EDUCATIONAL APPLICATIONS OF STAR FORMATION RESEARCH

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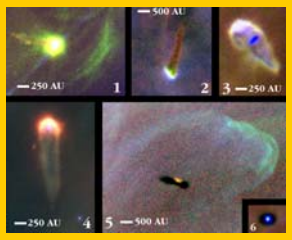


WHY BOTHER?

Our young people are not performing well enough in mathematics and science to take firm command of their own futures *("Before It's Too Late: A Report to the Nation from the National Commission on Mathematics and Science Teaching for the 21st Century," Glenn 2000)*

Approximately 40% of all Earth Science teachers have not taken courses in these sciences *("The Status of Secondary Earth Science Education," Weiss 2002).*

THE DILEMMA

Most pre-collegiate astronomy education is concerned with spatial relations among the Earth, Moon, Sun, and planets.

Most students and the general public are intrigued by (1) the Big Bang, (2) black holes, and (3) life beyond Earth.

➔ How can star formation education satisfy pedagogical needs while inspiring public curiosity?

THE "WOW" FACTOR

- Drop-dead *gorgeous* pictures.
- *Mystery* of birth inside dust-cloaked clouds.
- *Miracle* of diffuse clouds condensing into thermonuclear engines we call "stars."
- Lots of *pyrotechnics* – jets, scorching radiation, supernova explosions.
- Formation of planetary systems with prospects for *life*.

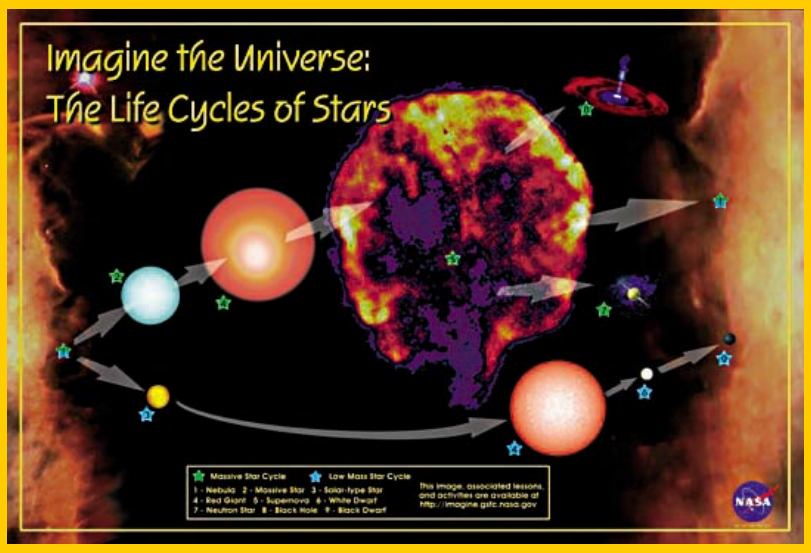
SCIENCE EDUCATION BENCHMARKS

- Role of *gravity* in forming and governing the Solar System, other stars and planetary systems, the Milky Way, and other galaxies.
- Properties and life histories of *stars*.
- Forms of *energy* and energy transfer (gravitational, kinetic, thermal, atomic, nuclear, radiant).
- Structure of *matter* and its phases.
- *Motion* of objects – momentum and energy.
- Properties of *light* and the *EM spectrum*.
- Use of *technology* to learn about the Universe (e.g. telescopes with multi-wavelength instruments, computer data analysis, mathematical modeling, and visualization).

OPPORTUNITIES FOR ENGAGEMENT

- ✓ E/PO funding opportunities for HST, Chandra, Spitzer, and ROSS/ROSES awardees.
- ✓ E/PO funding opportunities through IDEAS program.
- ✓ Public speaking venues with coaching opportunities.
- ✓ *NESSIE* and other E/PO brokers can help provide educator partners, venues, resources, and guidance.

AVAILABLE RESOURCES



AVAILABLE RESOURCES

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Chandra poster and interactive activities at
http://chandra.harvard.edu/edu/formal/stellar_ev/.

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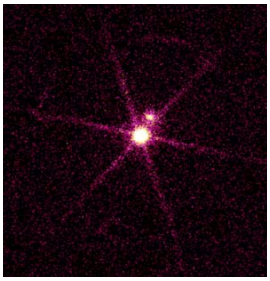

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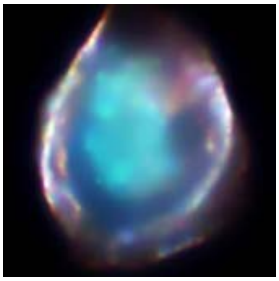

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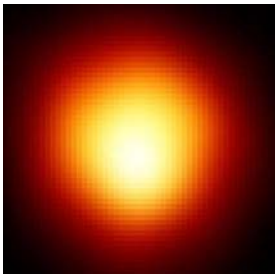

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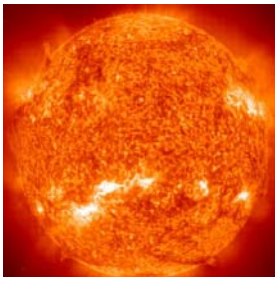

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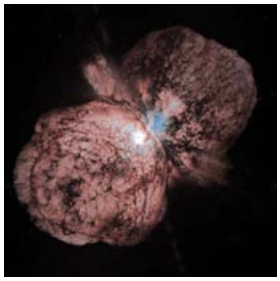

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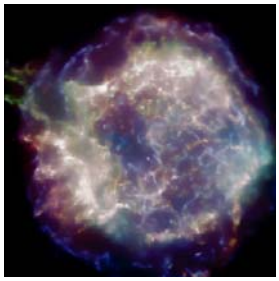

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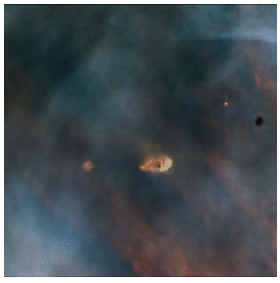

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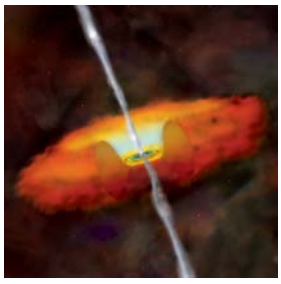

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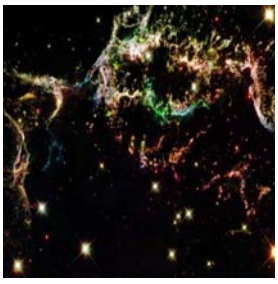

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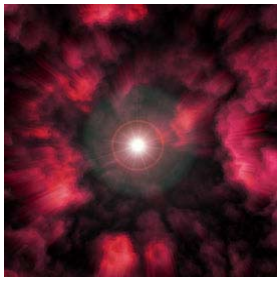

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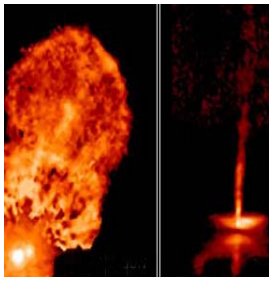

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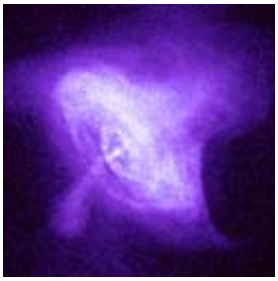
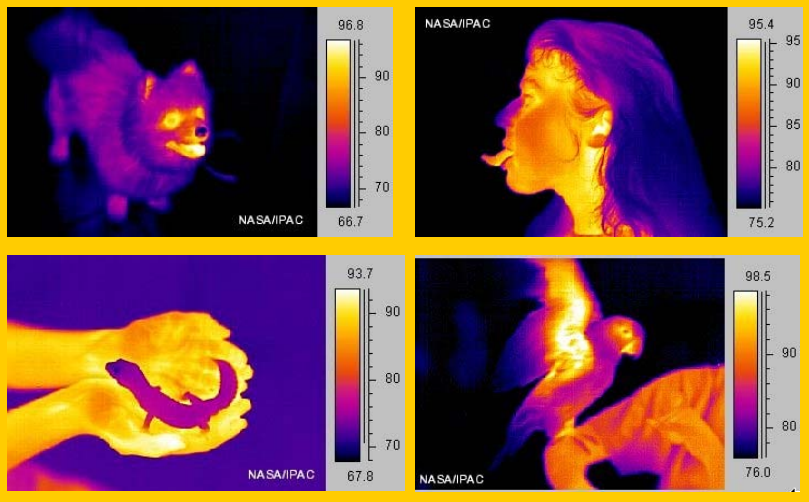


AVAILABLE RESOURCES



Mid-infrared imagery of warm- and cold-blooded creatures …
from Spitzer's "Cool Cosmos" website at
http://coolcosmos.ipac.caltech.edu/.

AVAILABLE RESOURCES

Also worth checking …

Star formation tutorial on the *COMPLETE* website at http://cfa-www.harvard.edu/COMPLETE/learn/star_and_planet_formation.html.

Star formation "video magazine article" on *ViewSpace* kiosks, hosted by STScI's Informal Education group at http://hubblesource.stsci.edu/exhibits/viewspace/.