



THE
ABEL
PRIZE
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Press Release

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Americans Nash and Nirenberg share the 2015 Abel Prize

The Norwegian Academy of Sciences and Letters has decided to award the Abel Prize for 2015 to the American mathematicians John F. Nash Jr. and Louis Nirenberg “*for striking and seminal contributions to the theory of nonlinear partial differential equations and its applications to geometric analysis.*”

The Abel Prize, which has been awarded annually since 2003, recognizes contributions of extraordinary depth and influence to the mathematical sciences and comes with a cash award of NOK 6,000,000 (about EUR 700,000 or USD 750,000). The President of the Academy, Kirsti Strøm Bull, announced the new laureates today. They will receive the Abel Prize from His Majesty King Harald at a ceremony in Oslo on 19 May.

John F. Nash Jr., aged 86, spent his career at Princeton University and the Massachusetts Institute of Technology. Louis Nirenberg, aged 90, worked at New York University’s Courant Institute of Mathematical Sciences. Even

though they did not formally collaborate on any papers, they influenced each other greatly during the 1950s. The results of their work are felt more strongly today than ever before.

Nash and Nirenberg are two mathematical giants of the twentieth century. They are being recognized for their contributions to the field of partial differential equations (PDEs), which are equations involving rates of change that originally arose to describe physical phenomena but, as they showed, are also helpful in analysing abstract geometrical objects. The Abel committee writes: “Their breakthroughs have developed into versatile and robust techniques that have become essential tools for the study of nonlinear partial differential equations. Their impact can be felt in all branches of the theory.”

In the 1950s Nash proved important theorems about PDEs, which are considered by his peers to be his deepest work. Outside mathematics, however, Nash is best known for a paper he wrote about game theory, the mathematics of decision-making, which ultimately won him the 1994 Nobel Prize for economics, and which features strongly in the 2001 film about him, *A Beautiful Mind*.



Nirenberg, who was born in Canada, has had one of the longest and most feted careers in mathematics, having produced important results right up until his 70s. Unlike Nash, who wrote papers alone, Nirenberg preferred to work in collaboration with others, with more than 90 per cent of his papers written jointly. Many results in the world of elliptic PDEs are named after him and his collaborators, such as the Gagliardo–Nirenberg inequalities, the John–Nirenberg inequality and the Kohn–Nirenberg theory of pseudo-differential operators.

“Far from being confined to the solutions of the problems for which they were devised, the results proven by Nash and Nirenberg have become very useful tools and have found tremendous applications in further contexts,” the Abel committee says.

Both men have received many distinguished awards. As well as winning the prize in economic sciences in memory of Alfred Nobel, Nash has won

the John von Neumann Theory Prize (1978) and the American Mathematical Society’s Steele Prize for a Seminal Contribution to Research (1999). Nirenberg has won the American Mathematical Society’s Bôcher Memorial Prize (1959) the inaugural Crafoord Prize awarded by the Royal Swedish Academy of Science (1982), the Steele Prize for Lifetime Achievement from the American Mathematical Society (1994) and the first Chern Medal for lifetime achievement from the International Mathematical Union and the Chern Medal Foundation (2010).

The Abel Prize: The prize is awarded by the Norwegian Academy of Science and Letters. The choice of the Abel Laureate is based on the recommendation of the Abel Committee, which is composed of five internationally recognized mathematicians. The Abel Prize and associated events are funded by the Norwegian government.

