ABSTRACTS FOR SEVENTH WEEK PROGRAM, AUGUST 3–AUGUST 7
ALLL TALKS ON REU ZOOM ACCOUNT

1:00 MWF (CST): PETER MAY; AlGEBRAIC TOPOLOGY

1:00 TTh (CST): ZHOULI ZHOU

STABLE HOMOTOPY GROUPS OF SPHERES AND APPLICATIONS TO SMOOTH STRUCTURES ON MANIFOLDS

ABSTRACT: Computing and understanding the stable homotopy groups of spheres is a fundamental problem in algebraic topology. It has many connections to other subjects of mathematics. In these four lectures, I will survey on two recent results regarding applications to smooth structures on manifolds. The first result, joint work with Wang, states that the spheres in dimensions 1, 3, 5, and 61 are the only odd dimensional ones that admit a unique smooth structure. The second result, joint work with Hopkins, Lin and Shi, is a "10/8 + 4" theorem of the geography problem for simply connected spin 4-manifolds. Both results are proved through computations of stable homotopy groups of spheres. I will talk about part of the techniques used in the proofs if time permits.

2:30 MONDAY: ANNA MARIE BOHMANN

WHAT WE THINK ABOUT WHEN WE THINK ABOUT GROUPS

ABSTRACT: Outside of mathematics, the word "group" simply refers to a set or collection of things, but in mathematics, it's a term of art that refers to a particular concept. These abstract groups are often loosely described in terms of "symmetries", and of course symmetry groups are an important example. In this talk, we discuss the history and development of the abstract concept of a group, including several ways of thinking about groups, both then and now.

2:30 WEDNESDAY: SPECIAL EVENT

EMPLOYMENT DAY EVENT; GUESTS FROM THE REAL WORLD

2:30 FRIDAY: MARK CEREZIAM

TBD

ABSTRACT: TBD

4:00 TTh (tentative): PETER MAY