



# MATEMATIČNI KOLOKVIJI

Za razumevanje predavanj je dobrodošlo znanje diplomiranega matematika ali študenta višjih letnikov matematike.



## VABILO

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Fakultete za matematiko in fiziko Univerze v Ljubljani

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predavanje:

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## **Bourgin-Yang theorems for the $p$ -toral groups**

In 1933 S. Ulam posed and K. Borsuk showed that if  $n > m$  then it is impossible to map  $f : S^n \rightarrow S^m$  preserving symmetry:  $f(-x) = -f(x)$ . Next, in 1954–55, C. T. Yang, and D. Bourgin, showed that if  $f : S^n \rightarrow \mathbb{R}^{m+1}$  preserves this symmetry then  $\dim f^{-1}(0) \geq n - m - 1$ .

We will present versions of the latter for some other groups of symmetries and also discuss the case  $n = \infty$ . Let  $V$  and  $W$  be orthogonal representations of a compact Lie group  $G$  with  $V^G = W^G = \{0\}$ . Let  $S(V)$  be the sphere of  $V$  and  $f : S(V) \rightarrow W$  be a  $G$ -equivariant mapping. We estimate the dimension of set  $Z_f = f^{-1}\{0\}$  in terms of  $\dim V$  and  $\dim W$ , if  $G$  is the torus  $\mathbb{T}^k$ , the  $p$ -torus  $\mathbb{Z}_p^k$ , or the cyclic group  $\mathbb{Z}_{p^k}$ ,  $p$ -prime. Finally, we show that for any  $p$ -toral group:  $e \hookrightarrow \mathbb{T}^k \hookrightarrow G \rightarrow \mathcal{P} \rightarrow e$ ,  $P$  a finite  $p$ -group and a  $G$ -map  $f : S(V) \rightarrow W$ , with  $\dim V = \infty$  and  $\dim W < \infty$ , we have  $\dim Z_f = \infty$

Ljubitelji matematike vljudno vabljeni!

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