

Preface

I wrote this book because I could not put aside a question about the way we explain the physical world. Quantum mechanics and general relativity are remarkably successful, yet they begin with different pictures of what nature is doing. I wanted to understand whether their difficulties in meeting might tell us something about the starting point we had chosen.

We usually begin with a thing and describe its properties. We give it a state, place it in an environment and ask what happens next. My instinct has been to look beneath that description. What makes the thing possible in the first place? What allows it to keep its identity as it interacts with everything around it? Those questions led me towards the thought that relations might be more fundamental than the objects we use them to describe.

Phase Differential Theory grew from that thought. It is my attempt to picture a world in which physical things endure through the organisation of their phase relations, and definite events arise when the conditions for further continuation become restrictive. I believe this may offer a common way of thinking about problems that appear quite separate in our present theories.

The philosophy behind that picture is mine. Mathematics gives it a discipline that conviction alone cannot provide. A physical idea becomes more useful when we can see precisely what it assumes and what follows from it. Sometimes that work supports an intuition. Sometimes it reveals that the intuition has asked too much. Both outcomes belong in an honest account of the theory.

I have tried to write a book that can be read by someone who is curious about nature without requiring them to become a specialist first. The main text follows the physical ideas. The appendices give the assumptions and technical comparisons a more exact form. There are places where I am putting forward a possible explanation whose full physical law still needs to be established. I want the reader to understand why I find it persuasive while remaining free to judge it differently.

I am particularly grateful to Dan Hilton for examining and refining the ideas and their mathematical structure. Neil Fincham-Dukes helped design and build applications through which parts of the theory could be explored. Matt Hilton offered guidance on commercial direction and practical positioning. Above all, I thank my wife, Rachael, for her patience and support.

Computational methods and AI tools have helped with the exploration and organisation of this work. The interpretation, reasoning and responsibility for the claims remain mine.

I do not expect a reader to share my starting belief. I hope to make the thought behind PDT clear enough that agreement or disagreement has something definite to rest on. The question that continues to interest me is whether the physical world can be understood more deeply by asking what its relations allow to persist.