Award of EPS Alfven Prize 2019 to Victor Malka and Toshiki Tajima

By Richard Dendy Published on 24 January 2019 in:
Awards January 2019 2019 Award EPS Hannes Alfen Prize EPS PDD EPS Plasma Physics Division

The EPS Hannes Alfvén Prize 2019 for outstanding contributions to plasma physics is jointly awarded to:

- **Professor Victor Malka**, of the Laboratoire d'Optique Appliquée of the CNRS/ENSTA-ParisTech/Ecole Polytechnique, France, and the Weizmann Institute of Science, Israel and
- **Professor Toshiki Tajima**, of the Department of Physics and Astronomy, University of California, Irvine, U.S.A.

Professor Malka is recognised for *"His major contributions to the development of compact laser-plasma accelerators, and to their innovative applications to science and society, which span ultra-fast phenomena, accelerator physics, medicine, radiobiology, chemistry and material science."*

Professor Tajima is recognised for *"His seminal, broad, and novel contributions to plasma physics and plasma-based accelerator physics, including the concept of laser wakefield acceleration."*

Victor Malka is an international research leader in the field of laser-driven plasma accelerators. He was one of the first researchers to realize the potential of laser-driven particle and radiation sources, and has dedicated much of his research career to developing this subject.

Victor Malka

His numerous world-leading achievements are frequently reported in leading international journals including *Science*, *Nature, Nature Physics,* and *Physical Review Letters*. He has more than two hundred scientific publications and has given more than two hundred invited lectures at international scientific conferences, workshops and summer schools. Prof. Malka's most significant contributions to the field include: the production of the first relativistic electron beams in the wave breaking regime; leading one of the first experiments to demonstrate monoenergetic electron beam acceleration in a laser-plasma wakefield; the introduction of colliding laser pulse techniques for controlling electron injection and acceleration; and pioneering measurements on laser-plasma accelerators as a driver of high energy synchrotron radiation. His most recent work includes the first use of wide-band spectral coherent transition radiation to temporally characterise electron acceleration, leading to identification of a 1.5 femtosecond electron bunch. In addition, he has made important contributions to laser-driven ion acceleration, and he is a pioneer of the application of laser-plasma accelerators to address several societal challenges. For example, he collaborates with clinicians and industry to pursue medical applications, both in terms of imaging and cancer therapy.

Professor Malka has demonstrated scientific leadership in the field of laser-plasma accelerators at the highest level. He has initiated and coordinated many joint European projects, and shown leadership in shaping European strategy in this research field. He has served on numerous scientific committees, and collaborates widely with many internationally leading groups in the field. He is also passionate about training the next generation of researchers in laser-plasma physics; many of the sixteen PhD students whom he has supervised have received awards for their research achievements. Professor Malka has contributed to many summer schools, and has been very active in promoting plasma physics to the general public, in the popular press and in interviews.

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Toshiki Tajima has exceptional scientific accomplishments. He is recognized, with the late John Dawson, as one of two inventors of the concept of laser wakefield acceleration (LWA). Their seminal scientific contribution on LWA was published in *Physical Review Letters* in 1979, and has been cited over four thousand times; his total citations exceed twenty-four thousand.These statistics eloquently express his work's extensive impact on physics, together with its wider applications. LWA has been a transformational concept: both in the physics of high-intensity laser-plasma interactions, and in particle acceleration technology. Driven by a laser at optical wavelengths, LWA has the potential to shrink the size of future accelerators by a factor of at least a thousand. It is seen as the preeminent solution to the limitations of conventional accelerator technology that the accelerator community is seeking. Professor Tajima's formidable impact is evidenced by the fact that several thousand researchers and engineers are now involved in LWA work, in 150 laboratories worldwide. The field remains one of the most exciting topics in laser physics. The continuing high level of financial investment is telling, and estimated at five billion dollars over the next five years. Within Europe, four large scale facilities are being built: Apollon in France, and the three Extreme Light Infrastructure (ELI) facilities in central and eastern Europe.

Toshiki Tajima

No related news.