

Preface

I wrote this book because I suspect that the universe is governed by phase relationships. That is the starting assumption behind Phase Differential Theory, and the idea I want to explore with you. It has changed how I think about matter, change and the ordinary business of things continuing to exist.

By phase, I mean where something is in a repeating cycle. Picture two swings moving at the same rate. They might rise together, or one might be coming back while the other moves forward. Their phase relationship describes how those movements line up. We can see this in a playground. My question is how deeply such relationships run through nature.

My starting picture is that what we call things depend on relationships that hold together through change. A particle, an atom or an everyday object would last because the activity within it maintains the relationships needed for it to continue. I also ask whether changes in those relationships could explain how an interaction produces one definite result. Could the same foundation account for both something lasting and something happening?

Quantum mechanics and general relativity helped sharpen that question. Both are remarkably successful, yet bringing them together remains difficult. I began to wonder whether phase relationships might offer a shared starting point. The engineer in me wanted to inspect the foundations before adding another floor.

That became PDT. The philosophy behind it is mine; mathematics gives it a discipline that conviction alone cannot provide. It makes me state my assumptions and check what follows. Sometimes it supports an intuition. Sometimes it shows that I have asked too much. Both outcomes matter. Some proposed explanations still need a full physical law before they can be tested properly. An attractive idea still has to carry its own weight.

I have written for people who are curious about nature without expecting them to become specialists first. Follow the examples and

explanations at your own pace. The appendices take a closer look at the assumptions and mathematics. I want to make my starting picture clear enough for you to examine it and reach your own judgement.

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.

You do not need to share my starting belief to come along. Keep your curiosity and bring your objections. For me, the fascination begins with something ordinary: a cup sits on the table, its matter busy with activity, yet it remains a cup. What keeps those relationships working? And could understanding them bring us closer to understanding the universe?