

## SEMINAIRE

## Isolants topologiques PbSnSe: introduction et transport électronique Wlodek ZAWADZKI

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Jeudi 19 mai 14h Bat. 21- Etage 4

A brief introduction is given to various kinds of topological insulators. In particular, recently discovered topological crystalline insulators PbSnSe are discussed which experience a change of trivial to nontrivial band ordering as the energy gap goes through zero as a function of temperature. Experimental evidence of their topological insulator band structure on the surface is presented.

Experimental data on the bulk electron transport near the vanishing energy gap in PbSnSe are shown. In particular, it is demonstrated that the Nernst-Ettingshausen thermoelectric effect goes through a maximum when the energy gap goes through zero. A situation is reached in which both the surface states and the bulk states are massless Dirac fermions. A theoretical description of electron transport at the vanishing energy gap encounters serious difficulties when the energy gap goes through zero and it is demonstrated how to overcome them by introducing damping. It is indicated that the presented experiments and their description have quite general applications

