The London Mathematical Society

THE INSTITUTE OF
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ITS APPLICATIONS

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Abel Prize 2010 – the 'Nobel Prize' for Mathematics

Today, the president of the Norwegian Academy of Science and Letters, Nils Christian Stenseth, announced that Professor John Tate, of the University of Texas at Austin, has been awarded the 2010 Abel Prize "for his vast and lasting impact on the theory of numbers".

The announcement was warmly received by the UK mathematical community. Professor Angus Macintyre, President of the London Mathematical Society, said, "On behalf of the LMS, I wish to convey to Professor John Tate our delight at the award to him of this year's Abel Prize. Algebraic number theory is one of the glories of mathematics, and John Tate has, since 1950, given to that subject many ideas of exceptional depth and beauty. The award is a source of particular pride and pleasure for us because he has been an Honorary Member of the LMS since 1999."

Professor Mike Walker, President of the Institute of Mathematics and its Applications added, "Professor Tate is a brilliant pure mathematician. But not only has he been able to shed light on some of the most ancient mathematical problems – his work has had significant impact on today's technology which in turn is vital to our modern economy."

Algebraic number theory has its origins in ancient questions about equations and primes. It developed rapidly in the 19th century, assimilating ideas from group theory and complex analysis to produce major results about primes and about special cases of Fermat's Last Theorem. Throughout the 20th century, new ideas from across the mathematical spectrum were added, including Galois cohomology, representation theory, complex function theory, abelian varieties, p-adic and rigid geometry, p-divisible groups, and étale

cohomology. Tate has been at the forefront of these developments, which have revealed exquisite structure, and enabled the solution of key problems, such as Fermat's Last Theorem. Many concepts and conjectures bear his name. Indeed, his 1950 PhD thesis (soon to be reprinted in an LMS publication) is one of the most influential of the last 60 years.

The real-world applications of Tate's mathematics are also distinctly modern. His work on elliptic curves has helped mathematicians to develop sophisticated new techniques to protect the privacy of mobile phones, smart cards and even air traffic control. Data can be converted into a point on a curve and a message can then be encrypted by moving the point around to another point using the geometry underlying these curves.

Professor Marcus du Sautoy, Simonyi Professor for the Public Understanding of Science and Professor of Mathematics at the University of Oxford said, "For thousands of years we've been wrestling with questions about numbers that are as old as mathematics itself. Just as the telescope allowed astronomers to see new worlds, Tate's mathematics has provided tools and insights which have allowed the mathematicians of this generation to see further into the universe of numbers than ever before. He truly deserves the title of the Galileo of number theory."

The Abel Prize is the most important international prize for mathematics. Announcing this year's prize, the Abel Committee noted, "Many of the major lines of research in algebraic number theory and arithmetic geometry are only possible because of the incisive contribution and illuminating insight of John Tate. He has truly left a conspicuous imprint on modern mathematics."

Amongst numerous honours, Tate was awarded the American Mathematical Society's Cole Prize for outstanding contributions to number theory at the age of just 31, and in 2002 received the prestigious Wolf Prize in Mathematics.

Notes for Editors

1.   The **Institute of Mathematics and its Applications (IMA)** is the learned and professional society for mathematics. It promotes mathematics research, education and careers, and the use of mathematics in business, industry and commerce. Amongst its activities the IMA produces academic journals, organises conferences, and engages with government. Founded in 1964, the Institute has 5,000 members. Forty percent of members are employed in education (schools through to universities), and the other 60% work in commercial, industrial and governmental organisations. In 1990 the Institute was incorporated by Royal Charter and was subsequently granted the right to award Chartered Mathematician designation.

2.   The **London Mathematical Society (LMS)** is the UK's learned society for mathematics. Founded in 1865 for the promotion and extension of mathematical knowledge, the Society is concerned with all branches of mathematics and its applications. It is an independent and self-financing charity, with a membership of over 2600 drawn from all parts of the UK and overseas. Its principal activities are the organisation of meetings and conferences, the publication of periodicals and books, the provision of financial support for mathematical activities, and the contribution to public debates on issues related to mathematics research and education. It works collaboratively with other mathematical bodies worldwide. It is the UK adhering body to the International Mathematical Union.

3.   The Niels Henrik Abel Memorial Fund was established in 2002 to award the **Abel Prize** for outstanding scientific work in the field of mathematics. The Abel Prize was awarded for the first time in 2003. The prize is awarded by the Norwegian Academy of Science and Letters. The choice of Abel Laureate is based on the recommendation of the Abel Committee, which consists of five internationally recognized mathematicians.

4.   For more information about the laureate, his achievements and the Abel Prize, visit the Abel Prize website www.abelprisen.no/en/. A photograph of Professor Tate is available from the Norwegian Academy of Science and Letters (see below).

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