

Saeed Abedinpour

PERSONAL INFORMATION

Name: Saeed
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Date/Place of Birth: 1979/Marand, Iran
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EDUCATION

- 10/2004-9/2007: Perfezionamento (i.e., Ph.D.) in Physics (70/70 cum laude), Scuola Normale Superiore, Pisa, Italy (*Advisor:* Late Prof. Mario P. Tosi)
 - 9/2001-12/2003: M.Sc. in Physics, Sharif University of Technology, Tehran, Iran (*Advisor:* Prof. Keivan Esfarjani)
 - 9/1997-9/2001: B.Sc. in Physics, K. N. Toosi University of Technology, Tehran, Iran
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SCIENTIFIC EMPLOYMENTS

- 6/2018-Now: Associate Professor, Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran
- 9/2010-5/2018: Assistant Professor, Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran
- 12/2016-06/2021: Part-time researcher, School of Nano Science, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran
- 9/2013-9/2015: Part-time researcher, School of Physics, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran
- 12/2007-11/2009: Post Doctoral Fellow, University of Missouri, Columbia, MO, USA (*Advisor:* Prof. Giovanni Vignale)

- 10/2007-11/2007: Post Doctoral Fellow, School of Physics, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran
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LONG TERM VISITS

- 5/2010-8/2010: Physics Department, Bilkent University, Ankara, Turkey (3 Months)
 - 12/2009-4/2010: School of Physics, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran (4 Months)
 - 9/2004: Faculty of Sciences, Scuola Normale Superiore, Pisa, Italy (1 Month)
 - 7/2003-9/2003: Physics Department, Bilkent University, Ankara, Turkey (2 Months)
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AWARDS

- Recipient of the "Iranian Science Elites Federation" (ISEF) top 15 young researcher of 2021 award (cash award and one postdoctoral grant)
 - Recipient of the "Iranian Science Elites Federation" (ISEF) top 25 young researcher of 2020 award (cash award and one postdoctoral grant)
 - Recipient of the "Iranian Science Elites Federation" (ISEF) top 50 researcher of 2019 award (cash award and one postdoctoral grant)
 - Recipient of the "Iranian Science Elites Federation" (ISEF) top 50 researcher of 2018 award (cash award and one postdoctoral grant)
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ADMINISTRATIVE AND ORGANIZING DUTIES:

- Member of the "Condensed Matter Executive Committee" of "The Physics Society of Iran", 08/2023-now
- Member of the "IASBS faculty hiring committee" at IASBS, Zanjan, 08/2020-now
- Member of the "Department of physics faculty hiring committee" at IASBS, Zanjan, 01/2016-now
- Scientific committee member of the 16th Condensed Matter Physics Conference of Iran, Shahid Beheshti University, Tehran, 25-26 January 2023

- Scientific committee member of the Annual Physics Conference of Iran, 23-26 August 2021
- Director of the IASBS research office, IASBS, Zanjan, 03/2016-5/2019
- Representative of the department of physics in the research council of the university, IASBS, Zanjan, 11/2014-03/2016
- Scientific/organizing committee member of the annual IASBS condensed matter meetings [2012 (chair), 2014, 2015,2016, 2017, 2021, 2023, and 2024]
- Scientific committee member of the 13th Condensed Matter Physics Conference of Iran, Shahid Rajaei University, Tehran, 1-2 February 2017
- Organizer of "Recent Progress in Two-dimensional Systems" workshop, 9 October 2014, School of Physics, IPM, Tehran
- Organizer of physics colloquium series, IASBS, Zanjan, 2011-2013
- Vice chair of the physics department, IASBS, Zanjan, 01/2013-06/2014

THESIS SUPERVISION

I have supervised 5 Ph.D. thesis, and over 20 M.Sc thesis. Currently, 2 Ph.D. and 2 M.Sc. students are working in my group.

TEACHING EXPERIENCE

Graduate:

- Many-body Physics I & II

- Condensed Matter Physics I, II & III
- Advanced Quantum Mechanics I & II
- Advanced Statistical Mechanics I & II
- Advanced Classical Mechanics
- M.Sc. Seminars

Undergraduate:

- Mechanics I, II, III, & IV
 - Solid State Physics 1& II
 - Quantum Physics II, III, IV
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PUBLICATIONS:

1. H. Rahimpour and S. H. Abedinpour, "Collective excitations and screening in two-dimensional tilted nodal-line semimetals", [Phys. Rev. B 109, 045120 \(2024\)](#).
2. F. Pouresmaeeli, S. H. Abedinpour, and B. Tanatar, "Density and pseudo-spin rotons in a bilayer of soft-core bosons" [J. Phys. B 56, 125001 \(2023\)](#).
3. M. Mir and S. H. Abedinpour, "Many-body correction to the intrinsic anomalous and spin Hall conductivities", [Phys. Rev. B 106 L201102 \(2022\)](#) [Selected as editor's suggestion].
4. I. Seydi, [S. H. Abedinpour](#), R. Asgari, M. Panholzer, and B. Tanatar, "Rydberg-dressed Fermi liquid: correlations and signatures of droplet crystallization", [Phys. Rev. A. 103, 043308 \(2021\)](#).
5. Sh. Barati and [S.H. Abedinpour](#), "Thermoelectric response of nodal-line semimetals: probe of the Fermi surface topology", [Phys. Rev. B 102, 125139 \(2020\)](#).
6. M. Mir and [S.H. Abedinpour](#), "Dynamical density response and collective modes of topological insulator ultra-thin films", [Phys. Rev. B 101, 115108 \(2020\)](#).

7. I. Seydi, S.H. Abedinpour, R.E. Zillich, R. Asgari, and B. Tanatar, "Rotons and Bose condensation in Rydberg-dressed Bose Gases", [Phys. Rev. A 101, 013628 \(2020\)](#).
8. S.H. Abedinpour and B. Tanatar, "Counterflow in Bose gas bilayers: collective modes and dissipationless drag", invited contribution to the special issue of [Low Temp. Phys. 46, 480 \(2020\)](#).
9. I. Seydi, S.H. Abedinpour, R. Asgari, and B. Tanatar, "Exchange-correlation effects and the quasiparticle properties in a two dimensional dipolar Fermi liquid" [J. Superconduc. Nov. Magn. 33, 2374\(2020\)](#) [Published as the proceeding of Super-stripes 2019 conference].
10. I. Seydi, S.H. Abedinpour, R. Asgari, B. Tanatar, "Composite quasiparticles in strongly correlated dipolar Fermi liquids", [Phys. Rev. A 98, 063623 \(2018\)](#).
11. A. Mazloom and S.H. Abedinpour, "Interplay of interlayer pairing and many-body screening in a bilayer of dipolar fermions", [Phys. Rev. B 98, 014513 \(2018\)](#).
12. J. Abouie, M.M. Jahromi, S.H. Abedinpour, "Magnetic properties of three-dimensional magnetic topological insulators: the effects of hexagonal warping" (in persian), [Iranian J. Phys. Res. 17, 681 \(2018\)](#).
13. E. Akaturk, S.H. Abedinpour, and B. Tanatar "Density-wave instability and collective modes in a bilayer system of antiparallel dipoles", [J. Phys. Comm., 2, 015018 \(2018\)](#).
14. M. Mir and S.H. Abedinpour, "Coupled spin-charge dynamics in helical Fermi liquids beyond the random phase approximation", [Phys. Rev. B. 96, 245110 \(2017\)](#).
15. R. Khasseh, S.H. Abedinpour, and B. Tanatar, "Phase diagram and dynamics of Rydberg-dressed fermions in two dimensions", [Phys. Rev. A 96, 053611 \(2017\)](#).
16. Sh. Barati and S.H. Abedinpour, "Optical conductivity of three and two dimensional topological nodal-line semimetals", [Phys. Rev. B 96, 155150 \(2017\)](#).
17. A. Mazloom and S.H. Abedinpour, "Superfluidity in density imbalanced bilayers of dipolar fermions", [Phys. Rev. B 96, 064513 \(2017\)](#).
18. I. Seydi, S.H. Abedinpour, and B. Tanatar, "Effective Mass Calculations for Two-dimensional Gas of Dipolar Fermions" [J. Low Temp. Physics 187, 705 \(2017\)](#), [Published as the proceeding of "Quantum Fluids and Solids" (QFS2016)].
19. A. Mazloom, F. Parhizgar, S.H. Abedinpour, and R. Asgari, "Relaxation times and charge conductivity of silicene", [Phys. Rev. B 94, 035153 \(2016\)](#).

20. A. Sabzalipour, J. Abouie, and S.H. Abedinpour, "Anisotropic conductivity in magnetic topological insulators", [J. Phys. Cond. Mat. 27 115301 \(2015\)](#).
21. H. Ustunel, S.H. Abedinpour, and B. Tanatar, "Density functional theory investigation of two-dimensional dipolar fermions in a harmonic trap", [J. Phys. Conf. Ser. 568 012020 \(2014\)](#) [Published as the proceeding of 27th International Conference on Low Temperature Physics (LT27)].
22. S.H. Abedinpour, R. Asgari, B. Tanatar, and M. Polini, "Ground-state and dynamical properties of two-dimensional dipolar Fermi liquids", [Ann. Phys. \(N.Y.\) 340, 25 \(2014\)](#).
23. B.Z. Rameshti, A.G. Moghaddam, S.H. Abedinpour, S. Abdizadeh, M. Zareyan, " Boltzmann conductivity of ferromagnetic graphene with magnetic impurities", [Phys. Rev. B 88, 245424 \(2013\)](#).
24. F. Parhizgar, R. Asgari, S.H. Abedinpour, M. Zareyan, "Anisotropic RKKY interaction in spin polarized graphene", [Phys. Rev. B. 87, 125402 \(2013\)](#).
25. S.H. Abedinpour, R. Asgari, and M. Polini, "Theory of correlations in strongly interacting fluids of two-dimensional dipolar bosons", [Phys. Rev. A 86, 043601 \(2012\)](#).
26. S.H. Abedinpour, G. Vignale, A. Principi, M. Polini, W.-K. Tse, and A.H. MacDonald, "Drude weight, plasmon dispersion, and a.c. conductivity in doped graphene sheets", [Phys. Rev. B 84, 045429 \(2011\)](#).
27. S.H. Abedinpour, G. Vignale, and I.V. Tokatly, Gauge-Invariant Formulation of Spin-Current Density-Functional Theory, [Phys. Rev. B 81, 125123 \(2010\)](#).
28. S.H. Abedinpour, M. Polini, A.H. MacDonald, B. Tanatar, M.P. Tosi, and G. Vignale, Theory of the pseudospin resonance in semiconductor bilayers, [Phys. Rev. Lett 99, 206802 \(2007\)](#).
29. S.H. Abedinpour, R. Asgari, M. Polini, and M.P. Tosi, "Analytic theory of pair-distribution functions in symmetric electron-electron and electron-hole bilayers", [Solid State Commun. 144, 65 \(2007\)](#).
30. S.H. Abedinpour, M. Polini, G. Xianlong, and M.P. Tosi, "Density-functional theory of inhomogeneous electron systems in thin quantum wires", [Eur. Phys. J. B 56, 127 \(2007\)](#).
31. S.H. Abedinpour, M. Polini, G. Xianlong, and M.P. Tosi, "Emergence of Wigner molecules in one-dimensional systems of repulsive fermions under harmonic confinement", [Phys. Rev. A 75, 015602 \(2007\)](#).

32. S.H. Abedinpour, M.R. Bakhtiari, G. Xianlong, M. Polini, M. Rizzi, and M.P. Tosi, "Phase behaviors of strongly correlated fermi gases in one-dimensional confinements", *Laser Physics* **17**, 162 (2007).
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Conference proceedings:

1. A. Mazloom and S.H. Abedinpour, "Unconventional superfluidity in density imbalanced bilayers of dipolar fermions", Proceeding of the 23rd annual IASBS meeting on condensed matter physics, Zanjan, Iran 17-19 May 2017
2. I. Seydi, S.H. Abedinpour, and B. Tanatar, "Quasiparticle properties of ultra-cold dipolar Fermi gas", Proceeding of the 13th Condensed Matter Physics Conference of Iran, Shahid Rajaei University, Tehran, 1-2 February 2017.
3. M. Mir and S.H. Abedinpour, "Dynamical response and collective modes of topological insulator thin films", Proceeding of 22nd Annual IASBS Meeting on Condensed Matter Physics, Zanjan, Iran, 26-27 May 2016.
4. M. Bashokouh and S.H. Abedinpour, "Thermoelectric properties of Phosphorene in the presence of impurities", Proceeding of 22nd Annual IASBS Meeting on Condensed Matter Physics, Zanjan, Iran, 26-27 May 2016.
5. I. Seydi, S.H. Abedinpour, and B. Tanatar, "Effects of dynamical correlations on density-wave instability in two-dimensional dipolar Fermi gas", Proceeding of the 23rd Spring School of IPM, Tehran, Iran 19-20 May 2016
6. F. Ildarabadi and S.H. Abedinpour, "Effects of artificial gauge fields on Bose-Einstein condensation in annular traps", Proceeding of the 12th Condensed Matter Physics Conference of Iran, Isfahan University of Technology, 28-29 January 2015.
7. A. Rezaei, A. Sabzalipour, S.H. Abedinpour, and J. Abouie, "Effect of hexagonal warping on the surface electrical conductivity of a topological insulator", Proceeding of the 12th Condensed Matter Physics Conference of Iran, Isfahan University of Technology, 28-29 January 2015.
8. Sh. Barati, S.H. Abedinpour, M. Zareyan, and R. Asgari, "Quantum spin-Hall effect in single layer graphene sheet in the presence of an exchange field", Proceeding of the 20th annual IASBS meeting on condensed matter physics, Zanjan, Iran 28-30 May 2014.
9. A. Sabzalipour, J. Abouie, and S.H. Abedinpour, "Anisotropic surface conductivity of magnetically doped topological insulator", Proceeding of the 20th annual IASBS meeting on condensed matter physics, Zanjan, Iran, 28-30 May 2014.

10. A. Mazloom, F. Parhizgar, S.H. Abedinpour, and R. Asgari, "Transport properties of silicene in the presence of a perpendicular electric field", Proceeding of the 20th annual IASBS meeting on condensed matter physics, Zanjan, Iran, 28-30 May 2014.
11. A. Rezaei, S.H. Abedinpour, and J. Abouie, "Thermodynamics properties of topological insulators doped with magnetic and non-magnetic impurities", Proceeding of the 21st Spring School of IPM, Tehran, Iran 2014.
12. S. Ahmadi and S.H. Abedinpour, "Ground-state properties of a two-dimensional electron gas with Rashba spin-orbit coupling", Proceeding of the 11th Condensed Matter Physics Conference of Iran, Shahrood University of Technology, 26-27 January 2013.
13. A. Deljouifar, S.H. Abedinpour, M. Zareyan, "Shot Noise in a Topological Insulator" Proceeding of the 11th Condensed Matter Physics Conference of Iran, Shahrood University of Technology, 26-27 January 2013.
14. S.H. Abedinpour and K. Esfarjani, "Linear response of carbon nanotubes", Proceeding of the 9th annual IASBS meeting on condensed matter physics, IASBS, Zanjan, Iran, 8-9 May 2003.

TALKS

- "Topology in Condensed Matter Physics", Invited talk at the Physics Department, University of Tabriz (1 March 2023).
- "Interaction induced topological collective excitations in layered structures", SCCS2022 Conference, Görlitz, Germany (24-29 July 2022).
- "BEC-BCS crossover in ultracold gases", 2nd National School on Superconductivity and Applications, Isfahan University of Technology, Isfahan Iran (5 July 2022).
- "Quasiparticles in Condensed Matter Physics", Physics Club for undergrads, Iranian Physics Society (PSI), Tehran, Iran (21 February 2022).
- "Quantum Droplets in Ultra-cold Gases", IASBS weekly condensed-matter seminars, IASBS, Zanjan, Iran (16 November 2021).
- "Quantum Droplets in Ultra-cold Gases", IPM weekly Nano/CMSP webinars, IPM, Tehran, Iran (29 December 2021).
- Ultra-cold atomic gases and quantum droplets, Physics colloquium at Shiraz University, Shiraz, Iran (25 May 2021).

- Electronic properties of nodal-line semimetals, e-talk at Condensed Matter Conference, Sharif University of Technology, Tehran, Iran (13-15 August 2020).
- Quasi-particle physics, 25th Special School on Topics in Physics, IASBS, Zanjan, Iran (1-5 Feb 2020)
- Quasiparticle properties and competing orders in ultra-cold gases with long-range interactions, Koç University, Istanbul, Turkey (30 July 2019)
- Superfluidity in layered dipolar fermions, The 6th National Conference on Progress in Superconductivity and Magnetism; University of Tehran, Tehran, Iran (1-2 May 2019)
- Composite quasiparticles in ultra- cold dipolar Fermi gases, School of Physics, IPM, Tehran, Iran (6 March 2019)
- Many-body properties of ultra-cold gases with long-range interactions, 14th Condensed Matter Physics Conference of Iran; Ahvaz, Iran (6-7 February 2019)
- Ultra-cold gases: simulators of quantum many-body systems, Department of Physics' Colloquium, Shahid Beheshti University, Tehran, Iran (13 November 2018).
- Many-body properties of ultra-cold dipolar fermions, "24th Annual IASBS Meeting on Condensed Matter Physics", IASBS, Zanjan, Iran (21-22 Jun, 2018)
- Competing Orders in Bilayers of Dipolar Fermions, "International Conference on Multi-Condensate Superconductivity and Superfluidity", ICTP, Trieste, Italy (14-18 May 2018).
- Quantum Hall Effect in New Materials, lecture given in Condensed Matter School on "New Advanced Materials", School of Nano Science, IPM, Tehran, Iran (17-18 Jan 2018).
- Optical Conductivity of Topological Semimetals, Transport Properties of Low-Dimensional Electronic Materials workshop, School of Nano Science, IPM, Tehran, Iran (19-20 Sep 2017).
- Ultra-cold Atomic Gases (2 lectures), 21st Special School on Topics in Physics, IASBS, Zanjan, Iran (13-18 Feb 2016).
- Transport Properties of Spin-polarized Graphene, Quantum transport in graphene (In memory of late Prof. Malek Zareyan), School of Physics, IPM, Iran (24 April 2014).
- Simulating many-body systems with ultra-cold gases, Faculty of Physics, University of Tabriz, Iran (10 March 2014).

- Ultra-cold Atomic Gases, 19th Special School on Topics in Physics, IASBS, Zanjan, Iran (22-26 Feb 2014).
- Many-body Physics: From Dense Matters to Dilute Gases, IASBS' Research Day, IASBS, Zanjan, Iran (28 Jan 2014).
- Ultra-cold Quantum Fluids (2 lectures), Advanced school on recent progress in strongly correlated systems, IPM, Tehran, Iran (25-26 September 2013).
- Spintronics and Pseudospintronics in Graphene, Advanced School on Graphene and its Optoelectronic Devices, RIAPA, Tabriz University (27 May 2013).
- Ground-state properties of a two-dimensional electron gas with Rashba spin-orbit coupling, 11th Condensed Matter Physics Conference of Iran, Shahrood University of Technology, Shahrood, Iran (27 Jan 2013).
- Quantum Polar Fluids, 19th IPM Spring Conference, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran (17 May 2012).
- Correlations in Two Dimensional Polar Molecules, [School of Physics](#), Institute for Research in Fundamental Sciences (IPM), Tehran, Iran (7 March 2012).
- Drude weight and a.c. conductivity of doped graphene sheet, Workshop on Graphene and Topological Insulators, Institute for Research in Fundamental Sciences (IPM), Tehran, Iran (20 October, 2011).
- Many-body Effects in the a.c. Conductivity of Doped Graphene Sheets, [17th Annual IASBS Meeting on Condensed Matter Physics](#), (27 May 2011).
- Graphene: A wonderland on a pencil tip, 16th Special School on Topics in Physics, Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran (1 March 2011).
- Foundations of Density Functional Theory, Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran (19 October 2010).
- Drude weight, plasmon dispersion, and optical response in doped graphene sheets, [Department of Physics](#), Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran (19 April 2010).
- Drude weight and optical conductivity in doped graphene: effects of electron-electron interaction, [School of Physics](#), Institute for Research in Fundamental Sciences (IPM), Tehran, Iran (20 January 2010).
- Collective Modes and Optical Conductivity in Doped Graphene Sheets, Department of Physics, [Shahid Beheshti University](#), Tehran, Iran (29 December 2009).
- Drude weight and optical conductivity in doped graphene, [Inaugural Fall 2009 Meeting of the PS-APS](#), Iowa City, Iowa, USA (13 November 2009).

- Effects of electron-electron interaction of the conductivity of graphene, Department of Physics, [University of Missouri](#), Columbia, USA (9 September 2009).
- Spin-Current-Density Functional Theory with SU(2) Potentials, [APS March Meeting](#), Pittsburgh, Pennsylvania, USA (16 March 2009).
- Pseudospin Resonance in Semiconductor Bilayers, [APS March Meeting](#), New Orleans, Louisiana, USA (14 March 2008).
- Pseudospintronics in Semiconductor Bilayers, Department of Physics, [University of Missouri](#), Columbia, USA (30 January 2008).
- Pseudospintronics in Semiconductor Bilayers, Department of Physics, [University of Tehran](#), Tehran, Iran (19 November 2007).
- Pseudospin Dynamics in Semiconductor Bilayers, [School of Physics](#), Institute for Research in Fundamental Sciences (IPM), Tehran, Iran (15 October 2007).
- Pseudospin dynamics in double-layer electron gases, [Department of Mathematical Physics](#), Lund Institute of Technology, Lund, Sweden (14 June 2007).