

Spotty Universe References and Notes

by Graham Bell

Topics which are germane to this presentation:

- Cosmology - <http://en.wikipedia.org/wiki/Cosmology>
- Topology - <http://en.wikipedia.org/wiki/Topology>
- Special Relativity - http://en.wikipedia.org/wiki/Special_relativity
- General Relativity - http://en.wikipedia.org/wiki/General_relativity
- String Theory - http://en.wikipedia.org/wiki/String_theory
- M-theory - <http://en.wikipedia.org/wiki/M-theory>
- Chaos - http://en.wikipedia.org/wiki/Chaos_theory
- CMB (cosmic microwave background)
- http://en.wikipedia.org/wiki/Cosmic_microwave_background_radiation

The above links are all to the primary Wikipedia reference. Google (and I presume other search engines) provide many more, and the Wikipedia links generally provide additional references.

How about handouts and notes from a course on Observational Cosmology, compliments of Dr. Remeis-Sternwarte Bamberg, Astronomical Institute of the University of Erlangen-Nuremberg. <http://pulsar.sternwarte.uni-erlangen.de/wilms/teach/cosmo.ws07/index.html>

Papers on recent results from WMAP (critical to the conclusions which Janna Levin reached), can be found at http://lambda.gsfc.nasa.gov/product/map/current/map_bibliography.cfm.

These papers are generally quite technical, and do **not** provide easy reading. I did not find anything in them to contradict Janna Levin's conclusions, but I hardly claim to have understood all my eyes saw. At least the newly derived Hubble constant and similar parameters are still consistent with her presumptions.

Some recommended additional books and references include:

Most of the presentation is from the book "How the Universe Got its Spots" by Janna Levin (Levin, 2002). This book is out of print, but I recently obtained a copy from Barnes and Nobel at a great price, and have seen some used ones available online. Heavy use was made of the historical book "Flatland, a romance of many dimensions" (Abbott, 1884). Though long out of print, a copy can be downloaded from www.geom.uiuc.edu/~banchoff/Flatland/ since the copyright expired some time ago. Note that the author's name is indeed Edwin Abbott Abbott.

A good general read, though dated, is "Chaos" (Gleick, 1987). Another book which I found interesting, though a little more technical and somewhat off topic

for this presentation is "Understanding Variation, the Key to Managing Chaos" (Wheeler, 2000). When the brain starts to feel signs of overload, I get a little respite from this How To book (Foxworthy, 2008)

One of my favorite references on relativity is the book "The Riddle of Gravitation" by Bergmann (Bergmann, 1968).

Works Cited

Abbott, E. A. (1884). *Flatland, A romance of many dimensions (2nd Edition)* (2nd Edition ed.). London?: Unknown?

Bergmann, P. G. (1968). *The Riddle of Gravitation*. New York, NY: Charles Schribner's Sons.

Foxworthy, J. (2008). *How to Really Stink at Golf*. New York, NY: Villard Books.

Gleick, J. (1987). *CHAOS, Making a New Science*. New York, NY: Penguin Books.

Levin, J. (2002). *How the Universe Got its Spots*. Princeton, NJ: Princeton University Pressw.

Wheeler, D. H. (2000). *Understanding Variation, the Key to Managing Chaos*. Knoxville, TN: SPC Press.