Laser pioneers win Nobel Physics Prize

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Arthur Ashkin of the US split the 2018 Nobel Physics Prize with Gerard Mourou of France and Donna Strickland of Canada

Three scientists on Tuesday won the Nobel Physics Prize, including the first woman to receive the prestigious award in 55 years, for inventing optical lasers that have paved the way for advanced precision instruments used in corrective eye surgery.

Arthur Ashkin of the United States won one half of the nine-million Swedish kronor (about $1.01 million or 870,000 euros) prize, while Gerard Mourou of France and Donna Strickland of Canada shared the other half.

Strickland is just the third woman to win a Nobel Physics Prize since it was first awarded in 1901, while Ashkin, 96, is the oldest person to win a Nobel, beating out American Leonid Hurwicz who was 90 when he won the 2007 Economics Prize.

Ashkin was honoured for his invention of "optical tweezers" that grab particles, atoms, viruses and other living cells with their laser beam fingers.

With this he was able to use the radiation pressure of light to move tiny objects, "an old dream of science fiction," the Royal Swedish Academy of Sciences said.

A major breakthrough came in 1987 when Ashkin used the tweezers to capture living bacteria without harming them, the Academy noted.

According to Ian Musgrave of Britain's Central Laser Facility, optical tweezers make it possible to use lasers to manipulate very small objects, such as beads of glass or oil droplets, to position them precisely or control the environment around them.

The winners of the Nobel Prize for Physics since 2012

The tweezers can for example be used to "trap droplets from asthma inhalers to improve the efficiency of delivery through the lungs," he said.

Ashkin made his discovery while working at AT&T Bell Laboratories from 1952 to 1991.

'Most intense laser pulses ever'

Meanwhile Mourou, 74, and Strickland, 59, won for helping develop a method to generate ultra-short optical pulses, "the shortest and most intense laser pulses ever created by mankind," the jury said.

Their technique is now used in corrective eye surgery, among other things.

Mourou was most recently affiliated with France's Ecole Polytechnique, while Strickland, who was his student at the University of Rochester in New York, is a professor at the University of Waterloo in Canada.

Contacted by AFP, Mourou said he was getting ready for his daily swim just before noon on Tuesday when he got the call from the Academy.

"You don't expect it. You can imagine it, but when it actually happens, it's different," he said, adding that his day had turned out "crazy".

Laser research has been honoured with Nobels on several occasions, including the 1964 physics prize and the 1999 chemistry prize.