

### Biographical Sketch

Henryk Iwaniec was born in Elblag, Poland, on October 9, 1947. He graduated from Warsaw University in 1971, and he received his Ph.D. there in 1972. From 1971 until 1983 he held various positions in the Institute of Mathematics of the Polish Academy of Sciences. In 1976 he defended his *habilitation* thesis. In the year 1976–77 he enjoyed a fellowship of the Accademia Nazionale dei Lincei at the Scuola Normale Superiore di Pisa. In 1979–80 he visited the University of Bordeaux. In 1983 he was promoted to professor. The same year he became member correspondent of the Polish Academy of Sciences.

Iwaniec left Poland in 1983 to take visiting positions in the USA at the Institute for Advanced Study in Princeton (1983–84 and 1985–86) and the University of Michigan at Ann Arbor (summer 1984), and he was the Ulam Distinguished Visiting Professor at Boulder (fall 1984). In January 1987 he assumed his present position as New Jersey State Professor of Mathematics at Rutgers University. He was elected to the American Academy of Arts and Sciences in 1995. He spent the year 1999–2000 as a distinguished visiting professor at IAS. Recently he became a citizen of the USA.

Iwaniec received first prizes in the Marcinkiewicz contests for student works in the academic years 1968–69 and 1969–70. In 1978 he received the State Prize from the Polish Government, in 1991 he received the Jurzykowski Award from the Alfred Jurzykowski Foundation in New York, and in 1996 he received the Sierpinski Medal. Iwaniec was an invited speaker at the International Congress of Mathematicians in Helsinki (1978) and in Berkeley (1986).

### Response from Professor Iwaniec

I thank from my heart the American Mathematical Society and the committee of the Cole Prize for selecting me for this award. My joy is even greater when I think that this is a significant award for professional accomplishments from beyond my native country, and in particular that this is coming from my new homeland in the USA. Less emotional, nevertheless important for me, is also the feeling of larger recognition of analytic number theory which the Cole Prize manifests in this case. Indeed, all the works cited for the prize are joint with many of my colleagues. Without their collaboration I cannot imagine how could I get that far. Yes, working together offers an immediate satisfaction from sharing ideas, but above all it is the only way we can cultivate in depth the modern analytic number theory.

Analytic number theory pursues hard classical problems of an arithmetical nature by means of best available technologies from any branch of mathematics, and that is its beauty and strength. Analytic number theory is not driven by one concept;

consequently it has no unique identity. Fourier analysis was always present, but in the last two decades it has been expanded to nonabelian harmonic analysis by employing the spectral theory of automorphic forms. For example, applying this analysis implicitly we have established the asymptotic distribution of primes in residue classes in the range beyond the capability of the Grand Riemann Hypothesis. Moreover, along these lines, we were able to produce primes in polynomial sequences. To this end one needs to enhance the Dirichlet characters by more powerful cusp forms on congruence groups. In a different direction we performed amplified spectral averaging from which to deduce important estimates for individual values of  $L$ -functions and to apply the latter to questions of equidistribution of many arithmetical objects. Other fruitful resources for solving problems in analytic number theory were uncovered by exploiting the Riemann hypothesis for varieties. Connections of these problems with the profound theory of Deligne are by no means straightforward. Perhaps these brief words may give some idea of what the trends are in the subject today, or at least what we are doing there.

There are many colleagues to whom I owe my gratitude for inspiration and joint research over the last years; among them I would like to mention Enrico Bombieri, Brian Conrey, Jean-Marc Deshouillers, William Duke, John Friedlander, Etienne Fouvry, Philippe Michel, and Peter Sarnak.

Richard Taylor

### Citation

The Frank Nelson Cole Prize in Number Theory is awarded to Richard Taylor of Harvard University for several outstanding advances in algebraic number theory. He led an effort to extend his earlier work with Wiles, to show that all elliptic curves over  $Q$  are modular, i.e., are factors of the Jacobians of modular curves. In his book with M. Harris, he established the local Langlands conjecture, giving a complete parametrization of the  $n$ -dimensional representations of a



Henryk Iwaniec



Richard Taylor