

Preface

This is a substantially revised set of lecture notes originally published in 2005 at IMPA, Brazil, under a slightly different title: “*Dynamics of infinite-dimensional groups and Ramsey-type phenomena*”.

The book has been restructured and expanded and in the present form contains about a quarter more material. Also, I have made a considerable number of corrections and updates.

I am grateful to Sergei Gelfand and to Vitali Milman, who have made this publication possible, as well as to Arlene O’Sean and to Christine Thivierge for their editorial help.

Vladimir Pestov
Gloucester, Ontario, September 25, 2006

Preface to the original IMPA edition

This set of lecture notes is an attempt to present an account of basic ideas of a small new theory located on the crossroads of geometric functional analysis, topological groups of transformations, and combinatorics. The presentation is certainly incomplete.

The lecture notes are organized on a “need-to-know” basis, and in particular I try to resist the temptation to achieve extra generality for its own sake or introduce concepts or results that will not be used more or less immediately.

The notes have grown out of mini-courses given by me at the Nipissing University, North Bay, Canada (26–27 May 2004), at the 8ième atelier sur la théorie des ensembles, CIRM, Luminy, France (20–24 september 2004), and in preparation for a mini-course to be given at IMPA, Rio de Janeiro, Brazil (25–29 July 2005).

In this area of study, I was most influenced by conversations with Eli Glasner, Misha Gromov, and Vitali Milman, to whom I am profoundly grateful.

Special thanks go to my co-authors Thierry Giordano, Alekos Kechris, Misha Megrelishvili, Stevo Todorčević, and Volodja Uspenskij, from whom I have learned much, and I am equally grateful to Pierre de la Harpe and Anatoly M. Vershik.

I want to acknowledge important remarks made by, and stimulating discussions with, Joe Auslander, V. Bergelson, Peter Cameron, Michael Cowling, Ed Granirer, John Clemens, Ilijas Farah, David Fremlin, Su Gao, C. Ward Henson, Greg Hjorth, Menachem Kojman, Julien Melleray, Ben Miller, Carlos Gustavo “Gugu” T. de A. Moreira, Christian Rosendal, Matatyahu Rubin, Slawek Solecki, and Benjy Weiss.

This manuscript has much benefitted from stimulating comments and suggestions made by V. Uspenskij, too numerous for most of them to be acknowledged. Many useful remarks on the first version of the notes were also made by T. Giordano, E. Glasner, X. Domínguez, I. Farah, A. Kechris, J. Melleray, V. Milman, C. Rosendal, and A. Vershik.

As always, the author bears full responsibility for the remaining errors and omissions, which are certainly there; the hope is that none of them are too serious. The reader is warmly welcomed to send me comments at vpest283@uottawa.ca.

During the past nine years that I have been working, on and off, in this area, the research support was provided by two Marsden Fund grants of the Royal Society of New Zealand (1998–2001, 2001–03), a Victoria University of Wellington research development grant (1999), University of Ottawa internal grants (2002–04, 2004–), and an NSERC discovery grant (2003–). The Fields Institute has supported the workshop “Interactions between concentration phenomenon, transformation groups, and Ramsey theory” (University of Ottawa, 20–22 October 2003).

Vladimir Pestov
Gloucester, Ontario, 12 May 2005