

Contents

1 Introduction: Network Perspectives on Innovations: Innovative Networks – Network Innovation	1
Andreas Pyka and Andrea Scharnhorst	

Part I Innovation Networks in Economics

2 Knowledge Networks: Structure and Dynamics	19
Pier Paolo Saviotti	
3 Death of Distance in Science? A Gravity Approach to Research Collaboration	43
Koen Frenken, Jarno Hoekman, Suzanne Kok, Roderik Ponds, Frank van Oort, and Joep van Vliet	
4 Evolution and Dynamics of Networks in ‘Regional Innovation Systems’ (RIS)	59
Frank Beckenbach, Ramón Briegel and Maria Daskalakis	
5 Agent-Based Modelling of Innovation Networks – The Fairytale of Spillover	101
Andreas Pyka, Nigel Gilbert and Petra Ahrweiler	
6 Structural Holes, Innovation and the Distribution of Ideas	127
Robin Cowan and Nicolas Jonard	

Part II Innovation Networks in Complex Theories

7 Tools from Statistical Physics for the Analysis of Social Networks	147
Jörg Reichardt and Stefan Bornholdt	

8 Modeling Evolving Innovation Networks 187
Michael D. König, Stefano Battiston and Frank Schweitzer

9 Propagation of Innovations in Complex Patterns of Interaction 269
Albert Diaz-Guilera, Sergio Lozano and Alex Arenas

10 Sensitive Networks – Modelling Self-Organization and Innovation Processes in Networks 285
Ingrid Hartmann-Sonntag, Andrea Scharnhorst and Werner Ebeling

Index 329