

Table of contents

1.	Introduction	1
2.	Two simple examples	6
2.1.	<i>Example 1</i>	6
2.2.	<i>Example 2</i>	9
2.3.	<i>Some questions arising from the examples</i>	18
3.	The general heuristic picture	19
3.1.	<i>Multidimensional localization in the limit of large disorder</i>	19
3.2.	<i>Asymptotics for the density of states and large deviations for Brownian motion</i>	21
3.3.	<i>One-dimensional localization and instability of the corresponding dynamical system</i>	25
4.	Some known results and open problems	30
4.1.	<i>Multidimensional localization in the limit of large disorder</i>	30
4.2.	<i>Asymptotics for the density of states and large deviations for Brownian motion</i>	32
4.3.	<i>The one-dimensional case</i>	36
5.	Explanation of Theorem 1 and introduction to an extended Boltzmann theory of entropy	43
5.1.	<i>Nature of the problem</i>	43
5.2.	<i>The technical core of the proof</i>	52
5.3.	<i>Introduction to an extended Boltzmann theory of entropy</i>	55
5.4.	<i>Large deviations for Brownian motion</i>	64
6.	Explanation of Theorem 2 and introduction to an extended Floquet-Weyl theory	71
6.1.	<i>Nature of the problem and some notions from spectral theory</i>	71
6.2.	<i>Heart of the proof</i>	79
6.3.	<i>Introduction to an extended Floquet-Weyl theory</i>	86
6.4.	<i>Proof of the remaining part of Theorem 2</i>	108
7.	Conclusion	113
7.1.	<i>Different roles of probability and notions of instability</i>	113
7.2.	<i>Extensions of classical notions and results</i>	114
7.3.	<i>From the vibrating string to infinitely many randomly coupled membranes and to non-linear wave equations</i>	115
	References	119
	<i>Index</i>	122