

Yuval Boneh

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Research Positions

- Ben-Gurion University of the Negev, Department of Geological and Environmental Sciences, Israel - Lecturer¹ (from January 2019)
- Brown University, Department of Earth, Environmental and Planetary - Postdoctoral Research Associate (2017-2018)
- Geological Survey of Israel - Research Assistant (2007-2009)

Education

Washington University in St. Louis	2012 – 2017	Ph.D.	Geophysics
Oklahoma University	2010 – 2012	M.S.	Geology
The Hebrew University of Jerusalem	2005 – 2009	B.Sc.	Geology and Philosophy

Invited positions

- Ruhr-Universität Bochum, Department of Geophysics, Workgroup for Experimental Geophysics, Germany - Visiting Scientist (July-August 2021).
- Massachusetts Institute of Technology, Department of Earth, Atmospheric, and Planetary Sciences - Visiting Researcher (April to July 2019)
- Bayerisches Geoinstitut, University of Bayreuth, Germany - Visiting Scientist (May 2017).

Publications

Boneh Y, Chin E. J, Hirth G., *in press*, Microstructural Analysis of a Mylonitic Mantle Xenolith Sheared at Laboratory-like Strain Rates from the Edge of the Wyoming Craton. *Minerals*. 11, 995.

¹ Tenure track; equivalent to assistant professor of the American system

- Chin E. J., Chilson-Parks B. H., **Boneh Y.**, Hirth G., Saal A. E., Hearn C. B., and Hauri E. H., 2021, The peridotite deformation cycle in cratons and the deep impact of subduction, *Tectonophysics*, p.229029. <https://doi.org/10.1016/j.tecto.2021.229029>.
- Boneh Y.**, Chin E. J., Chilson-Parks B. H., Saal A. E., Hauri E. H., Hearn C. B., and Hirth G., 2021 Microstructural shift due to post-deformation annealing in the upper mantle, *Geochem. Geophys. Geosyst.*, v. 22, e2020GC009377, <https://doi.org/10.1029/2020GC009377>.
- Boneh Y.**, Shottenfels E., Kwong K., van Zelst I., Tong X., Eimer M., Miller M. S., Moresi L., Warren J. M., Wiens D. A., Billen M., Naliboff J., Zhan Z., 2019, Intermediate-depth earthquakes controlled by incoming plate hydration along bending-related faults, *Geophysical Research Letters*, v. 46, p. 3688– 3697. <https://doi.org/10.1029/2018GL081585>.
- Boneh Y.**, and Reches Z., 2018, Geotribology - Friction, wear and lubrication of faults, *Tectonophysics*, v. 733, p. 171-181. <https://doi.org/10.1016/j.tecto.2017.11.022>.
- Boneh Y.**, Wallis D., Hansen L. N., Krawczynski M. J., and Skemer P., 2017, Oriented grain growth and modification of ‘frozen texture’ in the lithospheric mantle, *Earth and Planetary Science Letters*, v. 474, p. 368-374. <https://doi.org/10.1016/j.epsl.2017.06.050>.
- Hansen L., Conrad C. P., **Boneh Y.**, Skemer P., Warren J. M., Kohlstedt D. L., 2016, Viscous anisotropy of textured olivine aggregates, Part 2: Micromechanical model, *Journal of Geophysical Research – Solid Earth*, v. 121, p. 7137-7160, <http://dx.doi.org/10.1002/2016JB013240>.
- Boneh Y.**, Morales L. F. G., Kaminski E., and Skemer P., 2015, Modeling olivine CPO evolution with complex deformation histories: Implications for the interpretation of seismic anisotropy in the mantle, *Geochem. Geophys. Geosyst.*, v. 16, <http://dx.doi.org/10.1002/2015GC005964>.
- Siman-Tov S., Aharonov E., **Boneh Y.**, Reches Z., 2015, Fault mirrors along carbonate faults: Formation and destruction during shear experiments, *Earth and Planetary Science Letters*, v. 430, p. 367-376, <http://dx.doi.org/10.1016/j.epsl.2015.08.031>.
- Boneh Y.** and Skemer P., 2014, The effect of deformation history on the evolution of olivine CPO, *Earth and Planetary Science Letters*, v. 406, p. 213-222. <http://dx.doi.org/10.1016/j.epsl.2014.09.018>.
- Boneh Y.**, Chang J. C., Lockner, D. A., and Reches Z., 2014, Evolution of Wear and Friction Along Experimental Faults, *Pure and Applied Geophysics*. <http://dx.doi.org/10.1007/s00024-014-0801-3>.
- Lyakhovskiy V., Sagi A., **Boneh Y.**, Reches Z., 2014, Fault-wear by damage evolution during steady-state slip, *Pure and Applied Geophysics*. <http://dx.doi.org/10.1007/s00024-014-0787-x>.
- Boneh Y.**, Sagi A., and Reches Z., 2013, Frictional strength and wear-rate of carbonate faults during high-velocity, steady-state sliding, *Earth and Planetary Science Letters*, v. 381, p. 127-137, <http://dx.doi.org/10.1016/j.epsl.2013.08.050>.

Funding and Scholarships

Israel Science Foundation (ISF) - Personal Research Grant - “*The mechanical anisotropy of amphiboles at the transition from brittle to plastic deformation regimes*”, App. 1754/21, Total funds: 1,198,000₪ (~375,000\$) (2021-2025).

Israel Science Foundation (ISF) - New-Faculty Equipment Grants - “*Designated apparatus for rock deformation at high temperature and pressure with a system for monitoring brittle yielding*”, App. 1755/21 Total funds: 818,270₪ (~250,000\$)(2021).

United States - Israel Binational Science Foundation (BSF) – Startup grant number 2020194, “*The interplay between water content, deformation, and annealing in the upper mantle*” with Dr. Emily Chin, Scripps, UCSD). Funds: 150,000\$, (2021-2023).

European Research Infrastructure Consortium (EPOS-NL) – Proposal granted remote access to the Multi-scale Imaging and Tomography (MINT) facilities at Utrecht University and Delft University of Technology, “*Microphysical deformation mechanism of talc under conditions of a subducted slab*” (May, 2021).

German Academic Exchange Service (DAAD) – Research Stays for University Academics and Scientists, “*Rock Deformation Experiments simulating shearing at the subducted slab interface*”, with Prof. Joerg Renner, Ruhr-Universität Bochum (2021).

UC Davis - Israel Collaborations in Research, “*Establishing a Collaboration to Improve Integration of Material Science Data into Numerical Simulations of the Earth’s Tectonic Plates and Mantle*”, (with Prof. Magali Billen, UC Davies), Fund - \$19,872, (2020).

MISTI Global Seed Funds - MIT-Israel - Ben-Gurion University of the Negev Seed, “*The Rheology of Subducted Slabs*” (with Dr. Matěj Peč, MIT), Fund - \$20,000, (2019).

Invited Talks

Ruhr University Bochum, Germany, August 10, 2021 – “Deformation and annealing of mantle rocks; Observations from experiments and natural samples”

The Geological Survey of Israel, Jerusalem, Israel, June 21, 2020 – “Rheology of talc at high P-T conditions with implications for subduction-zone dynamics”

Tel-Aviv University, Israel, May 25, 2020 – “New perspective on recovery processes in the upper mantle from peridotitic xenoliths and experiments”.

Scripps Institution of Oceanography, UC San Diego, April 25, 2018 – “Effects of deformation history on the microstructure and texture of the upper mantle”.

BGI – Bayerisches Geoinstitut, Germany, May 30, 2017 – “Evolution of olivine crystallographic preferred orientation and anisotropy in the upper mantle”.

Invited speaker at the PPEM session, AGU Meeting, December 14, 2016 – “Upper mantle seismic anisotropy and the evolution of olivine crystallographic preferred orientation”.

Ben-Gurion University of the Negev, Beer-Sheva, Israel, October 13, 2016 – “Experimental and microstructural analysis of rheological processes in the crust and mantle”.

Gordon Research Seminar on Rock Deformation, August 20, 2016 – “Evolution of olivine crystallographic preferred orientation – How can we interpret seismic anisotropy?”.

Southern Illinois University, Geology department, January 21, 2016 – “The effect of deformation history on texture evolution and seismic anisotropy in the upper mantle”.

GFZ - German Research Centre for Geosciences, Potsdam, Germany, September 8, 2014 – “Effect of deformation history on texture evolution in experimentally deformed Åheim dunite”.

The Geological Survey of Israel, Jerusalem, Israel, July 22, 2012 – “Wear and strength of faults in high-velocity experiments”.

Teaching Experience

Teaching courses

Structural Geology (Autumn semester 2021)

Flow, fracture, and yielding of planetary materials (Spring 2020, 2021, BGU)

Our Earth (Autumn 2020, BGU)

Teaching Assistant

Earth forces (fall, 2015, Washington University in St. Louis)

Intro to geology (fall, 2013, Washington University in St. Louis)

Stratigraphy and Structural Geology for Petroleum Engineers (fall, 2011, University of Oklahoma)

Structural geology (fall, 2011, University of Oklahoma)

Professional Service

Member of the Ilse Katz Institute for Nanoscale Science and Technology, Ben-Gurion University of the Negev (from December 2019)

Panelist

NSF Division of Earth Sciences (2019)

AGU Fall Meeting session chair:

“Rheology, Microstructure, and Chemistry of the Upper Mantle” (2018)

AGU Fall Meeting session convener:

“Localized deformation of lithospheric materials: From grains to tectonic plates” (2017)

Peer review: Geophysical Research Letters, Journal of Geophysical Research: Solid Earth, Journal of Structural Geology, G-cubed, Lithos, Geosciences, Tribology Letters, Minerals, Energies, The Journal of Geology, NSF - Geophysics, and NSF – EarthScope, ISF - NSFC - China Israel Research Program (CIRP).

Workshops

Workshop on Experimental Solid-Medium Rock Deformation – Earth Sciences Institute of Orléans (ISTO), France, January 30 and 31, 2020.

GIF Young Scientists Meeting – “Going Down into the Abyss: Ocean-Floor Processes, Deep Life, and Climate Archives” – at MARUM, Center for Marine Environmental Sciences, Bremen, Germany (October 28-30, 2019).

Conference on Experimental Studies of Subduction Zone Processes (EssZP) – at Washington University in Saint-Louis (June 5 - 6, 2018)

Cooperative Institute for Dynamic Earth Research (CIDER) - "Subduction Zone Dynamics" - at the University of California, Berkeley (June 19 to July 21, 2017)

Seismic student workshop at Lamont Doherty Earth Observatory (February 2015)

‘Texture analysis with MTEX’ workshop at SFSU (December 2013)

‘Workshop on Advancing Experimental Rock Deformation Research: Scientific and Technical Needs’ – Harvard University (August 2012)

SAFOD workshop, EarthScope National Meeting, the University of Texas at Austin (May 2011)

Summary of Conferences/Abstracts

American Geophysical Union (AGU) – 2010-2018, 2020 (19 total abstracts)

European Geophysical Union (EGU) – 2017, 2020, 2021

Rock Deformation, Gordon Research Conference – 2014, 2016, 2018

Geological Society of America – 2010

American Rock Mechanics Association – 2016

Deformation Mechanisms, Rheology, and Tectonics (DRT) – 2017

International conference on Recrystallization and Grain Growth – 2019

Goldschmidt conference – 2021

Abstracts (*student)

Chin E., Chilson-Parks B., **Boneh Y.**, Hirth G., Saal A., Hearn B. C., Hauri E., The peridotite deformation cycle and the deep impact of subduction beneath the Wyoming Craton, Goldschmidt 2021, Lyon (France), 4 - 9 July, Abstract ID 6614.

*Topaz A., Golan Z., **Boneh Y.**, Texture Evolution of Amphiboles - a Case Study from the Mamonia Complex, Cyprus, virtual EGU General Assembly 2021, EGU21-11935.

Boneh Y., Peč M., Hirth G., 2020, (**Talk**), Rheology of Talc at High P-T Conditions with Implications for Subduction-zone Interface, AGU meeting, December 2020, T052-03.

Boneh Y., Peč M., Hirth G., 2020, (**Talk**), The rheology of talc at high P-T conditions with implications for subduction-zone dynamics, EGU meeting (*cancelled*), doi: 10.5194/egusphere-egu2020-12696.

Boneh Y., Chin E.J., Chilson-Parks B., Hauri E., Hirth G., 2019, (**Talk**), Texture modification through annealing and recrystallization in the Earth’s upper mantle, International conference on Recrystallization and Grain Growth, Ghent, Belgium, 4 -9 August.

Boneh Y., Chin E.J., Chilson-Parks B., Hauri E., Hirth G., 2019, (**Talk**), Textural and physical modification in the upper mantle due to annealing and recrystallization processes, Israel Geological Society, Kfar-Blum, Israel, 26 - 28 March.

- Boneh Y.**, Chin E., Parks B.C., and Hirth G., 2018, *(Talk)*, New perspective on recovery processes in the upper mantle and their geophysical implications from natural and experimental peridotites, AGU Meeting, Washington D.C., 10 -14 Dec.
- Carruthers S., **Boneh Y.**, Rowe C., Hirth G., 2018, Experimental Investigation of Geologic Controls on Blueschist Deformation in Slow Slip and Tremor Regions, AGU Meeting, Washington D.C., 10 -14 Dec.
- Boneh Y.**, Hirth G., 2018, Rheology of hydrous minerals under high pressures, Rock Deformation Gordon Research Conference, Andover, New Hampshire, 21-25 August.
- van Zelst I., **Boneh Y.**, et al., 2018, Linking Intermediate Depth Seismicity to Plate-bending Related Faulting, EGU Meeting, Vienna, Austria, 9-13 April.
- Boneh Y.**, Marquardt K., Skemer P., 2017, Chemical signature of migrating grain boundaries in polycrystalline olivine, AGU Meeting, New-Orleans, LA, 11 -15 Dec.
- Kwong K., **Boneh Y.**, et al., 2017, Exploring the Characteristics and Dynamics of Oceanic Plates Entering Subduction Zones, AGU Meeting, New-Orleans, LA, 11 -15 Dec.
- Boneh Y.**, Hansen L., Wallis D., and Skemer P., 2017, *(Talk)*, Anisotropic grain growth and modification of ‘frozen texture’ in the lithospheric mantle, DRT, Inverness, Scotland, 30 April – 4 May.
- Boneh Y.**, Reches Z., 2017, *(Talk)*, A general law of fault wear and its implication to gouge zone evolution, Abstract 3767, EGU, Vienna, Austria, 23-27 April.
- Boneh Y.**, Hansen L., Wallis D., and Skemer P., 2017, Anisotropic grain growth and modification of ‘frozen texture’ in the lithospheric mantle, EGU, Vienna, Austria, 23-27 April.
- Boneh Y.**, Hansen L., Wallis D., and Skemer P., 2016, Modification of olivine CPO during high temperature annealing, Fall Meeting, AGU, San-Francisco, Calif., 12-16 Dec.
- Reches Z., **Boneh Y.**, Liao Z., 2016, Energy Dissipation and Fault Slip Kinematics: Effects of Velocity History, AGU Fall Meeting, San-Francisco, Calif., 12-16 Dec.
- Boneh Y.**, Skemer P., 2016, *(Talk)*, Evolution of olivine crystallographic preferred orientation – How can we interpret seismic anisotropy? Rock Deformation Gordon Research Conference, Andover, New Hampshire, 21-25 August.
- Boneh Y.**, Reches Z., 2016, *(Talk)*, Wear of geo-materials by mechanical impulse, 50th US Rock Mechanics/Geomechanics Symposium, American Rock Mechanics Association.
- Boneh Y.**, Skemer P., Morales L.F., Kaminski E., 2015, *(Talk)*, The effect of deformation history on the interpretation of seismic anisotropy in the upper mantle: experiments and numerical modeling, 2015, AGU Fall Meeting, San-Francisco, Calif., 14-18 Dec.
- Boneh Y.**, Skemer P., Morales L.F., Kaminski E., 2015, *(Talk)*, The effect of deformation history on the texture and seismic anisotropy of the upper mantle, Seismic Student Workshop, Lamont-Doherty Earth Observatory, New-York, 18 March.
- Boneh Y.**, Skemer P., Morales L.F., 2014, *(Talk)*, Effects of deformation history on the texture and seismic anisotropy of the upper mantle: results from experiments and numerical modeling, 2014, Fall Meeting, AGU, San-Francisco, Calif., 15-19 Dec.
- Siman-Tov S., Aharonov E., **Boneh Y.**, Reches Z., 2014, Fault mirror formation and destruction correlates with slip rates on carbonate faults, AGU Fall Meeting, San-Francisco, 15-19 Dec.
- Boneh Y.**, Skemer P., 2014, Effects of deformation history on texture evolution in experimentally deformed Åheim dunite, Rock Deformation Gordon Research Conference, Andover, New Hampshire, 16-21 August.
- Reches Z., **Boneh Y.**, Sagy A., Siman-Tov S., Chen X., 2014, Brittle-to-ductile transition during extreme loading rates, 2014 EGU Meeting, Vienna, Austria, 27 April – 2 May.
- Boneh Y.**, Skemer P., 2013, Effects of deformation history on texture evolution in experimentally deformed Åheim dunite, AGU Fall Meeting, San-Francisco, Calif., 9-13 Dec.

- Reches Z., Chen X., **Boneh Y.**, Madden A., 2013, Cohesion, friction and wear of carbonate faults: high-velocity experiments, AGU Fall Meeting, San-Francisco, Calif., 9-13 Dec.
- Boneh Y.**, Sagy A., Reches Z., 2012, Friction and wear of carbonate rocks under high-velocity sliding, Abstract S21B-2463, AGU Fall Meeting, San-Francisco, Calif., 3-7 Dec.
- Reches Z., Sagy A., **Boneh Y.**, 2012, Breaking down of linear models of rock fracturing and fault wear, Abstract T14C-05, AGU Fall Meeting, San-Francisco, Calif., 3-7 Dec.
- Boneh Y.**, Chang J. C., Lockner D. A., Reches Z., 2011, Fault wear and friction evolution: Experimental analysis, T13A-2357, AGU Fall Meeting, San-Francisco, Calif., 5-9 Dec.
- Liao Z., Chang J. C., **Boneh Y.**, Chen X., Reches Z., 2011, Dynamic strengthening during high-velocity shear experiments with siliceous rocks, T23E-2471, AGU Fall Meeting, San-Francisco, Calif., 5-9 Dec.
- Boneh Y.**, Chang J. C., Lockner D. A., Reches Z., 2010, Fault-Wear under Constant Slip-Velocity: Experimental Observations, T41B-2117, AGU Fall Meeting, San Francisco, 13-17 Dec.
- Reches Z., Chang J. C., **Boneh Y.**, Lockner D. A., 2010, Fault Wear During Earthquake-Like Slip-Events in Laboratory Experiments, 31D-05, AGU Fall Meeting, San Francisco, 13-17 Dec.
- Boneh Y.**, Chang J. C., Lockner D. A., Reches Z., 2010, Fault wear experiments, Part 1: Transition and steady-state stages under constant slip-velocity, GSA Annual Meeting, Denver, Vol. 42, No. 5, p. 475, 31 Oct – 3 Nov.
- Chang J. C., **Boneh Y.**, Lockner D. A., Reches Z., 2010, Fault wear experiments, Part 2: Transition and steady-state stages under Earthquake-Like-Slip-Velocity history, 2010 GSA Denver Annual Meeting, Vol. 42, No. 5, p. 475, 31 Oct – 3 Nov.