# CCSU
## DEPARTMENT OF MATHEMATICAL SCIENCES

# COLLOQUIUM

Friday, November 18
4:30 – 5:30 PM
Maria Sanford, Room 101

## CARDINAL NUMBERS, CARDINAL FUNCTIOS, AND POL-ŠAPIROVSKII TECHNIQUE


## CARLOS PLAZA

(MA in Mathematics Thesis Presentation)

### CENTRAL CONNECTICUT STATE UNIVERSITY



**Abstract**: *Cardinal functions* assign to topological spaces cardinal numbers that represent some characteristics of the space like the cardinality of the entire space, the cardinality of the smallest dense set it contains, etc. Since the assigned cardinal numbers are the same for all spaces homeomorphic to each other, they are called *cardinal invariants*. Cardinal functions are often used to answer questions in General Topology since they help us gain additional insight into the characteristics of the topological spaces.

During this thesis presentation I will talk about several of the many interesting facts included in my thesis. First, I will state the axioms of the modern Set Theory widely known now as ZFC, then I will talk about Ordinal and Cardinal Numbers, and then I will recall some basic definitions from General Topology. That will allow me to talk about some cardinal invariants and cardinal function inequalities in General Topology. As an illustration I will demonstrate the proofs of one of the "easy" classical cardinal function inequalities and one of the "difficult" and most celebrated theorems for cardinal function inequalities which originally took nearly 50 years to prove. The proof of the last theorem will require transfinite induction and the so called "closure method" also known as "Pol – Šapirovskii Technique".



***For further information:***

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