

Malihe Ghodrat

Assistant Professor
Statistical and Soft Matter Physics

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Contact

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Research Interests

- Physics of living matter
- Soft matter physics - Charge disordered colloids/membranes
- Thermostatistics and hydrodynamics of Newtonian and relativistic systems

Teaching (this year)

1395 Spring Solid state physics
1395 Fall Computational physics

Employment

- Assistant professor, Physics Department, Tarbiat Modares University, since 1395.
- Postdoctoral research associate, Soft matter, Biological and Statistical Physics research group, School of Physics, Institute for Research in Fundamental Sciences (IPM), ([profile](#))

Education

Ph.D. (1385-1389)

- Statistical Physics, Shiraz University, Shiraz, Iran
- **Thesis:** "Thermostatistical properties of a relativistic gas: Equilibrium and non-equilibrium properties"
- **Advisor:** Dr. A. Montakhab

M.Sc. (1382-1385)

- Statistical Physics, Shiraz University, Shiraz, Iran
- **Thesis:** "Information theory and microscopic origin of irreversible macroscopic behavior"
- **Advisors:** Dr. M. Barati, and Dr. A. Montakhab

B.Sc. (1378-1382)

- Solid State Physics, Sharif University of technology, Tehran, Iran

Honors

- **Ranked second** in Ph.D. program.
- **Ranked first** in Master's program.
- **Member of** [Shiraz University Office of Talented Students](#)
- **Highlighted publication in Journal of Chem. Phys. 2015:** ([Featured article Vol. 143](#))
- **Highlighted publication in Journal of Chem. Phys. 2014:** [Sciencedaily](#), [AIP](#) and [PhysOrg](#).
- **Highlighted publication in Physical Rev. E. 2009:** [APS official site](#).

Publications

(See my publications/citations on [Google scholar](#))

- **Molecular dynamics approach to dissipative relativistic hydrodynamics: propagation of fluctuations**, L. Shahsavari, M. Ghodrati, A. Montakhab, [Phys. Rev. C 94, 064905 \(2016\)](#).
- **Ion-mediated interactions between net-neutral slabs: Weak and strong disorder effects**, M. Ghodrati, A. Najji, H. Komaie-Moghaddam, R. Podgornik, [J. Chem. Phys. 143, 234701 \(2015\)](#), ([Featured article](#))
- **Strong coupling electrostatics for randomly charged surfaces: Antifragility and effective interactions**, M. Ghodrati, A. Najji, H. Komaie-Moghaddam, R. Podgornik, [Soft Matter 11, 3441 \(2015\)](#).
- **Asymmetric Coulomb fluids at randomly charged dielectric interfaces: anti-fragility, overcharging and charge inversion**, A. Najji, M. Ghodrati, H. Komaie-Moghaddam, R. Podgornik, [J. Chem. Phys 141, 174704 \(2014\)](#), (*Highlighted by [Sciencedaily](#), [AIP](#) and [PhysOrg](#).*)
- **Thermodynamics of a morphological transition in a relativistic gas**, A. Montakhab, L. Shahsavari, M. Ghodrati, [Physica A, 412, 32 \(2014\)](#).
- **Heat transport and diffusion in a canonical model of a relativistic**, M. Ghodrati, A. Montakhab, [Physical Review E 87, 032120, \(2013\)](#).
- **Molecular dynamics simulation of a relativistic gas: thermostistical properties**, M. Ghodrati, A. Montakhab, [Computer Physics Communication 182, 1909-1913, \(2011\)](#).
- **Time parametrization and stationary distributions in a relativistic gas**, M. Ghodrati, A. Montakhab, [Phys. Rev. E.82, 011110, \(2010\)](#).
- **Statistical thermodynamics of two dimensional relativistic gas**, A. Montakhab, M. Ghodrati, M. Barati, [Phys. Rev. E. 79, 031124, \(2009\)](#). (*Highlighted by APS official site.*)
- **Information Theory and Microscopic Origin of Irreversible Macroscopic Behaviour, part I**, A. Montakhab and M. Ghodrati, Tabesh Magazine¹, winter 2009. (unrefereed)
- **Information Theory and Microscopic Origin of Irreversible Macroscopic Behaviour, part II**, A. Montakhab and M. Ghodrati, Tabesh Magazine, spring 2010. (unrefereed)

Presentation in Conferences

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| 5 Jan 2017
(Oral) | Relativistic effects in macroscopic properties of interacting gaseous systems , 9 th Statistical physics, soft matter and complex systems conference, Shiraz, Iran. |
| 18-22 Jul 2016
(Poster) | Relativistic hydrodynamic theories versus numerical experiments , Statphys 26 conference , Lyon, France. |
| 15-19 Sep 2014
(Poster) | Like-charge attraction: The interplay between charge randomness and electrostatic interactions , Advanced workshop on interdisciplinary views on chromosome structure and function , ICTP, Trieste, Italy, 2014. |
| 29-31 May 2013
(Poster) | Coulomb fluids near randomly charged dielectric interfaces , Condensed matter conference , The 19th Annual IASBS Meeting on Condensed Matter Physics , Zanjan, Iran |
| 22-23 May 2013
(Oral) | Interaction of randomly charged surfaces in the presence of asymmetric coulomb fluids , 20th Physics Spring Conference , Institute for Research in Fundamental Sciences (IPM), Tehran, Iran. |

¹Tabesh magazine is Shiraz University Student Association Magazine which has won numerous local and national awards.

- 18-19 May 2011 (Oral)** **Relativistic gas, [18th Physics Spring Conference](#)**, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran.
- 13-17 Sep 2010 (Poster)** **Statistical thermodynamics of a relativistic gas, [11th Granada Seminar on Foundations of Non-equilibrium Statistical Physics](#)**, Granada, Spain. (Abstract published online in [AIP Conf. Proc. 1332, 287, 2011](#))
- 23-26 Jun 2010 (Poster)** **Thermostatistics of a relativistic gas: equilibrium and non-equilibrium properties, [CCP2010](#)**, Trondheim, Norway. ([Poster P1-25](#))
- 22-23 Apr 2009 (Oral)** **Relativistic generalization of Maxwell distribution; modeling and applications**, National Conference on Astronomy, Astrophysics and Cosmology, Shiraz University, Shiraz, Iran.

Schools and Workshops

- 4-5 Feb 2015** Workshop on computational neuroscience, Shiraz, Iran
- 29-31 Apr 2014** Workshop on computer simulation of living systems, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran.
- 24 Oct 2013** Workshop on Polymer Physics, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran.
- 6-8 Jun 2005** Nanoscience and Nanotechnology Workshop, Kashan University, Kashan, Iran

Conferences and Workshops (member of organizing committee)

- 26 Oct 2011** **International Workshop on Physics of Novel Materials**, Shiraz University, Shiraz, Iran
- Winter 2010** **10th Annual Conference on Condensed Matter Physics**, Shiraz, Iran

Teaching (past)

Spring 2008-9	TA	Classical Electrodynamics	Shiraz Univ., Qeshm Int. Div.
Fall 2007-10	Teacher	General Physics (I), (II)	Shiraz University
Fall 2007	Teacher	Statistical Mechanics	Azad Univ., Shiraz Div.
Spring 2007	TA	Computational Physics	Shiraz University
Fall 2006	TA	Advanced Stat. Mech. (I)	Shiraz University
Fall 2004-6	Teacher	General Physics Lab. (I)	Shiraz University