

## Dr. Norbert Peyerimhoff Pompeiu's Problem on Damek-Ricci spaces

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In 1929, the Rumanian mathematician Dimitrie Pompeiu asked the following question: given a continuous function  $f$  on  $\mathbb{R}^2$  and a compact set  $K$ . Assume that the integral of  $f$  over all images of  $K$  under rigid motions vanishes. Does this imply that the function  $f$  itself is zero? The answer is negative in the case that  $K$  is a disk. But it can be shown that the conclusion holds in the case that  $f$  vanishes on all disks of radius  $r_1$  and of radius  $r_2$ , as long as  $r_1$  and  $r_2$  avoid a certain countable set of radii. It is natural to ask similar questions in more general geometries. In this talk we discuss the same (two radius) problem in Damek-Ricci spaces. These spaces became famous as counterexamples of the Lichnerowitch conjecture, namely that every harmonic space should be a rank one symmetric space.

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