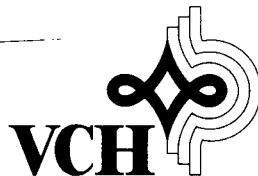


# **The Art of Measurement**

Metrology in Fundamental and  
Applied Physics

Edited by  
Bernhard Kramer



# Contents

Foreword . . . . .	V
Preface . . . . .	VII
Contributors . . . . .	XI
Measurement and the Progress of Knowledge in Physics . . . . .	1
<i>Wilhelm Walcher</i>	

## Part I Fundamental Physics

Lasers and Fundamental Physics . . . . .	33
<i>Gerd Leuchs and Herbert Walther</i>	
Chaotic Dynamics of Lasers . . . . .	55
<i>Carl O. Weiss and Wolfgang Klische</i>	
Anderson Localisation . . . . .	71
<i>Angus MacKinnon</i>	
Quantum Mechanics of a Macroscopic Object . . . . .	87
<i>Albert Schmid</i>	
Neutron Scattering and Condensed Matter Research . . . . .	109
<i>Reinhard Scherm</i>	

## Part II Precision Experiments

Precision when Dealing with Atoms . . . . .	139
<i>Peter E. Toschek</i>	
Optical Frequency Standards: Atomic Clocks of the Future? . . . . .	161
<i>Jürgen Helmcke</i>	
X-Ray Interferometry and $\gamma$ -Ray Wavelengths . . . . .	193
<i>Richard D. Deslattes</i>	

XIV    *Contents*

X-Ray Optics and X-Ray Microscopy . . . . .	209
<i>Günter Schmahl</i>	
Radiometry from the Infrared to the X-Ray Region: An Electron Storage Ring as a Primary Radiator Standard . . . . .	233
<i>Burkhard Wende</i>	
Superconducting Quantum Measures – Possibilities and Limits – . . . . .	249
<i>Volkmar Kose and Jürgen Niemeyer</i>	

**Part III Medicine**

Lasers in Medicine . . . . .	265
<i>Werner Schmidt</i>	
SQUID-Based Measuring Techniques – A Challenge for the Functional Diagnostics in Medicine . . . . .	287
<i>Manfried Hoke</i>	