

## Educational Resources on Supernovae for Children

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**Abstract.** The National Science Education Standards (1996, National Academy Press) suggest mention of objects like the “sun, moon, stars” in grades K-4 and element formation in grades 9-12. Children’s librarians and some astronomy librarians should know about some of the resources for children on supernovae not only because supernovae are critical to higher element formation, but also to educate others about the universe’s expansion and stars.

In addition, basic bibliometrics on these resources yields lessons on the importance of using many indexes, the pattern of literature for children on supernovae, the types of resources on supernovae, and the scattering of resources/information for children on supernovae.

### 1. Method

Educational resources for children on supernovae were collected in many forms: 1. Books, 2. ERIC Reports (print resources on education), 3. Internet Sites, 4. Citations for resources from databases like the Astrophysics Data System, Kid Quest and Junior Quest (Proquest Databases), World Cat (a First Search database), Google.com, and the ERIC (Educational Resources Information Center) database. Different search strategies were used like browsing book shelves, using databases (ERIC, Library Literature, ADS, World Cat, etc.), asking others for help, using Internet search engines, searching through websites (that is, looking at the links in websites), and looking at Science News@NASA email. The materials were read and the following results were determined.

### 2. Results

Internet sites for children on supernovae have some better features than print, like:

1. Links to other sites
2. Affiliation with NASA and their experts
3. More current data
4. Comments/Feedback Sections

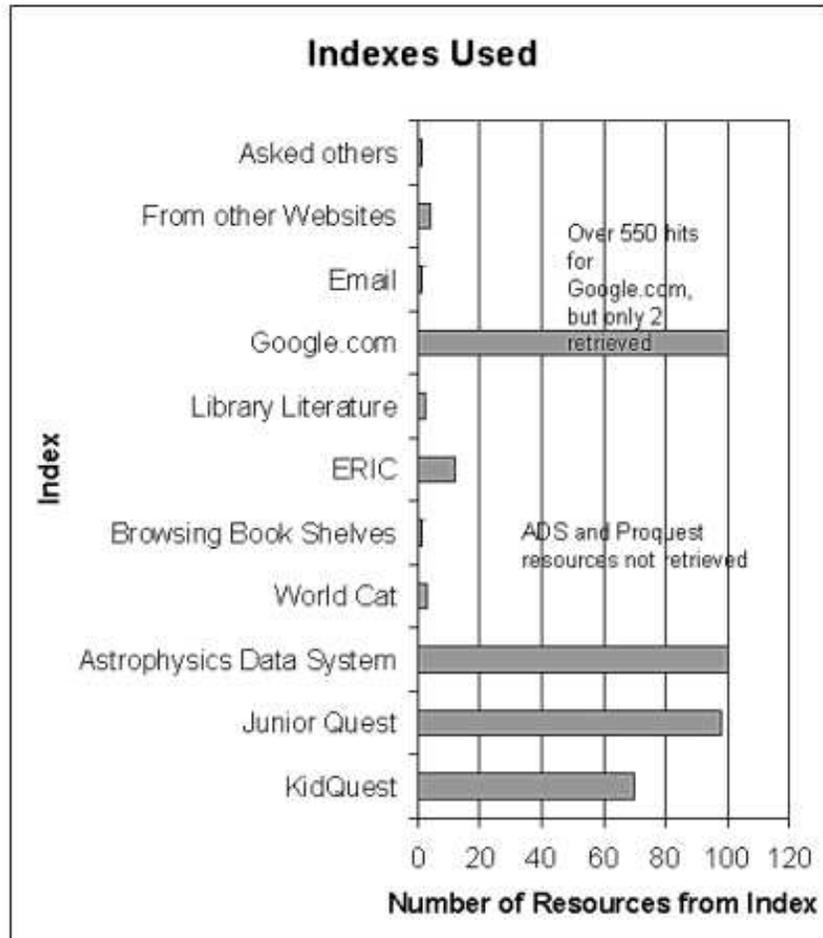


Figure 1. The “Indexes Used” graph shows that a wide variety of indexes need to be used to get all the information on this topic. ADS, Kidquest and Proquest had many resources/citations, but I did not retrieve them. ADS actually had over 16,000 hits for the search terms “educational (materials or resources) and children and (supernovae or supernova)”. Google.com actually yielded over 550 hits for the search terms “educational resources for children on supernovae”, but only two were retrieved for this poster. Many other Google.com sites may have been very helpful, but I did not use them all because of time limitations.

There are still incomplete or inaccurate Internet sites out there. (See the Inaccurate Site on Supernova Remnants below.)

Despite the wealth of information on the Internet, print sources are still important. The print sources—like an ERIC report from 1976 that gives the history of human observation of supernovae, discusses old theories about supernovae like carbon detonation and asks why the Milky Way does not have more supernovae or a children's book which asks about the color of a 1987 supernova—contain valuable lessons and questions not in the internet sites in the same way. There are incomplete/inaccurate print sources too (like one book that talks about a “star in existence since the creation of the universe”), but still part of my point is that a virtual library without some of these print sources would lack important materials. Weeding old material should be done with caution. Also, old data (like the 1976 ERIC document) is still important.

In addition, a search of the Children's Catalog (1909-2000) yields the lesson that some indexes are not comprehensive. Only two books — one in 1991 and one in 1986 — are cited under the term supernova, while, actually, at least four other books on supernovae were published over that period.

In the book *Astronomies and Cultures*, it is said that ancient elites used prediction of astronomical events as a display of power and prestige. (C. Ruggles and N.J. Saunders, *Astronomies and Cultures*, Niwot, Colo, University Press of Colorado, 1993) Besides being helpful teaching tools, children's resources on supernovae also function in some way as a display of the authority of elders as well.

### **3. Basic Bibliometrics**

Adult articles on supernovae literature (Virgil Diodato's 1991 article “Supernova 1987A: A Case Study of the Flow of Information in the Literature of Astronomy and Physics” and David Stern's 1989 article “Supernovae: A Guide to the Literature”) were reviewed. Similar to these articles, some basic bibliometric analysis was attempted.

## **4. Bibliography of some Resources**

### **4.1. ERIC Documents**

National Aeronautics and Space Administration. 1988. *The Death of a Star: Supernova 1987a*. NASA Educational Briefs for the Upper Elementary-Level Classroom. Washington, DC., National Aeronautics and Space Administration. (ERIC Document Reproduction Service No. ED 314240).

National Aeronautics and Space Administration. 1985. *Lifestyles of the Stars*. Cocoa Beach, FL, NASA John Kennedy Space Center. (ERIC Document Reproduction Service No. ED 260910).

Straka, W.C. 1976. *The Supernova—A Stellar Spectacle*. Washington, DC., National Aeronautics and Space Administration and Washington, DC., National Science Foundation (ERIC Document Reproduction Service No. ED 133200).

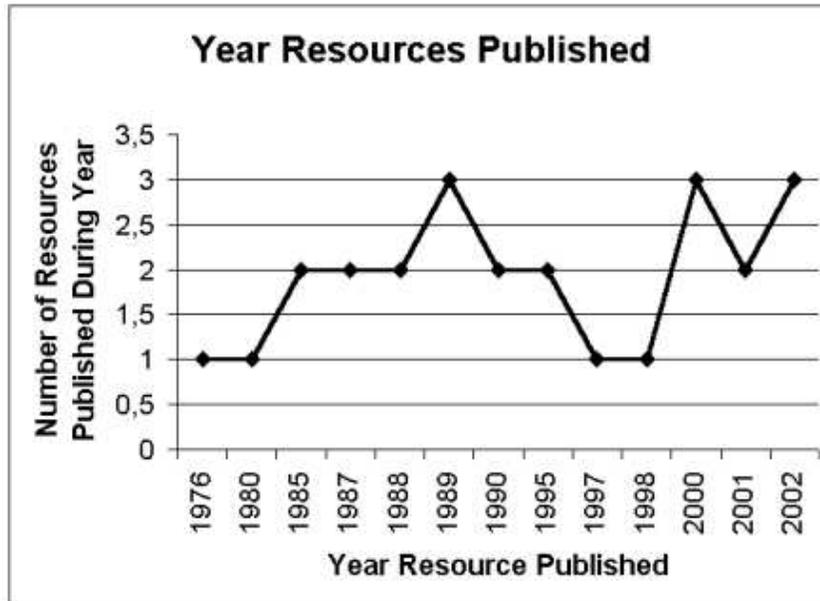


Figure 2. The “Year Resources Published” graph shows that 19 of 25 resources were from after 1987. Supernovae 1987A was possibly an important event for this type of literature.

Truelove, Elizabeth, Dejoie, Joyce. 1988. Starchild Presents. Starchild: A Learning Center for Young Astronomers. Black Holes. An Information and Activity Booklet. Grades K-8, 1998-1999. Greenbelt, MD, NASA Goddard Space Flight Center. (ERIC Document Reproduction Service No. ED431595).

Walker, Ormiston H. 1995. Astronomical 44 Activities, Experiments, and Projects. Classroom Resource 0-27440. Portland, ME, J. Weston Walch. (ERIC Document Reproduction Service No. ED 390695).

#### 4.2. Books

Asimov, Isaac. 1989. The Birth and Death of Stars. Milwaukee, Gareth Stevens, Inc.

Branley, Franklyn Mansfield. 1990. Superstar: the Supernova of 1987. New York, Crowell.

Davies, Taffy. 1997. The New Star. Nashville, TN, Abingdon Press. (This is the source I mention in the results as having incomplete or inaccurate information.)

Lampton, Christopher. 1988. Supernova! New York, Watts.

#### 4.3. Internet Sites

Astronomical Society of Pacific. Why Should We Care About Exploding Stars? Retrieved 5/12/2002 from <http://www.astrosociety.org/education/publications/tn1/08/08.html>.

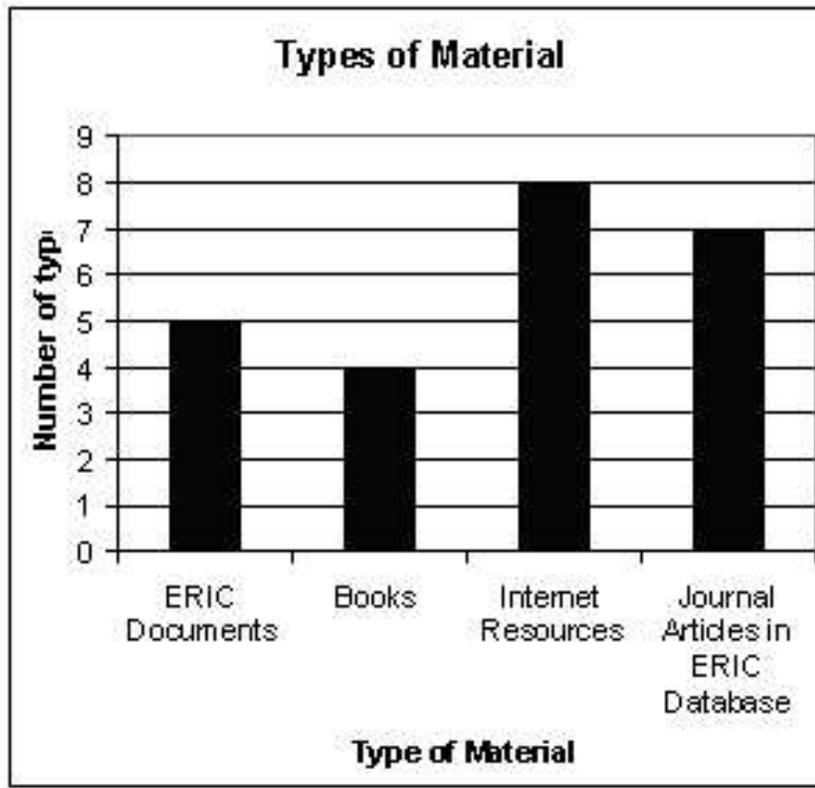


Figure 3. The "Types of Material" graph shows that the literature I retrieved was balanced between many types of resources.

Davies, Keith. Distribution of Supernova Remnants in the Galaxy. Retrieved 4/20/2002 from <http://www.creation.on.ca/cdp/articles/snrart.html>. (This is the inaccurate site I refer to in the project summary.)

NASA High Energy Astrophysics Science Archive Research Center. Starchild: A Learning Center for Young Astronomers. Retrieved 3/19/2002 from <http://starchild.gsfc.nasa.gov/docs/StarChild/StarChild.html>.

NASA Goddard Space Flight Center High Energy Astrophysics Science Archive Research Center (HEASARC). Imagine the Universe. Retrieved 9/16/00 from <http://imagine.gsfc.nasa.gov/index.html>.

NASA Observatorium. Stellar Evolution and Death. Retrieved 8/19/00 from <http://observe.arc.nasa.gov/nasa/core.shtml.html>

NASA Marshall Space Flight Center Science News@NASA. X-Ray Stuff. Retrieved 7/18/00 from <http://www1.msfc.nasa.gov/NEWSROOM/>

NASA Marshall Space Flight Center Science@NASA. NASA KIDS. Retrieved 3/19/2002 from <http://kids.msfc.nasa.gov>.

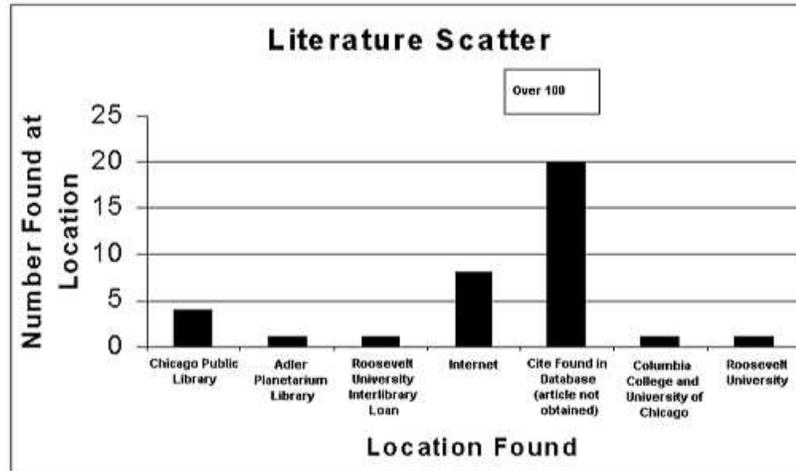


Figure 4. The “Literature Scatter” graph shows that the Internet is a very significant resource for this type of information. Citation indexes obviously are very important too. Interlibrary loan is important, but less important to someone living in a city with many libraries nearby. Information can be scattered and still retrieved, if one lives in a city with many libraries nearby.

Plait, P., Too Few Supernova Remnants for An Old Universe. Retrieved 4/20/2002 from <http://home.mmcable.com/harlequin/evol/lies/lie018.html>. (This is a response to the inaccurate site I list above.)

Young, Donna, Chandra X-Ray Observatory. Supernova-Related Demonstrations. Retrieved 4/28/02 from <http://chandra.harvard.edu/edu/formal/demos/snr.html>.

#### 4.4. Adult Articles On Supernovae Literature

Diodato, Virgil. 1990. Supernova 1987A: Case Study of the Flow of Information in the Literature of Astronomy and Physics. *Science and Technology Libraries*. 11:101-137.

Stern, David. 1988. Supernova: A Guide to the Literature. *Science and Technology Libraries*. 9:97-117.

#### 4.5. Samples of Journal Article Resources from the ERIC database.

Berry, D.A. Ed., 1990, AV Corner, *Physics Teacher* 28, 254-58.

Fraknoi, A., 1987, Astronomical Resources: Supernovae, *Mercury* 16, 122-123.

Greenstein, G., 1985, Neutron Stars and Discovery of Pulsars, *Mercury* 14, 66-73.

Mancuso, R.V. and Long, K.R., 1995, The Astro-Blaster, *Physics Teacher* 33, 358.

Mitalas, R. 1980. Supernovae in Binary Systems: An Application of Classical Mechanics, *American Journal of Physics* 48, 226-31.

Shaw, G.W. 1989. Science Notes, *School Science Review* 70, 67-93.

Straka, W., 1987. The Cygnus Loop: An Older Supernova Remnant, *Mercury* 16, 150-154.

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