



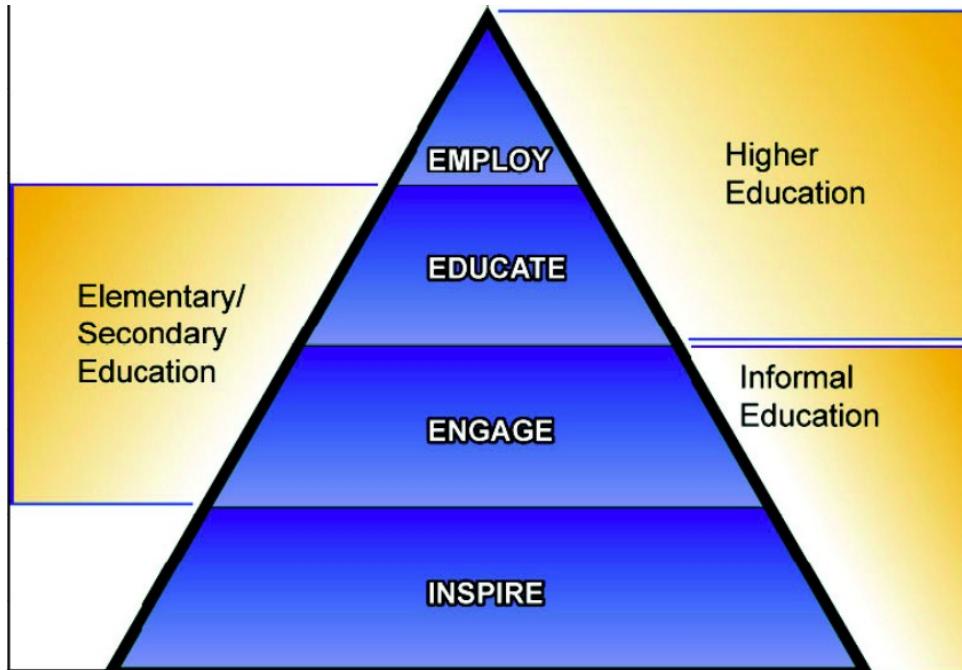
# The Swift Education and Public Outreach Program

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Sonoma State University

February 5, 2008



# 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**



# Informal and Public Outreach

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

***Night Sky Network***

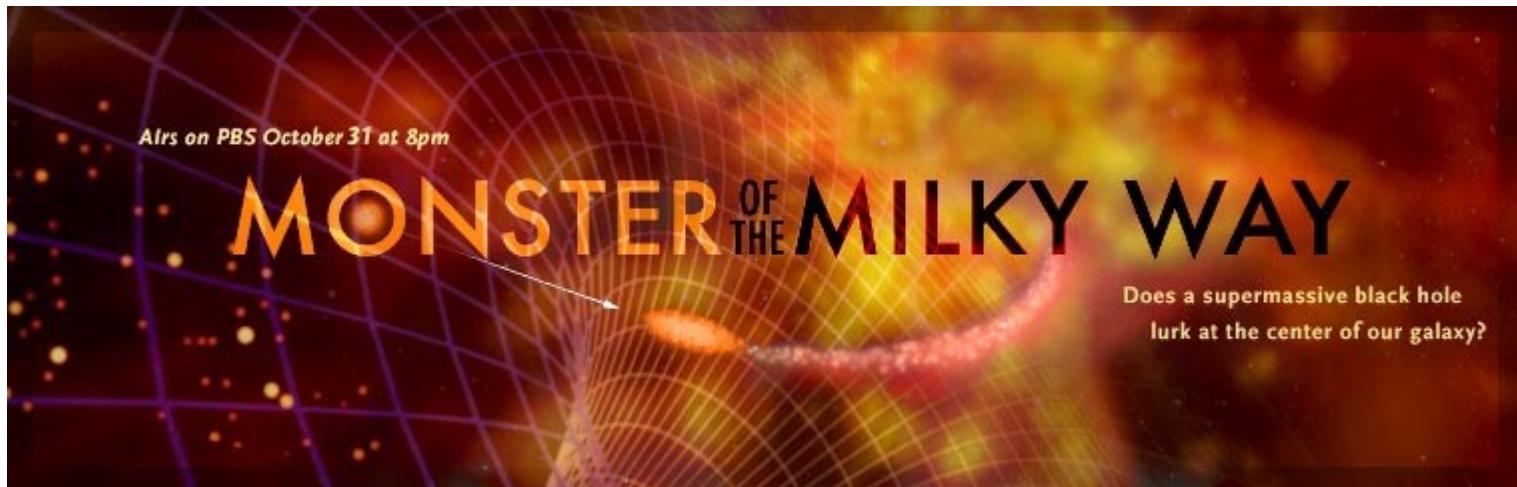
Astronomy Clubs bringing the wonders of the universe to the public





# 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 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 more
- CaféPress: <http://cafepress.com/swiftsatelli>





# Supernova! Toolkit

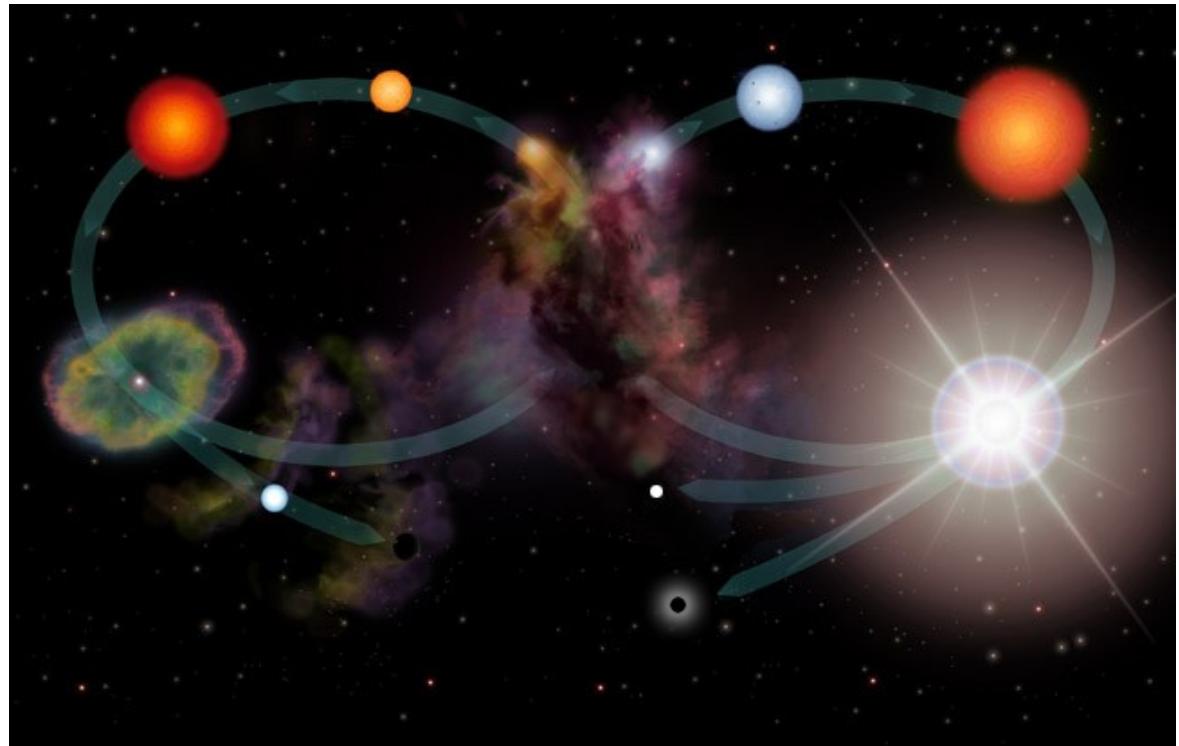
- NSN: Over 200 clubs nation-wide
- Joint project with Suzaku, GLAST and XMM-Newton, developed by Astronomical Society of the Pacific





# Supernova! Activities

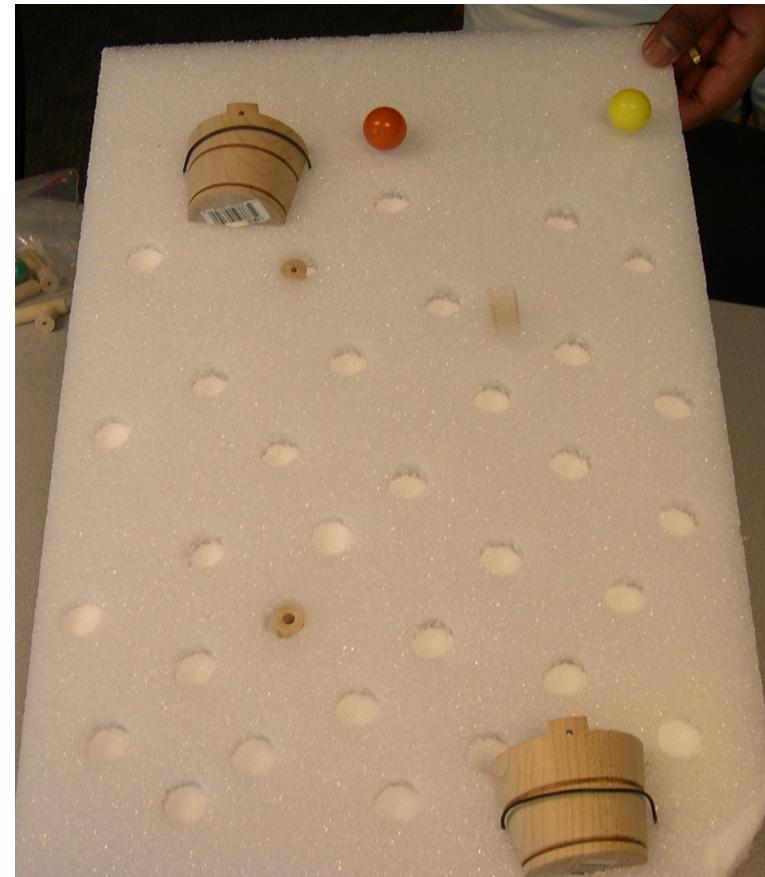
- Supernovae in the Lives of Stars
  - Life Cycles of Stars poster
  - Let's Make a Supernova
  - Star Maps: Stars Likely to Go Supernova





# 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





Swift: Catching Gamma Ray Bursts on the Fly

# 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?

The diagram shows a cross-section of a planet, likely Earth, with a large hole through its center. A person is sitting at a desk with a computer, looking at the hole. The interior of the planet is depicted with various layers and structures, including a core, mantle, and crust. A small sun is visible in the background.

**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](http://www.nasa.gov)



# 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

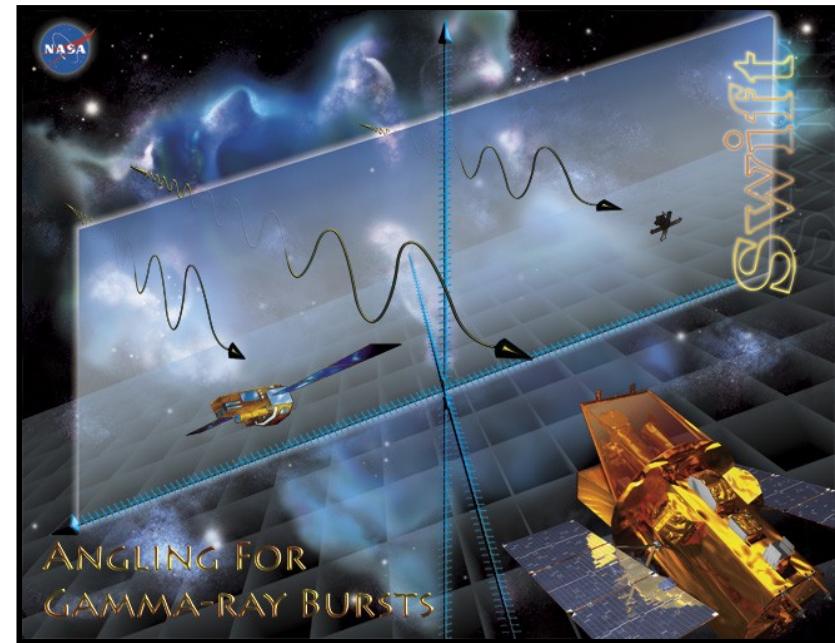


Lawrence Hall of Science • University of California at Berkeley



# Classroom Materials for grades 7-12

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



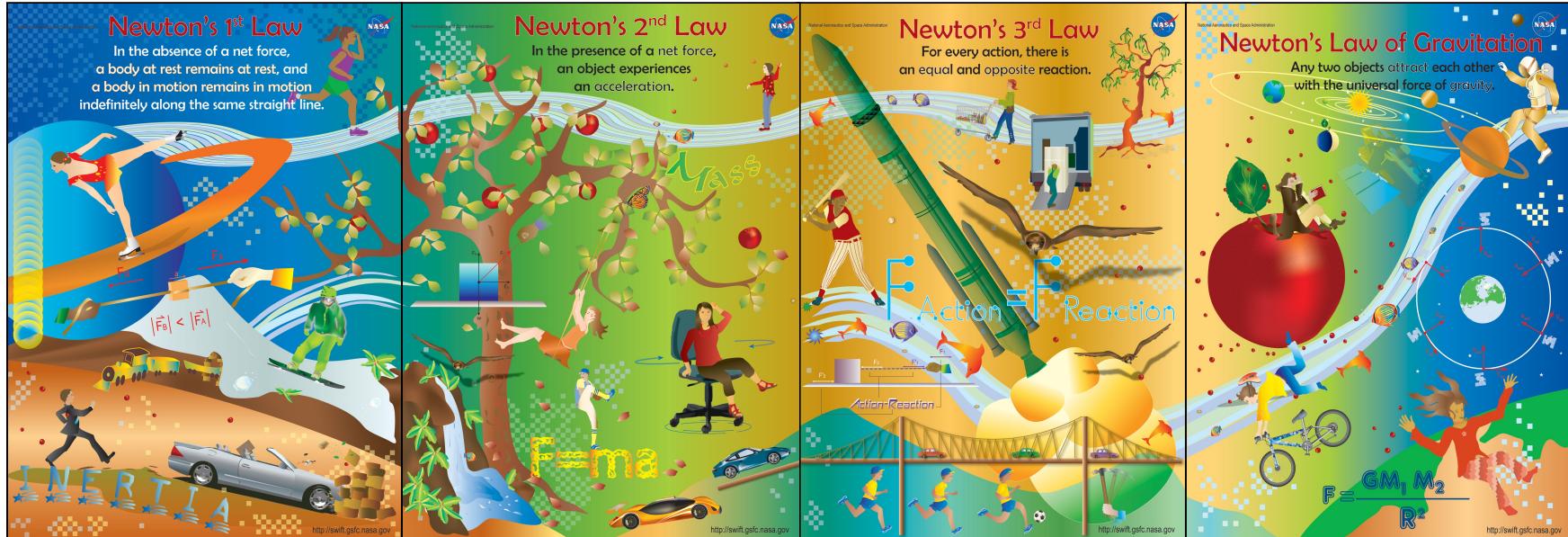
*GRB Guide Posters finally  
printed!*



Swift: Catching Gamma Ray Bursts on the Fly

# Newton's Laws

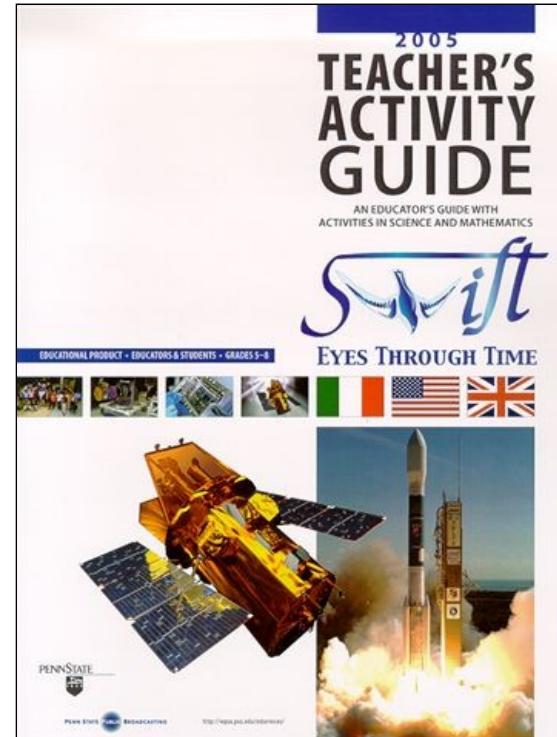
- Now available – limited number of sets without folds – write to [lynnc@universe.sonoma.edu](mailto:lynnc@universe.sonoma.edu)





# 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/>



# 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



# 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



# RUP Summer Experience at SSU



Last  
summer's  
group

Will do  
this again  
in June,  
2008 for  
rising  
seniors



## 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://gtn.sonoma.edu>



## 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



## 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



## 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

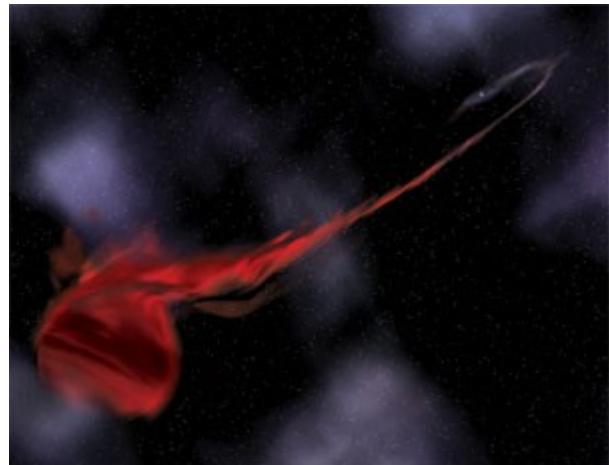
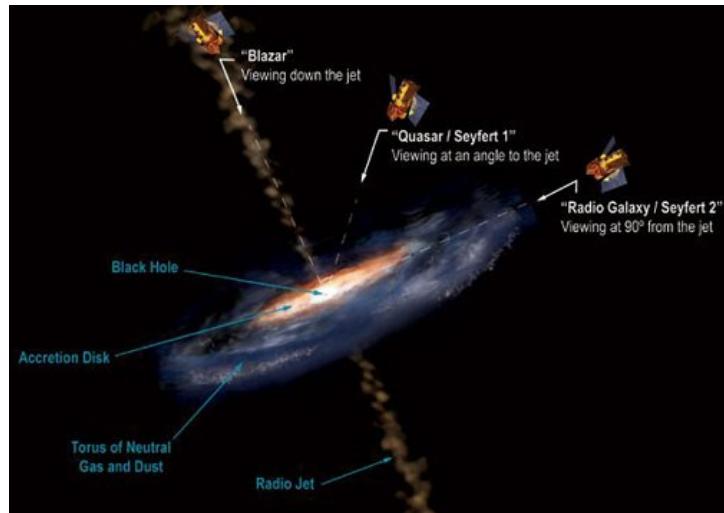


## Press Releases

- 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



# Recent Press Art



By Aurore  
Simonnet

