# *12th Annual Women in Mathematics Day*

# Jean E. Rubin Memorial Lecture

## Tuesday, September 18, 2018, 3:30 p.m.
## MATH 175

*Refreshments will be served at 3:00 p.m. in the Library Lounge*

### Geometry of Measures

**Abstract:**

In the 1920's Besicovitch studied linearly measurable sets in the plane, that is sets with locally finite "length". The basic question he addressed was whether the infinitesimal properties of the "length" of a set E in the plane yield geometric information about E itself. This simple question marks the beginning of the study of the geometry of measures and the associated field, Geometric Measure Theory.

In this talk I will present several examples of measures that arise naturally in different contexts, for example PDEs and free boundary regularity problems. I will discuss how the infinitesimal properties of a measure yield a great deal of information about the measure and its support. In turn this sheds light on the original problem which gave rise to the measure in question.

Speaker:
## Tatiana Toro

University of Washington
Craig McKibben & Sarah Merner Professor in Mathematics

Tatiana Toro is a mathematician working at the interface of geometric measure theory, harmonic analysis and partial differential equations. Her work focuses on understanding mathematical questions that arise in an environment where the known data is very rough.

The main premise of her work is that under the right lens, objects, which at first glance might appear to be very irregular, do exhibit quantifiable regular characteristics.

Toro, who was born in Colombia, received her Ph.D. from Stanford University. Currently she is the Craig McKibben & Sarah Merner Professor in Mathematics at the University of Washington in Seattle. Prior to this she was the Robert R. & Elaine F. Phelps Professor in Mathematics there. Her prior awards include a Guggenheim Foundation Fellowship, a Simons Foundation Fellowship, an Alfred P. Sloan Research Fellowship, a National Science Foundation Mathematical Sciences Postdoctoral Research Fellowship.

In 2017 she became a Miembro Correspondiente de la Academia Colombiana de Ciencias Exactas, Fisicas y Naturales. She is also a Fellow of the AMS.

Jean E. Rubin was Professor of Mathematics at Purdue University from 1967 until her death in 2002. She earned a B.S. from Queen's College in New York City in 1948, an M.A. from Columbia in 1949, and a Ph.D. from Stanford in 1955. She taught at the University of Oregon and Michigan State before coming to Purdue. Professor Rubin was the author of more than 40 papers and five books in set theory and questions related to the axiom of choice.