



The Swift Education and Public Outreach Program

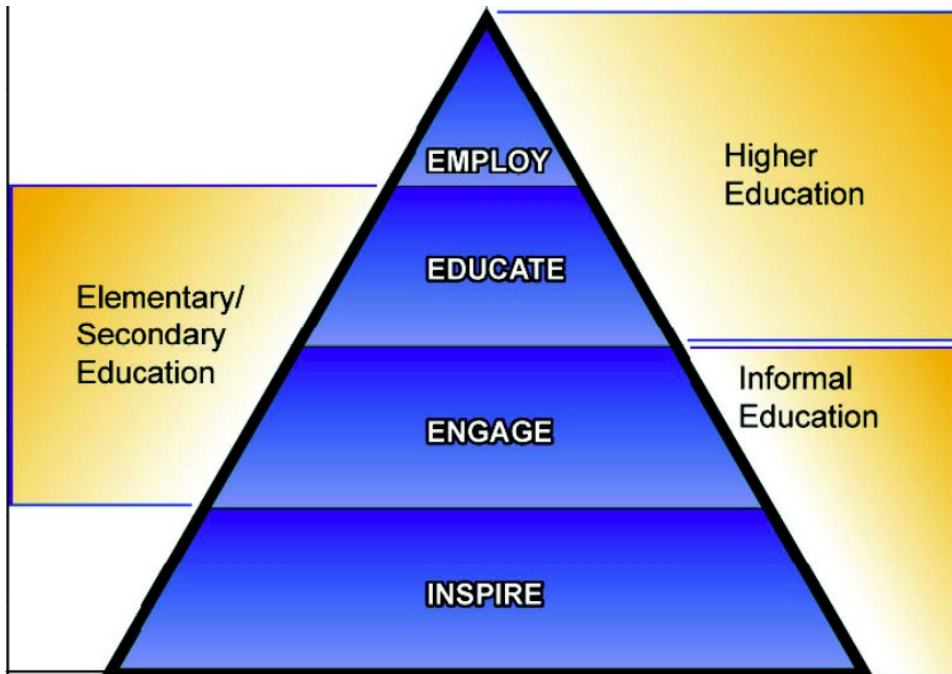
Lynn Cominsky
Sonoma State University

February 5, 2008

Swift: Catching Gamma Ray Bursts on the Fly

XRT
BAT
UVOT


Senior Review E/PO Proposal Overview



• New NASA Education Framework

- Informal education and public outreach
- Elementary & Secondary education
- Higher Education

• Emphasis on workforce development for under-represented populations



Swift: Catching Gamma Ray Bursts on the Fly



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Informal and Public Outreach

- Multi-media experiences
- Popular websites
- High-leverage activities conducted by the *Night Sky Network* of amateur astronomers

Night Sky Network

Astronomy Clubs bringing the wonders of the universe to the public



The top left of the slide features a composite image. On the left, the Swift satellite is shown in space, with its gold-colored body and solar panels. To its right, a bright, multi-colored gamma-ray burst is depicted as a glowing, multi-lobed structure against a dark background.

Swift: Catching Gamma Ray Bursts on the Fly

The top right of the slide shows a person in a white lab coat working at a desk, possibly in a control room or laboratory. The background is dark with some light patterns. Overlaid on this image are the names of astronomical instruments: XRT, BAT, and UVOT, arranged vertically and slightly faded.

XRT
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Multi-Media Experiences

- Black Holes: The Other Side of Infinity
 - Features Swift launch and animation
- Also PBS NOVA show features Swift
- <http://www.pbs.org/wgbh/nova/blackhole>




Swift: Catching Gamma Ray Bursts on the Fly

Swift Websites

- E/PO site: <http://swift.sonoma.edu>
- GRB SkyMap: <http://grb.sonoma.edu>
 - All bursts since August 2004
- MySpace: <http://myspace.com/swiftsatell>
 - Over 135 friends
 - Blog with current events
- Facebook (must be a member to view)
- Swift Newsletter:
<http://swift.sonoma.edu/resources/multimedia/newsletter/>
 - Eighth issue now online
 - Science news, mission report, E/PO news and mc
- CaféPress: <http://cafepress.com/swiftsatelli>





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Supernova! Toolkit

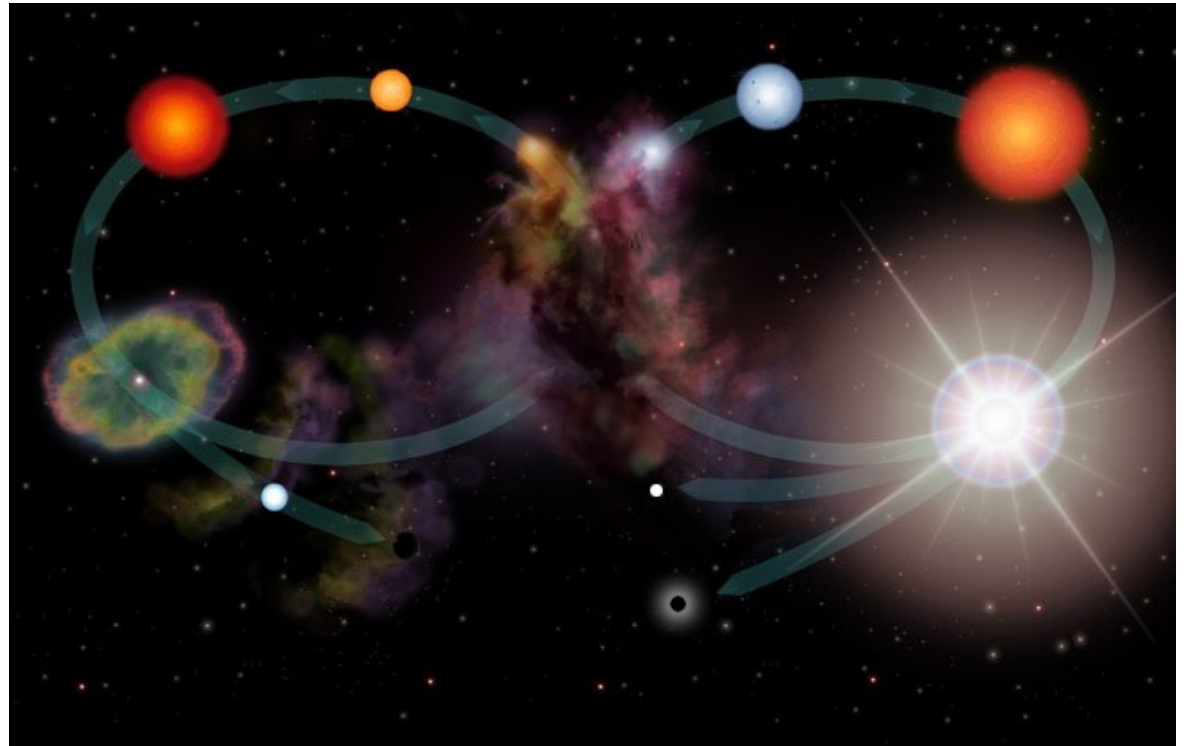
- NSN: Over 200 clubs nation-wide
- Joint project with Suzaku, GLAST and XMM-Newton, developed by Astronomical Society of the Pacific




Swift: Catching Gamma Ray Bursts on the Fly

Supernova! Activities

- Supernovae in the Lives of Stars
 - Life Cycles of Stars poster
 - Let's Make a Supernova
 - Star Maps: Stars Likely to Go Supernova





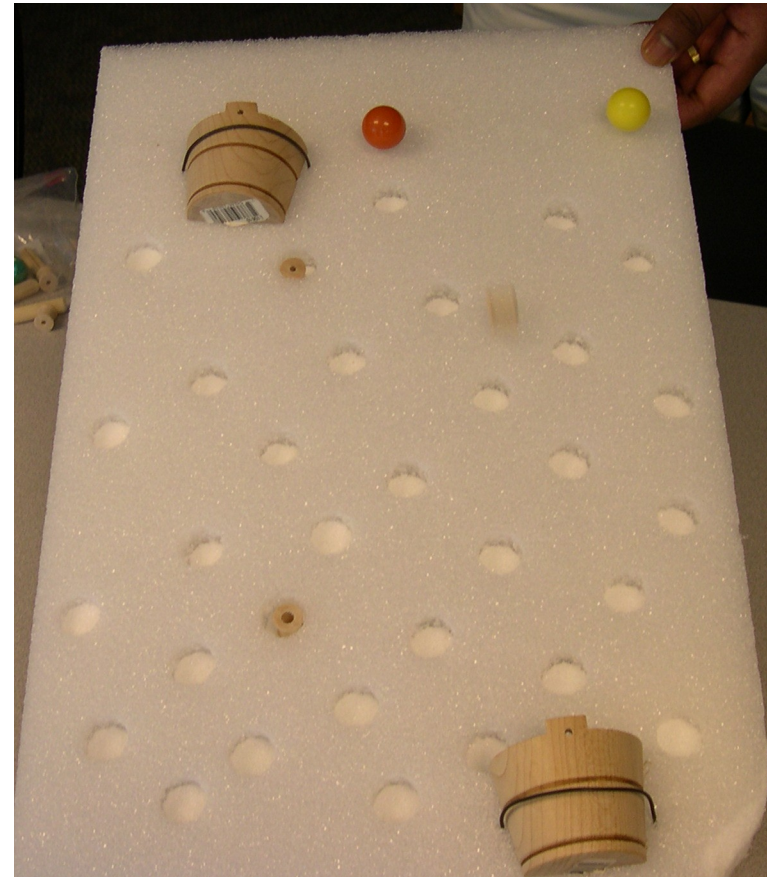
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Supernova! Activities

- Protecting the Earth from Cosmic Radiation
 - Nuclear Fusion, Cosmic Radiation and Supernovae
 - Protecting the Earth Activity
 - Air as a Shield
 - Gamma-ray Bursts




Supernova! Activities

- Universe without Supernovae
 - Cosmic Connection to the Elements (GSFC)
 - Activity, Guide and Poster

A Universe without Supernovae

If supernovae never occurred in our universe to disperse the elements made in stars, what would be left in the universe?



Basic Elements in the Universe
(originated in Big Bang)
Hydrogen, Helium

Common Elements whose primary source is from stars that go supernova

Aluminum
Calcium
Carbon
Chlorine
Copper
Gold
Iron
Magnesium
Mercury
Nickel
Oxygen
Phosphorus
Platinum
Potassium
Silicon
Silver
Sodium
Sulfur
Titanium
Uranium
Zinc


Common Elements originating from small stars

Nitrogen
Carbon
Lithium

Some of the elements found in:

Diamond rings: Carbon, Gold
Computers & Cell Phones: Silicon (computer chips), Carbon, Hydrogen, Oxygen, Sulfur (plastics)
Buildings: Iron (in steel), Calcium, Silicon, Oxygen (in concrete)
Plants, Animals, and People: Carbon, Hydrogen, Nitrogen, Oxygen, Sodium, Magnesium, Phosphorus, Sulfur, Potassium, Calcium, Iron, Zinc
Atmosphere: Nitrogen, Oxygen
Earth: Iron, Oxygen, Silicon, Aluminum, Calcium
Sun: Hydrogen, Helium

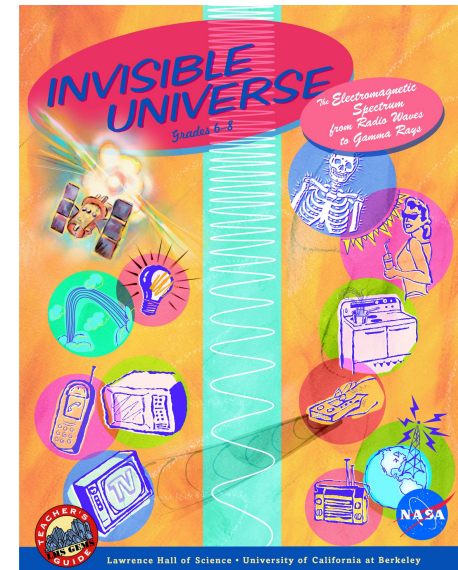
www.nasa.gov




Swift: Catching Gamma Ray Bursts on the Fly

Elementary & Secondary Education

- Standards-aligned classroom materials
 - GEMS Guide: Invisible Universe
 - GRB Educator's Guide
 - Newton's Laws Poster Set
 - Swift Eyes Through Time
- Educator Ambassadors
- After-School Programs

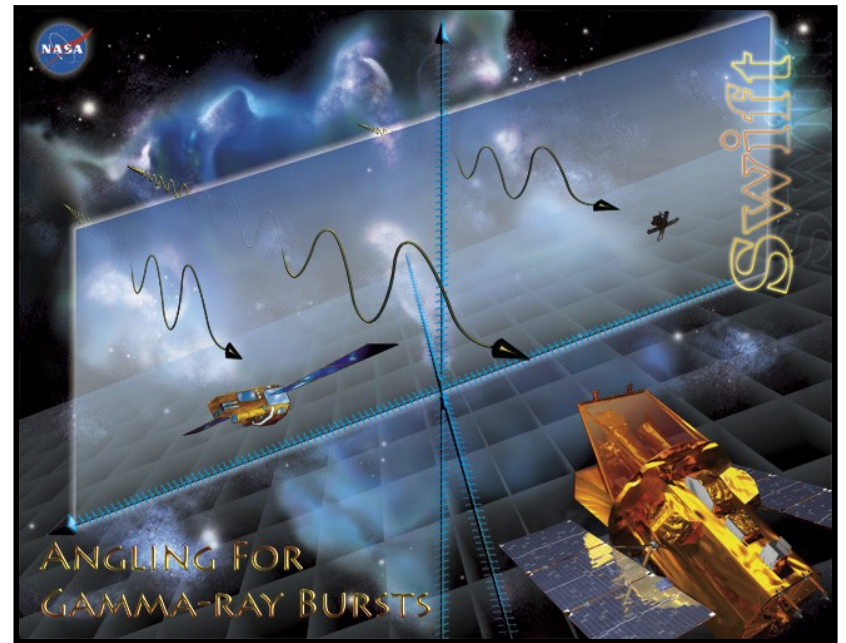




Swift: Catching Gamma Ray Bursts on the Fly

Classroom Materials for grades 7-12

- Approved by NASA and in wide distribution:
 - GEMS Guide
 - GRB Educator's Guide
 - Newton's Laws Poster Set




*GRB Guide Posters finally
printed!*

Swift: Catching Gamma Ray Bursts on the Fly

Newton's Laws

- Now available – limited number of sets without folds – write to lynnc@universe.sonoma.edu






Swift: Catching Gamma Ray Bursts on the Fly

Penn State E/PO: Swift Eyes through Time

- Six 5-minute video segments on a DVD, each with activity – some from WITN?
- Focus is process of Science
 - Earth, the Universe and Culture
 - Theories
 - Accidental Discoveries
 - The Relationship Between Science and Technology
 - Looking Back in Time
 - Creativity in Science
- Now in revision after NASA Product Review and available on-line



<http://www.wpsu.org/swift/>



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Educator Ambassadors Program

- Swift supports 5 EAs
 - Rob Sparks (Arizona)
 - Rae McEntyre (Kentucky)
 - Bruce Hemp (Virginia)
 - Janet Moore (Illinois)
 - David Beier (Missouri)
- Have reached over 7500 students and teachers through over 150 lectures, mini-courses and workshops
- Next EA training: July 28 – Aug 1 at SSU



Janet
Moore at
CLC

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After-School Programs with Under-represented students

- **Roseland University Prep**
 - 2/3 of seniors now admitted to 4-year college for F2008
 - >90% Hispanic, low-income
 - After-school club since 2005
- **MESA Schools Program**
 - Opened center at Cali Calmecac
- **MESA Engineering Program**
 - In progress at SSU



Lynn and Aurore at Cali Calmecac



RUP student working on college applications


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RUP Summer Experience at SSU



Last
summer's
group

Will do
this again
in June,
2008 for
rising
seniors



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Higher Education

- Authentic research experiences with high-school and college students through the Global Telescope Network
- 23 partner institutions
- New partnership with Dr. Kim Coble at Chicago State University to develop college curriculum and work with African-American students



- <http://gtm.sonoma.edu>

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Swift: Catching Gamma Ray Bursts on the Fly

The top right of the slide shows a person in a white lab coat working at a desk, possibly in a control room or laboratory. The background is dark with some faint lights. Overlaid on this image are the names of the Swift satellite's instruments: XRT, BAT, and UVOT, written in a light, semi-transparent font.

XRT
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Swift PR Overview

- Two scientific symposia at AAAS organized
 - 2006: A Giant Flare from a Magnetar: Blitzing the Earth from Across the Galaxy
 - Hurley, Palmer, Gaensler and Inan
 - 2008: The World-Wide Hunt To Solve The Mystery Of Gamma-Ray Bursts
 - Gehrels, Wells, Chincarini and Piran
- 33 Press releases to date (launch and beyond)
 - 2008: 1 so far (More on the way!)
 - 2007: 9 including Rossi Prize release
 - 2006: 9
 - 2005: 11 including first light of UVOT
 - 2004: 3 including launch and first light of BAT, XRT

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Swift: Catching Gamma Ray Bursts on the Fly

The top right of the slide shows a person in a white lab coat, likely an astronomer, working at a desk or control panel. The background is dark and slightly out of focus, with some faint, glowing elements. Overlaid on this image are the names of Swift's instruments: XRT, BAT, and UVOT, written in a light, semi-transparent font.

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Press Releases


- January 9, 2008 - Swift and Gemini Probe Mysterious Distant Explosion
- December 18, 2007 - 'Shot in the Dark' Star Explosion Stuns Astronomers
- October 30, 2007 - Swift helps shatter Black Hole Record
- September 12, 2007 - NASA Astronomers Find Bizarre Planet-Mass Object Orbiting Neutron Star
- July 30, 2007 - Japanese and NASA Satellites Unveil New Type of Active Galaxy
- June 26, 2007 - NASA's Swift Sees Double Supernova in Galaxy
- May 22, 2007 - Gamma-ray Bursts Active Longer Than Thought
- March 15, 2007 - Robotic Telescope Unravels Mystery of Cosmic Blasts



Swift: Catching Gamma Ray Bursts on the Fly

Press Releases

- March 8, 2007 - Gamma-Ray Birth Cries Suggest Massive Magnetic Engines
- January 16, 2007 - Top High-Energy Astronomy Prize Awarded for Swift Discoveries
- December 20, 2006 - NASA Satellite Discovers New Kind of Black Hole Explosion
- November 21, 2006 - Twin Star Explosions Fascinate Astronomers
- November 6, 2006 - Monster Stellar Flare Seen by NASA Scientists Dwarfs All Others
- October 5, 2006 - NASA Performs Headcount of Local Black Holes
- October 5, 2006 - Scientists Determine The Nature Of Black Hole Jets

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Press Releases

- October 4, 2006 - Mug Shots of Supernovas Reveal Two Key Findings
- August 30, 2006 - Caught in the Act, Scientists Watch Supernova Explode
- May 12, 2006 - X-rays Fly as Cracking Comet Streaks Across the Sky
- February 24, 2006 - Scientists Detect New Kind of Cosmic Explosion
- December 14, 2005 - Cosmic Explosion Could Be Black Hole Swallowing Neutron Star
- October 5, 2005 - In A Flash Nasa Helps Solve 35-Year-Old Cosmic Mystery
- September 12, 2005 - Most Distant Explosion Detected, Smashes Previous Record



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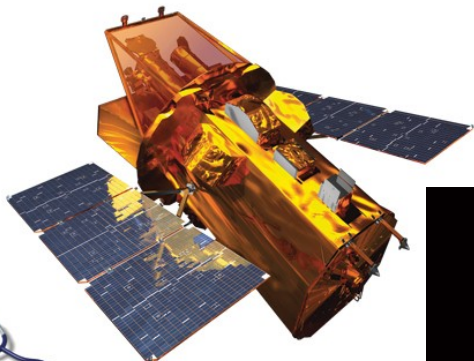
Press Releases

- August 18, 2005 - NASA's Swift Satellite Finds Newborn Black Holes
- May 11, 2005 - NASA Scientists Catch Unique Gamma-Ray Burst
- April 5, 2005 - Swift Mission Nabs Its First Distance Measurement to Star Explosion
- February 18, 2005 - NASA Observes One of Brightest Cosmic Explosions
- February 15, 2005 - NASA's Newest Observatory Detects Record-Making Gamma Rays
- February 01, 2005 - Swift Sees Pinwheel Galaxy, Satellite Fully Operational
- January 21, 2005 - Swift Mission Images the Birth of a Black Hole
- January 5, 2005 - NASA Swift Mission Turns on and Sees a Blast of Bursts

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Recent Press Art



By Aurore
Simonnet

