



EDUCATION

Universal Truths

Will the universe expand indefinitely or recompress in a big crunch? Did the early universe undergo a burst of rapid expansion that stamped its mark on the background radiation left over from the big bang? These are the kinds of questions that keep astronomers up nights—questions you can explore in this cosmology tutorial from Ned Wright of the University of California, Los Angeles.

To navigate the four dense chapters on topics such as the homogeneity and expansion of the universe and the inflation model, you should be conversant in geometry and algebra and have a good spatial sense. Wright adds useful sidebars on methods for determining distances to faraway objects and ways to estimate the age of the universe, along with a tutorial on relativity. An FAQ section answers basic questions about the big bang, dark matter, and other topics; the news section calls attention to recent discoveries, such as last October's observations of the most distant quasar known.

www.astro.ucla.edu/~wright/cosmolog.htm

DATABASE

Future Oil Fields of America

Amid debates over topics such as America's dependence on foreign oil and what to do about global warming, a crucial piece of information is how much fossil fuel remains in the United States. For the latest data, check out the U.S. Geological Survey's (USGS's) National Oil and Gas Assessment.

The site provides estimates of undiscovered oil and natural gas deposits—beyond known reserves—for more than 60 geological provinces in the United States. Most of the reports date from 1995, the last comprehensive national stocktaking, but USGS continues to post updated values for "priority areas." For example, new estimates include the Powder River Basin of Wyoming and Montana (1.5 billion barrels of oil). You can also find the most recent (1998) estimates for the Arctic National Wildlife Refuge in Alaska, whose coastal region could harbor more than 11 billion barrels of recoverable oil. Last year, the Senate blocked the Bush Administration's controversial plan to allow drilling within the reserve.

energy.cr.usgs.gov/oilgas/noga



RESOURCE

Reef Roundup

Reefs teem with eye-catching inhabitants, such as this bristly worm (above) moseying across a piece of coral off the Florida coast. ReefBase, a data storehouse sponsored by the World Fish Center in Penang, Malaysia, teems with information on reef biodiversity and conservation.

The growing site includes data on coral in more than 90 countries. You can read a brief description of each country's reefs and find out their conditions. The site examines human-caused and natural environmental changes that jeopardize coral, such as bleaching, overfishing, cyclones, and pollution. Learn what steps countries are taking to preserve their reefs, such as limiting fishing or designating protected areas, and how well they're working. You can browse through a huge image gallery or peruse a bibliography featuring 13,000 articles, some available as full text. Use the site's new mapping feature

to chart the extent and severity of coral bleaching or to pinpoint reefs blighted by disease.

www.reefbase.org

IMAGES

Primate Anatomy Lesson

With its beetling brows and jutting face, a gorilla could never pass for human, even at a fraternity party. Yet stripped to the bone, we primates are alike in many ways, such as in the position of the shoulder blades. To help students recognize the underlying similarities and differences among human beings, gorillas, and baboons, anthropologist John Kappelman of the University of Texas, Austin, created the e-Skeletons Project.



Users can study digital photos of the skull and other bones from multiple angles and highlight anatomical details. For example, color-coding pinpoints the different bones in the skull. Click to delineate muscle attachments, processes, tooth cusps, and other skeletal landmarks, or to see the points where one bone articulates with another. Another feature lets you juxtapose bones from different species (above, a human skull alongside a gorilla's). Kappelman plans to add chimpanzee and orangutan skeletons to the site.

www.eskeletons.org