

# Contents

Introduction xi

- 1 **Truth and the Success of Science** 3
  - Explaining Scientific Success 3
  - Simplistic Accounts of Success 6
  - Dismissive Attitudes toward Explanation 9
  - Underdetermination 12
  - The Alleged Superfluosness of Truth in Explanation 15
  - Excising Truth from Explanation 21
  - Surrogates for Truth 28
  - The Metaphysical Import of Truth 29
  
- 2 **Conceptions of Novelty** 34
  - The History of the Independence Requirement 34
  - Temporal Constraints 40
  - Bayesian Confirmation 44
  - Contemporary Analyses of Independence 49
  - Constraints on the Analysis of Novelty 63

- 3 **An Analysis of Novelty 64**  
    Overview and Motivation 64  
    Assumptions and Terminology 65  
    Conditions for Novelty 77
- 4 **Applications 83**  
    Fresnel's Theory of Diffraction 83  
    Special Relativity 86  
    The Expansion of the Universe 93  
    The Big Bang 94
- 5 **Realism and Novelty 98**  
    The Burden of Argument 98  
    Minimal Epistemic Realism 102  
    The Explanatory Poverty of Instrumentalism 104  
    In Defense of Abduction 116  
    Novel Prediction versus Retroactive Explanation 120  
    Partial Truth and Success 127  
    The Pragmatics of Partial Truth 131
- 6 **Counterarguments 136**  
    Overview 136  
    The Skeptical Historical Induction 141  
    Empirical Equivalence and Underdetermination 152  
    Is There Truth in Virtue? 164  
    NOA's Bark Is as Terse as It's Trite 173
- 7 **The Future of Realism 178**  
    Limits to Testability in Fundamental Physics 178  
    Methodological Practice 182  
    Warranting Methodological Change 186  
    A Measured Retreat 188