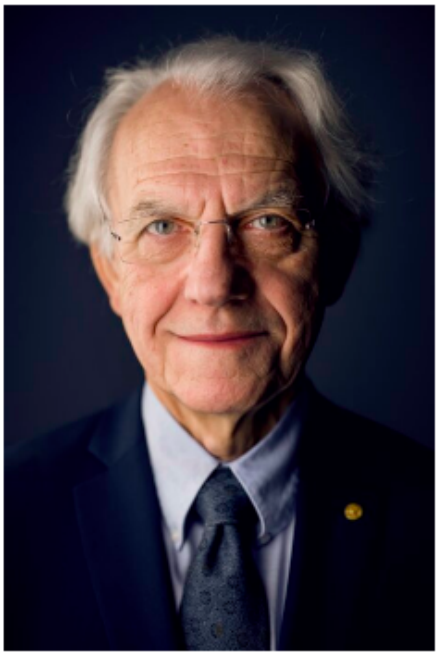
Gérard Mourou
Facts



Gérard Mourou
The Nobel Prize in Physics 2018

Born: 22 June 1944, Albertville, France

Affiliation at the time of the award: University of Michigan, Ann Arbor, MI, USA, École Polytechnique, Palaiseau, France

Prize motivation: "for their method of generating high-intensity, ultra-short optical pulses."

Prize share: 1/4

More

Life

Gérard Mourou was born in Albertville, France. He studied physics at the University of Grenoble and then at the Université Pierre-et-Marie-Curie in Paris, where he earned his PhD in 1973. He later moved to the United States and became a professor at the University of Rochester, where he did his Nobel Prize awarded work along with Donna Strickland. He subsequently worked at the University of Michigan and the École Polytechnique in Paris.

Work

The sharp beams of laser light have given us new opportunities for deepening our knowledge about the world and shaping it. In 1985, Donna Strickland and Gérard Mourou succeeded in creating ultrashort high-intensity laser pulses without destroying the amplifying material. First they stretched the laser pulses in time to reduce their peak power, then amplified them, and finally compressed them. The intensity of the pulse then increases dramatically. "Chirped pulse amplification" has many uses, including corrective eye surgeries.

PASSION EXTREME LIGHT

Gerard Mourou
Ecole Polytechnique
Palaiseau France

Extreme-light laser is a universal source providing a vast range of high energy radiations and particles along with the highest field, highest pressure, temperature and acceleration. It offers the possibility to shed light on some of the remaining unanswered questions in fundamental physics like the genesis of cosmic rays with energies in excess of 10^{20} eV or the loss of information in black-holes. Using wake-field acceleration some of these fundamental questions could be studied in the laboratory. In addition extreme-light makes possible the study of the structure of vacuum and particle production in "empty" space which is one of the field's ultimate goal, reaching into the fundamental QED and possibly QCD regimes.

Looking beyond today's intensity horizon, we will introduce a new concept that could make possible the generation of attosecond-zeptosecond high energy coherent pulse, de facto in x-ray domain, opening at the Schwinger level, the zettawatt, and PeV regime; the next chapter of laser-matter interaction.