Preface

Civil engineering trends in recent decades have placed increased importance on a multidisciplinary approach in the design, construction and reconstruction of buildings. Structures are no longer designed only to provide shelter from natural elements, but they are also meant to establish adequate living conditions and preserve human health. Furthermore, depletion of fossil fuels combined with climate changes have put building energy efficiency into focus. Although structural integrity remains the primary concern, knowledge of heat transfer, moisture, sound and light, which are phenomena traditionally covered by *building physics*, is rapidly becoming just as important.

However, significant advances in research, standards and legislation are not matched by advances in building physics education. Many excellent books cover particular sections of the discipline, often going into great detail and requiring advanced knowledge of higher mathematics, which makes them appropriate primarily for physicists. The choice of introductory literature suitable for future civil engineers and architects is much more scarce. Furthermore, there is a growing gap in terms of concise descriptions of a wide range of phenomena between people working in different groups and on varied subjects.

When I was entrusted with lectures on building physics for students of civil engineering and architecture, I decided to tackle this very problem. I wanted not only to bring all the subjects of interest under one roof but also to present connections between various topics within building physics, connections between those topics and *physical principles* from which they derive and connections between theory and application in the form of *international standards*. Making those connections should make the topics more instructive and interesting. In addition, following Albert Einstein's aphorism, 'Everything should be made as simple as possible, but no simpler', my aim is to keep the level of mathematical complexity as low as possible without distorting physical facts. To help the readers of this book, I also include introductory parts that deal with physical principles of thermodynamics and wave mechanics while assuming that the reader is familiar with solid and fluid mechanics. Finally, where a dynamical demonstration is essential, I provide a supplementary multimedia content.

My task was greatly simplified by the emergence of well-conceived standards that also cover the symbols and names of physical quantities. Adhering to subject- or group-specific inscriptions is no longer justified, so the book thoroughly complies with standardised symbols and names, as presented in Table A.1.

I am confident that this approach will increase awareness and knowledge about topics related to building physics and help new generations in their professional pursuits. On the other hand, there is always a room for improvement, and

I am looking forward to constructive suggestions and criticisms of the book. Please find contact details, book errata as well as supplementary content at http://www.pinteric.com/books/.

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