**Title**

*Singularity formation for the harmonic map flow from a volume into $S^2$.*

**Abstract:**

Consider a volume $V \subset \mathbb{R}^3$ generated by rotating around the Z axis a bounded smooth domain $\Omega \subset \mathbb{R}^2$ that lives in the XZ plane. We construct a finite time blow-up solution to the harmonic map flow from volume $V$ into the sphere $S^2$, the problem is

$$\nu_t = \Delta \nu + |\nabla \nu|^2 \nu \times (0, T) \quad \nu = \nu_{\partial V} \text{in} \partial V \times (0, T)$$

$$\nu(\cdot, 0) = \nu_0 \text{in} V,$$

where $\nu: V \times [0, T) \to S^2$, $\nu_0: \nu_0: \nu_{\partial V} : \partial V \to S^2$. Given a point $q \in \Omega$ we define the circumference $c(q)$ generated by the rotation of $q$ around the Z axis. We find initial and boundary data so that the solution $\nu$ blows up at exactly the curve $c(q)$ at a finite small time. The construction of the solution is done by reducing the problem to 2 dimensions and using the method of D’Avila, Del Pino and Wei [1] that transforms the problem into an inner-outer gluing system which separates the main effect of the equation near and far away from the singularity. We obtain a solution that at main order has the profile of a scaled 1-corrotational harmonic map near the singularity.
Primera Sesión 17:00 hrs

Expositor

Sébastien Breteaux
Université de Lorraine,

Title

Accuracy of the Time-Dependent Hartree-Fock Approximation.

Abstract:

We study the time evolution of a system of N spinless fermions in which interact through a pair potential, e.g., the Coulomb potential. We compare the dynamics given by the solution to Schrödinger’s equation with the time-dependent Hartree–Fock approximation, and we give an estimate for the accuracy of this approximation in terms of the kinetic energy of the system. This leads, in turn, to bounds in terms of the initial total energy of the system.

JUEVES 12 de julio a las 16.00 y 17:00 hrs en la sala de seminarios Felipe Álvarez Daziano, Sto. piso del DIM, U. de Chile.