



Seminar Topic:

Accelerator Physics

Speaker

Dr. Andrea Pisent

INFN - Laboratori Nazionali di Legnaro

Zoom Meeting link

<https://unipd.zoom.us/j/83841301295>

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Meeting ID: 838 4130 1295

April 7 at 3:30-5 pm

abstract:

Introduction, particle accelerators for research and applications, like medicine, cultural heritage and energy. Definition of acceleration and luminosity, various kind of accelerators, electrostatic and radiofrequency.

April 14 at 4-5:30 pm

abstract:

Focusing of a charge particle beam, paraxial optics, magnetic quadrupoles and multipoles.

Periodic focusing systems and alternating gradient, stability of beam transport, role of resonances. Courant and Snyder invariant, emittance. Circular orbits, equations of motion in magnetic dipoles, dispersion and chromaticity.

April 21 at 3:30-5 pm

abstract:

Ion sources, electrostatic acceleration and injectors. The beam acceleration with an RF field. Phase stability principle. How to produce bunched beams.

April 28 at 3:30-5 pm

abstract:

Linear accelerators and RF cavities. The challenge of intense beams, the space charge, the instabilities, the beam halo and small losses.

May 5 at 3:30-5 pm

abstract:

How the same basic principles apply to different kind of accelerators, linacs, cyclotrons, synchrotrons, colliders.

Some example of relevant accelerators (realized and under construction).