DIPARTIMENTO DI FISICA "E.Fermi"
UNIVERSITÀ DI PISA
CORSO DI DOTTORATO IN FISICA
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Ciclo di lezioni per il CORSO DI DOTTORATO IN FISICA

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"Vortices and their Geometry"

Abstract: Vortices are two-dimensional topological solitons that occur in abelian and non-abelian gauge theories with Higgs fields. Physically, they become string-like objects in three dimensions, and occur as flux tubes in superconductors, or perhaps as cosmic strings.

Mathematically, vortices can be defined on flat or curved surfaces. Quite a lot is known about vortices on the plane, and on general compact surfaces, even though the vortex solutions cannot be written down explicitly.

The Bogomolny equations that describe vortices become integrable when the vortices are on a hyperbolic surface, a surface of constant negative curvature. Abelian vortex solutions on the hyperbolic plane have been known for a long time, and some solutions on other hyperbolic surfaces have been discovered recently. More needs to be understood about what integrability means in the non-abelian case.

These lectures will present some of these results, and also mention how vortices are related to other solitons in higher dimensions, especially Yang--Mills instantons.

Lunedi 8 Febbraio 2010 - ore 15:00
Lunedi 15 Febbraio 2010 ore 15:00
Giovedi 18 Febbraio 2010 ore 11:00

Aula 248 - I Piano Ed. C

K.Konishi