

## CURRICULUM VITAE OF JACOB BEAR

Feb. 9,  
2012

Place and date of birth: Haifa, Israel, February 2, 1929.  
Marital Status: Married + 3 children.

### ACADEMIC DEGREES

B.Sc. Technion-Israel Inst. of Technology, 1953 (Summa Cum Laude).  
Dipl. Eng. Technion-Israel Inst. of Technology, 1954.  
M.Sc. Technion - Israel Inst. of Technology, 1957.  
Ph.D. University of California, Berkeley, Calif., 1960.  
All degrees in Civil Eng.

### ACADEMIC APPOINTMENTS

#### a. At Technion—Faculty of Civil Engineering

Lecturer	1957	Senior Lecturer	1961.
Associate Professor	1965	Professor	1970.
Professor Emeritus	Oct. 1, 97.		

#### b. At other Institutes

Visiting Lecturer, NSF Hydrology Institute at Princeton Univ., Summer 1965.

Visiting Professor, Dept. of Civil Engineering, M.I.T., Cambridge, Mass., U.S.A., 1966/7 (Sabbatical).

Visiting Professor at the Hebrew University, Jerusalem Center for Research in Ground Water, 1967-1970.

Visiting Professor, New Mexico Inst. Min. and Technology, Socorro, New Mexico, Fall, 1970.

Visiting Professor, University of Wisconsin at Madison, Wisconsin, Summer 1971.

Visiting Professor, State Univ. of New York, at Buffalo, Buffalo, New York, Spring and Summer 1973 (Sabbatical).

Visiting Professor, Dept. of Civil Eng., Princeton Univ., Princeton, N.J., Summer and Fall, 1976 (Sabbatical).

Visiting Professor, Dept. of Civil Engineering, Univ. of Hawaii, Honolulu, Hawaii, Spring 1977.

Visiting Professor, Dept. of Civil Eng. Univ. of Delaware, Newark, DL. Summers 1977, 1978.

Goebel Visiting Professor, Dept. of Civil Engineering, Univ. of Michigan, Ann Arbor, MI., Feb.-Aug. 1980 (Sabbatical).

Visiting Professor, Dept. of Civil Eng., Univ. of California, Irvine, CA 1986/1987, Winter 1998 (Sabbaticals) (Joint app. with UCLA).

Visiting Professor, Dept. of Civil Eng., Stanford Univ., Stanford, CA., Spring 1987 (Sabbatical).

Visiting Professor Dept. of Soil and Crop Environmental Sciences, Virginia Polytechnic Inst. Blacksburg, VA, Fall, 1989.

Visiting Professor Dept. of Civil Engineering, University of Minnesota, Minneapolis MN., Fall, 1991 (sabbatical).

Visiting Professor, Institute for Hydromechanics and Water Resources, ETH-Zurich, Switzerland, Feb.–July, 1994 (sabbatical).

Visiting Professor, Dept. of Civil Eng., Univ. of California, Irvine, CA., Fall 1997, (Sabbaticals) (Joint app. with UCLA and USC).

Visiting Professor, Dept. of Petroleum Engineering, University of Southern California, Los Angeles, CA, 1998 (sabbatical).

Visiting Professor, University of Auckland, Auckland, New Zealand, March-April, 1999.

Visiting professor, Delft Technological University, Delft, The Netherlands, May-June, 2001.

## **MAJOR ADMINIST. APPOINTMENTS AT TECHNION**

1967-1969	Head of Hydraulics Laboratory, Faculty of Civil Eng.
1967-1972	Head, Technion's Water Resources Center.
1970-1972	Deputy, Vice-President of Technion.
1972-1976	Vice-President for Academic Affairs, Technion.
1977-1978	Head, Technion's Water Resources Research Center.
1977-1978	Head, Division of Water resources and Environmental Engineering, Dept. of Civil Engineering.
1978-1981	Director, The Samuel Neaman Institute for Advanced Studies in Science and Technology.
Jan. 84-Oct.86	Dean of Graduate School.
Jan. 95-Sep. 97	Dean, Dept. of Civil Engineering.

## **MAJOR ADMINIST. APPOINTMENTS at the KINNERET COLLEGE on the Sea of Galilee**

Since Jan. 2003	Dean, School of Engineering.
Since 2006	Member of Academic Development and of Research Committees..
2006-2011	Chairman of College Appointments and Promotions Comm.

## **AWARDS AND SCHOLARSHIPS**

1955-1956	Scholarship of the Dutch Government, at the Government Institute for Water Supply, The Hague, Holland.
1958-1960	The University of California, Berkeley, California, Ph.D. in Civil Engineering, A Scholarships by the University of California and by H.T.I.
1963	A 3 month U.N. Food and Agricultural Organization scholarship for a study tour in the Netherlands, France and the U.S.A. on Ground Water Hydrology.

- 1977 First recipient of the Birdsall Distinguished Lecturer in Hydrogeology, awarded by the Geological Society of America, Hydrogeological Div., Washington, D.C.
- 1978 Honorary Doctorate in Technological Sciences, awarded by the Delft University, Netherlands.
- 1980 Appointment to the Albert and Anne Mansfield Chair in Water Resources, at the Technion.
- 1985 American Soc. of Civil Eng., 1985 J.C.Stevens Award for the best discussion published in J.A.S.C.E. in 1984 (Publ. D.107).
- 1988 Elected Fellow of the American Geophysical Union.
- 1988 Honorary Doctorate in Technological Sciences awarded by E.T.H. Zurich, Switzerland.
- 1990 M. K. Hubbert Award by the National Ground Water Association.
- 1998 Awarded the Rothschild Prize in Engineering.
- 2003 Awarded the 2003 Excellence in Geophysical Education Award by the American Geophysical Union (AGU).
- 2006 Elected Boussinesq Lecturer for 2006 by the Boussinesq Center for Hydrology, Academy of Arts and Sciences, Amsterdam, The Netherlands.
- 2009 Awarded (first) Honorary Lifetime Membership Award 2009, by INTERPORE –The International Society for Porous Media.
- 2010 Awarded the 2010 ROBERT E. HORTON MEDAL for outstanding contributions to hydrology, by the American Geophysical Union (AGU).

## TEACHING EXPERIENCE

### a. At Technion–Faculty of Civil Engineering

- General Hydrology (3rd years students of C.E. and Ag.E.)
- Hydrology (4th yr. and students of C.E. and Ag.E.)
- Advanced Ground Water Hydrology (graduate students of C.E. and Ag.E.)
- Flow Through Porous Media (4th yr. and graduate students of C.E., Chem. Eng. and Ag.Eng.)
- Modeling Flow and Contaminant Transport in the Subsurface (Graduate students of C.E., Environmental Eng., Chem. Eng.), also as a Computer Mediated Distance Learning course taught via the internet.

### b. At other Institutes

- Summer, 1965, Lecture series on ground water hydrology and advanced flow through porous media at NSF Hydrology Institute, Princeton Univ., Princeton, N.J.
- 1966-67, Flow through Porous Media (graduate course of C.E.) M.I.T.
- July, 1967. In charge of and main lecturer in a special Summer Program at M.I.T. to Engineers and University Professors on Ground Water Hydrology and Advanced Flow Through Porous Media.
- Fall Semester, 1970. Flow through Porous media (graduate course) New Mexico Inst. of Mining and Technology.

- Summer, 1971. Main lecturer in NSF Summer Course on Flow Through Porous Media and Groundwater Hydrology, University of Wisconsin, Madison, Wisconsin.
- November 8-19, 1971. In charge of and lecturer in Advanced Seminar on Development, and Management of Groundwater Resources, Buenos Aires, Argentine.
- Summer 1972. Main lecturer in a 3-week, summer course on management of Water Resources, University of New South Wales, Sydney, Australia.
- November 1972. Lecturer at a National Seminar on Management of Water Resources, University of San Carlos, San Carlos, Brazil.
- Spring, 1973. Graduate course on Flow through Porous Media at SUNY at Buffalo, N.Y.
- Summer, 1973. Graduate course on Management of Ground Water Resources at SUNY at Buffalo, N.Y.
- Summer, 1973. Director and main lecturer at an International Seminar on Water Resources management to ECAFE countries, Bangkok, Thailand.
- April, 1976. Lecturer on Hydraulics of Ground Water at a Latin American Seminar on Management of Ground Water Resources at San Juan, Argentine.
- Summer, 1976. Special one-week summer program on Advanced Ground Water Hydrology and Management, Princeton University, Princeton, N.J.
- Fall, 1976. Graduate course on flow through porous media, Dept. of Civil Engineering, Princeton Univ., Princeton, N.J.
- Spring, 1977. Graduate course on Hydraulics of Groundwater, Dept. of Civil Eng., Univ. of Hawaii, Honolulu, Hawaii.
- Summer, 1977. (One-week), Summer, 1978 (2-weeks). Short post-graduate courses on Hydraulics and Management of Groundwater Resources, Univ. of Delaware, Newark, Del.
- August, 1979 (one-week) and August, 1981 (one week). Short courses on Advanced Groundwater Management at E.T.H., Zurich, Switzerland.
- May, 1980 and October, 1980. IGWMC Short courses (one week) on Advanced Hydraulics of Groundwater; Nov. 86, Oct. 88, 89, 91, 92, 93 Math. & Num. Modelling of Groundwater, Flow and Pollution; June 93, October 96, Modeling of Flow and Contaminants in the Subsoil, at the Intern. Inst. for Infrastruct., Hyd. and Environ. Engineering, Delft, The Netherlands.
- Winter, 1980. Graduate course on Hydraulics of Groundwater, Dept. of C.E., Univ. of Michigan, Ann Arbor, MI., U.S.A.
- June, 1980. Short course (one week) on Hydraulics of Groundwater, Univ. of Michigan, Ann Arbor, MI. U.S.A.
- Sept. 1980. Short course (one week) on Hydraulics of Groundwater, Perugia, Italy.
- Feb. 1981. Short course (one week) on Hydraulics of Groundwater, Univ. of Florida, Gainesville, FL.
- March 1982, 83, 84. Short courses (one week) on Pollution and Quality Control of Groundwater, March 1987, 89, Mathematical and Numerical Modelling of Groundwater Flow and Pollution, E.T.H. Zurich, Switzerland.
- August, 1982, and July 83. Short Courses (one week) on Advanced Groundwater Hydraulics, Holcomb Institute, Butler Univ. Indianapolis, Ind.
- December, 1982. Short course (one week) on Advanced Hydraulics of Groundwater, Lund University, Lund, Sweden.
- July, 1983. Short course on Hydraulics of Groundwater and Pollution, University of California, Davis, Calif.

- Sept., 1983. Short course on Hydraulics of Groundwater, University of Padova, Italy.
- August, 1984. Short course on Modeling Transport Phenomena in porous media, Alberta Research Council, Edmonton, Canada.
- 1984, 85, 86. Short courses on Groundwater Flow and Pollution, University of Newcastle, Newcastle upon Tyne, U.K.
- July, 1985. Short course on Modelling Transport in Porous Media, Imperial College, London.
- August, 1986 and 1987. Short courses on Mathematical and Numerical Modelling of Groundwater Flow and Pollution, Baruch College, New York.
- Aug. 87, 88, 89, 90, 91, 92, 93, 94, Short course on Mathematical and Numerical Modelling of Groundwater Flow and Pollution, Univ. of Cincinnati, Ohio.
- March-April, 1999, Graduate course on Modeling Flow and contaminant Transport in the subsurface, Dept. of Engineering Sciences, Univ. of Auckland, Auckland, New Zealand.
- Fall, 1987. Graduate course on Modelling of Groundwater Flow and Contamination, Univ. of Calif., L.A., Dept. of C.E.
- Fall, 1987. Graduate course on Transport in Porous Media, UC.- Irvine., Dept. of C.E.
- Spring, 1987. Graduate course on Modelling of Groundwater Flow and Contamination, Stanford Univ., Dept. of C.E.
- November 1987 and Feb. 90. Lectures on Modelling Transport Phenomena in Porous Media at the von Karman Inst. for Fluid Dynamics, Brussels, Belgium.
- Spring, 1987. Graduate course on Transport in Porous Media, Stanford Univ., Dept. of Petroleum Eng.
- Aug. 1988, Modelling Transport in Porous Media, Short course at the Desert Research Ins. Reno, Nevada.
- Feb. 1989. Modelling Groundwater Flow and Pollution, Short courses at CSIRO Melbourne and Perth, Australia.
- May, 1990, 91, 92, 93. Modelling Groundwater Flow and Pollution, Short courses at Penn State Univ. State College, PA.
- August 1990. Lecture Series on Transport Phenomena in Porous Media, at the invitation of the National Science Council of Taiwan, at the National Taiwan Univ., Taipei, Taiwan.
- April 1991. Short course on Modeling Groundwater Flow and Pollution, Chia Tung University, Hsinchu, Taiwan.
- May 1991. Short Course on Modeling Groundwater Flow and Pollution, Texas A & M Univ., College Station, Texas.
- October 1993. Short course on mathematical and Numerical Modelling of Subsurface Flow and Contaminant Transport, University of the Witwatersrand, Johannesburg, South Africa.
- Aug 93, Short course on Modeling groundwater Flow and Pollution at the Institute of Geological & Nuclear Sciences, Wairakei, New Zealand.
- Spring, 1994. Graduate course on Modeling groundwater Flow and Pollution at ETH-Zurich, Switzerland (also short course, March, 94).
- April 1995, April 1996, Oct. 1999. Short course on Modeling Flow and Pollution in the Subsurface, Czech Technical Univ., and Charles Univ., Prague, Czech Republic.
- October 1996, Graduate course on Modeling Flow and Pollution in the Subsurface, Helsinki University, Helsinki, Finland.
- Fall, 1997. Graduate course on Transport in Porous Media, UC.- Irvine., Dept. of C.E.

- September 1998, Short course on Modeling Flow and Pollution in the Subsurface, Laboratório Nacional de Engenharia Civil (LNEC), Lisbon, Portugal.
- September 1998, Graduate short course on Modeling Flow and Pollution in the Subsurface, Politecnico, Dept. of Geotechnical Engineering, Turin, Italy.
- November 1998, April, 2001 Graduate short course on Modeling Flow and Pollution in the Subsurface, TU Bergakademie Freiberg, Institut fuer Bohrtechnik und Fluidbergbau, Freiberg, Germany.
- March 1999, Short course on Modeling Flow and Pollution in the Subsurface, University of Auckland, Auckland New Zealand.
- April 1999, Short course on Modeling Flow and Pollution in the Subsurface, Bureau of Rural Sciences, Land and Water Sciences Div. Canberra, Australia.
- April, 2001, Workshop (2 days) on Modeling flow and solute transport in the subsurface, Essaouira, Morocco.
- May 2002 Short course on Modeling Flow and Pollution in the Subsurface, China Institute for Geo-Environmental Monitoring, Beijing, China
- May 2002 Short course on Modeling Flow and Pollution in the Subsurface, Graduate School of Eng., Kyushu University, Fukuoka, Japan.
- June 2003 Lectures (5 hours) on Modeling Flow and Contaminant Transport in the Saturated Zone, in a short course on Modelling Coupled Phenomena in Saturated Porous Media, Centre of Excellence for Advanced Materials and Structures, Bydgoszcz, Poland.
- December 2003 Short course on Modeling Flow and Pollution in the Subsurface, Geological Institute UNAM, Mexico.
- August 2004 Short course on Modeling Flow and Pollution in the Subsurface, College of Environment and Resources, Jilin University, Changchun, China.
- November 2005, 21th International Postgrad. Course on THE EXPLORATION, EXPLOITATION AND MANAGEMENT OF WATER RESOURCES Faculty of Agriculture, Rehovot, Israel.
- October 2006 Short course on Modeling Flow and Contaminant Transport in the Subsurface, University of Mississippi, Oxford, Mississippi.
- September 2009 Short course on Modeling Phenomena of Transport in Porous Media, at the POLITECNICO DI TORINO, Turin, Italy.
- Director and Lecturer in an International Post-Graduate course on Management of Water Resources, Technion, Haifa (April-June, 1970, April-June, 1971, April-June, 1972).
- Academic Director and Lecturer at an International Program leading to an M.Sc. Degree in Engineering and Management of Water Resources, Technion, Haifa, Israel, 1977/78, 1978/79.

## **DISTANCE LEARNING**

1993–2005, active in preparing COMPUTER MEDIATED DISTANCE LEARNING COURSES, and teaching them to students at the TECHNION and around the world via the internet.

## RESEARCH—past and current

- Use of models and analogs, especially the Hele-Shaw analogs and electric analogs for investigations of flow through porous media, regional ground water hydrology, reservoir engineering and drainage (in the 60's).
- Artificial recharge of aquifers and underground storage (in the 60's).
- The use of the hodograph for ground water flow under phreatic conditions and for two fluids with an abrupt interface (in the 60's).
- Hydrology and management of groundwater resources.
- Sea water intrusion, and exploitation of water in coastal aquifers.
- Subsurface (aquifers and the unsaturated zone) contamination and remediation techniques.
- Phenomena of transport of extensive quantities (in particular mass, momentum and energy) in porous media, including various transport coefficients in isotropic and anisotropic porous media. Mathematical modelling of transport phenomena in porous media. Model applications.
- Multiphase flow and transport in porous media.
- Flow through porous media at high Reynolds numbers.
- Hydrodynamic dispersion in saturated and unsaturated flow. Dispersion and diffusion of extensive quantities.
- Modeling flow and contaminant transport in aquifers and in the unsaturated zone.
- Heat and mass transport in porous media. Applications to geothermal energy, heat storage in aquifers and in the unsaturated zone, and remediation of contaminated subsurface (in the 80's)
- Flow in deformable porous media. Subsidence in aquifers. Deformation of porous media. Pressure waves in porous media.
- Transport phenomena in fractured rocks and fractured porous media.
- Compressed air energy storage in aquifers.
- Optimal utilization of ground water; management of water resources. Water Resources Policy.
- 2002-2005 CRYSTECHSALIN—Research within the framework of PF5 funded by the European Community on Crystallization Technologies for Prevention of Salt Water Intrusion,
- 2006–2009 GABARDINE— Research within the framework of PF6 funded by the European Community on Groundwater Artificial Recharge Based on Alternative Sources of Water: Advanced Integrated technologies and Management.
- 2009– MUSTANG — Research within the framework of PF7 funded by the European Community on A Multiple Space and Time Scale Approach for the Quantification of Deep Saline Formations for CO<sub>2</sub> Storage
- 2012– PANACEA — Research within the framework of PF7 funded by the European Community on Predicting and Monitoring the Long-Term Behavior of CO<sub>2</sub> Injected in Deep Geological Formations

## PRACTICAL EXPERIENCE & CONSULTING

- 1953-1955 Planning engineer; regional water supply and irrigation systems, Water Planning for Israel, Haifa.
- 1956-1958 Hydrologist; Hydrological Department. Water Planning for Israel, Tel Aviv, Head of Hydrological Laboratory.
- 1960-1988 Consultant on Hydrology to Water Planning for Israel (Tahal) Ltd.
- 1966-1987 Consultant on Hydrology to the Hydrological Service, Ministry of Agriculture, Israel.
- 1960- Various short term consulting activities in Israel and abroad.
- 1983-1985 Consultant to Atomic Energy Committee, Ministry of Energy, Israel.
- 1985-1990 Consultant to Sandia National Laboratory, Albuquerque, NM, on Geological Radioactive Waste Disposal.
- 1985-1992 Planning the lowering of the water table in connection with the construction of power plants along the coast of Israel (for Israel Electric Company).
- 1990- Consultant to WEISS ASSOC. Emeryville, CA. on groundwater management and remediation.
- 1990- Consultant to Lawrence Livermore National Lab., Livermore CA., on remediation of contaminated groundwater.
- 1990- With EWRE, Israel (Environmental and Water Resources Engineering) on various groundwater development and remediation projects (e.g., Evaluation of Israel's water resources, contamination from the refinery in Ashdod, Modeling sea water intrusion into the coastal aquifer).

## PRESENTATIONS AT INTERNATIONAL CONFERENCES

- The 13th I.U.G.G. ( Intern. Union of Geodesy and Geophysics) Conference at Berkeley, California, August 1963. Lectures: (i) Intercepting Fresh Water above the Interface in a Coastal Aquifer. (ii) Investigations on the Mixing of Water in Underground Storage Operations.
- Symposium on Artificial Recharge and Management of Aquifers of the International Association of Scientific Hydrology; at Haifa, Israel, March 1967. Lectures: (i) A Generalized Theory of Hydrodynamic Dispersion. (ii) The Optimal Yield of an Aquifer.
- The 2nd Annual Conference of the American Water Resources Assoc. at Chicago, Illinois, U.S.A. November 1966. Lecture:
- The first International Symposium on the Fundamentals of Flow through Porous media, Technion, Haifa, Israel, Feb. 1969. Lectures: (i) Hydrodynamic dispersion in Porous Media, (ii) Immiscible Displacement in Fractured Porous Media. (co-author: C. Braester).
- First International Seminar for Hydrology Professors, Urbana, Illinois, July 1969. Lecture: Hydrologic Education in Israel.
- The Second International Symposium on the Fundamentals of Flow Through Porous Media, I.A.H.R., Guelph, August, 1972. Lecture: Mathematical Formulation of Transport Phenomena in Porous Media.
- American Society of Civil Engineers, Conference, Cornell N.Y. Lecture: Mathematical Modelling of Ground Water Systems (with U. Shamir).
- Pemrose Conference on Mass and Energy Transport in Porous and Fractured Media, Aspen, Colorado, Sept. 1974. Lecture: Hydrodynamic Dispersion in Porous Media.
- Belgium-Israel Seminar on Ground Water Quality Control and Management, November 1974, Brussels, Belgium.

- 2nd Conference on Flow through Porous Media, Rio Claro, Brazil, October, 1974. Paper: Some Comments on Hydrodynamic Dispersion in Porous Media.
- International Assoc. of Universities, Conference on High Education. Moscow, August 1975 (representing Technion).
- Water Resources Center Conference on Groundwater Quality Prediction, Measurement and Protection, Reading, England, Sept. 6-8, 1976. Paper: Some Comments on the Equations Governing the Movement and Accumulation of Pollutants in an Aquifer. Paper: Forward look.
- International Conference on Scale Effects in Porous Media, International Assoc. for Hydraulic Research, Thessaloniki, Greece, Aug. 29 - Sept. 1, 1978. Paper: Relations between Microscopic and Macroscopic Descriptions In Porous Media.
- Seminar on Free Boundary Problems at the Istituto Nazionale di Alta Matematica, Laboratorio di Analisi Numerica, Pavia, Italy, Sept. 1979. Papers: 1. Relationship between Microscopic and Macroscopic Approach to Flow through Porous Media, 2. Hydrodynamic Dispersion and the Movement and Accumulation of Pollutants in Aquifers, 3. The Intergrated Aquifer Equations.
- Meeting of the International Nuclide Transport Code Intercomparison study, February, 1982, in Interlaken, Switzerland. Invited paper on "Modeling Water Transport in Porous Media".
- NATO Advanced Study Institute on Mechanics of Fluids in Porous Media, Newark, DL. July 1982 (co-director of Institute). Papers: 1. Bear, J. and Y. Bachmat, Transport Phenomena in Porous Media-The Basic Equations, 2. Corapcioglu, Y. and J. Bear, Land Subsidence.
- International Conference on Modern Approaches to Groundwater Resources Management, Capri, Italy, October 25-27, 1982. Paper (invited): Education Problems Related to Groundwater Resources.
- NATO Advanced Study Institute on the Fundamentals of Transport Phenomena in Porous Media, Newark, DE., July 1985 (co-director of Institute). Papers: 1. Bachmat, Y. and J. Bear, The Concept and Size of an REV. 2. Bear J. and Y. Bachmat, Advective and Diffusive Fluxes.
- A.S.C.E. Speciality Conference on Hydraulics and Hydrology in the Small Computer Age. Invited Paper on: Conceptual and Mathematical Modeling of Groundwater Flow and Pollution.
- Joint Israel-Italy Workshop on Hydrology of Fractured Rock Aquifers Calgari, Sardinia, Italy, Oct. 1984. Paper: Modelling Flow and Pollution in Fractured Rocks (co-author B. Berkowitz).
- Joint EEC-Israel Workshop on the Management of Water Resources, (Head of Israel's delegation and Scientific Coordinator of workshop), Varese, Italy, Sep. 1985. Paper: Mathematical Modelling of Groundwater Flow and Pollution.
- International Assoc. for Scientific Hydrology, Symposium on the Scientific Basis for Water Resources Management, Jerusalem, Israel Sep. 1985. Paper: Shamir, U., Bear, J. and N. Arad, Y. Gal-Nor, N. Selbst, Y. Vardi. National Water Policy, a methodology and its application.
- Workshop on Leaky Aquifer Mechanics, Univ. of Mexico, Mexico City Jan. 1987. Invited Paper: A unified approach to transport phenomena in Porous Media.
- NATO Advanced Research Workshop on Advances in Analytical and Numerical Groundwater Flow and Quality Modelling, Lisbon, Portugal, June 2-6, 1987. Invited Lecture: Heat and Mass Transport in Porous Media with Application to Heat Storage in the Unsaturated Zone. (co-author: A. Nir and J. Bensabat).
- International Conference in Groundwater Contamination - Use of Models in Decision Making, Amsterdam, Netherlands, 26-29 Oct. 1987. Invited lectures: 1. The roles of Models in Decision Making. 2. Methodology for Developing a National Water Policy, with Israel's Case as an Example ( co-author, U.Shamir).

- NATO Advanced Study Institute on the Fundamentals of Transport Phenomena in Porous Media, Pullman, WA, July 1989 (co-director of Institute). Invited paper: Bear, J. and Y. Bachmat, Deletion of nondominant effects in modelling transport in porous media.
- International Symposium on Processes Governing the Movement and Fate of Contaminants in the Subsurface Environment, Stanford Univ. Stanford, CA July 1989.
- SCOPE Workshop on Groundwater Contamination—state of the art, Stanford Univ. Stanford, CA. July 1989.
- NATO Advanced Study Institute on the Heat and Mass Transport in Porous Media, Cesme, Turkey, July 1990, Invited Lecture: Bear, J. Transport Phenomena in Porous Media.
- International Conference on Modeling Groundwater Flow and Pollution (Co-director), Nanjing, P. R. China, April, 1991. Keynote Address: Modeling Transport Phenomena in Porous Media. Lecture: Bear, J. Ravina, I., and N. Shachar. Contamination of the Unsaturated Zone by Heavy Metals Originating in a landfill.
- International Seminar on Heat and Mass Transfer in Porous Media, International Center for Heat and Mass Transfer (ICHMT), Dubrovnik, Yugoslavia, May 20-25, 1991. Keynote Address: Transport in Porous media—A Unified Approach.
- International Conference on Flow through Porous Media: Fundamentals and Reservoir Engineering Applications. Institute for Problems in Mechanics of the Russian Academy of Science, Moscow, Sept. 21-26, 1992. Invited Lecture: A Unified Approach for Modeling transport in porous media.
- Colloquium on Porous or Fractured Media: Transport and behaviour, Ecole Polytechnique Federale de Lusanne, Institute of Soil and Water Management, Monte Verita, Switzerland, October 5-9, 1992. Invited Lecture: Conceptual and Mathematical Modeling of Contaminant Transport in the Unsaturated Zone Under Non-isothermal; Conditions (coauthor: J.J.Nitao).
- Institute for Mathematics and its Applications, summer program, Minneapolis, Minnesota, on Environmental Studies: Mathematical, Computational, and Statistical analysis. Invited lecture on Modeling Transport Phenomena in porous media, July, 1992.
- International Symposium on Transport and Reactive Processes in Aquifers, Zurich, Switzerland, April 11-15, 1994. Invited lectures: 1. Use of Models in Decision making, 2. On Equilibrium and the Number of Degrees of Freedom in Transport in Porous media (co-author, John J. Nitao).
- International workshop on Soil and Aquifer Pollution (Non-aqueous liquid phase—Contamination and Remediation). Lecture: On the movement of a NAPLs above and within a phreatic aquifer (Co-author: V. Rhyzik). Water Research Institute, Technion, Haifa, Israel, May 1996.
- International Conference on NAPL in the subsurface: modeling of contamination and remediation. Invited paper: On the movement of an LNAPL lens on the water table. Centre for Mathematics and Computer Science, Amsterdam, the Netherlands, October, 1996.
- 3rd International Dalya Gredinger Conference on Fertilization and the Environment. Lecture: Fuli, W., Bear, J., and A. Shaviv: Simulation of N Dynamics in Soils, Subject to Environmental Friendly Fertilization Practices. Technion, Haifa, Israel, March 24-27, 1997
- EUROMECH 366 Colloquium on POROUS MEDIA—theory and experiment, June 22-26, 1997, Essen. Germany. Invited Keynote lecture: "The continuum approach to modeling phenomena of transport in porous media".
- XVII Conference of Geotechnics of Torino on Control and Management of Subsoil Pollutants. Invited keynote address: "Modeling Flow and Contaminant Transport in the Subsurface", Torino, Italy, November 23-25, 1999.

- AGU Spring meeting, Boston, May 2001. matmon, D., Gridin, V. V., Bear, J., Frydman, S., Schechter, I., paper on " NAPL Penetration Into Clay Layers in the Unsaturated Zone" (presented by D. Matmon).
- International Conference on Sea Water Intrusion into Coastal aquifers—Monitoring, Modeling and Management, (1) invited keynote address "Sea Water Intrusion into Coastal Aquifers", (2) paper on "Three-dimensional Simulation of Sea Water Intrusion into Heterogeneous Coastal Aquifers: Application to the Coastal Aquifer of Israel" (co-authors: Q. Zhou and J. Bensabat) Essaouira, Morocco, April, 23-25, 2001.
- Darcy's law — 150 years old. Invited key-lecture at the annual meeting of the Boussinesq Center for Hydrology, Amsterdam, The Netherlands, Sept. 1, 2006.
- 60th Geological Congress of Turkey, invited keynote lecture on Modeling Flow and Contaminant Transport in the Subsurface, April 19, 2007
- International Symposium on Technology of Seawater Intrusion into Coastal Aquifers and International Symposium on Coastal Aquifers and Desalinization, invited keynote lecture on Seawater Intrusion into Coastal Aquifers, Almeria, Spain, October 17, 2007.

## MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

- 1960-1980 Member of the Israel Association of Geodesy and Geophysics (Hydrology Section).
- 1980- Member of Israel Association for Water Resources.
- 1967-1982 Member of International Assoc. for Hydraulic Research (IAHR).
- 1982- Member of American Geophysical Union (Fellow since 1988).
- 2008- Member of INTERPORE—International Society for Porous Media (Honorary Member since 2009)

## OTHER ACTIVITIES

- 1964-1965 Vice Chairman, Hydrology Section of the Israel Assoc. of Geodesy and Geophysics.
- 1967-1970 Chairman, Hydrology Section of Israel Assoc. of Geodesy and Geophysics.
- 1964-1966 Member of the Panel on Oceanography and Limnology of the Israel research and Development Council.
- 1964-1976 Member of the National Committee of the Hydrological Decade. 1968-1971: Chairman of this Committee.
- 1964-1970 Member of the Editorial Board of the Israel Journal of Earth Sciences, Weizman Institute for publication in Science and Technology.
- 1964-1966 Member, Advisory Committee for Artificial Recharge (Water Authority, Ministry of Agriculture).
- 1967-1971 Chairman, Section of Flow through Porous Media of the International Association for Hydraulic Research.
- 1968-1986 Member of Israel's Water Planning Committee.
- 1976-1977 Member, International Steering Committee, Joint SCOPE- Project on International Assessment of Groundwater Modelling as an Aid in Water Resources Management, carried out at Holcomb Research Institute, Butler Univ., Indianapolis, Ind.
- 1976-1986 Member, Israel's National Committee for the International

- Hydrological Programme (IHP).
- 1978-1988 Member of the Editorial Board of *Advances in Water Resources*, CML Publications.
- Mar. 1979 Participant as consultant in European Council Conference on Higher Education in Water Resources Management, Strasbourg, France.
- 1980-1982 Member, ASCE Task Group on Physics Based Environmental Modelling for Waste Disposal of Energy Technologies.
- 1983-1988 Member, International Technical Advisory Committee of International Groundwater Modelling Center, Holcomb Research Institute, Indianapolis, Indiana.
- 1983-1992 Member of Advisory Board of *Water Science and Technology Library* of D. Kluwer Acad. Publishers., Dordrecht, Holland.
- 1983 Member of Advisory Board, ETH (Zurich, Switzerland), Program of Continuing Education on Groundwater Management.
- 1985-2011 Founder and Chief Editor of *Journal of Transport in Porous Media*, Published by Springer Acad. Publishers, Dordrecht, The Netherlands.
- 1985-1997 Assoc. Editor of *J. of Contaminant Hydrology*, published by Elsevier Publishing Co., Amsterdam, The Netherlands.
- 1986- Editor of Book Series on Theory and Application of Transport in Porous Media, published by Kluwer Publ. Co., Netherlands.
- 1988-1991 Member of Scientific Advisory Committee of the Project on Groundwater Contamination conducted by the Scientific Committee on Problems of the Environment (SCOPE).
- 1988-1991 Member of Israel's National Committee of SCOPE on behalf of the Israeli National Academy of Sciences.
- 1994-1997 Member of the Rothschild Prize Committee.
- 1996-1998 Member of Editorial Board of the *Journal Continuum Mechanics and Thermodynamics*, published by Springer-Verlag, Germany.
- 1996-98 Member of Working Task Force on Contamination of the subsurface by CVOCs, at Lawrence Livermore National Lab., sponsored by the Dept. of Energy and the Interstate Technology and Regulatory Cooperation (USA).
- 1997 Honorary Editor of *Advances in Water Resources Series*, published by Computational Mechanics Publications, Southampton, UK.
- 2001-2006 Member of Editorial Board of *Environmental Fluid mechanics*, published by KLUWER Academic Publishers, Dordrecht, The Netherlands.
- 2012- Memeber of the Editorial Board of *Journal of Transport in Porous Media*, Published by Springer Acad. Publishers, Dordrecht, The Netherlands.

## GRADUATE STUDENTS

### Completed their studies for Doctor of Science degree:

- |                    |   |
|--------------------|---|
| G. Dagan (1965)    | The Movement of the Interface between Two Liquids in a Porous Medium with Application to a Coastal Collector.           |
| O. Levin (1966)    | Optimal Utilization of Aquifers as an Element of a Water Resources System.  |
| Y. Bachmat (1966)  | Hydrodynamic Dispersion in Non-Uniform Flow through Porous Media Taking into Account Density and Viscosity Differences. |
| C. Braester (1970) | On the Flow of Immiscible Fluids in a Fractured Rock with Special Reference to Reservoir Engineering Problems.          |

- E. A. Hefetz (1972) The Use of Hybrid and Digital Computers for Solving Ground Water Problems (co-advisor: U. Shamir).
- A. Barak (1975) Momentum Transfer Phenomena in Flow at High Reynolds Numbers of a Newtonian Liquid through Anisotropic Porous Media.
- A. Partom (1978) On the Movement of Salts in the Unsaturated Zone from the Ground Surface to the Ground Water Table.
- B. Berkowitz (1985) On Continuum and Discrete Models for Contamination Transport in fractured Porous Rock.
- J. Bensabat (1986) Heat and Mass Transport in the Unsaturated Zone, with Application to Compressed Air Energy Storage.
- P. Vadas (1988) Natural Convection in Porous Media (co-advisor: C. Braester).
- A. Gilman (1995) The influence of dissolved salts on heat transport in the unsaturated zone.
- Yunwei Sun (1995) Optimization of the Pump-and Treat technology for the remediation of Contaminated aquifers.
- Fuli Wang (1996) Modeling Nitrogen transport and transformation in soils, subject to environmentally friendly fertilization practices.
- Quanlin Zhou (1999) Modeling sea-water intrusion in coastal aquifers (co-advisor: J. Bensabat).
- Dorit Matmon (1999) Penetration of Hydrocarbons into Clays (co-advisor; S. Friedman).
- Leonid Krasovitsky (2001) Use of surfactants in subsurface remediation (co-advisor: A. Marmur).
- Arie Kremen (2004) Forecasting the Nitrogen transport and transformation processes in soils irrigated by reclaimed sewage (co-advisor A. Shaviv).

### Completed their studies for M.Sc. degree:

- D. Zeichner (1964) Drainage by Means of Interceptor Lines in Phreatic Aquifers.
- A. Mercado (1966) Mixing of Tracer Labelled Water by Injecting and Pumping in the Same Well.
- C. Breaster (1966) On the Possibility of Oil and Gas Entrapment in the Northern Negev Region.
- H. Lachmi (1966) Estimating the Volume of Flood Waves from Information on Rainfall Series and Corresponding Floods for a Shorter Period.
- R. Gabison (1969) The Use of a Three-Dimensional Electric Analog for Investigations of the Flow Regimes in Inhomogeneous Anisotropic Aquifers as a Result of Pumping and Artificial Recharge Schemes.
- E. Goldchlager (1970) On the Movement of the Interface in a Coastal Aquifer as a Result of Changes in the Exploitation Scheme.
- Y. Mualem (1970) The Form of the Interface in Steady Flow in a Stratified Medium.
- I. Caspi (1975) Linear Programming as a Method for Parameter Identification of an Aquifer Model.
- I. Kapuler (1975) Numerical Solution for the Movement of an Interface in a Coastal Multilayered Aquifer.
- S. Weiman (1976) Experiments on Hydrodynamic Dispersion in Porous Media (co-advisor: B. Zur).
- S. Bachu (1977) The Effect of Temperature of Injected Water on the Stability of Flow in an Aquifer (co-advisor: G. Dagan).
- G. Amir (1979) Optimal Operation of a Coastal Aquifer as a Multiobjective Problem (co-advisor: U. Shamir).
- I. Yaron (1982) A Simultaneous Solution of the Identification

- and Management Problems of an Aquifer by Means of Linear Programming (co-advisor: U. Shamir).
- E. Grossman (1982) Optimal Annual Management of the Coastal Aquifer in Israel - Quantity and Quality Considerations (co-advisor: U. Shamir).
- Y. Peled (1982) The Movement of Pollutants with Ion Exchange in the Unsaturated Zone (co-advisor: I. Rabina).
- P. Menier (1983) Relative Permeability in Anisotropic Porous Medium.
- O. Levin (1984) The Behavior of Aquifer Systems with Special Reference to the Aquifers of Northern Arava.
- Y. Orenstein (1985) Phosphate Transport to the Groundwater Table through the Unsaturated Zone (co-advisor: Y. Avnimelech).
- J. Margolin (1986) Well testing under simultaneously changing pressure and flow rate - the air chamber test (co-advisor: C. Braester).
- D. Pat (1986) Dispersion in Unsaturated Flow, with Emphasis on the Effect of Moisture Content (co-advisor: I. Rabina).
- Y. Gerby (1991) A Comparative Analysis of Different Approaches to the Problem of Sea Water Intrusion into a Coastal Aquifer (co-advisor: C. Braester).
- L. Krasovitsky (1997) Mathematical modeling of soil salinization processes.
- Arie Kremen (1999) Modeling leaching processes in a landfill (co-advisor: A. Shaviv).