



# Ion Beams in Materials Processing and Analysis

By Bernd Schmidt, Klaus Wetzig

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A comprehensive review of ion beam application in modern materials research is provided, including the basics of ion beam physics and technology. The physics of ion-solid interactions for ion implantation, ion beam synthesis, sputtering and nano-patterning is treated in detail. Its applications in materials research, development and analysis, developments of special techniques and interaction mechanisms of ion beams with solid state matter result in the optimization of new material properties, which are discussed thoroughly. Solid-state properties optimization for functional materials such as doped semiconductors and metal layers for nano-electronics, metal alloys, and nano-patterned surfaces is demonstrated. The ion beam is an important tool for both materials processing and analysis. Researchers engaged in solid-state physics and materials research, engineers and technologists in the field of modern functional materials will welcome this text.

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#### About the Author

**Bernd Schmidt** received his PhD in Physics at the State University of St. Petersburg (Russia) in 1976. Since 1994 he has been head of the Process Technology Division at the Helmholtz-Zentrum Dresden-Rossendorf, Germany. His research interests include semiconductor technology as well as ion implantation and the synthesis of nanostructures. He is author of the specialist book "Silicon Sensors" (1986) and of more than 150 refereed journal papers.

**Klaus Wetzig** received his PhD (1967) and postdoctoral (1973) degrees in Physics at the TU Dresden, Germany. From 1992 until his retirement in 2006 he was full professor of Materials Analysis at the TU Dresden and research director at the Leibniz Institute for Solid State and Materials Research Dresden (IFW). His research interests include materials analysis, nanostructures and particle-solid interactions. He is author of several specialist books and of more than 300 refereed journal papers.

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