

**Advances in laser plasma accelerators and their future prospect:  
Can small be the next big thing?**

Prof. Dr. Wim Leemans

*Deutsches-Elektronen Synchrotron – DESY, Hamburg, Germany  
& University of Hamburg, Germany*

Laser powered, plasma based accelerators where electrons surf on waves and can reach multi-GeV energy levels in a few 10's of cm that, if one relies on conventional methods, would require machines multiple football fields long. Although many challenges remain, this new technology is at the brink of offering a profoundly different way in which we may build particle accelerators. An overview of the latest progress and the next steps in the R&D needed to advance this technology will be presented. Applications such as generation of intense radiation, injection into storage rings, future colliders or medical therapy will be discussed.