

HADRONTHERAPY: what it is, how it works?

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**PARTICLE THERAPY:
PHYSICS BASICS**

The ballistic and radiobiological advantages of proton and light ion beams for external beam therapy, in particular the finite range and the elevated linear energy transfer, respectively, rest upon the Coulomb interaction between the projectiles and the constituents of the targets. While nuclear interactions deliver only a rather minor, but non-negligible, contribution to the dose deposition, they are of high importance for radiation protection and dedicated range measurement techniques in particle therapy. The lecture will give an overview on electromagnetic and nuclear interactions of proton and ion beams with matter and consequences for particle therapy technology.

Barbara Vischioni,
National Center for Oncological
Hadrontherapy CNAO, Pavia, Italy

**HADRONTHERAPY:
FROM PARTICLES TO PATIENTS**

I will discuss the major indications and advantages of hadrontherapy for patients' treatment compared to conventional photon therapy. Furthermore, I will give an overview of the results of particle therapy treatment at CNAO, the Italian National Center for Oncological Hadrontherapy, focusing especially on toxicity and oncological outcome, in comparison to experience of other particle facilities worldwide. Finally, an overview on the future CNAO clinical and fundamental research projects will be presented.

<https://youtu.be/RziV26c6tS8>