Williams and his associates hit on the idea of studying gas clouds by centering the STIS image on a quasar—a young galaxy with a brilliant beacon at its center—about 10 billion light-years from Earth, located on the sky about 0.1 degree from the basic deep-field image. As it observed the quasar's spectrum, STIS recorded dips in the amount of light produced by absorbing clouds of gas that lie along the line of sight. The redshifts of these absorption lines enable astronomers to map the distribution of intergalactic gas all the way out to the quasar. Although the lines of sight to the quasar and the southern deep field are not identical, they are close enough for astronomers to assume that the distribution of intergalactic matter is similar.

Astronomers have long sought to explain how galaxies formed from such clouds of gas when the universe was only a few billion years old. Once observers measure the exact redshifts of the Southern Fields galaxies from ground-based telescopes in Chile, "we'll be looking for correlations between the [galaxies' and clouds'] redshifts," says Williams. "This is going to provide an extremely important way to test our ideas of how the intergalactic medium turned into galaxies." **–DONALD GOLDSMITH**

Donald Goldsmith's most recent publication is *The Ultimate Planets Book* (Quality Paperback Book Club/Byron Preiss, 1998).

PATENT LAW

High Court to Review Standard for Appeal

How expert is the patent office? In a surprising move, the U.S. Supreme Court has agreed to rule on a tug-of-war over patent law that is being watched closely by computer and biomedical inventors and investors. Its decision, expected sometime next year, could limit the ability of inventors to appeal if the government rejects their patent application.

The case, *Lehman* v. *Zurko*, pits the U.S. Patent and Trademark Office (PTO) against a special federal court that hears appeals from inventors who have had their applications denied. PTO officials believe that judges for the U.S. Court of Appeals for the Federal Circuit, which hears cases ranging from patent challenges to government contract and employment disputes, have too much leeway to second-guess the government's rejections, which are often based on highly technical grounds. They would like the judges to show more respect for decisions reached by the PTO's patent examiners, many of whom hold advanced science and engineering degrees. "It's ironic that the court does not grant deference to an agency that has 400 Ph.D. scientists," says PTO Commissioner Bruce Lehman.

Lehman wants the appeals court to tell his agency to reconsider a patent rejection only if it finds the PTO acted in an "arbitrary and capricious" manner. Currently, the appellate judges can order a reconsideration if the agency was, in the court's opinion, "clearly in error" in interpreting the facts in the case.

The patent office argues that it deserves the less intrusive standard under a 1946 law, the Administrative Procedure Act (APA), which was designed to impose uniform judicial review standards on all federal agencies. But the 11-judge appeals panel, which includes several members with scientific training, has rebuffed the patent office's efforts to rein in its oversight powers. Its position is backed by many patent attorneys and business executives, who say that changing the rules could disrupt the patent appeals process and discourage research investments. The PTO hasn't "presented a compelling reason for turning a consistent system of appeals on its head," charges the Biotechnology Industry Organization in Washington, D.C., which represents about 750 companies and research institutions and has lined up with the appeals court.

The controversy stems from a 1990 patent application for a software program from computer scientist Mary Ellen Zurko, now with Iris Associates in Westford, Massachusetts, and eight colleagues then working for the Digital Equipment Corporation (DEC). The software is intended to protect transactions between secured and unsecured computer networks. In 1994 one of the agency's 2500 examiners decided that the code was too "obviously" a variation on earlier inventions to merit legal protection. In 1995 the PTO's internal Board of Appeals upheld the denial, which DEC then took to federal court.

ILLUSTRATION: TERRY E. SMITH

Two years later a three-judge panel found that the factual basis for the denial was "clearly in error" and ordered the agency to reconsider the application. In a footnote to its decision, however, the court invited the PTO to request a rehearing of the case before the full appellate panel in hope of settling the standard-of-review conflict. Last May the full 11-member panel unanimously upheld the initial ruling, finding that Congress never intended the APA to limit the court's oversight authority. "Courts do not set aside long-standing practices absent a substantial reason," it concluded, noting that adopting a more deferential standard might make the PTO's patent denials "virtually unreviewable."

Such a unanimous decision normally dooms an appeal to the Supreme Court. But earlier this month the justices accepted the PTO's plea for one more hearing on the matter. The petition complained that the appeals court had "aggrandized" its role in the patent process. It also implied that the judges don't have the technical savvy to review many patent decisions. "There was not a single judge on the [panel] who had technical expertise in the field involved" in the Zurko case, notes Nancy Linck, until recently the PTO's top attorney and now an executive at Guilford Pharmaceuticals in Baltimore, Maryland.

Such arguments are "interesting but irrelevant," says Ernest Gellhorn, who will present oral arguments this winter for Zurko and Compaq, the Houston-based company that recently purchased DEC. The key issue, says Gellhorn, a law professor at George Mason University in Fairfax, Virginia, is whether the APA allows the judges to go beyond the law's "arbitrary and capricious" standard in reviewing patent decisions. In his view, it does. Attorneys familiar with the case expect Antonin Scalia and Stephen Breyer, who have written extensively on the APA, to be influential in the decision.

Any ruling that changes the appeals process is likely to affect just a handful of cases directly. Although patent examiners reject over half of the more than 200,000 patent applications submitted each year, fewer than 100 denials end up in the appeals court. Still, patent attorneys say, those few cases can have a disproportionate influence on patent law. That's why, says the biotechnology association, inventors and investors have taken "a special interest in this issue." **–DAVID MALAKOFF**