

1. Record Nr.	UNISA996466409303316
Titolo	Rationality of varieties // Gavril Farkas [and three others], editors
Pubbl/distr/stampa	Cham, Switzerland : , : Birkhauser, , [2021] ©2021
ISBN	3-030-75421-9
Descrizione fisica	1 online resource (440 pages)
Collana	Progress in mathematics ; ; Volume 342
Disciplina	516.35
Soggetti	Geometry, Algebraic Rational points (Geometry) Mathematics Geometria algebraica Punts racionals (Geometria) Llibres electrònics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Intro -- Contents -- Rationality of Algebraic Varieties -- On Geometry of Fano Threefold Hypersurfaces -- 1. Introduction -- 2. Non-solid Fano threefolds -- 3. Birationally non-rigid Fano threefolds -- 3.1. How to read off the equation of Z ? -- 4. Evidence for Conjecture 1.4 -- Acknowledgement -- References -- On the Image of the Second l -adic Bloch Map -- Introduction -- 0.1. Mazur's question with Q -coefficients -- 0.2. Mazur's question with Q -coefficients in positive characteristic -- 0.3. Mazur's question with Z -coefficients -- 0.4. Universal cycles and the image of the second l -adic Bloch map -- 0.5. Decomposition of the diagonal and the image of the second l -adic Bloch map -- 0.6. Stably rational vs. geometrically stably rational varieties over finite fields -- 0.7. Notation and conventions -- 1. On various notions of coniveau filtrations -- 1.1. Recalling the geometric coniveau filtrations -- 1.2. p -adic coniveau filtrations -- 2. The image of the l -adic Bloch map and the coniveau filtration -- 2.1. The image of the l -adic Bloch map -- 2.2. The image of the p -adic Bloch map -- 3. Decomposition of the diagonal, algebraic representatives, and miniversal cycles -- 3.1. Decomposition of the diagonal -- 3.2. Surjective regular

homomorphisms and algebraic representatives -- 3.3. Miniversal cycles and miniversal cycles of minimal degree -- 3.4. Decomposition of the diagonal and algebraic representatives -- 4. Miniversal cycles and the image of the second l -adic Bloch map -- 5. Decomposition of the diagonal and the image of the second l -adic Bloch map -- 6. Modeling cohomology via correspondences -- 6.1. Modeling Q -cohomology via correspondences -- 6.2. Modeling Z -cohomology via correspondences: Theorem 15 -- 7. The image of the l -adic Bloch map in characteristic 0 -- Appendix: A review of the l -adic Bloch map.

A.1. Conventions for l -adic and p -adic cohomology -- A.1.1. l -adic cohomology -- A.1.2. p -adic cohomology -- A.2. The l -adic Bloch map -- A.2.1. The Abel-Jacobi map on torsion -- A.2.2. Bloch's preliminaries -- A.2.3. The l -Bloch map -- A.2.4. Bloch's Key Lemma -- A.2.5. The l -adic Bloch map -- A.2.6. The Bloch map -- A.3. Suwa's construction of the l -adic Bloch map -- A.3.1. Structure of abelian l -primary torsion groups -- A.3.2. l -adic cohomology from cohomology with torsion coefficients -- A.3.3. Suwa's l -adic Bloch map -- A.3.4. The l -adic Bloch map and Suwa's construction -- A.3.5. Gross-Suwa's p -adic Bloch map -- A.4. Properties of the Bloch maps -- A.5. Restriction of the Bloch map to algebraically trivial cycle classes --

Acknowledgment -- References -- Rational Curves and MBM Classes on Hyperkähler Manifolds: A Survey -- 1. Introduction -- 2. MBM classes: equivalent definitions and basic properties -- 2.1. Deforming rational curves: first remarks -- 2.2. Parameter spaces for hyperkähler manifolds -- 2.3. MBM classes -- 3. Results on MBM classes and applications -- 3.1. Markman's Torelli theorem and the birational cone conjecture -- 3.2. The cone conjecture via ergodic theory -- 3.3. Uniform boundedness and an application -- 4. Contractibility and deformations -- 5. Classification of MBM classes in low dimension for K3 type -- 6. Some open questions -- Acknowledgement -- References --

Unirationality of Certain Universal Families of Cubic Fourfolds -- 1. Introduction -- 2. The existence of the universal cubic fourfold, and some properties of scrolls and associated K3 surfaces -- 3. Unirationality for $C_{26,1}$ and $C_{42,1}$ via universal K3 surfaces -- 4. Unirationality through rational special surfaces -- 4.1. Special cubics in C_d in the range $8d \leq 38$ -- 4.2. Special cubics in C_{42} -- 4.3. Unirationality of $C_{d,n}$ -- 5. Some results of non-unirationality.

5.1. Open questions -- Acknowledgement -- References -- A Categorical Invariant for Geometrically Rational Surfaces with a Conic Bundle Structure -- 1. Introduction -- Notations -- 2. Basics on geometrically rational surfaces -- 2.1. Elementary links -- 3. Basics on derived categories -- 3.1. Categorical representability -- 3.2. Conic bundles -- 4. Links of type I/III and the definition of the Griffiths-Kuznetsov component -- 5. Links of type II -- 6. Links of type IV -- Acknowledgment -- References --

Marked and Labelled Gushel-Mukai Fourfolds -- 1. Introduction -- 2. Gushel-Mukai fourfolds -- 2.1. Cohomology and period domain of Gushel-Mukai fourfolds -- 2.2. Hodge-special Gushel-Mukai fourfolds -- 3. Marked and labelled Gushel-Mukai fourfolds -- 4. Gushel-Mukai fourfolds with associated K3 surface -- 4.1. Rational maps to moduli spaces of K3 surfaces -- 4.2. Fibers of Fourier-Mukai partners -- 5. Gushel-Mukai fourfolds and twisted K3 surfaces -- 5.1. Moduli and periods of twisted K3 surfaces -- 5.2. Twisted K3 surfaces associated to GM fourfolds -- 5.3. Fourier-Mukai partners in the twisted case -- Acknowledgment -- References -- Supersingular Irreducible Symplectic Varieties -- 1. Introduction -- 2. Generalities on the notion of supersingularity -- 3. Supersingular symplectic varieties -- 4. Moduli spaces of stable sheaves on K3 surfaces -- 5. Moduli spaces of twisted sheaves on K3 surfaces -- 6.

Moduli spaces of sheaves on abelian surfaces -- References -- Symbols and Equivariant Birational Geometry in Small Dimensions -- 1. Brief history of previous work -- 2. Equivariant birational types -- 2.1. Antisymmetry -- 2.2. Multiplication and co-multiplication -- 2.3. Birational invariant -- 3. Computation of invariants on surfaces -- 3.1. Sample computations of $B2(Cp)$ -- 3.2. Examples for noncyclic groups -- 3.3. Linear actions yield torsion classes. 3.4. Algebraic structure in dimension 2 -- 4. Reconstruction theorem -- 5. Refined invariants -- 5.1. Encoding fixed points -- 5.2. Encoding points with nontrivial stabilizer -- 5.3. Examples of blowup relations -- 5.4. Examples -- 5.5. Limitation of the birational invariant -- 5.6. Reprise: Cyclic groups on rational surfaces -- 6. Cubic fourfolds -- 7. Nonabelian invariants -- 7.1. The equivariant Burnside group -- 7.2. Resolution of singularities -- 7.3. The class of XG -- 7.4. Elementary observations -- 7.5. Dihedral group of order 12 -- 7.6. Embeddings of $S3C2$ into the Cremona group -- Acknowledgment -- References -- Rationality of Fano Threefolds of Degree 18 over Non-closed Fields -- 1. Introduction -- 2. Projection constructions -- 2.1. Projection from lines -- 2.2. Projection from conics -- 2.3. Projection from points -- 3. Unirationality constructions -- 3.1. Using a point -- 3.2. Using a point and a conic -- 4. Rationality results -- 5. Analysis of principal homogeneous spaces -- 5.1. Proof of Theorem 1 -- 5.2. A corollary to Theorem 1 -- 5.3. Generic behavior -- 5.4. Connections with complete intersections? -- Acknowledgment -- References -- Rationality of Mukai Varieties over Non-closed Fields -- 1. Introduction -- 2. A birational transformation given by a family of quadrics -- 2.1. The statement -- 2.2. The proof -- 2.3. Grassmannians of lines -- 2.4. Orthogonal Grassmannian -- 2.5. Grassmannian of the group $G2$ -- 3. Mukai varieties of genus 7, 8, and 10 -- 3.1. Forms of linear sections -- 3.2. Rationality of Mukai varieties -- 4. Mukai varieties of genus 9 -- 4.1. The statement -- 4.2. The proof -- 4.3. Implications for genus 9 Mukai varieties -- 5. Fano threefolds of genus 12 -- 5.1. Vector bundles and Grassmannian embedding -- 5.2. Birational transformation for ${}^{39}42^{613A}{}^{45}47^{603A}Gr(3,7)$. 5.3. The induced transformation of threefolds -- Appendix: Application to cylinders -- Acknowledgment -- References -- A Refinement of the Motivic Volume, and Specialization of Birational Types -- 1. Introduction -- Terminology -- 2. The Grothendieck ring of varieties graded by dimension -- 2.1. Reminders on the Grothendieck ring of varieties -- 2.2. The graded Grothendieck ring -- 2.3. Birational types -- 2.4. A refinement of Bittner's presentation -- 2.5. A refinement of the theorem of Larsen & Lunts -- 3. Dimensional refinement of the motivic volume -- 3.1. The motivic volume -- 3.2. Strictly toroidal models -- 3.3. Construction of the motivic volume -- 4. Applications to rationality problems -- 4.1. Specialization of birational types -- 4.2. Obstruction to stable rationality -- 4.3. Examples -- 5. The monodromy action -- 5.1. The equivariant Grothendieck ring -- 5.2. The monodromy action on the motivic volume -- Acknowledgment -- References -- Explicit Rationality of Some Special Fano Fourfolds -- Introduction -- 1. Rationality via linear systems of hypersurfaces of degree $3e-1$ having points of multiplicity e along a surface -- 1.1. Linear systems of quintics with double points along a general Sd -- 2. Birational maps to $P4$ for cubics in $C14$, $C26$ and $C38$ -- 3. Birational maps to linear sections of $G(1,3+k)$ for cubics in $C(14+12k)$ for $k \geq 2$ -- 4. A divisor of rational Gushel-Mukai fourfolds -- 4.1. Del Pezzo fivefolds through a $K3$ surface of degree 14 and genus 8 -- 4.2. GM fourfolds through a $K3$ surface of degree 14 and genus 8 -- 4.3. Surfaces of degree 10 and sectional genus 6 with a node in $P5$ obtained

as projections of general K3 surfaces of degree 10 and genus 6 -- 4.4.
Rationality of the GM fourfolds in $p=1(D_{10}')$ -- 5. Computations via
Macaulay2 -- Acknowledgement -- References.
Unramified Cohomology, Algebraic Cycles and Rationality.
