

# 44th Summer Symposium in Real Analysis

## Participant

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## Title of the talk

Compactness in normed spaces: a unified approach through semi-norms

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## Abstract

In this talk we present two abstract compactness criteria in normed spaces. To this end we first introduce the notion of an equinormed set using a suitable family of semi-norms on the given normed space satisfying some natural conditions. Those conditions state that the norm can be approximated (on the equinormed sets even uniformly) by the elements of this family. As we are given some freedom of choice of the underlying semi-normed structure that is used to define equinormed sets, our approach opens a new perspective for building compactness criteria in specific normed spaces. As an example we show that natural selections of families of semi-norms in spaces  $C(X, \mathbb{R})$  and  $l^p$  for  $p \in [1, +\infty)$  lead to the well-known compactness criteria (e.g. the Arzelà-Ascoli theorem).

## References

- [1] J.Gulgowski, P.Kasprzak, P.Maćkowiak, *Compactness in normed spaces: a unified approach through semi-norms*, arXiv:2111.10547 [math.FA], 2021.