

## JERONIMO MAZE RIOS

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## Education

**Harvard University**, Cambridge, USA

Ph.D. Physics, April 2010.

- Dissertation on coherent manipulation of nitrogen-vacancy defects in diamond: from basic properties to applications.

**Pontificia Universidad Catolica**, Santiago, Chile

M. Sc., Physics, 2002 - 2004.

- Thesis on transmission of quantum properties via continuous quantum teleportation.

**Pontificia Universidad Catolica**, Santiago, Chile

Civil Engineer of Industry with Diploma in Electrical Engineering, 1996 - 2002.

**Pontificia Universidad Catolica**, Santiago, Chile

B. Sc., Engineering, 1996 - 2002.

## Awards

**Teaching Award** Fall Semester 2009 at Harvard University.

**Scholarship** Fulbright Grant for studying Physics at Harvard.

**Scholarship** Conicyt Master Program Scholarship, 2002-2003.

**Ranking** Physics class: 1 out of 12. Graduated with Maximum Distinction.

Engineering class: 6 out of 505. Graduated with Two Votes of Distinction.

**Best GPA** Top Ten Faculty of Engineering. Years: 2001, 2000, 1999, 1997, 1996.

## Business Experience

**Banco Chile - Promarket S.A.**, Santiago, Chile.

System/Process Analyst, December 2003 - June 2005.

## Research Experience

**Pontificia Universidad Catolica**, Santiago, Chile.

Analysis of the conductance of electrons through a Fibonacci set of magnetic barriers. Evaluation of the second order correlation energy in the Hartree Fock approximation in the 2D Hall Effect. *Principal Investigator*: PhD. Francisco Claro.

## Teaching Experience

**Harvard University**, Cambridge, MA

*Head Teaching Assistant*, Modern atomic and optical physics, Prof. Mikhail Lukin, 2009.

*Teaching Assistant*, Wave Phenomena, Prof. Howard Georgei, 2007.

**Pontificia Universidad Catolica**, Santiago, Chile

*Head Teaching Assistant* of more than 10 courses between 1998 - 2003 ranging from

General Physics to General Relativity. Professors: Andreas Reisenegger, Hernan Quintana, Alejandro Cabrera and Miguel Orszag.

## Selected Publications

- “Properties of nitrogen-vacancy centers in diamond: the group theoretic approach”, J. R. Maze, A. Gali, E. Togan, Y. Chu, A. Trifonov, E. Kaxiras and M. D. Lukin, *New J. Phys.* 13 025025 (2011).
- “Imaging mesoscopic nuclear spin noise with a diamond magnetometer”, Carlos A. Meriles, Liang Jiang, Garry Goldstein, Jonathan S. Hodges, Jeronimo Maze, Mikhail D. Lukin, and Paola Cappellaro, *J. Chem. Phys.* 133, 124105 (2010).
- “Coherence of nitrogen-vacancy electronic spin ensembles in Diamond”, P. L. Stanwix, L. M. Pham, J. R. Maze, D. Le Sage, T. K. Yeung, P. Cappellaro, P. R. Hemmer, A. Yacoby, M. D. Lukin, and R. L. Walsworth, *Phys. Rev. B* 82, 201201(R) (2010).
- “Quantum entanglement between an optical photon and a solid-state spin qubit”, E. Togan, Y. Chu, A. S. Trifonov, L. Jiang, J. Maze, L. Childress, M. V. G. Dutt, A. S. Srensen, P. R. Hemmer, A. S. Zibrov and M. D. Lukin, *Nature* 466, 730734 (2010).
- “Far-field optical imaging and manipulation of individual spins with nanoscale resolution”, P.C. Maurer, J.R. Maze, P.L. Stanwix et al. *Nature Physics* 6, 912918 (2010).
- “A diamond nanowire single-photon source”, T. M. Babinec, B. J. M. Hausmann, M. Khan, Y. Zhang, J. R. Maze, P. R. Hemmer, M. Loncar, *Nat. Nano.* 5, 195-199 (2010).
- “Repetitive Readout of a Single Electron Spin via Quantum Logic with Nuclear Spin Ancillae”, L. Jiang, J. S. Hodges, J. R. Maze et al. *Science* 326, 267-272 (2009).
- “Nanoscale magnetic sensing with an individual electronic spin in diamond”, J. R. Maze et al. *Nature* 455, 644 - 647 (2008).
- “Electron spin decoherence of single nitrogen-vacancy defects in diamond”, J. R. Maze, J. M. Taylor, and M. D. Lukin, *Phys. Rev. B* 78, 094303 (2008).
- “Quantum Register Based on Individual Electronic and Nuclear Spin Qubits in Diamond”, M. V. Gurudev Dutt, L. Childress, L. Jiang, E. Togan, J. Maze, F. Jelezko, A. S. Zibrov, P. R. Hemmer, M. D. Lukin, *Science* 316, 1312 (2007).

- “Strong magnetic coupling between an electronic spin qubit and a mechanical resonator”, P. Rabl, P. Cappellaro, M. V. Gurudev Dutt, L. Jiang, J. R. Maze, M. D. Lukin, Phys. Rev. B 79, 041302 (2009).
- “Holelike analytic mean-field solutions in the fractional quantum Hall regime”, Alejandro Cabo, Francisco Claro, Alejandro Perez, and Jeronimo Maze. Phys. Rev. B 76, 075308 (2007).
- “Transmission of a mixed state via Continuous-Variable Teleportation”, M. Orszag and J. Maze, Laser Physics, Vol. 14, No. 9, 2004, pp. 12651267.
- “Perfect Transmission of the sub-Poissonian character of a field via continuous-variable teleportation”, J. Maze and M. Orszag, Journal of Modern Optics, Vol. 51, No. 13, September 10, 2004, pp. 2021–2028.
- “Optimized transmission of quantum properties in continuous teleportation”, J. Maze and M. Orszag., J. opt. B: Quantum and Semiclass. Opt. 6 S566-S574, June 2004.
- “The Shapley Supercluster III. Collapse Dynamics and Mass of the Central Concentration”, Andreas Reisenegger, H. Quintana, Eleazar R. Carrasco, and Jeronimo Maze, The Astronomical Journal, 120 523-532, August 2000.

## Areas of Interest

(1) Development of multidisciplinary and self-sustainable investigations that apply physics to biological and medical sciences and industry; (2) theoretical studies related with phase transitions and decoherence in spin systems. Quantum entanglement and non-demolition techniques for high precision measurements. Group theoretical analysis of highly symmetrical hamiltonians in solid-state physics. Density matrix renormalization as a technique to simplify the evolution and calculation of properties in many body problems.

## Professional Internships

**CIMM Co.**, Santiago, Chile

January - February 2002. Digital Image Analyst.

- Creation and Implementation of algorithms for the image segmentation with the purpose of calculate the size statistic of the stones before their milling (or grilling).

**Paneles Arauco**, Arauco, Chile

January 1999. Assistant of the Electrical Maintenance Group.

- Recording of machines electrical consumption with the purpose of optimizing the system. Use of oscilloscopes, measurement instruments, PLCs (Program Logic Controller), frequency converters, and single-linear planes (high and low tension).

## Extra Curricular Activities

**Philosophy of Sciences** Participant of weekly meetings (between years 2004-2005) on philosophy of physics lead by PhD. Wilfredo Quezada at the department of Philosophy, Santiago University.

**Theater** Three years (2002-2004) in amateur dramatics with a group of friends. One of our performances was the play “The Bald Soprano” of Eugene Ionesco, theater of the absurd.

**Social service** 1999 to 2001 at School Pablo de Rohka, La Pintana. Free classes of mathematics for students preparing the test needed for applying to higher education. The creation and implementation of a nearly free pre-university for the municipality.