XMM-Newton

Sonoma State University Education and Public Outreach November 2005

Lynn Cominsky

Sonoma State University

E/PO Exhibit Booth

Used for teacher conferences

Educator Ambassador Program

- 20 Master educators selected in national competition
- Trained bi-yearly at SSU – next in 2006
- Help develop, test, and disseminate our materials
- Did over 140 workshops nationally last year, reached over 10,000 teachers directly

You are Here!

- Mini-course for 8th -9th grade students
  - The Size and Scale of Things
  - How We See the Universe
  - Trip to the Sun
  - Solar System Travel Plans
  - Our Milky Way Galaxy and Beyond
- Uses Scale the Universe and GEMS

Global Telescope Network

- Website: http://gtn.sonoma.edu
  - Educator activities
  - Partner and Associate information
  - Tools for generating scripts and importing program objects into telescope control software
- GORT NOW ONLINE!!
- Remote demonstration at HEA AAVSO meeting
- Scripted observations now running
- Mkn 501 campaign with VERITAS
- 4C 29.45 campaign with Spitzer

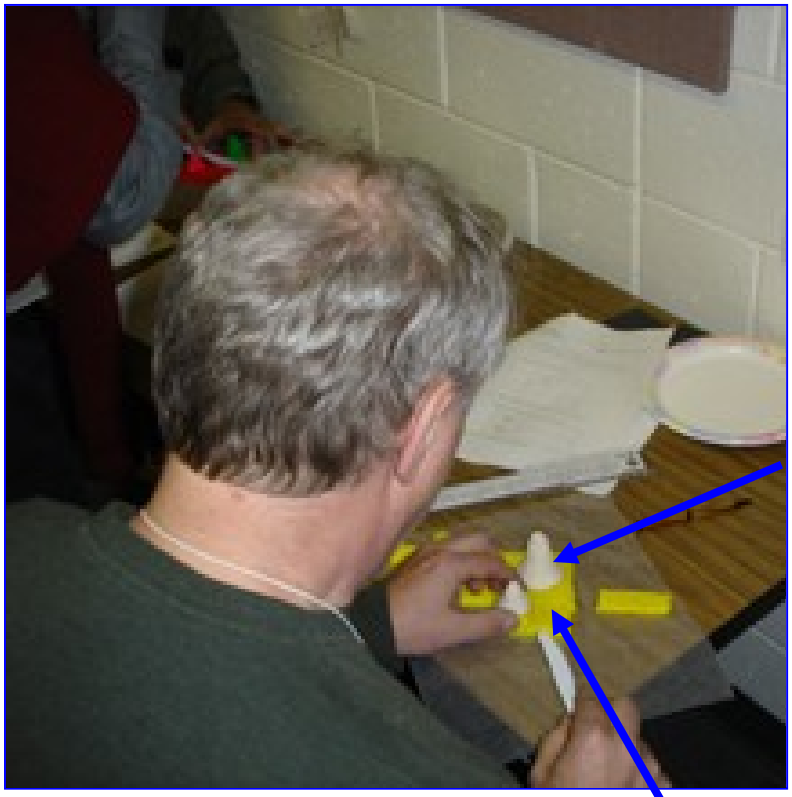
GLAST Optical Robotic Telescope at the California Academy of Science's Pepperwood Natural Preserve

Global Telescope Network

- Simple image reduction and analysis of ~15 AGN to establish variability baselines
- Hands-On Universe
- AAVSO participation

- Elk Creek Observatory at Holton, Kansas HS
- Agrupacion Astronomica de Sabadell. Barcelona, Spain
- Tonantzintla Observatory Tonantzintla, Mexico
- Universidad Nacional de La Plata Buenos Aires, Argentina
- Bernard Heathcote. Victoria, Australia
- Carnes Hill Observatory. Sydney, Australia
- Nyrola Observatory Muurame, Finland
- Western Kentucky University

Cookie Cutter Photometry



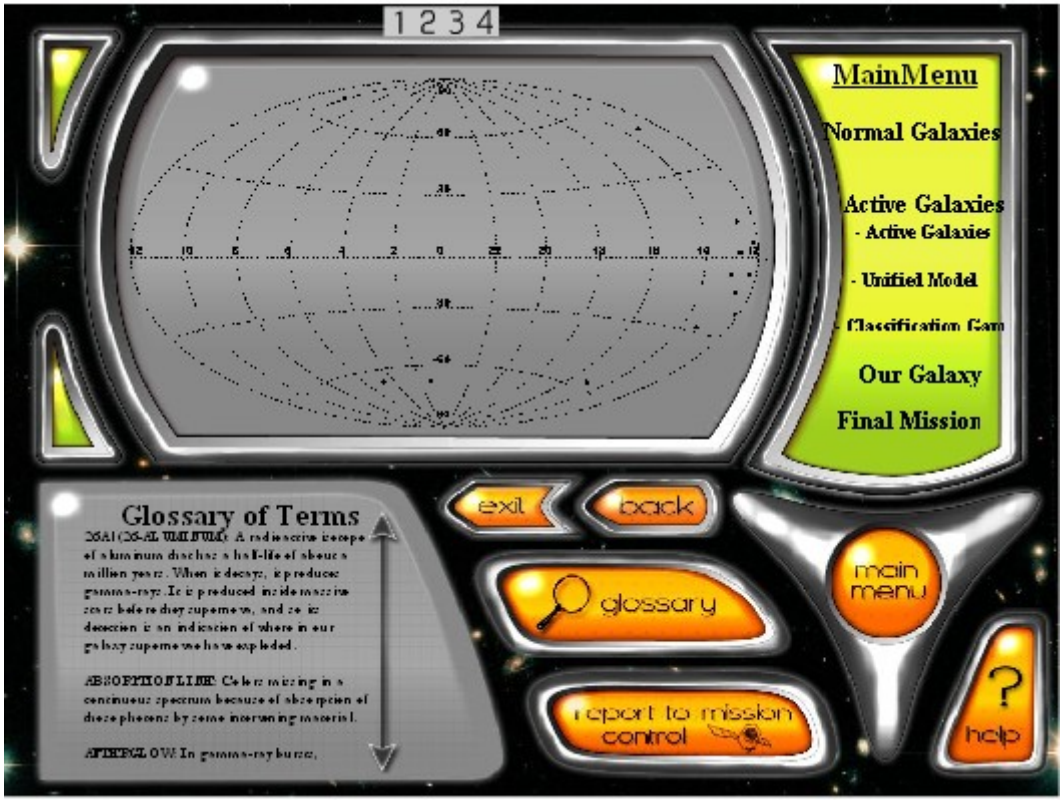
- Goal is to remove background from stellar image
- Must also compare the brightnesses of the two stars in the “image”
- Tools: scale, ruler and plastic knife
- Also: Jelly Bean Spectroscopy – coming soon!

Space Mysteries

- http://mystery.sonoma.edu
  - Galactic Doom?
  - Solar Supernova?

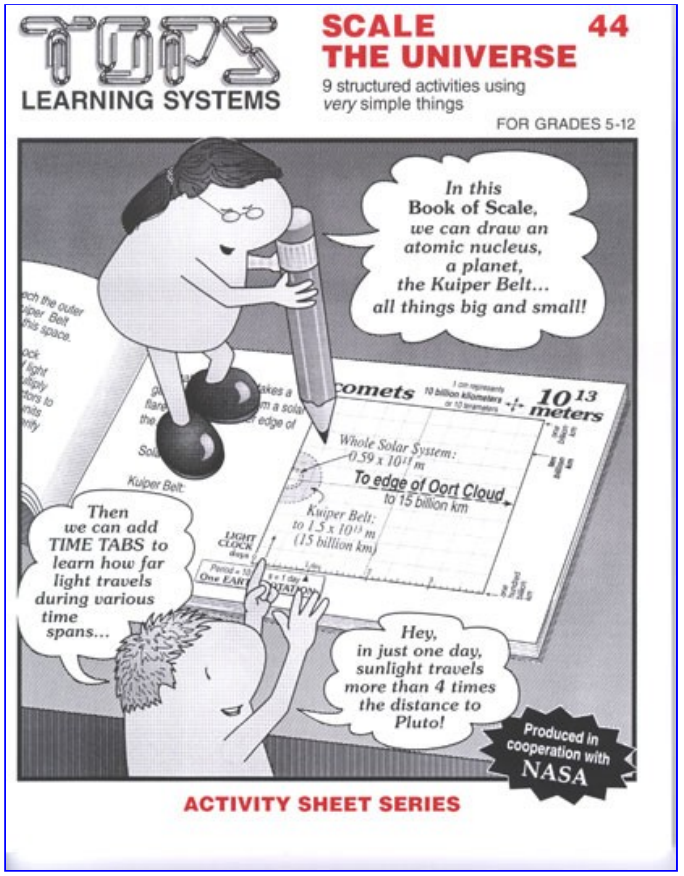
New console

Still under development



TOPS Learning Systems

- Far Out Math
  - Released in 2002
  - Very widely in use now
- Scale the Universe
  - Released in 2004
  - Basis of You Are Here
- Pi in the Sky
  - Now in print

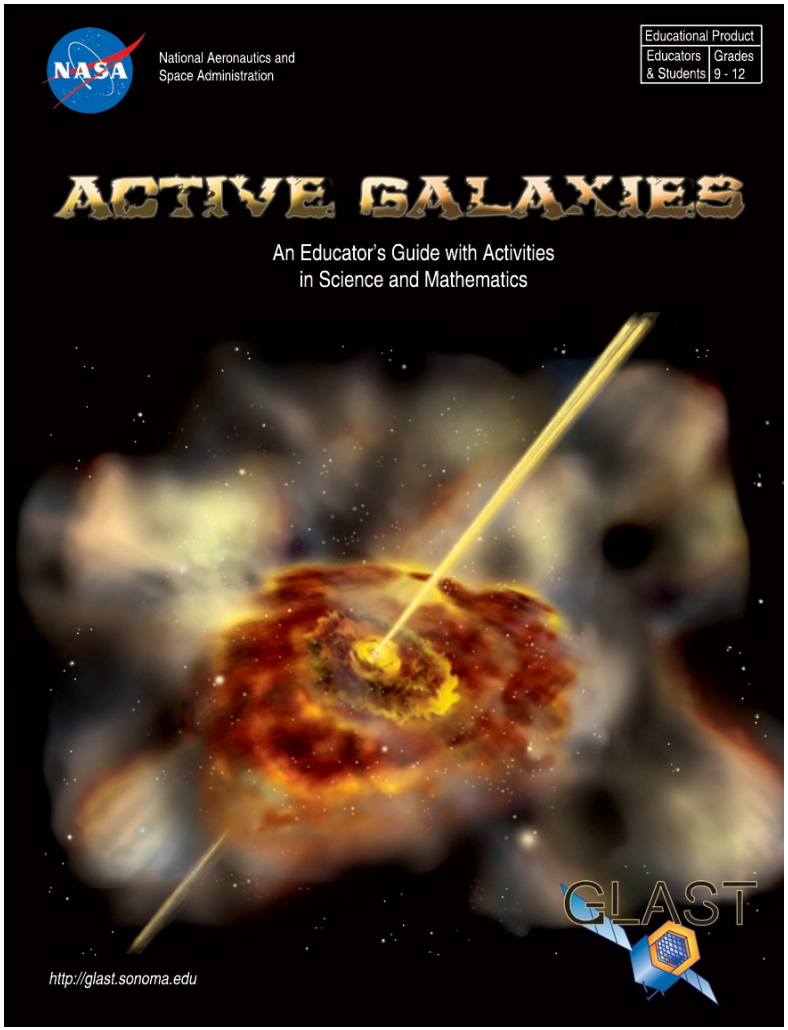


TOPSCIENCE.ORG

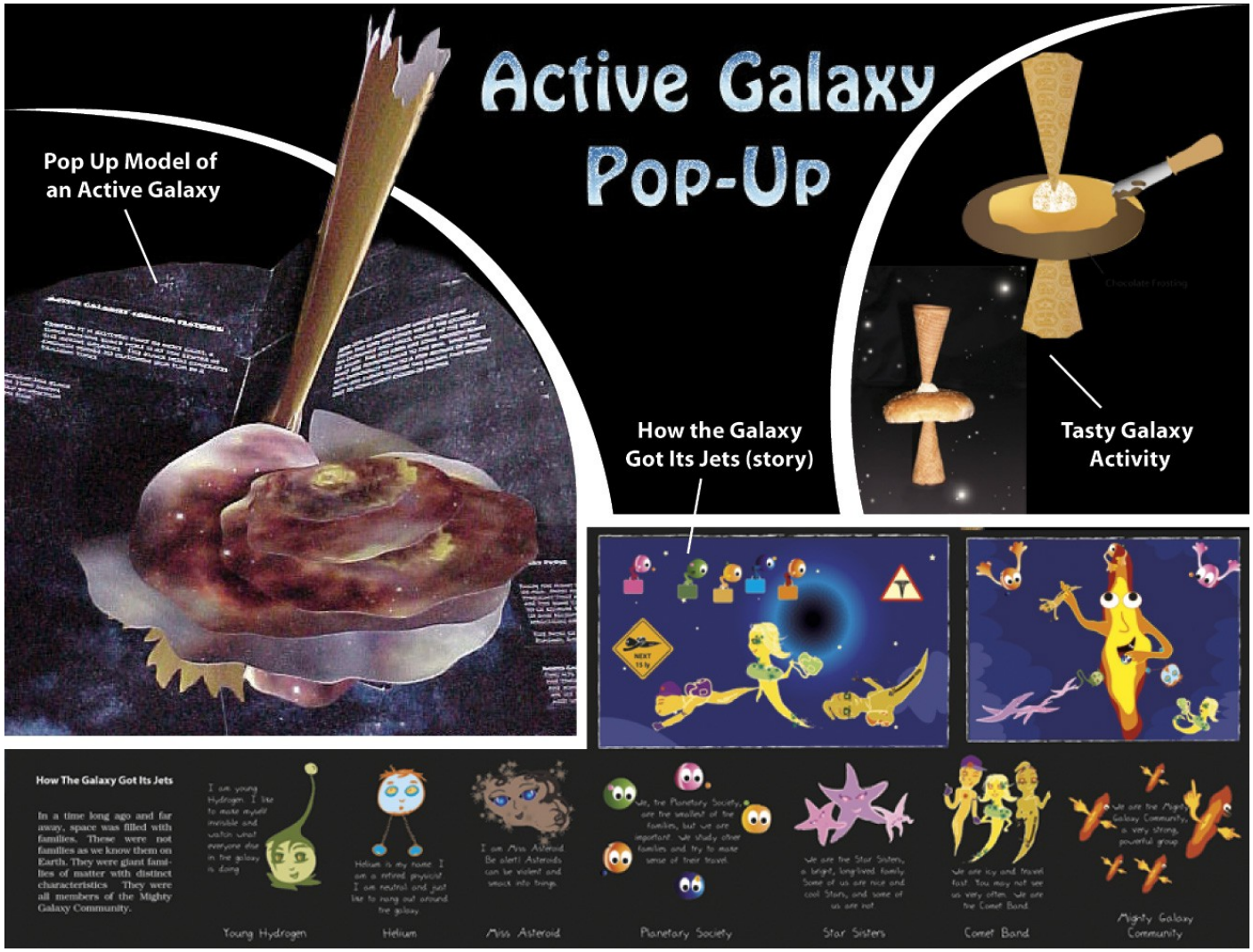
http://www.topscience.org/

Active Galaxy Educator's Guide

- Released in 2003
- 3 activities
  - Building Perspectives with Active Galaxies
  - Zooming in on Active Galaxies
  - Light Travel Time and the Size of Active Galaxies
- Poster of AGN
  - Widely used in many venues
  - Shows different angles, different zooms



AGN Popup Book



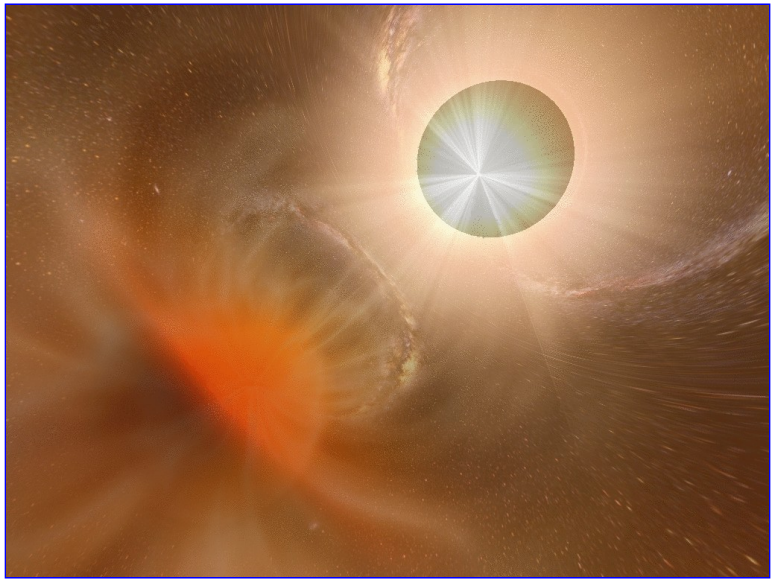
SLAC Virtual Visitor's Center

New console image – uses FRED to do simulation runs

PBS Television Special

- Tom Lucas productions - $1M NSF grant to augment GLAST E/PO funds
- Program script now in development
  - NOVA Contract
  - Should air summer of 2006
- Planetarium show almost done

Still image from black hole flight simulator sequence



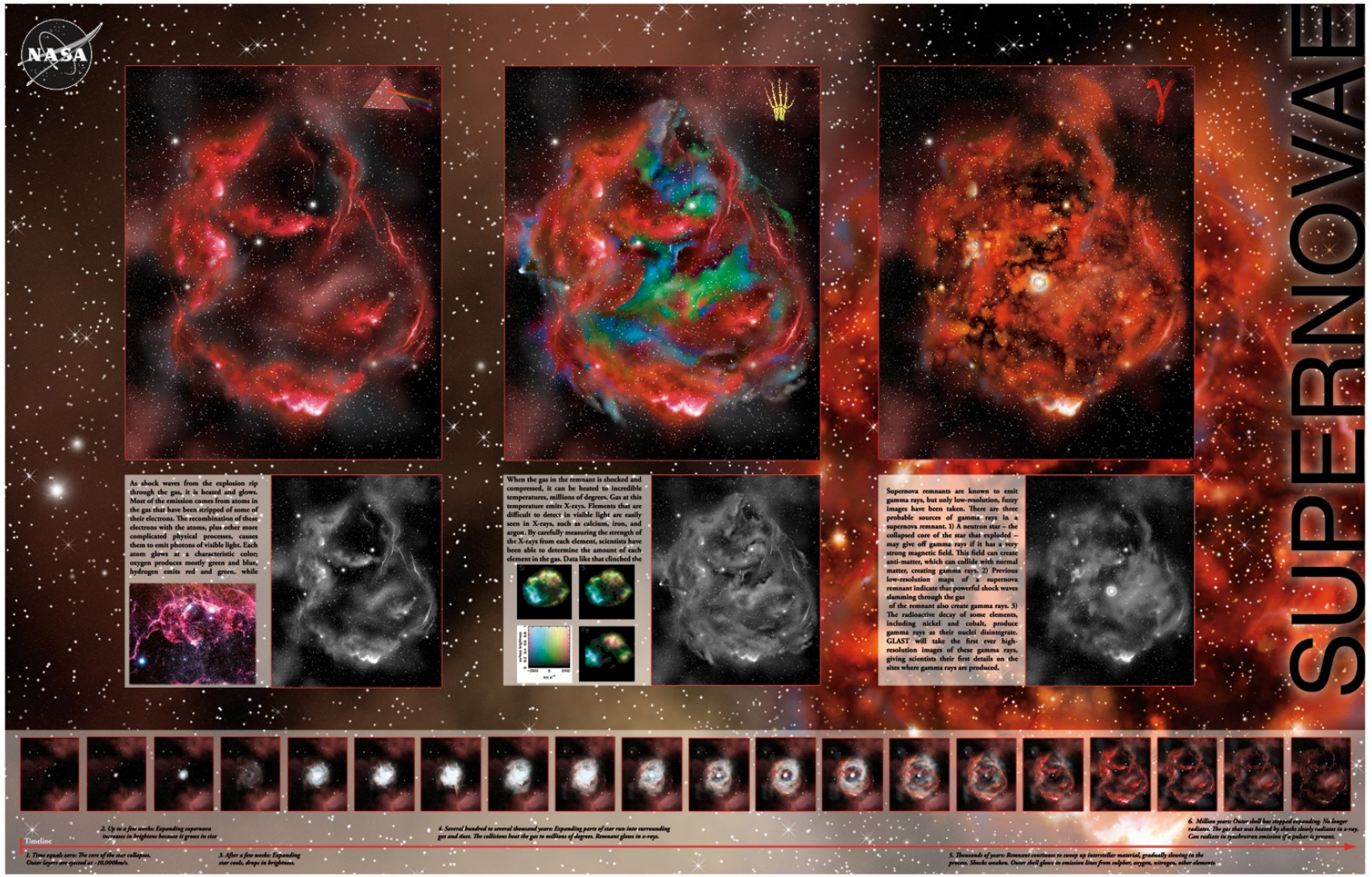
Supernova Educator Unit

Joint with XMM-Newton

- 3 activities
  - Decaying Supernovae
  - The Crawl of the Crab
  - At the Heart of a Supernova

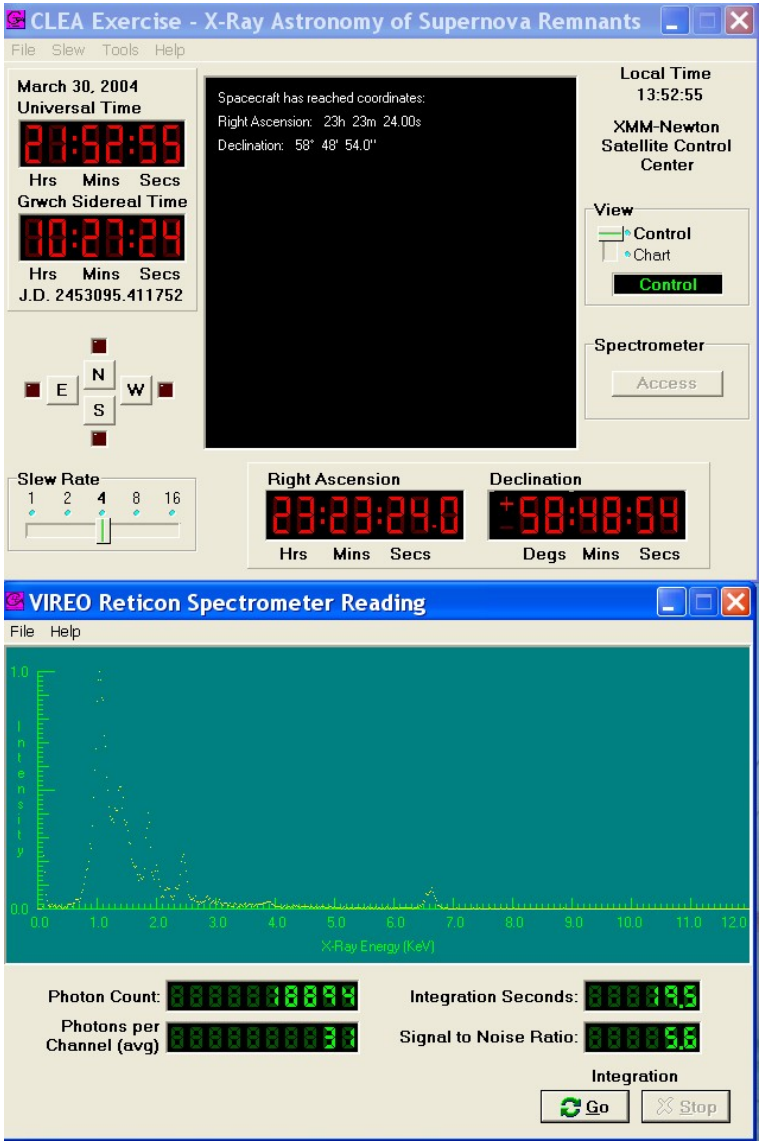
- Poster of Supernovae
  - Images of supernovae at different wavelengths
  - Shows what a Supernova looks like during different stages of the explosion

Supernova poster



CLEA Laboratory

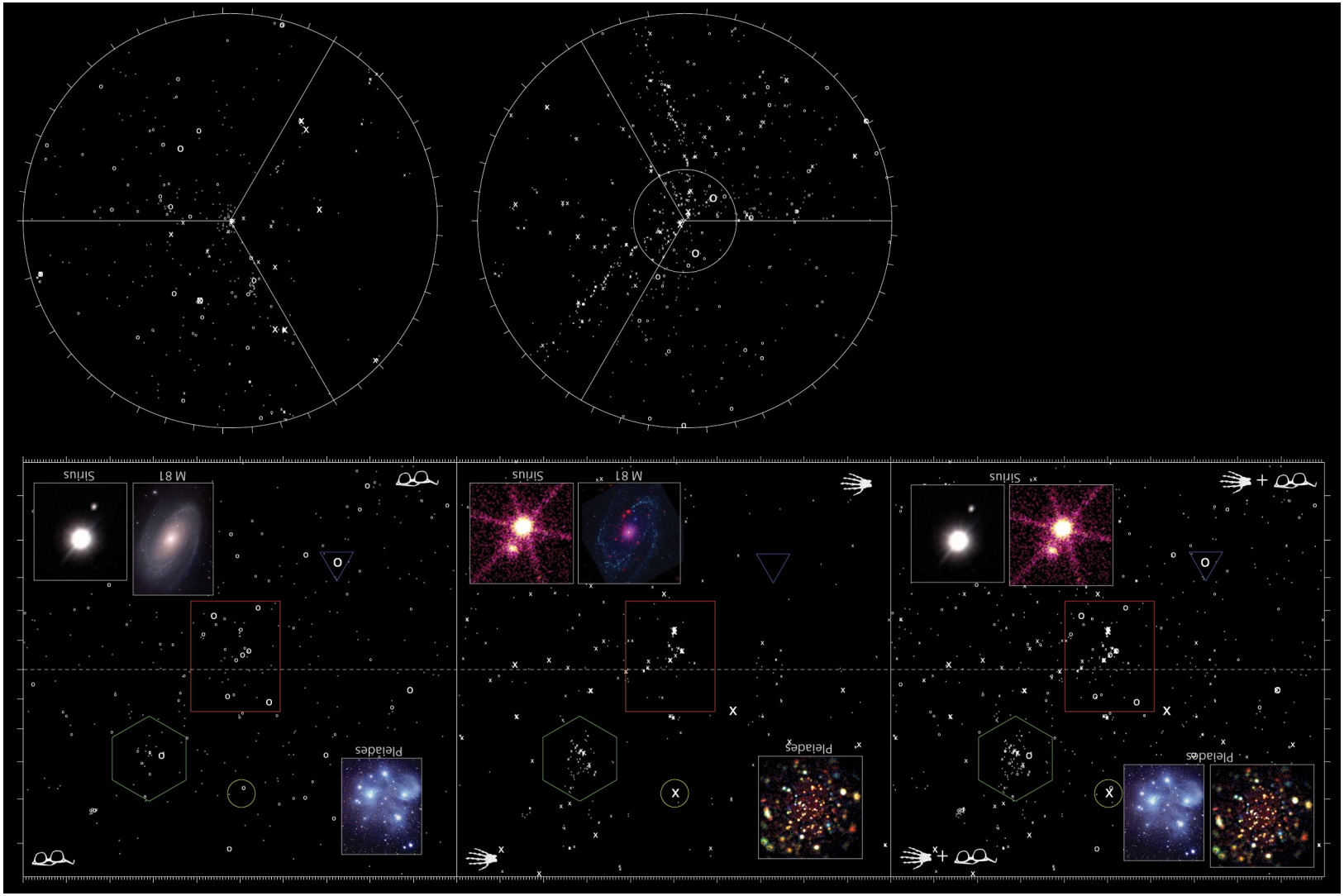
- Dying Stars and the Birth of the Elements
- Just returned from testing by WestEd
- Will be released in early 2006
- Uses simulated x-ray spectra to teach about the abundances of chemical elements in supernovae



X-ray Sky Planetarium Show

- Being developed for Starlab or Digitalis portable planetaria
- Includes student manual and teacher's guide
- Compares optical and x-ray sky and images of several interesting regions

X-ray Sky Planetarium Show



Partnership with Space Place

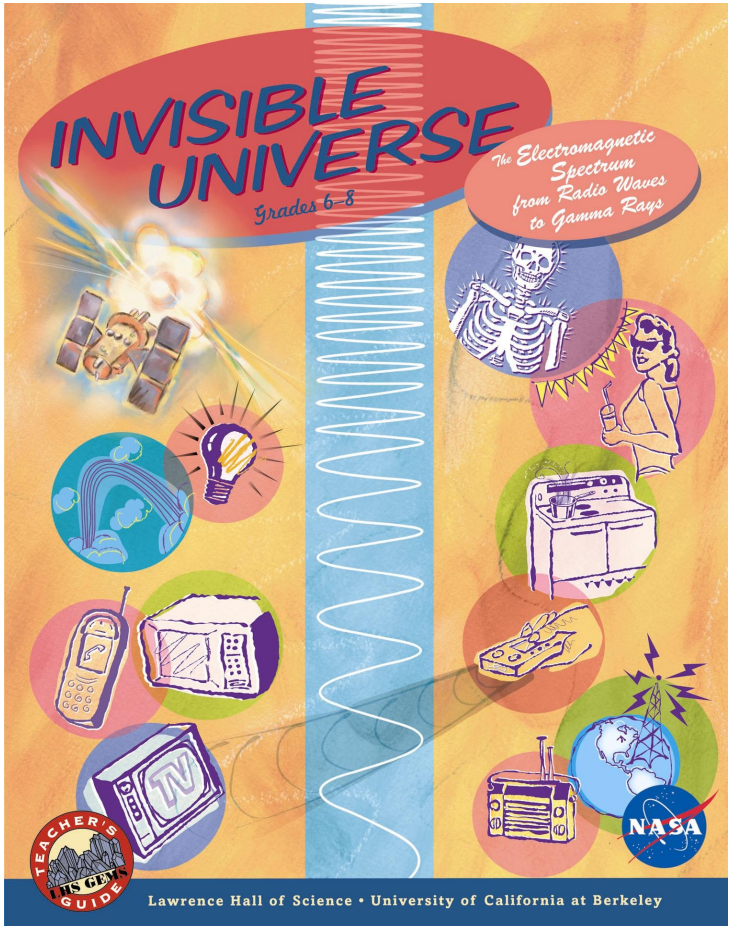
- Black Hole Rescue!
- http://spaceplace.nasa.gov/en/kids/blackhole

• New interactive black hole spelling game

•Catch the letters to spell words before they disappear!

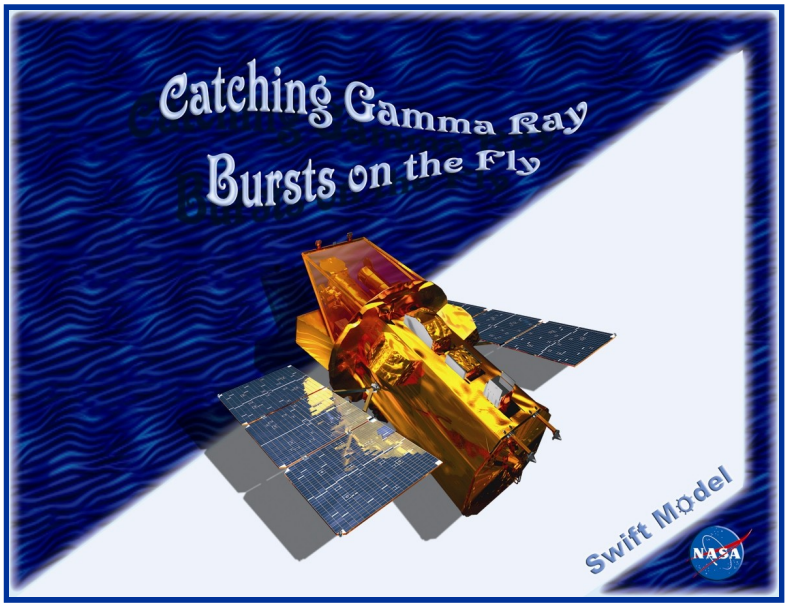
GEMS Invisible Universe

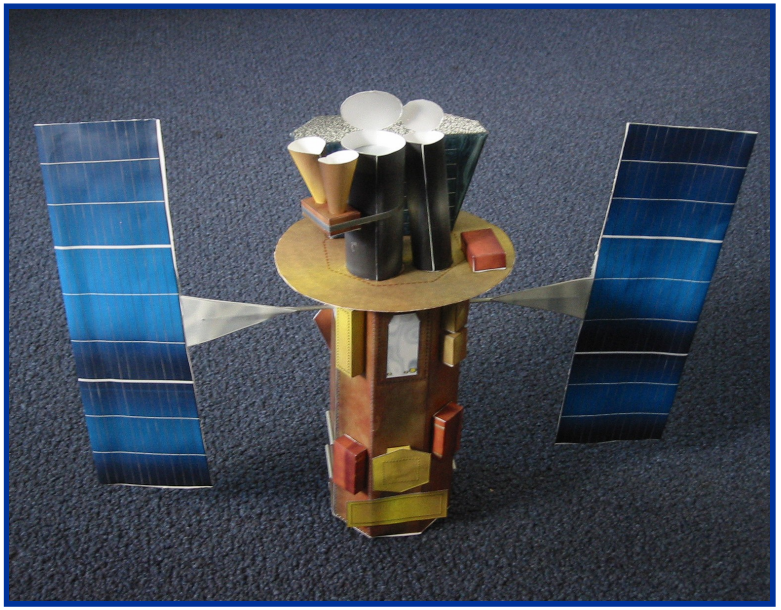
- Developed by SSU and GEMS for Swift
- Very popular!



Swift model booklet

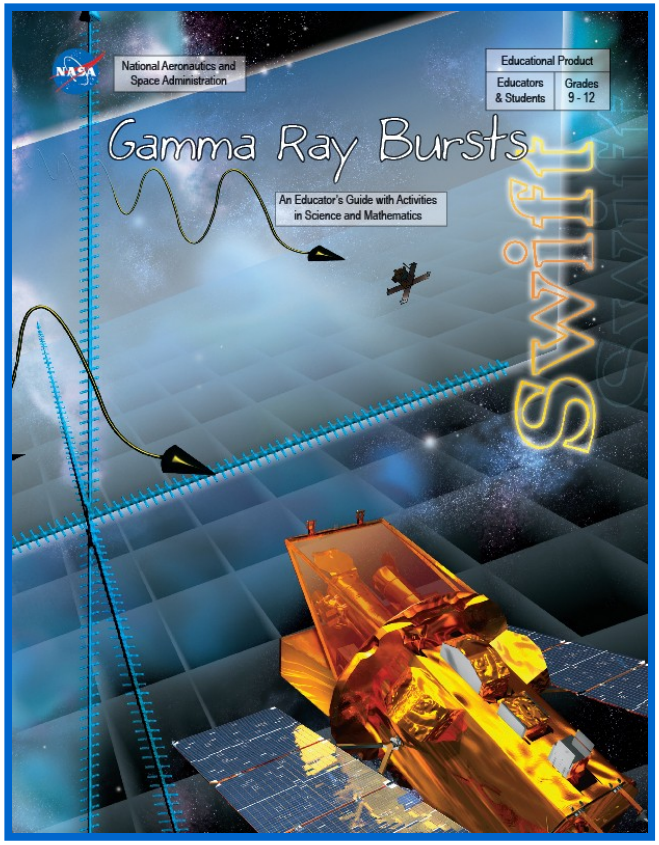
- Build a model of Swift – launch product





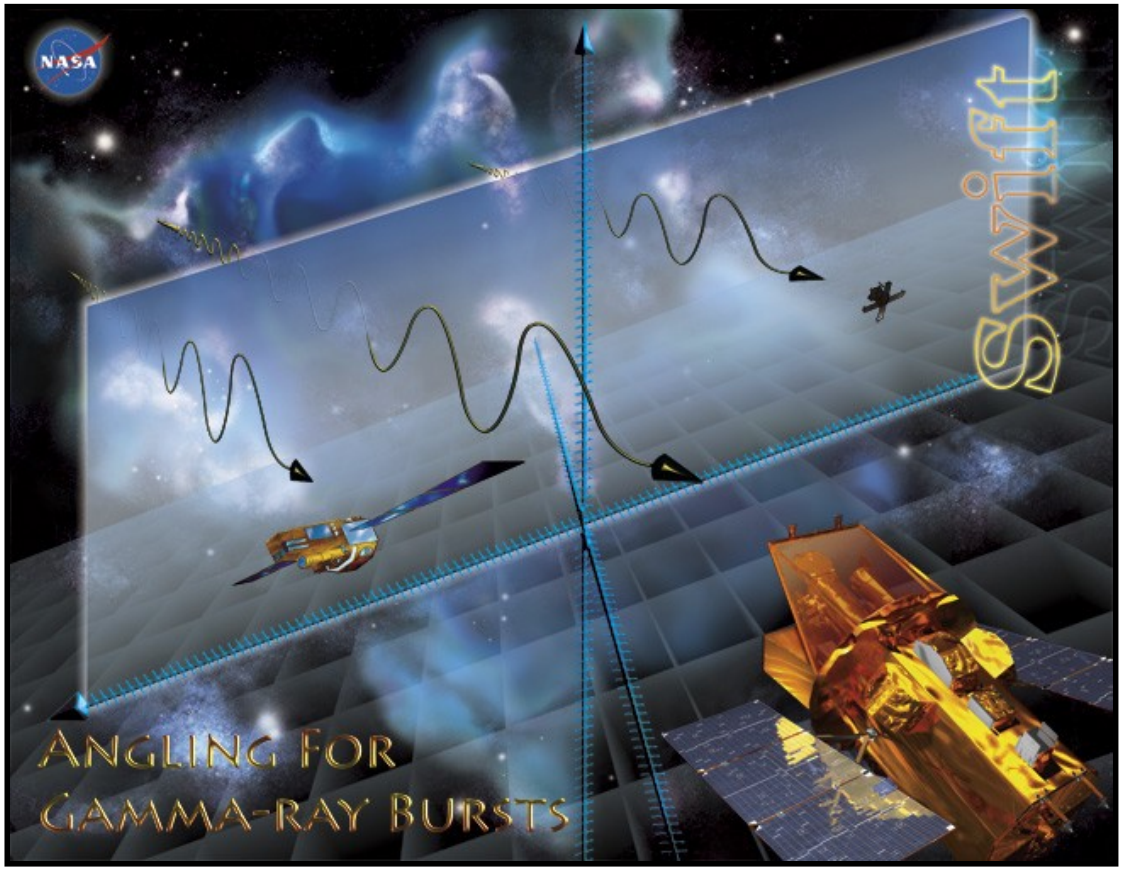
GRB Educator's Guide

- Aligned with national mathematics and science standards
- Four classroom tested activities
  - Sorting out the Cosmic Zoo
  - Angling for GRBs
  - GRB Distribution on the Sky: The Plots Thicken
  - Beam Me Up!



Angling for GRBs poster

- Classroom poster that accompanies GRB guide

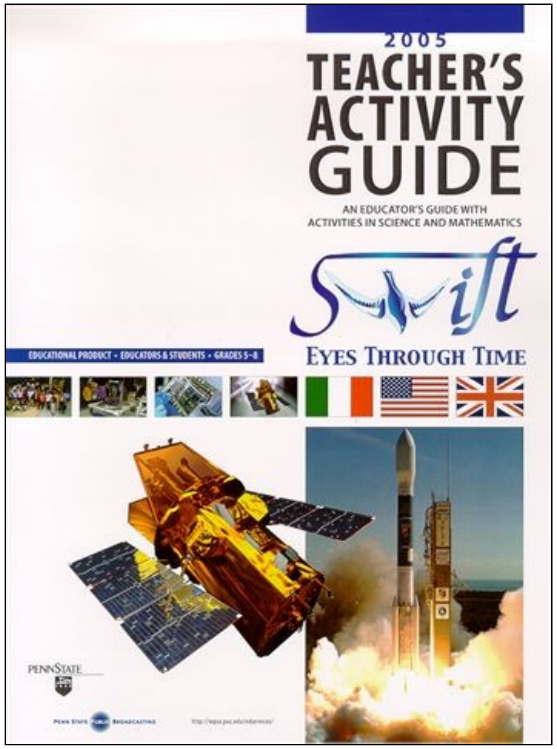


Swift Newsletter

- http://swift.sonoma.edu/resources/multimedia/newsletter/
- Second issue now online:
- To subscribe:
  http://swift.sonoma.edu/resources/multimedia/newsletter/signup.html

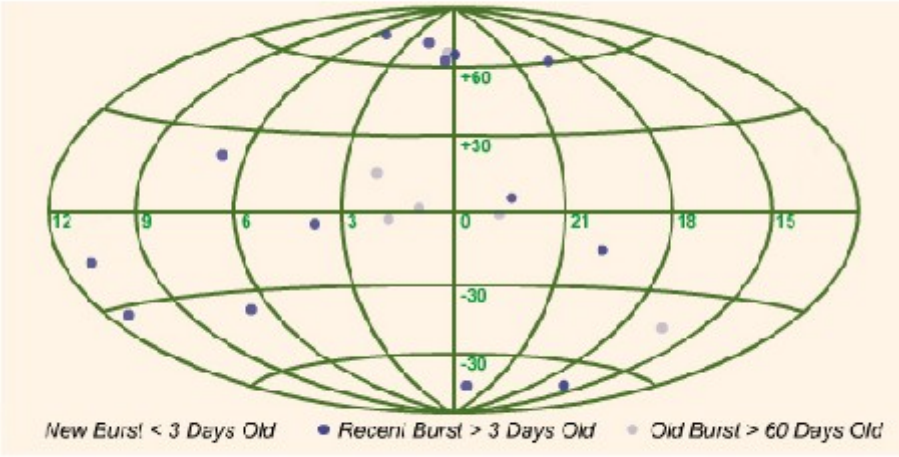
New from Penn State E/PO: Eyes through Time

- 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
- Being field-tested this summer by PSU Astronomy Workshop teachers and EAs



GRB SkyMap: http://grb.sonoma.edu

- New version coming soon – will include expanded burst table
- Over 250,000 unique hits to date



External Evaluation

- All formal educational products are evaluated by WestEd
- Some informal educational products also
- Scientific review by team members
- Dissemination studies now underway
- Tracking results of teacher training into classroom effectiveness

For more information

- GLAST: http://glast.sonoma.edu
- Swift: http://swift.sonoma.edu
- XMM-Newton: http://xmm.sonoma.edu
- GRB Sky: http://grb.sonoma.edu
- Space Mysteries: http://mystery.sonoma.edu
- GTN: http://gtn.sonoma.edu
- Our group: http://epo.sonoma.edu
- Ordering materials: http://epo.sonoma.edu/orderformpublic.html