

Preface

Our book discusses issues at the heart of the modern science of the Universe. Astronomical discoveries of recent years have inspired us to relate how the understanding of the structures in the Universe has evolved, looking at this story from the middle of the events, as if caught in a storm.

Astronomy is an endless enterprise, held in motion by the promise of unexpected phenomena. The discovery of megafractals is such a surprise for cosmology. And new ideas spring from the fractals, questioning our basic beliefs about the cosmos. Writing this book we were delighted to find how history once and again confirms the golden rules: *cast doubt on the obvious, expect the unexpected, keep watch for new paths.*

We divide our book to four parts to help the reader make the excursion from the birth of cosmological thinking in Part I, through the cosmological physics of the 20th century in Part II and encountering the deep enigmas of modern cosmology in Part III. Finally in Part IV the reader is taken aboard for advanced studies at the frontiers of research into the fractal architecture of the Universe.

We have endeavoured to explore in a simple manner the key questions in our science, to allow the reader to obtain a feeling for the events taking place at the frontline of cosmological research. In the footnotes and the Appendix the interested reader may find brief, more technical details and definitions. This book may also be regarded as illuminating our view on the philosophy of cosmology, complementing our forthcoming scientific monograph “Fundamental Questions of Practical Cosmology”.

We would like to note that our citations come from texts available to us in different, not always original, languages. Sometimes we use existing

translations, sometimes our own ones from the Russian, Finnish, German, French and Swedish. We will mostly use the unit system of Gauss, i.e. cm, g, sec, which is normal in astronomical literature. Also, when convenient, we use other units, e.g. give distances in astronomical units and parsecs. If the value of the Hubble constant is not mentioned, we usually adopt $H = 60 \text{ km s}^{-1}/\text{Mpc}$. We also note that the Index contains the persons and the main concepts appearing in our story, and refers to the corresponding sections (for example, 10.5 means the section 5 in the chapter 10).

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