

# Unclassifiability in manifold topology

A spontaneous Lecture Series  
ANNOUNCING RECENT AND ONGOING WORK

**July 1, 2026**

**Oskar Morgenstern Platz 1,  
Lecture Hall HS 13 (floor 2)**

This seminar series will explore recent interactions between manifold topology and descriptive set theory. The main Mathematical Colloquium lecture will discuss the longstanding problem of classifying smooth structures on  $\mathbb{R}^4$ , and how methods from descriptive set theory can be used to derive a strong form of unclassifiability for such smoothings.

Two accompanying lectures will develop the broader context and reach of these techniques. The first will introduce the Borel reduction hierarchy, a complexity theory for classification problems, it will survey recent developments in the area and will provide new upper bounds which show that manifolds in various categories are classifiable by countable structures. The second lecture will present manifold-theoretic constructions which can be used to realize these complexity upper bounds.



**13:30-14:30**

**Mathematical Colloquium:**

**On classifying smoothings of  $\mathbb{R}^4$**

R. E. Gompf, University of Texas

**14:30-15:00**

Coffee Break

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**15:00-15:40**

**Descriptive Obstructions to Classification**

A. Panagiotopoulos, University of Vienna

**15:50-16:30**

**Constructing unclassifiable families of manifolds**

R. E. Gompf, University of Texas



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