

Contents

<i>List of contributors</i>	page xi
<i>Preface</i>	xiii
1 Projectivity of the moduli of curves <i>Raymond Cheng, Carl Lian, Takumi Murayama</i>	1
1.1 Stable curves	2
1.2 Nakai–Moishezon criterion for ampleness	7
1.3 Positivity of invertible sheaves	11
1.4 Nef locally free sheaves	15
1.5 Ampleness lemma	24
1.6 Nefness for families of nodal curves	29
1.7 Projectivity of the moduli of curves	39
2 The stack of admissible covers is algebraic <i>Elsa Corniani, Neeraj Deshmukh, Brett Nasserden, Emanuel Reinecke, Nawaz Sultani, Rachel Webb</i>	44
2.1 Introduction	44
2.2 Setup	48
2.3 Admissible G -covers	61
3 Projectivity of the moduli space of vector bundles on a curve <i>Jarod Alper, Pieter Belmans, Daniel Bragg, Jason Liang, Tuomas Tajakka</i>	90
3.1 The moduli stack of all vector bundles	91
3.2 Semistability	94
3.3 Good moduli spaces	101
3.4 Determinantal line bundles	109
3.5 Projectivity	115

4	Boundedness of semistable sheaves	<i>Haoyang Guo, Sanal Shivaprasad, Dylan Spence, Yueqiao Wu</i>	126
4.1	Introduction		126
4.2	Preliminaries		129
4.3	Bogomolov’s inequality		143
4.4	Restriction to hypersurfaces and Bogomolov’s inequality		150
4.5	Boundedness of torsion-free sheaves		159
5	Theorem of the Base	<i>Raymond Cheng, Lena Ji, Matt Larson, Noah Olander</i>	163
5.1	The Picard functor		165
5.2	Components of the Picard functor		167
5.3	Castelnuovo–Mumford regularity		171
5.4	Boundedness		178
5.5	Finiteness of cycles modulo numerical equivalence		179
5.6	Alterations in families		182
5.7	Theorem of the Base		184
5.8	Examples of Picard schemes		188
6	Weil restriction for schemes and beyond	<i>Lena Ji, Shizhang Li, Patrick McFaddin, Drew Moore, Matthew Stevenson</i>	194
6.1	Weil restriction of schemes		194
6.2	Basic properties of Weil restriction		197
6.3	Geometric connectedness		201
6.4	Examples		205
6.5	Weil restriction of algebraic spaces		212
6.6	Olsson’s theorem		217
7	Heights over finitely generated fields	<i>Stephen McKean, Soumya Sankar</i>	222
7.1	Introduction		222
7.2	Generalized global fields		224
7.3	Heights		230
7.4	Analytic background		236
7.5	Arithmetic intersection theory and Arakelov theory		241
7.6	Moriwaki heights		248
8	An explicit self-duality	<i>Nikolas Kuhn, Devlin Mallory, Vaidehee Thatte, Kirsten Wickelgren</i>	255
8.1	Introduction		255
8.2	Commutative algebra preliminaries		257
8.3	The explicit isomorphism		263

	<i>Contents</i>	ix
9	Tannakian reconstruction of coalgebroids <i>Yifei Zhao</i>	268
9.1	Introduction	268
9.2	Tannakian adjunction	270
9.3	Reconstruction	279
9.4	The embedding problem	285