

Preface

The creative process of writing this book was less a result of that which arises out of one's own head, hand, pen and paper than a result of the interactive dialogue between authors with a similar vision. Our desire is to present a clear and concise presentation of principal phenomena, basic concepts, and novel ideas in pattern formation using the language of nonlinear dynamics supplemented by photographs of actual patterns observed in the laboratory. We believe, perhaps a little presumptuously, that the principle we adhere to, namely "one chapter – one topic" together with a careful selection of examples, has enabled us to write a book that is comprehensible to graduates, postgraduates, and those researchers who have just started investigating this extremely fascinating field of science. As is well known, the elegance of simplicity tempts one to simplify real phenomena by fitting them to conventional and universal models. We hope that we succeeded in avoiding this temptation unduly, since every chapter is focused on specific experiments.

The text is supplemented with two appendices. Appendix A — A Short Guide to Nonlinear Dynamics — is provided as a review of the theoretical underpinnings of nonlinear systems and Appendix B — Key Experiments in Pattern Formation — is included for readers curious about experimental setups designed to observe pattern phenomena in the laboratory.

For the most part, the book is based on the lectures read by MIR to students of the University of Nizhny Novgorod, the University of Chicago, and the University of California at San Diego. Some sections are the result of laboratory experiments spearheaded by ABE and PDW.

We greatly appreciate numerous discussions on the topics presented

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