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edited by JOCELYN KAISER

Web Math Made Easy

NEWS

Talking shop on the I-Way will soon be a lot easier for scientists and mathematicians, thanks to a new computer language released last week by the group that sets Web standards (**www.w3.org**). The language, which should also be a boon to blind scientists, will for the first time allow people to write mathematical formulas in an HTML document.

Until now, formulas had to be presented as images pasted in a document. As a result, to read Los Alamos physics preprints, for example, one has to add a plug-in such as Acrobat to their Web browser, says Robert Miner of the University of Minnesota's Geometry Center.

That will change with the advent of an HTML dialect called Math Markup Language (MathML) developed by the World Wide Web Consortium (W3C), a dues-funded group of tech companies.

MathML has two ways of encoding a formula, says Miner, who helped write it. One, better for high-quality printing, specifies the exact appearance; for example, it might encode "pi squared" as the Greek letter pi with a superscript of 2. The other captures semantic meaning: It encodes "pi squared" as 3.14 multiplied by itself. Formulas made this way can be understood by screen-reading software. According to W3C, this will allow visually impaired people to work with math "in a way that has never been feasible."

You still need a plug-in for MathML, but two types are available for free (as is MathML) at the W3C site. One benefit of MathML is that because formulas are text, not images, documents can be searched or indexed by formula. "I think that will have an enormous impact on the scientific enterprise," says Miner, who hopes most scientists will be using it within a year

or two. Not everyone is so sanguine, however: One industry computer scientist says he has "mixed feelings" about MathML, because like so much Web computing, it's "good for the mass market" but may not meet the needs of "a sophisticated user."

Astronomical per diem. Storm clouds on Mars, a cluster of jewellike stars, the first lunar footprint, a bruise-colored nebula, Hale-Bopp streaking above mountaintops, the eerie aurora over Alaska (right)—these are just some of the eye-popping images that appear on a calendar called the Astronomy Picture of the Day (APOD).*

DICK HUTCHINSON

"It's a bit of everything," says Jerry Bonnell of the Goddard Space Flight Center in Greenbelt, Maryland, who launched APOD with colleague Robert Nemiroff in June 1995. "We look for a great image in a press release or some brief bit of science we could explain." That ranges from pics fresh off the Hubble Space Telescope to stills from the Apollo missions. APOD's creators add educational value as well by writing captions with links to other scientific sites. For example, the 4 March aurora picture, sent in by an Alaskan fan, has URLs for home pages on auroras and spruce trees. "Bob and I have day jobs, so it's pretty much a spare time kind of thing," says Bonnell, a high-energy gamma ray astronomer. But one fringe benefit of running APOD, he says, is that it keeps him up on research news outside his corner of astronomy. "It helps me pay attention."
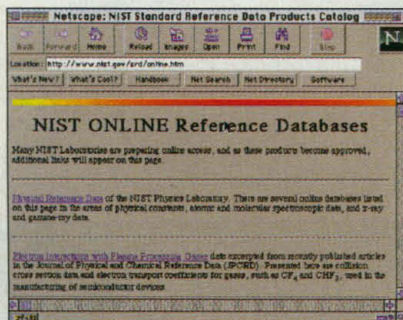
*http://antwrp.gsfc.nasa.gov/apod/astropix.html

Straight Dope on Chemicals

SITE VISIT

It may not sport fancy graphics or Java applets, but for chemists and physicists, one of the hottest draws on the Web is the National Institute of Standards and Technology's (NIST's) Online Reference Databases site. A rare source of free information on chemicals, the site maintains several databases covering everything from melting points to half-lives. One repository is the Chemistry WebBook, full of spectroscopic and thermodynamic data—entropy and vapor pressure, for example—on over 5000 organic and small inorganic compounds, not to mention data on ion energetics and fluid physics. A second cache worth plundering is called Physical Reference Data, where you can look up, for instance, x-ray and gamma ray data on radioactive isotopes, or uranium's energy levels. All data are scrupulously assessed, referenced, and updated by NIST experts.

www.nist.gov/srd/online.htm

Three specialized databases contain information on topics such as superconductors and enzymes, and more are coming soon, says NIST's Charles Sturrock. "It will become more and more useful," notes Chuck Huber, chemistry librarian at the University of California, Santa Barbara.

Chemistry precis. The American Chemical Society this month will unveil free access to the table of contents for all 26 of its journals back to January 1996, including articles on the Web but not yet in print. Single articles can be ordered for $25 each. **pubs.acs.org**

Funding insight. If *Science* doesn't satisfy your hunger for biomedical policy news, try *Comment*—a new, free weekly Web newsletter produced for Funding First, an initiative of the Mary Woodard Lasker Charitable Trust. To appear on Wednesdays, *Comment* promises analyses, interviews, and background links. **www.fundingfirst.org/comment/01/index.html**

HOT PICKS

Software meltdown. Struggling to imagine—thermodynamically, that is—what the inside of Jupiter's moon Io might be like? For this and other serious exercises requiring an analysis of mineral phases, download University of Washington, Seattle, geochemical modeler Mark Ghiorso's newest release of MELTS, a Java applet version that runs on a Web browser. **melts.geology.washington.edu**

SCIENCE ONLINE

This month's Tech.Sight reviews how NASA's Pathfinder Mission to Mars used state-of-the-art computer technology to create Sojourner, a robot rover capable of traveling to selected "waypoints" while probing and avoiding obstacles with its sophisticated sensors (p. 454). To help you navigate robotics on the Web, the enhanced online version of Tech.Sight offers links to NASA Web pages, information about autonomous navigation, and sites on robot technology. **www.science mag.org/feature/data/techsight/tech_intro.shl**

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