

## Science Fiction with Good Astronomy On the Themes of *400 Years of the Telescope*

A Listing by Andrew Fraknoi (*Foothill College*)

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Many of the astronomical ideas and breakthroughs described in *400 Years of the Telescope* have inspired science fiction writers as well as PBS viewers. Here we list a few fun science fiction stories on the topics discussed in the show -- stories that work out reasonable scientific ideas in human terms. (Note: This is not a complete list, but just a selection of favorite stories to whet your appetite.)

### Asteroids

Baxter, Stephen "Pilot" in *Vacuum Diagrams*. 1997, Harper Prism. Future space travelers hollow out Chiron and use it as a spaceship to escape invading aliens.

Clarke, Arthur "Summertime on Icarus" in *The Nine Billion Names of God*. 1967, Signet. An astronaut is stranded on Icarus, the asteroid with the smallest perihelion distance, just as it is approaching the Sun.

Hoyle, Fred "Element 79" in *Element 79*. 1967, New American Library. An asteroid with significant amount of gold wreaks havoc with the Earth's economy.

Preuss, Paul "Small Bodies" in Preuss, Byron, ed. *The Planets*. 1985, Bantam. A fundamentalist preacher and a scientist find fossils on an asteroid.

See also under "Impacts"

### Astronomers

Banville, John *Doctor Copernicus*. 1976, Godine. A fictionalized biography of the astronomer.

Banville, John *Kepler: A Novel*. 1981, Godine. Fictionalization of Kepler's life.

Benford, Gregory *Timescape*. 1981, Bantam Spectra. *Eater*. 2000, Eos/HarperCollins. Many of the novels of physicist Benford portray what it is like to be a scientist. In these two books, some of the astronomer characters are based on real astronomers.

Bezzi, Tom *Hubble Time*. 1987, Mercury House. A fictional memoir of Hubble's life; gets some of the facts wrong, but an intriguing effort.

Brecht, Bertold *Galileo*. A 1938 stage play available alone (Grove Press) or in many collections; not historically accurate, but with strong political points to make.

Sagan, Carl *Contact*. 1985, Simon & Schuster. Main character is loosely based on astronomer Jill Tarter, the leader of the SETI program.

Stover, Barrie *Lamp at Midnight*. 1966, Bantam Books. Revised edition of a 1942 play about Galileo and his conflict with the Church.

### Cosmology (The Origin and Evolution of the Universe as a Whole)

Asimov, Isaac *The Gods Themselves*. 1972, Fawcett. Ambitious novel that "solves" the origin of the big bang and quasars.

- Benford, Gregory *Cosm.* 1998, Avon/EOS. A Brookhaven physicist makes a universe in a particle accelerator and watches it evolve.
- Benford, Gregory "Matter's End" in *Matter's End*. 1994, Bantam. Physicists in India find that protons do decay as predicted by some Grand Unified Theories, with dire consequences for reality.
- Martin, Mark & Benford, Gregory *A Darker Geometry*. 1996, Baen. A convoluted, brilliant novel of multiple universe, in which ours is manipulated by advanced beings from another universe about to enter Big Crunch.
- Sawyer, Robert *Calculating God*. 2000, Tor. Two alien races join humans in trying to understand a God that survived the Big Crunch Big Bang and is manipulating evolution for its own purposes.
- Updike, John *Roger's Version*. 1988, Fawcett Crest. A computer student and a professor of divinity grapple with questions of cosmology and religion.

### **Impacts (Asteroid & Comet)**

- Benford, Gregory & Rotsler, William *Shiva Descending*. 1980, Avon Books. A massive asteroid heads for our planet.
- Carver, Jeff *Neptune Crossing*. 1994, Tor. An intelligent life-form on Neptune's moon Triton helps humans prevent a comet from crashing into the Earth.
- Clarke, Arthur *The Hammer of God*. 1993, Bantam. An asteroid threatens to collide with the Earth.
- Fodor, R. & Taylor, G. *Impact*. 1979, Leisure Books. A giant meteorite is headed our way; Taylor is a planetary scientist.
- Gribbin, John & Chown, Marcus *Double Planet*. 1988, Avon Books. A comet heads for Earth; written by two scientists.
- Morton, Oliver "The Albian Message" in *Year's Best SF II*, Hartwell, David & Cramer, Kathryn, eds. 2006, Eos. 100 million years ago, predicting the K/T impact, aliens landed on Earth and preserved life on Earth at the time in a container on an asteroid at a jovian Trojan point, leaving a message about it coded in the human genome.
- Niven, Larry & Pournelle, Jerry *Lucifer's Hammer*. 1977, Fawcett. A giant asteroid or comet collides with the Earth. Among the first of the scientifically reasonable impact stories.
- Sawyer, Robert *Calculating God*. 2000, Tor. When aliens finally come to Earth, they reveal that mass extinctions due to impacts happened simultaneously on three planets – which leads them to suspect that they were caused by a higher intelligence.

### **Life Elsewhere (Plausible Examples)**

- Anderson, Kevin & Beason, Doug "Reflections in a Magnetic Mirror" in *Full Spectrum*, ed. L. Aronica & S. McCarthy (1988, Bantam). A plasma physicist and science writer explore a life-form that can exist within plasma anomalies, but on a different time-scale.
- Baxter, Stephen "Cilia-of-Gold" in Dozois, W. & Williams, S., eds. *Isaac Asimov's Solar System*. 1999, Ace (and in *Vacuum Diagrams*, 1997, Harper Prism). Suggests a very clever ancient form of life that adapted (after crashing there) to live on Mercury.
- Baxter, Stephen "Sunpeople" in *Vacuum Diagrams*. 1997, Harper Prism. A human expedition on a Kuiper Belt object finds a life-form made of ice with liquid helium for circulation.

- Baxter, Stephen "Gossamer" in *Vacuum Diagrams*. 1997, HarperCollins. Suggests a life form that can thrive on and go between Pluto and Charon at perihelion.
- Benford, Gregory *In the Oceans of Night*. 1977, Dell. Physicist Benford postulates a universe in which advanced machine intelligences confront (and often overwhelm) organic life. The story continues in *Across the Sea of Suns* (1984, Bantam) and in his novels that take place at the galactic center (*Great Sky River*, 1987, Bantam; *Tides of Light*, 1989, Bantam; *Furious Gulf*; 1994, Bantam; *Sailing Bright Eternity*, 1995, Bantam.)
- Benford, Gregory "Dance to Strange Musics" in *Year's Best Science Fiction 4*, ed. David Hartwell. 1999, Eos/HarperCollins. First expedition to Alpha Centauri finds a planet-wide, collective life form that takes energy from pizo-electric effects enhanced by tidal stresses.
- Brotherton, Mike *Star Dragon*. 2003, TOR. Suggests a life-form that lives in a cataclysmic binary star system.
- Clement, Hal *Mission of Gravity*. 1962, Pyramid. Life on a massive, rapidly rotating planet. Clement is a high-school science teacher.
- Clement, Hal "Uncommon Sense" in *Space Lash*. 1966, Dell. About life-forms with liquid metal blood that "see" by smell.
- Crichton, Michael *The Andromeda Strain*. 1969, Dell. Doctors & scientists battle an extra-terrestrial microorganism; by a doctor.
- Hoyle, Fred *The Black Cloud*. 1957, Signet. Intelligence develops in interstellar dust clouds which can move from star to star.
- LeGuin, Ursula *The Left Hand of Darkness*. 1969, Ace. Award-winning story of contact with aliens who are alternately one sex and then the other.
- Sawyer, Robert *Calculating God*. 2000, Tor. Suggests that most alien species will choose to upload themselves into a computer reality rather than deal with their own hostility and the isolation of the universe.
- Sawyer, Robert *Illegal Alien*. 1997, Ace. Aliens with quadrilateral symmetry and the ability to hibernate for very long times come to Earth, to wipe out any threat to them while they sleep for 400,000 years.
- Sheckley, Robert "Specialist" in Keyes, N., ed. *Contact*. 1963, Paperback Library. Proposes the idea that life in the universe is all specialized by function, except on Earth.
- Sheffield, Charles *Between the Strokes of Night*. 1985, Baen Books. Proposes a life-form that can thrive in intergalactic space.
- Sterling, Bruce "The Swarm" in Silverberg, R., ed. *The Nebula Awards 18*. 1983, Bantam. A form of life that absorbs other life forms and converts them to symbiotic components. Nice discourse on whether intelligence has value in the long run.
- Stewart, Ian & Cohen, Jack *Whealers*. 2000, Aspect/Warner. A mathematician and a biologist have written a novel that suggests an intelligent life form that can live in Jupiter's atmosphere.
- Swanwick, Michael "Slow Life" in Hartwell, David, ed. *Best SF 8*. 2003, Eos. Suggests a form of life that can survive deep under Titan's seas.
- Tiptree, James "Love is the Plan the Plan is Death" in Goldin, Stephen, ed. *The Alien Condition*. 1973, Ballantine. Haunting, complex story of a truly alien life-form.
- Varley, John *The Ophiuchi Hotline*. 1977, Dell. Ambitious novel about interstellar communication and the idea of a struggle between life-forms that develop on terrestrial and jovian planets throughout the universe.

## **SETI: The Search for Extra Terrestrial Intelligence via Radio Surveys**

- Benford, Gregory “Dance to Strange Musics” in *Year’s Best Science Fiction 4*, ed. David Hartwell. 1999, Eos/HarperCollins. First expedition to Alpha Centauri finds a planet-wide, collective life form that is sending out huge, information-rich SETI messages to one star after another.
- Gunn, James *The Listeners*. 1972, Signet. Good early portrayal of a scientifically reasonable search. (Note that the author is not the James Gunn who is an astronomer.)
- McDevitt, Jack *The Hercules Text*. 1986, Ace. Flawed, but interesting novel about radio communication with a distant civilization.
- McDevitt, Jack “Nothing Ever Happens in Rock City” in *Nebula Awards Showcase 2004*, ed. Vonda McIntyre. 2004, ROC/Penguin. The first radio SETI discovery as seen from the perspective of the owner of the liquor store closest to the observatory.
- Morton, Oliver “The Albian Message” in *Year’s Best SF 11*, Hartwell, David & Cramer, Kathryn, eds. 2006, Eos. Suggests that the place to search for alien messages is in the human genome.
- Sagan, Carl *Contact*. 1985, Simon & Schuster. The discovery of radio signals from extra-terrestrial intelligence leads humanity to re-evaluate its self-image.
- Sawyer, Robert *Factoring Humanity*. 1998, Tor. A radio message from Alpha Centauri helps humanity get in touch with another civilization and itself.
- Spinrad, Norman “The Helping Hand” in *Full Spectrum 3*, ed. Lou Aronica, et al., 1991, Bantam. An alien message unites humanity, but turns out to be a benevolent lie.
- Zerwick, C. & Brown H. *The Cassiopeia Affair*. 1968, Curtis. An exploration of the effects that an alien radio message might have on Earth. One of the authors is a geochemist.

## **Sun, The**

- Benford, Gregory & Eklund, Gordon *If the Stars Are Gods*. 1977, Berkley. Proposes that the Sun might have an intelligence within.
- Brin, David *Sundiver*. 1980, Bantam. Involves a trip into the Sun. Brin has a PhD in astrophysics.
- Clarke, Arthur “The Wind from the Sun” in *The Wind from the Sun*. 1973, Signet. About the effect of a solar flare on a solar wind “sailing race” of the future.
- Clayton, Donald *The Joshua Factor*. 1986, Texas Monthly Press. A novel by an astronomer involving intrigue and neutrinos from the Sun.
- Clement, Hal “Proof” in Asimov, Isaac, ed. *Where Do We Go from Here?* 1971, Fawcett. About possible life-forms within the Sun.
- Niven, Larry “Inconstant Moon” in *All The Myriad Ways*. 1971, Ballantine. A giant flare on the Sun wreaks havoc with civilization.

## **Supernovae (Exploding Stars)**

- Allen, Roger & Kotani, Eric *Supernova*. 1991, Avon. An exploding star threatens the Earth. (Kotani is the pen-name of a NASA astrophysicist)
- Anderson, Poul “Day of Burning” in *Beyond the Beyond*. 1969, Signet. An advanced race tries to mobilize the still feudal inhabitants of a planet whose star is about to go supernova.
- Clarke, Arthur “The Star” in *The Nine Billion Names of God*. 1967, Signet. Classic story about a supernova that becomes the star of Bethlehem.

- Cowper, Richard *The Twilight of Briarius*. 1974, John Day. An alien intelligence rides the shock wave of a supernova explosion to Earth.
- Sawyer, Robert *Calculating God*. 2000, Tor. The star Betelgeuse goes supernova, apparently through the actions of an advanced race of beings, and threatens the Earth.
- Sheffield, Charles *Aftermath*. 1998, Bantam. Alpha Centauri A goes supernova, even though that kind of star is not supposed to. But the book has a good description of how the electromagnetic pulse from the explosion wreaks havoc with modern civilization, especially computer chips. Written by a scientist. (A sequel, called *Starfire*, was published by Bantam in 1999.)
- Silverberg, Robert "The Iron Star" in Preiss, Byron & Fraknoi, Andrew, eds. *The Universe*. 1987, Bantam. Involves two supernova explosions, a neutron star, and a black hole.

## Telescopes

- Brett, Alex *Cold Dark Matter*. 2005, Dundurn. A mystery novel whose plot turns on astronomical research; much of it takes place at the Mauna Kea observatories.
- Ehrlich, Max *The Big Eye*. 1949, Doubleday. Parts of this early novel about the threat of the end of the world from a planetary collision take place at the Palomar observatory; written just after the 5-meter (200-inch) telescope was finished.
- Landis, Geoffrey "Impact Parameter" in *Impact Parameter*. 2001, Golden Gryphon. Orbiting telescopes in the near future discover that a group of stars are out of place. Nice descriptions of how astronomy is done.
- Sagan, Carl *Contact*. 1985, Simon & Schuster. Main character is loosely based on radio-astronomer Jill Tarter; has lots of good descriptions of how astronomers use radio telescopes to search for signals from civilizations out there.