

Triton Fun Company

Science Newsletter March 2009

Science Newsletter

March 2009

Earth's First Pre-Known Asteroid Impact: The Sudan Event of October 7, 2008

T. Dockweiler

Special points of interest:

Splat in Sudan

Triton Fun stuff

Superfluous questions

Earth and all of the other planets in our solar system have been vulnerable to impact events by other celestial bodies over the course of geological history. The first recorded pre-known event was that of Comet Shoemaker-Levy 9, composed of many pieces impacting Jupiter in 1994. The Jupiter event caused political shockwaves across our world, not to mention great excitement amongst astronomers and geologists. The belief of massive bombardment of our Moon by celestial objects in the ancient past was proved quite possible with this particular comet hitting our Solar System's largest planet. It quickly fostered the creation of a threat assessment color-coded number index (the Torino Scale).

Not counting various annual meteor showers, Earth has had no event that was known before impact until now. Following on the heels not long after the 100th anniversary of the Tunguska Impact Event of June, 1908, this first pre-known impact event occurred in Sudan on October 07, 2008. The asteroidal object, 2008 TC3, was only discovered the day before by Richard A. Kowalski while asteroid searching as part of the Catalina Sky Survey with the 60-Inch Telescope at the Mount Lemmon Observatory northeast of Tucson, Arizona. The meteoroid has been estimated to have been about 2-5 meters in size.

After an initial analysis indicating imminent impact, and in the first real test of the worldwide network "Spaceguard" (a term created by Arthur C. Clarke in his book *Rendezvous with Rama*), over 1,000 astrometric and photometric observations were conducted by 27 people plus support staff spanning almost 19 hours; this resulted in a significant set of 25 issued *Minor Planet Circulars* with further refined orbit information. The object lit the pre-dawn sky in Sudan and left a significant vapor trail. It approached from the west at a grazing angle of 19 degrees from the horizon. In under 20 hours from discovery the object travelled over and burst above the desert in an unpopulated area in far northern Sudan at 5:46 a.m. local time (0246 UTC). Entry was observed distantly by a German airline crew and by various infrared detecting civilian and military satellites.

Like Tunguska, the resulting airburst destroyed the object before it reached the ground. The bolide produced a shockwave of sound and fragments. Fragments have been recently recovered in Sudan not far from the southern border of Egypt by persons from the University of Khartoum (as announced by Lindley Johnson of NASA at a United Nations meeting on 2009 February 16 in Vienna).



Meteorite landing

On Oct 7, 2008, a meteor hit the Earth and mostly broke up in the atmosphere; some pieces were recovered on the ground

Analyses of the meteorites are on-going. No professional published papers have yet appeared. The small meteorites are the first pre-known meteor phase samples collected.

Statistically, this meteoroid (a very minor near-Earth object now off the tracking lists), was part of a vast number of asteroidal objects orbiting in our Solar System. The first object, *1 Ceres*, initially called a *planet*, then an *asteroid*, and recently the *largest dwarf planet*, was discovered on New Year's Day 1801 by the Italian-Catholic monk-astronomer Giuseppe Piazzi. In a little over 200 years, the number of known asteroids has grown to just under a half million (444,080) from about 62 million observations, most only in the last decade!

continued, pg 2 —>

We are always looking for **contributors** to the Science Newsletter. If you would like to write an article about a science subject you are excited about, or contribute a superfluous question, or if you would like to be on our **mailing list** for future newsletters, please e-mail us at:

info@tritonfun.com

Asteroid Impact: continued

Photos/Info: NASA/CIA Factbook/University of Texas at Austin

Half of those have sufficient orbits determined that they have been given permanent numbers (210,454). As of 2009 March 11 there are 15,118 asteroids given permanent honoring or mythological names. Earth is threatened by 6,126 near-Earth objects. (Out of the 6,126 objects, 1,029 are potentially hazardous, with 142 of those that are thought to possibly be significantly dangerous).

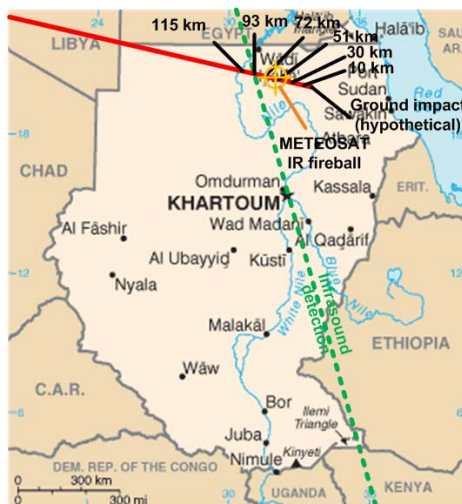
Video-recording has been done recently of some transient lunar phenomena directly caused by meteor hits from meteor showers on our Moon. Mars has now been observed with the Mars Reconnaissance Orbiter to have similar meteor-shower phenomena. Photographs taken before and after show post-impact dark dusting sprays of some small sites on the Martian world.

A significant future event will be witnessed 20 years from now by Earthlings of the very close passing of 99942 *Apophis* on Friday, April 13, 2029. It is hoped technology will improve by then to allow more advance warning than that obtained for the Sudan Event, especially from objects coming from the direction of our Sun. With the recent direct imaging of planets around other stars just beginning to occur, there may come a time when rogue worlds and objects, travelling above their corresponding stellar escape velocities, will also be directly discovered in advance before they enter our Solar System.

===

References:

1. "Found: Pieces of meteorite spotted before impact", *New Scientist*, news brief, Issue 2697, p. 15, February 25, 2009.
2. "First tracked space rock recovered after impact", *New Scientist*, online blog article re: Space, February 19, 2009.



Above: Map of Sudan, in northeast Africa

Left: Map showing the path of the asteroid that hit northern Sudan on October 7, 2008

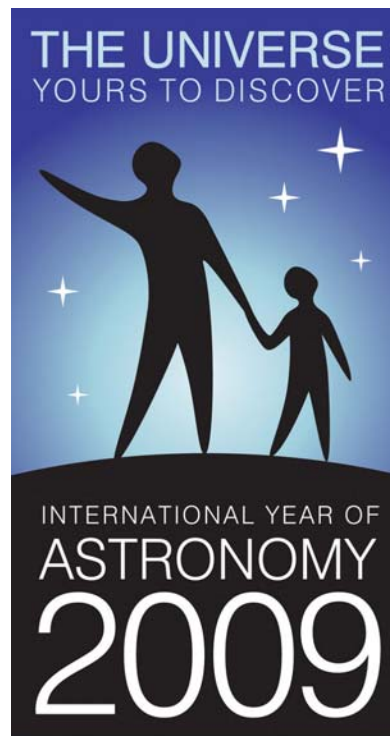
TRITON FUN PRODUCTS

2009 has been declared the "International Year of Astronomy". Events and activities to further the excitement of astronomy are being planned by IYA committees in over 100 countries. The logo for the IYA2009 is shown below. For more info on upcoming IYA2009 events, go to: <http://www.astronomy2009.org>

Triton Fun is an authorized distributor of T-shirts, sweatshirts and long-sleeve tees sporting this new logo. Part of the proceeds from the sale of these shirts will go to support astronomy clubs and astronomy activities connected with IYA2009 in California.

Get yours today ! These shirts can be ordered online on our website: <http://www.tritonfun.com>

Or, order by phone (toll-free) : 800-778-0560



<http://www.tritonfun.com>

Mailing Address:

Triton Fun Company
P.O. Box 1522
La Canada Flintridge, California 91012

Phone: 800-778-0560

E-mail: info@tritonfun.com

Website: <http://www.tritonfun.com>



Triton Fun Company

Science and Astronomy-related products for the whole family

See our online catalog for great gift ideas !

All back-issues of our Science Newsletter are available in our "Newsletter Archive" at:
<http://www.tritonfun.com>

We're on the Web !

<http://www.tritonfun.com>

** Send us your superfluous questions for a future issue ! They can be on any subject. The funnier, the better. M.D., our editor, appreciates the help and will send you a free Triton Fun coffee mug as compensation for your question. Or write an article for us and be read by professional and amateur astronomers and scientists in the U.S. and Canada ! **

Superfluous Questions:

- 1) In the TV show *Adderly* (1986), who was the Russian agent who damaged Adderly's hand ?
 - a) Serov b) Titov c) Baranov d) Palianov
- 2) After being injured, Adderly was assigned to *what* department ?
 - a) International Affairs b) Internal Affairs c) Regulatory Affairs d) Miscellaneous Affairs
- 3) Adderly worked at ISI, *International Security and Intelligence*, a fictional spy agency. What is the name of the government building in Toronto that served as ISI Headquarters ?
 - a) Ferguson Block b) Drew Building c) Frost Building d) McMurtry-Scott Building
- 4) What was the name of Adderly's espionage partner in his tale of intrigue in Morocco ?
 - a) Suzy b) Jesse c) Billy d) Sally

→ ANSWERS in next months issue of the Science Newsletter ! ←---

** ANSWERS to February's Superfluous Questions: 1. c) R. Dreyfuss 2. c) Hawaii 3. d) James Madison 4. d) John Adams