1663

LOS ALAMOS SCIENCE AND TECHNOLOGY MAGAZINE

About Our Name:
During World War II, all that the outside world knew of Los Alamos and its top-secret laboratory was the mailing address—P. O. Box 1663, Santa Fe, New Mexico. That box number, still part of our address, symbolizes our historic role in the nation's service.

About the LDRD Logo:
Laboratory Directed Research and Development (LDRD) is a competitive, internal program by which Los Alamos National Laboratory is authorized by Congress to invest in research and development that is both highly innovative and vital to our national interests. Whenever *1663* reports on research that received support from LDRD, this logo appears at the end of the article.

About the Cover:


Even with rapid growth of renewable energy sources, the world will remain dependent on fossil fuels for the foreseeable future. Burning these fuels produces carbon dioxide and other greenhouse gases, which drive increased temperatures and climate change worldwide. The capture and long-term storage of carbon dioxide in deep, geological reservoirs is one possible approach to mitigating these changes but presents challenges in the scale at which it must be done (billions of metric tons per year) and the associated cost. To meet these global challenges, Los Alamos scientists are making advances in virtually every aspect of carbon capture and storage research.

Los Alamos Firsts

Server Science

Paul Ginsparg never intended his "e-print archive" to catalyze a revolution in science communication. It just turned out that way.

Ginsparg was a maverick young theorist at Los Alamos National Laboratory when he conceived of the archive. It was 1991, there was email but no World Wide Web, and in many physics disciplines, new ideas and results were routinely communicated through preprints—abstracts or un-refereed early drafts of papers—which were available months before the corresponding published papers. Researchers spent considerable time and institutional resources preparing, printing, and mailing preprints, but often little time organizing the ones they received (choosing to utilize the ever-popular "paper mound" filing system).

Ginsparg recognized that if researchers simply emailed their preprints to a common site, a computer could automatically extract the content, organize it, store it, and avail it to be read or downloaded. Preprint costs would be obviated, and a structured, searchable archive of breaking research would lay at a subscriber's fingertips.

Such an archive would also, in a sense, level the research playing field. Each institution constructed its own preprint distribution list—those not on it were excluded from the research buzz. But anyone connected to a computer network would be able to access Ginsparg's archive, so everyone from students to Nobel laureates could contribute to the science.

After spending a few summer weekends writing the necessary computer code, Ginsparg launched the system in August of 1991. The whole enterprise ran on a computer that sat beneath his desk. He had envisioned the archive serving a few hundred scientists and receiving roughly 100 full-text submissions per year, but he severely underestimated its cultural impact.

Scientists began using the archive as an unofficial record of scientific activity—even using it to stake claims of intellectual property. Within two years, the archive had evolved into the primary means of daily communication for a global community of researchers.

Today, the official "arXiv," (pronounced "archive," on the web at http://arXiv.org) contains close to 800,000 full texts, receives 83,000 new texts each year, and serves roughly a million full-text downloads to about 400,000 distinct users every week. It has broadened to cover most active research fields of physics, astronomy, mathematics, nonlinear sciences, computer science, statistics, and, more recently, parts of biology and even finance. Its role in promulgating science cannot be overestimated.


Paul Ginsparg
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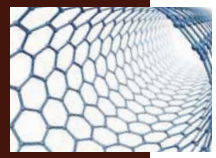
FEATURES



SPOTLIGHT