

For Further Exploration of *The Violent Universe*

A Reading Guide by Andrew Fraknoi



As a general introduction to astronomical topics, see the free on-line introductory textbook for which I am the lead author, entitled *Astronomy* and published by the non-profit OpenStax Project at Rice University: <http://openstax.org/details/astronomy>
In particular, see:

- Chap 1: Introduction to the universe and to the scientific method
- Chap 15: Introduction to activity on the Sun (esp. 15.4: Space Weather)
- Chap 23: The death of stars (esp. 23.2 & 23.3 on supernovae)
- Chap 24: Black holes (plus section 27.2 on supermassive black holes)

Space Weather (Violent Activity on the Sun)

- Berman, B. "How Solar Storms Could Shut Down Earth" in *Astronomy*, Sept. 2013, p. 22. Up-to-date review of how events on the Sun can hurt our civilization.
- James, C. "Solar Forecast: Storm Ahead" in *Sky & Telescope*, July 2007, p. 24. Review of effects of the Sun's outbursts on Earth and how we monitor "space weather."
- NOAA Space Weather Prediction Center Information Pages:
<http://www.swpc.noaa.gov/content/education-and-outreach> (includes primers, videos, a curriculum and training modules)
- NOAA Profile of Space Weather (a primer):
http://www.swpc.noaa.gov/sites/default/files/images/u33/primer_2010_new.pdf
- Solar Storms Website by Sten Odenwald: <http://www.solarstorms.org/> (an archive of historical materials on great storms from the Sun in the past)

Asteroid Impacts

- Boslaugh, J. "in Search of Death Plunge Asteroids" in *Astronomy*, July 2015, p. 28. On search programs.
- Brusatte, S. "What Killed the Dinosaurs?" in *Scientific American*, Dec. 2015, p. 54. On the asteroid and other causes of extinction.
- Durda, D. "The Chelyabinsk Super-Meteor" in *Sky & Telescope*, June 2013, p. 24. A nice summary with photos and eye-witness reports.

Tyson, P. "Space Invaders" in *Sky & Telescope*, June 2018, p. 12. On the statistics of near-Earth asteroids and the chances for impacts.

B612 Foundation to Deal with Asteroids: <https://b612foundation.org>

NASA Center for Near-Earth Object Studies: <https://cneos.jpl.nasa.gov/> (Look in the menu under "Extras" for "Related Links" for many other good websites.)

Impact Earth: <https://impact.ese.ic.ac.uk/ImpactEarth/> Calculates effects of impacts.

Killer Asteroids Site from the Space Science Institute: <http://www.killerasteroids.org/>

Supernovae (Exploding Stars)

Kruesi, L. "Supernova 1987A: 30 Years Later" in *Astronomy*, Mar. 2017, p. 28. Nice overview of what we have learned about this much-studied explosion.

Hillebrandt, W., et al. "How To Blow Up a Star" in *Scientific American*, Oct. 2006, p. 42. On supernova mechanisms.

Wheeler, J. C. *Cosmic Catastrophes: Exploding Stars, Black Holes, and Mapping the Universe*. 2nd ed. 2014, Cambridge U. Press. Deep introduction.

Schuyler VanDyk's page: What Are Supernovae:

<http://spider.ipac.caltech.edu/staff/vandyk/supernova.html>

Black Holes

Schnittman, J. "A Brief History of Black Holes" in *Astronomy*, Oct. 2016, p. 30. Nice overview.

Talcott, R. "Black Holes in our Backyard" in *Astronomy*, Sep. 2012, p. 44. Different kinds of black holes in the Milky Way and the 19 objects known to be black holes.

Black Holes FAQ: <http://cosmology.berkeley.edu/Education/BHfaq.html>. Frequently asked questions about black holes, answered by Ted Bunn of UC–Berkeley's Center for Particle Astrophysics.

Hubble Space Telescope Black Hole Encyclopedia (a good introduction for beginners): http://hubble.stsci.edu/explore_astronomy/black_holes/encyclopedia.html

Supermassive Black Holes

Haggard, D. & Bower, G. "In the Heart of the Milky Way" in *Sky & Telescope*, Feb. 2016, p. 16. About observations of the supermassive black hole in our galaxy.

Kormendy, J. "Why Are There so Many Black Holes?" in *Astronomy* (Aug. 2016): 26. Discussion of why supermassive black holes are so common in the universe.

Monsters in Galactic Nuclei: <http://chandra.as.utexas.edu/stardate.html>. An article on supermassive black holes by John Kormendy, from *StarDate* magazine.

Quasar Astronomy Forty Years On: <http://www.astr.ua.edu/keel/agn/quasar40.html>. A 2003 popular article by William Keel.

See the instructor's website: www.fraknoi.com for science fiction, radio interviews, etc.