A DEFINITIVE NEW INVESTIGATION OF THE SCIENCE OF SNOWFLAKES BY THE WORLD'S LEADING EXPERT

A snowflake's sophisticated symmetry emerges when crystalline ice grows from water vapor within the winter clouds. While certain iconic snowflake shapes are visually familiar to us, microscopic close-ups of falling snow reveal a rich menagerie of lesser-known forms, including slender needle clusters, hollow columns, bullet rosettes, triangular crystals, and exotic capped columns. What explains the myriad and unusual structures of snowflakes that materialize under different atmospheric conditions? In *Snow Crystals*, Kenneth Libbrecht delves into the science of snowflakes, examining why ice crystals grow the way they do, how patterns emerge, and what they illuminate about the fundamental physics of crystal growth, structure formation, and self-assembly.

Libbrecht—the world's foremost expert on snowflakes—describes the full range of physical processes underlying their occurrence. He explores such topics as the centuries-long development of snow crystal science, the crystalline structure of ice, molecular dynamics at the ice surface, diffusion-limited growth, surface attachment kinetics, computational models of snow crystal growth, laboratory techniques for creating and studying snow crystals, different types of natural snowflakes, and photographing snow crystals. Throughout, Libbrecht's extensive detailed discussions are accompanied by hundreds of beautiful full-color images.

From the molecular dynamics of surface premelting to the aerodynamics of falling snow, *Snow Crystals* chronicles the continuing quest to fully understand this fascinating phenomenon.

Praise for *Snow Crystals*

"This tour de force is a comprehensive examination of the physics and beauty behind the incredible emergent richness of snowflakes. Filled with striking photographs, *Snow Crystals* presents a broad view that is interesting and pedagogically useful. I know of no other book quite like it."
—DOUGLAS NATELSON, RICE UNIVERSITY

"Although there are some general books on ice physics and crystal growth, there is not a great deal of work dedicated exclusively to examining the snowflake and snow crystal. This useful addition to the literature will be read and enjoyed, and people coming into the field will learn a lot from it."
—JULYAN CARTWRIGHT, SPANISH NATIONAL RESEARCH COUNCIL (CSIC)

KENNETH G. LIBBRECHT is professor of physics at the California Institute of Technology. His many books include *The Snowflake: Winter's Secret Beauty*.

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