

CURRICULUM VITÆ

Address:

Department of Chemical Engineering
Ben-Gurion University of the Negev
84105 Beer-Sheva, Israel
Email: tsori@bgu.ac.il
Tel (972)-8-647 7794
Fax (972)-8-647 2916
Web: <http://www.bgu.ac.il/~tsori>

OrcidID: 0000-0003-3664-6498

ResearcherID: F-1524-2012

ScopusID: 6603006999

Member of the Ilse Katz Institute for Nanoscale Science & Technology, and the Reimund Stadler Minerva Center for Mesoscale Macromolecular Engineering.

Employment

Mar. 2015 – Present: Full Professor, Dept. Chemical Engineering (Ben Gurion Univ., Israel)
Oct. 2009 – Mar. 2015: Associate Professor, Dept. Chemical Engineering (Ben Gurion Univ., Israel)
Apr. 2005 – Oct. 2009: Senior Lecturer, Dept. Chemical Engineering (Ben Gurion Univ., Israel)
Sep. 2004 – Mar. 2005: Post-doc with Profs. J.-F. Joanny/J. Prost (Institut Curie, Paris)
Sep. 2003 – Sep. 2004: Post-doc with Prof. P.-G. de Gennes (Collège de France, Paris)
Oct. 2001 – Sep. 2003: Post-doc with Prof. Ludwik Leibler (ESPCI, Paris),
Chateaubriand fellowship program.

Education

1998-2001: Graduate studies in Condensed Matter Physics: Ph.D. student.
Tel Aviv University, Israel.
2001: Ph.D. in Physics, with distinction.
Thesis Subject: *Ordered Morphologies of Diblock Copolymers in Bulk and Thin-Film Systems.*
Supervisor: Prof. D. Andelman.

1996-1997: Graduate studies in Condensed Matter Physics: M.Sc. student.
Hebrew University, Jerusalem, Israel.
1997: M.Sc. in Physics, Magna cum Laude.
Thesis Subject: *On the Theory of a Two-Dimensional Ballast Resistor.*
Supervisor: Prof. B. Meerson.

1992-1995: Undergraduate studies in Combined Mathematics – Physics Program.
Hebrew University, Jerusalem, Israel.
1995: B.Sc. in Combined Mathematics – Physics Program.

Awards and Appointments

- Frankel Family Chair in Energy and Chemical Engineering (2018 – today).
- Member of the Young Academy of Europe (YAE) (2013 – today).
<http://www.yacadeuro.org>.
- Chair Michelin, Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI) (2008).
- The Joseph and May Winston Foundation Career Development Chair in Chemical Engineering (2008).
- The Wolf Foundation Krill Prize for Excellence in Scientific Research (2007).
- Toronto prize for excellency in scientific research (2006).
- Joliot Curie visiting professor, ESPCI (2005).
- Chateaubriand fellowship (2001).
- Excellency award of the Union of Iranian Immigrants in Israel (1995).
- Excellency award of the Karples Family (HUJI, 1995, 1996).

Edited Books

- “Polymers, liquids and colloids in electric fields: Interfacial instabilities, orientation, and phase-transitions”
Eds. Y. Tsori and U. Steiner, World Scientific (2008).

Book Chapters

- Y. Tsori
External-Field Induced Pattern Formation in Some Polymer Systems,
In *Nonlinear Dynamics in Polymeric Systems,*
ACS Symposium Series No. 869; Pojman, J. A.; Tran-Cong-Miyata, Q. Eds.; Oxford University Press: Oxford, 2003; pp 264.

Grants

- Y. Tsori
Nucleation, ordering, and crystallization in electric field gradients,
Israel Science Foundation (ISF) grant no. 274/19, 2019-2023.
- Y. Tsori
Electrostatics of liquid mixtures – phase transitions, colloidal stabilization and flow,
Israel Science Foundation (ISF) grant no. 56/14, 2014-2018.

- Y. Tsori
NANOFLUIDS – Heat capacity of ionic liquids,
Abengoa Solar New Technology, 2015-2016.
- Y. Tsori
Phase Transitions and Chemical and Biological Reactions in Electric Field Gradients,
European Research Council (ERC) “Starting Grant” no. 259205, 2010-2015.
- Y. Tsori
Phase transitions in liquid mixtures in electric fields gradients,
Israel Science Foundation (ISF) grant no. 11/10, 2010-2014.
- Y. Tsori and M. Müller
Kinetics of directed assembly in diblock copolymer thin films under the influence of electric fields,
Deutsche Forschungsgemeinschaft (DFG) grant no. MU1674/11-1, 2010-2013.
- Y. Tsori
Demixing dynamics and instabilities in ion-containing liquid mixtures in nonuniform electric fields,
Young German- Israel Fun (GIF) grant no. 2144-1636.10/2006, 2008.
- Y. Tsori
Electric-Field Induced Phase Separation in Liquid Mixtures,
Israel Science Foundation (ISF) grant no. 284/05, 2005-2008.

Patents

- Y. Tsori
Electric-Field Induced Phase Separation in Liquid Mixtures,
US 8357280 B2, PCT/IL2007/000737.
- S. Samin and Y. Tsori
Stabilization Of Particles In Solutions Using Antagonistic Salts,
30403/US/12 PROV, 61/772,261.

Invited Talks at Scientific Meetings

- *Electro-prewetting phase transitions and pattern-formation in liquid mixtures in electric field gradients*,
SIAM Conference on Mathematical Aspects of Materials Science,
Bilbao, Spain **5/2021**.
- *Force and Torque on an Uncharged Colloid in Water Near a Charged Wall*,
Workshop on Optofluidics and Electrokinetics in Micro and Nanoscale Devices,
Technion, Israel **12/2018**.

- *Reversible Pore Gating in Aqueous Mixtures Via External Potentials*,
Reversible Control of Surface Interactions,
Oxford, UK **9/2016**.
- *Phase Transitions in Polymers and Liquids in Electric Field Gradients*,
Smart and Green Interfaces: Multiphase flows with/without phase change,
Zaragoza, Spain **10/2013**.
- *The Interaction Between Colloids in Polar Mixtures*,
Meeting of COST action MP1106 – Smart and green interfaces - from single bubbles and
drops to industrial, environmental and biomedical applications,
Academy of Sciences of the Czech Republic, Prague **3/2013**.
- *Dynamics of Phase Transitions in Liquids in Electric Fields*,
CMS summer school on Microstructure: evolution and dynamics,
Technion, Israel **8/2013**.
- *The Interaction Between Colloids in Polar Mixtures*,
Workshop on New Challenges in Electrostatics of Soft and Disordered Matter,
Toulouse, France **5/2012**.
- *Phase Transitions in Polymers and Liquids in Electric Field Gradients*,
The 9th Stadler Minerva Student Workshop,
Ein-Gedi, Israel **3/2011**.
- *Demixing with Electric Field Gradients*,
Electrokinetic Phenomena in Nano-Colloids and Nano-Fluidics,
Technion, Israel **12/2010**.
- *Phase Transitions in Nonuniform Forcing*,
Workshop on Fluctuation-induced Forces in Condensed Matter, Max-Planck Institute for
the Physics of Complex Systems,
Dresden, Germany **10/2010**.
- *Phase Separation Transition in Liquids in Electric Field Gradients*,
Tel Aviv Symposium in Chemical Physics,
Tel Aviv, Israel, **6/2009**.
- *Phase Separation Transition in Liquids in Electric Field Gradients*,
Soft matter at interfaces: from self assembly to nano-confinement,
Neve Ilan, Israel, **6/2009**.
- *Phase Separation Transition in Liquids in Electric Field Gradients*,
EU SoftComp Network on Self-Assembly and Biomimetics,
Weizmann Institute of Science, Rehovot, Israel, **3/2009**.
- *Phase Transitions in Polymers and Liquids in Electric Fields*,
Meeting of the Israel Chemical Society,
Tel-Aviv, Israel, **2/2009**.

- *Phase-Separation Transition in Liquid Mixtures Near Charged Objects*, Franco-Israeli Trends in soft matter, biophysics and microfluidics, Biarritz, France **10/2007**.
- *Discontinuous Liquid Rise in Capillaries With Varying Cross-Sections*, Israel Physics Society annual meeting, Jerusalem, Israel, **12/2006**.
- *Phase Separation in Liquid Mixtures Induced by External Fields: switchable lubrication and more*, 4th Eastern Mediterranean Chemical Engineering Conference, Dead Sea, Israel **1/2006**.
- *On the Rise and Fall of Liquid in Capillaries With Nonuniform Cross-Sections*, Symposium in honor of Prof. P.-G. de Gennes, Trieste, Italy, **5/2006**.
- *Phase-Separation in Liquid Mixtures Induced by Spatially Nonhomogeneous Forces*, Matnon 2005, International symposium on forefront of nonlinear science and its applications to materials science in the 21st century, Kyoto, Japan, **9/2005**.

Editorials and Citations

- Review in **Science Now**: “*Parting the Oils*”, by A. Cho, *Science Now*, 28 **July** (2004).
- Review in **Physics Web**: “*Liquid Separation Goes Electric*”, by I. Dumé, *Physics Web*, 28 **July** (2004).
- Media clip in **PhysOrg**: “*Electric-Field-Induced Phase-Separation of Liquid Mixtures*”, by A. Pol, *PhysOrg*, 9 **Aug** (2004).
- Review story on bacteria work in **Science & Vie**: “*La Bactérie, le Trou Noir et le Polaron*”, by F. Lassagne, *Science & Vie* (Hors séries), **September**, pg 42 (2004).
- Article “*Champ Électrique et Démixtion*”, in *Pour la Science*, n° **324** pg 18, **Octobre** (2004).
- Interview in **La Recherche**: “*Une Méthode Simple Pour Séparer des Liquides*”, by Jean-Baptiste Guion, *La Recherche*, n° **379** pg 12, **Octobre** (2004).
- Article “*La Démixtion Controlée par Champ Électrique*”, by Nadège Aumond, *l’Usine Nouvelle*, n° **2937** pg 48, 28 **Octobre** - 3 **Novembre** (2004).

Book Chapters, Conference Proceedings/Abstracts

- J. Galanis, S. Samin and Y. Tsori
Controlling the fluid-fluid mixing-demixing phase transition with electric fields, In *Electrostatics of Soft and Disordered Matter*. Eds. D.S. Dean, J. Dobnikar, A. Naji and R. Podgornik. Proceedings of the CECAM Workshop “New challenges in Electrostatics of Soft and Disordered Matter” (Pan Stanford Publishing, 2013).

- S. Samin, G. Marcus and Y. Tsori
Phase-separation transition in binary mixtures near charged cylindrical surfaces,
Proceedings of the 10th Granada Seminar, Sep 15-19, 2008.
Modeling and Simulation of New Materials (AIP conference proceedings) **1091** (2009).
- Y. Tsori and D. Andelman
Control of diblock copolymer morphology in thin film,
Abstracts of papers of the American Chemical Society **224**, U485-U485 762-POLY Part 2,
(2002).
- Y. Tsori and D. Andelman
Ordered Morphologies of Confined Diblock Copolymers,
Symposium Proceedings, Dynamics in Small Confining Systems, MRS Fall Meeting 2000
(Boston).
Mat. Res. Soc. Symp. Proc. 651, T8.1.1-T8.1.11 (2001) [cond-mat/0101022].

List of Publications

57. Y. Tsori and R. Granek
Spatiotemporal spread of COVID-19: Comparison of the inhomogeneous SEPIR model and data from South Carolina,
medRxiv <https://doi.org/10.1101/2021.08.15.21262074>.
56. Y. Tsori
Electroprewetting near a flat charged surface,
Phys. Rev. E **104**, 054801 (2021) [arXiv:xxx:yyyy].
<https://doi.org/10.1103/PhysRevE.104.054801>.
55. R. Kroll and Y. Tsori
Liquid nucleation around charged particles in the vapor phase,
J. Chem. Phys. **155**, 174101 (2021) [arXiv:2111.02255].
<https://doi.org/10.1063/5.0067249>.
54. Y. Tsori and R. Granek
Epidemiological model for the inhomogeneous spatial spreading of COVID-19 and other diseases,
PLOS ONE **16**, 1 (2021).
<https://doi.org/10.1371/journal.pone.0246056>.
medRxiv <https://doi.org/10.1101/2020.07.08.20148767>.
53. Z. Chernia and Y. Tsori
Hydrogen bonding of Dimethylpyridine's molecular clusters in water: The Quantum Mechanical description of the LCST's hierarchy in phase separation phenomena,
J. Chem. Phys. **152**, 204304 (2020).
52. R. Kroll and Y. Tsori
Surface tension in liquids containing antagonistic ions,
Soft Matter **16**, 2055 (2020).
51. Y. Tsori
Bistable colloidal orientation in polar liquid near a charged wall,
J. Coll. Interf. Sci. **559**, 45-50 (2020) [arXiv:1910.06580].
<https://doi.org/10.1016/j.jcis.2019.09.096>.
50. J. Galanis and Y. Tsori
Surface tension and domain growth in nonuniform electric fields,
Eur. Phys. J.-Spec. Top. **227**, 2675 (2019).
49. S. D. Deshmukh and Y. Tsori
Controlled chemical kinetics in porous membranes,
J. Phys. Chem. B **122**, 8269 (2018).
48. Z. Chernia and Y. Tsori

Complexation reactions in pyridine and 2,6-dimethylpyridine-water system: The quantum-chemical description and the path to liquid phase separation,
J. Chem. Phys. **148**, 104306 (2018).

47. Y. Katsir and Y. Tsori
Recent advances in liquid mixtures in electric fields,
J. Phys.: Condens. Matter **29**, 063002 (2017) [arXiv:1701.02482].
46. S. Samin and Y. Tsori
Reversible pore gating in aqueous mixtures via external potential,
Coll. Interf. Sci. Comm. **12**, 9 (2016).
45. S. D. Deshmukh and Y. Tsori
Control of chemical reactions using electric field gradients,
J. Chem. Phys. (Communication) **144**, 191102 (2016) [arXiv:1701.04980].
44. J. Galanis and Y. Tsori
Interface initiation and propagation in liquid demixing with electric fields,
J. Chem. Phys. **141**, 214506 (2014).
43. S. Samin, M. Hod, E. Melamed, M. Gottlieb and Y. Tsori
Stabilization of colloids by addition of salt,
Phys. Rev. Applied **2**, 024008 (2014) [arXiv:1409.3557].
42. K. Orzechowski, M. Adamczyk, A. Wolny and Y. Tsori
Shift of the critical mixing temperature in strong electric fields. Theory and experiment,
J. Phys. Chem. B **118**, 7187-7194 (2014).
41. U. Welling, M. Müller, H. Shalev and Y. Tsori
Block copolymer ordering in cylindrical capacitors,
Macromolecules **47**, 1850-1864 (2014).
40. J. Galanis and Y. Tsori
Phase separation dynamics of simple liquids in non-uniform electric fields,
J. Chem. Phys. **140**, 124505 (2014).
39. S. Samin and Y. Tsori
Stabilization of charged and neutral colloids in salty mixtures,
J. Chem. Phys. **139**, 244905 (2013) [arXiv:1312.7199].
38. J. Galanis and Y. Tsori
Mixing-demixing phase diagram for simple fluids in non-uniform electric fields,
Phys. Rev. E **88**, 012304 (2013) [arXiv:1307.4520].
37. S. Samin, Y. Tsori, and C. Holm
Vapor-liquid coexistence of the Stockmayer fluid in nonuniform external fields,
Phys. Rev. E **87**, 052128 (2013) [arXiv:1303.2293].

36. S. Samin and Y. Tsori
The interaction between colloids in polar mixtures above T_c ,
J. Chem. Phys. **136**, 154908 (2012) [arXiv:1201.3535].
35. S. Samin and Y. Tsori
Attraction between like-charge surfaces in polar mixtures,
EPL **95**, 36002 (2011) [arXiv:1103:0544].
34. S. Samin and Y. Tsori
Vapor-liquid equilibrium in electric field gradients,
J. Phys. Chem. B **115**, 75 (2011).
33. G. G. Putzel, D. Andelman, Y. Tsori and M. Schick
Ionic effects on the electric field needed to orient dielectric lamellae,
J. Chem. Phys. **132**, 164903 (2010) [arXiv:1004:5158].
32. V. Viasnoff, A. Meller, U. Bockelmann, H. Isambert and Y. Tsori
Localized Joule heating produced by ion current focusing through micron-size holes,
Appl. Phys. Lett. **96**, 163701 (2010) [arXiv:1004.4740].
31. S. Samin and Y. Tsori
Stability of binary mixtures in electric field gradients,
J. Chem. Phys. **131**, 194102 (2009) [arXiv:0907.4855].
30. Y. Tsori
Colloquium: Phase transitions in polymers and liquids in electric fields,
Rev. Mod. Phys. **81**, 1471 (2009) [arXiv:0912.1736].
29. G. Marcus and Y. Tsori
Phase separation transition in liquids and polymers induced by electric field gradients,
J. Phys. Soc. Jap. **78**, 041010 (2009) [arXiv:0901.1990].
28. G. Marcus, S. Samin and Y. Tsori
Phase-separation transition in liquid mixtures near curved charged objects,
J. Chem. Phys. **129**, 061101 (2008) [arXiv:0712.2901].
27. Y. Tsori, D. Andelman and J.-F. Joanny
Interfacial instability of charged end-group polymer brushes,
Europhys. Lett. **82**, 46001 (2008) [arXiv:0801.3318].
26. Y. Tsori and L. Leibler
Phase-separation of miscible liquids in a centrifuge,
C. R. Physique **8**, 955 (2007) [arXiv:0707.2266].
25. Y. Tsori
Discontinuous meniscus location in tapered capillaries driven by pressure difference and dielectrophoretic forces,
Langmuir **23**, 8028 (2007) [cond-mat/0702099].

24. Y. Tsori and L. Leibler
Phase-separation in ion-containing mixtures in electric fields,
Proc. Natl. Acad. Sci. USA **104**, 7348 (2007) [cond-mat/0610475].
23. Y. Tsori
Lamellar phase in nonuniform electric fields: Breaking the in-plane rotation symmetry and the role of dielectric constant mismatch,
Macromolecules **40**, 1698 (2007) [cond-mat/0609319].
22. Y. Tsori
Discontinuous liquid rise in capillaries with varying cross-sections,
Langmuir **22**, 8860 (2006) [cond-mat/0604231].
21. Y. Tsori, C.-Y. Li, D. Andelman and M. Schick
Block-copolymers in electric fields – a comparison of single-mode and self-consistent field approximations,
Macromolecules **39**, 289 (2006) [cond-mat/0508179].
20. Y. Tsori and D. Andelman
Coarse graining in block copolymer films,
J. Pol. Sci.: Pol. Phys. B **44**, 2725 (2006) [cond-mat/0603096].
19. Y. Tsori, E. Sivaniah, D. Andelman and T. Hashimoto
Orientalional transitions in symmetric diblock copolymers on rough surfaces,
Macromolecules (note) **38**, 7193 (2005) [cond-mat/0504410].
18. Y. Tsori and L. Leibler
Electrostatic cancellation of gravity effects in liquid mixtures,
Phys. Rev. E (Brief Reports) **71**, 032101 (2005) [cond-mat/0501744].
17. Y. Tsori and P.-G. de Gennes
Damping of acoustic waves in dilute polymer solutions,
Macromolecules (Communication to the Editor) **37**, 8195 (2004) [cond-mat/0407698].
16. Y. Tsori, F. Tournilhac and L. Leibler
Demixing in simple fluids induced by electric field gradients,
Nature **430**, 544 (2004).
15. Y. Tsori and P.-G. de Gennes
Frustrated rotations in nematic monolayers,
Eur. Phys. J. E **14**, 91 (2004) [cond-mat/0404259].
14. Y. Tsori and P.-G. de Gennes
Self Trapping of a single bacterium in its own chemoattractant,
Europhys. Lett. **66**, 599 (2004) [q-bio.PE/0405005].
13. Y. Tsori
Controlled pattern formation in some block copolymer systems,
ACS symposium series **869**, 264-275 (2004).

12. Y. Tsori and D. Andelman
Parallel and perpendicular lamellae on corrugated surfaces,
Macromolecules **36**, 8560 (2003) [cond-mat/0304334].
11. Y. Tsori, F. Tournilhac and L. Leibler
Orienting ion-containing block copolymers using ac electric fields,
Macromolecules **36**, 5873 (2003) [cond-mat/0301116].
10. Y. Tsori, F. Tournilhac, D. Andelman and L. Leibler
Structural changes in block copolymers: coupling of electric field and mobile ions,
Phys. Rev. Lett. **90**, 145504 (2003) [cond-mat/0208129].
9. Y. Tsori and D. Andelman
Ordering mechanisms in confined diblock copolymers,
J. Interf. Sci. **11**, 259 (2003) [cond-mat/0208127].
8. Y. Tsori and D. Andelman
Control of diblock copolymer morphology in thin film,
Abstracts Of Papers Of The American Chemical Society **24**, U485 (2002).
7. Y. Tsori and D. Andelman
Thin films of diblock copolymer in electric field:
transition from perpendicular to parallel oriented lamellae,
Macromolecules **35**, 5161 (2002) [cond-mat/0110282].
6. Y. Tsori and D. Andelman
Diblock copolymers thin films: parallel and perpendicular
lamellar phases in the weak segregation,
Eur. Phys. J. E. **5**, 605 (2001) [cond-mat/0105213].
5. Y. Tsori and D. Andelman
Surface induced ordering in thin film diblock copolymers: tilted lamellar phases,
J. Chem. Phys. **115**, 1970 (2001) [cond-mat/0103250].
4. Y. Tsori and D. Andelman
Diblock copolymer ordering induced by patterned surfaces above the order-disorder
transition,
Macromolecules **34**, 2719 (2001) [cond-mat/0007055].
3. Y. Tsori and D. Andelman
Diblock copolymer ordering induced by patterned surfaces,
Europhys. Lett. **53**, 722 (2001) [cond-mat/0007056].
2. Y. Tsori, D. Andelman and M. Schick
Defects in lamellar diblock copolymers: chevron- and omega-shaped tilt boundaries,
Phys. Rev. E. **61**, 2848 (2000) [cond-mat/9905378].

1. B. Meerson and Y. Tsori

Annular Ballast resistor: symmetry breaking, pinning and coarsening in a globally constrained reaction-diffusion system,
Phys. Rev. E. **57**, 159 (1998).