1138-46-141 **J. Alejandro Chávez-Domínguez***, Department of Mathematics, University of Oklahoma, Norman, OK 73019. *Isoperimetric and Sobolev inequalities on magnetic graphs.*

The classical isoperimetric problem on the plane, dating back to antiquity, asks for the region of maximal area having a fixed perimeter. It is well-known that the solution to this problem (and its higher-dimensional versions) is intimately related to inequalities that give the norm of the embedding of a Sobolev space into an L_p space (that is, Sobolev inequalities). In many practical situations, the domains of interest are not continuous regions but rather discrete sets of points. A very useful model is to take the domain to be a graph, and Sobolev-style inequalities in this context have found plenty of applications in subjects such as theoretical computer science and spectral graph theory. Some situations, e.g. the presence of a magnetic potential in some quantum-mechanic models of bonds between atoms, are modeled not just with a graph but also with an additional assignment of a complex number of modulus one for each edge of the graph. In this talk we define isoperimetric inequalities for such "magnetic" graphs, and show that they imply Sobolev-style inequalities. (Received February 07, 2018)