Hendrik W. Lenstra, Jr Encyclopedia Article

Hendrik W. Lenstra, Jr

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Hendrik W. Lenstra, Jr

1949-

Dutch Mathematician

In 1981 Hendrik W. Lenstra, Jr. demonstrated that a certain class of integer programming problems does not exhibit a pattern of exponential growth. This greatly assisted mathematicians in calculating the solution time needed for such problems. Four years later, in 1985, he developed a means of factoring based on so-called elliptic curves, the first great improvement in this area since the time of Carl Friedrich Gauss (1777-1855) more than 150 years before.

Lenstra was born on April 16, 1949, in the Netherlands. He studied at the University of Amsterdam, where he obtained his Ph.D. in mathematics in 1977. In 1978 he became a professor of mathematics at the University of Amsterdam. The first of Lenstra's two most notable contributions to mathematics came in 1981, when he showed that a pattern of exponential growth does not occur with a certain class of integer programming problems. Previously mathematicians had supposed that as the complexity or size of a problem grew, likewise the solution time would grow exponentially.

In 1985 Lenstra devised a method of factoring based on what are sometimes called elliptic curves. In many cases, the behavior of these curves makes it possible to factor large numbers that have resisted all other methods. Up to this time, all theories of factoring had been based on the properties of certain quadratic equations introduced by Carl Friedrich Gauss in the late eighteenth century.

During the 1990s Lenstra divided his time between fall semesters at the University of California, Berkeley, where he taught algebraic number theory and algorithms, and spring semesters at the Universiteit Leiden in the Netherlands. His research focuses on algorithmic number theories that interface with the computer sciences and algebraic number theories. Among his students, Lenstra is known for his sense of humor, which he has demonstrated, for instance, by collaborating on a limerick about Fermat's famous last theorem.

Awards received by Lenstra include the Fulkerson Prize of the American Mathematics Society (AMS) and Parisienne Society in 1985, and the Royal Dutch Academic Service Prize. He is a member of the AMS, and of the Dutch Mathematical Society.