

Preface

John Torrence Tate Jr. was born on March 13, 1925, in Minneapolis, Minnesota. He received his A.B. degree from Harvard University in 1946 and his Ph.D. degree from Princeton University in 1950.

He has had a major impact on algebraic number theory and arithmetic algebraic geometry. In his thesis, which has become a classic, he proved the functional equation for Hecke's L-series by a novel method involving Fourier analysis on idele groups. The Tate conjectures play the same fundamental role in arithmetic algebraic geometry that the Hodge conjectures play in complex algebraic geometry.

For his many deep contributions to number theory, Professor Tate was awarded the Wolf prize in 2003. The citation of the award says that he received the Wolf prize "*for his creation of fundamental concepts in algebraic number theory.*"

Indeed, the citation continues, "*For over a quarter of a century, Professor John Tate's ideas have dominated the development of arithmetic algebraic geometry. Tate has introduced path breaking techniques and concepts, that initiated many theories which are very much alive today. These include Fourier analysis on local fields and adèle rings, Galois cohomology, the theory of rigid analytic varieties, and p -divisible groups and p -adic Hodge decompositions, to name but a few. Tate has been an inspiration to all those working on number theory. Numerous notions bear his name: Tate cohomology of a finite group, Tate module of an abelian variety, Tate-Shafarevitch group, Lubin-Tate groups, Neron-Tate heights, Tate motives, the Sato-Tate conjecture, Tate twist, Tate elliptic curve, and others. John Tate is a revered name in algebraic number theory.*"

He also received the AMS Cole Prize in 1956 and is a member of many prestigious professional organizations, including the National Academy of Sciences, French Academy of Sciences (foreign member) and London Mathematical Society (honorary member).

He has had a profound influence on the development of number theory also through his role as a Ph.D. advisor. His former students include Joe Buhler, Ted Chinburg, Benedict Gross, Robert Kottwitz, Stephen Lichtenbaum, Jonathan Lubin, James Milne, Andrew Ogg, Carl Pomerance, Ken Ribet, Joseph H. Silverman, Dinesh Thakur, Jeremy Teitelbaum, and Jerrold Tunnell.

To celebrate the 80th birthday of Professor Tate, the editorial board of

PAQM has decided to publish two special issues in his honor.

We hope that they could convey a sense of his highly original and long lasting influence on mathematics and particularly on number theory, and his former students, colleagues and friends' strong admiration and deep appreciation for his efforts and help.

The editorial board of these two special issues:

Lizhen Ji (the managing editor)

Shing-Tung Yau

Jiu-Kang Yu

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