Further Corrections, January 18, 2013

Introduction to Quantum Mechanics, 2nd ed.

by David Griffiths

- Page 23, Problem 1.18(a): sodium is not a good example; silicon would be better.
- Page 29, footnote 7: the applet is currently accessible at

  http://eve.physics.ox.ac.uk/Personal/artur/Keble/Quanta/Applets/quantum/deepwellmain.html
- Page 126, Eq. 3.96: $\dfrac{dV}{dx} \to \dfrac{\partial V}{\partial x}$.
- Page 229, first full paragraph: the description of **semiconductors** is misleading. Silicon, for example, is a semiconductor, even without doping.
- Page 269, footnote 9, and Pages 270-271, Problem 6.15: this is incorrect. The operator p^4 *is* hermitian. The Laplacian of $1/r$ picks up a delta function (see, for example, D. J. Griffiths, *Introduction to Electrodynamics, 4th ed.*, Eq. 1.102), and when this is correctly included the extra term disappears. Specifically,

$$\nabla^2 \left[e^{-kr}\right] = \left(-\frac{2k}{r} + k^2\right) e^{-kr},$$

$$\nabla^4 \left[e^{-kr}\right] = \left(-\frac{4k^3}{r} + k^4\right) e^{-kr} + 8\pi k \delta^3(\mathbf{r}),$$

and hence

$$\langle e^{-r/na} | \nabla^4 e^{-r/ma} \rangle = \frac{8\pi}{a} \frac{(n^2 + 3nm + m^2)}{(n+m)^3} = \langle \nabla^4 e^{-r/na} | e^{-r/ma} \rangle.$$

I thank Edward Ross and Li Yi-ding for pointing out this error.