, J., 2011. Towards global adjoint tomography, Adam M. Dziewonski Symposium, Advances in Seismology Implications for Interdisciplinary Research, June, 4-5, Harvard University, Cambridge, MA, USA.

(57) **Bozdağ, E.**, Zhu, H., Peter, D. & Tromp, J., 2010. Towards adjoint tomography for a global crustal model, European Seismological Commission (ESC) 32nd General Assembly, September 6-10, Montpellier, France.

(58) **Bozdağ, E.**, 2009. Assessing crustal corrections in surface wave tomography, Princeton University Solid Earth Brown Bag Seminars, October 30, Princeton, NJ, USA.

Awards / Recognition

- **NSF CAREER award** (2020) for the research project (An)elastic mantle structure based on 3D wave simulations & full waveform inversion: From GLobal ADjoint models to visualization of Slabs, Plumes And Convection in MANtle.
- **Outstanding Reviewer** (2017), Geophysical Journal International.
- **Chaire d'Excellence** (2014-2019): Chair position in France to support young researchers for five years by extra salary of 6,000 Euros per year and research budget of 10,000 Euros per year with reduced teaching duty (1/3 of regular positions).
- **SPICE** (**S**eismic wave **P**ropagation and **I**maging in **C**omplex media: a **E**uropean network) Marie Curie Early-Career Researcher (2005-2008)
- **Winner of the Excellence Program** of the 32nd General Assembly of European Seismological Commission (2010).

Student/postdoc awards:

- **Reynaldo Vite** (Mines PhD student), Seismological Society of America travel grant to attend the 2022 annual meeting in Bellevue, WA, USA.
- **John Rekoske** (Mines senior), Undergraduate Research Scholar Distinction at graduation in spring 2020 for the research he carried out on the effect of outer-core models on seismic waveforms.
- **Neala Creasy** (Mines postdoctoral research associate), NSF Postdoctoral Fellowship (January 2020-January 2022).
- **Rachel Willis** (Mines PhD student), NSF Graduate Student Fellowship Honorary Mention (2021).

Funded Research & Computational Proposals

- **Collaborative Research: Frameworks: SCOPED: Seismic COmputational Platform for Empowering Discovery (Co-PI, $613K, total budget:$3.2M)** funded by the NSF-CSSI (Cyberinfrastructure for Sustained Scientific Innovation) program to build a computational platform for seismology on Texas Advanced Computing Center's "Frontera" system with Carl Tape (University of Alaska Fairbanks), Marine Denolle (Harvard University), Felix Waldhouser (Columbia University), Ian Wang (TACC, UT Austin) (2021-2025).
- **Collaborative Research: Towards improved imaging of the outermost core through determination of the effects of lowermost mantle heterogeneity and anisotropy (Co-PI, $269,379, total amount: ~ $800K)**: funded by the NSF-EAR (Division of Earth Sciences) program for three years together with Ed Garnero (PI, Arizona State), Maureen Long (Yale) and Dan Frost (Berkeley) (2020-2023).
- **CAREER: (An)elastic mantle structure based on 3D wave simulations & full waveform inversion: From GLobal ADjoint models to visualization of Slabs, Plumes And Convection in MANtle (sole PI, $620,624)**, NSF-EAR CAREER award for five years (2020-2025).
- **Investigation of Mars Interior based on 3D Simulations of Seismic Wave Propagation (sole PI, $353K):** NASA proposal selected for the InSight Participating Scientist Program (2018-2021, 1-year no-cost extension).
- **Full-waveform inversion of the Middle East with ISC data (sole PI, $346K):** Air Force Research Laboratory (AFRL) proposal to construct high-resolution seismic images of the region and relocate seismic sources (2019-2021, no-cost extension until February 2022).
- **Investigation of seismic signals and the structure of the InSight landing site based on receiver functions and 3D regional wave simulations (PI, $71K):** JPL proposal with Dr. Mark Panning to support a graduate student for two semesters within the InSight mission (2019-2020, with no-cost extension).

Postdoctoral fellowships:

- **Shear Wave Splitting based on 3D Seismic Wave Simulations: Forward to Inverse Modeling of Upper Mantle and D" Anisotropy - EAR-PF 1855206 (Host Professor, PI: Neala Creasy)**: NSF-EAR Postdoctoral Fellowship submitted by N. Creasy to do her postdoctoral research under my supervision (2020-2022).

- **Applications of full-waveform inversion for high-resolution seismic velocity models and site response in support of earthquake ground motion investigations (Co-advisor, Haiyang Kehoe):** the USGS (United States Geological Survey) Mendenhall research proposal for H. Kehoe to work as a Mendenhall postdoctoral researcher at the USGS Golden, CO. Kehoe will be supervised together with Oliver S. Boyd, Morgan Moschetti, William J. Stephenson, Erin Moriarty from USGS (estimated start date August 2022).

Awarded computational proposals:

- **Imaging Earth's mantle and core with 3D wave simulations and the adjoint method**, April 2022, renewal proposal (750,000 node hours) for 3D wave simulations and full-waveform inversion on UT Austin's "Frontera" supercomputer (PI Ebru Bozdag, Co-PI Daniel Peter).

- **Imaging Earth's mantle and core with 3D wave simulations and the adjoint method**, April 2021, ~3M node hours awarded to perform high-performance simulations on UT Austin's "Frontera" supercomputer (PI Ebru Bozdag, Co-PI Daniel Peter).

- **(An)elastic Global Full-Waveform Inversion**, April 2021, ~48M core hours European Union PRACE consortium to run global full-waveform inversions on the GPU supercomputer Marconi100. PI: Daniel Peter (KAUST), Co-PI: Ebru Bozdag, Co-PI: Emanuele Casarotti (INGV Rome). Reviewers' comments: **Excellent**.

- **Exploring Earth's mantle with 3D seismic wave simulations and the adjoint method**, computational proposal to have startup account on TACC's Frontera system to get ready for large-scale simulations, PI: Ebru Bozdag, Co-PI: Daniel Peter (KAUST).

- **Shear-wave splitting based on 3D wave simulations**, PI: Neala Creasy (Mines), Co-PI: Ebru Bozdag (Mines). XSEDE Resource Allocations on TACC systems. Estimated dollar value of the allocation is $5,155,968.03.

- **Shear-wave splitting based on 3D wave simulations**, PI: Neala Creasy (Mines), Co-PI: Ebru Bozdag (Mines). Startup account for XSEDE Resource Allocations on TACC systems.

- **Global Adjoint Tomography (Co-I):** received an Innovative and Novel Computational Impact on Theory and Experiment (INCITE) award, 400,000-node-hours for 2019 dedicated to global adjoint tomography simulations on the Oak Ridge National Laboratory, IBM "Summit system" with Jeroen Tromp (PI, Princeton) and Daniel Peter (KAUST).

- **Global Adjoint Tomography (Co-I):** received an Innovative and Novel Computational Impact on Theory and Experiment (INCITE) award, 700,000-node-hours for 2019 dedicated to global adjoint tomography simulations on the Oak Ridge National Laboratory, IBM "Summit system" with Jeroen Tromp (PI, Princeton), Dimitri Komatitsch (Marseille), Matthieu Lefebvre (Princeton) and Daniel Peter (KAUST).

- **Global Adjoint Tomography (Co-I):** received an Innovative and Novel Computational Impact on Theory and Experiment (INCITE) award, 100 million-core-hours for 2018 dedicated to global adjoint tomography simulations on the Oak Ridge National Laboratory, Cray XK7 "Titan" system with Jeroen Tromp (PI, Princeton), Dimitri Komatitsch (Marseille), Matthieu Lefebvre (Princeton) and Daniel Peter (KAUST).

- **Global Adjoint Tomography (Co-I):** received an Innovative and Novel Computational Impact on Theory and Experiment (INCITE) award, 80 million-core-hours for 2017 dedicated to global

adjoint tomography simulations on the Oak Ridge National Laboratory, Cray XK7 "Titan" system with Jeroen Tromp (PI, Princeton), Dimitri Komatitsch (Marseille), Matthieu Lefebvre (Princeton) and Daniel Peter (KAUST).

- **Global Adjoint Tomography (Co-I):** received an Innovative and Novel Computational Impact on Theory and Experiment (INCITE) award, 80 million-core-hours for 2016 dedicated to global adjoint tomography simulations on the Oak Ridge National Laboratory, Cray XK7 "Titan" system with Jeroen Tromp (PI, Princeton), Dimitri Komatitsch (Marseille), Matthieu Lefebvre (Princeton) and Daniel Peter (KAUST).

- **Towards Exascale Seismic Imaging & Inversion (Co-I):** selected by Oak Ridge Leadership Computing Facility (OLCF) into its Center for Accelerated Application Readiness (CAAR) program in 2015 to run global inversions on the next-generation supercomputer "Summit" in 2018 with Jeroen Tromp (PI, Princeton), Dimitri Komatitsch (Marseille), Matthieu Lefebvre (Princeton) and Daniel Peter (KAUST).

- **Global Adjoint Tomography (Co-I):** received an Innovative and Novel Computational Impact on Theory and Experiment (INCITE) award, 50 million-core-hours for 2015 dedicated to global adjoint tomography simulations on the Oak Ridge National Laboratory, Cray XK7 "Titan" system with Jeroen Tromp (PI, Princeton), Dimitri Komatitsch (Marseille), Matthieu Lefebvre (Princeton) and Daniel Peter (KAUST).

- **Global Seismic Tomography based on Spectral-Element and Adjoint Methods (Collaborator - major part in writing the proposal):** received an Innovative and Novel Computational Impact on Theory and Experiment (INCITE) award, 100 million-core-hours for 2014 dedicated to global adjoint tomography simulations on the Oak Ridge National Laboratory, Cray XK7 "Titan" system with Jeroen Tromp (PI, Princeton), Dimitri Komatitsch (Marseille), Matthieu Lefebvre (Princeton) and Daniel Peter (KAUST).

- **Global Seismic Tomography based on Spectral-Element and Adjoint Methods (Collaborator - major part in writing the proposal):** received an Innovative and Novel Computational Impact on Theory and Experiment (INCITE) award, 100 million-core-hours for 2013 dedicated to global adjoint tomography simulations on the Oak Ridge National Laboratory, Cray XK7 "Titan" system with Jeroen Tromp (PI, Princeton) and Olaf Schenk (ETH Zurich).

- **Community Computational Platforms for Developing Three-Dimensional Models of Earth Structure (collaborator):** awarded 7,300,000 core-hours to run a joint project of S. California and global inversions at NCAR (National Center for Atmospheric Research)-Wyoming Supercomputing Center with Southern California Earthquake Center (SCEC).

- **InSight: Interior Exploration using Seismic Investigations, Geodesy and Heat Transport (Collaborator):** granted 250,000 core hours in 2015 on a joint DARI campaign with IPGP on GENCI cluster of Commissariat à L'énergie Atomique (CEA) to run numerical simulations for Mars with the InSight science researchers in France.

Teaching

Colorado School of Mines

(1) GPGN598AB - **Full-Waveform Inversion:** *instructor*

(2) GPGN598AB - **Full-Waveform Modeling Across Scales:** *instructor*

(3) GPGN329A - **Physics of the Earth-II:** *instructor*

(4) GPGN455A & GPGN555A - **Earthquake Seismology:** *instructor*

(5) GPGN320A - **Elements of Continuum Mechanics and Wave Propagation:** *instructor*

(6) GPGN322A - **Theory of Fields II: Dynamic Fields:** *instructor*

(7) GPGN101 - **Geophysics and Society:** *guest lecturer for 3 h/semester* (2018-2021).

University of Côte d'Azur (formerly known as University of Nice)

(1) **Numerical Modeling:** *instructor*, undergrad course (L3-junior) of Geophysics

(2) **Introduction to Geophysics:** *instructor*, graduate course (M1-first-year master) of Astrophysics

(3) **Geological Debate:** *instructor*, graduate (M1)/undergrad course (L3) of Geology/Geophysics

Princeton University

(1) **Introductory Seismology:** *co-instructor*, undergraduate course

(2) **Computational Geophysics:** *co-instructor*, graduate course

Students & Postdoctoral Researchers Advised

PhD/MSc students - graduated:

- **Ridvan Örsvuran,** (PhD - March 2021), student at University of Côte d'Azur, France, and visiting student at Mines from January 2018 until graduation. Now postdoctoral researcher at Mines.
  Thesis title: Towards Anisotropic and Anelastic Global Adjoint Models: Improving Measurements and Parametrization for Global Full-Waveform Inversion.

- **Caio Ciardelli,** (PhD - July 2021, co-advisor with M. Assumpcao from Sao Paolo and S. van der Lee from Northwestern), student at University of Sao Paolo, visiting student at Mines from August 2018-February 2019. After a short remote postdoc at Mines, moving to Northwestern as a postdoctoral researcher.
  Thesis title: Adjoint Tomography of South America based on 3D Numerical Wave Simulations.

- **Glendon Rewerts,** (non-thesis MSc - 2021), student at Mines. Now working for industry.

- **Gaspard Minster,** (MSc, M2 student - Spring 2015), master student at Nice and Brest. PhD from Brest, France.
  Thesis title: Simulations of Seismic Wave Propagation on Mars.

- **Julien Thurin,** (MSc, M1, Spring 2015), master student at Nice and Grenoble, co-advised with Suzan van der Lee. PhD from Grenoble and now a postdoc at Alaska-Fairbanks.
  Thesis title: Robust Seismic Structures in the Mediterranean Upper Mantle: Application of Normalized Cross-Correlation to Quantify Similarities between Tomographic Models.

- **Arnaud Pladys,** (MSc, M1, Spring 2015), master student at Nice and Grenoble, co-advised with Suzan van der Lee. PhD from Grenoble, France, now working for industry..
  Thesis title: Robust seismic structures in the Mediterranean upper mantle.

PhD/MSc students - in progress:

- **Ayon Ghosh** (since August 2022), PhD student at Mines. Lower-mantle attenuation based on full-waveform inversion

- **Rachel Willis** (since August 2020), PhD student at Mines. Improving resolution of mantle plumes by combining MERMAID data with waveforms in adjoint tomography

- **Reynaldo Vite Sanchez** (since August 2021), PhD student at Mines. Investigation of Earth's outer core with 3D full-waveform modeling

- **Claire Richardson** (NSF Graduate Student Fellow at Arizona State, co-advisor since May 2021, primary advisor Ed Garnero from Arizona State). Sharpening the focus in seismic imaging of Earth's deep mantle

Postdoctoral researchers

- **Haiyang Kehoe** (expected to start in fall 2022). USGS Mendenhall Postdoctoral Fellow. Applications of full-waveform inversion for high-resolution seismic velocity models and site response in support of earthquake ground motion investigations (co-advised with Boyd, Stephenson, Moschetti, Moriarty from USGS).

- **Doga Cagdas Demirkan** (expected to start in fall 2022). Visualization of global mantle models in Virtual Reality (VR) environments

- **Andrea Riano** (since March 2022). Multi-scale full-waveform inversion as part of the SCOPED.

- **Ridvan Orsvuran** (since July 2021). Full-waveform inversion of the Middle East.

- **Quancheng Huang** (since November 2021). Mars seismology from InSight

- **Neala Creasy** (January 2020 - January 2022), NSF Postdoctoral Fellow. Mantle and D" anisotropy from shear-wave splitting based on 3D wave simulations. Now postdoctoral researcher at Los Alamos National Laboratory.

- **Caio Ciardelli** (July 2021 - October 2021). Full-waveform inversion of the Middle East. Caio could not come to Mines as planned because of visa issues related to Covid (the US and Brazilian border was closed). Now future postdoc at Northwestern University.

- **Susini Desilva** (November 2019 - June 2021). Full-waveform inversion of the Middle East combined with ISC data. Now instructor at Columbus State Community College.

- **François Lavoué** (spring 2019). Azimuthally anisotropic global adjoint tomography. Now postdoc at the University of Grenoble, France.

- **Sam Haugland** (June 2019 – January 2020). 3D regional numerical simulations of the landing site of InSight, global adjoint tomography.

Undergraduate students

- **Devrim Gunal** (Spring 2022, student researcher at Mining Engineering): Visualization in Virtual Reality (VR) environments, co-advised with Sebnem Duzgun.
- **Kieran Coumou** Fall 2021-Spring 2022, Mines senior: Visualization of 3D global seismic Earth models in Virtual Reality (VR) environments.
- **Kacey Wade** Spring 2021, Mines junior: Visualization of 3D global seismic Earth models in Virtual Reality (VR) environments.
- **Elizabeth Bruce** Spring 2021, Mines junior: Signature of plumes and slabs on 3D synthetic seismic waveforms.
- **John Rekoske** (Fall 2019 - Spring 2020, Mines senior, MURF research assistant): 1) Investigation of signature of outer-core models and plumes on seismic waveforms, 2) Moment tensor inversions with 3D simulations of Green's functions.
- **Amabel Teca** (Fall 2019): Independent study on Earthquake Data Processing. Amabel received 1 credit from this course towards his graduation.
- **Elizabeth Bruce** (Fall 2019 - Spring 2020, Mines sophomore): Exploring the signature of South American slab on seismic waveforms.
- **Anacleto Mandela Vunge** (Fall 2019 - Spring 2020, Mines senior): Effect of Aleutians slab on core phases.
- **Dylan Mayes** ((Fall 2019 - Spring 2020), Mines senior): Visualization of global mantle models in VR systems.
- **Daniel Choi** (Fall 2018-Spring 2019, Mines senior): How well do global seismic models explain Earth's mantle?
- **Kenneth Li** (Fall 2017 - Spring 2018, Mines senior): Senior design project on Mars seismology.

Graduate thesis committees:

- *Stephen Cuttler* (MSc-Geophysics, graduated in Spring 2019), *Samara Omar* (MSc-Geophysics, graduated in spring 2018), *Whitney Schultz* (MSc-Geophysics, graduated in Spring 2019), *Samuel Courville* (MSc-Geophysics, graduated in Fall 2019), *Nienke Bloem* (PhD-Geophysics, Utrecht University, graduated in June 2018), *Ezgi Karasozen* (PhD-Geophysics, graduated in December 2018), *Oscar Alberto Jarillo* (PhD-Geophysics, graduated in Fall 2019), *Aaron Prunty* (PhD-Geophysics, graduated in Fall 2019), *David Hernandez Uribe* (PhD-Geology, graduated in Spring 2020), *Can Ören* (PhD-Geophysics, graduated in January 2022), *Sagar Singh* (PhD-Geophysics, graduated January 2022), *Jared Klemm* (PhD Geophysics), *Mert S. R. Kiraz* (PhD-Geophsyics), *Qifan Liu* (PhD-Geophysics), *Harpreet Singh Sethi* (PhD-Geophysics), *Patipan (Mickey) Saengduean* (PhD-Geophysics), *Ashish Kumar* (PhD-Geophysics), *Kim A Cone* (PhD-Geology), *Soraya Terrab* (PhD-Applied Math)

Service and Mentoring Activities

- **National and international committees, editorial boards, panels, etc.**
  - **Member of the CIG writing committee (led the Seismology section)** of the NSF-Geoinformatics proposal to provide funding for the fourth-term of the **CIG** (Computational Infrastructure for Geodynamics) (2021).
  - **Editorial Board** of **Geophysical Journal International** (**invited,** *since September 2020)*.
  - **NSF Geophysics** panel, November 2020 (**invited**).
  - **NASA Solar System Workings** panel, April 2020 (**invited**).
  - **Chair** of the **AGU (American Geophysical Union) Gutenberg Lecture selection committee** in 2020.
  - **AGU selection committee** for the **Gutenberg Lecture** for the selection of 2019 and 2020 lecturers (**invited**).
  - **IRIS (Incorporated Research Institutions for Seismology) Data Services Standing Committee** (2020-2023) (**invited**).
  - **IRIS institutional representative** of Mines since January 2020.
  - **EarthScope-Oceans Science Steering Committee** since December 2019 (**invited**).
  - **Mines representative** of **CIG** (Computational Infrastructure for Geodynamics) (since 2018).
  - **Re-elected for the Science Steering Committee** of **CIG** for two more years (Computational Infrastructure for Geodynamics) (January 2022-January 2024).
  - **Vice-chair of the Science Steering Committee** of **CIG** (Computational Infrastructure for Geodynamics) (January 2022, will be the Chair in January 2023).
  - **Elected for the Science Steering Committee** of **CIG** (Computational Infrastructure for Geodynamics) (January 2018-January 2023).
  - **Committee member of the Seismology Working Group** of **CIG** (Computational Infrastructure for Geodynamics) (October 2017-).
  - **Reviewer for refereed journals:** Journal of Geophysical Research (Solid Earth & Planetary sections), Geophysical Journal International, Earth and Planetary Science Letters, Geophysics, Geophysical Research Letters, Bulletin of Seismological Society of America, AGU Advances, Tectonophysics, Seismological Research Letters, Geochemistry-Geophysics-Geosystems, Solid Earth, Physics of the Earth and Planetary Interiors, Space Science Reviews, Statistical Analysis and Data Mining, Bollettino di Geofisica Teorica e Applicata, Science Advances, PASC'16 (Platform for Advanced Scientific Computing) Conference manuscripts.
  - **Reviewer for grants:** United States National Science Foundation (NSF), UK Space Agency, ETH Zurich, CSCS Swiss National Supercomputing proposals, King Abdullah University of Science and Technology (KAUST) The Competitive Research Grants (CRG) program proposals, Livermore National Laboratory Computing Grand Challenge Program proposals.
  - **Member of Minisymposia and Posters Program Committee of PASC19, PASC20** (canceled due to Covid-19) **& PASC21** (The Platform for Advanced Scientific Computing 2019-2021) organized by the Swiss National Supercomputing Centre, Switzerland.
  - **Domain Co-Chair for Solid Earth Dynamics, Papers, Minisymposia, and Posters** at PASC18 (The Platform for Advanced Scientific Computing 2018) organized by Swiss National Supercomputing Centre, Switzerland.

- Departmental and campus committees, graduate student committees, junior faculty mentoring, assessment activities, accreditation activities, student engagement and retention activities, student group advising, activities in partnership with Student Life, etc.
    - Member of the **Faculty Senate** at Mines (since April 2022).
    - Member of the **Geophysics newsletter** committee at Mines (since February 2022).
    - Member of the **Re-Imagine** graduate geophysics curriculum committee at Mines (since February 2022).
    - Organized **volleyball** series for Mines Geophysics with SSG and SGS student leaders (fall 2021).
    - **Graduate Council** Mines Geophysics representative since fall 2019.
    - **Chair** of the Geophysics **Graduate Advisory Committee** at Mines since fall 2019.
    - Member of Mines Geophysics **Graduate Advisory Committee** since 2017.
    - Mines **High-Performance Computing (HPC) Committee** - member since fall 2019.
    - Led **User's Needs Sub-Committee** of the Mines HPC committee in fall 2019.
    - Member of Mines Geophysics **Undergrad Advisory Committee** since fall 2021.
    - Member of the **Re-Imagine** undergrad geophysics curriculum committee at Mines (since 2017).
    - Mines Geophysics **Heiland Lectures** (fall 2017-spring 2020, co-organizer as of fall 2021).
    - **Search committee** member for the faculty position of Petroleum Geophysics at Mines (2018).
    - **Search committee** member for the faculty position of Geophysics Department Head at Mines (2019-2020).
    - **Search committee** member for Mines' Chief Information Officer (2022).
    - **Faculty panel** for the faculty position for HPC Visualization Engineer at Mines (2020).
- **Professional societies**
    - American Geophysical Union (AGU)
    - European Geosciences Union (EGU)
    - Seismological Society of America (SSA)
- **Organizing conferences, sessions, workshops, etc.**
    - **Co-organizer** of the SPECFEM Developers Workshop in Toronto, October 2022.
    - Organizer of the **IRIS Data Services Standing Committee meeting** in March 2022 at Mines.
    - **Convener and member of the program committee** of 2021 AGU-SEG Full-Waveform Inversion Workshop, from September to November, multiple virtual sessions.
    - **Chair of the session** "Applications in image attributes and inversion" at the KAUST Virtual Workshop: Intelligent illumination of the Earth, 20th - 23rd June, 2021 (virtual).
    - **Co-convener** of the session on "Advances in Theoretical and Computational Seismology" in the 2020 European Geosciences Union (EGU) General Assembly in Vienna.
    - **Co-convener** of three mini symposia on "Advances in Computational Seismology and Earth Sciences" at PASC19 (The Platform for Advanced Scientific Computing 2019).

- **Co-convener** of the session on "Exploring Mars with InSight: First-Year Results" at 2019 American Geophysical Union (AGU) Fall Meeting in San Francisco, CA.
- **Convener** of the session on "Advances in Theoretical and Computational Seismology" in the 2019 European Geosciences Union (EGU) General Assembly in Vienna.
- **Convener** of two mini symposia on "Advances in Computational Geosciences" at PASC18 (The Platform for Advanced Scientific Computing 2018).
- **Co-convener** of the session on "A Multidisciplinary View of Mantle Heterogeneity: Linking Earth's Chemical, Physical, and Dynamical Evolution" at 2018 American Geophysical Union (AGU) Fall Meeting in Washington, DC.
- **Organized a special lecture** at Mines given by Prof Heiner Igel from University of Munich for graduate and undergraduate students in February 2018.
- **Convener** of the session on "Advances in Computational Seismology" in the 2018 European Geosciences Union (EGU) General Assembly in Vienna.
- **Convener** of the session on "Computational Seismology: From forward to inverse modelling across the scales" in the 2017 European Geosciences Union (EGU) General Assembly in Vienna.
- **Co-convener** of the session on "Earth system and space science applications on current and emerging high performance computing architectures" in the 2016 European Geosciences Union (EGU) General Assembly in Vienna.
- **Co-convener** of the session on "Seismic modelling and inversion: Theory and methodological developments" in the 2015 American Geophysical Union (AGU) Fall Meeting in San Francisco, CA.
- **Co-convener** of the session on "Adapting geophysical applications to future high performance computing architectures" in the 2015 European Geosciences Union (EGU) General Assembly in Vienna.
- **Co-convener** of the session on "Adapting geophysical applications to many- and multi-core high performance computing architectures" in the 2014 European Geosciences Union (EGU) General Assembly in Vienna.
- **Coordinator** of the practicals of the First TIDES Training School (Time Dependent Seismology) by the EU COST Association on "Seismic Data" in Bertinoro (FC) Italy, June 1-5 2015.
- **Organiser** of the Solid Earth Brownbag seminar series of the Department of Geosciences at Princeton University (Fall 2012 & Spring 2013).