

# Contents

## Part I Stanley Decompositions

<b>A Survey on Stanley Depth</b> .....	3
Jürgen Herzog	
Introduction .....	3
1 Basic Definitions and Concepts .....	6
2 Prime Filtrations and Stanley Decompositions .....	9
3 Upper and Lower Bounds for Stanley Depth .....	11
4 Clean and Pretty Clean Modules .....	14
5 Janet Decompositions.....	17
6 Stanley Depth and Regular Sequences.....	19
7 How to Compute the Stanley Depth .....	21
8 Characteristic Posets and Skeletons .....	25
9 Special Partitions of Posets .....	29
10 Stanley Decompositions and Alexander Duality .....	32
11 The Size of an Ideal.....	34
12 The Hilbert Depth.....	37
13 Further Results and Open Problems .....	40
<b>Stanley Decompositions Using CoCoA</b> .....	47
Anna Maria Bigatti and Emanuela De Negri	
1 First Steps with CoCoA-5 .....	47
2 Stanley–Reisner Ideals.....	49
3 Posets .....	52
4 The Hibi Ideal of a Poset .....	54
5 Hibi Rings .....	55
6 The Size of a Squarefree Monomial Ideal .....	57
7 Stanley Decompositions .....	58

## Part II Edge Ideals

<b>A Beginner's Guide to Edge and Cover Ideals</b> .....	63
Adam Van Tuyl	
Introduction .....	63
1 The Basics of Edge and Cover Ideals .....	65
2 Splitting Monomial Ideals and Fröberg's Theorem .....	76
3 Colouring Graphs and Decomposing Cover Ideals .....	87
<b>Edge Ideals Using Macaulay2</b> .....	95
Adam Van Tuyl	
1 The <i>Macaulay 2</i> Package <code>EdgeIdeals</code> .....	95
2 Tutorials .....	102

## Part III Local Cohomology

<b>Local Cohomology Modules Supported on Monomial Ideals</b> .....	109
Josep Àlvarez Montaner	
Introduction .....	109
1 Basics on Local Cohomology Modules .....	111
2 Local Cohomology Modules Supported on Monomial Ideals .....	126
3 Bass Numbers of Local Cohomology Modules .....	159
Appendix .....	173
<b>Local Cohomology Using Macaulay2</b> .....	179
Josep Àlvarez Montaner and Oscar Fernández-Ramos	
1 Getting Started .....	180
2 Tutorial .....	183
<b>References</b> .....	187

Monomial Ideals, Computations and Applications

Bigatti, A.M.; Gimenez, P.; Sáenz-de-Cabezón, E. (Eds.)

2013, XI, 194 p. 42 illus., Softcover

ISBN: 978-3-642-38741-8