

Curriculum Vitae

Name: Young-Gui Yoon
Address: Princeton Materials Institute
70 Prospect Avenue
Princeton University
Princeton, NJ 08544
E-mail: yyoon@princeton.edu
Web: <http://www.princeton.edu/~yyoon>
Phone: (609) 258-2775
Fax: (609) 258-6878

EDUCATION

- **B.S. in Physics, Seoul National University**, Seoul, Korea, *1989-1993*.
 - **M.S. in Physics, Seoul National University**, Seoul, Korea, *1994-1996*.
 - Student of Prof. Jisoon Ihm.
 - **Ph.D. in Physics, UC Berkeley**, Berkeley, California, *1996-2001*.
 - Student of Prof. Steven G. Louie.
 - **Research Associate, Princeton University**, Princeton, New Jersey, *2002-present*.
 - Working in the group of Prof. Roberto Car, Princeton Materials Institute.
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HONORS

- A Prize of the Korean Mathematical Society in a college math competition (*June 1989*).
 - KFAQ (the Korea Foundation for Advanced Studies) Undergraduate Merit Scholarship (*March 1991-August 1993*), and KFAQ Study Abroad Fellowship (*August 1996-July 2001*).
 - Seoul National University Honor Scholarship (*March 1991-February 1993*).
 - Graduated *summa cum laude* from Seoul National University (highest academic ranking) (*August 1993*).
 - Seoul National University Graduate Merit Scholarship (*March 1994-February 1996*).
 - UC Berkeley Regent Fellowship (*August 1996-July 1997*).
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RESEARCH EXPERIENCE

- *Ab initio* and classical molecular dynamics simulations.
 - Car-Parrinello molecular dynamics simulation of hydrogenated amorphous silicon.

- Molecular dynamics calculation of thermal conductivity of ceramic coating materials at high temperatures using self-consistent polarization.
 - Aqueous benzene to study hydrophobic hydration effects at constant temperature within the Nóse and Berendsen scheme.
 - *Ab initio* quantum conductance, based on LCAO or planewaves, in nanostructures.
 - Carbon nanotubes with defects to study resonance effects from quasi-bound states.
 - Liquid metal contacted carbon nanotubes to explain novel conductance quantization.
 - Crossed carbon nanotube junctions to understand deformation-driven junction currents.
 - Carbon nanopeapods, fullerenes in carbon nanotubes, to study electronic and transport properties.
 - NMR chemical shifts in condensed matter systems from *ab initio* DFT calculations.
 - Hard carbon nitrides to identify various phases and compounds.
 - Vitreous silica to analyze Si-O-Si bond angle distribution.
 - Amino acids to clarify the effects of environments.
 - Aqueous benzene to understand the effects of solvent water.
 - A real-space approach to pseudopotential DFT calculations.
 - First-principles wavelet formalism for electronic structure calculations of semiconductors.
 - Programming Experience and Computer Skills:
 - Parallelization of a molecular dynamics code with self-consistent polarization and the asymmetric ion model potential, and implementation of the velocity Verlet algorithm.
 - Implementation of the spin polarized GGA in a self-consistent parallel planewave code, and multiple Kleinman-Bylander-type projectors in a pseudopotential generation code.
 - Integration of a conductance code and the SIESTA *ab initio* LCAO code, and development of an electronic structure program based on Daubechies wavelets.
 - Experience with IBM SP3, SP2, RS6000, Cray T3E, T90, and SGI Origin 2000.
 - Expertise in Fortran, C, and MPI; familiarity with MATLAB, and IBM Data Explorer.
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TEACHING EXPERIENCE

- Teaching Assistant at Seoul National University (*March 1994-December 1995*).
 - Quantum Physics (*Spring and Fall 1994*), Statistical Physics (*Spring 1995*), and College Introductory Physics (*Fall 1995*).
 - Teaching Assistant at UC Berkeley (*August 1997-May 1998*).
 - Quantum Theory of Solids (graduate level).
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PUBLICATIONS

(electronic versions at <http://www.princeton.edu/~yyoon/cv.html#publications>)

1. "NMR chemical shifts in hard carbon nitride compounds", by Y.-G. Yoon, B. Pfrommer, F. Mauri, and S.G. Louie, *Physical Review Letters*, **80** 3388 (1998).
2. "Possible explanation for the conductance of a single quantum unit in metallic carbon nanotubes", by H. Choi, J. Ihm, Y.-G. Yoon, and S.G. Louie, *Physical Review B*, **60** R14009 (1999).
3. "Disorder, pseudospins, and backscattering in carbon nanotubes", by P. McEuen, M. Bockrath, D. Cobden, Y.-G. Yoon, and S.G. Louie, *Physical Review Letters*, **83** 5098 (1999).
4. "Crossed nanotube junctions", by M. Fuhrer, J. Nygard, L. Shih, M. Forero, Y.-G. Yoon, M. S. Mazzone, H. Choi, J. Ihm, S.G. Louie, A. Zettl, and P. McEuen, *Science*, **288** 494 (2000).
5. "Si-O-Si bond angle distribution in vitreous silica from first-principles ^{29}Si NMR analysis", by F. Mauri, A. Pasquarello, B. Pfrommer, Y.-G. Yoon, and S.G. Louie, *Physical Review B*, **62** R4786 (2000).
6. "Structural deformation and intertube conductance of crossed carbon nanotube junctions", by Y.-G. Yoon, M. S. Mazzone, S. G. Louie, H. Choi, and J. Ihm, *Physical Review Letters*, **86** 688 (2001).
7. "Electronic structure and quantum conductance of carbon nanotubes", by Y.-G. Yoon, and S. G. Louie, in *Nanostructured Carbon for Advanced Applications*, G. Genedek, P. Milani, and V. G. Ralchenko (eds.), Kluwer academic publishers, Dordrecht (2001).
8. "Quantum conductance of multiwall carbon nanotubes", by Y.-G. Yoon, P. Delaney, and S. G. Louie, to appear in *Physical Review B*.
9. "NMR chemical shifts in amino acids: effects of environments, electric field, and amine group rotation", by Y.-G. Yoon, B. Pfrommer, S. G. Louie, and A. Canning, submitted to *Physical Review B*.
10. "Electronic structure quantum conductance and scanning tunneling microscopy of carbon nanopeapods", by Y.-G. Yoon, M. S. Mazzone, and S. G. Louie, submitted to *Physical Review Letters*.
11. "A first-principles LCAO formalism for the quantum conductance of nanostructures", by Y.-G. Yoon, H. Choi, M. S. Mazzone, and S. G. Louie, to be submitted.
12. "Anomalous conductance scaling of carbon nanotubes in contact with liquid metal", by H. Choi, J. Ihm, Y.-G. Yoon, and S. G. Louie, to be submitted.
13. "NMR chemical shifts of a benzene molecule in liquid water", by M. S. Mazzone, Y.-G. Yoon, S. G. Louie, and E. Artacho, to be submitted.

TALKS AND PRESENTATIONS

- "NMR Chemical Shifts in Hard Carbon Nitride Compounds", American Physical Society March Meeting, Los Angeles, CA, *March 1998*.
- "NMR Chemical Shifts in Amino Acids: Effects of Environments", American Physical Society March Meeting, Atlanta, GA, *March 1999*.
- "First-principles Study of Intertube Conductance of Crossed Carbon Nanotube Junctions", American Physical Society March Meeting, Minneapolis, MN, *March 2000*.

- “NMR Chemical Shifts of a Benzene Molecule in Liquid Water”, American Physical Society March Meeting, Minneapolis, MN, *March 2000*.
 - “First-principles Study of Intertube Conductance of Crossed Carbon Nanotube Junctions”, Seminars at Seoul National University, and Sogang University, Seoul, Korea, *May 2000*.
 - “Theoretical Study of the Quantum Conductance of Carbon Nanotube Structures”, Invited talk at American Physical Society March Meeting, Seattle, WA, *March 2001*.
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REFERENCES

Prof. Steven G. Louie
University of California, Berkeley
Department of Physics
366 Le Conte Hall
Berkeley, CA 94720-7300
(510) 642-1709
sglouie@uclink.berkeley.edu

Prof. Marvin L. Cohen
Department of Physics
366 Le Conte Hall
University of California
Berkeley, CA 94720-7300
(510) 642-4753
cohen@civet.berkeley.edu

Prof. Roberto Car
Princeton Materials Institute
70 Prospect Avenue
Princeton University
Princeton, NJ 08544-1009
(609) 258-2534
rcar@princeton.edu

Prof. Jisoon Ihm
Department of Physics
Seoul National University
Seoul 151-742, Korea
+82-2-880-6614
jihm@snu.ac.kr

Prof. Paul L. McEuen
Laboratory of Atomic and Solid State Physics
Clark Hall
Department of Physics
Cornell University
Ithaca, NY 14853
(607) 255-6308
mceuen@ccmr.cornell.edu