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Condensed Matter Physics
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ACADEMIC

Assistant Professor, since 2019
Condensed Matter Physics, Basic Sciences department
Tarbiat Modares University, Tehran, IRAN

Researcher, 2015-2020
Superconducting electronics research laboratory (SERL), Department of electrical engineering
Sharif University of technology, Tehran, IRAN
Focus: THz and IR science and technology, High resolution magnetometry

University lecturer, 2017-2019
Electronic Micro and Nano Devices, Science and Research Branch
Islamic Azad University, Tehran, IRAN

Postdoctoral researcher, July 2013-September 2015
Institute for quantum optics and quantum information, Innsbruck, AUSTRIA
Focus: Superconducting quantum circuits and AMO systems

Laboratory associate, July-September 2014
Department of applied physics, Yale University, CT, USA
Focus: Design and fabrication of superinductance resonators

PhD in Condensed matter physics, August 2013
University of Geneva, SWITZERLAND
Focus: Low energy electrodynamics of high T_c superconductors

Master of science, Nano-scale science and technology, 2007
Chalmers University of technology, Göteborg, SWEDEN
Focus: Superconductors electronic devices and properties

Bachelor of Engineering, Electrical Engineering, 2005
Khajeh Nassir Toosi University of Technology (KNTU), Tehran, IRAN
Focus: Solid state electronic devices, sensors

PUBLICATIONS

R. Nazifi, R. Mohajeri, S. I. Mirzaei, M. Ahmadi-Boroujeni, and M. Fardmanesh, "0.1 THz imaging with a monolithic High- T_c superconducting transition-edge detector," Nov. 2021, Accessed: Jan. 09, 2022. [Online]. Available: <https://sciforum.net/paper/view/11304>

R. Nazifi et al., "Millimeter-Wave Response of All Metal-Organic Deposited YBCO Transition Edge Bolometer," IEEE Transactions on Applied Superconductivity, vol. 31, no. 1, pp. 1-5, Jan. 2021, doi: 10.1109/TASC.2020.3033413.

R. Moahjeri, S. I. Mirzaei, R. Nazifi, A. C. Wulff, J.-C. Grivel, and M. Fardmanesh, "Demonstration of Thermal Images Captured by a Backside Illuminated Transition Edge Bolometer," arXiv:2108.10154 [cond-mat, physics:physics], Aug. 2021, Accessed: Jan. 09, 2022. [Online]. Avail-

able: <http://arxiv.org/abs/2108.10154>

S. Ansari, R. Nazifi, M. Y. Arzefouni, R. Mohajeri, S. I. Mirzaei, and M. Fardmanesh, "3D Modeling of a Superconducting Transition Edge Detector," in 2021 29th Iranian Conference on Electrical Engineering (ICEE), May 2021, pp. 56–60. doi: 10.1109/ICEE52715.2021.9544163.

S. Sheibani, S. Iman Mirzaie, M. Fardmanesh, and P. Norouzi, "Extended-Gate Field-Effect Transistor based Sensor for Detection of Hyoscine N-Butyl Bromide in its Pharmaceutical Formulation," *Analytical and Bioanalytical Electrochemistry*, vol. 12, no. 2, pp. 238–249, Feb. 2020.

S. Hajitabarmarznaki, M. Ahmadi-Boroujeni, S. Z. Shojaeian, R. Nazifi, S. I. Mirzaei, and M. Fardmanesh, "A wide band low profile linear cross polarizer for millimeter wave applications," arXiv:2004.04031 [physics], Apr. 2020, <http://arxiv.org/abs/2004.04031>

M. A. Ghezghaya, M. Mirsalehi, S. I. Mirzaei, Z. Kavehvasht, and M. Fardmanesh, "Image Quality Improvement in Single Pixel IR-Imaging," in 2020 28th Iranian Conference on Electrical Engineering (ICEE), Aug. 2020, pp. 1–5. doi: 10.1109/ICEE50131.2020.9260577.

B. Rostami, S. I. Mirzaei, A. Zamani, A. Simchi, and M. Fardmanesh, "Development of an enhanced porosity AgAgCl reference electrode with improved stability," *Eng. Res. Express*, vol. 1, no. 1, p. 015039, Sep. 2019, doi: 10.1088/2631-8695/ab4544.

M. Annabestani, I. Mirzaei, P. Esmaeili-Dokht, and M. Fardmanesh, "Design and fabrication of an ubiquitous, low-cost, and wearable respiratory bio-sensor using ionic soft materials," in 2019 26th National and 4th International Iranian Conference on Biomedical Engineering (ICBME), Nov. 2019, pp. 55–59. doi: 10.1109/ICBME49163.2019.9030397.

P. R. Muppalla et al., "Bistability in a mesoscopic Josephson junction array resonator," *Phys. Rev. B*, vol. 97, no. 2, p. 024518, Jan. 2018, doi: 10.1103/PhysRevB.97.024518.

A. Aghassizadeh, M. R. Nematollahi, I. Mirzaie, and M. Fardmanesh, "Blood Glucose Measurement Based on Infra-Red Spectroscopy," arXiv:1804.03135 [q-bio], Apr. 2018, Accessed: Jan. 09, 2022. [Online]. Available: <http://arxiv.org/abs/1804.03135>

M. Dalmonte, S. I. Mirzaei, P. R. Muppalla, D. Marcos, P. Zoller, and G. Kirchmair, "Realizing dipolar spin models with arrays of superconducting qubits," *Phys. Rev. B*, vol. 92, no. 17, p. 174507, Nov. 2015, doi: 10.1103/PhysRevB.92.174507.

S. I. Mirzaei et al., "Spectroscopic evidence for Fermi liquid-like energy and temperature dependence of the relaxation rate in the pseudogap phase of the cuprates," *PNAS*, vol. 110, no. 15, pp. 5774–5778, Apr. 2013, doi: 10.1073/pnas.1218846110.

J. Hancock et al., "Optical investigation of the parent compounds of iron-based superconductors," vol. 2010, p. Y39.002, Mar. 2010.

J. N. Hancock et al., "Strong coupling to magnetic fluctuations in the charge dynamics of iron-based superconductors," *Phys. Rev. B*, vol. 82, no. 1, p. 014523, Jul. 2010, doi: 10.1103/PhysRevB.82.014523.

S. I. Mirzaei et al., "Far-infrared probe of superconductivity in $\text{SmO}_{1-x}\text{F}_x\text{FeAs}$ " arXiv:0806.2303 [cond-mat], Jun. 2008, Accessed: Jan. 09, 2022. [Online]. Available: <http://arxiv.org/abs/0806.2303>

Conference and seminar contributions

"Fabrication and some bio-applications of advanced high-T_c superconductive radiation detectors (IR and THz)", Invited talk, 6th national conference on superconductivity advances, Univ. Tehran, 2019 (1398)

"Application of Synchrotron Radiation in Infrared Spectroscopy", Invited talk, 9th Iranian light source facility Users' meeting, 2017, Qazvin, Iran

"Spectroscopic evidence for Fermi liquid-like energy and temperature dependence of the relaxation rate in the pseudogap phase of the cuprates" contributed talk in the SWM13 MaNEP workshop in Les Diablerets, Switzerland.

"Pseudogap and electron-boson coupling in single layer $\text{HgBa}_2\text{CuO}_4$ " presented at Materials & Mechanisms of Superconductivity Conference, Washington DC, U.S.A, 2012

"Universal scaling collapse of the dynamic relaxation rate in underdoped high- T_c cuprates", presented at annual meeting of Swiss physical society SPS, Zurich, Switzerland, 2012

"Pseudogap and electron-boson coupling in single layer $\text{HgBa}_2\text{CuO}_4$ " presented at Swiss Workshop on Materials with Novel Electronic Properties (Superconductivity and novel metals), Les Diablerets, Switzerland, 2011

"Optical investigations of Fe-based parent and superconducting compounds" presented at Swiss Workshop on Materials with Novel Electronic Properties (Superconductivity and novel metals), Les Diablerets, Switzerland, 2009

TRAINING AND SCHOOLS

Conference on Resonator QED 2013, Munich, Germany

5th MaNEP winter school (Understanding electronic and magnetic correlations), Saas-Fee, Switzerland, 2013

Swiss Workshop on Materials with Novel Electronic Properties (Superconductivity and novel metals), Les Diablerets, Switzerland, 2011

European COMSOL conference, Stuttgart, Germany, 2011

Swiss Workshop on Materials with Novel Electronic Properties (Superconductivity and novel metals), Les Diablerets, Switzerland, 2009

8th PSI summer school on Functional materials (X-rays and Neutron diffraction, Muon spectroscopy and X-ray microscopy), Zuoz, Switzerland, 2009

3rd MaNEP winter school (Exploring New Phases of Electronic Matter), Saas-Fee, Switzerland, 2009

EXPERIMENTAL SKILLS

Design and fabrication of quantum circuits

Microwave design and measurements

Infra-red spectroscopy (FTIR)

Ellipsometry

Thin film deposition (CVD & PVD)

Ion etching

E-beam and optical lithography and resist processing

Scanning electron microscopy

4-probe dc-resistivity measurement

Infrared detectors measurements (Bolometers, MCT, DTGS)

Lock-in detection and signal acquisition

Vacuum pumps

Ultra-high vacuum cryostats

Cryogenic measurements (LHe & LN₂ & Dilution systems)

Vibrating Sample Magnetometry (VSM)

LANGUAGES

Farsi (Mother language)

English (Fluent)

French (Basic-Medium)

German (Basic-Medium)