Title: Analysis of Dirac-harmonic maps

Abstract: For a n-dimensional spin Riemannian manifold (M, g) with a fixed spin structure and spinor bundle ΣM, and another compact Riemannian manifold (N, h), we consider the Dirac-harmonic map $(\phi, \psi) : M \otimes \Sigma M \to N \otimes \phi^* TN$, which is a critical point of the energy functional:

$$L(\phi, \psi) = \int_M [|d\phi|^2 + \langle \psi, D\psi \rangle],$$

where D is the nonlinear Dirac operator on $\Sigma M \otimes \phi^* TN$. In this talk, we will show that any such map is smooth for $n = 2$, and enjoys partial regularity property for $n \geq 3$ provide it is stationary with the domain variations.