CCSU
DEPARTMENT OF MATHEMATICAL SCIENCES

COLLOQUIUM

Friday, October 14
2:00 – 3:00 PM
Maria Sanford, Room 101

WHATS IS AN A_∞-SPACE?

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ABSTRACT

The associative law for the real numbers states that (ab)c=a(bc), where a, b, c are real numbers. There is, of course, an associative law for addition, and in general, mathematicians frequently encounter binary operations defined on a set **X**,

$$\mathbf{m}: \boldsymbol{X} \times \boldsymbol{X} \to \boldsymbol{X},$$

which also satisfies the associative law.

However, there are also situations in which the binary operation **m** is not associative, but is very close to being associative. For example, if **Y** is a topological space, the based loop space of **Y** has a binary operation given by loop concatenation. But this operation is not strictly associative. In this case, we can measure the deviation from satisfying the associative relation in relation to a three-to-one operation. The binary (two-to-one) and three-to-one operations must satisfy a condition, which can be described in relation to a four-to-one operation. The process continues in this way to define infinitely many operations satisfying certain compatibilities. The based loop space together with all the n-to-one operations define an $\boldsymbol{A}(ssociative)_\infty$-space.

In this talk, we will describe the above process and give a definition of an A_∞-space. This will allow us to state the Recognition Theorem, which shows why these objects are of interest to homotopy theorists.

For further information:

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