

Contents

<i>List of Contributors</i>	v
<i>Preface</i>	vii
<i>Contents of Volume II</i>	xi

Chapter I. Introduction

ALAN M. THORNDIKE

I. General Features of Bubble Chambers and Spark Chambers	1
II. Previous Track Recording Techniques	5
III. History of Bubble Chamber Development	6
IV. History of Spark Chamber Development	10
V. Analyzing Large Numbers of Events	15
References	16

Chapter II. Bubble Chamber Principles

CH. PEYROU

I. Phases in Metastable States	20
II. Bubble Formation—The Theory of Glaser, or the Electrostatic Theory	24
III. The Theory of Seitz, or the Heat Spike Theory	27
IV. Quantitative Experiments—The Relativistic Rise	38
V. The Growth of the Macroscopic Bubble	45
VI. Applications of the Theory to Special Chambers; Summary and Conclusions	49
References	57

Chapter III. Cryogenic Bubble Chambers

W. B. FOWLER

I. Introduction	59
II. Criteria for Design	67
III. Design and Some Design Solutions	78
IV. Operations and Some Performance Data	128
References	144
Appendix	146
References to Appendix	151

Chapter IV. Heavy Liquid Bubble Chambers

A. LAGARRIGUE and A. ROUSSET

I. General Characteristics of Heavy Liquid Bubble Chambers	159
II. Construction of Large Heavy Liquid Bubble Chambers	168
III. Special Problems in Data Processing	200
IV. Examples of Experiments	218
References	230

Chapter V. Illumination and Photography of Bubble Chambers

W. T. WELFORD

I. Light Scattering by Bubbles	234
II. Modes of Illumination: Contrast in Dark Field and Bright Field Systems	240
III. The Illuminated Volume	268
IV. Windows	278
V. Photography	290
VI. Light Sources	301
VII. Cameras	304
VIII. The Optical Constants	310
References	312

Chapter VI. Spark Chambers

JAMES W. CRONIN

I. Introduction	316
II. Basic Properties of Spark Chambers	322
III. Construction Techniques	344
IV. Triggering Techniques	351
V. Photography of Spark Chambers	359
VI. Considerations of Accuracy	365
VII. Applications	371
VIII. Filmless Spark Chamber Techniques	383
IX. Developments of Other Types of Chambers	390
X. Concluding Remarks	400
References	402
<i>Author Index</i>	407
<i>Subject Index</i>	415