

# Hessam Habibian



## *Current Address:*

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## Personal

- Born on July 30, 1982 (*Solar Hejri calendar: Mordad 8, 1361*), Babol, Mazandaran, IRAN citizen.

## Education

- **Ph.D. candidate in Quantum Optics**  
since October 2008,  
Joint co-tutelle program between Universitat Autònoma de Barcelona, Spain and  
Universität des Saarlandes, Germany.  
Thesis title: *Cavity Quantum Electrodynamics with Ultracold Atoms.*
- **M.Sc. in Theoretical Physics (Quantum Information)**  
October 2004 till February 2007,  
Tabriz University, Tabriz, Iran.  
Thesis title: *Invesitagation of Entanglement Witnesses and Stabilizer Operators.*
- **B.Sc. in Solid State Physics**  
October 2000 till July 2004,  
University of Mazandaran, Babolsar, Iran.
- **Diploma - High School**  
October 1996 till June 1999,  
Alborz high school Tehran, Iran.  
October 1999 till June 2000,  
Kharazmi Pre-university, Tehran, Iran. .

## Research positions

- Doctoral fellowship from Spanish Ministry of Science and Innovation (beca FPI), December 2008 till November 2012,  
Project: *Fotonica Cuantica No Lineal*.
- Fellowship from the European project CMMC, October 2008 till November 2008,  
Project: *Cavity-Mediated Molecular Cooling*.
- Fellowship from Christian Doppler Lab., Johannes Kepler Universität Linz, Austria, October 2007 till September 2008,  
Project: *Switching and Slow-light Applications*.

## Publications

**Number of Journal publications: 6**

**Sum of the Times Cited : 31**

**h-index : 3**

(Reference: ISI Web of Science and Scopus)

### *Journal Articles*

- H. Habibian, S. Zippilli, and G. Morigi,  
*Quantum light by atomic arrays in optical resonators*,  
**Phys. Rev. A** 84, 033829 (2011).
- J. W. Clark, H. Habibian, A. D. Mandilara and M. L. Ristig,  
*Aspects of Entanglement in Quantum Many-Body Systems*,  
**Foundation of Physics** 40, 1200-1220 (2010).
- H. Habibian, J. W. Clark, N. Behbood, K. Hingerl,  
*Greenberger-Horne-Zeilinger and W entanglement witnesses for the noninteracting Fermi gas*,  
**Phys. Rev. A** 81, 032302 (2010).
- G. Manzacca, H. Habibian, K. Hingerl, G. Cincotti,  
*Coupled Cavities Polaritons for Switching and Slow-light Applications*,  
**Photonics and Nanostructures-Fundamental and Application** 7, 39-46 (2008).
- M. A. Jafarizadeh, G. Najarbashi, Y. Akbari, H. Habibian,  
*Multi-qubit Stabilizer and Cluster Entanglement Witnesses*,  
**Eur. Phys. Jour. D** 47, 233-255 (2008).

- M. A. Jafarizadeh, G. Najarbashi, H. Habibian,  
*Manipulating Multi-qudit Entanglement Witnesses by Using Linear Programming*,  
**Phys. Rev. A** 75, 052326 (2007).

### *Proceedings*

- H. Habibian, J. W. Clark, K. Hingerl, M. Bergmair,  
*GHZ\W Type Tripartite Entanglement in Non-Interacting Fermi Gas*,  
International Conference on Quantum Information (ICQI), Boston, Massachusetts,  
13 July (2008), **JMB44**.

### Scientific Visits

- Universität Innsbruck, visiting the group of Prof. H. Ritsch, March 6-12, 2011. Talk entitled:  
*Ultracold atoms in a disordered quantum potential of an optical cavity*.
- Universität Kaiserslautern, joint-meeting with the group of Prof. M. Fleischhauer, May 17, 2011. Talk entitled:  
*Ultracold atoms in an optical cavity potential*.
- Albert-Ludwigs-Universität Freiburg, joint-meeting with the group of Prof. A. Buchleitner, June 1-3, 2009.

### Scientific meetings

- 76<sup>th</sup> Annual Meeting of the DPG Spring Meeting of the Section AMOP, March 12-16, 2012, Stuttgart, Germany.  
*Ultracold atoms in a disordered quantum potential. (talk)*  
*Semiclassical dynamics of self-organization of atoms in optical cavities. (talk)*  
*Quantum light generated by atomic arrays. (poster)*  
*Spin-light entanglement in an optical cavity. (poster)*
- QOIT Consolider meeting, October 5-7, 2011, Barcelona, Spain.  
*Cavity Quantum Electrodynamics with Ultracold Atoms. (invited talk)*
- Many-body quantum dynamics in closed systems conference, September 7-9, 2011, Barcelona, Spain.  
*Quantum phase transition in a disordered quantum potential. (poster)*
- 75<sup>th</sup> Annual Meeting of the DPG Spring Meeting of the Section AMOP, March 13-18, 2011, Dresden, Germany.

*Ultracold atoms in a disordered quantum potential. (talk)*

*Semiclassical dynamics of self-organization of atoms in optical cavities. (poster)*

- PhD Day at Universität des Saarlandes, March 1-2, 2011, Saarbrücken, Germany.  
*Quantum ground state of ultracold atoms in disordered potential. (talk)*
- 74<sup>th</sup> Annual Meeting of the DPG Spring Meeting of the Section AMOP, 8-12 March 2010, Hannover, Germany.  
*Quantum non-linear optics with ultra-cold atoms in an optical lattice. (talk)*  
*Crystallization of photons in optical lattices. (poster)*
- SCALA summer school on Scalable Quantum Computing with Light and Atoms, 17-29 August 2009, Cargèse, Corsica, France.
- 73<sup>th</sup> Annual Meeting of the DPG Spring Meeting of the Section AMOP, 2-6 March 2009, Hamburg, Germany.
- CMMC Workshop on "Cavity Cooling of Atoms, Molecules and Ions" February 4-8, 2009, Obergurgl, Austria.
- QOIT Consolider Annual Meeting, February 3-4, 2009, Madrid, Spain.
- Workshop MPQ/Barcelona Research Centers on Quantum Information, December 3-6, 2008, Sant Benet, Spain.
- Workshop on "Light and matter at the quantum level", October 20, 2008, ICFO, Barcelona, Spain.
- OSA Congress, Quantum Entanglement and Decoherence (SL), 13-16 July 2008, Boston, MA, USA.  
*GHZ\W type tripartite entanglement in non-Interacting Fermi gas. (poster)*
- EMRS Spring meeting, May 26-30, 2008, Strasbourg, France.  
*Coupled Cavities Polaritons for Switching and Slow-light Applications. (talk)*  
*Entanglement Witnesses for detecting Cluster states in Photonic Crystal Cavity QED. (poster)*
- Heinrich-Heine-Universität Düsseldorf, 28-29 April 2008, Düsseldorf, Germany.  
*Entanglement witnesses for non-interacting Fermi gas. (invited talk)*
- Leibniz Institute for Solid State and Materials Research, 23-24 April 2008, Dresden, Germany.  
*Slow light and switching applications enhanced by coupled cavities. (invited talk)*
- N2T2 Annual Meeting for European projects, March 6-7, 2008, Bratislava, Slovakia.

- 15<sup>th</sup> International Winterschool on New Developments in Solid States Physics, February 17-22, 2008, Bad Hofgastein, Salzburg, Austria.
- Advanced Winterschool on the Mathematical Foundations of Quantum Control and Quantum Information Theory, February 10-15, 2008, Castro Urdiales, Bilbao, Spain.
- Danmark Tekniske Universitet, 24-26 January 2008, Copenhagen, Denmark.  
*Entanglement witnesses with Stabilizer operators. (invited talk)*
- 75<sup>th</sup> Workshop on General Algebra, November 2007, Darmstadt, Hessen, Germany.
- Iran International Conference on Quantum Information, September 7-10, 2007, Kish, Iran.  
*Multi-partite entanglement witnesses by using linear programming. (talk)*

## Teaching Activities

- Tutor of Theoretical Physics V (Advances Quantum Mechanics), by G. Morigi at Universität des Saarlandes, Summer-semester 2011.
- Tutor of Seminar on quantum mesoscopic systems, by G. Morigi and H. Rieger at Universität des Saarlandes, Summer-semester 2010.
- Tutor of Classical Electrodynamics, by G. Morigi at Universität des Saarlandes, Winter-semester 2009.
- Tutor of Classical Mechanics at Tabriz University, by S. Ashrafi, Summer-semester 2006.
- Electromagnetism Laboratory assistant at Tabriz University, Winter-semester 2006.
- Tutor of Classical Electrodynamics at Mazandaran University, by H. Milani, Winter-semester 2002.

## Awards

- FPI grant for young researchers from Spanish Ministry of Science and Innovation for 4 years (accepted).
- Scholarship from Leibniz Institute for Solid State and Materials Research Dresden, Germany (declined).
- Chinese Government Scholarship for Ph.D. studies in Physics at Harbin University, China (declined).

- Selected by Iranian Ministry of Science (from the entrance exam) for Master in Theoretical Physics at Institute of Advanced Studies in Basic Sciences (IASBS), Zanjan, Iran.
- Selected by Iranian Ministry of Science (from the entrance exam) for Bachelor in Solid State Physics at University of Mazandaran, Iran.

## Language Skills

- Persian: Mother Tongue.
- English: Fluent.
- Spanish, Arabic: Intermediate.
- German, Turkish: Basic.

## Other Activities

- Member of the European Physical Society (EPS).
- Member of the German Physical Society (Deutsche Physikalische Gesellschaft: DPG).
- Member the the Physical Society of Iran (PSI).
- Head of the Student Physical Society, University of Mazandaran, October 2002 till September 2003.

## Hobbies

Playing Soccer, Hiking, Playing Music (*Santoor*: persian musical instrument), Studying Old Literatures, Traveling, Internet Surfing, Cooking.