

Yaniv Edery, Ph.D.

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SCHOLARLY PROFILE

My current interest is in the field of flow in porous media, it is a fascinating field that has implications ranging from fuel cell batteries to membrane and oil recovery. By training I am a physicist with keen interests in statistical and fluid mechanics; these interests are utilized to address fundamental physical problems that have real world implication.

RESEARCH EXPERIENCE

2018 - Assistant Professor, Civil and Environmental Engineering, Technion, Israel

EDUCATION

2015 - 2018 Post-Doctoral Fellow in Two Phase Flow in Porous Media, Applied Science and Engineering, Harvard University
Faculty Advisor: David Weitz
Project: Thin film dynamics and its effect on two phase flows in porous media

2007 - 14 Ph.D. in Reaction and Flow in Porous media, Weizmann Institute of Science.
Thesis: Reactive Transport in Porous Media
Advisor: Brian Berkowitz

2003 - 07 B.A. in Physics, Hebrew University of Jerusalem.

PUBLICATIONS

Selected

1. Edery, Y., H. Scher and B. Berkowitz (2009), Modeling bimolecular reactions and transport in porous media, Geophysical Research Letters, 36, L02407, doi:10.1029/2008GL036381.
2. Edery, Y., A. B. Kostinski, S. N. Majumdar and B. Berkowitz (2013), Record-breaking statistics for random walks in the presence of measurement error and noise. Physical Review Letters, 110, 18, doi:10.1103/PhysRevLett.110.180602.
3. Edery, Y., H. Scher, A. Guadagnini and B. Berkowitz (2014), Origins of anomalous transport in disordered media: structural and dynamic controls. Water Resources Research, 50, doi:10.1002/2013WR015111.
4. Edery, Y., S. Berg, & D. Weitz, (2017). Surfactant variations in porous media localize capillary instabilities during Haines jumps. Physical Review Letters, 120, 02, doi:10.1103/PhysRevLett.120.028005.

Published

5. Edery, Y., H. Scher and B. Berkowitz (2010), Particle tracking model of bimolecular reactive transport in porous media, *Water Resources Research*, 46, W07524, doi:10.1029/2009WR009017.
6. Edery, Y., H. Scher and B. Berkowitz (2011), Dissolution and precipitation dynamics during dedolomitization, *Water Resources Research*, 47, W08535, doi:10.1029/2011WR010551.
7. Edery, Y., A. Kostinski and B. Berkowitz (2011), Record setting during dispersive transport in porous media, *Geophysical Research Letters*, 38, L16403, doi:10.1029/2011GL048558.
8. Edery, Y., A. Guadagnini, H. Scher and B. Berkowitz (2013), Reactive transport in disordered media: Role of fluctuations in interpretation of laboratory experiments, *Advances in Water Resources*, 51, 86-103, doi:10.1016/j.advwatres.2011.12.008.
9. Berkowitz, Y., Y. Edery, H. Scher and B. Berkowitz (2013), Fickian and non-Fickian diffusion with bimolecular reactions. *Physical Review E*, 86, 032812, doi:10.1103/PhysRevE.87.032812.
10. Ciriello, V., A. Guadagnini, V. D. Federico, Y. Edery and B. Berkowitz (2013), Comparative analysis of formulations for conservative transport in porous media through sensitivity-based parameter calibration, *Water Resources Research*, 49, 5206–5220 doi:10.1002/wrcr.20395.
11. Raveh-Rubin, S., Y. Edery, I. Dror and B. Berkowitz (2015), Nickel migration and retention dynamics in natural soil columns. *Water Resources Research* 51 (9), 7702-7722
12. Edery, Y., I. Dror, H. Scher and B. Berkowitz (2015), Anomalous reactive transport in porous media: Experiments and modeling. *Physical Review E* 91 (5), 052130
13. Ciriello, V., Y. Edery, A. Guadagnini and B. Berkowitz (2015), Multimodel framework for characterization of transport in porous media. *Water Resources Research*.
14. Naftaly, A. Y. Edery, I. Dror, B. Berkowitz, B. (2015), Visualization and analysis of nanoparticle transport and ageing in reactive porous media. *Journal of Hazardous Materials* 299, 513-519
15. Edery, Y. G. M. Porta, A. Guadagnini, H. Scher, and B. Berkowitz. (2016) Characterization of bimolecular reactive transport in heterogeneous porous media. *Transport in Porous Media*.
16. Edery, Y., Geiger, S., & Berkowitz, B. (2016). Structural controls on anomalous transport in fractured porous rock. *Water Resources Research*, 52(7), 5634-5643.
17. Edery, Y., Berg, S., & Weitz, D. (2017). Thin film effect on capillary forces in porous media. In preparations.

PRESENTATIONS

Invited Lectures

2015 Institute of Petroleum Engineering, Heriot-Watt University, United Kingdom.

- 2016 Center for Energy and Propulsion Research Reacting Gas Dynamics Laboratory (CEPR/RGD) Seminar, MIT.
- 2017 Earth Sciences Institute, the Hebrew University of Jerusalem, Israel.
- 2017 Dept. of Civil and Environmental Engineering, Technion, Israel.
- 2017 Zuckerberg Institute for Water Research, Ben-Gurion University, Israel.
- 2017 Department of Geological and Environmental Sciences, Ben-Gurion University, Israel.
- 2017 School of Mechanical Engineering, Tel-Aviv University, Israel.
- 2017 CUPB - SEAS workshop, China University of Petroleum Beijing.
- 2017 Squishy Physics, Harvard University.
- 2018 SEG Rock Physics and Digital Rock Applications Workshop, Beijing, China.

Conference Talks

Edery, Y., S. Berg., D. Weitz (2017), Thin film dynamics and its effect on two phase flows in porous media. 2017 AGU Fall Meeting, 11-15 December, New Orleans, Louisiana.

Edery, Y., S. Berg., D. Weitz (2017), Thin film dynamics and its effect on two phase flows in porous media. 70th Annual Meeting of the APS Division of Fluid Dynamics November 19 - 21, 2017, Denver, Colorado.

Edery, Y., S. Berg., D. Weitz (2017), Surfactant variations in porous media localize capillary instabilities during Haines jump. Featured lecture at the 9th Interpore conference May 8-12, 2017, Rotterdam, the Netherlands.

Edery, Y., D. Weitz (2016), Instability in micromodel porous media two phase flow due to interfacial drag, 8th International Interpore Conference, May 9-12, 2016, Cincinnati, OH.

Edery, Y., H. Scher, A. Guadagnini and B. Berkowitz (2013), Origins of anomalous transport in disordered media: structural and dynamic controls, Waterconf2013, June 13, Hebrew University

Edery, Y., H. Scher, A. Guadagnini and B. Berkowitz (2013), Origins of anomalous transport in disordered media: structural and dynamic controls, American Geophysical Union Fall Meeting, Dec. 913, San Francisco, 2013

Edery, Y., S. Rubin, Dror. I and Berkowitz, B., (2012), Experimental and particle-tracking model analysis of anomalous transport and sorption of nickel in natural soil columns, American Geophysical Union Fall Meeting, Dec. 3-7, San Francisco, 2012

Edery, Y., T. Klein, H. Shpaisman (2009), Supplying Israel's Electric Energy Demand: Life Cycle Analysis Approach, Annual Meeting of the Israel Sustainable Energy Society. Weizmann Institute of Science, Sept. 9, 2009

Posters and abstracts

Edery, Y., H. Scher and B. Berkowitz (2012), Particle tracking model of bimolecular reactive transport in porous media, Gordon Research Conference (GRC) on Flow & Transport in Permeable Media, June 2329, Les Diablerets, Switzerland 2012

Edery, Y., H. Scher and B. Berkowitz (2010), Particle tracking model of bimolecular reactive transport in porous media, Gordon Research Conference (GRC) on Flow & Transport in Permeable Media, Nov. 1116, Bates College, Lewiston, ME, 2010

TEACHING & ADVISING EXPERIENCE

Teaching

Lab demonstrations & tutoring in Introduction to Fluid Mechanics and Transport course at Harvard. 40 students.

Advising Experience

5 undergraduate students, 1 master student, 2 graduates students.

AWARDS & GRANTS

Fellowships

2010, 2011 Rieger Foundation Fellowship for advancing the field of Environmental Sciences.

2012, 2013 Israel Water Authority (IWA) Fellowship

2015 Receiving the IMON post-doctorate fellowship.

2015 Receiving the BARD post-doctorate fellowship (the fellowship was declined due to fellowship rules).

Academic Recognition

2009 Dean's Award, Faculty of Chemistry, Weizmann Institute of Science.

2013 Best lecture award in waterconf2013 conference, Hebrew University.

2014 Valedictorian, Ph.D. graduation ceremony, Weizmann Institute of Science.

2017 Postdoctoral Award for Professional Development, Harvard.

Research Grants

2017 Receiving the National Science Foundation Grant (DMR-1310266, DMR-1206765).

Travel awards

2017 Travel Grant, Division of Fluid Dynamics of the American Physical Society, 500\$.

PROFESSIONAL SERVICE

Committee Experience

Organizing committee of the CARESS conference. Conference organizer, 2011, 2013.

Best poster committee at the inter pore conference. Judging the posters, 2016, 2017.

Session Chair, Division of Fluid Dynamics of the American Physical Society, 2017.

Educational Outreach

REU Mentor, 2016, 2017

Highschool mentor for gifted kids, 2011, 2012, 2013.

Professional memberships

American Geophysical Society. 2012, 2013, 2017

American Physical Society. 2017