

COLOQUIO DEL DEPARTAMENTO DE MATEMÁTICA

Próxima reunión: jueves 25 de agosto.

Hora: 11:00 hs.

Lugar: Aula 5, primer piso, Departamento de Matemática.

Expositor: Julio Rossi (UBA).

Título: Nonlocal evolution equations

Resumen: We study the fractional p -Laplacian evolution equation given by

$$u_t(t, x) = \int_A \frac{1}{|x - y|^{N+sp}} |u(t, y) - u(t, x)|^{p-2} (u(t, y) - u(t, x)) dy$$

for $x \in \Omega$, $t > 0$, $0 < s < 1$, $p \geq 1$. In a bounded domain Ω we deal with the Dirichlet problem by taking $A = \mathbb{R}^N$ and $u = 0$ in $\mathbb{R}^N \setminus \Omega$, and the Neumann problem by taking $A = \Omega$. We include here the limit case $p = 1$ that has the extra difficulty of giving a meaning to $\frac{u(y)-u(x)}{|u(y)-u(x)|}$ when $u(y) = u(x)$. We also consider the Cauchy problem in the whole \mathbb{R}^N by taking $A = \Omega = \mathbb{R}^N$. We find existence and uniqueness of strong solutions for each of the above mentioned problems. We also study the asymptotic behaviour of these solutions as $t \rightarrow \infty$. Finally, we recover the local p -Laplacian evolution equation with Dirichlet or Neumann boundary conditions, and for the Cauchy problem, by taking the limit as $s \rightarrow 1$ in the nonlocal problems multiplied by a suitable scaling constant.