

Preface

Response surface methodology (RSM) began with the work of Box and Wilson (1951) in the *Journal of the Royal Statistical Society*, Series B. That work was motivated by the need to run experiments efficiently, by a proper choice of design, and to determine operating conditions on a set of controllable variables that give rise to an optimal response. The key ideas in the so-called *classical RSM* were developed using linear polynomial models, mainly first-degree and second-degree models, with continuous response variables assumed, for the most part, to be independently and normally distributed with constant error variances. Since the 1970's, RSM has gone through several stages of development that were aimed at making it more applicable to wider experimental situations under less stringent assumptions. The purpose of this volume is to provide an exposition of a variety of topics covering a wide range of methods and techniques used in RSM, including the more recent advances made in the field.

The present volume contains 17 chapters written by leading experts in RSM. The topics covered include factorial and fractional factorial designs, processes with high variation, split-plot experiments, response surface optima, robust parameter designs, applications in the treatment of cancer, designs for generalized linear models, non-standard designs, a review of mixture experiments, graphical techniques for comparing response surface designs, and designs for estimating the slope of a response surface. These chapters provide an overview of the key ideas that have shaped RSM.

This volume should be useful to researchers as well as practitioners interested in RSM's theory and potential applications. Those who have used RSM in the past, but have not kept up with its recent developments, will find the volume particularly helpful. All the volume's chapters were refereed.

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André I. Khuri
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Gainesville, Florida