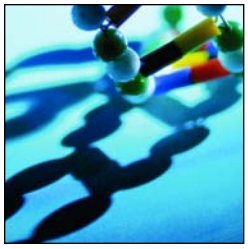
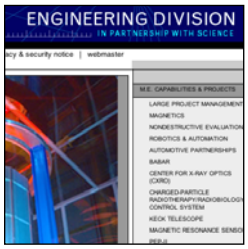
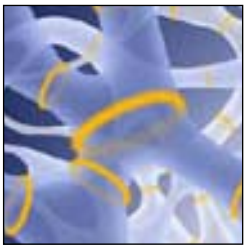
CSO
creativeservices
office

BERKELEY LAB







technical writing/editing

design and illustration

photography

printing and duplication

web development and design

video services

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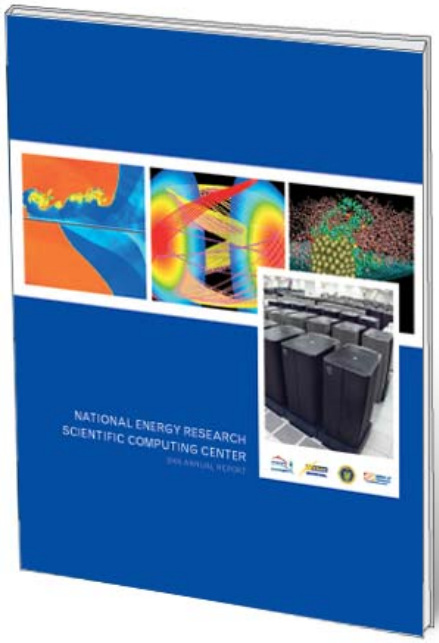
creative
services

design] reports

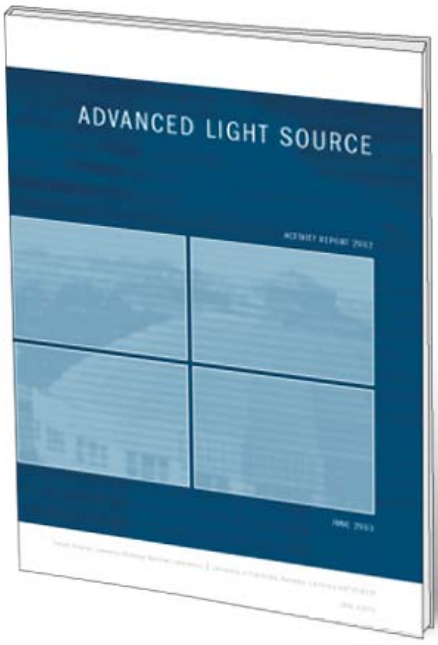
NERSC ANNUAL REPORT 2003

- writing/editing
- design
- illustration
- photography
- printing



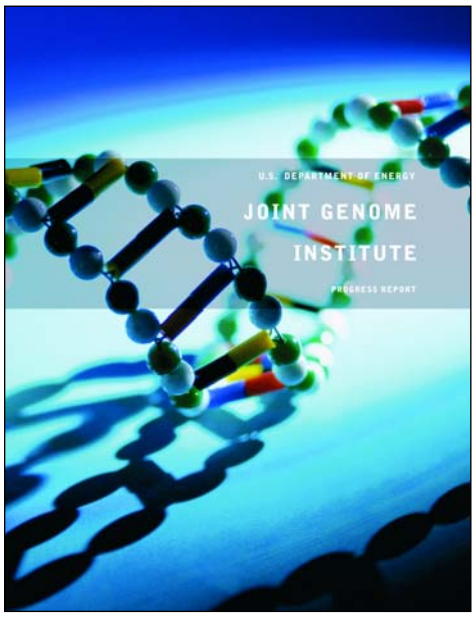
ALS ACTIVITY REPORT 2002

- writing/editing
- design
- illustration
- photography
- printing



JGI PROGRESS REPORT

- writing/editing
- design
- photography
- printing



READ A SAMPLE

ABSTRACTS COVER

- design
- photography

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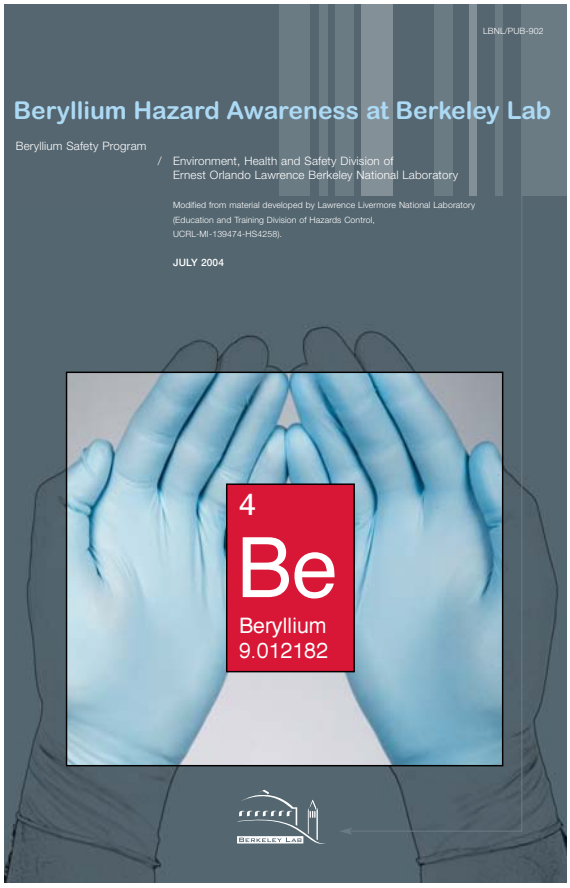
design] brochures

JGI BROCHURE: EXPLORING LIFE'S MYSTERIES

- design
- illustration
- photography
- printing

BERYLLIUM HAZARD AWARENESS

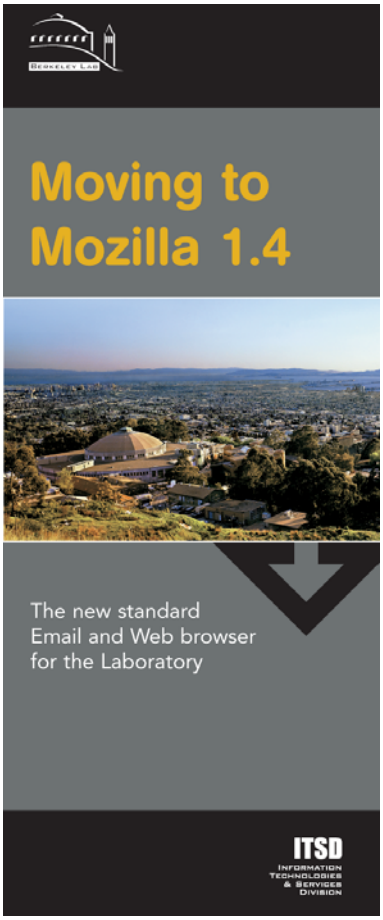
- writing
- design
- photography
- printing



READ A SAMPLE

MOZILLA MIGRATION BROCHURE

- writing
- design
- photography
- printing



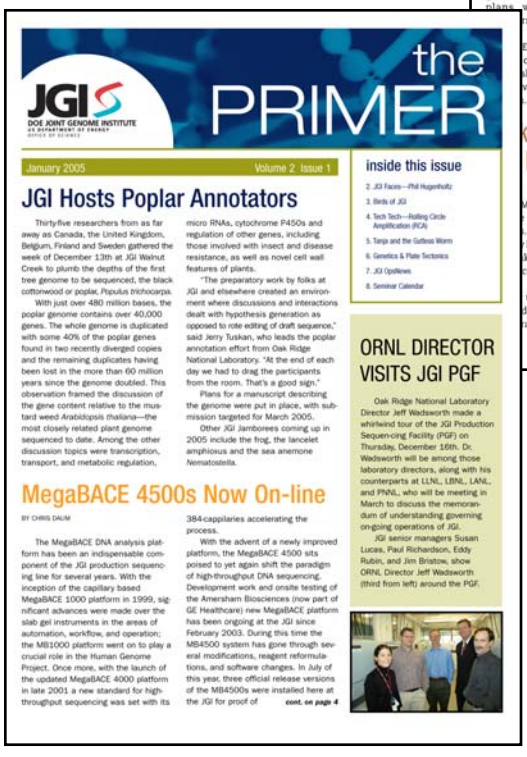
design] identity marks

design] newsletters/editorial

BERKELEY LAB VIEW
- design/layout
- production
- illustration
- photography
- printing

ENGINEERING NEWS
- writing/editing
- design/layout
- production
- photography
- color duplication

THE PRIMER
- editing
- design/layout
- production
- photography
- color duplication



READ A SAMPLE

< previous

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web] design

JGI HOMEPAGE

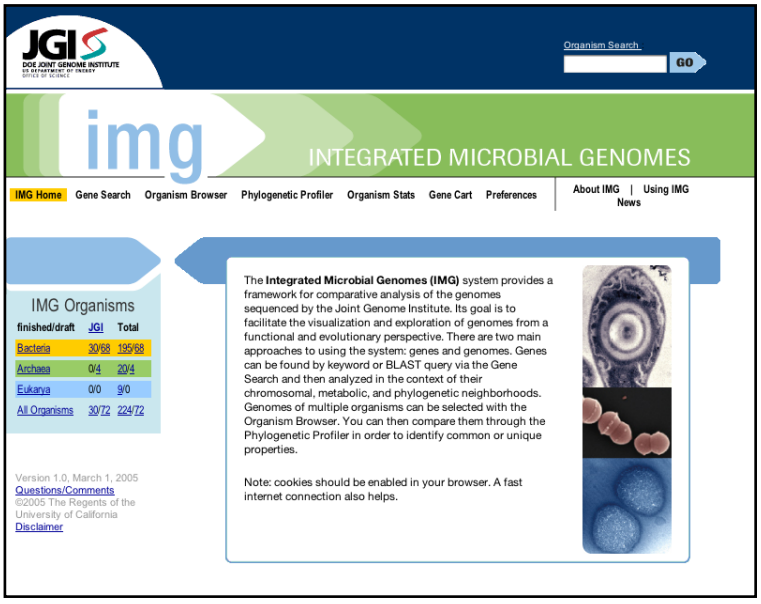
• design

"For the design of the new JGI Web site, we got a quote from an outside firm and one from LBNL's Creative Services. The Creative Services quote was significantly less expensive, both in hourly rate and in the amount of time estimated to do the job. Creative Services came through with an absolutely stunning design and even beat its own time estimate. As a project manager, I find a tremendous advantage in using creative professionals that already know something about the science we do here and can translate it into effective communications at the drop of a hat."

—project manager

IMG: INTEGRATED MICROBIAL GENOMES HOMEPAGE

• design



web] design + development

ENGINEERING DIVISION

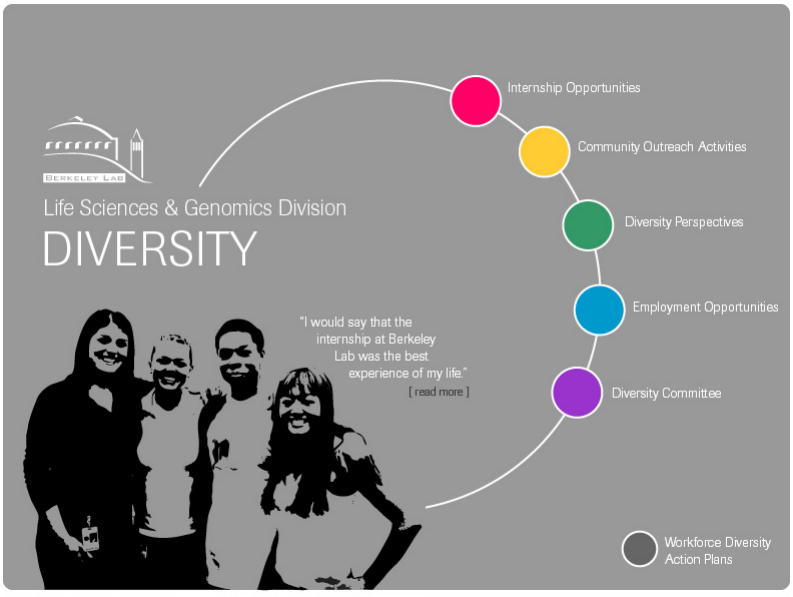
- web development
- design
- web maintenence
- photography

MANAGER'S HR TOOLKIT

- web development
- design
- web maintenence
- photography

LIFE SCIENCES AND GENOMICS DIVISION DIVERSITY

- design
- web development

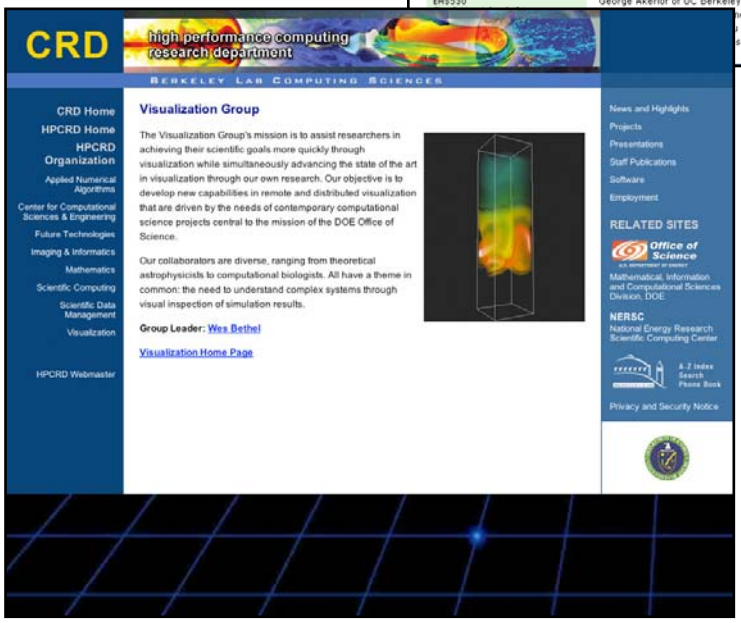


web] design + development

INTERFACES BY DESIGN
- design
- web development
- web maintenence

TODAY AT BERKELEY LAB
- design
- web development
- web maintenence

CRD (COMPUTATIONAL RESEARCH DIVISION) SITE
- design
- web development
- web maintenence



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illustration] traditional

JGI LOBBY

client JGI

AIRFLOW AND INSULATION

client EETD

< previous

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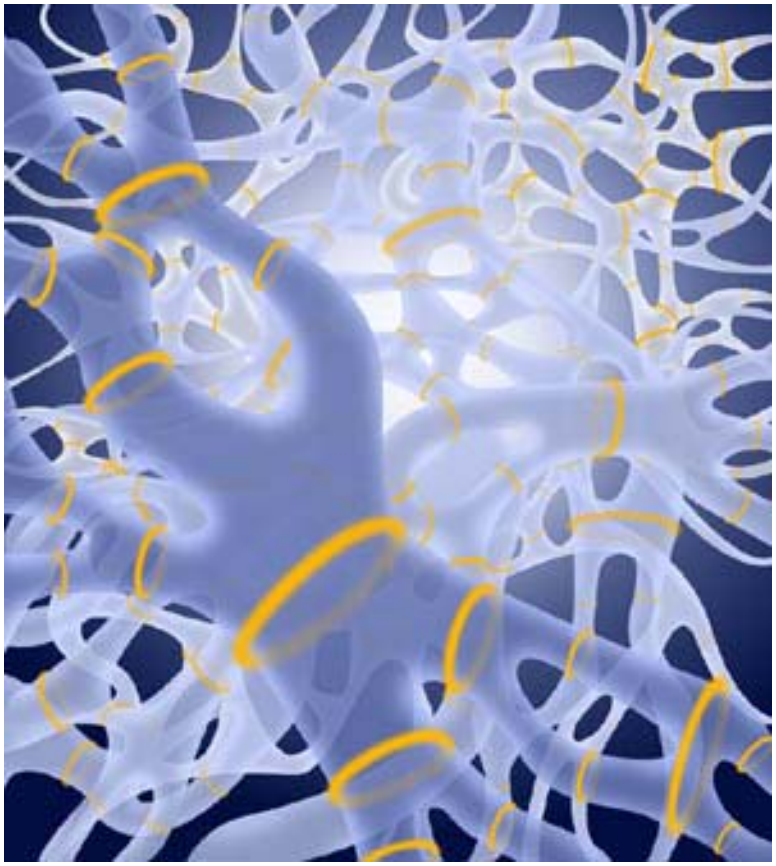
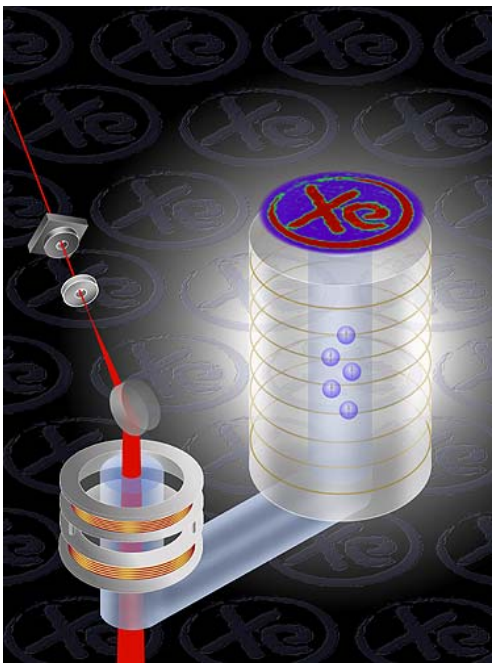
illustration] technical

STRING THEORY FOR
RESEARCH REVIEW



COVER ART FOR A
SPECTROSCOPY
JOURNAL

client Alex Pines



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illustration] posters

SERIES OF POSTERS FOR LABORATORY DIVISIONS

- illustration
- design
- printing

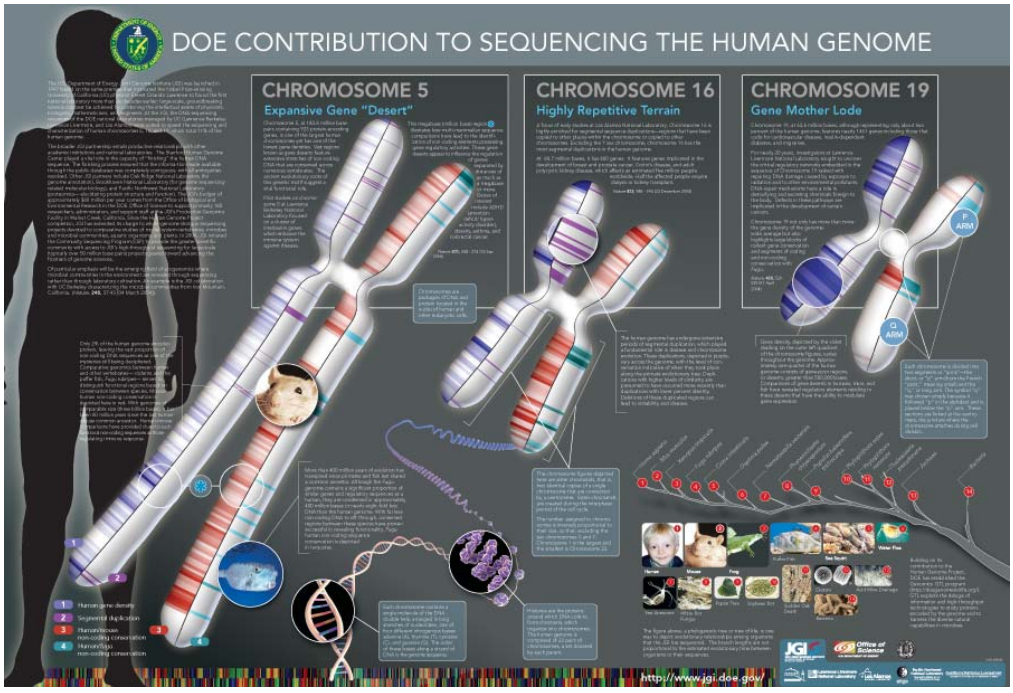
BERKELEY LAB RECYCLING POSTER

- writing/editing
- illustration
- design
- printing

READ A SAMPLE

DOE CONTRIBUTION TO SEQUENCING THE HUMAN GENOME

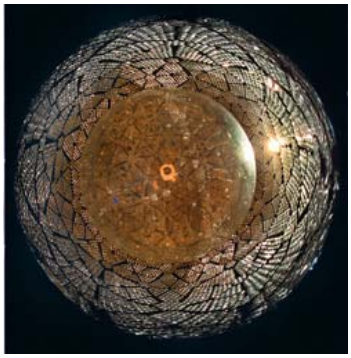
- illustration
- 3D illustration
- design
- editing



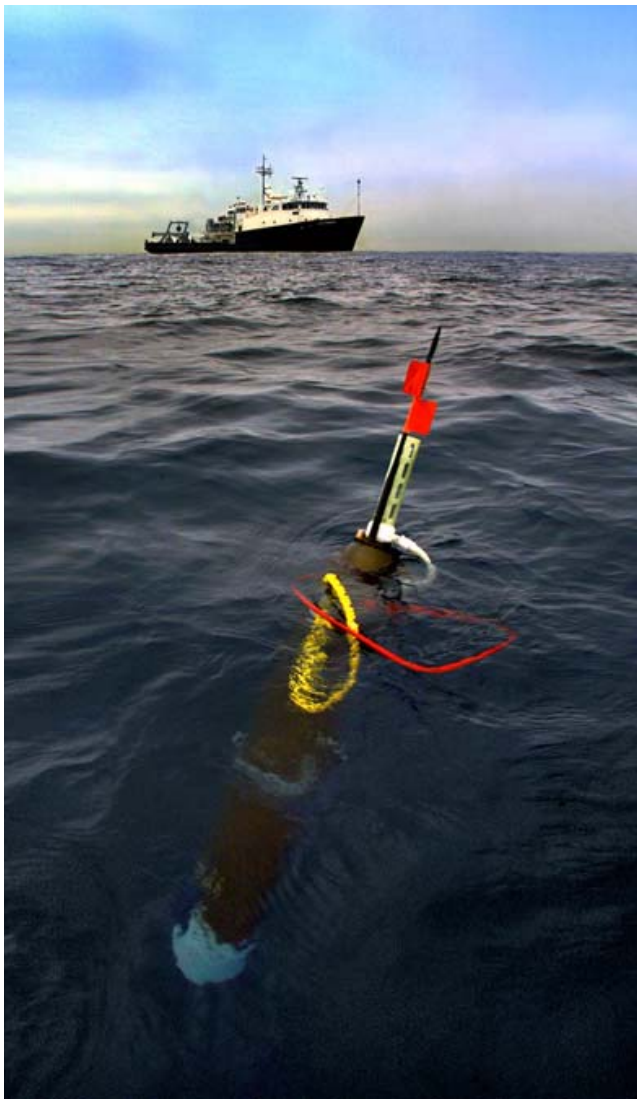
photography] location

COLLECTING WHEAT SAMPLES IN OKLAHOMA FOR THE CARBON SEQUESTRATION PROJECT; MARGARET TORN (ESD)
• location photography

SUDBURY NEUTRINO OBSERVATORY IN SUDBURY, CANADA; KEVIN LESKO (NUCLEAR PHYSICS)
• location photography



SOLO SATELLITE FOR THE OCEAN CARBON SEQUESTRATION PROJECT; JIM BISHOP (ESD)
• location photography



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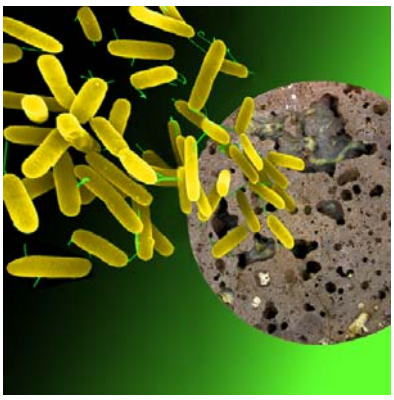
photography] studio

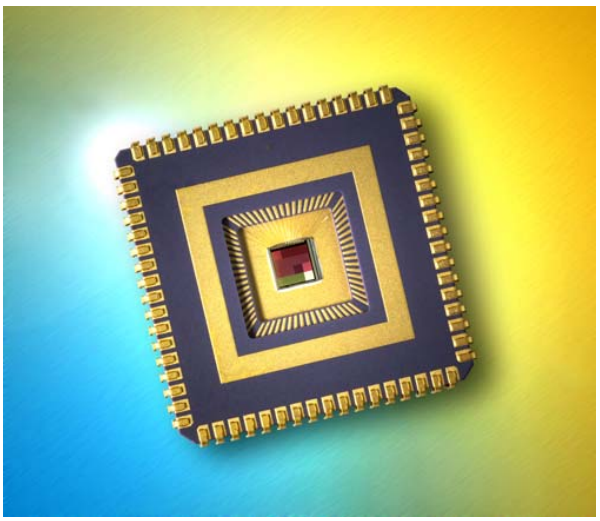
PETER NUGENT (LBL COMPUTING SCIENTIST) WITH NERSC IBMS FOR ASTROPHYSICS DARK ENERGY; PAM PATTERSON (COMMUNICATIONS)
- location photography
- image compositing

HANDS WITH STERILE GLOVES FOR AN EH&S SAFETY BROCHURE; JACK SALAZAR (EH&S)
- studio photography

MICROBES IN BASALT; HOI-YING HOLMAN (ESD)
- image compositing



APS CHIP FOR RHIC-STAR PROJECT; HOWARD MATIS (NUCLEAR SCIENCE)
- studio photography
- image compositing



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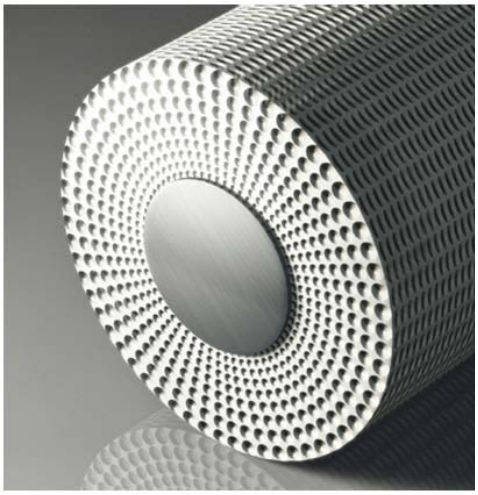
3D illustration]

MOLECULAR FOUNDRY VISUALIZATION
• 3D illustration

MODELS OF ARTIFICIAL BONE, TONY TOMSIA, P.I.
• 3D illustration



CSO creativeservices office] services

TECHNICAL WRITING/EDITING

- Scientific writing and editing
- Proofreading
- Copyediting
- Information Management
- Proposals
- Procedures
- User manuals
- Annual reports, brochures, newsletters, etc.

MATRIX SERVICES AVAILABLE
$74 per hour x6491

DESIGN AND ILLUSTRATION

- Annual reports, brochures, posters, fliers, newsletters, web sites, etc
- Identity marks
- Technical/scientific, 3D illustration
- Animation
- Word processing/production (simple page layout)
- Presentations
- Displays, exhibits

MATRIX SERVICES AVAILABLE
$70 per hour x6765

PHOTOGRAPHY

- Photography (studio and location)
- Scanning
- Printing
- Slides
- Large format poster printing (43.5" x 96")
- Lamination
- Mounting

PLEASE CALL FOR AN ESTIMATE
$100 per hour x5731

PRINTING AND DUPLICATION

- High speed black-and-white and color copies
- Binding, custom-printed tab dividers, collating, punching, and trimming of documents
- DOE mandated: GPO printing coordination*
- CD duplication
- Business card setup and printing

CONTACT FAYE HUTCHINGS FOR PRICING x6787

WEB DEVELOPMENT AND DESIGN

- New Web site design
- Existing site redesign
- Conversion of print media (brochures, flyers, etc.) and other document types (MS-Excel, MS-Powerpoint, etc.) into HTML or PDF
- Information Management
- Information/navigation/useability analysis and best practices recommendations
- Web forms
- Surveys/questionnaires
- Web-based training/quizzes
- HTML-based email newsletter templates
- JavaScript, DHTML
- Quality control/uploading of your finished site to Lab Web server and access

$100 per hour Web development
$70 per hour for Web design
. . . . . x6172

VIDEO SERVICES

Services will be available Monday-Thursday 8:00 AM-1:00 PM. If services are needed outside of these hours please contact us at least 2-3 weeks in advance.

- Pre-production planning
- Video production
- DVD design and authoring
- Script writing
- Digital video editing
- Video graphics
- Audio editing
- Voiceover recording
- Camcorder rental
- Duplication—VHS, S-VHS, Hi8, ¾", Beta SP, DVCam PAL & Webcam
- Video digitizing— (Mpeg, Quicktime, Real, AVI)
- Streaming video
- File-to-tape transfer (audiocassette-to-CD transfer

$105 per hour x6765

*Procurement of printing, including photocopy duplication, from a commercial source is restricted to Printing Services in CSO as noted in Section 5.04 of the RPM.

For more information regarding our services and contacts please visit our web site
http://www.lbl.gov/LBL-PID/CSO/

Humans, mice, fish, and microbes have a lot in common. Through the process of conservation, we retain similar DNA sequences that go back millions and hundreds of millions of years to a shared ancestor.

BEYOND CHROMOSOMES 5, 16, & 19:
THE POWER OF COMPARATIVE GENOMICS

Another goal of the Human Genome Project has been to determine the complete sequence of the three billion DNA subunits of the human genome. These subunits, or nucleotides, consist of a nitrogenous base (adenine, guanine, thymine, or cytosine), a phosphate molecule, and a sugar molecule. Thousands of nucleotides are linked to form each DNA molecule.

However, it is doubtful whether the use of computational tools alone can accomplish this task. The mechanism for obtaining a full description of the human genome and understanding its structure and function is *comparative genomics*—looking at other life-forms' genetic material to interpret human gene function.

Throughout evolution, functions within cells have been defined and then not reinvented. They are instead conserved. The consequences are that genes and pathways established early in development have been maintained up to the present. Through this process of evolutionary conservation, we share a surprising number of genes with mice, fish, and even in such distant and supposedly primitive organisms as *Escherichia coli*.

Of Mice and Men

The first major example of the power of comparative genomics was published in *Science* by JGI in July 2001. This paper described the sequencing and analysis of human chromosome 19 (HSA19) and its corresponding regions in the mouse genome. It showed that sequencing of evolutionarily distinct organisms would prove to be invaluable in defining human gene structure both in the coding and noncoding regions. This noncoding area, sometimes called "junk DNA," is starting to yield valuable data.

Spanning 65–70 Mb (million bases) and containing an estimated 1,100 genes, HSA19 is one of the smallest and most gene-dense of the human chromosomes. Comparisons between HSA19 and related mouse segments identified a large number of candidate exons (the protein-coding DNA sequence of a gene) and regulatory elements

associated with known genes. These analyses have also provided significant new evidence for the validity of hypothetical genes, and identified clusters of conserved sequences that offer new candidates for undiscovered HSA19 genes. Using this information, we have developed a comprehensive overview of HSA19 gene conservation and defined significant evolutionary changes that distinguish the human chromosome from related mouse DNA.

The Reader's Digest Version of the Human Genome: *Fugu rubripes*

An interesting candidate for illuminating the human genome is the Japanese puffer fish. *Fugu rubripes*, known for its poisonous enzymes, can kill an unwitting diner if the fish is prepared improperly.

"*Fugu* is just like the human genome, but at a steep discount—the Reader's Digest version," says Sydney Brenner, the two-time winner of the prestigious Lasker Award, who took up the molecular genetic study of *Fugu* a dozen years ago. Although the *Fugu* genome contains essentially the same genes and regulatory sequences as the human genome, it carries them in a package consisting of approximately 400 million bases. This is small when compared to the 3 billion bases that make up human DNA.

In November 2000 the JGI formed the Fugu Genome Consortium, which included Sydney Brenner, the Institute for Systems Biology, Myriad Genomics, Celera Genomics, and various groups in Singapore and Cambridge, UK. This has been one of the largest international consortia since the sequencing of the human genome began.

The Fugu draft represents the first vertebrate sequence assembled and made available since the Human Genome Project.

On October 26, 2001, at the 13th International Genome Sequencing and Analysis Conference in San Diego, California, the Consortium announced the completion of a draft sequence. This draft included sequencing the genome to a total of nearly sixfold coverage, and is freely available on the Web (fugu.jgi-psf.org/).

It is too early to see the full impact of the *Fugu* genome sequence, but with far less junk DNA to sort through, finding genes and controlling sequences is proving to be a much easier task. We have been able to confirm significant numbers of human genes and find many regulatory elements within the noncoding regions of the human genome.

The Searchable Squirt: Building a Platform for Discovery

Sea squirts, or *Ciona intestinalis* as they are known more formally, may look like rubbery blobs, but they are actually very advanced animals whose larvae share a similar body plan with all vertebrates, including humans. Sea squirts belong to the phylum Chordata, which includes all animals with a spinal chord and a supporting notochord (backbone). This includes everything from fish to humans.

Because *Ciona intestinalis* is perhaps the most primitive proto chordate, studying it will allow us to see how genes and gene families have evolved to higher order vertebrates. It has a very small number of cells, about 1,000 in the tadpole stage and 2,000 in the adult.

Sea squirts get their nickname from their tendency to "squirt" when they are removed from their watery home.

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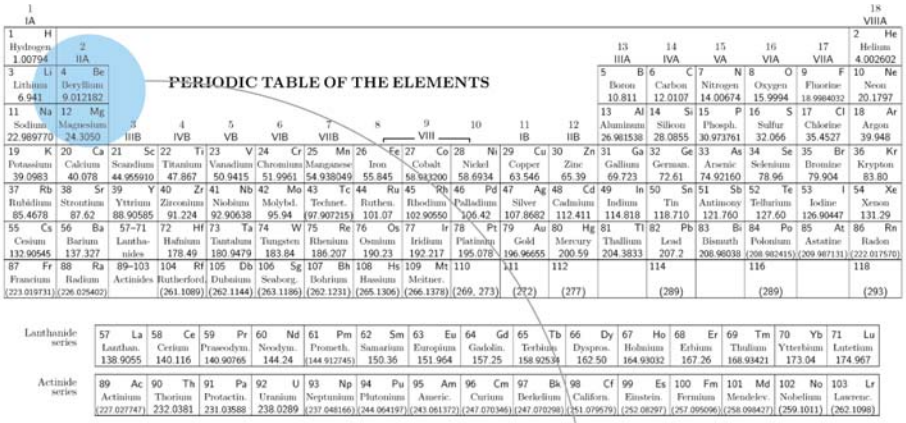
writing] beryllium awareness



INTRODUCTION

This pamphlet is intended to familiarize all Laboratory employees and guests with the potential hazards of beryllium metal, beryllium compounds, and beryllium-containing materials, and Berkeley Lab resources available to ensure all beryllium operations are conducted safely.

Beryllium is a naturally occurring metal with many industrial and R&D applications, particularly in the aerospace, nuclear, electronics, and automotive arenas. Despite its benefits, serious health problems are caused by exposure to airborne beryllium particles. The most common of these is a respiratory disease known as Chronic Beryllium Disease, or CBD.

Although current and projected uses of beryllium at Berkeley Lab are primarily limited to research and therefore pose a relatively low degree of risk compared to industrial or machining operations involving beryllium, everyone on site must be made fully aware of what the risks are. This pamphlet looks at these risks and how to safeguard against exposure (especially for those working with beryllium or in areas where beryllium may be present), as well as at the characteristics of beryllium and its applications.

WHAT IS BERYLLIUM?

Beryllium is a silver-gray metallic element that occurs naturally in about 30 minerals. It is the second lightest of the metals (lighter than aluminum), but is stiffer than steel. It has a high melting point, conducts heat well, and is corrosion resistant. Beryllium-containing minerals are found in rocks, coal, oil, soil, and volcanic dust. It is 46th in natural abundance in the Earth's crust, slightly more than uranium or tin. Beryllium is a key element in gems such as blue-green aquamarines and green emeralds.

MANY PRODUCTS AND PROCESSES USE BERYLLIUM

Beryllium metal has been used in industrial processes and products since the late 1950s. Both structural and instrument-grade beryllium-containing materials are manufactured, especially for the aerospace and defense industries, as well as for use in some research and development (R&D) applications, including windshield frames and other structures in high-speed aircraft and space vehicles; aircraft and space shuttle brakes; neutron moderators or reflectors in nuclear reactors; x-ray windows (such as those used at the Advanced Light Source); nuclear weapons components; nonsparking tools and springs (beryllium–copper alloy); and foil targets for accelerator experiments.

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Engineering News

October 2004, Vol. 2, No. 1

BERKELEY LAB ENGINEERING DIVISION

ENGINEERING: IN PARTNERSHIP WITH SCIENCE

If the recommendations of the Engineering Task Force (ETF) can be distilled into one key imperative, it is this: develop and implement a strategic technical plan. The Engineering Division strategic plan is technical in that it will capture the intersection of all the programmatic divisions' strategic plans with their short- and long-term engineering requirements.

The Engineering strategic plan will be characterized by a strong partnership between the programmatic divisions and the Engineering Division. The American Heritage Dictionary of the English Language defines "partnership" as "a relationship between individuals or groups that is characterized by mutual cooperation and responsibility, as for the achievement of a specified goal." At Berkeley Lab, that means each partner shares in all the liabilities and all the benefits to achieve a common objective.

In this issue we follow up on our article in the July issue of *Engineering News*—"Engineering Focus on Partnership"—and look at what makes a successful science and engineering partnership a reality. The focus is on two such partnerships: a transatlantic partnership to create a small-scale wind turbine; and support to the SNAP project by development of radiation-resistant integrated circuitry that can survive the demands of outer space.

Future issues will focus on other science and engineering partnerships and the further evolution of our strategic technical plan.

IN THIS ISSUE:

Berkeley Lab and Russian Scientists and Engineers Harness the Wind

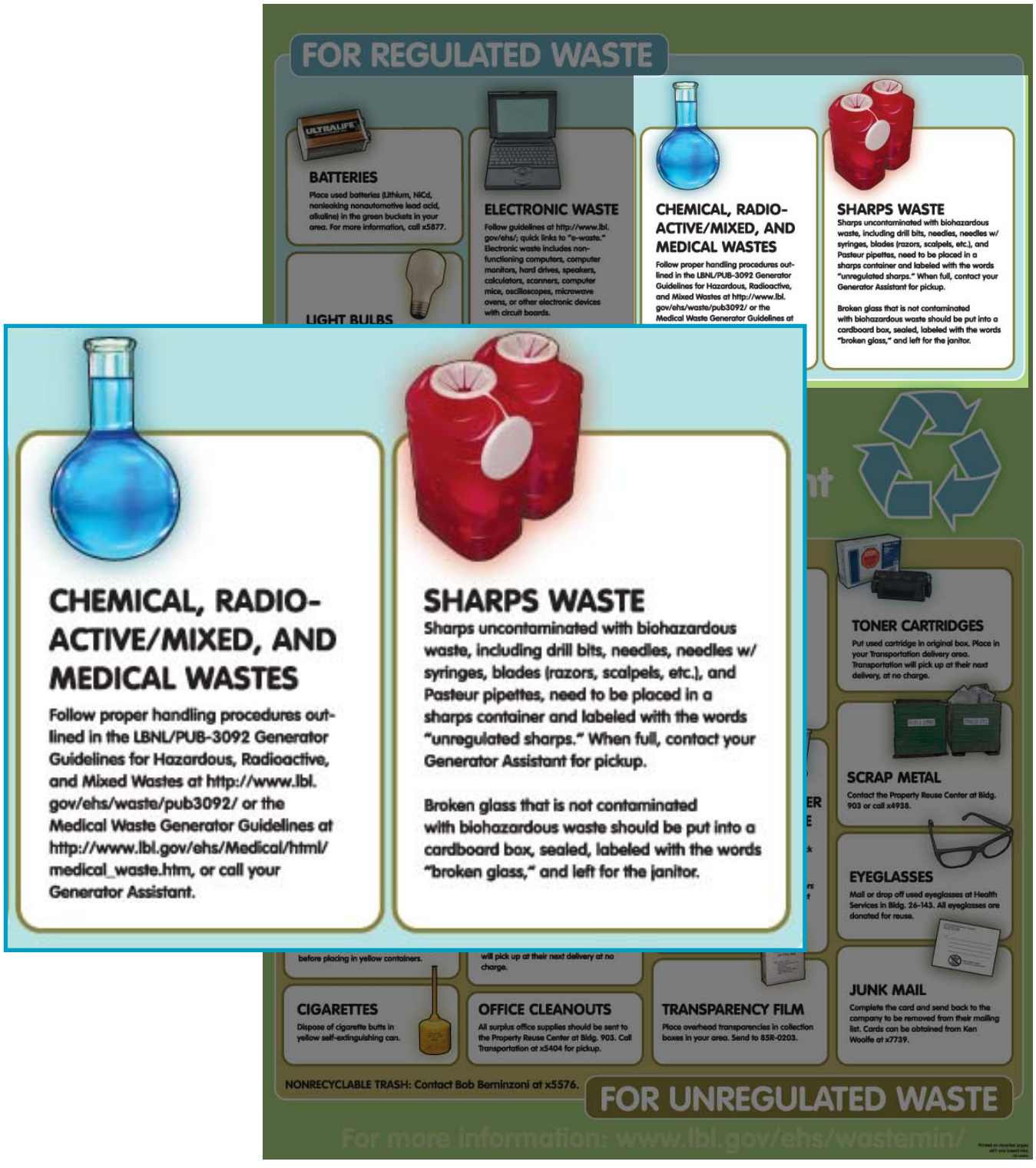
The Makeyev State Rocket Center (MSRC) in Miass, Russia, used to make missiles for Russian submarines. Now in partnership with Berkeley Lab's Engineering Division, they make wind turbines to generate electricity for single-family homes.

Over the last two years, scientists and engineers at MSRC have collaborated with Berkeley Lab and Empire Magnetics of Rohnert Park, CA to develop tech-

continued on page 2

Three-kilowatt wind turbine to be tested in October.

writing] berkeley lab recycling



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