

1. Record Nr.	UNINA9910817994603321
Autore	Cross Michael
Titolo	Pattern formation and dynamics in nonequilibrium systems // Michael Cross, Henry Greenside
Pubbl/distr/stampa	Cambridge, UK ; ; New York, : Cambridge University Press, 2009
ISBN	1-107-19468-7 1-139-63673-1 0-511-62720-3 0-511-65151-1 0-511-59363-5 0-511-59270-1 0-511-59556-5
Edizione	[1st ed.]
Descrizione fisica	1 online resource (xvi, 535 pages) : digital, PDF file(s)
Altri autori (Persone)	GreensideHenry
Disciplina	500.201185
Soggetti	Pattern formation (Physical sciences) Chaotic behavior in systems
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Title from publisher's bibliographic system (viewed on 05 Oct 2015).
Nota di bibliografia	Includes bibliographical references (p. 526-530) and index.
Nota di contenuto	Cover; Half-title; Title; Copyright; Dedication; Contents; Preface; 1 Introduction; 2 Linear instability: basics; 3 Linear instability: applications to reacting and diffusing chemicals; 4 Nonlinear states; 5 Models; 6 One-dimensional amplitude equation; 7 Amplitude equations for two-dimensional patterns; 8 Defects and fronts; 9 Patterns far from threshold; 10 Oscillatory patterns; 11 Excitable media; 12 Numerical methods; Appendix 1 Elementary bifurcation theory; Appendix 2 Multiple scales perturbation theory; Glossary; References; Index
Sommario/riassunto	Many exciting frontiers of science and engineering require understanding the spatiotemporal properties of sustained nonequilibrium systems such as fluids, plasmas, reacting and diffusing chemicals, crystals solidifying from a melt, heart muscle, and networks of excitable neurons in brains. This introductory textbook for graduate students in biology, chemistry, engineering, mathematics, and physics provides a systematic account of the basic science common to these diverse areas. This book provides a careful pedagogical motivation of

key concepts, discusses why diverse nonequilibrium systems often show similar patterns and dynamics, and gives a balanced discussion of the role of experiments, simulation, and analytics. It contains numerous worked examples and over 150 exercises. This book will also interest scientists who want to learn about the experiments, simulations, and theory that explain how complex patterns form in sustained nonequilibrium systems.

---