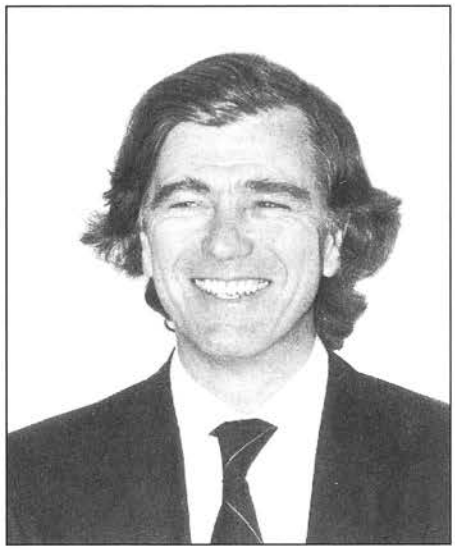
Nesterenko and Pisier Share Ostrowski Prize

Yuri V. Nesterenko



Gilles I. Pisier

Photographs courtesy of Math. Inst., University of Basel, Switzerland.

YURI V. NESTERENKO of Moscow State University and GILLES I. PISIER of University Paris VI, France, shared the 1997 Ostrowski Prize. The prize carries a monetary award of 100,000 Swiss francs (approximately $66,000) and a Fellowship of 50,000 Swiss francs.

Nesterenko received the Ostrowski Prize for establishing the algebraic independence of $a = \pi$ and $b = exp(\pi)$. This means that there is no relation $P(a, b) = 0$ for any nonzero polynomial $P(x, y)$ with rational or even algebraic coefficients. Actually, the result appears as a trivial corollary to the algebraic independence of the three numbers a, b, and the value c of Euler's gamma function at 1/4. It is surprising that the proof uses modular functions. The proof is based on a result of Barré-Sirieix, Diaz, Gramain, and Philibert on transcendence of modular function values, an algebraic independence criterion of P. Philippon, and a new "zero estimate" for modular functions by Nesterenko himself. Nesterenko has derived various zero estimates in the past twenty years, and these have been applied by him and others to obtain other results on algebraic independence, a very sharp estimate for linear forms in logarithms, and sharp bounds in the Hilbert Nullstellensatz.

Pisier has obtained many fundamental results in various parts of analysis. In recent years he concentrated his efforts on the area of operator spaces. He transformed this area into a deep research area. In the framework of his research on this area Pisier solved in the last three years two extremely long-standing open problems. In C^* theory he solved, jointly with Junge, the problem of uniqueness of C^* norms on the tensor product of two copies of $B(H)$, the algebra of all bounded operators on Hilbert space. Pisier and Junge were able to produce two such tensor norms that are nonequivalent. In operator theory Pisier solved (again negatively) the problem of whether an operator which satisfies the von Neumann inequality (with a constant) is similar to a contraction. Both results are based on elegant constructions, and the verifications of the examples are ingenious. Both of these results had a considerable impact and have already led to important further research.

The Ostrowski Foundation was created by Alexander M. Ostrowski, for many years a professor at the University of Basel. He left his entire estate to the foundation and stipulated that the income should provide a prize for outstanding recent achievements in pure mathematics and the foundations of numerical mathematics. The prize is awarded every other year. Previous recipients of the Ostrowski Prize are Louis de Branges, Jean Bourgain, Miklós Laczkovich, Marina Ratner, and Andrew Wiles. The jury of the prize consists of representatives from the universities of Basel, Jerusalem, and Waterloo, and from the academies of Denmark and the Netherlands.

The 1997 prize was awarded April 25, 1998, at the University of Leiden.

—from Ostrowski Foundation news release