

## Personal Information

**Name:** Jia Kong    **Nationality:** P. R. China    **Date of Birth:** 04/17/1986  
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## Education Experience

- **February/2014 – February/2015**    **Visiting Ph.D. student**  
Quantum information with cold atoms and non-classical light group, The Institute of Photonic Sciences (ICFO).
- **September/2011-June/2015**    **Ph.D. student**  
State Key Laboratory of Precision Spectroscopy, Department of Physics, East China Normal University (ECNU).  
Majored in Atomic, Molecular and Optical Physics.  
Doctor's Degree obtained on July 2015.
- **June/2009-June/2010**    **Visiting master student**  
Institute of Physics, Chinese Academy of Sciences (CAS).
- **September/2008-June/2011**    **Master student**  
Department of Physics, Henan Normal University (HNU).  
Majored in Atomic, Molecular and Optical Physics.  
Master of Science Degree obtained on June 2011.
- **September/2004-July/2008**    **Undergraduate student**  
Department of Physics, Henan Normal University (HNU).  
Majored in Physics.  
Bachelor of Science Degree obtained on July 2008.

## Research Experience

- **September/2015 – Now** Work on generation and manipulation of structured quantum spin correlations in  $^{87}\text{Rb}$  atomic ensembles project as a Postdoc researcher in Prof. Morgan W. Mitchell's group at ICFO. Our goal is to experimentally determine the spatial distribution of the generated entanglement bonds, to implement measurements of structured variables, and to implement structured feedback, thereby completing the toolkit for both detection and generation of unpolarised phases by quantum polarization spectroscopy (QPS).
- **February/2014 – February/2015** Take part in the project of optical magnetometry beyond the standard quantum limit in Prof. Morgan W. Mitchell's group. This project implements some proposals to surpass the photon shot noise limit for magnetic field detection. It uses squeezed light to probe ensembles of hot atoms in a high-sensitivity optical magnetometer. As it requires a long term frequency stability of a laser lock, we developed a new, flexible and cheap way to stabilize it, which is capable of locking at a large detuning from atomic resonance line based on two fiber interferometers. With this locking system and the squeezed probe, we have improved the signal to noise ratio of a spin noise spectroscopy.
  1. Vito Giovanni Lucivero, Ricardo Jiménez-Martínez, **Jia Kong**, and Morgan W. Mitchell, *Squeezed-light spin noise spectroscopy*, [arXiv:1509.05653](https://arxiv.org/abs/1509.05653) (2015), under review at PRL.
  2. **Jia Kong**, Vito Giovanni Lucivero, Ricardo Jiménez-Martínez, and Morgan W. Mitchell, *Long-term laser frequency stabilization using fiber interferometers*, **Review of Scientific Instruments** 86, 073104 (2015).
- **September/2011-February/2014** Investigate the noise performance in a cascaded Four-wave mixing (FWM) system in Prof. Weiping Zhang's group. The first FWM is used to generate signal and idler fields which are two-mode squeezed state, while the second one is used to recombine them and implement a nonlinear interferometer. As the intermediate modes are entangled, the output signal to noise ratio can be improved by a factor of two comparing to the linear case. Also the quantum correlations of two output modes can be manipulated by controlling the relative phase

between the intermediate modes. It can act as a low noise amplifier at a dark fringe, or achieve squeezing enhancement at bright fringe.

3. F. Hudelist, **Jia Kong**, Cunjin Liu, Jietai Jing, Z. Y. Ou, and Weiping Zhang, *Quantum metrology with parametric amplifier-based photon correlation interferometers*, **Nature Communications** 5:3049 (2014).
  4. **Jia Kong**, F. Hudelist, Z.Y. Ou, and Weiping Zhang, *Cancellation of Internal Quantum Noise of an Amplifier by Quantum Correlation*, **Physical Review Letters** 111, 033608 (2013).
  5. **Jia Kong**, Jietai Jing, Hailong Wang, F. Hudelist, Cunjin Liu, and Weiping Zhang, *Experimental investigation of the visibility dependence in a nonlinear interferometer using parametric amplifiers*, **Applied Physics Letters** 102, 011130 (2013).
  6. **Jia Kong**, Z. Y. Ou, and Weiping Zhang, *Phase-measurement sensitivity beyond the standard quantum limit in an interferometer consisting of a parametric amplifier and a beam splitter*, **Physical Review A** 87, 023825 (2013).
- **September/2009-June/2011** Work on an experimental subject about unshielded three-axis vector atomic magnetometer in Prof. Ruquan Wang's group. The main method is to measure the Larmor precession frequency  $\omega$  of atomic spins which is proportional to the magnetic field B. The sensitivity of our magnetometer is about  $50\text{pT}/\sqrt{\text{Hz}}$ .
- **September/2008-May/2009** Do theoretical study about combining ultra-cold molecules by using quantum super-chemistry in Prof. Hui Jing's group.
7. JING Hui and **KONG Jia**, *Coherent assembly of ultra-cold polyatomic molecules: two-channel interference*, **Commun. Theor. Phys.** 55, 275-262 (2011).
  8. H. Jing, **J. Kong**, and Y.G. Deng, *Squeezing molecular matter waves with a squeezed associating light*, **Eur. Phys. J. D** 55, 167-171 (2009).

## Skills

- **English ability:** Band 6 of College English Test. Have experience of doing research in foreign country. Fluent for daily and scientific communications.
- **Optics Experiment:** Proficient in Ti:sapphire laser, semiconductor laser, balanced homodyne detection, laser frequency locking with saturated absorption spectroscopy or with fiber interferometers, and so on.
- **Computer skills:** familiar with Origin, Python, Matlab, Mathematica, Labview, Inkscape.

## Awards:

- **2015** Outstanding Graduate of Shanghai
- **2013** National Scholarship for Postgraduate/Graduate students
- **2013** Fostering Project for National Top Hundred Doctoral Dissertations
- **2013** Baogang Scholarship
- **2011** Outstanding Graduate of Henan Normal University
- **2009-2010** Merit Graduate Student of Henan Normal University
- **2008-2011** Tuition-Waiver Scholarship of Henan Normal University
- **2008** Outstanding Undergraduate of Henan Normal University
- **2008** Outstanding thesis award of Henan Normal University
- **2006-2007** Pivot of Merit Student of Henan Normal University
- **2005-2006** Merit Student of Henan Normal University
- **2004-2005** Merit Student of Henan Normal University