

## Arkadii Arinstein

Research Professor Associate

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## Curriculum Vitae

### Education

- 1977: M.Sc. (with honors), Physical Department, Tomskii State University, Tomsk, Russia

### Academic Degrees

- 1982: Ph.D., Landau Institute of Theoretical Physics, USSR Academy of Sciences, Moscow, Russia
- 1995: Doctor of Sciences (habilitation), N.N. Semenov Institute of Chemical Physics, Russian Academy of Sciences, Moscow, Russia
- 1999: The government certificate of Full Professor, Moscow, Russia

### Research Interests

- **Polymer Physics**
- **Nanotechnology:** polymer nanofibers, polymer system under confinement
- **Kinetic processes in dispersion systems:** aggregation processes, structure formation, self-ordering in the kinetic systems, kinetics of chemical reactions in condensed phase
- **Transport phenomena in heterogeneous media**

### Membership in Professional Societies

Vinogradov Society of Rheology, Russia: Member.

American Physical Society: Member.

IOP Institute of Physics: Member.

### Honors and Awards

The laureate of the Annual Vinogradov Prize awarded by Vinogradov Society of Rheology (2019);

The laureate of the State Grant for Outstanding Scientists of Russia (1995);

Soros Foundation Grant awarded by the American Physical Society (1993).

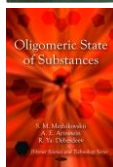
### Books



S.M. Mezhevikovskii, A.E. Arinstein, R.Ja. Deberdeev.

**Oligomeric state of material.**

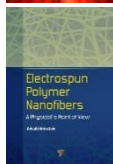
-320 p. Publishing House "Nauka",  
Moscow. 2005 (in Russian).



S.M. Mezhevikovskii, A.E. Arinstein, and R.Ja. Deberdeev.

**Oligomeric State of Substances.**

Series: Polymer Science and Technology.  
Nova Publishers, 2009.



A. Arinstein.

**Electrospun Polymer Nanofibers.**

-250 p. Pan Stanford Publishing, 2017.  
ISBN 9789814745277.

## Selected Publications

- Sh. Deng, A. Arinstein, E. Zussman. “*Size-Dependent Mechanical Properties of Glassy Polymer Nanofibers via Molecular Dynamics Simulations.*” *Journal of Polymer Science Part B: Polymer Physics* **55**, 506–514, 2017.
- I. Khamaysi, A. A. Ammar, G. Vasilyev, A. Arinstein, Y. Chowders, and E. Zussman. “*Differentiation of Pancreatic Cyst Types by Analysis of Rheological Behavior of Pancreatic Cyst Fluid.*” *Scientific Reports* **7**, 45589, 2017.
- R. Pogreb, R. Loew, E. Bormashenko, G. Whyman, V. Multanen, E. Shulzinger, A. Abramovich, D. Rozban, A. Shulzinger, E. Zussman, A. Arinstein, G. Vasilyev, Al. Ya. Malkin. “*Relaxation spectra of polymers and phenomena of electrical and hydrophobic recovery: interplay between bulk and surface properties of polymers.*” *Journal of Polymer Science Part B: Polymer Physics* **55**, 198–205, 2017.
- G. Vasilyev, M. Burman, A. Arinstein, and E. Zussman. “*Estimating the degree of polymer stretching during electrospinning: an experimental imitation method.*” *Macromolecular Materials and Engineering* **302**, 1600554, 2017.
- Cl. Marmorat, A. Arinstein, N. Koifman, Y. Talmon, E. Zussman and M. Rafailovich. “*Cryo-imaging of hydrogels supermolecular structure.*” *Scientific Reports* **6**, 25495, 2016.
- D. Alhazov, M. Burman, A. Arinstein, E. Zussman. “*Relaxation suppression in a stretched copolymer matrix above  $T_g$ .*” *Journal of Polymer Science Part B: Polymer Physics* **53**, 12554–1259, 2015.
- Ya. Malkin, A. Arinstein, V. G. Kulichikhin. “*Polymer extension flows and instability.*” *Progress in Polymer Science* **39**, 959–978, 2014.
- V. G. Kulichikhin, A. Ya. Malkin, A. V. Semakov, I. Yu. Skvortsov, A. Arinstein. “*Jet instability due to stretch-induced phase separation in polymer solutions.*” *European Physical Journal E* **37**, 10, 2014.
- O. Regev, A. Arinstein, and E. Zussman. “*Creep anomaly in engineered protein fibers.*” *Physical Review E* **88**, 062605, 2013.
- D. Alhazov, A. Gradys, P. Sajkiewicz, A. Arinstein, and E. Zussman. “*Thermo-mechanical behavior of electrospun thermoplastic polyurethane nanofibers*”. *European Polymer Journal* **49**, 3851–3856, 2013.
- Arinstein. “*Confinement mechanism of electrospun polymer nanofiber reinforcement.*” *Journal of Polymer Science Part B: Polymer Physics* **51**, 756, 2013.
- Greenfeld, A. Arinstein, K. Fezzaa, M. H. Rafailovich, E. Zussman. “*Evolution of Polymer Solution Structure during Electrospinning: Simplest Theoretical Model and Experimental Observations.*” *Physical Review E* **84**, 041806, 2011.
- M. Burman, A. Arinstein, and E. Zussman. “*Do surface effects explain the unique properties of polymer nanofibers?*” *Europhysics Letters* **96**, 16006, 2011.
- Arinstein, and E. Zussman. “*Electrospinning Polymer Nanofibers: Mechanical and Thermodynamics Perspectives.*” *Journal of Polymer Science Part B: Polymer Physics* **49**, 691, 2011.
- C.S. Reddy, A. Arinstein, and E. Zussman. “*Polymerization kinetics under confinement.*” *Polymer Chemistry* **2**, 835, 2011.
- A. Arinstein, Y. Liu, M. Rafailovich, and E. Zussman. “*Shifting of the melting point for semicrystalline polymer nanofibers.*” *Europhysics Letters* **93**, 46001, 2011.
- C.S. Reddy, A. Arinstein, R. Avrahami and E. Zussman. “*Fabrication of thermoset polymer nanofibers by co-electrospinning of uniform core-shell structures.*” *Journal of Materials Chemistry* **19**, 7198, 2009.
- A. Arinstein. “*Longitudinal oscillations and flights of the string pendulum driven by a periodic force.*” *Physical Review E* **79**, 056609, 2009.
- A. Arinstein, R. Avrahami, and E. Zussman. “*Buckling Behaviour of Electrospun Microtubes: a Simple Theoretical Model and Experimental Observations.*” *Journal of Physics D: Applied Physics* **42**, 015507, 2009.
- M. Burman, A. Arinstein, and E. Zussman. “*A novel non-destructive method for mechanical testing of individual nanofibers.*” *Applied Physics Letters* **93**, 193118, 2008.
- A.E. Arinstein and M. Gitterman. “*Inverted spring pendulum driven by a periodic force: linear versus nonlinear analysis.*” *European Journal of Physics* **29**, 385, 2008.
- A. Arinstein. “*The Features of Ribbon-Like Polymers in Thin Films.*” *Israel Journal of Chemistry* **47**, 289, 2007.
- A. Arinstein, and E. Zussman. “*Postprocesses in tubular electrospun nanofibers.*” *Physical Review E* **76**, 056303, 2007.

- A. Arinstein, M. Burman, O. Gendelman, and E. Zussman. “*The effect of supermolecular structure on polymer nanofiber elasticity.*” *Nature Nanotechnology* **2**, 59, 2007.
- J. Mathé, A. Arinstein, Y. Rabin, and A. Meller. “*Equilibrium and irreversible unzipping of DNA in a nanopore.*” *Europhysics Letters* **73** 128, 2006.
- A.E. Arinstein. “*Uniaxial ordering and rotator phase of ribbon-like polymers.*” *Physical Review E* **72**, 051806, 2005.
- A.E. Arinstein. “*Conformational statistics of ribbon-like semiflexible polymer chains.*” *Physical Review E* **72**, 051805, 2005.
- A.E. Arinstein and M. Gitterman. “*Random walks and anomalous diffusion in two-component random media.*” *Physical Review E* **72**, 021104 2005.

### **Chapters in books**

- A. Arinstein. “*Supermolecular structure formation during electrospinning, and its effect on electrospun polymer nanofiber unique features.*” In: “*Problems of Nonlinear Mechanics and Physics of Materials*” Collection of Papers dedicated to the 80th birthday of Professor Leonid I. Manevitch. Springer. 2018.
- L. Persano, F. Cardarelli, A. Arinstein, S. Uttiya, E. Zussman, D. Pisignano, A. Camposeo. “*3D printing of optical materials: an investigation of the microscopic properties.*” *Organic Photonic Materials and Devices XX*. Book Series: Proceedings of SPIE **10529**, UNSP 105290V, 2018
- A. Arinstein. “*The evolution of polymer system during electrospinning: from a semi-dilute polymer solution in to a non-equilibrium state.*” In: “*Nonlinearity: Problems, Solutions, Applications.*” Ed. by L. Uvarova, A. Latyshev. Nova Science Publishers, Inc. 2017, p. 203–232.
- A. Arinstein. “*Spontaneous symmetry breaking in a thermodynamic system of pulleys.*” In: “*Problems of Nonlinear Dynamics and Condensed Matter Physics*” Collection of Papers dedicated to the 75th birthday of Professor Leonid I. Manevitch. Moscow, Russia, 2013 p. 177.