Understanding Solid State Physics

Supplementary Material

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http://www.sharonannaholgate.com/solidStatePhysicsBook.htm
http://www.crcpress.com/product/isbn/9780750309721
1 Links and Further Reading

During the course of writing this book, I have studied many fascinating articles, papers and websites. Please page down for a selection of these - together with some more recent finds - grouped by the chapters they relate to.

Chapter 2
CRYSTAL CLEAR: Bonding and Crystal Structures

- Trying to create the world’s roundest objects from an almost perfect crystal. ‘Silicon balls’, New Scientist, p52, 28th July 2007.
- History of the Pitch Drop Experiment. Maybe you can see the next drop fall! Live webcam of the Pitch Drop Experiment.
- CEA Saclay in French and English.
- Prof Thomas C Hale’s webpages on proving the Kepler Conjecture.
- Prof Kellar Autumn’s website on biomechanics, physiology, and evolution of animal locomotion (includes videos and pictures of gecko adhesion).

Chapter 3
THE REJECTION OF PERFECTION: Defects, Amorphous Materials and Polymers

- Research at Eastman Dental Institute, UCL.
- The Macrogalleria created by the School of Polymers and High Performance Materials at the University of Southern Mississippi contains a wealth of information about polymers and is available in Afrikaans, English, French, Italian, Portuguese, Russian, and Spanish.
- The WorldWide Electroactive Polymer Actuators Webhub contains links to groups all around the world that work in this area, as well as details of arm wrestling matches between EAP actuated robotic arms and humans.
- ‘The fake in the crown? That precious emerald on your finger may turn out to be just a common mineral. Spotting the difference is a rare art’ by France Besette, New Scientist, 21 Dec 1991, vol 132, no1800, p25.
Chapter 4
STRESSED OUT: The Mechanical Properties of Solids

► Computer models make ‘super-alloys’.
► Petcore - a non-profit European association encouraging both the use and recycling of PET containers. (Site available in English, French, German and Italian.)
► Information on plastics in the environment from the American Chemistry Council.

Chapter 5
IN, OUT, SHAKE IT ALL ABOUT: Diffraction, Phonons and Thermal Properties of Solids

► Biographical information on Rosalind Franklin.
► Centre for Science at Extreme Conditions (CSEC).

Chapter 6
UNABLE TO RESIST: Metals, Semiconductors and Superconductors

► ‘Wonder wire puts up no resistance’ news story on physicsworld.com.
► ‘Exciting times for superconductors’ gives an idea of the buzz in the solid state physics community just after the discovery of superconductivity in magnesium diboride.
► ‘Researchers Find That Superman’s Teeth Can Superconduct’, details a discovery at the University of Warwick.
► The 7 minute trip on the Transrapid maglev train from Longyang Road station to Shanghai Pudong International Airport, China.

Chapter 7
CHIPS WITH EVERYTHING: Semiconductor Devices and Dielectrics

► ‘The microchips that could heat your home’, by Duncan Graham-Rowe, New Scientist, p26, 8th March 2008.
► African Laser Centre - a virtual centre of excellence for laser research in Africa.
Bristol University’s CVD Diamond Group.


‘Copper nanowires enable bendable displays and solar cells’, by Fraser Shand, Nano News, 02 June 2010.

‘Look, Ma - No Junctions!’, by Davide Castelvecchi, Scientific American, p26, June 2010.


Chapter 8
LIVING IN A MAGNETIC WORLD: Magnetism and its Applications

Trying to develop a new type of magnetic memory storage. ‘For a really great memory, spend a day at the racetrack’, by Paul Marks, New Scientist, pp20-21, 19th April 2008.

Mesoscopic Physics Group, The University of Manchester (includes video footage of the ‘floating frog’ experiment, which I was told came to no harm during the experiment).

The 2000 Ig Nobel Prize in Physics shared by Andrey Geim and Michael Berry for ‘The Physics of Flying Frogs’.

‘Scientists capture first direct images of theoretically predicted magnetic monopoles’, press release from University College Dublin, 17 October 2010.


‘Sharing a Nobel Prize at 36’, by Elisabeth Pain, Science Careers, February 25, 2011.


‘Building nanomagnets, atom by atom’, Physics World, June 2012, p5. This news item is based on the following paper: http://www.nature.com/nphys/journal/v8/n6/full/nphys2299.html

2 Video Quiz

Click on the image below to test your knowledge of solid state physics with this light-hearted quiz from the author.
3 Interview with the Author

Click on the image below to view an interview with the author.

![Dr Sharon Ann Holgate: Physicist and Science writer](image)

4 Corrections and Comments

If you detect any misprints or mistakes or have any comments, please let us know by e-mailing john.navas@informa.com.