

Contents

Preface v

The truth, the whole truth and nothing but the truth:
The challenges of reporting on mathematics
George G. Szpiro 1

Experimental mathematics in the society of the future
David H. Bailey and Jonathan M. Borwein 7

What is the impact of interactive mathematical experiments?
Albrecht Beutelspacher 27

Mathematics and finance
Walter Schachermayer 37

Statistics in high dimensions
Aad van der Vaart and Wessel van Wieringen 51

Filtering theory: Mathematics in engineering, from Gauss to particle filters
Ofer Zeitouni 71

Mathematical models for population dynamics: Randomness versus determinism
Jean Bertoin 81

The quest for laws and structure
Jürg Fröhlich 101

Geometry and freeform architecture
Helmut Pottmann and Johannes Wallner 131

Some geometries to describe nature
Christiane Rousseau 153

Mathematics in industry
Helmut Neunzert 167

Mathematics of signal design for communication systems
Holger Boche and Ezra Tampubolon 185

Cryptology: Methods, applications and challenge

Claus Diem 221

A Mathematical view on voting and power

Werner Kirsch 251

Numerical methods and scientific computing for climate and geosciences

Jörn Behrens 281

Authors 295

Index 297