



# High Energy Education and Public Outreach

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Sonoma State University

# E/PO group



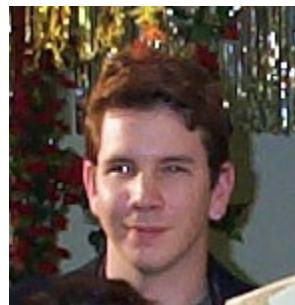
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Scientific Illustrator



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Program Manager



**Laura Chase**  
Project Support  
Assistant



# Students and Staff



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Special  
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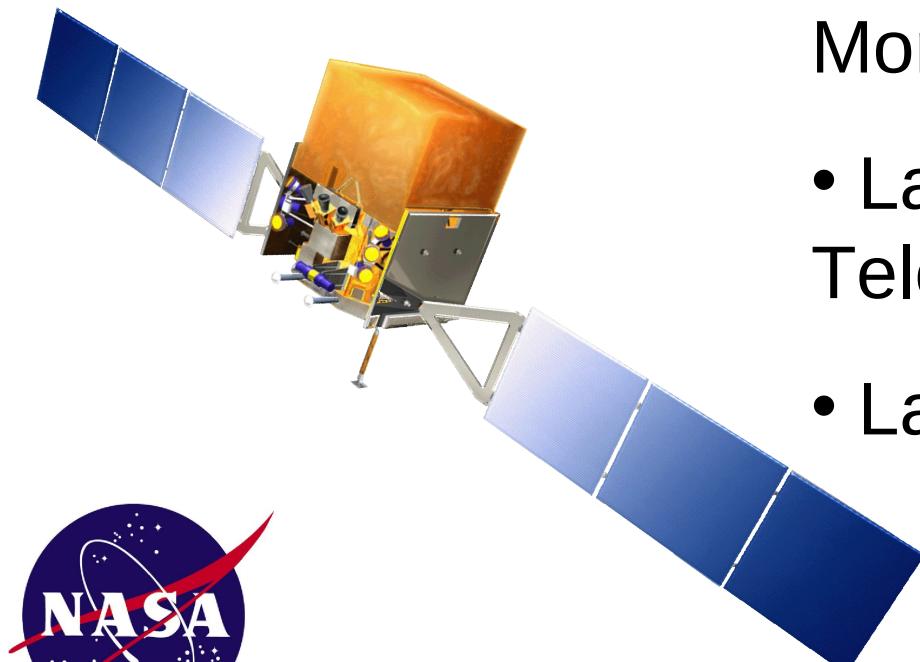


Prof. Gordon Spear  
SSUO Director



Kevin McLin Ph.D.  
Special Consultant

# Gamma-ray Large Area Space Telescope (GLAST)



- GLAST Burst Monitor (GBM)
- Large Area Telescope (LAT)
- Launch in Fall 2007



# Highlights



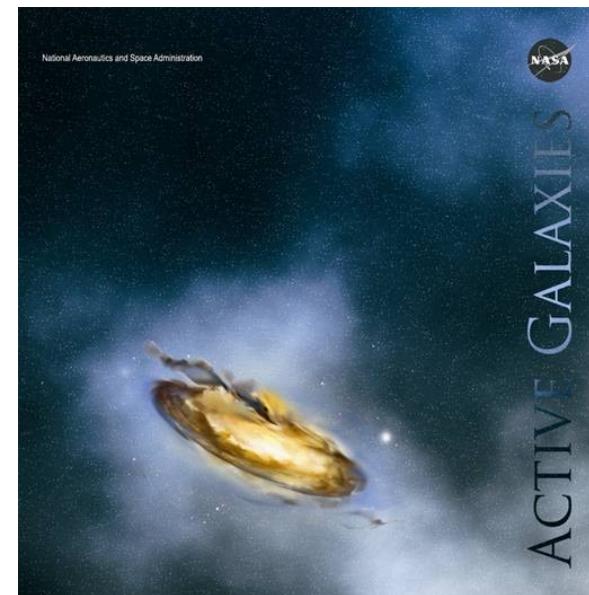
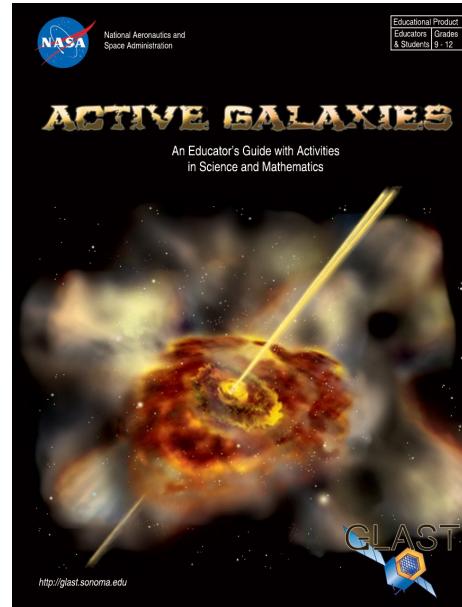
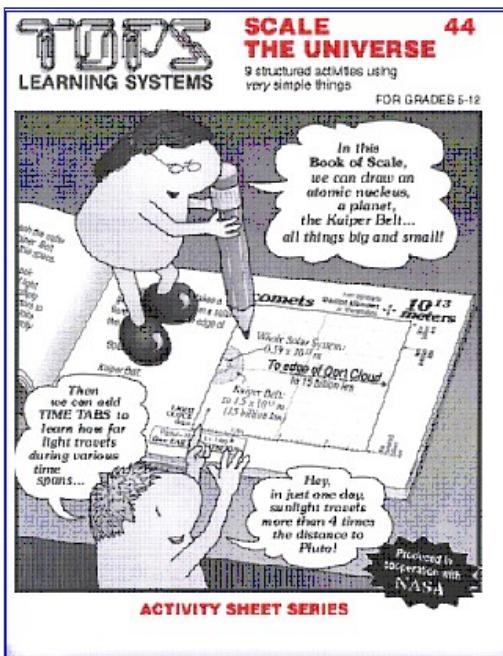
- Web-based materials
  - <http://glast.sonoma.edu>
  - New Space Mystery: Solar Supernova
  - GLAST LAT Simulator
- Global Telescope Network
  - <http://gtn.sonoma.edu>
  - Robotic observatory in partnership with California Academy of Sciences



# Highlights



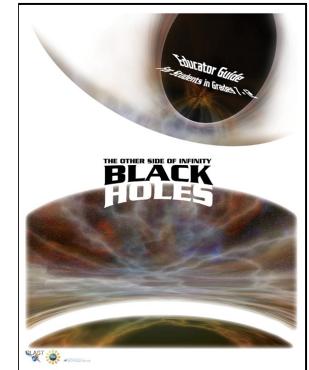
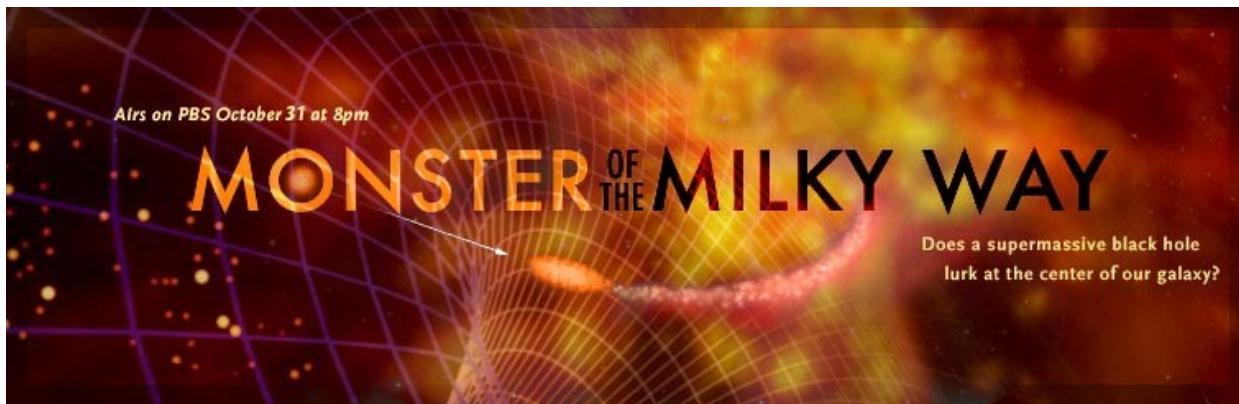
- Printed materials
  - 3 TOPS curriculum guides
  - Active Galaxy wallsheet and educator's guide
  - Active Galaxy Pop-up book for younger kids



# Highlights



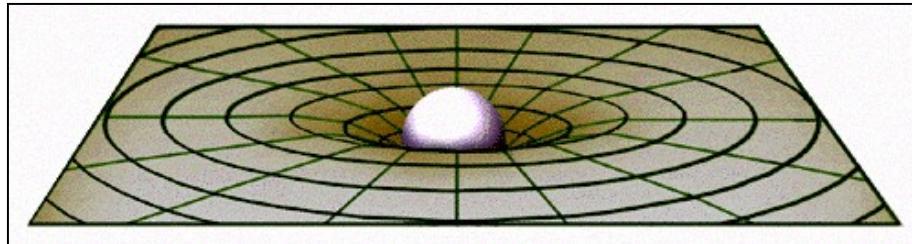
- PBS NOVA “Monster of the Milky Way”
  - Premiered 10/31/06  
<http://www.pbs.org/wgbh/nova/blackhole>
  - Seeded with GLAST E/PO funds
  - Features HD simulations of black holes
  - “Black Holes: The Other Side of Infinity” planetarium show at the Denver Museum of Nature & Science and many others
  - Educator’s guide to accompany both television and planetarium shows



# Black Hole Space Warp



Using ordinary supplies to discuss and discover abstract science concepts.



# Black Hole Space Warp



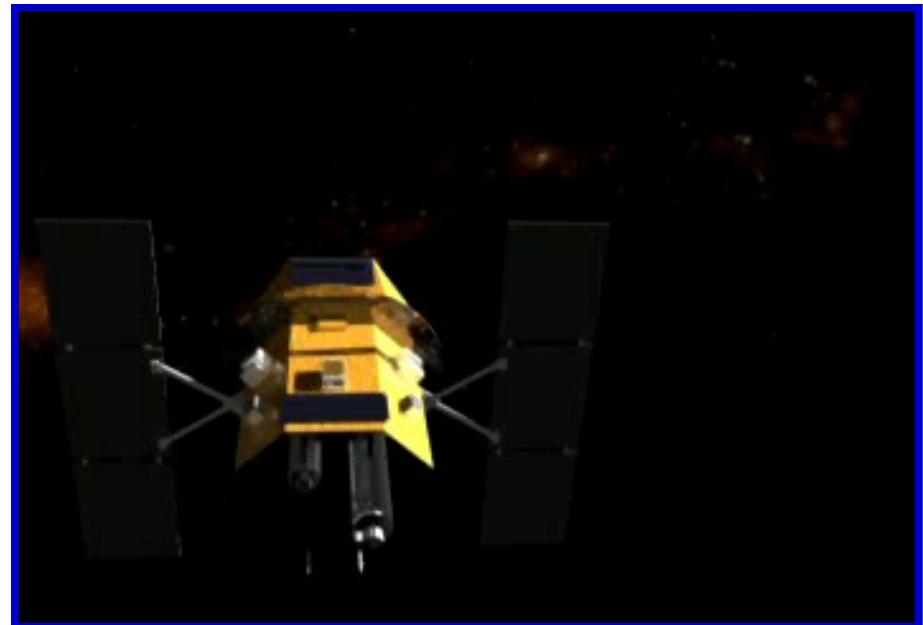
## In groups

- Group members must hold the hoop horizontally.
- Place the weight at the center of the hoop. (what does this represent?)
- Have two people slowly toss in the bouncy balls one at a time. Toss them so that they are near the edge of the hoop when you release them.
- Observe what happens to the path and the speed of the balls.
- Repeat

# Swift GRB Mission



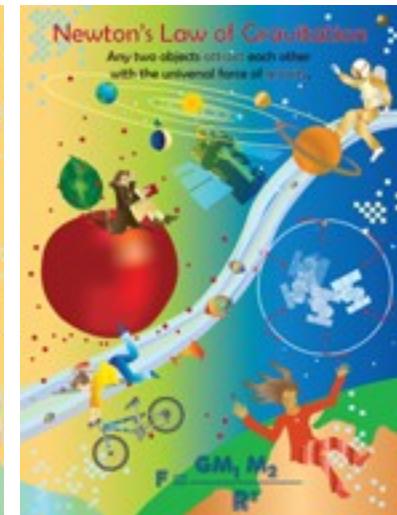
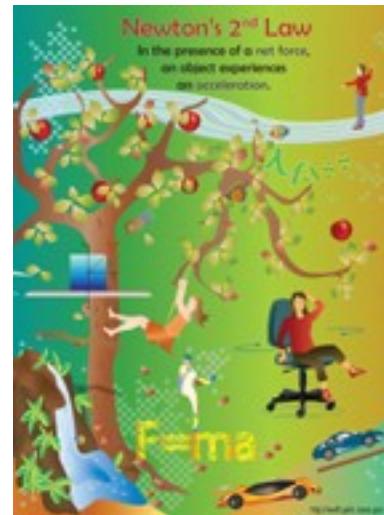
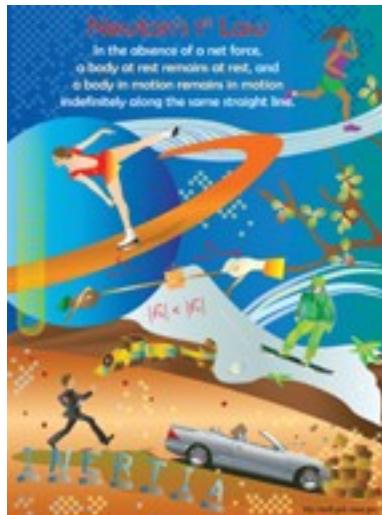
- Studies Gamma-Ray Bursts with a “swift” response
- Launched 11/20/04



# Highlights



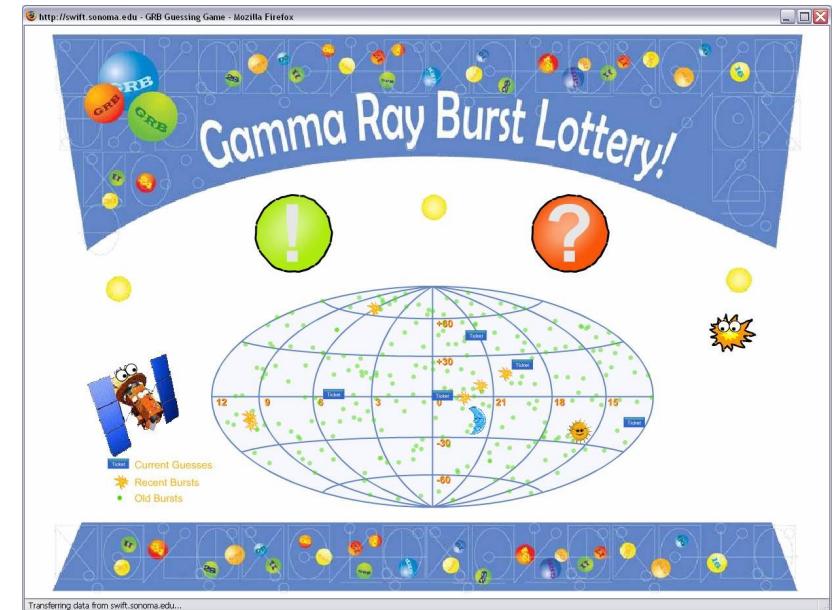
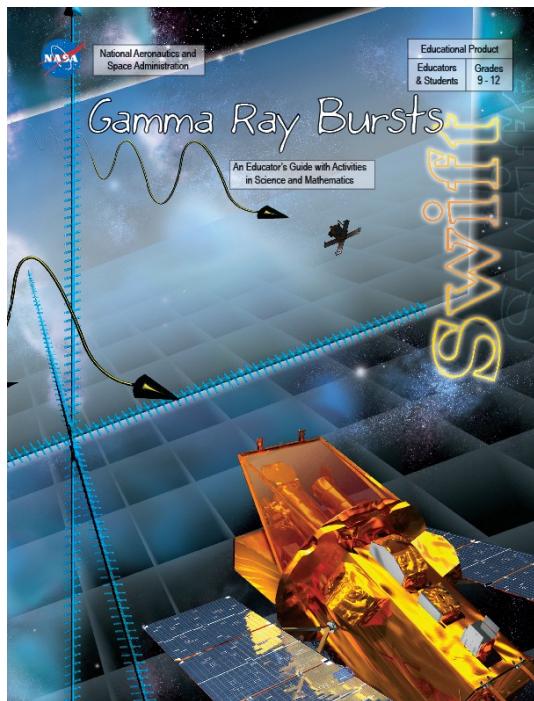
- Web-based materials
  - <http://swift.sonoma.edu>
  - Interactive skymap of GRBs  
<http://grb.sonoma.edu>
- Printed materials
  - GEMS Invisible Universe guide
  - GRB wallsheet and educator's guide
  - Swift model booklet
  - Newton's Laws poster and activity set



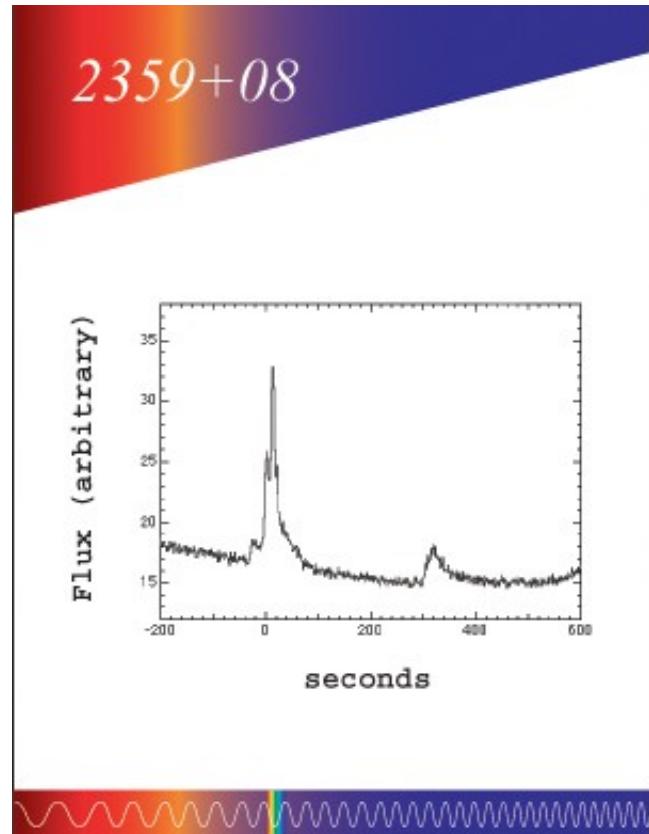
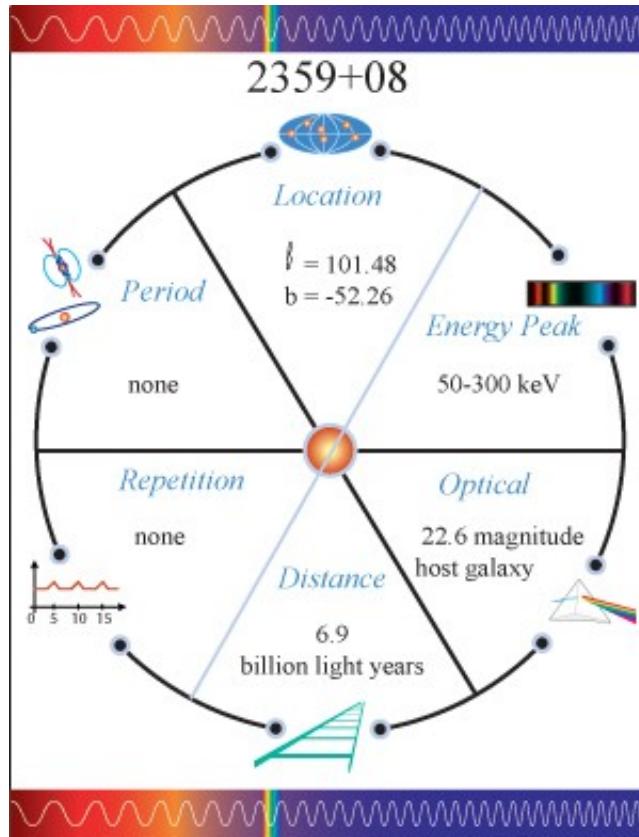
# The Cosmic Zoo



Using real science data to encourage students to think scientifically



# Pick a Card...



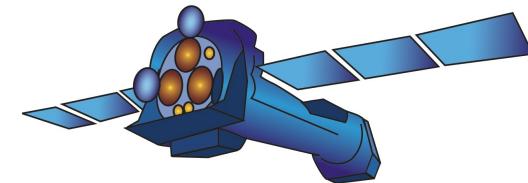
# The Terrestrial Zoo

Swift



# X-ray Multi-Mirror - Newton

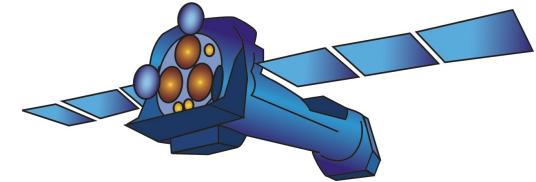
XMM-Newton



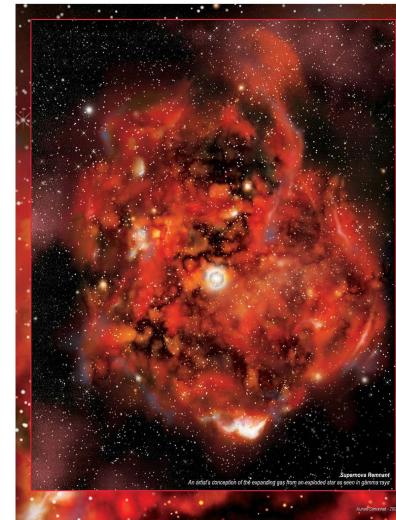
- Launched in December, 1999
- European Space Agency mission with NASA instruments and Guest Observers
- Large X-ray focusing mirror assembly
- High throughput X-ray spectroscopy



# Highlights

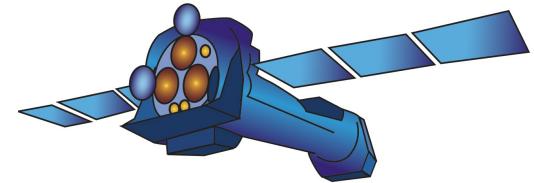


- Web-based materials
  - <http://xmm.sonoma.edu>
  - CLEA Lab: “Dying Stars and the Birth of the Elements”
- Supernova educator’s guide in review
- Black Hole Space Rescue Game for younger kids (in both English and Spanish)  
<http://spaceplace.jpl.nasa.gov/en/kids/blackhole/game.shtml>  
<http://spaceplace.jpl.nasa.gov/sp/kids/blackhole/index.shtml>

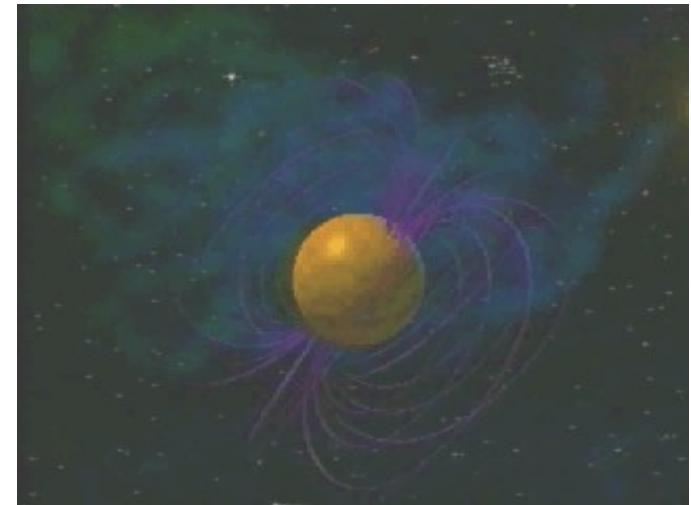


# Magnetic Globe

XMM-Newton

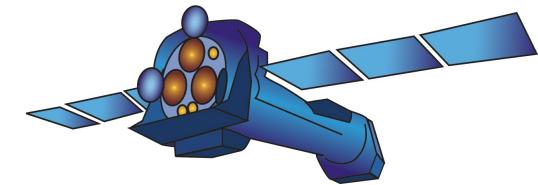


Bringing complicated astrophysical concepts  
down to Earth

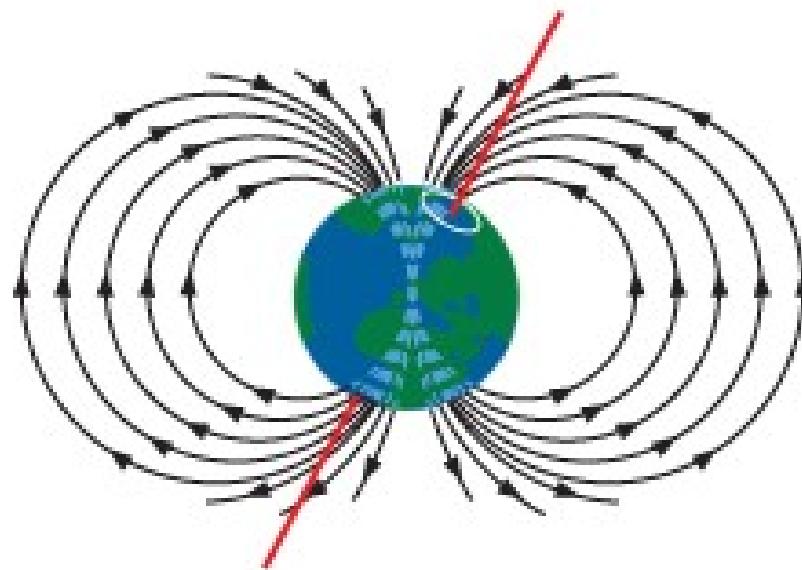


# Magnetic Globe Demo

XMM-Newton



*North geographic pole*  
**South magnetic pole**



*South geographic pole*  
**North magnetic pole**

# Educator Ambassadors



Summer training July 2006

# Highlights



- 19 Astrophysics Educator Ambassadors
- Master teachers who help review, test and disseminate Astrophysics E/PO materials
- Trained every other year at SSU
- Have trained over 35,000 teachers in workshops at national, regional and state conferences



# Conclusions

- The most successful E/PO is inquiry-based and engages the audience
- We have tried to model this approach in today's talk – and we have lots more activities for students, teachers, and the general public
- We are happy to share any of our ideas and materials with you and to work with you on future projects!

# For more information:

- <http://epo.sonoma.edu>
- <http://glast.sonoma.edu>
- <http://swift.sonoma.edu>
- <http://xmm.sonoma.edu>
- <http://mystery.sonoma.edu>
- <http://grb.sonoma.edu>
- <http://gtn.sonoma.edu>