

Honorary Doctor of Science

Professor Gérard MOUROU

Public Orator Professor Michael YANG Mengsu

Mr Pro-Chancellor:

To the question, “What advice would you give to young scientists?” Professor Gérard Mourou, the Nobel Laureate in Physics in 2018, answers, “Love what you do.” This would have been a mere platitude if he didn’t practice what he preaches. In his illustrious career as a teacher and a scientist, Professor Mourou’s passion for his work has led to the groundbreaking results that we are celebrating here today.

When Professor Mourou was growing up in Savoy in France after World War II, the electrification of his country was rapidly transforming daily life. He remembers distinctly his fascination with electric lights. With the flip of a switch, a darkened room at night would light up instantly like a summer’s day. His father, an electrical engineer, nurtured his son’s curiosity by explaining to him the wonders of electricity, thus initiating him into the wider world of science. It is from his father that Professor Mourou first heard about the Nobel Prize and Madam Joliot-Curie, daughter of Madam Marie Curie and the recipient of the Nobel Prize in Chemistry in 1935. These early glimpses of the mysteries of science have led to a lifelong dedication to its study and a career with many significant discoveries that have broadened our understanding of the universe and improved the quality of life for all of us.

Professor Mourou was awarded the Nobel Prize in Physics in 2018, along with Professor Donna Strickland, a former student of his, for the invention of Chirped Pulse Amplification. Known mostly by its abbreviation CPA, the technique was later used to create ultrashort pulses that are in effect laser beams of very high intensity. Today, CPA has found applications in many fields, including corrective eye surgery, and is expected to have a significant impact on cancer therapy and other areas of physics research in the future. Professor Mourou’s work has also touched on many other areas of our daily lives such as high-capacity telecommunication systems, laser micromachining, and improved astrophysical calibrations.

Professor Mourou has set up, and served as Director for, many laboratories engaged in cutting-edge research. He has advanced laser science in Europe by proposing the Extreme Light Infrastructure, which consists of extremely powerful lasers located in facilities based in the Czech Republic, Hungary and Romania.

In addition to the Nobel Prize, Professor Mourou has won many other awards and recognitions, all of which spotlight his remarkable contributions to the progress of science and improving human life. To name but a few, he has been awarded the Officier de l'Ordre National de la Légion d'Honneur from France in 2020, the 2018 Arthur L. Schawlow Prize in Laser Science, and the Frederic Ives Medal / Jarus W. Quinn Prize and the Berthold Leibinger Innovation Prize in 2016. Professor Mourou is also a member of the US Academy of Engineering, and a Foreign Member of the Academies of Austria, China, Greece, Lombardy and Russia.

That science should serve humans and the well-being of the planet is the central tenet in Professor Mourou's heart-felt mission. Science allows us to make tremendous progress in history, and yet it has caused no small degree of environmental damage. As Professor Mourou reminds us, the time has come to develop "toilet science", which will clean up our mess and develop more sustainable alternatives. In this regard, his laser technology has opened up a range of possibilities, including the acceleration of radioactive waste decomposition and the invention of more precise devices for measuring chemical contaminants found in the air.

In the spirit of the Nobel Prize "to confer the greatest benefit to humankind", Professor Mourou is turning his attention to issues concerning nuclear energy. His recent research focuses on the application of Extreme Light, short pulses capable of generating the largest peak power, temperature, pressure and acceleration for the production of clean and plentiful nuclear energy. Instead of uranium, he proposes the use of thorium, which is more efficient and abundant, with enough energy reserves for 10 billion people for 10,000 years. Thorium has the added advantage of emitting no carbon dioxide, thus eliminating the harmful greenhouse effect. It produces a small amount of nuclear waste with a shorter radiotoxicity time. Moreover, since plutonium cannot be produced from thorium, the danger of nuclear proliferation can be avoided. Indeed, Professor Mourou is "a scientist who can't be stopped".

Professor Mourou has taught in top-ranking universities and institutions all over the world, and trained many scientists of international fame, including Professor Strickland. He exemplifies the best qualities one can hope for in a teacher: he is at once approachable but at the same time serious. He holds high expectations for everyone, impressing on students in particular the vital importance of passion and persistence. While luck certainly plays a part in many scientific discoveries — you might find something in addition to or instead of what you had been originally looking for in your research — it is only the curious, passionate, hard-working and vigilant who successfully seize an opportunity. Therefore, aspiring young scientists should aim for tenacity and diligence, while failure should never be dismissed out of hand since errors can prepare you for the next step in life just as much as success can.

City University of Hong Kong is proud to be associated with Professor Gérard Mourou, whose illustrious career as a scientist and a teacher represents a model to which we can all aspire. Mr Pro-Chancellor, may I present to you Professor Gérard Mourou for the conferment of a Doctor of Science, *honoris causa*.