Part IV

Canonical Transforms

The aim of this part is to introduce a class of integral transforms which include, as particular cases, most of those which were discussed in Part III. It is a parametrized continuum of transforms which share several basic properties and which can be subject to *composition*. In fact, they constitute a *Lie semigroup*. For the benefit of the general reader we shall present these developments independently with a minimum of explicit use of Lie theory. Chapter 9 is devoted to the construction of the integral transform set, and Chapter 10 applies this tool to the deeper study of the diffusion equation and a class of Schrödinger equations. The ease and generality of the method, we hope, will spur the interested reader to acquaint himself with the growing research literature on the subject.