

Curriculum Vitae

HABER, SHIMON
Department of Mechanical Engineering
Technion, Israel Institute of Technology
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Personal

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Date and place of birth: 28.2.1946, Russia, Angero-Sugensk
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Academic Degrees

1976-1978 D.Sc.,
Faculty of Mechanical Engineering,
Technion-Israel Institute of Technology,
Haifa, Israel
1967-1969 M.Sc.,
Faculty of Aeronautical Engineering,
Technion-Israel Institute of Technology,
Haifa, Israel
1963-1967 B.Sc.,
Faculty of Aeronautical Engineering,
Technion-Israel Institute of Technology,
Haifa, Israel

Tenure

1984 Faculty of Mechanical Engineering,
Technion-Israel Institute of Technology,
Haifa, Israel

Academic Appointments (Research and Teaching):

2010-2011	Professorial Visiting Fellow (Sabbatical) Department of Mechanical Engineering University of New South Wales Sydney, Australia Visiting Scientist (Sabbatical) Bio-Engineering Institute Auckland University Auckland , New Zealand
2005	Professor Faculty of Mechanical Engineering, Technion-Israel Institute of Technology Haifa, Israel
2002	Visiting Professor (Sabbatical) Department of Chemical Engineering University of California at Santa Barbara Santa Barbara, CA, USA
2001	Visiting Scientist (Sabbatical) Harvard School of Public Health Harvard University Boston, MA, USA
1997-1998	Visiting Scientist, (Sabbatical) Department of Chemical Engineering MIT, Cambridge, MA, USA
1993,1994,1995,1996,2003,2004,2005,2006,2007,2009 (Summer)	Visiting Scientist Harvard School of Public Health Harvard University Cambridge, MA, USA
1988,1989,1990,1999 (Summer)	Visiting Scientist, Department of Chemical Engineering MIT Cambridge, MA, USA
1988	Associate Professor Faculty of Mechanical Engineering, Technion-Israel Institute of Technology Haifa, Israel
1985-1987	Visiting Assistant Professor (Sabbatical) Department of Chemical & Nuclear Engineering University of California, Santa Barbara Santa-Barbara, CA, USA
1980-1988	Senior Lecturer, Faculty of Mechanical Engineering, Technion-Israel Institute of Technology Haifa, Israel

1978-1980 Research Associate -(Post Doctoral Fellow)
Faculty of Chemical Engineering,
University of Rochester,
Rochester, NY, USA

Academic Appointments (Administration):

2006-8 Dean of Students

2005 Member of the Permanent Committee of
the Technion Senate for
Senior Faculty Promotion and Tenure

2005-6 Head of the Students Appeals Court
Technion-Israel Institute of Technology
Haifa, Israel

2005-6 Head of the Brakim Program in the Faculty of
Mechanical Engineering
Technion-Israel Institute of Technology
Haifa, Israel

2005-2006 Deputy Dean for Graduate Studies,
Faculty of Mechanical Engineering,
Technion-Israel Institute of Technology,
Haifa, Israel

2004 Coordinator of the Faculty of Mechanical Engineering
Review Report.

2003-2006 Head of the Energy Program in the Faculty of
Mechanical Engineering
Technion-Israel Institute of Technology
Haifa, Israel

2003-Present Head of the two phase flow laboratory
Faculty of Mechanical Engineering
Technion-Israel Institute of Technology
Haifa, Israel

1997 Head of Energy Engineering and Environmental
Conservation Research Center,
Faculty of Mechanical Engineering
Technion-Israel Institute of Technology,

Haifa, Israel

- 1992-1996 Development and Coordination of Master of Engineering (M.E.) Degree Program, Faculty of Mechanical Engineering, Technion-Israel Institute of Technology, Haifa, Israel
- 1992-1996 Deputy Dean for Graduate Studies, Faculty of Mechanical Engineering, Technion-Israel Institute of Technology, Haifa, Israel
- 1992 Head of The Scientific Committee, The 24th Israel Conference on Mechanical Engineering
- 1990-1991 Deputy Dean for Undergraduate Studies, Faculty of Mechanical Engineering Technion-Israel Institute of Technology, Haifa, Israel
- 1989-1990 Coordinator of Undergraduate Studies, Faculty of Mechanical Engineering Technion-Israel Institute of Technology, Haifa, Israel
- 1984-1985 Head of The Scientific Committee, The 18th Israel Conference of Mechanical Engineering

Professional Positions

- 1973-1976 Head of Aeronautical Design Section in The Israeli Air Force
- 1969-1973 Member of Aeronautical Design Section in The Israeli Air Force

Research Interests

Fluid Mechanics: Low Reynolds Number Flows, Particulate Systems- Hydrodynamic Interactions, Dispersion, Diffusion, Rheology, Sedimentation. Porous Media, Electrophoresis.
Bio-Fluid Mechanics: Lungs and blood flow.

Teaching Experience

Undergraduate: Fluid Mechanics, Heat Transfer,

P.D.E., Numerical Analysis,
Mechanical Engineering Design 1 & 2,
Statics, Strength of Materials 1 & 2.

Graduate: Analytical Fluid Mechanics, Heat Transfer,
Multiphase Flows, Viscous Flows,
Computer Aided Design, Analytical methods 1.

Technion Activities

1996	Chair- Committee for the Development of the Technion Master of Engineering (M.E.) Degree Program
1992-1995	Member- Technion's supervising committee of the Master and Ph.D. programs in the Department of Education in Technology and Science.
1996-2001	Member- Interdisciplinary Committee on Polymers.
1994-2001	Vice-Chief Judge in Students Court.
2005-2006	Chief Judge of Students Appeals Court

Consulting

1980	NASA & Johns Hopkins University, "Fluid Mechanics of Space Accelerometer".
1986	Rockwell International, Los Angeles, "Heat Transfer in Fast Breeders".
1987	Desalination Enterprises, Tel Aviv, "Design of Large Blades".
1996	Indigo, Rehovot, "Flow in Thin Films".
1999	Dan Mamtirim, Kibutz Dan, "Flow in Sprays".
2002	Nanosize Materials, "Flow Through Porous Materials"
2010	Nilimedix, Insulin pump

Awards

1964	Bar Yehuda Award- for Best Scholastic Achievements, Faculty of Aeronautical Engineering, Technion- Israel Institute of Technology
1968	Gutwirt Award- for Excellence in Research, Technion- Israel Institute of Technology
1976	The Israel Air Force Prize- for Excellence in Design that Enhanced the Security of the State of Israel (First

Recipient).

1977

Gutwirt Award- for Excellence in Research,
Technion- Israel Institute of Technology

Sponsored Research

GIF(IL+GER) "Collection of Particles at High Temperatures and Pressures" (with J. Goldshmidt) \$10,000 (1980-1982),
Technion- Israel Institute of Technology

NASA(USA) "Bubbly Lubricating Films" (with I. Etsion)
\$90,000 (1981-1983),
Technion- Israel Institute of Technology

NASA(USA) "Squeeze Film Dampers" (with I. Etsion)
\$10,000 (1984)
Technion- Israel Institute of Technology

IME(IL) "Gasification of Oil Shales" (with Y. Dayan and A. Shavit)
\$150,000 (1983-1985),
Technion- Israel Institute of Technology

DOE(USA) "Heat Transfer in Fast Breeder Reactors" (with S. Banerjee)
\$30,000 (1986-1987)
University of California at Santa Barbara

AFOSR(USA) "Electrophoretic Deposition of Ceramic Particles in Porous Substrates"
(with L. Gal-Or), \$150,000 (1988-1991),
Technion- Israel Institute of Technology

DOE(USA) "Transport of Contaminants in Porous Media (with H. Brenner)
\$10,000 (1990),
Massachusetts Institute of Technology

NIH(USA) "Particle Deposition in Human Lungs" (with A. Tsuda P.I.)
\$150,000 (1991-1994),
Harvard School of Public Health

NIH(USA) "Chaotic Dispersion of Particles in Human Lungs" (with A. Tsuda P.I. and JP Butler, FS Henry)
\$700,000 (1995-1998),
Harvard School of Public Health

NATIONAL LUNG AND BLOOD INSTITUTE (USA)

"Deposition of micron size particles in human lungs" (with A. Tsuda P.I.)
\$60,000 (2001-2003),
Harvard School of Public Health

Post Doctoral Fellow

Emanuel, Ilya (1995-1996)

Graduate Students

Ph.D.

- Mauri, Roberto - On the Brownian motion of discrete and continuous bodies. (1984).
- Lam, Kin - Numerical simulation of turbulent open channel flow (1988).
- Peles, Yoav - Microchannel heat exchanger (with Professor G. Hetsroni as chief advisor, 1999).
- van Dyke, Marc – Transport and dispersion of a flexible macromolecule under gravity and in a homogeneous, unbounded shear flow. (2003).
- Zuri, Nimrod - Micropumps for microchannels (with Professor G. Hetsroni as chief advisor, 2003).
- Itzhak, Dror – Surfactant transport and particles clearance from the alveolar liquid lining. (2008)
- Eshkoli, Ely – Flow in the mouth cavity (deceased).
- Salib, Ishak – Modeling of the human lung (2010).
- Eduard Katz – Release of material from an elastic liposome in a shear flow (With Dr. Michael Shusser as chief advisor 2010).
- Maleshenko Andrei – Aerosol generation during recruitment of blocked airways in the lung (in progress)

M.Sc.

- Letzter, Marcel - Gasification of Oil Shale (1983). (with Professor Y. Dayan as chief advisor)
- Shapira, Moshe - Low Reynolds number hydrodynamics of droplets or bubbles between two flat plates (1985).
- Brodkin, Oleg - Numerical simulation for red blood cells motion in middle size conduits (1995) .
- Peles, Yoav- Design of a domestic heat exchanger made of plastic (1995), (with Professor G. Hetsroni as chief advisor).
- Zuri, Nimrod - Enhancement of heat transfer from solid plates to liquids utilizing small bubbles (with Professor G. Hetsroni as chief advisor, 1996).
- Hao, Yue- Reverse roll coating flow and particle electrophoretic motion normal to a dielectric layer (1996).
- Pinchevski, Vadim - Temperature and humidity control in incubators (1998), (with Professor A. Shitzer).
- Zelig, Dafna - Hydrodynamical self-cleansing of pulmonary alveoli (2001).
- Itzhak, Dror - Particle behavior in lung alveoli (2002).
- Debi Abraham - Two phase flow in parallel micro-channels (with Professor G. Hetsroni, 2002).
- Ben Shmuel Yaron - Flow in cyclones (in progress, with Professor M. Shapiro).
- Talis Arie - Rigid ball indentation into semi-infinite elasto-plastic solid (2007), (with Professor J. Tirosh).

Gendel Sergei - Diffusion of fine particles in lung alveoli (2007).

Maleshenko Andrei – Aerosol generation during recruitment of blocked airways in the lung (2007).

List of Publications (February 2011)

Theses

1. Haber S., "The flow field in and around a droplet or bubble moving axially within a tube", M.Sc. in The Faculty of Aeronautical Engineering, Technion, I.I.T., Haifa, 1969, 120 pages (in Hebrew).
2. Haber, S. "On Drops in Stokesian Fields", D.Sc. in The Faculty of Mechanical Engineering Technion- I.I.T., Haifa, 1978, 165 pages (in Hebrew).

Refereed Papers in Professional Journals

1. Hetsroni, G., Wacholder, E. and Haber, S., Heat conduction in reactor fuel elements. *Nuc. Sci. & Eng.*, **37**, 329-336 (1969).
2. Hetsroni, G., Haber, S. and Wacholder, E., The flow field in and around a droplet moving axially within a tube. *J. Fluid Mech.*, **41**, 689-706 (1970).
3. Hetsroni, G. and Haber, S., The flow in and around a droplet or bubble submerged in an unbounded arbitrary velocity field. *Rheologica Acta*, **9**, 488-498 (1970).
4. Hetsroni, G., Walcholder, E. and Haber, S., The hydrodynamic resistance of a fluid sphere submerged in Stokes flow. *ZAMM*, **51**, 45-50 (1971).
5. Haber, S. and Hetsroni, G., Hydrodynamics of a drop submerged in an unbounded velocity field in the presence of surfactants. *Appl. Sci. Res.*, **25**, 215-255 (1971).
6. Haber, S. and Hetsroni, G., The dynamics of a deformable drop suspended in an unbounded Stokes flow. *J. Fluid Mech.*, **49**, 257-278 (1972).
7. Hetsroni, G., Haber, S., Brenner, H. and Greenstein, T., A second order theory for a deformable drop suspended in a long conduit. *Progress in Heat and Mass Transfer*, , 591-612 (1972).
8. Haber, S., Hetsroni, G. and Solan, A., Low Reynolds number motion of two droplets. *Int. J. Multiphase Flow*, **1**, 57-71 (1973).
9. Haber, S. and Hetsroni, G., Low Reynolds number motion of two drops submerged in an unbounded arbitrary velocity field. *Int. J. Multiphase Flow*, **4**, 1-17, (1977).
10. Haber, S. and Hetsroni, G., Interfacial boundary conditions on a droplet. *Int. J. Multiphase Flow*, **6**, 249-253 (1980).
11. Haber, S. and Hetsroni, G., Sedimentation of small drops of various sizes, *J. of Colloid & Interface Sci.*, **79** (1), 56-75 (1981).
12. Brenner, H. and Haber, S., Symbolic operator representation of generalized Faxen relations, *Physico-Chemical Hydrodynamics*, **4**, (3), 271-278 (1983).
13. Haber, S. and Mauri, R., Boundary conditions for Darcy's flow through porous media, *Int. J. Multiphase Flow*, **9** (5), 561-574 (1983).

14. Haber, S., A note on the Stokes resistance tensors of multiparticle systems in shear field, *ZAMP*, **34**, 246-252 (1983).
15. Haber, S. and Brenner, H., Rheological properties of dilute suspensions of centrally symmetric Brownian particles at small shear rates, *J. of Colloid & Interface Sci.*, **97** (2), 496-514 (1984).
16. Brenner, H. and Haber, S., Symbolic operator solutions of Laplace's and Stokes equations, Part I - Laplace's Equation. *Chemical Engineering Communications*, **27**, 283-295 (1984).
17. Haber, S. and Brenner, H., Symbolic operator solutions to the Laplace and Stokes equation, Part II - Stokes flow past a rigid sphere. *Chemical Engineering Communications*, **27**, 297-311 (1984).
18. Haber, S., Shavit, A., Dayan, J., Drying of porous oil shales, *Int. J. of Heat and Fluid Flow*, **5** (3), 149-154 (1984).
19. Haber, S., Shavit, A., Dayan, J., The effect of heat convection on drying of a porous semi-infinite space, *Int. J. of Heat and Mass Transfer*, **27**, 2347-2353 (1984).
20. Haber, S. & Etsion, I., Analysis of an oscillatory oil squeeze film containing a central gas bubble, *ASLE Transaction*, **28** (2), 253-260 (1985).
21. Laufer, G. and Haber, S., Numerical analysis of the thermochemical tooth damage induced by laser radiation, *Transaction ASME Biomechanical Engineering*, **107**, 234-240 (1985).
22. Mauri, R., and Haber, S., Application of Wiener's path integral for the diffusion of Brownian particles in shear flows, *SIAM*, **46** (1), 49-55 (1986).
23. Haber, S. and Brenner, H., Recent developments in structured continua, Chapter 2, 33-70, *Research Notes in Mathematics*, Issue **143**, Longman Scientific & Technical, John Wiley.(1986)
24. Brenner, H., Nadim, A. and Haber, S., Sedimentation and dispersion of flexible chains and clusters of hydrodynamically interacting Brownian particles, *Advances in Multiphase Flow and Related Problems* (G. Papanicolau Ed.) pp. 1-16, SIAM publication, Philadelphia Pa. (1986).
25. Haber, S., Shapira, M. and Etsion, I., The effect of two phase lubricant on bearing performance, *ASLE Transactions* **30** (1), 34-40 (1987).
26. Brenner, H., Nadim, A. and Haber, S., Long time molecular diffusion sedimentation and Taylor dispersion of a fluctuating cluster of interacting Brownian particles, *J. Fluid Mech.*, **183**, 511-542 (1987)
27. Shapira, M. and Haber, S., Low Reynolds number motion of a droplet between two parallel flat plates. *Int. J. Multiphase Flow* , **14**, 483-506 (1988) .
28. Haber, S. and Mauri, R., Lagrangian approach to time-dependent laminar dispersion in rectangular conduits, Part I, two dimensional flows. *J. of Fluid Mech.*, **190**, 201-215 (1988)
29. Brenner, H., Nadim, A. and Haber, S., Long time nonpreaveraged molecular diffusivity, sedimentation velocity and Taylor dispersivity of a fluctuating cluster of interacting Brownian particles in viscous flow. KINMAN, *Revista de Fisica*, **9**, Series A (1988).
30. Shapira, M. and Haber, S., Low Reynolds number motion of a droplet in shear flow including wall effects. *Int. J. Multiphase Flow*, **16**, 305-321 (1990).
31. Haber, S., Brenner, H. and Shapira, M., Diffusion, sedimentation and Taylor dispersion of a

- Brownian cluster subjected to a time-periodic external force: A micromodel of AC electrophoresis phenomena. *J. Chem. Phys.*, **92**(9), 5569-5579 (1990).
32. Mauri, R. and Haber, S., Time dependent dispersion of small particles in rectangular conduits. *SIAM J. Appl. Math.*, **51**(6), 1538-1555 (1991).
 33. Haber, S. and Gal-Or, L., Deep electrophoretic penetration and deposition of ceramic particles inside porous substrates - An analytical model. *J. of Electromech. Soc.*, **139**(4), 1071-1077 (1992).
 34. Gal-Or, L. and Haber, S., Deep electrophoretic penetration and deposition of ceramic particles inside porous substrates - Experimental. *J. of Electromech. Soc.*, **139**(4), 1078-1081 (1992).
 35. Haber, S. and Brenner, H., Effect of entrained colloidal particles in enhancing the transport of adsorbable chemical contaminants during groundwater flow in porous media, *J. Colloid Int. Sci.*, **155**, 226-246 (1993).
 36. Haber, S. and Mauri, R., Brownian motion of continuous deformable bodies. *Chem. Engng. Comm.* **148-150**, 73-84 (1996).
 37. Haber, S., Deep electrophoretic penetration and deposition of ceramic particles inside impermeable porous substrates. *J. Colloid and Int. Sci.* **179**, 380-390 (1996).
 38. Tsuda, A., Henry, F.S., Otani, Y., Haber, S. and Butler, J.P. Aerosol transport and deposition in the rhythmically expanding pulmonary acinus. *J. of Aerosol Medicine*, **9**, 389-408 (1996).
 39. Haber, S. and Tsuda, A. The effect of flow generated by a rhythmically expanding pulmonary acinus on aerosol dynamics. *J. of Aerosol Sci.* **29**, 309-322 (1998).
 40. Hao, Y. and Haber, S. Electrophoretic motion of a charged spherical particle to a planar dielectric wall. *Int. J. of Multiphase Flow*, **24**, 793-824 (1998).
 41. Hao, Y. and Haber, S. Reverse roll coating flow. *Int. J. for Num. Methods in Fluids*, **30**, 635-652 (1999).
 42. Haber, S. and Brenner, H. Hydrodynamic interactions of spherical particles in quadratic Stokes flows. *Int. J. of Multiphase Flow*, **25**, 1009-1032 (1999).
 43. Haber, S., Butler, J.P., Brenner, H., Emanuel, I. and Tsuda, A. Shear flow over a self-similar expanding alveolus during rhythmical expansion. *J. Fluid Mech.*, **405**, 243-268 (2000).
 44. Peles, Y. and Haber, S. A steady-state, one-dimensional model for boiling two-phase flow in triangular micro-channels. *Int. J. Multiphase Flow*, **26**, 1095-1115 (2000).
 45. Haber, S. and Brenner, H. Inhomogeneous Viscosity Fluid Flow in a Wide-Gap Couette Apparatus: Shear-Induced Migration in Suspensions *Phys. of Fluids*, **12**, 3100-3111 (2000).
 46. Haber, S. and Brenner H. Lateral migration in sheared suspension. A case study of the diffusion model, *Int. J. Multiphase Flow*, **28**, 1687-1696, (2002).
 47. Zelig, D. and Haber, S. Hydrodynamic cleansing of lung alveoli (*SIAM J. Appl. Math.* **63**(1), 195-221 , (2002).
 48. Haber S., Itzhak D. and Tsuda H. Gravitational deposition in a rhythmically expanding and contracting alveolus *J. Appl. Physiol.* **95**, 657-671 (2003).

49. Haber, S. An exact solution for the coupled Navier Stokes and energy equations in liquids *SIAM J. Appl. Math* **64**, 961-976 (2004).
50. van Dyke, M. and Haber, S. Density induced coupling effects on the dispersivity of a flexible chain molecule *J. Chem. Phys.* **120**, 10815-10827 (2004). Also selected to be published in *Virtual J. Bio. Phys. Res.* **7**, 11 (2004)
51. Minikes, A., Bucher, I. and Haber, S. Levitation force induced pressure in gas squeeze films. *J. Acoustical Soc. America* **116**(1), 217-227 (2004).
52. Sher, I., Haber, S. and Hetsroni, G. A new state model of liquid-vapor interfaces - to yield analytic expression for interface tension. *Chem. Engng. Sci.* **60**, 711-716 (2005).
53. Feldman, Y., Kligerman, Y., Etsion, I. and Haber, S. The Validity of the Reynolds Equation in Modeling Hydrostatic Effects in Gas Lubricated Textured Parallel Surfaces. *J. of Tribology, ASME* **128**, 345-350 (2006).
54. Haber, S. and Tsuda, A. A cyclic model for particle motion in the pulmonary acinus *J. Fluid Mech.* **567**, 157-184 (2006).
55. Haber, S., Filipovic, N., Kojic, M. and Tsuda A. Dissipative Particle Dynamics Simulation of Flow Generated by Two Rotating Concentric Cylinders. Part I: Boundary Conditions, *Phys, Rev. E* **74**, 1-8 (2006).
56. Haber, S. A spherical particle moving slowly in a fluid with a radially varying viscosity *SIAM J. Appl. Math.* **67**, 279-304 (2006).
57. N. Filipovic, D. Ravnic, M. Kojic, S.J. Mentzer, S. Haber, A. Tsuda. Platelet adhesion to a collagen wall: Experimental investigation and computer modeling by Discrete Particle Dynamics Method. *Microvascular Research* **75**, 279-284 (2008).
58. Filipovic, N., Haber S., Kojic M. and Tsuda A., Dissipative Particle Dynamics Simulation of Flow Generated by Two Rotating Concentric Cylinders. Part II: Lateral Dissipative and Random Forces. *Phys Review D* **41**, 035504 (2008).
59. A. Malashenko, A. Tsuda and S. Haber "Propagation and breakup of liquid menisci and aerosol generation in small airways. *J. Aerosol Medicine and Pulmonary Drug Delivery*, **22**, 1-13, (2009).
60. Haber, S., Itzhak, D. and Tsuda, A. The effect of alveoli rhythmical expansion on trajectories and deposition sites of aerosols in the acinar region. Part II: Spherical particles in a gravity-free environment. *J. Aerosol Medicine and Pulmonary Drug Delivery.* **10**, 1089, (2010).
61. Kosa, G., Shoham, M. and Haber S. The Action of Waving Cylindrical Tails with Non-Circular Cross-Section in Propelling Micro-Robots. *Phys. Fluids.* **22**,083-101,(2010).
62. Setter, E., Bucher, I. and Haber S. Low Reynolds number swimmer utilizing surface travelling waves-analytical and experimental study. *Phys. Rev. E*, **B**, 066304-066316, (2012)).
63. Salib, A. and Haber, S. : Is the cutoff radius in DPD simulations with a fluid of constant density arbitrary? *Computer Phys. Comm.* **183**, (8), 1714- 1718, (2012)

64. Henry, F.S., Haber, S., Haberthür, D., Filipovic, N., Milasinovi, D., Schittny, J.C., Tsuda, A. The simultaneous role of an alveolus as flow mixer and flow feeder for the deposition of inhaled submicron particles. (accepted to *J. of Biomech. Eng.* 2012)
65. Haber, S., Clark, A. and Tawhai, M. Blood flow in capillaries of the human lung (Submitted to *J. of Theoretical Biology* 2012).
66. Salib A. Haber S., Compressible flow in a bounded domain DPD simulation. (Submitted to *Phys. Rev. E* 2012)
67. Salib A. Tsuda A. Haber S. Can The DPD Numerical Method Simulate Blood Flow ? (Submitted to *Phys. Rev. E* 2012)
68. Salib A. Haber S. A Note on Slip Boundary Condition Implementation in DPD Near a Corner (Submitted to *Phys. Rev. E* 2012)
69. Haber S. and Timchenko V. Motion of a freely suspended needle in unbounded quadratic flow (in preparation 2012)

Book Review

70. Haber, S. "Heat Exchangers" Ed. Kakac, S., Bergles, A.E. and Mayinger, F. *Int. J. Multiphase Flow*, **9**, 102 (1983).
71. Haber, S. "Physicochemical Hydrodynamics" by R.F. Probstein *Int. J. Multiphase Flow* **23**(5),1004, (1997).
72. Haber S. "Foundations of fluid mechanics with application" by S.P. Kiselev, E.V. Vorozhtsov and V.M. Fomin *Int. J. Multiphase Flow* **27**, 391 (2001).

Reports

73. Mauri, R. and Haber, S. Brownian motion for a system of particles of arbitrary shape, TME-420.
74. Mauri, R. and Haber, S. The fluctuations of an elastic thread immersed in a straining flow, TME-428.
75. Haber, S. and Banerjee, S. Multifield modelling of two phase transients in horizontal and near horizontal pipes . Rockwell International.
76. Haber, S. The analysis of probes for local velocity measurement in liquid metal flow Rockwell International.

Review Activity

Serves as a Reviewer/Referee of the following international Journals on topics concerning “Low Reynolds Number Hydrodynamics” and “Particulate Systems”.

Journal of Fluid Mechanics

Physics of Fluids

Journal of Applied Physiology

International Journal of Multiphase Flow

Journal of Colloid and Interface Science

Journal of Aerosol Science

Invited Lectures

1. Hebrew University, Jerusalem, 1969, "On drops in Stokesian Flows".
2. Symposium on Meteorology, Beit-Dagan, Israel, 1970, "On the collection efficiency of drops in clouds".
3. The Founding Meeting of The Israel Aerosole Society, Tel Aviv, Israel, Dec.8, 1983, "Sedimentation".
4. Recent Development in Structured Continua, University of Windsor, Ontario, Canada, May 29-31, 1985, "Taylor Aris dispersion of n particles with internal constraint".
5. SIAM Workshop on Multiphase Flow, New York, USA, June 2-4, 1986 "Sedimentation and dispersion of flexible chains and clusters of hydrodynamically interacting Brownian Particles".
6. Workshop on "Basic Research in Ceramics", Dayton, Ohio, 4-5 April 1990, "Electrophoretic deposition of ceramic particles on porous substrates".
7. Annual Meeting of The Biomedical Engineering Society, State College, Pennsylvania, 10-13 October 1996, "Flow in bifurcating airways-a potential source of basic breath sounds".
8. Ben Gurion University at the Negev. 18 November 1999. "Shear flow over a self-similar expanding alveolus during rhythmical expansion".
9. Soreq Nuclear Center, 14 March 2000. "Flow in human lungs".
10. The Israel Conference of Mechanical Engineers, Ben Gurion University at The Negev, 14-15 June 2000, "Fluid flow inside the human lung alveoli" (Keynote lecture).
11. Joachim Heyder's Retirement Symposium, "Inspired by inspired particles", Hoehenried, Germany, October 2004, "chaotic mixing in the lungs".
12. International Conference of Applied Mathematics, "Exact similarity solutions of the Navier-Stokes equations", Plovdiv, Bulgaria, August, 2005.
13. Flow in the human lung, UNSW, Sydney, Australia, November 2010.
14. Flow in the human lung, Bioengineering Institute, Auckland University, Auckland, New Zealand,

December 2010

Participation in Congresses, Workshops, Symposia

1. The Israel Conference of Mechanical Engineering, Technion City, Haifa, 1969, "On the motion of a droplet in a long circular conduit".
2. International Symposium on Two Phase Systems, Technion City, Haifa, Aug.29-Sept.2, 1971, "On the radial migration of small drops in long conduits".
3. AIChE Meeting, Boston, USA, Aug.20, 1979, "On sedimentation of small drops under gravity".
4. Symposium on Heterogeneous Solids and Liquids, University of Tel Aviv, Tel Aviv, May 26, 1981. "Sedimentation of droplets of various sizes".
5. Society of Rheology, 54th Annual Meeting, Chicago, USA, Oct.25-29 1982, "On the rheology properties of a suspension of small ellipsoidal particles".
6. ASLE Annual Meeting, Chicago, USA, May 7-10, 1984, "On squeeze film damper with bubbly lubricant".
7. First Annual Conference of The Israel Aerosole Society, Jerusalem Israel, Dec.25, 1984, "Droplets in high shear flows".
8. G. I. Taylor Meeting, Cambridge, England, March 23-28, 1986, "Molecular diffusion, sedimentation and Taylor dispersion of flexible Brownian bodies", (poster session).
9. American Chemical Society Meeting, New York, USA, April 15-18, 1986, "Diffusion and sedimentation of flexible Brownian Dumbbell".
10. ASLE Annual Meeting, Toronto, Canada, May 12-15, 1986, "The effect of two phase lubricant on bearing performance".
11. AIChE Meeting, Miami Beach, USA, Nov.2-7, 1986, "Multifield modelling of two phase transients in horizontal and near horizontal pipes".
12. Annual Confernce of the Israel Aerosol Society, Nes Ziona, Israel, Feb. 3, 1988, "Time dependent dispersion in 2D conduits".
13. 62nd Colloid and Surface Science Symposium, Penn. State University USA, June 19-22, 1988, "Transport of a small fluid particle undergoing deformational Brownian motion".
14. Symposium on Macrotransport Processes, Massachusetts Institute of Technology, Cambridge, August, 1989 "Taylor dispersion of clusters"
15. Symposium on Macrotransport Processes, Massachusetts Institute of Technology, Cambridge, August, 1990 "Taylor dispersion of a cluster subjected to time

Periodic external force"

16. Workshop on Basic Research in Ceramics, NTIS Gaithersburg, Maryland, July 1991 "Electrophoretic deposition of ceramic particles on closed end porous substrates"
17. 24th Israel Conference on Mechanical Engineering, Technion, Haifa, May 1992.
18. Israel Germany joint symposium on Aerosols, Technion, Haifa, June 1992, "Time dependent dispersion of particles in rectangular conduits"
19. Symposium on Macrotransport Processes, Massachusetts Institute of Technology, Cambridge, August, 1993. "Fluid mechanics inside the lungs"
20. Annual Conference of the Israel Aerosol Society ,Technion, Haifa, February 1993.
21. 25th Israel Conference on Mechanical Engineering, Technion, Haifa, May 1994.
22. Symposium on Macrotransport Processes, Massachusetts Institute of Technology, Cambridge, August, 1994. "Dispersion and deposition of particles inside human lungs"
23. The Annual Fall Meeting of the Biomedical Engineering Society, Boston University, October 1995, "Chaotic Mixing of Acinar Flow in the Pulmonary Acinus", Ann. Biomed. Eng. 23(1):S-9, 1995.
24. Ninth Annual Meeting of the Israeli Association for Aerosol Research, Haifa Technion, December 1995, "Numerical Simulation of Red Blood Cells Motion in Middle Size Vessels"
25. International workshop on Biofluidynamics (in memory of Sir James Lighthill), Haifa, Technion, January 2000, "Flow in human lungs".
26. APS Annual Meeting, Washington D.C., 2001 "Instability induced shear migration in suspensions"
27. ATS conference, Atlanta, May 2002 "Trajectories and deposition sites of aerosols in the acinar region".
28. Austrian Technion Society conference, Vienna, February 2003, on "Particulate Matter and Health".
29. ATS conference, Seattle, May 2003, "Gravitational deposition in cyclically expanding alveolus".
30. ISBIE conference (International Symposium on Bio-Inspired Engineering), Haifa, December 2003, "Trajectories and deposition sites of aerosols moving inside rhythmic expanding alveolus"
31. ATS conference, Orlando, May 2004, "A Tensorial Analysis On Alveolar Recirculation Flow-Induced Mixing In The Pulmonary Acinus".
32. Energy at the Technion, Haifa, Jan. 2005, "Thermal management of electronic equipment", and "Gasification of solid organic waste, biomass, coal in two-chamber reactor".
33. ATS Conference, San Diego, May 2005, "A cyclic model of aerosol particle motion in the pulmonary acinus".
34. The 30th Israel Conference on Mechanical Engineering, Tel-Aviv, May 2005. "Gravitational deposition

in a rhythmically expanding and contracting alveolus”.

35. The IAAR 19th Annual Meeting, Tel Aviv, Dec. 2005. "Hydrodynamic risk factors of oral cancer related to smoking".
36. The IAAR 20th Annual Meeting, Haifa, Dec. 2006. "Particle diffusion in lung alveoli".
37. ATS Conference, San Francisco, May 2007, "Platelet adhesion to a collagen wall".
38. The 11th World Congress on Medical Physics and Biomedical Engineering, , Munich, Germany, September 2009. "Can The DPD Numerical Method Simulate Blood Flow ?".
39. Lecture on "Motion of submicron organisms/robots"

University of Sao Paulo - March 2012
University of Buenos Aires - March 2012,
University of Santiago - April 2012,
State University at San Diego - July 2012,
University of California at San Diego – July 2012,
Harvard School of Public Health - September, 2012