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Ravid Rosenzweig- Resume

rravid@gsi.gov.il ravidrosen@gmail.com

Scientific Interest:

I'm interested in studying the flow and transport in saturated and unsaturated porous media. Specific topics include:

- CO_2 storage in deep geological formations.
- Reactive transport models.
- Flow and transport in biofilm affected soils (including under unsaturated conditions).
- Volume averaging techniques and scaling methods
- Flow and topology of fractured systems.

Education

October 2006- January 2012 PhD student, Faculty of Civil and Environmental Engineering. Thesis title: "Effect of biofilms on the hydraulic properties of unsaturated soils"
Advisors: Prof. Uri Shavit (primary) and Dr. Alex Furman (co-advisor). Grades: 96.6

October 2002-February 2005 M.Sc, Faculty of Civil and Environmental Engineering (Summa Cum Laude).Thesis title: "The flow Field at the interface of porous media". Advisor: Prof. Uri Shavit. Grades: 97.8 (courses GPA), 95 (research grade).

March 1999-March 2003 B.Sc, Environmental Engineering, Faculty of Chemical Engineering, Technion, Haifa (Cum Laude).
Grades: 96.2/100.

Professional Experience

2013- present-	Researcher, Israel Geological Survey
11.2011-12.2012	Post doctoral fellow SISPYPHE, UPMC, Paris France Title: Geometry and topology of solid blocks in fracture networks. Host: Dr. Pierre Adler.
7.2006-9.2006-	Research assistant, water and soil institute, Agricultural Research organization (ARO), Beit Dagan, project title: "Modeling the solute transport in an effluent irrigated orchard", (supervisor: Dr. Alex Furman)
9.2005-1.2006	Research assistant, Technion Haifa. Project title: "Deoptition of fractal-like aggregates in human lungs" (supervisor: Dr. David Broday)
3.2005-9.2005	Research assistant, Technion Haifa. Project title: "Flow at the interface of porous media" (supervisor: Prof. Uri Shavit)
2001-2002	Research assistant, Flow measurement laboratory, Technion Haifa. Studies of dispersion and porous interface flow.

Course teaching:

2014-2015	The Technion Israel Institute of Technology, Lecturer, Advanced groundwater hydrology (Undergraduate+ Graduate)
2002-2004, 2006-2011	The Technion Israel Institute of Technology, Teaching assistant in the following classes: Introduction to fluid mechanics, Micro-environmental meteorology, Introduction to flow and pollution in soils, Physics of porous media, Introduction to soil science for landscape planners.

Student guidance:

- Elazar Volk, MSc., Technion, Measuring the hydraulic properties of unsaturated biofilm-affected soils (In progress, Co advisor, with Prof. Alex Furman)
- Evyatar Cohen, MSc., The Hebrew University, Modeling migration and trapping of injected CO_2 in the Jurassic saline aquifers of the Negev (In progress, Co advisor, with Dr. Ran Holtzman)
- Itamar Michel Meyer, MSc., Technion, The effect of groundwater flow and hydrodynamic dispersion on dissolution trapping of injected CO_2 (In progress, Co advisor, with Prof. Uri Shavit)

Awards and Distinctions

June 2012-	The Irmai award for best research in hydrology, hydrodynamics and flow in porous media, the civil and environmental engineering department, Technion IIT
November 2011-	Chataubriand fellow of the French foreign affairs ministry for postdoctoral studies.
October 2009-	Eshkol Fund of the Israeli ministry of science and technology for PhD studies.
January 2009-	Wolf foundation scholarship for excellence in graduate studies.
October 2008-	The Gutwirth scholarship for excellence in PhD studies
October 2007-	Rieger foundation fellowship for environmental studies.
January 2007, 2009-	The complete organism program fellowship, the ministry of Agriculture and rural development (twice).
October 2006-	Fine fellowship for PhD students, Technion graduate school.
March 2004-	Gutwirth fellowship for MSc. Studies.
January 2004-	Wolf foundation scholarship for excellence in graduate studies.

January 2004- The complete organism program fellowship, the ministry of agriculture and rural development.

October 2003- Rieger foundation fellowship for environmental studies.

June 2002- The Knesset's education committee award (awarded to the top 90 students in Israel).

April 2002- Reznik award for excellence in environmental studies, faculty of Chemical Engineering Technion, Haifa.

2000-2002- Technion Presidents award, six consecutive semesters.

Research Grants

2014 BARD (pending)- Alteration of soil hydraulic properties due to biological activity. Cooperating Investigator for 3 years. Budget: Total: 109000$/year. Part: 17000$/year.

2013 GIF young scientist. Study of Mixing-Enhancement Mechanisms in Early-Time CO_2 Dissolution Trapping During CO_2 Geological Storage. Principal Investigator for 1 year. Budget: 36000$/year

2013 The Ministry of Energy and Water. Modeling CO_2 migration and trapping in the Jurassic saline aquifers of the Negev. PI, 2 years, Budget: 50,000 NIS/year.

Journal Aritcles

- Rosenzweig, R., Mourzenko, V. V., Thovert, J. F., & Adler, P. M., Solid matrix partition by fracture networks. *Physical Review E*, 90(2), 022407, 2014
- Rosenzweig, R., Furman, A., Dosoretz, C., & Shavit, U., Modeling biofilm dynamics and hydraulic properties in variably saturated soils using a channel network model. *Water Resources Research*, 50(7), 5678-5697, 2014
- Rosenzweig R, Furman A., and Shavit U., A channel network model as a framework for characterizing variably-saturated flow in biofilm-affected soils, *Vadose Zone Journal* 12 (2), doi: 10.2136/vzj2012.0079, 2013

- Rosenzweig R., Shavit U., and Furman A., Water retention curves of biofilms-affected soils using xanthan as an analogue, *Soil science society of America Journal*, doi:10.2136/sssaj2011.0155, 2012
- Broday, D.M. and Rosenzweig, R., Deposition of fractal-like soot aggregates in the human respiratory tract, *Journal of aerosol science*, 42, 372-386, 2011.
- Rosenzweig R, Shavit U., and Furman A., The influence of biofilm spatial distribution scenarios on hydraulic conductivity of unsaturated soils, *Vadoze Zone Journal*, 8 (4), 1080-1084, 2009.
- Rosenzweig, R., and Shavit, U., The laminar flow field at the interface of a Sierpinski carpet configuration, *Water Resources Research*, 43, W10402, 2007.
- Shavit, U., Rosenzweig, R., and Assouline, S., Free Flow at the Interface of Porous media: A generalization of the Taylor Brush Configuration, *Transport in porous media*, 54 (3) 345-360, 2004
- Shavit, U., Bar-Yosef, G., Rosenzweig, R., and Assouline, S., Modified Brinkman Equation for a Free Flow Problem at the Interface of Porous Surfaces: The Cantor- Taylor Brush Configuration Case, *Water Resources Research*, 38(12), 1320-1334, 2002.

Book Chapters and Refereed Proceedings

- Furman A., Shavit U. and Rosenzweig R., Field water processes, in exercises in soil physics. (Lazarovitch N. and Warrick A.W., Editors). Catena Verlag, Reiskirchen, 147-189, 2013.
- Rosenzweig R, Furman A., and Shavit U., A channel network model as a framework for characterizing variably-saturated flows in biofilm-affected soils: conceptual model, in XVIII international conference on computational methods in water resources, 21-24 June 2010, Barcelona, Spain (J., Carrera, Editor)
- Rosenzweig, R., and Shavit, U., Theoretical and numerical study of flow at the interface of porous media, *in Dynamics of fluids and transport in fractured rock* (Faybishenko, B., Witherspoon, P.A., and Gale, J., editors), American Geophysical union, Washington DC, 65-80, 2005.

Reports and unrefereed publications

- Rosenzweig, R., Modeling CO_2 migration and trapping in the Jurassic saline aquifers of the Negev-first year report. GSI report, GSI/33/2014, 29. pp, 2014.

- Calvo R., Rosenzweig R., Bar O., Buch-Leviatan O., and Gvirtzman Z., Examination of CO_2 storage scenarios in the middle saline aquifer (Ardon, Inmar, Daya, Sherif and Zohar formations) of the Northern Negev. GSI Report GSI/32/2014 (In Hebrew), 27 pp., 2014.

- Rosenzweig, R., Shalev, E., Calvo R. and Dody A., Hydrological model for evaluating radioactive waste contamination of the vadose zone from a shallow storage site. Part A: Scenarios of water percolation through the vadose zone into the underlying aquifer. GSI report, GSI/31/2014 (In Hebrew), 14. pp, 2014.
- Rosenzweig, R., Analytical, semi-analytical and numerical solutions of migration and trapping of injected CO_2 in deep saline aquifers. GSI report, GSI/27/2014, 34. pp, 2014.

- Calvo R., Knafo R. and Rosenzweig R., A comparative study for potential CO_2 storage units in the subsurface Paleozoic-Mesozoic section in Southern Israel: Petrological and Petrophysical dataset, GSI Report GSI/24/2014 (In Hebrew), 56 pp., 2014.

- Gelman, F., Rosenzweig, R. and Ronen, Z., Degradation of petroleum hydrocarbons in groundwater in Israel, GSI Report GSI/11/2014 (In Hebrew), 32 pp., 2014.

Presentations in conferences and seminars

- Rosenzweig, R., CO_2 storage in deep geological formations: principles and potential in Israel, 27 November 2014, The department of soil and water, the faculty of agriculture, food and environment, the Hebrew University, Rehovot, Israel (invited).
- Rosenzweig, R., Volk E., Shavit, U., and Furman, A., Experimental study of biofilm effect on hydraulic properties of unsaturated soils, Gordon Research Conference on flow and transport in permeable media, 6-11 July 2014, Bates college, Maine (poster).
- Rosenzweig R. and Calvo R., Preliminary simulations of migration and trapping of injected CO_2 in the Jurassic deep saline aquifer of the negev, Israel Geological Society meeting, 25-27 February 2014, The Dead Sea (poster)
- Rosenzweig R, The effect of biofilms on the hydraulic properties of unsaturated media, Zuckenberg Institute of Water Research, Ben Gurion University, 24 June 2013, Sdeh Boker, Israel (invited)
- Rosenzweig R., Shavit U., and Furman A., The effect of biofilms on the hydraulic properties of unsaturated soils, The Dahlia Gredinger International Symposium, 4-7 March, 2013, Haifa Israel (poster).
- Rosenzweig R., Shavit U., and Furman A., The effect of biofilms on the hydraulic properties of unsaturated soils, AGU Fall Meeting 9-13.12.2012 San Francisco (poster)
- Rosenzweig R, The effect of biofilms on the hydraulic properties of unsaturated media, Geological Survey of Israel, 4 November 2013, Jerusalem, Israel (invited)
- Rosenzweig R., Shavit U., and Furman A., The effect of biofilms on the hydraulic properties of unsaturated soils, IMVUL conference, Groundwater vulnerability-emerging issues and new approaches, 9 July 2012, Paris, France (oral)
- Rosenzweig R., Shavit U., and Furman A., Dynamics of hydraulic properties due to biological clogging, The European Geophysical union general assembly, 24 April 2012, Vienna, Austria (oral).

- Rosenzweig R, The effect of biofilms on the hydraulic properties of unsaturated soils, 30 March 2012, Sisyphe, UPMC, Paris, France (invited).
- Rosenzweig R, Furman A., and Shavit U., A channel network model for characterizing flow and biofilm growth in unsaturated soils, The Israel society of ecology and environmental sciences annual meeting, 27 June 2011, Ramat Hashofet, Israel (oral).
- Rosenzweig R, Furman A., and Shavit U., A channel network model variably-saturated flows in biofilm-affected soils, The Israeli soil science society annual meeting, 5 December 2010, Volcani institute, Israel (oral).
- Rosenzweig R, Furman A., and Shavit U., A channel network model as a framework for characterizing variably-saturated flows in biofilm-affected soils: conceptual model, XVIII international conference on computational methods in water resources, 21-24 June 2010, Barcelona, Spain (oral).
- Rosenzweig R, Furman A., and Shavit U., A channel network model for characterizing variably-saturated flows in soils, The Israeli soil science society annual meeting, 13 December 2009, Rehovot, Israel (poster).
- Rosenzweig R, Furman A., Shavit U. and Dosoretz, C., The effect of biofilms on the hydraulic conductivity of unsaturated soils, The Israeli soil science society annual meeting, 25 December 2008, Haifa, Israel (poster).
- Rosenzweig R, Furman A., Shavit U. and Dosoretz, C., The effect of biofilms on the hydraulic conductivity of unsaturated soils, Gordon Research Conference-Flow and Transport in Permeable Media, 13-19.7.2008, Oxford, UK (poster).
- Rosenzweig R., and Broday, D. M., Deposition of fractal-like soot aggregates in the human lungs, The annual meeting of the Israeli association for aerosol research, 19.12.2006, Haifa (poster).
- Rosenzweig R, Shavit U., Polak A., and Assouline S., Flow at the interface of artificial porous media- a combined analytical, experimental, and numerical study (invited poster), Kirkham conference, 28-29.10.2004, Logan, Utah.
- Rosenzweig R, Shavit U., Polak A., and Assouline S., Flow at the interface of grooved geometries- a combined analytical, experimental, and numerical study

(poster), Gordon Research Conference- Flow and Transport in Permeable Media, 11-16.7.2004, Oxford, UK.

- Shavit U., Rosenzweig R. and Assouline S., Free Flows at the Interface of Grooved Geometries (poster), AGU Fall Meeting 8-12.12.2003 San Francisco.
- Rosenzweig R., Shavit U. and Assouline S., The flow field at the interface of porous media, The Israeli society of soil science annual meeting, 12.2.2002, Volcani institute, Israel (oral).

Service and professional affiliation:

- The European Geosciences union
- The American Geophysical Union
- The Israeli Soil Science Society
- The Israel Society of Ecology and Environmental Sciences
- The Israeli Geological Society
- Reviewer: Transport in porous media, Vadose zone journal, Journal of environmental quality, Journal of porous media.