puter search performed a decade ago showed that Fermat's last theorem was true for all exponents less than 125,000. But despite the efforts of innumerable mathematicians, a proof for the general case remained elusive (SN: 6/20/87, p.397).

In 1983, Gerd Faltings, now at Princeton (N.J.) University, opened up a new direction in the search for a proof. As one consequence of his proof of the Mordell conjecture (SN: 7/23/83, p.58), he showed that if there are any solutions to Fermat's equations, then there are only a finite number of them for each value of n. However, that was still far from the assertion that there are no such solutions.

Some of the key ideas for Faltings' proof came from the work of Russian mathematician S. Arakelov, who was looking for connections between prime numbers, curves and geometrical surfaces. Both Arakelov and Faltings found that analogs of certain classical theorems already well established for geometrical surfaces could apply to curves and provide information about statements, such as Fermat's last theorem, that involve only integers.

About a year ago, A.N. Parshin of the Steklov Institute in Moscow, following Arakelov's lead, proved that if the arithmetical analog of an inequality, or bound, governing certain geometrical structures were true, then Fermat's last theorem would also be true. That inequality, in its original geometric form, had been discovered by Miyaoka and Shing-Tung Yau, now at Harvard University. By showing that the so-called Miyaoka-Yau inequality, in a modified form, also applies to the appropriate arithmetical structures, Miyaoka has apparently completed the chain of reasoning leading to a proof of Fermat's last theorem.

Miyaoka's results also demonstrate the increasing number of links being forged between diverse mathematical fields. If Miyaoka's proof turns out to be correct, then, according to some experts in arithmetical algebraic geometry (as this new field is called), similar methods may be useful for tackling a variety of tough mathematical problems.

"Fermat's last theorem is not important in mathematics directly," says Zagier. "It has no consequences." But the search for a proof has, over the years, prompted the development of much new mathematics. "It's a pity," he says, "that this goal may disappear."

Miyaoka is now busy carefully rechecking his proof and waiting for word from other experts who are studying his manuscript. "Things are looking good at the moment," says mathematician Lawrence C. Washington of the University of Maryland in College Park, who has been monitoring the situation. "But I don't think anyone wants to certify the proof yet." It's a time for both caution and excitement. — *I. Peterson*

FOI may open secret cache of energy data

As former director of the Justice Department's Office of Privacy and Information Appeals, Quinlan J. Shea Jr. is an expert on the Freedom of Information Act and how it can be used to disclose data the government would rather not share with the public. Now, as special counsel for the National Security Archive in Washington, D.C., a private nonprofit clearinghouse of government documents, Shea is using Freedom of Information (FOI) requests and appeals to dig up "secret caches of government records." His latest conquest is the Department of Energy (DOE). Late last month he unearthed titles to 545 "limited [distribution] reports" that had been collected by the DOE's Office of Scientific and Technical Information (OSTI) in Oak Ridge, Tenn.

Until now, Shea says, even the titles to these unclassified reports "have been off-limits to the entire public." The reason the DOE has been unable to make these documents publicly available is that their subject matter falls under the data-control provisions of one or more laws, according to Charles Spath, OSTI's assistant manager for information acquisition and appraisal. Samples he cites include copyright laws, the Small Business Innovation Act (which protects proprietary data of commercial value to its developers), export-control laws and controls on unclassified nuclear information.

Shea, however, says he doubts that a solid case can be made to protect each document on the list. For example, he says that despite OSTI's assertions to the contrary, copyright is not a defense against a document's disclosure under FOI. And so, to test the DOE on its defense of these restrictions, Shea planned this week to file a new FOI request, asking for copies of about three dozen documents from the list. A number include English translations of research published in Soviet journals. If he succeeds in getting any or all, Shea says, this will be the first time an outsider has penetrated OSTI's library, with holdings estimated to exceed 600,000 documents.

Ironically, Spath says, concern over OSTI's restricted-access reports developed after his office sent out an Aug. 4, 1987, memo offering certain university libraries a chance to collect microfiche copies of the documents. These libraries were already receiving other, unrestricted-access OSTI documents.

"Our intent," Spath says, "has always been to make our information as widely available as possible." In fact, it was to broaden the availability of these controlled-access reports that OSTI offered them to university-based DOE contractors through their libraries, he says.

The memo said that to receive these "limited reports," libraries must promise to prohibit their viewing by anyone other than employees of government agencies — especially the DOE — and their contractors. Paula Kaufman at Columbia University in New York City read this as a new attempt by the government to restrict public access to unclassified research.

Upset at the prospect, she sent the memo to Nancy Kranich, a New York University librarian and chairman of the Coalition on Government Information, 43 organizations — including the American Association for the Advancement of Science and Shea's National Security Archive — that are fighting restrictions on access to information.

Learning of the memo through the Coalition, Shea offered to investigate. The FOI request he filed with the DOE in September asked for a list of these "limited reports," any other memos involving such documents, any additional documents covered by such memos, records explaining why restrictions had been placed on these unclassified documents and a chance to view each document in a DOE reading room. On Oct. 22, OSTI's deputy assistant manager responded, saying there was no list of restricted documents and no additional memos. Moreover, the deputy assistant manager informed Shea that all the documents he referred to were available for review at OSTI's reading room in Oak Ridge, but only "by organizations and individuals authorized to have access to them." That excluded Shea.

Shea appealed OSTI's response to DOE's Office of Hearings and Appeals — and won. OSTI challenged the appeal in mid-January, saying production of a list would be too time consuming. Furthermore, OSTI officials claimed that since their data were in a computer, manipulating them to create the list would amount to creating a new file — something they are not required to do under the Freedom of Information Act. The appeals board disagreed, and on Feb. 24 Shea got his list of 545 titles.

Meanwhile, a number of university librarians say they are still concerned about OSTI's Aug. 4 proposal and a Nov. 9 follow-up memo that attempted to smooth ruffled feathers. Jay Lucker, director of libraries at MIT, says that while his libraries won't accept documents requiring restricted access, "I'm still concerned about what [OSTI] is not sending me.... Unless there's a [national] security issue at stake," he believes, "these materials ought to be made available to everyone." — *J. Raloff*