

***CURRICULUM VITAE***

*November 2022*

Address: 24 Einav str., Herzliya 46432  
Tel. 972-9-9545840  
Date and Place of Birth: 24 June, 1947, Riga, Latvia, USSR  
Family Status: Married + 3  
Immigration to Israel: 22 August, 1973

***EDUCATION***

1964 - 1970 Moscow Physico-Technical Institute, Faculty of Molecular and Chemical Physics. M.Sc. Thesis: Investigation of two unsteady processes of combustion of solid propellants. Supervisor: Dr. Y. Ryazantsev. (Cum Laude).  
1974 - 1981 Tel-Aviv University, Faculty of Engineering. Ph.D. Thesis: Investigation of the turbulent characteristics of a pulsating pipe flow. Supervisor: Prof. I. Wygnanski.

***PROFESSIONAL EXPERIENCE***

1970 - 1973 Engineer and Senior Engineer, R/D Organizations in Riga, USSR.  
1974 - 1975 Military Service, Israel Defense Forces.  
1975 - 1982 Assistant (1975), Instructor (1977), Post-Doctoral Fellow (1982), Faculty of Engineering, Tel-Aviv University.  
1982- 1984 Bantrell Post-Doctoral Fellow, Dept. of Aeronautics and Astronautics, M.I.T., Cambridge, Mass., U.S.A.  
1984- present Lecturer (1984), Senior Lecturer (1986), Associate Professor (1990), Professor (1996), Professor Emeritus (2015), School of Mechanical Engineering, Faculty of Engineering, Tel-Aviv University.  
1989 - 1990 NRC Senior Research Associate, Naval Postgraduate School, Monterey, California, USA  
2000 Visiting Professor, ETH Zurich, Switzerland  
2013, 2014 Visiting Professor, l'Université du Sud Toulon-Var, France

***MEMBERSHIP IN PROFESSIONAL SOCIETIES***

American Geophysical Union; American Physical Society, ASME; Euromech, Israel Society for Applied and Theoretical Mechanics

***MEMBERSHIP IN EDITORIAL BOARDS:***

*Editor-in-Chief, International Journal of Ocean and Coastal Engineering (IJOCE)*  
*International Journal of Multiphase Flow (IJMF)*  
*Journal of Oceanological Research*  
*Journal of Marine Science and Engineering (JMSE)*

***TEACHING EXPERIENCE***

1974, 1975 - 1979 Faculty of Engineering, Tel-Aviv University, teaching assistant (Hydraulics, Fluid Mechanics, Propulsion, Engineering

## ***Lev Shemer, Ph.D***

Oceanography, Laboratory in Fluid Mechanics and Heat Processes).

1976 - 1981

Technical College, Tel-Aviv University, also Syngalowski. Technical College. Courses in Technical Thermodynamics, Heat Transfer and Technical Hydraulics.

1984 - present, 1978 - 1982

Faculty of Engineering, Tel-Aviv University; teaching undergraduate and graduate courses in Fluid Mechanics I and II, Heat and Flow Processes, Ocean Engineering, Thermodynamics I and II, Mechanics (Mechanics of Particles, Statics, Dynamics), Laboratory in Fluid Mechanics and Heat Processes, Boundary Layers Theory, Pollutant Control in Combustion Processes.

### ***AWARDS AND FELLOWSHIPS***

The Lazarus Brothers Chair in Fluid Mechanics (Tel-Aviv University) (2014 - 2017)

Chair in Experimental Fluid Mechanics (Tel-Aviv University) (2011 – 2014)

Bantrell Post-Doctoral Fellowship at M.I.T., Cambridge, Ma. (1982 - 1984).

U.S.A. National Research Council Senior Research Associate Reward at Naval Postgraduate School, Monterey, Ca (1989 - 1990).

### ***REVIEWER TO***

J. Fluid Mechanics, Phys. Fluids, J. Geophys. Res. (Oceans), Phys. Rev. Lettrs., Phys. Rev. E, Phys. Rev. Fluids, Phys. Rev. Appl., Proc. Roy. Soc. A, European J. Mech.– B/Fluids, J. Phys. Oceanography, IEEE Trans. Geosci. Remote Sensing, Int. J. Remote Sensing, Nonlinear Proc. Geophys., J. Fluids Engng., Int. J. Multiphase Flow, Appl. Ocean Res., JoVE, Fluid Dynamics Res., Wave Motion, Int. J. Heat and Mass Transfer, AIChE J., Int. J. Thermal Sci., Exp. Thermal and Fluid Sci., Int. J. Heat and Fluid Flow, Computers and Fluids, Energy, Meccanica, Ocean Modelling, Ocean Engng., Ocean Dynamics, Env. Fluid Mech., Natural Hazards and Earth System Sciences, The Global Atmosphere - Ocean System, ASME J. Offshore Mech. Arctic Eng., MDPI Water, MDPI Sensors, IEE Proc.– Radar, Sonar and Navigation, Flow Meas. and Instr., Sensors, IEEE Access, The ANZIAM Journal, Chem. Eng. Sci., Chem. Eng. Res. Design, J. Zhejiang Univ. Science A, J. Taiwan Inst. Chem. Engineers, U.S. - Israel Binational Science Foundation, Israel Science Foundation, Pazy Foundation, Israeli Ministry of Science and Technology, Italian Committee for Research Evaluation, Dutch Technology Foundation, US National Science Foundation.

### ***SUPERVISION OF GRADUATE STUDENTS***

#### **M. Sc. (with thesis)**

Chamasse Milad, On the role of dissipation in evolution of nonlinear sloshing waves, Tel-Aviv University, 1989.

Trachtenberg David, Measurements of void fraction in two-phase flows, 1991.

Van Hout Rene. Experimental investigation of hydrodynamic parameters in vertical two-phase slug flow, with D. Barnea, 1991.

Barak Avisar, Three dimensional velocity field in a “Kippod” heat exchanger, 1999

Amir Roni, CO<sub>2</sub> enrichment in fan-ventilated greenhouse, 2004.

Magal Meirav, Examination of municipal wastewater treatment by MBR technology, 2004.

Trostinetsky Elena, Application of borescope to studies of gas-liquid flow in downward inclined pipes, with D. Barnea, 2005.

## ***Lev Shemer, Ph.D***

Liberzon Dan, Investigation of capillary waves on the surface of Taylor bubble propagating in vertical tubes, with D. Barnea, 2005.  
Dorfman Boris, Application of digital image processing for investigation of spatially and temporally varying wave groups, 2006.  
Hashmonai Tomer, Gas-solid flow in horizontal pipes: solids concentration distribution, with D. Barnea, 2007.  
Babin Valery, Flow field behind a fixed bluff body simulating a moving Taylor bubble, with D. Barnea, 2007.  
Perelstein Yuri, Development of a method predicting temperature profile at the exit of annular combustion chamber, 2008.  
Sinuani Assaf, Application of the flying hot film technique for measuring wave-induced velocity field in water and air, 2011.  
Zavadsky Andrey, On some important characteristics of waves generated by wind, 2011.  
Sanker Edan, Laser slope gauge for measuring 2D wave slopes, 2012.  
Bar Amit, Water quality model based only on water quality online measurements, 2015  
Ginzburg Eyal, Current and wave velocities measurement with X-band Doppler radar, 2018 (with Y. Toledo)

## **Ph.D.**

Chamesse Milad, Experimental study of the nonlinear water waves using image processing technique, 1998.  
Polonsky Shlomo, Study of the velocity field in the two-phase slug flow, with D. Barnea, 1999.  
Haiying Jiao, Experimental measurements and numerical simulations of nonlinear water waves, 2000.  
Van Hout Rene, Study of void fraction distribution in two-phase slug flows, with D. Barnea, 2001.  
Gulitsky Anna, Experimental investigation of the flow field in the wake of a Taylor bubble and its effect on the motion of a consecutive bubble in vertical slug flow, with D. Barnea, 2005.  
Goulitski Konstantin, Experimental and numerical study of non-linear wave groups with wide spectra, with E. Kit, 2007.  
Liberzon Dan, Experimental study of the initial stages of water waves generation by wind, 2010.  
Roitberg Elena, Hydrodynamic characteristics of gas-liquid slug flow in pipes, with D. Barnea, 2012.  
Babin Valery, Experimental investigation of the local heat transfer in gas-liquid slug flow, with D. Barnea, 2015.  
Zavadsky Andrey, Experimental study of water waves generated by wind, 2017.  
Fershtman Adam, Local instantaneous hydrodynamic and convective heat transfer in two-phase gas liquid flow in pipes (with D. Barnea), 2019.  
Chernyshova Anna, Two- and three-dimensional effects in spatial and temporal evolution of water waves excited by wind and generated mechanically, 2021.  
Kalenko Sabrina, in progress  
Krishanu Kumar, in progress

## **PostDoctoral Fellows**

Markman Dmitry, 1990-1992  
Gluzman Michael, 1999-2000  
Liberzon Dan, 2012-2013  
Ee, Bernard Kuowei, 2013 – 2015  
Khait Anatoly, 2016 – 2019  
Singh Santosh Kumar, 2019 – 2021  
Geva Meital, 2019 – present  
Banerjee Ayan Kumar, 2020 - 2021

**RESEARCH GRANTS (as a Principal Investigator)**

1. Theoretical and experimental investigation of nonlinear sea waves (1985 - 1986) Israel Ministry of Immigration.
2. Nonlinear evolution of water waves; an experimental and theoretical investigation (1986 - 1987). Rector foundation for basic research, Tel-Aviv University.
3. A theoretical and experimental program on nonlinear cross waves, with Prof. S. Lichter, University of Arizona, USA (1986 - 1989), U.S.A. - ISRAEL Binational Science Foundation.
4. Dynamical system for image processing, with 4 co-authors. University foundation for acquisition of scientific equipment, 1987.
5. Feasibility study of enhancement of smoke diffusion from chimneys using superstructure devices, 1991-92. Ashdod Oil Refineries.
6. Remote sensing of the ocean surface by an interferometric SAR, 1993. University Research Foundation.
7. The mechanism for bubble acceleration in a pipe in the wake of a leading bubble. University Research Foundation (with D. Barnea), 1994-1995.
8. Study of a ship wake in the sea using a regular or interferometric synthetic aperture radar. Israel Defense Ministry, 1994-2004 (with G. Zilman).
9. Experimental investigation of the new nonlinear standing waves. The Israel Science Foundation (with M. Stiassnie, Technion), 1996 - 1999.
10. Experimental study of the flow field in irrigation devices. Kibbutz Naan, 1997 - 1999.
11. Experimental study of the three-dimensional flow field in a solar collector. Rotem Industries Ltd., 1997 - 1999.
12. Experimental study of hydrodynamic and statistic parameters of transient two-phase slug flow in pipes. The Israel Science Foundation (with D. Barnea), 1999-2003.
13. Extreme waves: strongly nonlinear surface waves in the ocean. INTAS, with C. Kharif and international group of scientists, 2000-2002.
14. Experimental study of the governing hydrodynamic mechanisms in the formation and evolution of gas-liquid slug flow. The Israel Science Foundation (with D. Barnea), 2003-2007.
15. Modeling and forecasting of anomalous sea waves (freak waves). The Israel-Russian Cooperation Program, Ministry of Science, Culture and Sport, Israel, 2007 – 2009.
16. Spatial and/or temporal growth of water waves in a wind-wave flume: experiments and theory. The Israel Science Foundation, 2007 – 2011.
17. Underwater communication link tests, SWIST Technologies Ltd - RAMOT, 2007 – 2010.
18. A novel stereo image method for determination of statistics, spectra and dissipation rates of ocean waves, The Israeli-Italian Cooperation Program, Ministry of Science and Technology, 2011 – 2013.
19. Extreme water waves in deterministic and random wave fields, U.S.A. - ISRAEL Binational Science Foundation, with V. Zakharov (University of Arizona), 2011-2015.
20. An experimental study of wind interaction with water waves. The Israel Science Foundation, 2011 – 2015.
21. Laboratory investigation of inhomogeneous wind-waves under steady and/or unsteady forcing. The Israel Science Foundation, 2015 – 2019.
22. Field, theoretical and laboratory investigations of nonlinear nearshore wave interactions and their effect on harbor agitation (with Y. Toledo and Y. Agnon), Ministry of Science and Technology, 2015-2018.
23. Effects of nonlinearity, randomness and directional spreading on evolution of young wind-waves. The Israel Science Foundation, 2019 – 2023.

24. Mixing and internal gravity waves in thermally stratified pools. Pazy Foundation, 2020-2023.

**ADMINISTRATIVE RESPONSIBILITIES**

1985 -1987	Member of the Computers Committee, Faculty of Engineering
1987 - 1988	In charge of the technical services of the Faculty of Engineering (Mechanical Workshop)
1987 - 1989	Representative of Senior Lecturers in the Faculty Council
1987 - 1989	Representative of the Faculty of Engineering in the University Library Committee
1988 - 1989	Mechanical Curriculum Committee, Faculty of Engineering
1990 - 1994	Professional Committee on Mathematics, National Institute for Testing and Evaluation.
1990 - 1994	Undergraduate Affairs Committee, Faculty of Engineering.
1990 - 1994	Chairman, Admission Committee of the Faculty of Engineering.
1994 - 1998	Chairman, Department of Fluid Mechanics and Heat Transfer
1994-1996	Member, University Committee for Preliminary Studies
1994-1998	Member, University Admission Committee
1998-2000	Member, Graduate Studies Committee, Faculty of Engineering
1999-2003	Chairman, Academic Committee, Tel-Aviv University Technical College
2000-2004	Chairman, Ph.D. Studies Committee, Faculty of Engineering
2001-2005	Special Dean for Absorption, Tel-Aviv University
2002	Member, ad hoc Committee for examination of the structure of the Faculty of Engineering.
2002	Chairman, University ad hoc Committee for examination of accreditation policy at the School of Architecture.
2005-2009	Member, University Committee for PhD Students.
2006-2010	Member of the University (small) Senate
2012-2015	“ “
2006-2008	University Senate Representative; Tel-Aviv University Board of Governors
2006 – 2011	Head, School of Mechanical Engineering, Tel-Aviv University
2009 - 2013	Member, University Committee for PhD "Honoris Causa" degrees
2011 – 2015	Head, Appointment and Promotion Committee, Faculty of Engineering
2012 – 2018	Member, Israel Council of Higher Education, Committee for Israel-Asia academic relations
2013 – 2015	Member Tel-Aviv University Coordination Committee
2015 – 2018	Head, Faculty of Engineering stipends committee
2015 – 2020	School of Mechanical Engineering curriculum committee

**FIELDS OF INTEREST**

1968-1970	Combustion theory (in particular solid propellants), numerical solutions of heat transfer equation with moving boundary (Stefan's problem)
1974 - 1979	Laser-Doppler anemometry in liquids and gases and its application to measurements of turbulence.
1978 - 1982	Mass transfer in reacting systems, in particular, in immobilized enzyme reactors.
1978 - 1984	Experimental investigation of unsteady turbulent and laminar flows, based on multi-wire thermo-anemometry and computer-based data acquisition and processing.

***Lev Shemer, Ph.D***

- 1983 - 1984      Measurements of the turbulence bursting frequency in pipes.
- 1982 - 1984      Laminar-turbulent transition in pulsating pipe flow.
- 1983 - present    Non-linear dynamics of water waves, including: i) experimental study of stability and long-time evolution of gravity-capillary waves based on modification of Zakharov integral equation; ii) long-time behavior of sloshing waves in a rectangular tank, based on numerical solutions of non-linear Schrödinger equation and comparison with the detailed experimental results; iii) theoretical and experimental investigation of parametrically excited cross-waves; iv) modeling and experimental study of evolution of nonlinear regular and random gravity-capillary waves; v) modeling of long-time evolution of nonlinear waves and wave groups in near shore region.
- 1986 - present    Experimental investigation of hydrodynamic and heat transfer in liquid-gas flows using a variety of experimental methods, including probes conductance and fiber optic probes, digital analysis of video and IR images, PIV, wire-mesh sensor.
- 1989 - 2006      Remote sensing of the ocean wave and current systems, including ship wakes, using the Synthetic Aperture Radar in regular and along-track interferometric modes. Digital processing of the radar and optical images of surface water waves in laboratory wave tank and in ocean.
- 2005 – present    Wind-wave interaction and water wave generation by wind.
- 2019 – present    Internal waves

**LIST OF PUBLICATIONS**

1. L. Shemer & S. Einav (1979), Sensing volume and biasing correction for dual counter LDA processor, **Rev. Sci. Instr.**, **50**, 879 - 881.
2. L. Shemer, R. Granot, A. Freeman, M. Sokolovski and L. Goldstein (1979), Multilayer immobilized-enzyme filter reactors: urease bound to nylon fabric filters, **Biotechnology and Bioengineering**, **21**, 1607 - 1627.
3. L. Shemer & I. Wygnanski (1981), On the pulsating flow in a pipe, Proc. 3rd Symposium on Turbulent Shear Flows, Davis, Ca, 8.13 - 8.18.
4. L. Goldstein, M. Levy & L. Shemer (1983), Kinetics of multilayer immobilized enzyme-filter reactor: behavior of urease-filter reactors in different buffers, **Biotechnology and Bioengineering**, **25**, 1485 - 1499.
5. L. Shemer & E. Kit (1984), An experimental investigation of the quasi-steady turbulent pulsating flow in a pipe, **Phys. Fluids**, **27**, 72 - 76.
6. M. Stiassnie & L. Shemer (1984), On modification of Zakharov equation for surface gravity waves, **J. Fluid Mech.**, **143**, 47 - 67.
7. L. Shemer, I. Wygnanski & E. Kit (1985), Pulsating flow in a pipe, **J. Fluid Mech.**, **153**, 313 - 337.
8. L. Shemer, E. Kit & I. Wygnanski (1985), On the impedance of the pipe in laminar and turbulent flow regimes, **Experiments in Fluids**, **3**, 185-189.
9. L. Shemer & M. Stiassnie (1985), Initial instability and long-time evolution of Stokes waves, *The Ocean Surface: Wave Breaking, Turbulent Mixing and Radio Probing*, ed. by Y. Toba and H. Mitsuyasu, D. Reidel Publishing Co., Dordrecht, Holland, 51 - 57.
10. L. Shemer (1985), Laminar-turbulent transition in a slowly pulsating pipe flow, **Phys. Fluids**, **28**, 3506 - 3509.
11. S. Lichter & L. Shemer (1986), Experiments on nonlinear cross waves, **Phys. Fluids**, **29**, 3971 - 3975.
12. D. Barnea & L. Shemer (1986), Rise velocity of large bubbles in stagnant liquid in non-circular ducts, **Int. J. Multiphase Flows**, **12**, 1025 -1027.
13. M. Stiassnie & L. Shemer (1987), Energy computations for coupled evolution of Class I and Class II instabilities of Stokes waves, **J. Fluid Mech.**, **174**, 299 - 312.
14. L. Shemer, E. Kit & T. Miloh (1987), Measurements of two- and three-dimensional waves in a channel including the vicinity of cut-off frequencies, **Experiments in Fluids**, **5**, 66 - 72.
15. L. Shemer & D. Barnea (1987), Visualization of the instantaneous velocity profiles in gas-liquid slug flow, **PhysicoChemical Hydrodynamics** **8**, 243 - 253.
16. E. Kit, L. Shemer & T. Miloh (1987), Experimental and theoretical investigation of nonlinear sloshing waves in a rectangular channel, **J. Fluid Mech.** **181**, 265 - 291.
17. L. Shemer & S. Lichter (1987), Identification of cross wave regimes in the vicinity of cut-off frequency, **Phys. Fluids** **30**, 3427 - 3433.
18. L. Shemer & E. Kit (1988), Study of the role of dissipation in evolution of nonlinear sloshing waves in a rectangular channel, **Fluid Dynamics Res.**, **4**, 89 - 105.
19. E. Kit and L. Shemer (1989) On dissipation coefficients in a wave tank. **Acta Mechanica** **77**, 171 - 180.
20. D. Barnea & L. Shemer (1989) Void fraction measurements in vertical slug flow: applications to slug characteristics and transition. **Int. J. Multiphase Flows** **15**, 495 - 504.
21. L. Shemer, M. Chamesse & E. Kit (1989) Measurements of the dissipation coefficient at the wavemaker in the process of generation of the resonant standing waves in a tank. **Exp. Fluids** **7**, 506 - 512.

22. E. Kit & L. Shemer (1989) On the neutral stability of cross-waves. **Phys. Fluids A1**, 1128 - 1132.
23. L. Shemer & E. Kit (1989) Long-time evolution and regions of existence of parametrically excited nonlinear cross-waves in a tank. **J. Fluid Mech.** **209**, 249 - 263.
24. L. Shemer & M. Chamesse (1990) On the hysteresis phenomenon in the directly excited nonlinear sloshing waves in a tank. **Acta Mechanica** **81**, 47- 58.
25. L. Shemer (1990) On the directly generated resonant standing waves in a rectangular tank. **J. Fluid Mech.** **217**, 143 - 165.
26. L. Shemer & S. Lichter (1990) The mode number dependence of neutral stability of cross-waves. **Exp. Fluids** **9**, 148 - 152.
27. M. Marom, R.M. Goldstein, E.B. Thornton & L. Shemer (1990) Remote sensing of ocean wave spectra by interferometric synthetic aperture radar. **Nature** **345**, 793 - 795.
28. M. Stiassnie, Y. Agnon & L. Shemer (1991) Fractal dimensions of random water surfaces. **Physica D** **47**, 341 - 352.
29. L. Shemer, N. Dodd & E.B. Thornton (1991) Slow-time modulation of finite-depth nonlinear water waves: relation to longshore current oscillations. **J. Geophys. Res.** **96**, 7105 - 7113.
30. M. Marom, L. Shemer & E.B. Thornton (1991) Energy density directional spectra of nearshore wavefield measured by interferometric synthetic aperture radar. **J. Geophys. Res.** **96**, 22125 - 22134.
31. L. Shemer & E. Kit (1991) Simulation of an interferometric SAR imagery of an ocean system consisting of a current and a monochromatic wave. **J. Geophys. Res.** **96**, 22063 - 22074.
32. R. van Hout, L. Shemer & D. Barnea (1992) Spatial distribution of void fraction within the liquid slug and some other related slug parameters. **Int. J. Multiphase Flow** **18**, 831 - 845.
33. L. Shemer & M. Marom (1993) Estimates of ocean coherence time using an interferometric SAR. **Int. J. Remote Sens.** **14**, 3021-3029.
34. L. Shemer, M. Marom & D. Markman (1993) Estimates of currents in the near shore ocean region using interferometric synthetic aperture radar. **J. Geophys. Res.** **98**, 7001-7010.
35. L. Shemer (1993) Interferometric SAR imagery of a monochromatic ocean wave in the presence of the Real Aperture Radar modulation. **Int. J. Remote Sens.** **14**, 3005-3019.
36. L. Shemer (1995) On the focusing of the ocean swell images produced by a regular and an interferometric SAR. **Int. J. Remote Sens.** **16**, 925-947.
37. L. Shemer (1995) An analytical presentation of the monochromatic ocean wave image by a regular or an interferometric synthetic aperture radar. **IEEE Trans. Geosci. Remote Sens.** **33**, 1008-1013.
38. A. Seifert & L. Shemer (1995) Pollutant dispersion from a chimney with an elongated exit cross-section. **Atm. Environ.** **29**, 709-713.
39. L. Shemer, L. Kagan & G. Zilman (1996) Simulation of ship wake image by an along-track interferometric SAR. **Int. J. Remote Sens.** **17**, 3577-3597.
40. L. Shemer, E. Kit, Haiying Jiao & O. Eitan (1998) Experiments on nonlinear wave groups in intermediate water depth. **J. Waterway, Port, Coastal & Ocean Eng.** **124**, 320-327.
41. L. Shemer & M. Chamesse (1999) Experiments on nonlinear gravity-capillary waves. **J. Fluid Mech.** **380**, 205-232.
42. G. Zilman & L. Shemer (1999) An exact analytic representation of a regular or interferometric SAR image of ocean swell. **IEEE Trans. Geosci. Remote Sens.** **37**, 1015-1022.
43. S. Polonsky, D. Barnea & L. Shemer (1999) Averaged and time-dependent characteristics of the motion of an elongated bubble in a vertical pipe. **Int. J. Multiphase Flow** **25**, 795-812.
44. S. Polonsky, L. Shemer & D. Barnea (1999) An experimental study of the relation between the Taylor bubble motion and the velocity field ahead of it. **Int. J. Multiphase Flow** **25**, 957-975.



45. E. Kit, L. Shemer, E. Pelinovsky, T. Talipova, O. Eitan, Haiying Jiao (2000) Nonlinear wave group evolution in shallow water. **J. Waterway, Port, Coastal & Ocean Eng.** **126**, 221-228.
46. C. Aladjem Talvy, L. Shemer & D. Barnea (2000) On the interaction between two consecutive elongated bubbles in a vertical pipe. **Int. J. Multiphase Flow** **26**, 1905-1923.
47. L. Shemer, Haiying Jiao, E. Kit & Y. Agnon (2001) Evolution of a nonlinear wave field along a tank: experiments and numerical simulations based on the spatial Zakharov equation. **J. Fluid Mech.** **427**, 107-129.
48. R. van Hout, D. Barnea & L. Shemer (2001) Evolution of statistical parameters of gas-liquid slug flow along vertical pipes. **Int. J. Multiphase Flow** **27**, 1579-1602.
49. B. Avisar, L. Shemer & A. Kribus (2001) Measurements of velocity fields in finite cylinder arrays with and without tip clearance. **Exp. Thermal and Fluid Sci.** **24**, 157-167.
50. R. van Hout, D. Barnea & L. Shemer (2002) Translational velocities of elongated bubbles in continuous slug flow. **Int. J. Multiphase Flow** **28**, 1333-1350.
51. E. Kit & L. Shemer (2002) Spatial versions of the Zakharov and Dysthe evolution equations for deep water gravity waves. **J. Fluid Mech.** **450**, 201-205.
52. R. van Hout, A. Gulitski, D. Barnea, L. Shemer (2002) Experimental investigation of the velocity field induced by a Taylor bubble rising in stagnant water. **Int. J. Multiphase Flow** **28**, 579-596.
53. L. Shemer, E. Kit and H.-Y. Jiao (2002) An experimental and numerical study of the spatial evolution of unidirectional nonlinear water-wave groups. **Phys. Fluids** **14**, 3380-3390.
54. R. van Hout, L. Shemer & D. Barnea (2003) Evolution of hydrodynamic and statistical parameters of gas-liquid slug flow along inclined pipes. **Chem. Eng. Sci.** **58**, 115-133.
55. L. Shemer, (2003) Hydrodynamic and statistical parameters of slug flow. **Int. J. Heat and Flow** **24**, 334-344.
56. K. Goulitski, L. Shemer & E. Kit (2004) Steep unidirectional waves: experiments and modeling. **Izvestiya VUZ. Applied Nonlinear Dynamics** **12**, 122-131.
57. L. Shemer, A. Gulitski & D. Barnea (2005) Experiments on the turbulent structure and the void fraction distribution in the Taylor bubble wake. **Multiphase Sci. Tech.** **17**, 103-122.
58. M. Stiassnie & L. Shemer (2005) On the interaction of four water-waves. **Wave Motion** **41**, 307-328.
59. E. Roitberg (Trostinetsky), L. Shemer & D. Barnea (2006) Application of a borescope to studies of gas-liquid flow in downward inclined pipes. **Int. J. Multiphase Flow** **32**, 499-516.
60. D. Liberzon, L. Shemer & D. Barnea (2006) Upward-propagating capillary waves on the surface of short Taylor bubbles. **Phys. Fluids** **18**, 048103 (DOI: 10.1063/1.2192781).
61. L. Shemer, K. Goulitski, E. Kit (2007) Evolution of wide-spectrum wave groups in a tank: an experimental and numerical study. **Europ. J. Mechanics B/Fluids** **26**, 193-219.
62. E. Roitberg, L. Shemer, D. Barnea (2007) Measurements of cross sectional instantaneous phase distribution in gas-liquid pipe flow. **Exp. Thermal and Fluid Sci.** **31**, 867-875.
63. L. Shemer, A. Gulitski & D. Barnea (2007) On the turbulent structure in the wake of Taylor bubbles rising in vertical pipes. **Phys. Fl.** **29**(3) 035108 (DOI: 10.1063/1.2711478).
64. L. Shemer, A. Gulitski & D. Barnea (2007) Movement of two consecutive Taylor bubbles in vertical pipes. **Multiphase Sci. Tech.** **19**, 99-120.
65. E. Roitberg, L. Shemer & D. Barnea (2008) Hydrodynamic characteristics of gas-liquid slug flow in a downward inclined pipe. **Chem. Eng. Sci.** **63**, 3605-3613 (DOI 10.1016/j.ces.2008.04.034).
66. L. Shemer & B. Dorfman (2008) Experimental and numerical study of spatial and temporal evolution of nonlinear wave groups. **Nonlinear Processes in Geophysics** **15**, 931-942.

67. L. Shemer & A. Sergeeva (2009) An experimental study of spatial evolution of statistical parameters in a unidirectional narrow-banded random wavefield, **J. Geophys. Res.**, **114**, C01015, doi:10.1029/2008JC005077.
68. L. Shemer, A. Sergeeva, & A. Slunyaev (2010) Applicability of envelope model equations for simulation of narrow-spectrum unidirectional random field evolution: Experimental validation. **Phys. Fl.** **22**, 011601; doi: 10.1063/1.3290240.
69. D. Liberzon and L. Shemer (2010) An inexpensive method for measurements of static pressure fluctuations. **J. Atm. Oceanic Tech. JTECH-A**, **27**, 776-784, doi: 10.1175/2009 JTECHA 1352.1.
70. A.M. Fridman, L.S. Alperovich, L. Shemer, L. Pustilnik, D. Shtivelman, A.G. Marchuk, D. Liberzon (2010) Tsunami wave suppression using submarine barriers, **Physics – Uspekhi** **53**, 809-816, doi: 10.2267/UFNe.0180.201008d.0843.
71. L. Shemer, A. Sergeeva, & D. Liberzon (2010), Effect of the initial spectrum on the spatial evolution of statistics of unidirectional nonlinear random waves, **J. Geophys. Res.**, **115**, C12039, doi:10.1029/2010JC006326.
72. L. Shemer (2010) On Benjamin-Feir instability and evolution of a nonlinear wave with finite-amplitude sidebands. **Nat. Hazards Earth Syst. Sci.** **10**, 2421–2427, doi:10.5194/nhess-10-2421-2010.
73. D. Liberzon & L. Shemer (2011) Experimental study of the initial stages of wind waves' spatial evolution. **J. Fluid Mech.** **681**, 462-498, doi:10.1017/jfm.2011.208.
74. A. Zavadsky & L. Shemer (2012) Characterization of turbulent air flow over evolving water-waves in a wind-wave tank, **J. Geophys. Res.** **117**, C00J19, doi: 10.1029/2011JC007790.
75. A. Zavadsky, D. Liberzon & L. Shemer (2013) Statistical analysis of the spatial evolution of the stationary wind-wave field, **J. Phys. Oceanography** **43**, 65-79.
76. D. Barnea, E. Roitberg & L. Shemer (2013) Spatial distribution of void fraction in the liquid slug in the whole range of pipe inclinations, **Int. J. Multiphase Flow**, **52**, 92–101.
77. L. Shemer & L. Alperovich (2013) Peregrine breather revisited, **Phys. Fl.** **25**, 051701 (1-7), doi: 10.1063/1.4807055 (**selected by Editor as a Featured Letter**).
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65. E. Roitberg, L. Shemer and D. Barnea (2006) Cross sectional instantaneous phase distribution in gas-liquid pipe flow wire-mesh sensor vs. borescope measurements. 4<sup>th</sup> European-Japanese Two-Phase Flow Group Meeting, Kyoto, Japan.
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67. Lev Shemer, Valery Babin and Dvora Barnea (2007) Bluff body in a pipe as a model of a Taylor bubble: similarities and differences in the induced flow field. ETPFGM'07, Toulouse, France.
68. Elena Roitberg, Lev Shemer and Dvora Barnea (2007) Cross Sectional Phase Distribution in Downward Gas-Liquid Pipe Flow. 6<sup>th</sup> International Conference on Multiphase Flow ICMF2007, Leipzig, Germany.
69. Alexey Slunyaev, Lev Shemer and Boris Dorfman (2008) Strongly nonlinear simulation of wave packet dynamics and verification versus laboratory experiment. 2008 EGU General Assembly, Vienna, Austria.
70. L. Shemer and B. Dorfman (2008) Spatial vs. temporal evolution of nonlinear wave groups – experiments and modeling based on the Dysthe equation. 27<sup>th</sup> Int. Conf. on Offshore Mechanics and Arctic Engineering, Estoril, Portugal (ASME Paper OMAE2008-57652).
71. Lev Shemer and Dan Liberzon (2008) On problems related to verification of wind-wave generation models by experiment. Topical Problems of Nonlinear Physics (NWP-2008), Nizhny Novgorod, Russia.

72. Lev Shemer, Alexey Slunyaev and Boris Dorfman (2008) Spatial and temporal evolution of wave groups: experiments vs. simulations. ICTAM 2008, Adelaide, Australia.
73. Dan Liberzon and Lev Shemer (2008) Measurements of growth rates of wind-generated water waves. ICTAM 2008, Adelaide, Australia.
74. L. Shemer, A. Sergeeva and A. Slunyaev (2008) Freak waves in unidirectional nonlinear random wave groups in a tank. Rogue Waves 2008, IFREMER, Brest, France
75. Lev Shemer, Alexey Slunyaev and Boris Dorfman (2008) Spatial and temporal evolution of deep-water wave groups: laboratory experiments vs. simulations. Rogue Waves 2008, IFREMER, Brest, France
76. L. Shemer (2008) Rogue (freak) waves in ocean and in a laboratory tank. ISTAM Annual Symposium, Tel-Aviv, Israel.
77. A. Sergeeva, L. Shemer, and A. Slunyaev (2009) Evolution of 2D steep random gravity wave groups: numerical simulations based on laboratory measurements. Temporal and spatial approaches. EGU2009-556, EGU General Assembly, Vienna, Austria
78. A. Sergeeva and L. Shemer (2009) Variation of statistical parameters of random wave groups along a large wave tank. EGU2009-557, EGU General Assembly, Vienna, Austria.
79. L. Shemer and A. Sergeeva (2009) Experimental study of the effect of the initial spectrum width on the statistics of random wave groups. AGU 2009 Fall Meeting, San-Francisco.
80. L. Shemer, A. Sergeeva, D. Liberzon (2010) Effect of the initial spectral shape on the evolution of random unidirectional wave field along the tank, HYDRALAB III Joint User Meeting, Hannover, Germany.
81. A. Sergeeva and L. Shemer (2010) Effect of the initial spectral shape on spatial evolution of the statistics of unidirectional nonlinear random waves, EGU2010 General Assembly, Vienna, Austria
82. A. Sergeeva, L. Shemer, A. Slunyaev (2010) Evolution of unidirectional irregular nonlinear waves to a steady state in deep water, 4th Int. Conf. "Frontiers in Nonlinear Physics FNP-2010", Nizhniy Novgorod, Russia.
83. L. Shemer and D. Liberzon (2010) Experiments on the momentum exchange between wind and waves. 4th Int. Conf. "Frontiers in Nonlinear Physics FNP-2010", Nizhniy Novgorod, Russia (**invited lecture**). Nizhny Novgorod, Russia.
84. L. Shemer (2010) Extreme water waves: deterministic vs. random, 4th Int. Conf. "Frontiers in Nonlinear Physics FNP-2010", Nizhniy Novgorod, Russia (**invited lecture**).
85. V. Babin, D. Barnea and L. Shemer (2010) Heat transfer characteristics in a slug unit. 14<sup>th</sup> Int. Heat Transfer Conf., Washington D.C., USA.
86. D. Liberzon, A. Zavadsky and L. Shemer (2011) Turbulent boundary layer in wind over water waves. 7th Int. Symp. on Turbulence & Shear Flow Phenomena, Ottawa, Canada, July 28-31, 2011.
87. Sergeeva, L. Shemer, A. Slunyaev (2011) Effects of occasional wave breaking on extreme wave statistics in stochastic modeling, EGU2011 General Assembly, Vienna, Austria.
88. L. Shemer and A. Zavadsky (2011) On Reynolds stresses over wind waves, EGU2011 General Assembly, Vienna, Austria.
89. V. Babin, L. Shemer and D. Barnea (2011), Experimental investigation of the local heat transfer in a vertical gas-liquid slug unit, 49th European two-phase flow group meeting, Tel-Aviv, Israel.
90. L. Shemer (2011) On the relation of the wave spectrum to the appearance of rogue water waves (**invited lecture**), International workshop on rogue waves, Dresden, Germany.
91. L. Shemer and A. Sergeeva (2011) Statistics of unidirectional random breaking water-waves, 64th Annual Meeting of the APS Division of Fluid Dynamics, Baltimore, Bull. Am. Phys. Soc. 56, E3 10, p. 111.

92. V. Babin, L. Shemer and D. Barnea, (2011) Application of IR Thermography Technique for Heat Transfer Measurements to Gas-Liquid Two-Phase Flow”, The 7th Int. Symp. on Measurement Techniques for Multiphase Flows, Tianjin, China.
93. L. Shemer and A. Zavadsky (2012) Laboratory study of turbulent boundary layer in wind over water waves, the Oceanography Soc. – AGU Ocean Sciences Meeting, Salt Lake City.
94. V. Babin, D. Barnea and L. Shemer (2012) Local and instantaneous temperature field around a Taylor Bubble, 50th European two-phase flow group meeting, Udine, Italy.
95. L. Shemer and S.H. Noskowitz (2012) On kinematics and dynamics of breaking water waves, IUTAM Symposium “Waves in fluids: effects of non-linearity, rotation, stratification and dissipation”, Moscow (**invited lecture**)
96. V. Babin, D. Barnea, and L. Shemer (2012) Measurement of the Local Heat Transfer in Gas-Liquid Vertical Slug Flow by Infrared Thermography Technique, 32<sup>nd</sup> Israeli Conference on Mechanical Engineering, Tel-Aviv
97. E. Roitberg, L. Shemer, D. Barnea (2012) Hydrodynamic Characteristics of Gas-Liquid Slug Flow in Pipes, 32<sup>nd</sup> Israeli Conference on Mechanical Engineering, Tel-Aviv
98. E. Sanker, L. Shemer (2012) Laser Slope Gauge for measuring 2D wave slopes, 32<sup>nd</sup> Israeli Conference on Mechanical Engineering, Tel-Aviv
99. A. Zavadsky and L. Shemer (2012) Statistical description of water-waves in a wind-wave tank. 32<sup>nd</sup> Israeli Conference on Mechanical Engineering, Tel-Aviv
100. L. Shemer, A. Zavadsky and D Liberzon (2012): On similarity of wind-waves spectral shapes in laboratory and in ocean, 65th Annual Meeting of the APS Division of Fluid Dynamics, San Diego.
101. V. Babin, D. Barnea, Lev Shemer (2013) Local instantaneous heat transfer in slug flow - effect of Re number, 8<sup>th</sup> International Conference on Multiphase Flow ICMF 2013, Jeju, Korea
102. L. Shemer and D. Liberzon (2013) Experiments on kinematics of deep-water breaking waves, WISE 2013, College Park, MD.
103. D. Liberzon and L. Shemer (2013) Experimental investigation of the inception of a spilling breaker, 66th Annual Meeting of the APS Division of Fluid Dynamics, Pittsburgh, PA.
104. L. Shemer (2014) On the relevance of nonlinear Schrödinger breathers to evolution and breaking of steep (rogue) water waves. Wave Interactions (WIN-2014), Linz, Austria (**invited lecture**).
105. A. Zavadsky and L. Shemer (2014) Experiments on waves under transient wind conditions, WISE 2014, Reading, England.
106. L. Shemer (2014) The advantages and limitations of the nonlinear Schrödinger equation in description of evolution of nonlinear water-wave groups, IUTAM symposium “Complexity of Nonlinear Waves”, Tallinn, Estonia (**invited lecture**).
107. L. Shemer, A. Zavadsky and A. Benetazzo (2015) On spatial structure of waves in a wind-wave tank, WISE 2015, Goa, India.
108. L. Shemer and A. Zavadsky (2015) Experiments on wind-waves under transient wind conditions using laser slope gauge, WISE 2015, Goa, India.
109. A. Fershtman, D. Barnea and L. Shemer (2015) Local instantaneous heat transfer in slug flow of two consecutive Taylor bubbles, 7<sup>th</sup> European-Japanese two-phase flow group meeting, Zermatt, Switzerland.
110. L. Shemer and A. Zavadsky (2015) Measurements of wind-waves under transient wind conditions. 68th Annual Meeting of the APS Division of Fluid Dynamics, Boston, MA.
111. L. Shemer (2016) Characterization of wave field evolution in a wind-wave tank under steady and unsteady wind forcing, Brazilian Symposium on Ocean Waves, Rio de Janeiro, Brazil (**invited lecture**).
112. L. Shemer (2016) Duration- and fetch-limited wind waves in a laboratory flume. Wave Interactions (WIN-2016), Linz, Austria (**keynote lecture**).

113. A. Fershtman, D. Barnea and L. Shemer (2016) Convective local heat transfer around elongated bubbles propagating in downward liquid pipe flow, Int. Conf. Multiphase Flow, Florence, Italy.
114. A. Zavadsky and L. Shemer (2016) Measurements of wind-waves under transient wind conditions. 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, OR.
115. L. Shemer and A. Zavadsky (2016) Experiments on waves under impulsive wind forcing in view of the Phillips (1957) theory. 69th Annual Meeting of the APS Division of Fluid Dynamics, Portland, OR.
116. L. Shemer and A. Zavadsky (2017) On distinct stages in temporal evolution of water waves excited by impulsive wind forcing, WISE 2017, Victoria, BC, Canada
117. A. Chernyshova and L. Shemer (2017) Nonlinear spatial evolution of an initially narrow-banded wave train. WISE 2017, Victoria, BC, Canada
118. A. Fershtman, L. Robers, H.-. Prasser, D. Barnea and L. Shemer (2017) Circumferential distribution of film thickness and interfacial structure in downward inclined flow, 53<sup>rd</sup> European two-phase flow group meeting, Gdansk, Poland
119. L. Shemer (2017) Laboratory study of temporal and spatial evolution of waves excited on water surface initially at rest by impulsive wind forcing, IUTAM Symposium “Wind Waves” UC London
120. G.G. Rozenman, L. Shemer, M. Zimmermann, W. P. Schleich, M. Efremov, A. Arie (2018) Measuring phases of quantum mechanical wavepackets using surface gravity water-waves. PQE - USA
121. L. Shemer, D. Liberzon and A. Zavadsky (2018) Wave excitation by wind: theories of Miles and Phillips revisited in view of recent experiments. WISE 2018 Tel-Aviv.
122. A. Chernyshova and L. Shemer (2018) Experimental study of interaction of mechanically generated waves with waves excited by wind. WISE 2018 Tel-Aviv.
123. A. Khait and L. Shemer (2018) Validation of the kinematic wave-breaking criterion: experiments and BEM simulations. WISE 2018 Tel-Aviv.
124. A. Fershtman, D. Barnea and L. Shemer (2018) Local instantaneous heat transfer around a single elongated bubble in inclined pipes, 8<sup>th</sup> European-Japanese two-phase flow group meeting, New York
125. L. Shemer (2018) Wave generation by wind: On coupling between linear and nonlinear effects, 3<sup>rd</sup> Latinamerican Symposium on ocean water waves, Medellin, Colombia
126. A. Khait and L. Shemer (2018) Wave energy dissipation in two-dimensional breakers, the 35th Israeli Conference on Mechanical Engineering, Beer-Sheva
127. G. G. Rozenman, L. Shemer, M. Zimmermann, M. A. Efremov, W. P. Schleich, and A. Arie (2019) Quantum mechanical analogies in surface gravity waves, PQE 2019, Utah, USA
128. L. Shemer (2019) Young wind-waves under strong forcing: the relative importance of linear and nonlinear effects, EGU 2019 General Assembly, Vienna, Austria
129. A. Fershtman, L. Robers, H.-M. Prasser, D. Barnea and L. Shemer (2019) Interfacial structure of upward gas-liquid annular flow in an inclined pipe. Int. Conf. Multiphase Flow, Rio de Janeiro.
130. L. Shemer (2019) The role of nonlinear effects in spatial evolution of young wind-waves, WISE 2019, Sapporo, Japan.
131. G.G. Rozenman, L. Shemer, M. Zimmermann, M.A. Efremov, A. Arie and W.P. Schleich (2019) Quantum Mechanical and Optical Systems Explored in Surface Gravity Water-Waves, FQMT19, Prague.
132. L. Shemer (2019) Experiments on wind-waves in a laboratory tank and their implications for wind-wave modelling, 2<sup>nd</sup> International workshop on waves, storm surges and coastal hazards, Melbourne

133. G.G. Rozenman, L. Shemer, M. Zimmermann, M.A. Efremov, W.P. Schleich, and A. Arie (2020). Quantum-classical analogies of wave phenomena in surface gravity waves, Control of quantum and classical waves in complex media (WCM2020), Ein Gedi, Israel
134. S. K. Singh and L. Shemer, Combined numerical and experimental study of evolving regular water-waves under steady wind forcing, XXV ICTAM 2020+1, Milano, Italy.
135. M. Geva and L. Shemer, Excitation of water waves by impulsively applied wind: Orr-Sommerfeld computations vs. experiments. XXV ICTAM 2020+1, Milano, Italy.
136. M. Geva & L. Shemer, Theoretical model of wind-wave evolution: from initial ripples to finite steady state, WISE 2021, Bergen, Norway.
137. S. K. Singh and L. Shemer, Numerical and experimental investigation of spatially evolving wave field, WISE 2021, Bergen, Norway.
138. K. Kumar, S. K. Singh and L. Shemer, Point measurement of surface elevation and slope component of young wind waves: Cross-correlation and directional spectra, WISE 2021, Bergen, Norway.
139. G. G. Rozenman, L. Shemer, M. Zimmermann, M.A. Efremov, W.P. Schleich, A. Arie, The Temporal Talbot Effect on the Surface of Water, CLEO2021, AOS.
140. G.G. Rozenman, F. Ullinger, M. Zimmermann, M.A. Efremov, W.P. Schleich, L. Shemer and A. Arie (2022) Emulating black holes using surface gravity waves, PQE 2022, Utah, USA.
141. M. Geva and L. Shemer, Viscous shear instability at air-water interface as a function of wind velocity profile, EGU 2022 General Assembly, Vienna, Austria
142. M. Geva and L. Shemer, Wind waves under steady wind forcing: rigorous modeling vs. experiments, Wind waves in the Earth System (WISE) Meeting 2022, Brest, France
143. K. Kumar, S. K. Singh & L. Shemer, Spatial evolution of directional wave spectra in a wind-wave tank, WISE 2022, Brest, France
144. M. Geva & L. Shemer, Scaling of turbulent boundary layer profiles in airflow over young wind-waves, 12th Int. Symp. on Turbulence and Shear Flow Phenomena, TSFP12, 2022, Osaka, Japan.
145. S. Kalenko, L. Shemer and E. Zemach, Nonlinear standing internal waves, 14<sup>th</sup> European Fluid Mechanics Conference (EFMC), Athens, Greece, 2022
146. K. Kumar and L. Shemer, Young wind waves on along- and counter-wind current, 14<sup>th</sup> EFMC, Athens, Greece, 2022
147. L. Shemer and M. Geva, The coupling between the turbulent airflow and young wind waves, 14<sup>th</sup> EFMC, Athens, Greece, 2022
148. M. Geva and L. Shemer, The spatial wind-wave growth in a coupled shear flow, 14<sup>th</sup> EFMC, Athens, Greece, 2022