

# MANUEL DE LA CRUZ GUTIERREZ

Human Neuroimaging Laboratory • Baylor College of Medicine  
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Age: 31  
Citizenship: Mexican  
Languages: English (fluent), Spanish (native speaker)

## EDUCATION

Ph.D. in Optics, University of Rochester, Institute of Optics, August 2007. Experimental doctoral work carried out at the Clarendon Laboratory, Oxford University, U.K.  
Thesis: “Evaluation of Photonic Quantum State Tomography Methods using Convex Optimization”

*Licenciatura* (~B.S.) in Physics *with honors*, Universidad de Guadalajara (Mexico), CUCEI, Dept. of Physics, February 1999

## RESEARCH EXPERIENCE

HUMAN NEUROIMAGING LABORATORY, Baylor College of Medicine

**Post-Doctoral Associate:** Aug. 2007 – Present

- Research on modern neuroimaging techniques including integrating computational neuroscience models into imaging experiment analysis

CLARENDON LABORATORY, University of Oxford

**Doctoral Researcher:** Jan. 2002 – July 2007

- Performed the first experiments to explore iterative, adaptive quantum estimation protocols of polarization qubits using optimal experiment design techniques
- Adapted general code for solving convex optimization problem in photonic state reconstruction
- Designed and built an optimized source of optical fiber-coupled entangled photon pairs

THE INSTITUTE OF OPTICS, University of Rochester

**Doctoral Researcher:** May 2000 – Jan. 2002

- Experimentally investigated the role of dispersion in two-photon interference and demonstrated dispersion-cancellation phenomena in pulsed-pump, type II – generated photon pairs
- Performed experiments for the development of nonlinear crystal superlatticed sources for control of photonic quantum interference.

DEPARTMENT OF PHYSICS, State U. of N.Y. at Stony Brook

**Undergraduate Researcher:** June -July 1998

- Characterized quantum noise from coherent states of light in a Mach-Zehnder interferometer using homodyne measurements.

INSTITUTE OF PHYSICS, Universidad Nacional Autonoma de Mexico (Mexico)

**Undergraduate Researcher:** July 1997

- Performed computer data analysis of recorded nuclear scattering events using FORTRAN routines.

## TEACHING EXPERIENCE

THE INSTITUTE OF OPTICS, University of Rochester

### Teaching Assistant

- Graduate course "*Complex Analysis and Differential Equations*", Fall 2000: graded homeworks and held office hours to help students

### Teaching Assistant

- Undergraduate course "*Interference and Diffraction*", Spring 2001: guided students in lab sessions and graded their reports

## PUBLICATIONS

**Manuel de la Cruz-Gutierrez**, Robert Kosut, Herschel Rabitz and Ian A. Walmsley, "Evaluation of optimal experiment design method for quantum photonic state tomography." *in preparation*.

Alfred B. U'Ren, Reinhard K. Erdmann, **Manuel de la Cruz-Gutierrez**, and Ian A. Walmsley, "Interferometric quantum positioning with slow detectors." *in preparation*.

A. U'Ren, R. Erdmann, **M. de la Cruz-Gutierrez**, and I. A. Walmsley, "Generation of two-photon states with arbitrary joint spectrum via nonlinear crystal superlattices." *Physical Review Letters* 97 (22), 223602.

R. Erdmann, **M. de la Cruz-Gutierrez**, A. U'Ren, I. Walmsley "Parametric down-conversion using multi-crystal dispersion-compensated sources for control of quantum interference" *CLEO/IQEC and PhAST Technical Digest*, OSA (2004), CMF1

J.-J. Greffet, **M. De La Cruz-Gutierrez**, P. V. Ignatovich, A. Radunsky, "Influence of spatial coherence on scattering by a particle" ; *JOSA A* (2003), Vol. 20, 2315

A. U'Ren, R. Erdmann, **M. de la Cruz**, I. Walmsley, "Experimental observation of quantum dispersion cancellation", in *OSA Trends in Optics and Photonics (TOPS) Vol. 57, Quantum Electronics and Laser Science Conference (QELS 2001)*, Technical Digest, OSA, (2001), pg. 61

## HONORS AND AWARDS

Fulbright Scholar: August 1999 – December 2001.

Telmex Foundation Scholarship, (Mexico): 1997-1999

Winner of the National contests "To Read the Science from Mexico", organized in Mexico by the Mexican Government's Public Education Department and *Fondo de Cultura Económica* Publishers. 5th Edition: *First Place* (1998); 4th Edition: *Third Place* (1996); 3rd Edition: *Second Place* (1994)

## MEMBERSHIPS

Member of the *Optical Society of America (OSA)* and the *American Physical Society (APS)*.

Member of the *Society for Neuroscience*.

## REFERENCES

Prof. Read Montague, Director of the Human Neuroimaging Laboratory and Brown Foundation  
Professor of the Department of Neurosciences, Baylor College of Medicine, Tel: +1 713 798 3134, fax:  
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Prof. Ian A. Walmsley, Clarendon Laboratory, University of Oxford, Tel: +44 1865 272205, fax: +44  
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Prof. Alfred U'Ren, Centro de Investigacion Cientifica y Educacion Superior de Ensenada (CICESE),  
Ensenada, Mexico, Tel: +52(646) 1750500 ext. 25077, fax: +52(646) 1750553, auren@cicese.mx

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