E/PO Resources from NASA Astrophysics Space-Based Telescopes/Observatories/Missions/Instruments/Data Archives/Programs

Wavelength	E/PO Program And Website	Science and E/PO Topic Highlights	Example Resource	Ways Resource Could Be Used	How/Where To Get It
Gamma-Ray	Fermi Gamma-ray Space Telescope (http://fermi.sonoma.edu)	Black holes, gamma-ray bursts and pulsars	1. Fermi Race Card Game 2. Make Your Own Pulsar	1. Could be used in afterschool program for high school students, encouraging students to play and learn about both science and strategy. 2. Create a 3-D model of a pulsar to help your audience visualize how we can observe pulses from a spinning neutron star.	1. Download it from http://fermi.sonoma.edu/teachers/race.php 2. The Pulsar Activity is described on the back of the Fermi Litho, downloadable at: http://fermi.sonoma.edu/teachers/FermiLitho09pt.pdf
Gamma-Ray/X-Ray/UV/Optical	Swift Gamma-Ray Burst Explorer (http://swift.sonoma.edu)	Gamma-ray bursts and their afterglows, black holes	1. Swift Gamma-ray Burst Real-time Sky Map 2. Global Telescope Network	1. Show students and the public the locations and information about some of the most explosive events in the Universe, in near real-time. 2. Participate in astronomical follow-up observations of energetic cosmic events observed by the Swift, Fermi and XMM-Newton space observatories.	1. Find GRB information at: http://grb.sonoma.edu 2. Discover the GTN at http://gtn.sonoma.edu/
X-Ray	Chandra X-Ray Observatory (http://chandra.harvard.edu/edu/)	Exploding stars, supermassive black holes, active galaxies, dark matter, hot gas in clusters of galaxies, and other energetic phenomena	1. Chandra PowerPoint Presentation: The Universe in a Jelly Bean Jar 2. Chandra posters, bookmarks, postcards, etc.	1. Could be used in your outreach presentation, giving an overview of the total matter-energy distribution in the universe, and how X-rays help resolve related mysteries. 2. Handouts of X-ray images of celestial objects, for hands-on activities or public talks.	1. Download it from: http://www.chandra.harvard.edu/resources/pptshows/ 2. Request (limited number of) hardcopies of Chandra E/PO resources and handouts at: http://chandra.harvard.edu/edu/request.html
X-Ray	Rossi X-Ray Timing Experiment (RXTE) (http://heasarc.nasa.gov/docs/xte/learning_center)	Black holes, active galaxies, neutron stars, pulsars and other energetic and rapidly changing phenomena	High Energy Groovie Movie	Share the excitement of black holes, pulsars and active galaxies with a montage of X-ray images and animations set to the “High Energy Groove” by AstroCappella.	View the movie online and find related activities at http://heasarc.nasa.gov/docs/xte/outreach/HEG/groovie.html
X-Ray	Suzaku, formerly Astro-E2 (http://heasarc.gsfc.nasa.gov/docs/astroe_lc/)	X-rays from high-energy phenomena in stars, including supernovae and black holes	X-ray spectroscopy video clip	Show how X-ray spectroscopy can help us understand details of high-energy phenomena.	Download it from http://suzaku-epo.gsfc.nasa.gov/docs/suzaku-epo/education/video/video.html
X-Ray	XMM-Newton (http://epo.sonoma.edu/projects.php)	Pulsars, black holes and active galaxies	Supernova Educator Guide	Engage students in basic science and math by exploring how stars die in supernovae, sometimes creating pulsars.	Download the activity book from http://xmm.sonoma.edu/edu/supernova/index.html
Extreme UV/X-ray/ Gamma-Ray/ Microwave	High Energy Astrophysics Science Archive Research Center (HEASARC) (http://heasarc.gsfc.nasa.gov/)	Black holes, Big Bang, extremely energetic phenomena	Imagine the Universe	Use educational resources in classrooms for students age 14 and up, and for outreach to interested public.	Explore them online at http://imagine.gsfc.nasa.gov/
Ultraviolet	GALaxy Evolution eXplorer (GALEX) (http://www.galex.caltech.edu/education/teachers.html)	Formation and evolution of galaxies and their stars	Recipe for a Galactic Mobile	Teach young children science through craft! Make an art mobile using GALEX images.	See http://spaceplace.nasa.gov/en/kids/galex_make1.shtml
Far-UV/Optical/ Radio	Multimission Archive at STScI (MAST) (http://archive.stsci.edu/)	Science data and higher level products from many missions	MAST press release image search	Product developers can find Hubble Space Telescope press release images for their E/PO products	Explore them online at http://archive.stsci.edu/stpr/search.php
Near-UV/ Optical/Near-IR	Hubble Space Telescope (http://amazing-space.stsci.edu/)	Solar System, comets and asteroids, stars and stellar evolution, black holes, galaxies, cosmology, electromagnetic spectrum and telescopes	1. Telescopes from the Ground Up 2. Cats Eye Nebula lithograph and others	1. Explore and share the history of telescopes, from Galileo’s pioneering one to NASA’s Great Observatories. 2. Use Hubble images to engage audiences in asking and finding answers to their own questions about the Universe.	1. Check out Amazing Space (http://amazing-space.stsci.edu/eds/tools/) for lots of teaching tools and Hubble science topics. 2. Request limited number of hardcopy materials from Ms. Holly Ryer (hgreat@stsci.edu).
Near-UV/ Optical/Near-IR	Exoplanet Exploration Program (http://planetquest.jpl.nasa.gov/)	Exoplanets, habitable zones around stars	New Worlds Atlas	Discover what scientists are learning about the more than 500 exoplanets known to date, and explore the extrasolar neighborhood in 3-D with Adobe Shockwave.	Online at: http://planetquest.jpl.nasa.gov/atlas/atlas_index.cfm

*Current as of December, 2011

Continued overleaf

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Optical	Kepler (http://kepler.nasa.gov/education/)	Exoplanets, especially Earth-size or habitable planets orbiting Sun-size stars	1. January 2011 Kepler Mission Update (video) 2. Kepler Bookmark	1. Learn about the Kepler mission's search for habitable planets using the transit method. 2. Handout at talks about exoplanets, etc.	1. Kepler Mission videos at: http://kepler.nasa.gov/multimedia/AnimationsandMore/movies/ 2. Explore available lithographs, bookmarks and teacher poster at: http://kepler.nasa.gov/education/resources/info/. Request printed materials from: Pamela Harman (pharman@seti.org) or Edna DeVore (edevore@seti.org).
Infrared	James Webb Space Telescope (JWST) (http://www.jwst.nasa.gov/teachers.html, http://jwstsite.stsci.edu/webb_telescope/)	Birth of the first galaxies, rise of solar systems, and identifying planets with the potential for life	Scope It Out!	Learn about telescopes by comparing a simple telescope to the James Webb and Hubble Space Telescopes in this online game.	Play it online at: http://www.jwst.nasa.gov/scope.html
Infrared	JWST-NIRCam (http://zeus.as.arizona.edu/~dmccarthy/GSUSA/index.htm)	Birth of the first galaxies, rise of solar systems, and identifying planets with the potential for life	E/PO Activities	Use these in your outreach presentations.	Explore them online at: http://zeus.as.arizona.edu/~dmccarthy/GSUSA/Activities.htm
Infrared	Stratospheric Observatory for Infrared Astronomy (SOFIA) (http://www.sofia.usra.edu/Edu/edu.html)	Star birth and death, formation of new solar systems, comets and asteroids in the Solar System, nebulae and dust in galaxies, supermassive black holes, electromagnetic spectrum	Active Astronomy	Hands-on activities to help students and the public understand infrared astronomy	Download from: http://www.sofia.usra.edu/Edu/materials/activeAstronomy/activeAstronomy.html
Infrared	Spitzer Space Telescope and Infrared Processing and Analysis Center (http://coolcosmos.ipac.caltech.edu/)	Star birth, planet forming disks around stars, nebulae, young galaxies, dusty galaxies, multi-wavelength astronomy	Cool Cosmos	Multi-media website with all you want to know about multi-wavelength astronomy including lots of educational activities, podcasts.	View at: http://coolcosmos.ipac.caltech.edu/
Infrared	Wide-field Infrared Survey Explorer (WISE) (http://wise.ssl.berkeley.edu/education.html)	Asteroids in the Solar System, young stars and their dusty disks, brown dwarf stars, nearby galaxies, active galaxies	Multimedia Gallery	Use WISE images and multimedia in your outreach presentations.	Download multimedia from http://wise.ssl.berkeley.edu/gallery_images.html
Microwave	Planck (http://planck.caltech.edu/epo/epo.html)	Cosmic Microwave Background, cosmology, Big Bang	From Sound Waves to Microwaves: Listen to the Oldest Light of the Universe with the Planck Mission	Slides and sound files for use in outreach presentations about cosmology	Online at: http://planck.caltech.edu/epo/NSTA-webinar.html
Microwave	Wilkinson Microwave Anisotropy Probe (WMAP) (http://map.gsfc.nasa.gov/resources/edresources1.htm)	Cosmic Microwave Background, cosmology, Big Bang	The Inflatable Universe beach ball	Show the 3-d full sky map of the oldest light in the Universe, while discussing cosmology, the Big Bang, etc.	Request one at: http://imagine.gsfc.nasa.gov/cgi-bin/order.pl

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National Aeronautics and Space Administration

NASA Science Mission Directorate

Astrophysics Education and Public Outreach Resources:

A Sampler and Quick Start Guide