ERNST **UZHANSKY**

ernstuzhansky@gmail.com | +972-53-303-99-01 | linkedin.com/in/ernst-u | researchgate.net/profile/Ernst-Uzhansky

Summary

- Ocean acoustics physicist with 8+ years of experience in academia and industry; research assistant in 5 independent projects
- Author of 13 publications refereed journals, including 7 first author papers
- Ability to lead a project, make decisions and solve problems, strong leadership skills, team-player, high in conscientiousness, industriousness, and extraversion, excellent planning, organizing and prioritizing skills

Education

Ph.D. in Marine Geosciences, University of Haifa, Israel 2018 – 2022

M.Sc. in Marine Geosciences, University of Haifa, Israel 2015 – 2018

Honors: Dean's honor student for advanced studies (i.e., *magna cum laude*)

B.Sc. in Nuclear Physics and Technology, Voronezh State University, Russia 2011 – 2015

Selected courses: Marine Acoustics, Numerical Methods in Continuum Physics, Physical Oceanography, Geophysical Methods in the Marine Environment Research, Processing and Imaging of Seismic Data

Research Interests and Expertise

Interests: Applied Geophysics, Nonlinear acoustics, Geoacoustic Inversion, Reverberation, Wave Propagation Theory, Ocean Noise, Seafloor Characterization, Gas Bubbles Acoustics, Time Reversal Mirrors

Skills: Research & Development, Sound Propagation Modeling, Acoustic Data Acquisition, Processing & Analysis, Hands-on Lab & Field Work, Digital Signal Processing

Computer languages and software: MATLAB, Python, LabView, ANSYS, k-Wave (nonlinear acoustics)

Languages: English (fluent speaking, writing, reading), Hebrew (intermediate speaking, writing, reading), German (beginner), Russian (native)

Professional Experience

Postdoctoral Researcher at the Dept. of Oceanography, Dalhousie University, Canada 2023 - Present

- **Topic:** Passive acoustic measurements of ocean acidity

Postdoctoral Fellow at the Dept. of Mechanical Engineering, Technion, Israel[1] 2022 - 2023

- **Topic:** Interaction of sound generated by an ultrasonic parametric acoustic array with externally generated low-frequency sound

Visiting researcher — Naval Postgraduate School, CA, USA 2022

- **Topic:** Acoustic Characterization of the Seabed with a Time-Reversal Mirror

Acoustic researcher — University of Haifa, Israel 2016 - 2022

- **Project:** Acoustic Characterization of Levant Seafloor[2] 2019 - 2022
  - Research and development of acoustical methods for remote estimations of sea bottom parameters, acoustic data processing
  - Developed of a novel method, published two papers in scientific journals, received 3 awards at international conferences and University of Haifa
- **Project:** Experimental Research and Theoretical Modeling of Reverberation[3] 2019 - 2022
  - Responsible for the project
  - Research and development of numerical approaches for underwater reverberation modeling and its experimental validation, signal processing, writing software for simulations
  - Created and tested 3 software packages for reverberation modeling
- **Project:** Theoretical study and remote acoustic observations of dynamics of gaseous methane in aquatic environment[3] 2016 – 2018, 2020 - 2022
- **Project:** Sound Propagation and Acoustic Monitoring of Nonlinear Internal Waves in of the Shelf Break and Underwater Canyon[3] 2018 - 2019

Research assistant — Israel Oceanographic and Limnological Research, Israel 2016 – 2018

- Processing and analysis of acoustic data obtained with Acoustic Doppler Current Profilers

Teaching experience & supervision

- Invited lecturer at the Acoustical Oceanography course at Dalhousie University **2023**
- Co-supervising a master-student at the Dept. of Mechanical Engineering, Technion **2022- present**
- Laboratory Instructor at the Technion: **2022 - present**
  - Dept. of Mechanical Engineering: Experimental methods and measurements (Strain gauge, photoelasticity, Digital Image Correlation method)
  - Physics Faculty: Waves labs (mechanical, sound, micro, light waves, acousto-optics)
- Regular teaching of underwater acoustics principles to our partners from industry **2019 - 2022**
- Teaching of underwater acoustics and applicational geophysics to our partners from industry. The teaching consisted of 17 2-hours long meetings. **2020**
- Organized several meetings during the "Seismic Processing and Imaging" course to explain principles of seismic-signal modeling to the students **2019**
- Faculty of Physics, Voronezh State University, Russia - Teaching assistant **2014**
  - Probability Theory and Mathematical Statistics
  - Theoretical Foundations of Electrical Engineering

Publications, conferences, and prizes

Summary

- 11 papers in refereed journals (+2 submitted)
- 12 conference proceedings
- 13 grants, prizes, and awards
- 30+ scientific cruises
- 44 conferences (most of which are international)

Selected list of published papers (see full list at the end of the document)

- Godin, **Uzhansky,** et al. (2023). Acoustic characterization of the seabed with a single-element time-reversal mirror. *Applied Acoustics*, *210*, 109442. https://doi.org/10.1016/j.apacoust.2023.109442 **Q1**
- Katsnelson, **Uzhansky,** et al. (2022). *Characterization of gassy layer of sediment in shallow water using acoustical method. Lake Kinneret as a case study.* Limnology & Oceanography: Methods. https://doi.org/10.1002/lom3.10506 **Q1**
- **Uzhansky, E.,** Gadol, O., Lang, G., Katsnelson, B., Copel, S., Kazaz, T., & Makovsky, Y. (2021). Geoacoustic Estimation of the Seafloor Sound Speed Profile in Deep Passive Margin Setting Using Standard Multichannel Seismic Data. *Journal of Marine Science and Engineering*, *9*(1423), 1–27. https://doi.org/10.3390/jmse9121423 **Q1**
- **Uzhansky, E.,** Katsnelson, B., Lunkov, A., & Ostrovsky, I. (2020). Spatial and temporal variability of free gas content in shallow sediments: Lake Kinneret as a case study. *Geo-Marine Letters*, *40*(4), 491–505. https://doi.org/10.1007/s00367-019-00629-4 **Q2**

Selected list of talks at the conferences

- Interaction of sound generated by a high-frequency parametric array with externally generated low-frequency sound. *Underwater Acoustics Conference & Exhibition*, Kalamata, Greece, 2023
- Geoacoustic Characterization of the Levant Seafloor as a Basis for Reverberation Modeling, *The 10th Tel-Aviv University Underwater Acoustics Symposium*, Tel-Aviv, Israel, 2022
- "Estimating seafloor compressional sound speed using a long towed horizontal line array", the 181st Meeting of the Acoustical Society of America, Seattle, USA, 2021.
- **"**Long-range propagation and modal structure of the sound field in a shallow water waveguide with low-sound speed bottom", IEEE-COMCAS-2021, Tel-Aviv, Israel, 2021

Grants

- The Aharon and Ephraim Katzir Study Grant by the Israel Academy of Sciences and Humanities, The Batsheva de Rothschild Fund **2022**
- Acoustical Society of America's Technical Committee on Acoustical Oceanography Travel Grant **2021**
- Four PhD Article Publication Grants, University of Haifa **2021 - 2022**

Awards

- Winning the national stage of the Brian Moss Student Competition help by SIL – International Society of Limnology **2023**
- Best poster award at the 9th international conference on Climate-Ocean-Change **2022**
- Cool paper award of the Charney School of Marine Sciences **2022**
- Winning the national stage of the SIL 4th International Student Competition for the best published paper in limnology as a part of a master's or PhD thesis. I was chosen as a representative of Israel at the international stage. **2022**
- Best Student Paper Award in memory of Leif Bjørnø at Underwater Acoustics Conference & Exhibition, 2021. Honorary medal and student grant were received. **2021**
- Nomination in Leif Bjørnø Award for Best Graduate Student Papers (Underwater Acoustics Conference and Exhibition 2019). Honorary pin was received. **2019**

Scholarships

- Scholarship for excellence in master's studies, University of Haifa **2017**

Miscellaneous

- Ran four 42.2 km marathons with 3:27:51 personal best
- Climbed to the peak of mount Elbrus (5642 m)

References

[1]Prof. Izhak Bucher
Dynamics Lab Head, Department of Mechanical Engineering, Technion
Email: bucher@me.technion.ac.il

[2]Prof. Yizhaq Makovsky
Applied Marine Exploration Laboratory Head, Department of Marine Geosciences, University of Haifa
Email: yizhaq@univ.haifa.ac.il

[3]Prof. Boris Katsnelson
Department of Marine Geosciences, University of Haifa
Email: bkatsnels@univ.haifa.ac.il

Refereed journal articles including refereed conference proceedings

Uzhansky, E., Friedlender, M., Bucher, I. (In Preparation). Leveraging an ultrasonic parametric acoustic array to affect externally generated low frequency sound. *Applied Acoustics.*

Uzhansky, E., Katsman, R., Lunkov, A., Katsnelson, B. (In Preparation). Acoustic methodology for gas bubbles characterization in shallow marine sediments, Lake Kinneret as a case study. *Journal of Marine Science & Engineering.*

Uzhansky, E., Lunkov, A., & Katsnelson, B. (Submitted). Effect of an internal Kelvin wave on sound propagation in a coastal wedge. *Journal of Acoustical Society of America*.

Katsman, R., **Uzhansky, E.,** Lunkov, A., Katsnelson, B. (Submitted, under review). Methane Gas Dynamics in Sediments of Lake Kinneret, Israel, and Its Limnological Controls: Insights from a Multiannual Acoustic Investigation and Correlation Analysis. *STOTEN.*

Uzhansky, E., Katsnelson, B., Lunkov, A. A., Katsman, R., & Ivakin, A. N. (2023). Estimating bubble size in Lake Kinneret through reflection of wideband sound signals from gas-rich sediment environment. *Proceedings of Meetings on Acoustics*, *50*(00501), 1–10. https://doi.org/doi.org/10.1121/2.0001721

Godin, O. A., **Uzhansky, E. M.,** Tan, T., Katsnelson, B. G., Tan, D. Y., Renucci, T., Voyer, A., & Mcmullin, R. M. (2023). Acoustic characterization of the seabed with a single-element time-reversal mirror. *Applied Acoustics*, *210*(109442). https://doi.org/10.1016/j.apacoust.2023.109442

Uzhansky, E., Lunkov, A., & Katsnelson, B. (2022). Mode coupling in a coastal wedge with a sloping thermocline. *Proceedings of Meetings on Acoustics*, *43*(022002), 1–11. +https://doi.org/10.1121/2.0001631

Katsnelson, B. G., **Uzhansky, E.,** Lunkov, A. A., & Ostrovsky, I. (2022). Characterization of gassy layer of sediment in shallow water using acoustical method. Lake Kinneret as a case study. *Limnology and Oceanography: Methods*, *20*(9), 581–593. https://doi.org/10.1002/lom3.10506

Uzhansky, E., Gadol, O., Lang, G., Katsnelson, B., Copel, S., Kazaz, T., & Makovsky, Y. (2021). Geoacoustic Estimation of the Seafloor Sound Speed Profile in Deep Passive Margin Setting Using Standard Multichannel Seismic Data. *Journal of Marine Science and Engineering*, *9*(1423), 1–27. https://doi.org/10.3390/jmse9121423

Katsman, R., Lunkov, A., **Uzhansky, E.,** & Katsnelson, B. (2021). Effective model of gassy sediments and acoustical approach for its verification. *6th Underwater Acoustics Conference and Exhibition*, *44*(September), 005001. https://doi.org/10.1121/2.0001462

Uzhansky, E., Gadol, O., Lang, G., Katsnelson, B., Copel, S., Kazaz, T., & Makovsky, Y. (2021). Using a kilometers-long horizontal multichannel array for estimating seafloor sound speed in a passive margin setting. *Proceedings of Meetings on Acoustics (Conference: UACE-2021)*, *44*(005002), 1–11. https://doi.org/10.1121/2.0001466

Uzhansky, E., Katsnelson, B., Lunkov, A., & Ostrovsky, I. (2021). Sound field variability in the presence of an Internal Kelvin Wave in the Sea of Galilee. *The 183rd Meeting of the Acoustical Society of America*, *36*(005001), 1–8. https://doi.org/10.1121/2.0001433

Uzhansky, E., Katsnelson, B., Lunkov, A., & Ostrovsky, I. (2020). Spatial and temporal variability of free gas content in shallow sediments: Lake Kinneret as a case study. *Geo-Marine Letters*, *40*(4), 491–505. https://doi.org/10.1007/s00367-019-00629-4

Liu, L., Sotiri, K., Dück, Y., Hilgert, S., Ostrovsky, I., **Uzhansky, E**., Katsman, R., Katsnelson, B., Bookman. R., Wilkinson, J. Lorke, A. (2019). The control of sediment gas accumulation on spatial distribution of ebullition in Lake Kinneret. *Geo-Marine Letters*, *40*(4), 453–466. https://doi.org/10.1007/s00367-019-00612-z

Katsnelson, B., Lunkov, A., Ostrovsky, I., & **Uzhansky, E.** (2019). Estimation of gassy sediment parameters from measurements of angular and frequency dependencies of reflection coefficient. *Proceedings of Meetings on Acoustics*, *33*(005004), 1–9. https://doi.org/10.1121/2.0000963

Conference proceedings and presentations

Uzhansky, E., Lunkov, A., Katsnelson B. Investigating Reflections and Backscattering from Gas-Saturated Sediments with a Phased Hydrophone Array. IEEE COMCAS 2023. Nov 2023. Submitted, accepted.

Friedlender, M., **Uzhansky E.**, Bucher, I. (2023). Affecting Low-Frequency Sound Beams with an Ultrasonic Parametric Acoustic Array Under Minimal Distortions. IEEE COMCAS 2023. Submitted, accepted.

Uzhansky, E., Friedlender, M., Bucher., I. Interaction of sound generated by a high-frequency parametric array with externally generated low-frequency sound. *Underwater Acoustics Conference & Exhibition*, Kalamata, Greece. June 2023. Submitted, accepted.

Uzhansky E., Katsnelson B., Katsman R., Lunkov A., Ivakin A., Katsman, R. Studying reflections and backscattering from gas-saturated sediments using a phased hydrophone array. *Underwater Acoustics Conference & Exhibition*, Kalamata, Greece. June 2023. Submitted, accepted.

Uzhansky E., Lunkov, A., Katsnelson B., Multi-Physical Controls on Gas Content in Sediments of Lake Kinneret, Israel. *SeaAI 23.* June 2023.

Bucher, I., Friedlender, M., Uzhansky, E. Leveraging Ultrasonic Parametric Acoustic Arrays to Manipulate External Low-Frequency Sounds. The 11th *Tel Aviv University Underwater Acoustics Symposium*. June 2023.

Katsnelson B., **Uzhansky, E.,** Katsman, R., Lunkov, A., Ivakin, A. Multi-physical controls on gas content in sediments of lake Kinneret, Israel, evaluated by acoustic applications. EGU23. Apr 2023.

Uzhansky E., Lunkov A., Katsnelson B., Influence of internal Kelvin waves on sound propagation in shallow water. *The 5th GWRI biannual student conference, Technion.* December 2022.

Uzhansky, E., Katsnelson, B., Lunkov, A., Katsman, R., Ivakin, A. Volume scattering of sound signals in

gassy bottom and estimation of bubbles concentration in Lake Kinneret. *183rd Meeting of the Acoustical Society of America.* Oct 2022.

Uzhansky, E., Gadol, O., Lang, G., Katsnelson, B., Copel, S., Kazaz, T., & Makovsky, Y.. Geoacoustic Characterization of the Levant Seafloor as a Basis for Reverberation Modeling. The 10th *Tel Aviv University Underwater Acoustics Symposium*. August 2022.

Uzhansky, E., Katsman R., Lunkov, A., Katsnelson B. Spatio-temporal variability of gas content in sediments of Lake Kinneret. *Climate-Ocean-Change – 9th Haifa International Conference in Marine Sciences.* June 2022.

Uzhansky, E., Gadol, O., Lang, G., Katsnelson, B., Copel, S., Kazaz, T., & Makovsky, Y. (2021). Geoacoustic Estimation of the Seafloor Sound Speed Profile in Deep Passive Margin Setting Using Standard Multichannel Seismic Data. *School seminar – Cool paper award.* May 2022.

Uzhansky E., Katsnelson B., Lunkov A. Sound field variability and mode coupling in presence of an internal Kelvin wave in Lake Kinneret, Israel. *182nd Meeting of the Acoustical Society of America.* May 2022.

Katsnelson B., **Uzhansky E.**, Katsman R., Lunkov A., Ivakin A. Geoacoustic inversion of gassy sediment parameters using reflection and scattering of acoustic signals. *182nd Meeting of the Acoustical Society of America.* May 2022.

Uzhansky, E., Lunkov A., Katsman R., Katsnelson B. Spatial and temporal variability of gas content in sediments of Lake Kinneret, North of Israel. *EGU22.* May 2022.

Uzhansky E., Makovsky Y., Katsnelson B., Copel S., Kazaz T., Gadol O. Estimating seafloor compressional sound speed using a long towed horizontal line array. *181st Meeting of the Acoustical Society of America, Seattle, USA.* Dec 2021.

Uzhansky E., Makovsky Y., Katsnelson B., Copel S., Kazaz T., Gadol O. Using a long horizontal multichannel antenna for estimating the compressional sound speed in a compacting passive margin basin setting. *IEEE COMCAS 2021, Tel-Aviv, Israel.* Nov 2021.

Lunkov A., Katsnelson, B., **Uzhansky E.** Long-range propagation and modal structure of the sound field in a shallow water waveguide with low-sound speed bottom. *IEEE COMCAS 2021, Tel-Aviv, Israel.* Nov 2021.

Uzhansky E., Katsnelson B., Makovsky. I., Geoacoustic Characterization of the Levant Seafloor. *The 9th Tel Aviv University Underwater Acoustics Symposium*. August 2021.

Uzhansky E., Katsnelson B., Lunkov A., Ostrovsky I., Estimation of Free Gas Content and Thickness of Gassy Layer in Shallow Water using Acoustical Method. *Aquatic Sciences Meeting Virtual.* June 2021.

Uzhansky, E., Makovsky, Y., Gadol, O., Katsnelson, B., Copel, S., Kazaz, T. (2021). Estimating Seafloor Compressional Sound Speed in a Compacting Passive Margin Basin Setting using Standard Multichannel Seismic Data. *Underwater Acoustics Conference & Exhibition.* June 2021.

Uzhansky, E., Lunkov, A., Katsnelson, B. Mode coupling and sound field variability in near-coastal area in the presence of internal Kelwin waves. *Acoustics in Focus, 180th Meeting of the Acoustical Society of America.* June 2021.

Uzhansky E., Katsnelson B., Lunkov A., Ostrovsky I., Spatial and Temporal Variability of Gas Content in Sediment of Lake Kinneret, North of Israel. *GWRISC2020 - Water Research in Israel.* Jan 2020.

Uzhansky, E., Katsnelson, B., Lunkov, A., Ostrovsky, I. (2019). *Variability of the sound field in the presence of internal Kelvin waves in a stratified lake: The Sea of Galilee as a case study.* UACE 2019 - Conference Proceedings, 1037–1042.

Uzhansky, E., Katsnelson, B., Lunkov, A., & Ostrovsky, I. Variability of the sound field in the presence of internal Kelvin waves in a stratified lake: the Sea of Galilee as a case study. *177th Meeting of the Acoustical Society of America Louisville, Kentucky.* May 2019.

Uzhansky, E., Katsnelson, B., Lunkov, A., Ostrovsky, I. Spatial and Temporal Variability of Gas Content in Sediment of Lake Kinneret, North of Israel. *EPScon2019, Weizmann Institute, Israel*. Jan 2019.

Uzhansky, E., Katsnelson, B., Chefranov, S., Ostrovsky, I. Manifestation of Dissipative Centrifugal Instability in Mesoscale Cyclonical and Anti cyclonical Currents in Lake Kinneret. Geophysical Fluid

Dynamics Conference. Jan 2019.

Uzhanskii E., Lunkov A., Multipath structure of the sound field in acoustic sensing of gas-saturated sediments and data processing. *GIMS 14, Haifa, Israel.* Oct 2018.

Uzhanskii E., Katsnelson B., Lunkov A., Ostrovsky I. Seasonal and Temporal Variability of Gas Content in Sediments of Lake Kinneret, North of Israel. *GIMS 14, Haifa, Israel.* Oct 2018.

Ostrovsky, I., **Uzhanskii, E.**, Kaganovsky, S., & Katsnelson, B. I*mplementation of Acoustic Methodology for Investigation of the Ecology of Gas-Containing Toxic Cyanobacterium Microcystis sp. Joint Conference – Acoustics*. Sep 2018

Uzhanskii, E., Katsnelson, B., Ostrovsky, I. Dynamics of echo-reflecting objects in aquatic systems: implementation of acoustic Doppler current profiler for ecosystem analysis. *Seventh International Symposium Monitoring of Mediterranean Coastal Areas: problems and measurement techniques.* June 2018.

Katsnelson, B., Lunkov, A., **Uzhanskii, E.,** Ostrovsky, I. Acoustic estimation of parameters of gas-saturated sediment in the sea: Implementation of Multichannel Vertical Hydrophone Line Array. *Seventh International Symposium Monitoring of Mediterranean Coastal Areas: problems and measurement techniques.* June 2018.

Ostrovsky, I. Wu, X., Yang, T., Feng, S., Li, L., Song, L., Moses, W. J., **Uzhanskii, E.**, Katsnelson, B., Sukenik. A. Harmful Algal Blooms (HAB): Significance of floating colonies (in situ observations and tank experiments). *Seventh International Symposium Monitoring of Mediterranean Coastal Areas: problems and measurement techniques.* June 2018.

Ostrovsky I., Sukenik A., Yacobi Y., Moses W., Katsnelson B., **Uzhanskii E.** (2017) *Hydroacoustic assessment of spatiotemporal dynamics of toxic cyanobacterium Microcystis: the role of physical factors in bloom formation*, (UACE2017).

Uzhanskii E., Katsnelson B., Ostrovsky I. (2017), Dynamics of the echo-reflecting layers in a deep lake: implementation of Acoustic Doppler Current Profiler (ADCP) for ecosystem analysis. *Underwater Acoustics Conference & Exhibition.* September 2017

Katsnelson, B., Lunkov, A., Ostrovsky, I., **Uzhanskii, E.** Acoustic Properties of Gas-Saturated Sediment in a Lake: Implementation of Multichannel Vertical Hydrophone Array. *Underwater Acoustics Conference & Exhibition.* September 2017

Uzhansky E., Katsnelson B., Katsman, R., Lunkov A., Ostrovsky I., Estimation of Gassy Sediment Parameters Using Remote Acoustical Methods, Lake Kinneret, North of Israel. *EGU 2017, Vienna, Austria. Apr* 2017.

Uzhansky E., Katsnelson B., Katsman, R., Lunkov A., Ostrovsky I., Estimation of Gassy Sediment Parameters Using Remote Acoustical Methods, Lake Kinneret, North of Israel. *EPScon 2017, Weizmann Institute, Israel.* Feb 2017.

Uzhansky E., Katsnelson B., Lunkov A., Ostrovsky I., Estimation of Gassy Sediment Parameters Using Remote Acoustical Methods, Lake Kinneret, North of Israel. *It's all about marine sciences conference, University of Haifa, Israel.* Jan 2017.