Séminaire : Problèmes spectraux en physique mathématique

Les séminaires ont lieu un lundi par mois, à l'**Institut Henri Poincaré**, 11 rue Pierre et Marie Curie, 75005 Paris.

Programme du 2 décembre 2013, en **salle 201** (2e étage)

— 11h15 - 12h15 : **Gregory Eskin** (UCLA)
Spectral asymptotics and the Aharonov-Bohm effect

This is a joint work with Jim Ralston. We study the magnetic Schrödinger operator in the domain $\Omega \subset \mathbb{R}^2$ between a convex obstacle and the circle $\{|x| = R\}$ where R is large. We assume that the magnetic field is zero in Ω but the magnetic flux α is not zero. The Aharonov-Bohm effect is the assertion that the magnetic flux has a physical impact. We compute explicitly the singularity of the wave trace corresponding to the inscribed equilateral triangles (or more generally n-gons) and we recover $\cos \alpha$ from the singularities. This gives a proof of the Aharonov-Bohm effect since the magnetic flux influences the spectrum of the Schrödinger operator. The first result on the Aharonov-Bohm effect and the spectrum of Schrödinger operator was proven by Bernard Helffer in the 1980ties. In the talk we also briefly describe other approaches to the proof of the Aharonov-Bohm effect.

— 14h - 15h : **Nicolas Popoff** (Marseille)
On the ground state of the magnetic Laplacian in polyhedral bodies

I will present recent results about the first eigenvalue of the magnetic Laplacian in polyhedral domains with Neumann boundary condition in the semi-classical limit. The use of singular chains show that the asymptotics of the first eigenvalue is governed by a hierarchy of model problems on the tangent cones of the domain. We provide estimations of the remainder depending on the geometry and the variations of the magnetic field. This is a joint work with V.Bonnaillie-Noël and M.Dauge.

— 15h15 - 16h15 :**Victor Ivrii** (Toronto)
Asymptotics of the ground state energy and related topics for heavy atoms and molecules : results : old, new, in progress and in perspective

We consider asymptotics of the ground state energy when the total charge of nuclei Z and the number of electrons $N \sim Z$ tend to infinity (number of nuclei remains constant). We include cases of an external constant magnetic field with intensity $B \ll Z^3$ and of self-generated magnetic field. The other problems are number of extra electrons which system can bind, the excessive positive charge when two or more nuclei do not fly away, and the estimates from above and below for ionization energy.

Pour tout renseignement, contacter les organisateurs
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