

# David Roundy

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|--------------------------|--|-------------------------------|
| <i>Education</i>         | <b>University of California at Berkeley</b><br>Ph.D. in Physics  | Berkeley, CA<br>December 2001 |
|                          | <b>University of California at Berkeley</b><br>B.A. in Physics and Chemistry   | Berkeley, CA<br>May 1995      |
| <i>Experience</i>        | <b>Oregon State University Department of Physics</b><br><i>Assistant Professor</i>   | September 2006 - Present      |
|                          | <b>Cornell Department of Physics</b><br><i>Postdoctoral Researcher</i>   | January 2004 - August 2006    |
|                          | <b>MIT Department of Physics</b><br><i>Postdoctoral Researcher</i>   | January 2002 - December 2003  |
|                          | <b>U. C. Berkeley Department of Physics</b><br><i>Graduate Student Researcher</i>  | January 1998 - December 2001  |
|                          | <b>California State University at Fullerton</b><br><i>Undergraduate Researcher</i>   | June 1992 - July 1996         |
| <i>Honors and Awards</i> | 1995 Phi Beta Kappa Inductee<br>1995 Merck Index Award   |                               |
| <i>Current Research</i>  | <ul style="list-style-type: none"><li>◇ Development of new joint density functional method with application to solvation in water.</li><li>◇ Study of defect-mediated internal friction.</li><li>◇ Study of phonon-phonon induced mechanical loss in nanotubes.</li></ul>  |                               |
| <i>Invited Talks</i>     | <ul style="list-style-type: none"><li>◇ 2000 “Computation of the ideal strength.” Presented at the MRS Fall Meeting in Boston.</li><li>◇ 2005 “Internal Friction and the Silicon Divacancy” Presented at the Electronic Structure conference at Cornell.</li><li>◇ 2005 “The Myth and Reality of using Haskell in the Real World” Presented at the Commercial Users of Functional Programming, at the International Conference on Functional Programming in Estonia.</li><li>◇ 2005 “Darcs: Distributed Version Management in Haskell” Presented at the Haskell Workshop at the International Conference on Functional Programming in Estonia.</li><li>◇ 2006 “The Darcs Patch Formalism” To be presented at the Free and Open source Software Developers’ European Meeting (FOSDEM) in Brussels.</li><li>◇ 2006 “Losses due to phonon-phonon interactions in nanotube oscillators: from classical potentials through one-dimensional elasticity and many-body perturbation theory” To be presented at the APS March Meeting in Baltimore.</li></ul> |                               |

- Publications*
- 1) M. A. Khakoo, D. Roundy, and F. Rugamas. Electron-impact excitation of the  $^1S \rightarrow ^3P$  transition in Helium. *Phys. Rev. Lett.* **75**(1), 41–44 (1995).
  - 2) M. A. Khakoo, D. Roundy, and F. Rugamas. Electron-impact excitation of the  $^1S \rightarrow ^3P$  and  $^1S \rightarrow ^4P$  transition in Helium. *Phys. Rev. A* **54**(5), 4004–4014 (1996).
  - 3) D. Roundy, C. R. Krenn, M. L. Cohen, and J. W. Morris, Jr. Ideal shear strengths of Aluminum and Copper. *Phys. Rev. Lett.* **82**(13), 2713 (1999).
  - 4) F. Rugamas, D. Roundy, G. Mikaelian, G. Vitug, M. Rudner, J. Shih, D. Smith, J. Segura, and M. A. Khakoo. Angular profiles of molecular beams from effusive tube sources: I. Experiment. *Measurement Science and Technology* **11**(12), 1750–1765 (2000).
  - 5) D. Roundy, C. R. Krenn, M. L. Cohen, and J. W. Morris, Jr. The ideal strength of tungsten. *Phil. Mag. A* **81**(7), 1725 (2001).
  - 6) M. A. Khakoo, D. Roundy, C. Hicks, N. Margolis, E. Yeung, A. W. Ross, and T. J. Gay. Monte Carlo studies of Mott scattering asymmetries from gold foils. *Phys. Rev. A* **64**(5), 052713 (2001).
  - 7) C. R. Krenn, D. Roundy, J. W. Morris, Jr., and M. L. Cohen. The nonlinear elastic behavior and ideal shear strength of Al and Cu. *Mat. Sci. Eng. A* **317**, 44–48 (2001).
  - 8) J. W. Morris, Jr., C. R. Krenn, D. Roundy, and M. L. Cohen. Deformation at the limit of elastic stability. *Mat. Sci. Eng. A* **309**, 121–124 (2001).
  - 9) H. Sun, S. H. Jhi, D. Roundy, M. L. Cohen, and S. G. Louie. Structural forms of cubic  $BC_2N$ . *Phys. Rev. B* **64**(9), 094108 (2001).
  - 10) C. R. Krenn, D. Roundy, J. W. Morris, Jr., and M. L. Cohen. The Ideal Strengths of BCC Metals. *Mat. Sci. Eng. A* **319**, 111–114 (2001).
  - 11) D. Roundy and M. L. Cohen. Ideal strength of diamond, Si and Ge. *Phys. Rev. B* **64**, 212103 (2001).
  - 12) H. J. Choi, D. Roundy, H. Sun, M. L. Cohen, and S. G. Louie. First-principles calculation of the superconducting transition in  $MgB_2$  within the anisotropic Eliashberg formalism. *Phys. Rev. B* **66**, 020513 (2002).
  - 13) H. J. Choi, D. Roundy, H. Sun, M. L. Cohen, and S. G. Louie. The origin of the anomalous superconducting properties of  $MgB_2$ . *Nature* **418**, 758–760 August (2002).
  - 14) C. R. Krenn, D. Roundy, M. L. Cohen, D. C. Chrzan, and J. W. Morris, Jr. Connecting Atomistic and Experimental Estimates of Ideal Strength. *Phys. Rev. B* **65**, 134111 (2002).
  - 15) F. J. Ribeiro, D. Roundy, and M. L. Cohen. Electronic Properties of MoSe nanowires. *Phys. Rev. B* **65**, 153401 (2002).
  - 16) W. Luo, D. Roundy, M. L. Cohen, and J. W. Morris, Jr. Ideal strength of bcc molybdenum and niobium. *Phys. Rev. B* **66**, 094110 (2002).
  - 17) D. Roundy and John Joannopoulos. Photonic crystal structure with square symmetry within each layer and a three-dimensional band gap. *App. Phys. Lett.* **82**(22), 3835 (2003).
  - 18) H. J. Choi, D. Roundy, H. Sun, M. L. Cohen, and S. G. Louie. Reply to “Comment on ‘First-principles calculation of the superconducting transition in  $MgB_2$  within the anisotropic Eliashberg formalism’ ”. *Phys. Rev. B* **69**(5), 056502 (2004).

- 19) Hong Sun, F. J. Ribeiro, Je-Luen Li, D. Roundy, M. L. Cohen, and S. G. Louie. *Ab initio* pseudopotential studies of equilibrium lattice structures and phonon modes of bulk  $\text{BC}_3$ . *Phys. Rev. B* **69**, 024110 (2004).
- 20) R. E. Kraig, D. Roundy, and M. L. Cohen. A study of the mechanical and structural properties of polonium. *Solid State Commun.* **129**(6), 411–413 (2004).
- 21) M. Ibanescu, S. G. Johnson, D. Roundy, C. Luo, Y. Fink, and J. D. Joannopoulos. Anomalous dispersion relations by symmetry breaking in axially uniform waveguides. *Phys. Rev. Lett.* **92**(6), 063903 (2004).
- 22) V. Sazonova, Y. Yaish, H. Üstünel, D. Roundy, P. L. McEuen, and T. A. Arias. A tunable carbon nanotube electromechanical oscillator. *Nature* **431**, 284–287 (2004).
- 23) D. Roundy, E. Lidoriki, and J. D. Joannopoulos. Polarization-selective waveguide bends in a photonic crystal with layered square symmetry. *J. Appl. Phys.* **96**(12), 7750–7752 (2004).
- 24) H. Üstünel, D. Roundy, and T. A. Arias. *Ab initio* mechanical response: internal friction and structure of divacancies in silicon. *Phys. Rev. Lett.* **94**, 025503 (2005).
- 25) Seung-Hoon Jhi, D. Roundy, S. G. Louie, and M. L. Cohen. Formation and electronic properties of double-walled boron nitride nanotubes. *Solid State Commun.* **134**, 397–402 (2005).
- 26) M. Ibanescu, S. G. Johnson, D. Roundy, Y. Fink, and J. D. Joannopoulos. Microcavity confinement based on an anomalous zero group-velocity waveguide mode. *Optics Letters* **30**(5), 552–554 (2005).
- 27) H. Üstünel, D. Roundy, and T. A. Arias. Modelling a suspended nanotube oscillator. *Nano Letters* **5**(3), 523–526 (2005).
- 28) A. Farjadpour, D. Roundy, Alejandro Rodriguez, M. Ibanescu, Peter Bermel, J. D. Joannopoulos, Steven G. Johnson, and G. W. Burr. Improving accuracy by subpixel smoothing in the finite-difference time domain. *Optics Letters* **31**(20), 2972–2974 (2006).
- 29) S. A. Petrosyan, Jean-Francois Briere, David Roundy, and T. A. Arias. Joint density-functional theory for electronic structure of solvated systems. *Phys. Rev. B* **75**(20), 205105 (2007).