
Preface

The purpose of this collective book is to present a non-exhaustive survey of spin-related phenomena in semiconductors with a focus on recent research. In some sense it may be regarded as an updated version of the *Optical Orientation* book, which was entirely devoted to spin physics in bulk semiconductors.

During the 24 years that have elapsed, we have witnessed, on the one hand, an extraordinary development in the wonderful semiconductor physics in two dimensions with the accompanying revolutionary applications. On the other hand, during the last maybe 15 years there was a strong revival in the interest in spin phenomena, in particular in low-dimensional semiconductor structures. While in the 1970s and 1980s the entire world population of researchers in the field never exceeded 20 persons, now it can be counted by the hundreds and the number of publications by the thousands. This explosive growth is stimulated, to a large extent, by the hopes that the electron and/or nuclear spins in a semiconductor will help to accomplish the dream of factorizing large numbers by quantum computing and eventually to develop a new spin-based electronics, or “spintronics”. Whether any of this will happen or not, still remains to be seen. Anyway, these ideas have resulted in a large body of interesting and exciting research, which is a good thing by itself.

The field of spin physics in semiconductors is extremely rich and interesting with many spectacular effects in optics and transport. We believe that a representative part of them is reviewed in this book. We have tried to make the presentation accessible to graduate students and to researchers new to the field.

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