

## Hamideh Shakeripour

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### Research Positions

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2008-2010 Postdoctoral Researcher, Université de Sherbrooke, Canada  
Supervisor: Prof. Louis Taillefer (Canada Research Chair in Quantum Materials)  
"Investigation of Gap Symmetry in New Pnictide (Iron-Based) Superconductors"

### Education

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2003-2008 Université de Sherbrooke, Canada  
Ph.D. in Condensed Matter Physics ("Excellent Degree in Science Faculty, 2008")  
Supervisor: Prof. Louis Taillefer  
"Unconventional Superconductivity and Quantum-Criticality in the Heavy-Fermion Metal  $CeIrIn_5$ "

1996-1998 Sharif University of Technology, Tehran, Iran  
M.Sc. in Condensed Matter Physics, Supervisor: Prof. Mohammad Akhavan  
"Preparing and Investigation of Electric and Magnetic Properties of High Temperature  $Gd_{1-x-z}Pr_xCa_zBa_2Cu_3O_{7-\delta}$  Superconductors"

1990-1994 Sharif University of Technology, Tehran, Iran  
B.Sc. in Condensed Matter Physics.

### Awards

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- Dean's Honours List, PhD Level, Université de Sherbrooke (2008).
- Award for the best poster in superconductivity, presented in The First Regional Conference on Magnetic and Superconducting Materials (MSM-99), Iran, Sept. 1999.

### Research Interest

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- Unconventional superconductivity (high-temperature), magnetism and superconductivity
- Strongly correlated electron systems
- Quantum criticality, competing order parameters
- Nano materials
- Mathematic

### Publications

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#### Journal Publications

1. Paglione Johnpierre, Tanatar, M.A., Reid, J.-Ph, **Shakeripour, H.**, Petrovic, C., Taillefer L., *Quantum critical quasiparticle scattering within the superconducting state of  $CeCoIn_5$* . (2015) Preprint at [arXiv:1406.0031](https://arxiv.org/abs/1406.0031)
2. Reid, J.-Ph., Tanatar, M. A., Luo, X. G., **Shakeripour, H.**, René de Cotret, S., Doiron-Leyraud, N., Chang, J., Shen, B., Wen, H.-H., Kim, H., Prozorov, R., Taillefer, L., *Doping-induced vertical line nodes in the superconducting gap of the iron arsenide  $K-Ba122$  from directional thermal conductivity*. (2015) Preprint at [arXiv:1105.2232](https://arxiv.org/abs/1105.2232)
3. Reid, J.-Ph., Juneau-Fecteau, A., Gordon, R.T., René de Cotret, S., Doiron-Leyraud, N., Luo, X.G., **Shakeripour, H.**, Chang, J., Tanatar, M.A., Kim, H., Prozorov, R., Saito, T., Fukazawa, H., Kohori, Y., Kihou, K., Lee, C.H., Iyo, A., Eisaki, H., Shen, B., Wen, H.-H., Taillefer L., *From d-wave to s-wave pairing in the iron-pnictide superconductor  $(Ba,K)Fe_2As_2$* . [Superconducting Science and Technology](https://doi.org/10.1038/nature11271) **25**, 084013 (2012) - [arXiv:1207.5719](https://arxiv.org/abs/1207.5719).
4. Reid, J.-Ph., Tanatar, M.A., Luo, X.G., **Shakeripour, H.**, Doiron-Leyraud, N., Ni, N., Bud'ko, S.L., Canfield, P.C., Prozorov, R., and Taillefer L., *Nodes in the gap structure of the iron-arsenide superconductor  $Ba(Fe_{1-x}Co_x)_2As_2$  from c-axis heat transport measurements*. [Physical Review B](https://doi.org/10.1126/science.1194781) **82**, 064501 (2010) - [arXiv:1004.3804](https://arxiv.org/abs/1004.3804)  
  
*See also the associated Viewpoint : Led by the nodes* Hirschfeld P.J. and Scalapino D.J. [Physics](https://doi.org/10.1126/science.1194781) **3**, 64 (2010)
5. Tanatar, M.A., Reid, J.-Ph., **Shakeripour, H.**, Luo, X.G., Doiron-Leyraud, N., Ni, N., Bud'ko, S.L., Canfield, P.C., Prozorov, R., and Taillefer L., *Doping Dependence of Heat Transport in the Iron-Arsenide Superconductor  $Ba(Fe_{1-x}Co_x)_2As_2$*

$x\text{Co}_x\text{)}_2\text{As}_2$ : From Isotropic to a Strongly  $k$ -Dependent gap structure. [Physical Review Letters 104,067002 \(2010\)](#) - [arXiv:0907.1276v2](#)

6. **Shakeripour, H.**, Tanatar, M.A., Petrovic, C., and Taillefer, L. *Universal heat conduction and nodal gap structure of the heavy-fermion superconductor CeIrIn<sub>5</sub>*. [Physical Review B 82, 184531 \(2010\)](#), [arXiv:0902.1190](#)
7. Luo, X.G., Tanatar, M.A., Reid, J.-Ph., **Shakeripour, H.**, Doiron-Leyraud, N., Ni, N., Bud'ko, S.L., Canfield, P.C., Luo, Huiqian, Wang, Zhaosheng, Wen, Hai-Hu, Prozorov, Ruslan, and Taillefer L., *Quasiparticle Heat Transport in Ba(Fe<sub>1-x</sub>Co<sub>x</sub>)<sub>2</sub>As<sub>2</sub>*. (2009) Preprint.
8. Luo, X.G., Tanatar, M.A., Reid, J.-Ph., **Shakeripour, H.**, Doiron-Leyraud, N., Ni, N., Bud'ko, S.L., Canfield, P.C., Luo, Huiqian, Wang, Zhaosheng, Wen, Hai-Hu, Prozorov, Ruslan, and Taillefer L., *Quasiparticle Heat Transport in Ba<sub>1-x</sub>K<sub>x</sub>Fe<sub>2</sub>As<sub>2</sub>: Evidence for a  $k$ -dependent Superconducting Gap without Nodes*. [Physical Review B 80, 140503\(R\) \(2009\)](#) - [arXiv:0904.4049](#)
9. **Shakeripour, H.**, Petrovic, C., and Taillefer, L. *Heat Transport as a probe of superconducting gap structure*. [New Journal of Physics 11, 055065 \(2009\)](#)
10. **Shakeripour, H.**, Tanatar, M.A., Li, S.Y., Taillefer, L., and Petrovic, C. *Hybrid Gap Structure in Heavy-Fermion Superconductor CeIrIn<sub>5</sub>*. [Physical Review Letters 99, 187004 \(2007\)](#).
11. **Shakeripour, H.**, and Akhavan, M. *Thermally Activated Phase-Slip in High-Temperature Cuprates*. [Superconductor Science and Technology 14, 234 \(2001\)](#).
12. **Shakeripour, H.**, and Akhavan, M. *Investigation of Structure and Transport Properties of Gd<sub>1-x-z</sub>Pr<sub>x</sub>Ca<sub>z</sub>Ba<sub>2</sub>Cu<sub>3</sub>O<sub>7-δ</sub>*. [Superconductor Science and Technology 14, 213 \(2001\)](#).
13. **Shakeripour, H.**, and Akhavan, M. *Investigation of Doping Effects on Gd-123 System*. [Iranian Journal of Physics Research \(2001\). Vol 3, 1 \(1380\) p. 39](#)

#### Refereed Conference Proceedings

- **Shakeripour, H.**, and Akhavan, M. *Effect of Ca Substitution on Superconducting Properties of Gd<sub>1-x</sub>Pr<sub>x</sub>-123*. (2000) Proceeding. 1st Regional Conf. on Magnetic and Superconducting materials (MSM-99), Ed. M. Akhavan, J. Jensen and K. Kitazawa (Singapore: World Scientific) vol. A: 161-166.
- **Shakeripour, H.**, and Akhavan, M. *The influence of Flux Pinning by Ca and Weak Links by Pr Doping in Gd<sub>1-x-z</sub>Pr<sub>x</sub>Gd<sub>z</sub>-123*. (2000) Proceeding. 1st Regional Conf. on Magnetic and Superconducting materials (MSM-99), Ed. M. Akhavan, J. Jensen and K. Kitazawa (Singapore: World Scientific) vol. A: 523-528.
- **Shakeripour, H.**, and Akhavan, M. *Magnetic Field Effect on the Gd<sub>1-x-z</sub>Pr<sub>x</sub>Ca<sub>z</sub>Ba<sub>2</sub>Cu<sub>3</sub>O<sub>7-δ</sub> Systems*. (1998) 9th CTMTEC-World Ceramics Congress & Forum on New Materials, p. 196.

#### Invited Talks

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- Invited talk at the triennial conference on Materials and Mechanisms of Superconductivity (M2S), Tokyo, Japan, Sept (2009).
- *Heat Transport as a Probe of Gap Structure*  
The Canadian Neutron Beam Center (CNBC), Chalk River, Canada (2009).

#### Keynote Talks

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- *Heat Transport in Superconductors*  
12<sup>th</sup> Conference on Condensed matter, Isfahan, IUT (28-29 Jan. 2015).

#### Selected Talks

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- *Study of gap symmetry in superconductor CeIrIn<sub>5</sub> by thermal conductivity*. The fourth national conference on advances in superconductivity (NCAS4), Sharif University of Technology, Tehran, Iran (6-7 Feb. 2014).
- *How to Probe Gap Structure of Heavy-Fermion Superconductor CeIrIn<sub>5</sub> from Heat Transport*. Shahid Beheshti Univ., Tehran, Iran (2011).
- *Universal heat transport in the heavy-fermion superconductor CeIrIn<sub>5</sub>*. American Physical Society March Meeting (APS), New Orleans, Louisiana, USA (2008), <http://meetings.aps.org/Meeting/MAR08/Event/76776>

- *Gap Structure of Heavy-Fermion Superconductor CeIrIn<sub>5</sub> from Heat Transport*. American Physical Society March Meeting (APS), Baltimore, USA (2006), <http://meetings.aps.org/Meeting/MAR06/Event/44145>
- *Probe of Gap Structure in Heavy-Fermion Superconductor CeIrIn<sub>5</sub> by Heat Transport*. USherbrooke, Canada, (2006).
- *Field Dependence of Low-Temperature Resistivity in CeIrIn<sub>5</sub>*. American Physical Society March Meeting (APS), Los Angeles, USA (2005), <http://meetings.aps.org/Meeting/MAR05/Event/22057>
- *A Review on High Temperature Superconductivity Phenomenon*. High School Conferences on Physics, Qom, Iran (1998).
- *Ca and Pr Doping Effect on High-T<sub>c</sub> Superconductor Gd-123 Compounds*. 4th Condensed Matter Anniversary Conference, Shahid Beheshti University, Tehran, Iran (1997).
- *High Temperature Superconductivity*. Students Seminars, Magnetic Research Laboratory (MRL), Sharif University of Technology, Tehran, Iran, (Jan. 1996 to March 1997).

### Posters

- *Quasiparticle Heat Transport in Ba<sub>1-x</sub>K<sub>x</sub>Fe<sub>2</sub>As<sub>2</sub>: Evidence for a k-dependent Superconducting Gap without Nodes*. CIFAR, Vancouver (2009).
- *Unconventional Superconductivity in CeMIn<sub>5</sub>*. RQEMP scientific meeting, Montreal (Dec. 2007).
- *Universal Thermal Conductivity in Heavy-Fermion CeIrIn<sub>5</sub>*. RQEMP scientific meeting, Montreal (May 2006).
- *Gap Anisotropy in Heavy-Fermion Superconductor CeIrIn<sub>5</sub>*. Canadian Institute for advanced research (CIFAR), Montreal (2006).
- *Quantum Criticality in Heavy-Fermion Superconductor CeIrIn<sub>5</sub>*. Canadian Institute for advanced research (CIFAR), Toronto (2004).
- *Field-Induced Fermi Liquid State in CeCoIn<sub>5</sub>*. RQEMP first scientific meeting, Montreal (June 2004).

### Experimental Experience

- Experience in low temperature physics, including the operation of <sup>3</sup>He-<sup>4</sup>He Dilution Fridge in high magnetic fields.
- Experimental condensed matter physics at Sherbrooke University (2003 – 2010)  
Exploring the gap symmetry of superconductors by heat and charge transport studies at very low temperatures and in different current orientations with respect to the crystal axes.
- Expertise in making electrical contacts with the lowest contact resistance on the smallest samples.
- Expertise in fabrication and synthesis of Gd<sub>1-x-z</sub>Pr<sub>x</sub>Ca<sub>z</sub>Ba<sub>2</sub>Cu<sub>3</sub>O<sub>7-δ</sub> high T<sub>c</sub> superconductor ceramics.
- Experience in X-ray diffraction, to align single crystals for neutron scattering experiments, for example, and characterize powders by Rietveld.
- Leading a project on neutron scattering in collaboration with the CNBC and Johns Hopkins University.

### Teaching Experience

- General Physics 1, 2 and Physics 3; Winter 2012 – till now, Department of Physics, Isfahan Univ of Tech., Iran.
- General Physics 2 (Electricity & Magnetism); Lecturer, Fall 2002, Spring 2002, Department of Physics, Azad University, Karaj, Iran.
- General Physics 1 (Mechanics); Lecturer, Fall 2002, Department of Physics, Azad University, Karaj, Iran.
- Electricity Laboratory; Lecturer, Spring 2001, Fall 2001, Spring 2002, Department of Physics, Azad University, Karaj.
- General Physics 1 (Mechanics); Lecturer, Spring 1999, Department Of Physics, University of Qom, Qom, Iran.
- Magnetic Research Laboratory; Research Teaching, Fall 1996 to Spring. 1999, Sharif University of Technology.
- General Physics and Physics Laboratory; High School Teaching, Fall 1995 to Fall 1996, Qom, Iran.

### References

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<b>Prof. Kamran Behnia</b> <i>ESPCI UPR5-Laboratoire de Physique Quantique, École Supérieure de Physique et de Chimie Industrielle, 10 Rue Vauquelin, 75005 Paris, France.</i>	Phone: 33 1 4079 4626 Fax: 33 1 4079 4744 E-mail : <a href="mailto:kamran.behnia@espci.fr">kamran.behnia@espci.fr</a>
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