

# Contents

## Part I Introduction

- 1 What the Book Is Dealing With** . . . . . 3  
Armin Bunde, Jürgen Caro, Jörg Kärger and Gero Vogl
- 2 Spreading Fundamentals** . . . . . 11  
Armin Bunde, Christian Chmelik, Jörg Kärger and Gero Vogl

## Part II Nature

- 3 Dispersal in Plants and Animals** . . . . . 29  
Michael Leitner and Ingolf Kühn
- 4 Search for Food of Birds, Fish and Insects** . . . . . 49  
Rainer Klages
- 5 Epicuticular Wax Formation and Regeneration—A Remarkable Diffusion Phenomenon for Maintaining Surface Integrity and Functionality in Plant Surfaces** . . . . . 71  
Wilfried Konrad, Anita Roth-Nebelsick and Christoph Neinhuis
- 6 Brain Interstitial Structure Revealed Through Diffusive Spread of Molecules** . . . . . 93  
Charles Nicholson
- 7 Turbulent Diffusion in the Atmosphere** . . . . . 115  
Manfred Wendisch and Armin Raabe
- 8 Hot Brownian Motion** . . . . . 127  
Klaus Kroy and Frank Cichos
- 9 On Phase Transitions in Biased Diffusion of Interacting Particles** . . . . . 147  
Philipp Maass, Marcel Dierl and Matthias Wolff

**Part III Technology**

<b>10 Diffusive Spreading of Molecules in Nanoporous Materials</b> . . . . .	171
Christian Chmelik, Jürgen Caro, Dieter Freude, Jürgen Haase, Rustem Valiullin and Jörg Kärger	
<b>11 Nature-Inspired Optimization of Transport in Porous Media</b> . . . . .	203
Marc-Olivier Coppens and Guanghua Ye	
<b>12 NMR Versatility</b> . . . . .	233
Scott A. Willis, Tim Stait-Gardner, Allan M. Torres, Gang Zheng and William S. Price	
<b>13 Diffusion in Materials Science and Technology</b> . . . . .	261
Boris S. Bokstein and Boris B. Straumal	
<b>14 Spreading Innovations: Models, Designs and Research Directions</b> . . . . .	277
Albrecht Fritzsche	
<b>15 The Spreading of Techno-visionary Futures</b> . . . . .	295
Armin Grunwald	

**Part IV Society**

<b>16 The Neolithic Transition: Diffusion of People or Diffusion of Culture?</b> . . . . .	313
Joaquim Fort	
<b>17 The Diffusion of Humans and Cultures in the Course of the Spread of Farming</b> . . . . .	333
Carsten Lemmen and Detlef Gronenborn	
<b>18 Modeling Language Shift</b> . . . . .	351
Anne Kandler and Roman Unger	
<b>19 Human Mobility, Networks and Disease Dynamics on a Global Scale</b> . . . . .	375
Dirk Brockmann	
<b>20 Spreading of Failures in Interdependent Networks</b> . . . . .	397
Louis M. Shekhtman, Michael M. Danziger and Shlomo Havlin	
<b>Index</b> . . . . .	411



<http://www.springer.com/978-3-319-67797-2>

Diffusive Spreading in Nature, Technology and Society

Bunde, A.; Caro, J.; Kärger, J.; Vogl, G. (Eds.)

2018, XVI, 418 p. 148 illus., 103 illus. in color.,

Hardcover

ISBN: 978-3-319-67797-2