Preface Issue 2-2013

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“Curvature driven interface evolution” is one of the major current themes in the numerics resp. the numerical analysis resp. the analytical theory of partial differential equations. It is particularly attractive due to numerous physical applications on the one hand and due to close relations to differential geometry on the other hand. Harald Garcke gives a survey on the most important topics in this research area. Among these are models for crystal growth of snow flakes, melting ice in water or grain coarsening (aging) in two-phase mixtures: Stefan problem, Mullins-Sekerka-problem and variants. Moreover, the mean curvature and surface diffusion flow are covered as well as phase field models like the Allen-Cahn and Cahn-Hilliard equation. In the latter sharp classical interfaces are replaced by interfacial regions. All of these models are introduced, their physical applicability as well as their main properties are explained and they are illustrated by means of numerical simulations. The present survey will certainly prove to be a very helpful reference work for anybody working on resp. interested in these kinds of models.

The integral group ring $\mathbb{Z}G$ of a group G consists of elements of the form $\sum_{g \in G} z_g g$, where only finitely many of the coefficients $z_g \in \mathbb{Z}$ may be different from 0. These elements form a free $\mathbb{Z}$ -module with G as a basis, while the multiplication in $\mathbb{Z}G$ is the $\mathbb{Z}$ -linear extension of that in G . Wolfgang Kimmerle’s survey article gives a brief account of classical results and focusses then on recent achievements and developments concerning the structure of the unit group of $\mathbb{Z}G$.

The Zentralblatt für Mathematik and the Jahresbericht der DMV begin a collaboration to review again classical books and the effect that they have had or could have had on the development of specific mathematical branches from today’s point of view.

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In this issue Franz Lemmermeyer reviews the 2012-reprint of the 1893 edition of Richard Dedekind's book: "Was sind und was sollen die Zahlen?" It was Dedekind's purpose to provide a safe foundation for the natural numbers. However, his rather abstract approach was not appreciated by his contemporaries and Franz Lemmermeyer outlines why nowadays Peano's approach instead of Dedekind's is mostly used. Further book reviews concern recently released books dealing with combinatorial set theory and with regularity issues in obstacle problems.