

**Kenneth Brown****Curriculum Vitae, April 2004**

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**Education**

**Ph.D.** in Theoretical Chemistry  
University of California, Berkeley (1998-2003)  
**B.Sc.** in Chemistry (Summa Cum Laude)  
University of Puget Sound (1994-1998)

**Prizes and Awards**

1998-2003 John and Fannie Hertz Fellow  
2001 ITP Graduate Fellow, Institute for Theoretical Physics, UC Santa Barbara  
1997 Barry M. Goldwater Scholar  
1997 Lando Research Fellow, Univ. of Minnesota  
1996 Murdoch Research Fellow, Univ. of Puget Sound  
1994-1998 Washington Scholar  
1994-1998 National Merit Scholar

**Research Experience**

2003-Present Postdoctoral Research, Center for Bits and Atoms, MIT  
Quantum Computation: Experimental NMR and Theory  
Advisor: Prof. I. L. Chuang  
1998-2003 Ph.D. Graduate Research, Department of Chemistry, UC Berkeley  
Thesis: "Theoretical Issues in Quantum Information Technologies"  
Advisor: Prof. K. B. Whaley  
1996-1998 Undergraduate Research, Department of Chemistry, Univ. of Puget Sound  
Growth Hormone Releasing Peptides: Synthesis and Phosphorescent  
Characterization.  
Advisor: Prof. K. W. Rousslang  
1997 Summer Undergraduate Research, University of Minnesota  
Ab-initio Studies of Phenylnitrenium Ions.  
Advisor: Prof. C. J. Cramer

## **Poster Presentations**

### *Higher-order Composite Pulses*

Gordon Research Conference on Quantum Information Science  
Ventura, CA, Feb 22-27, 2004

### *Scalable Decoherence Free Ion Trap Quantum Computers*

Southwest Quantum Information and Technology Network (SQuInT) Annual  
Workshop, Santa Fe, NM, Feb 7-9, 2003

### *Deterministic N-photon generation*

SQuInT Annual Workshop, National Inst. of Standards and Technology, Boulder,  
Mar 2-3, 2002

### *Phonon Coupled Quantum Dot Quantum Computer*

SQuInT Annual Workshop, University of New Mexico, May 19-21, 2000

### *Quantum Computing with Quantum Dots on Linear Supports*

Naval Research Office Workshop on Quantum Computation Using Quantum  
Dots, Naval Research Lab, Sept 13-15, 1999

## **Oral Presentations**

### *Fault Tolerant Ion Trap Quantum Computation*

Quantum Computation and Information Seminar, UC Berkeley, Apr 20, 2004

### *Arbitrarily Reliable Composite Pulses*

Center for Bits and Atoms Seminar, MIT, Mar 1, 2004

### *Linear Optics for Computer Scientist*

Quantum Computation Lunch, Dept. of Computer Science, UC Berkeley, 2002

### *Measurement and Universality: A Review*

Quantum Computation and Information Seminar, UC Berkeley, Feb 19, 2002

### *Quantum Dots on Linear Supports: a Solid State Analogy to Ion Trap Quantum Computation, SQuInT Annual Workshop, Caltech, Mar 2-3, 2001*

### *Beyond Cirac- Zoller: Fast Gates for Ion Traps*

Quantum Computation and Information Seminar, UC Berkeley, Nov 6, 2000

### *Quantum Computation using Quantum Dots Connected by Quantum Springs*

Quantum Computation and Information Seminar, UC Berkeley, Oct 20, 1999

## **Scientific Visits and Summer Schools**

Institute for Theoretical Physics Graduate Fellow, University of California Santa Barbara,  
Fall 2001

SPINTECH: International Conference and School on Spintronics, and Quantum  
Information Technology, Maui, Hawaii, May 13-18, 2001

Quantum Computation Summer School, Institute for Scientific Interchange, Torino, Italy,  
July 12-23, 1999

## **Publications**

*Quantum Simulation of a Pairing Hamiltonian on an NMR Quantum Computer*

K. R. Brown, R.J. Clark, and Isaac Chuang  
in preparation

*Higher-Order Composite Pulses*

K. R. Brown, A.M. Harrow, and Isaac Chuang  
in preparation

*Transmission Spectrum of an Optical Cavity containing  $N$  atoms*

S.A. Leslie, N. Shenvi, K. R. Brown, D.M. Stamper-Kurn, and K. B. Whaley  
Phys. Rev. A **69** 043805 (2004)

*Effects of Noisy Oracle on Search Algorithm Complexity*

N. Shenvi, K. R. Brown, and K. B. Whaley  
Phys. Rev. A **68** 052313 (2003)

*Deterministic  $N$ -photon Generation*

K. R. Brown, K. Dani, D.M. Stamper-Kurn, and K. B. Whaley  
Phys. Rev. A **67** 043818 (2003)

*Scalable Ion Trap Quantum Computation with Pair-wise Interactions only*

K. R. Brown, J. Vala, and K. B. Whaley  
Phys. Rev. A **67** 012309 (2003)

*Quantum Computation using Quantum Dots on Linear Supports*

K. R. Brown, D. A. Lidar, and K. B. Whaley  
Phys. Rev. A **65** 012307 (2002)

*Coherence Preserving Quantum Bits*

D.A. Bacon, K. R. Brown, and K. B. Whaley  
Phys. Rev. Lett. **87** 247902 (2001)

*Quantum Chemical Analysis of para-Substitution Effects on the Electronic Structure of Phenylnitrenium Ions in the Gas Phase and Aqueous Solution*

M. B. Sullivan, K. Brown, C. J. Cramer, and D. G. Truhlar  
J. Am. Chem. Soc. **120** 11778 (1998)

## **Teaching Experience**

Quantum Information Science (Physics 8.371J)

Guest lectures, MIT

Physical Chemistry: Quantum Mechanics (Chemistry 120A)

Graduate student instructor, 1 semester, U.C. Berkeley

Graduate Statistical Mechanics (Chemistry 220A)

Graduate student instructor, 1 semester, U.C. Berkeley

Freshman Chemistry (Chemistry 1A)

Graduate student instructor, 1 semester, U.C. Berkeley

Physical Chemistry (Chemistry 340 & 341)

Teaching Assistant, 2 semesters, Univ. of Puget Sound

Organic Chemistry (Chemistry 251)

Teaching Assistant, 1 semester, Univ. of Puget Sound

## **References**

Professor K. Birgitta Whaley

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Professor Dan M. Stamper-Kurn

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Professor Isaac L. Chuang

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