

AUTO GENERATED INDEX

Contents

1.	Alphabetized definitions	1
2.	Definitions listed per chapter	32
3.	Other chapters	59

1. Alphabetized definitions

<p>(-1)-index in 3.8</p> <p>(-2)-index in 3.16</p> <p>$(2, 1)$-category in 29.1</p> <p>$(2, 1)$-periodic complex in 3.1</p> <p>$(Spaces/S)_{\acute{e}tale}$ in 4.5</p> <p>$(Spaces/S)_{fppf}$ in 7.6</p> <p>$(Spaces/S)_{ph}$ in 8.5</p> <p>$(Spaces/X)_{\acute{e}tale}$ in 4.6</p> <p>$(Spaces/X)_{fppf}$ in 7.7</p> <p>$(Spaces/X)_{ph}$ in 8.6</p> <p>(A, B)-bimodule in 11.6</p> <p>(R_k) in 151.1</p> <p>(R_k) in 12.1</p> <p>(S_k) in 151.1</p> <p>(S_k) in 12.1</p> <p>(S_k) in 11.1</p> <p>(S_k) in 11.1</p> <p>(U', R', s', t', c') is cartesian over (U, R, s, t, c) in 21.1</p> <p>1-morphisms in 28.1</p> <p>2-category of algebraic stacks over S in 12.3</p> <p>2-category of categories fibred in groupoids over \mathcal{C} in 34.6</p> <p>2-category of categories fibred in setoids over \mathcal{C} in 38.3</p> <p>2-category of categories fibred in sets over \mathcal{C} in 37.3</p> <p>2-category of categories over \mathcal{C} in 31.1</p> <p>2-category of fibred categories over \mathcal{C} in 32.9</p>	<p>2-category of stacks in groupoids over \mathcal{C} in 5.5</p> <p>2-category of stacks in setoids over \mathcal{C} in 6.5</p> <p>2-category of stacks over \mathcal{C} in 4.5</p> <p>2-category in 28.1</p> <p>2-morphisms in 28.1</p> <p>2-periodic complex in 3.1</p> <p>α-small with respect to I in 2.4</p> <p>δ is compatible with γ in 4.1</p> <p>δ-dimension of Z in 8.5</p> <p>δ-functor from \mathcal{A} to \mathcal{D} in 3.6</p> <p>δ-functor in 11.1</p> <p>δ-invariant of A in 38.3</p> <p>δ-invariant of X at x in 38.7</p> <p>$\delta(\tau)$ in 40.2</p> <p>$\delta_j^n : [n-1] \rightarrow [n]$ in 2.1</p> <p>ℓ-adic cohomology in 102.8</p> <p>ℓ-adic sheaf in 102.1</p> <p>ϵ-invariant in 43.15</p> <p>Ext-group in 6.2</p> <p>$\text{Hom}(U, V)$ in 14.1</p> <p>$\text{Hom}(U, V)$ in 15.1</p> <p>$\text{Hom}(U, V)$ in 17.1</p> <p>κ-generated in 23.1</p> <p>\mathbf{Z}_ℓ-sheaf in 102.1</p> <p>\mathcal{A}^0 in 18.3</p> <p>\mathcal{C}_Λ in 3.1</p> <p>\mathcal{F} is flat over S in dimensions $\geq n$ in 20.10</p>
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- \mathcal{F} is flat over Y in dimensions $\geq n$ in fs^{-1} in 26.12
- 11.3 f has relative dimension d at x in 32.1
- \mathcal{G} -torsor in 5.1 F is relatively representable over G in 8.2
- \mathcal{G} -torsor in 5.1
- \mathcal{I} is cofinal in \mathcal{J} in 17.1 f -ample in 35.1
- \mathcal{I} is initial in \mathcal{J} in 17.3 f -ample in 12.1
- \mathcal{K}_X in 23.1 F -crystal on X/S (relative to σ) in 26.2
- \mathcal{O}^* in 31.1 f -map $\varphi : \mathcal{G} \rightarrow \mathcal{F}$ in 17.8
- \mathcal{O}_1 -derivation in 25.1 f -map $\xi : \mathcal{G} \rightarrow \mathcal{F}$ in 21.7
- \mathcal{O}_1 -derivation in 32.1 f -relatively ample in 35.1
- \mathcal{O}_X -module in 7.1 f -relatively ample in 12.1
- \mathcal{S} is endowed with the topology inherited from \mathcal{C} in 10.2 f -relatively very ample in 36.1
- \mathcal{S}_F in 35.2 f -very ample in 36.1
- \mathcal{S}_F in 36.2 $f^{-1}\mathcal{S}$ in 12.9
- \mathcal{X} is relatively representable over \mathcal{Y} in 40.5 f_* in 4.19
- 40.5 $f_*\mathcal{S}$ in 12.4
- \mathfrak{g}_d^r in 3.1 G -equivariant quasi-coherent \mathcal{O}_X -module in 12.1
- ϕ lies over f in 31.2 G -equivariant quasi-coherent \mathcal{O}_X -module in 10.1
- $Sh(\mathcal{C})$ in 7.5 G -equivariant in 10.1
- $\sigma_j^n : [n+1] \rightarrow [n]$ in 2.1 G -equivariant in 8.1
- τ G -torsor in 11.3 G -invariant in 3.1
- τ G -torsor in 9.3 G -module in 56.1
- τ local on the base in 19.1 G -set in 2.1
- τ local on the base in 9.1 G -torsor in the τ topology in 11.3
- τ local on the source in 23.1 G -torsor in the τ topology in 9.3
- τ local on the source in 13.1 G -torsor in 11.3
- τ local on the target in 19.1 G -trace of f on P in 99.2
- τ local on the target in 9.1 G -Sets in 2.1
- τ torsor in 11.3 $g_!\mathcal{F} = (g_{p!}\mathcal{F})^\#$ in 16.1
- τ torsor in 9.3 $g_{p!}\mathcal{F}$ in 16.1
- τ -covering in 20.1 $H^{i+k}(A^\bullet) \rightarrow H^i(A[k]^\bullet)$ in 13.8
- $Adeq((Sch/S)_\tau, \mathcal{O})$ in 5.7 H_1 -Koszul-regular in 27.1
- $Adeq(\mathcal{O})$ in 5.7 H_1 -regular ideal in 29.1
- $Adeq(S)$ in 5.7 H_1 -regular immersion in 21.1
- $Fil^f(\mathcal{A})$ in 29.4 H_1 -regular immersion in 42.2
- \underline{U} in 12.3 H_1 -regular in 20.2
- φ -derivation in 25.1 $H_{i+k}(A_\bullet) \rightarrow H_i(A[k]_\bullet)$ in 13.2
- φ -derivation in 32.1 I -adically complete in 95.2
- $\widehat{\mathcal{C}}_\Lambda$ in 4.1 I -adically complete in 95.2
- A is a wedge of A_1, \dots, A_n in 39.4 I -depth in 71.1
- A -biderivation in 12.1 I -power torsion module in 77.1
- C in 4.9 i th extension group in 27.1
- C_r in 66.5 i th right derived functor $R^i F$ of F in 17.2
- $C_{S/R}$ in 145.2 k -cycle associated to \mathcal{F} in 11.2
- $d(M)$ in 58.8 k -cycle associated to Z in 10.2
- $D_c(X, \Lambda)$ in 96.1 k -cycle in 9.1
- $D_{ctf}(X, \Lambda)$ in 96.7

- k*-shifted chain complex $A[k]_{\bullet}$ in 13.1
- k*-shifted cochain complex $A[k]^{\bullet}$ in 13.7
- k*-shifted module in 4.3
- k*th Fitting ideal in 8.3
- L*-function of \mathcal{F} in 103.1
- L*-function of \mathcal{F} in 103.3
- $M \mapsto M^{\vee}$ in 52.5
- M*- H_1 -regular in 27.1
- M*-Koszul-regular in 27.1
- m*-pseudo-coherent relative to R in 72.4
- m*-pseudo-coherent relative to R in 72.4
- m*-pseudo-coherent relative to S in 48.2
- m*-pseudo-coherent relative to S in 48.2
- m*-pseudo-coherent relative to Y in 43.3
- m*-pseudo-coherent relative to Y in 43.3
- m*-pseudo-coherent in 60.1
- m*-pseudo-coherent in 60.1
- m*-pseudo-coherent in 41.1
- m*-pseudo-coherent in 41.1
- m*-pseudo-coherent in 37.1
- m*-pseudo-coherent in 37.1
- M*-quasi-regular in 68.1
- M*-regular sequence in I in 67.1
- M*-regular sequence in 67.1
- m*-regular in 34.6
- n*-simplex of U in 11.1
- n*-truncated simplicial object of \mathcal{C} in 12.1
- R*-bilinear in 11.1
- R*-derivation in 130.1
- R*-equivalent in 5.4
- R*-invariant in 19.1
- R*-invariant in 19.1
- R*-invariant in 19.1
- R*-invariant in 17.1
- R*-invariant in 17.1
- R*-invariant in 17.1
- R*-invariant in 17.1
- R*-invariant in 3.1
- R*-linear category \mathcal{A} in 17.1
- R*-linear in 17.2
- R*-linear in 11.1
- R*-module of finite presentation in 5.1
- R*-orbit in 5.1
- R*-orbit in 5.4
- R*-perfect in 74.1
- R*- G -module in 56.1
- $R_{(f)}$ in 26.3
- S is a finite type R -algebra in 6.1
- S*-birational in 46.11
- S*-derivation $D : \mathcal{O}_{X/S} \rightarrow \mathcal{F}$ in 12.1
- S*-derivation in 25.10
- S*-perfect in 31.1
- S*-pure in 16.1
- S*-pure in 16.1
- S*-rational map from X to Y in 46.1
- $s^{-1}f$ in 26.4
- T is proper over Y in 7.2
- U*-admissible blowup in 31.1
- U*-admissible blowup in 17.1
- x is a point of codimension d on X in 9.2
- x is an associated point of X in 2.2
- x is associated to \mathcal{F} in 2.2
- X is regular at x in 24.2
- x lies over U in 31.2
- $X_{spaces, \acute{e}tale}$ in 17.2
- Y is cartesian over X in 28.1
- Y*-derivation in 32.10
- Y*-perfect in 50.1
- Y*-pure in 3.1
- Y*-pure in 3.1
- Z is proper over S in 25.2
- 2-fibre product of f and g in 30.2
- 2-morphism from f to g in 35.1
- 2-morphism from f to g in 8.1
- étale at \mathfrak{q} in 141.1
- étale at $x \in X$ in 34.1
- étale at $x \in X$ in 11.4
- étale at x in 38.1
- étale covering of T in 4.1
- étale covering of X in 4.1
- étale covering in 4.1
- étale covering in 27.1
- étale equivalence relation in 9.2
- étale homomorphism of local rings in 11.1
- étale local on source-and-target in 29.3
- étale local on the source-and-target in 30.1
- étale local ring of S at \bar{s} in 33.2
- étale local ring of X at \bar{x} in 21.2
- étale local in 18.1
- étale neighborhood in 29.1
- étale neighborhood in 18.2
- étale neighbourhood of (S, s) in 31.1
- étale sheaf in 4.3
- étale topos in 21.1

- étale topoi* in 17.6
- étale-smooth local on source-and-target* in 20.1
- étale* in 141.1
- étale* in 34.1
- étale* in 17.2
- étale* in 11.4
- étale* in 26.1
- étale* in 15.2
- étale* in 34.1
- abelian presheaf over X* in 4.4
- abelian presheaf* in 9.1
- abelian sheaf on X* in 8.1
- abelian sheaves* in 11.4
- abelian variety* in 9.1
- abelian* in 5.1
- absolute frobenius of X* in 35.1
- absolute Galois group* in 55.1
- absolute ramification index* in 94.3
- absolutely flat* in 87.1
- absolutely flat* in 87.1
- absolutely flat* in 53.1
- absolutely integrally closed* in 12.1
- abuts to $H(K)$* in 20.6
- abuts to $H^*(K^\bullet)$* in 21.9
- abuts to $H^n(sK^\bullet)$* in 22.5
- abuts to $H^n(sK^\bullet)$* in 22.5
- action of G on the algebraic space X/B* in 8.1
- action of G on the scheme X/S* in 10.1
- acts freely* in 14.4
- acyclic for LF* in 16.3
- acyclic for RF* in 16.3
- acyclic* in 12.4
- acyclic* in 12.10
- additive* in 3.1
- additive* in 3.8
- adequate* in 3.2
- adequate* in 5.1
- adic constructible* in 24.1
- adic constructible* in 25.4
- adic lisse* in 24.1
- adic lisse* in 25.4
- adic morphism* in 17.1
- adic** in 5.7
- adic* in 33.1
- adic* in 5.7
- admissible epimorphism* in 7.1
- admissible monomorphism* in 7.1
- admissible relation* in 2.1
- admissible short exact sequence* in 7.1
- admissible* in 33.1
- admissible* in 2.1
- affine n -space over R* in 5.1
- affine n -space over S* in 5.1
- affine blowup algebra* in 69.1
- affine cone associated to \mathcal{A}* in 7.1
- affine formal algebraic space* in 5.1
- affine scheme* in 5.5
- affine variety* in 26.1
- affine* in 11.1
- affine* in 20.2
- affine* in 9.1
- algebraic k -scheme* in 20.1
- algebraic closure of k in K* in 26.9
- algebraic closure* in 10.3
- algebraic extension* in 8.1
- algebraic space over S* in 6.1
- algebraic space structure on Z* in 11.6
- algebraic stack over S* in 12.1
- algebraic stack structure on Z* in 10.4
- algebraic stack* in 5.1
- algebraically closed in K* in 26.9
- algebraically closed* in 10.1
- algebraically closed* in 10.3
- algebraically independent* in 26.1
- algebraic* in 8.1
- algebraic* in 28.1
- algebraic* in 55.1
- algebraic* in 8.1
- almost cocontinuous* in 41.3
- almost integral over R* in 36.3
- alteration of X* in 48.12
- alteration of X* in 5.3
- alternating Čech complex* in 24.1
- alternating Čech complex* in 6.2
- amalgamated sum* in 5.1
- ample on X/S* in 35.1
- ample on X/Y* in 12.1
- ample* in 26.1
- an f -power torsion module* in 77.1
- an ideal of definition of R* in 58.1
- analytically unramified* in 156.9
- analytically unramified* in 156.9
- annihilator of m* in 39.3
- annihilator of M* in 39.3

- approximation by perfect complexes holds* in 13.2
- approximation by perfect complexes holds* in 14.2
- approximation holds for the triple* in 13.1
- approximation holds for the triple* in 14.1
- arithmetic frobenius* in 86.8
- Artinian* in 52.1
- Artinian* in 6.16
- associated étale site* in 4.1
- associated fppf site* in 4.1
- associated graded ring* in 22.7
- associated morphism of fppf topoi* in 4.5
- associated points of X* in 2.1
- associated simple complex sA^\bullet* in 22.3
- associated smooth site* in 4.1
- associated syntomic site* in 4.1
- associated total complex* in 22.3
- associated Zariski site* in 4.1
- associated* in 62.1
- associated* in 2.1
- associates* in 119.1
- at-worst-nodal of relative dimension 1* in 20.2
- at-worst-nodal of relative dimension 1* in 53.1
- Atiyah class* in 16.1
- Atiyah class* in 18.1
- augmentation $\epsilon : U \rightarrow X$ of U towards an object X of \mathcal{C}* in 20.1
- auto-associated* in 13.1
- automorphism functor of x* in 19.5
- automorphisms of E over F* in 15.7
- automorphisms of E/F* in 15.7
- Bézout domain* in 98.5
- base change of F' to S* in 16.2
- base change* in 13.1
- base change* in 13.1
- base change* in 18.1
- base change* in 18.1
- base change* in 18.1
- base change* in 18.1
- base change* in 3.4
- base extension along f* in 4.15
- base for the topology on X* in 5.1
- base point* in 6.1
- basis for the topology on X* in 5.1
- big τ -site of S* in 20.4
- big τ -topos* in 21.1
- big étale site of S* in 4.8
- big étale site over S* in 27.3
- big étale site* in 4.6
- big affine étale site of S* in 4.8
- big affine fppf site of S* in 7.8
- big affine ph site of S* in 8.10
- big affine pro-étale site of S* in 11.12
- big affine smooth site of S* in 5.8
- big affine syntomic site of S* in 6.8
- big affine Zariski site of S* in 3.7
- big crystalline site* in 8.4
- big fppf site of S* in 7.8
- big fppf site* in 7.6
- big ph site of S* in 8.10
- big ph site* in 8.8
- big pro-étale site of S* in 11.12
- big pro-étale site* in 11.8
- big smooth site of S* in 5.8
- big smooth site* in 5.6
- big syntomic site of S* in 6.8
- big syntomic site* in 6.6
- big Zariski site of S* in 3.7
- big Zariski site* in 3.5
- big* in 27.3
- birational* in 46.11
- birational* in 47.1
- birational* in 21.1
- bivariant class c of degree p for f* in 32.1
- blowing up $X' \rightarrow X$ of X at x* in 4.1
- blowing up of X along Z* in 29.1
- blowing up of X along Z* in 15.1
- blowing up of X in the ideal sheaf \mathcal{I}* in 29.1
- blowing up of X in the ideal sheaf \mathcal{I}* in 15.1
- blowup algebra* in 69.1
- bounded above* in 21.7
- bounded above* in 8.1
- bounded below* in 21.7
- bounded below* in 8.1
- bounded derived category* in 11.3
- bounded filtered derived category* in 14.7
- bounded* in 21.7
- bounded* in 8.1
- bounds the degrees of the fibres of f* in 53.1
- Brauer group* in 5.2
- Brauer group* in 60.4

- canonical descent datum* in 3.5
- canonical descent datum* in 2.3
- canonical descent datum* in 31.10
- canonical descent datum* in 31.11
- canonical descent datum* in 3.3
- canonical descent datum* in 21.10
- canonical descent datum* in 21.11
- canonical scheme structure on T* in 25.3
- canonical section* in 14.1
- canonical topology* in 46.12
- Cartan-Eilenberg resolution* in 21.1
- cartesian* in 6.2
- cartesian* in 21.1
- cartesian* in 12.1
- cartesian* in 12.1
- cartesian* in 12.1
- cartesian* in 12.1
- cartesian* in 14.1
- cartesian* in 15.1
- cartesian* in 28.1
- Cartier divisor* in 46.1
- categorical moduli space in \mathcal{C}* in 12.1
- categorical moduli space* in 12.1
- categorical quotient in \mathcal{C}* in 4.1
- categorical quotient in schemes* in 4.1
- categorical quotient in the category of schemes* in 4.1
- categorical quotient* in 4.1
- category $\widehat{\mathcal{F}}$ of formal objects of \mathcal{F}* in 7.1
- category cofibered in groupoids over \mathcal{C}* in 5.1
- category fibred in discrete categories* in 37.2
- category fibred in setoids* in 38.2
- category fibred in sets* in 37.2
- category of (cochain) complexes* in 8.1
- category of complexes of \mathcal{A}* in 19.3
- category of cosimplicial objects of \mathcal{C}* in 5.1
- category of finite filtered objects of \mathcal{A}* in 14.1
- category of graded objects of \mathcal{A}* in 15.1
- category of groupoids in functors on \mathcal{C}* in 21.1
- category of sheaves of sets* in 11.4
- category of simplicial objects of \mathcal{C}* in 3.1
- category* in 2.1
- catenary* in 11.4
- catenary* in 104.1
- catenary* in 11.1
- catenary* in 17.1
- catenary* in 17.1
- centered* in 49.1
- center* in 29.1
- center* in 15.1
- central* in 2.4
- chain of irreducible closed subsets* in 10.1
- change of base of \mathcal{X}'* in 19.3
- characteristic* in 5.1
- chern classes of \mathcal{E} on X* in 34.1
- choice of pullbacks* in 32.6
- Chow cohomology* in 32.2
- Chow group of k -cycles modulo rational equivalence on X* in 20.1
- Chow group of k -cycles on X* in 20.1
- class group of A* in 21.3
- classical case* in 3.1
- classical generator* in 33.2
- classical* in 5.7
- closed immersion of ringed spaces* in 13.1
- closed immersion* in 42.7
- closed immersion* in 4.1
- closed immersion* in 10.2
- closed immersion* in 12.1
- closed immersion* in 20.1
- closed immersion* in 9.1
- closed subgroup scheme* in 4.3
- closed subscheme* in 10.2
- closed subspace of X associated to the sheaf of ideals \mathcal{I}* in 4.4
- closed subspace* in 12.1
- closed substack* in 9.8
- closed subtopos* in 42.6
- closed* in 17.2
- closed* in 9.2
- closed* in 13.2
- closed* in 6.22
- coarse quotient in schemes* in 6.1
- coarse quotient* in 6.1
- cocartesian* in 9.2
- cocontinuous* in 19.1
- cocycle condition* in 3.1
- cocycle condition* in 2.1
- cocycle condition* in 3.1
- cocycle condition* in 31.1
- cocycle condition* in 3.1

- cocycle condition* in 21.1
- codimension* in 11.1
- codirected* in 20.1
- codirected* in 20.1
- coefficient ring* in 154.4
- coequalizer* in 11.1
- cofiltered* in 20.1
- cofiltered* in 20.1
- cofinal* in 17.1
- Cohen ring* in 154.5
- Cohen-Macaulay at x* in 20.1
- Cohen-Macaulay at x* in 26.2
- Cohen-Macaulay morphism* in 20.1
- Cohen-Macaulay morphism* in 26.2
- Cohen-Macaulay* in 102.1
- Cohen-Macaulay* in 102.12
- Cohen-Macaulay* in 103.1
- Cohen-Macaulay* in 103.6
- Cohen-Macaulay* in 8.1
- Cohen-Macaulay* in 11.2
- Cohen-Macaulay* in 27.1
- coherent \mathcal{O}_X -module* in 12.1
- coherent module* in 89.1
- coherent ring* in 89.1
- coherent* in 23.1
- coherent* in 12.1
- coherent* in 35.6
- cohomological δ -functor* in 11.1
- cohomological dimension of I in A* in 9.2
- cohomological* in 3.5
- cohomology modules* in 3.1
- cohomology modules* in 3.1
- coimage of f* in 3.9
- cokernel* in 3.9
- colimit* in 14.2
- colimit* in 2.3
- combinatorially equivalent* in 8.2
- commutative* in 3.4
- compact object* in 34.1
- compactly generated* in 34.5
- compatible with the differential graded structure* in 6.4
- compatible with the triangulated structure* in 5.1
- complete dévissage of $\mathcal{F}/X/S$ at x* in 5.2
- complete dévissage of $\mathcal{F}/X/S$ over s* in 5.1
- complete dévissage of $N/S/R$ at \mathfrak{q}* in 6.4
- complete dévissage of $N/S/R$ over \mathfrak{r}* in 6.2
- complete intersection (over k)* in 133.5
- complete intersection* in 8.5
- complete local ring* in 154.1
- completed tensor product* in 4.6
- completely normal* in 36.3
- completion $(U, R, s, t, c)^\wedge$ of (U, R, s, t, c)* in 22.2
- completion of \mathcal{F}* in 7.3
- completion of X along T* in 9.3
- complex* in 5.7
- composition $f \circ g$* in 15.1
- composition of φ and ψ* in 21.9
- composition of morphisms of germs* in 17.1
- composition of morphisms of ringed sites* in 6.1
- composition of morphisms of ringed spaces* in 25.3
- composition of morphisms of ringed topoi* in 7.1
- composition* in 28.1
- composition* in 14.4
- compositum of K and L in Ω* in 27.1
- computes* in 15.10
- computes* in 15.10
- condition (RS)* in 16.1
- condition (RS)* in 5.1
- condition (RS^*)* in 18.1
- conditions $(S1)$ and $(S2)$* in 10.1
- cone $\pi : C \rightarrow S$ over S* in 7.2
- cone associated to \mathcal{A}* in 7.1
- cone* in 9.1
- cone* in 6.1
- connected component* in 7.1
- connected component* in 6.26
- connected* in 16.1
- connected* in 7.1
- connected* in 6.26
- conormal algebra $\mathcal{C}_{Z/X,*}$ of Z in X* in 19.1
- conormal algebra $\mathcal{C}_{Z/X,*}$ of Z in X* in 6.1
- conormal algebra of f* in 19.1
- conormal algebra of i* in 6.1
- conormal module* in 145.2
- conormal sheaf $\mathcal{C}_{Z/X}$ of Z in X* in 30.1
- conormal sheaf $\mathcal{C}_{Z/X}$ of Z in X* in 5.1

- conormal sheaf of i* in 30.1
- conormal sheaf of i* in 5.1
- conormal sheaf of Z over X* in 7.2
- conormal sheaf of Z over X* in 15.5
- conservative* in 37.1
- constant presheaf with value A* in 3.2
- constant sheaf with value A* in 7.4
- constant sheaf with value A* in 63.1
- constant sheaf with value E* in 63.1
- constant sheaf with value M* in 63.1
- constant sheaf* in 42.1
- constant sheaf* in 23.1
- constant sheaf* in 63.1
- constant sheaf* in 63.1
- constant sheaf* in 63.1
- constructible Λ -sheaf* in 24.1
- constructible* in 15.1
- constructible* in 70.1
- constructible* in 70.1
- constructible* in 70.1
- constructible* in 23.1
- constructible* in 25.1
- content ideal of x* in 22.1
- continuous group cohomology groups* in 56.2
- continuous* in 13.1
- contravariant* in 3.2
- converges to $H^*(K^\bullet)$* in 21.9
- converges to $H^n(sK^\bullet)$* in 22.5
- converges to $H^n(sK^\bullet)$* in 22.5
- coproduct* in 5.1
- coproduct* in 14.6
- coregular* in 21.7
- cosimplicial abelian group* in 5.1
- cosimplicial object U of \mathcal{C}* in 5.1
- cosimplicial set* in 5.1
- cotangent complex $L_{X/Y}$ of X over Y* in 23.1
- cotangent complex $L_{X/Y}$ of X over Y* in 25.1
- cotangent complex* in 3.2
- cotangent complex* in 17.2
- cotangent complex* in 19.1
- cotangent complex* in 21.1
- countably indexed* in 6.2
- coverings of \mathcal{C}* in 6.2
- coverings* in 10.2
- covering* in 3.1
- covering* in 3.1
- covers F* in 15.3
- crystal in $\mathcal{O}_{X/S}$ -modules* in 11.1
- crystal in finite locally free modules* in 11.3
- crystal in quasi-coherent modules* in 11.3
- crystalline site* in 9.1
- curve* in 42.1
- curve* in 66.9
- cycle on X* in 9.1
- decent* in 6.1
- decent* in 16.1
- decomposition group of \mathfrak{m}* in 93.10
- decreasing filtration* in 16.1
- Dedekind domain* in 119.14
- defined in a point $x \in X$* in 46.8
- defines a nodal singularity* in 16.2
- defines a nodal singularity* in 19.1
- defines a rational singularity* in 8.3
- deformation category* in 16.8
- degeneracy of x* in 11.1
- degenerates at E_r* in 17.2
- degenerate* in 11.1
- degree d finite Hilbert stack of \mathcal{X} over \mathcal{Y}* in 18.2
- degree of X over Y* in 48.8
- degree of X over Y* in 4.4
- degree of Z with respect to \mathcal{L}* in 44.10
- degree of a zero cycle* in 41.1
- degree of inseparability* in 14.7
- degree* in 7.1
- degree* in 45.1
- degree* in 43.1
- degree* in 43.1
- degree* in 45.2
- Deligne-Mumford stack* in 12.2
- depth k at a point* in 11.1
- depth k at a point* in 11.1
- depth* in 71.1
- derivation* in 130.1
- derived category of (A, d)* in 15.2
- derived category of \mathcal{A}* in 11.3
- derived category of \mathcal{O}_X -modules with quasi-coherent cohomology sheaves* in 4.1
- derived category of \mathcal{O}_X -modules with quasi-coherent cohomology sheaves* in 5.1
- derived colimit* in 31.1
- derived complete with respect to \mathcal{I}* in 11.4

- derived complete with respect to I* in 80.4
- derived complete with respect to I* in 80.4
- derived limit* in 32.1
- derived tensor product* in 55.15
- derived tensor product* in 27.13
- derived tensor product* in 18.12
- descent datum $(\mathcal{F}_i, \varphi_{ij})$ for quasi-coherent sheaves* in 2.1
- descent datum $(\mathcal{F}_i, \varphi_{ij})$ for quasi-coherent sheaves* in 3.1
- descent datum (N, φ) for modules with respect to $R \rightarrow A$* in 3.1
- descent datum (V_i, φ_{ij}) relative to the family $\{X_i \rightarrow S\}$* in 31.3
- descent datum (V_i, φ_{ij}) relative to the family $\{X_i \rightarrow X\}$* in 21.3
- descent datum (X_i, φ_{ij}) in \mathcal{S} relative to the family $\{f_i : U_i \rightarrow U\}$* in 3.1
- descent datum for $V/X/S$* in 31.1
- descent datum for $V/Y/X$* in 21.1
- descent datum relative to $X \rightarrow S$* in 31.1
- descent datum relative to $Y \rightarrow X$* in 21.1
- descent datum* in 16.1
- descent datum* in 16.5
- descent morphism for modules* in 4.15
- determinant of (M, φ, ψ)* in 4.1
- determinant of the finite length R -module M* in 2.1
- differential $d\varphi : T\mathcal{F} \rightarrow T\mathcal{G}$ of φ* in 12.3
- differential graded algebra over R* in 3.1
- differential graded category \mathcal{A} over R* in 19.1
- differential graded direct sum* in 19.4
- differential graded module* in 4.1
- differential object* in 19.1
- differential operator $D : \mathcal{F} \rightarrow \mathcal{G}$ of order k* in 33.1
- differential operator $D : M \rightarrow N$ of order k* in 131.1
- different* in 8.1
- dimension function* in 20.1
- dimension of \mathcal{X} at x* in 12.2
- dimension of X at x* in 10.1
- dimension of X at x* in 8.1
- dimension of the local ring of \mathcal{X} at x* in 6.3
- dimension of the local ring of X at x* in 9.2
- dimension of the local ring of the fibre of f at x* in 32.1
- dimension* in 10.1
- dimension* in 10.1
- dimension* in 8.2
- dimension* in 12.3
- direct image functor* in 24.1
- direct image functor* in 19.1
- direct image* in 35.1
- direct image* in 35.3
- direct sum dévissage* in 83.1
- direct sum* in 3.5
- directed inverse system* in 21.4
- directed partially ordered set* in 21.1
- directed set* in 21.1
- directed set* in 2.1
- directed system* in 21.4
- directed system* in 8.1
- directed* in 19.1
- directed* in 19.1
- discrete G -module* in 56.1
- discrete G -set* in 2.1
- discrete valuation ring* in 49.13
- discrete* in 37.1
- discriminant of L/K* in 20.8
- distance between M and M'* in 120.5
- distinguished triangle of $K(\mathcal{A})$* in 10.1
- distinguished triangles* in 3.2
- distinguished triangle* in 8.2
- divided power A -derivation* in 6.1
- divided power envelope of J in B relative to (A, I, γ)* in 2.2
- divided power ring* in 3.1
- divided power scheme* in 7.2
- divided power structure γ* in 7.1
- divided power structure* in 2.1
- divided power structure* in 6.1
- divided power thickening of X relative to (S, \mathcal{I}, γ)* in 8.1
- divided power thickening* in 5.2
- divided power thickening* in 7.3
- DM over S* in 4.2
- DM* in 4.1
- DM* in 4.2
- domain of definition* in 46.8
- domain* in 2.2
- dominant* in 8.1
- dominant* in 46.10

- dominant* in 18.1
- dominates* in 49.1
- dominates* in 87.2
- dotted arrow* in 38.1
- double complex* in 22.1
- dual numbers* in 16.1
- dual numbers* in 34.1
- dualizing complex normalized relative to ω_S^\bullet* in 21.5
- dualizing complex* in 15.1
- dualizing complex* in 2.2
- dualizing complex* in 2.2
- effective Cartier divisor* in 13.1
- effective Cartier divisor* in 6.1
- effective Cartier divisor* in 46.1
- effective descent morphism for modules* in 4.15
- effective epimorphism* in 12.1
- effective* in 3.5
- effective* in 2.3
- effective* in 3.4
- effective* in 31.10
- effective* in 31.11
- effective* in 16.1
- effective* in 16.6
- effective* in 3.3
- effective* in 21.10
- effective* in 21.11
- effective* in 9.4
- Eilenberg-MacLane object $K(A, k)$* in 22.3
- elementary étale localization of the ring map $R \rightarrow S$ at \mathfrak{q}* in 6.1
- elementary étale neighbourhood* in 31.1
- elementary étale neighbourhood* in 11.3
- elementary distinguished square* in 9.1
- elementary divisor domain* in 98.5
- elementary standard in A over R* in 2.3
- embedded associated point* in 4.1
- embedded associated primes* in 66.1
- embedded component* in 4.1
- embedded point* in 4.1
- embedded primes of R* in 66.1
- embedding dimension of X at x* in 45.1
- embedding dimension of X/k at x* in 45.2
- embedding* in 42.1
- enough P objects* in 39.2
- enough injectives* in 24.4
- enough projectives* in 25.4
- enough weakly contractible objects* in 39.2
- epimorphism* in 13.1
- equalizer* in 10.1
- equidimensional* in 10.5
- equivalence of categories* in 2.17
- equivalence relation on U over B* in 4.1
- equivalence relation on U over S* in 3.1
- equivalent types* in 3.2
- equivalent* in 28.4
- equivalent* in 27.4
- equivalent* in 46.1
- equivalent* in 60.3
- equivariant quasi-coherent \mathcal{O}_X -module* in 12.1
- equivariant quasi-coherent \mathcal{O}_X -module* in 10.1
- equivariant* in 10.1
- equivariant* in 8.1
- essential extension of* in 2.1
- essential surjection* in 3.9
- essentially constant inverse system* in 22.2
- essentially constant system* in 22.2
- essentially constant* in 22.1
- essentially of finite presentation* in 53.1
- essentially of finite type* in 53.1
- essentially surjective* in 2.9
- essential* in 2.1
- essential* in 2.1
- Euler characteristic of \mathcal{F}* in 32.1
- Euler characteristic of \mathcal{F}* in 13.1
- Euler-Poincaré function* in 25.2
- everywhere defined* in 15.9
- everywhere defined* in 15.9
- exact at y* in 5.7
- exact couple* in 18.1
- exact functor* in 3.3
- exact sequences of graded modules* in 25.3
- exact* in 23.1
- exact* in 5.7
- exact* in 3.1
- excellent* in 49.1
- exceptional divisor* in 29.1
- exceptional divisor* in 15.1
- exhaustive* in 16.1
- existence part of the valuative criterion* in 38.10

- extends* in 4.1
- extension E of B by A* in 6.1
- extension $j_! \mathcal{F}$ of \mathcal{F} by 0* in 31.5
- extension $j_! \mathcal{F}$ of \mathcal{F} by e* in 31.5
- extension $j_{p!} \mathcal{F}$ of \mathcal{F} by 0* in 31.5
- extension $j_{p!} \mathcal{F}$ of \mathcal{F} by e* in 31.5
- extension by 0* in 31.5
- extension by 0* in 31.5
- extension by zero* in 19.1
- extension by zero* in 69.1
- extension by zero* in 69.1
- extension by zero* in 22.1
- extension by zero* in 22.1
- extension of \mathcal{F} by the empty set $j_! \mathcal{F}$* in 31.3
- extension of \mathcal{F} by the empty set $j_{p!} \mathcal{F}$* in 31.3
- extension of \mathcal{G} by the empty set* in 24.1
- extension of discrete valuation rings* in 93.1
- extension of valuation rings* in 97.1
- extremally disconnected* in 26.1
- face of x* in 11.1
- faithfully flat* in 38.1
- faithfully flat* in 38.1
- faithfully flat* in 9.1
- faithfully flat* in 9.3
- faithful* in 2.9
- family of morphisms with fixed target* in 6.1
- family of morphisms with fixed target* in 10.1
- fibre category* in 31.2
- fibre of f over s* in 18.4
- fibre product of V and W over U* in 7.1
- fibre product of V and W over U* in 10.1
- fibre product* in 6.1
- fibre product* in 17.1
- fibred category over \mathcal{C}* in 32.5
- fibred in groupoids* in 34.1
- fibres of f are universally bounded* in 53.1
- fibres of f are universally bounded* in 3.1
- field extension* in 6.2
- field of rational functions* in 46.6
- field* in 2.1
- filtered acyclic* in 14.2
- filtered acyclic* in 29.7
- filtered complex K^\bullet of \mathcal{A}* in 21.1
- filtered derived category of \mathcal{A}* in 14.5
- filtered derived functor* in 91.1
- filtered differential object* in 20.1
- filtered injective* in 26.1
- filtered injective* in 90.1
- filtered injective* in 29.3
- filtered object of \mathcal{A}* in 16.1
- filtered quasi-isomorphism* in 14.2
- filtered quasi-isomorphism* in 90.1
- filtered quasi-isomorphism* in 29.6
- filtered* in 19.1
- filtered* in 19.1
- final object* in 30.1
- final* in 12.1
- finer* in 46.8
- finite Tor-dimension* in 95.1
- finite R -module* in 5.1
- finite free* in 17.1
- finite global dimension* in 108.10
- finite injective dimension* in 64.1
- finite locally constant* in 42.1
- finite locally constant* in 63.1
- finite locally constant* in 63.1
- finite locally free of rank r* in 77.1
- finite locally free of rank r* in 14.1
- finite locally free* in 77.1
- finite locally free* in 14.1
- finite locally free* in 23.1
- finite locally free* in 45.1
- finite locally free* in 45.2
- finite locally free* in 21.1
- finite presentation at $x \in X$* in 20.1
- finite presentation at x* in 28.1
- finite presentation* in 6.1
- finite presentation* in 11.1
- finite presentation* in 20.1
- finite presentation* in 2.8
- finite projective dimension* in 108.2
- finite projective dimension* in 63.1
- finite tor dimension* in 61.1
- finite tor dimension* in 61.1
- finite tor dimension* in 42.1
- finite tor dimension* in 38.1
- finite type at $x \in X$* in 14.1
- finite type at x* in 23.1
- finite type point* in 15.3
- finite type point* in 25.2

- finite type point* in 18.2
- finite type* in 6.1
- finite type* in 9.1
- finite type* in 14.1
- finite type* in 18.1
- finitely generated R -module* in 5.1
- finitely generated field extension* in 6.6
- finitely presented R -module* in 5.1
- finitely presented relative to R* in 71.2
- finitely presented relative to S* in 47.1
- finite* in 7.1
- finite* in 7.1
- finite* in 2.1
- finite* in 16.1
- finite* in 42.1
- finite* in 44.2
- finite* in 10.1
- first order infinitesimal neighbourhood* in 5.1
- first order infinitesimal neighbourhood* in 12.1
- first order thickening* in 2.1
- first order thickening* in 9.1
- first order thickening* in 3.3
- flabby* in 13.1
- flasque* in 13.1
- flat (resp. faithfully flat)* in 9.1
- flat at $x \in X$* in 9.3
- flat at x over Y* in 30.2
- flat at x* in 16.3
- flat at x* in 18.1
- flat at x* in 29.1
- flat at x* in 25.2
- flat at a point $x \in X$* in 24.1
- flat base change property* in 7.1
- flat base change* in 3.4
- flat group scheme* in 4.4
- flat local complete intersection over R* in 134.1
- flat over $(Sh(\mathcal{D}), \mathcal{O}')$* in 30.3
- flat over S at a point $x \in X$* in 24.1
- flat over S* in 24.1
- flat over Y at $x \in X$* in 9.3
- flat over Y at a point $x \in X$* in 18.3
- flat over Y* in 18.3
- flat over Y* in 30.2
- flat pullback of α by f* in 15.1
- flat-fppf site* in 11.1
- flattening stratification* in 21.2
- flattening stratification* in 21.2
- flat* in 38.1
- flat* in 38.1
- flat* in 16.1
- flat* in 18.1
- flat* in 28.1
- flat* in 28.1
- flat* in 28.1
- flat* in 28.1
- flat* in 30.1
- flat* in 30.1
- flat* in 24.1
- flat* in 9.1
- flat* in 9.3
- flat* in 29.1
- flat* in 24.1
- formal algebraic space* in 7.1
- formal branches of \mathcal{X} through x_0* in 4.1
- formal object $\xi = (R, \xi_n, f_n)$ of \mathcal{F}* in 7.1
- formal object* in 9.1
- formal spectrum* in 5.9
- formally étale over R* in 146.1
- formally étale* in 8.1
- formally étale* in 13.1
- formally étale* in 16.1
- formally catenary* in 91.1
- formally principally homogeneous under G* in 11.1
- formally principally homogeneous under G* in 9.1
- formally smooth for the \mathfrak{n} -adic topology* in 34.3
- formally smooth over R* in 136.1
- formally smooth over R* in 34.1
- formally smooth* in 11.1
- formally smooth* in 13.1
- formally smooth* in 19.1
- formally smooth* in 8.1
- formally unramified over R* in 144.1
- formally unramified* in 6.1
- formally unramified* in 13.1
- formally unramified* in 14.1
- fppf covering of T* in 7.1
- fppf covering of X* in 7.1
- fppf sheaf* in 4.3
- fpqc covering of T* in 9.1
- fpqc covering of X* in 9.1

- fpqc covering* in 15.1
- free \mathcal{O} -module* in 17.1
- free abelian presheaf on \mathcal{G}* in 18.4
- free abelian presheaf* in 4.1
- free abelian sheaf* in 5.1
- free module* in 52.5
- free* in 10.2
- free* in 8.2
- full subcategory* in 2.10
- fully faithful* in 2.9
- function field* in 46.6
- functor of R -linear categories* in 17.2
- functor of differential graded categories over R* in 19.2
- functor of graded categories over R* in 18.2
- functorial injective embeddings* in 24.5
- functorial projective surjections* in 25.5
- functor* in 2.8
- functor* in 28.5
- fundamental group* in 6.1
- G -ring* in 47.1
- G -unramified at \mathfrak{q}* in 147.1
- G -unramified at $x \in X$* in 33.1
- G -unramified at x* in 37.1
- G -unramified* in 147.1
- G -unramified* in 33.1
- G -unramified* in 37.1
- Galois category* in 3.6
- Galois cohomology groups of K with coefficients in M* in 56.2
- Galois cohomology groups* in 56.2
- Galois group* in 21.3
- Galois* in 21.1
- Galois* in 28.1
- generalizations lift along f* in 19.3
- generalization* in 19.1
- generalization* in 6.22
- generalizing* in 19.3
- generated by r global sections* in 17.1
- generated by finitely many global sections* in 17.1
- generated by global sections* in 4.1
- generated by global sections* in 17.1
- generates the field extension* in 6.6
- generate* in 4.1
- generator* in 33.2
- generator* in 10.1
- generic point* in 8.4
- generic point* in 6.12
- genus* in 6.3
- genus* in 8.1
- geometric frobenius* in 86.4
- geometric frobenius* in 86.10
- geometric genus* in 11.1
- geometric point lying over x* in 18.1
- geometric point* in 29.1
- geometric point* in 18.1
- geometric quotient* in 10.1
- geometrically connected over k* in 47.3
- geometrically connected* in 7.1
- geometrically connected* in 9.1
- geometrically integral over k* in 48.1
- geometrically integral* in 9.1
- geometrically integral* in 11.1
- geometrically irreducible over k* in 46.4
- geometrically irreducible* in 8.1
- geometrically irreducible* in 10.1
- geometrically normal at x* in 10.1
- geometrically normal* in 159.2
- geometrically normal* in 10.1
- geometrically pointwise integral at x* in 9.1
- geometrically pointwise integral* in 9.1
- geometrically reduced at x* in 6.1
- geometrically reduced at x* in 8.1
- geometrically reduced over k* in 42.1
- geometrically reduced* in 6.1
- geometrically reduced* in 8.1
- geometrically regular at x* in 12.1
- geometrically regular over k* in 12.1
- geometrically regular* in 160.2
- geometrically unibranch at x* in 15.1
- geometrically unibranch at x* in 22.2
- geometrically unibranch at x* in 13.1
- geometrically unibranch* in 89.1
- geometrically unibranch* in 15.1
- geometrically unibranch* in 22.2
- gerbe over* in 11.4
- gerbe over* in 27.1
- gerbe* in 11.1
- gerbe* in 27.1
- germ of X at x* in 17.1
- global complete intersection over k* in 133.1
- global dimension* in 108.10

- global finite presentation* in 17.1
- global Lefschetz number* in 98.1
- global presentation* in 17.1
- global sections* in 44.1
- going down* in 40.1
- going up* in 40.1
- going-down theorem* in 23.1
- going-up theorem* in 23.1
- good quotient* in 9.1
- good reduction* in 14.8
- good stratification* in 28.2
- Gorenstein at x* in 26.2
- Gorenstein at x* in 27.2
- Gorenstein morphism* in 26.2
- Gorenstein morphism* in 27.2
- Gorenstein* in 21.1
- Gorenstein* in 21.1
- Gorenstein* in 25.1
- graded A -algebra* in 25.3
- graded category \mathcal{A} over R* in 18.1
- graded direct sum* in 18.4
- graded functor* in 18.2
- graded ideals* in 25.3
- graded module M over a graded A -algebra B* in 25.3
- graded module* in 25.2
- graded submodules* in 25.3
- Grassmannian over \mathbf{Z}* in 22.2
- Grassmannian over R* in 22.2
- Grassmannian over S* in 22.2
- Grothendieck abelian category* in 10.1
- group algebraic space over B* in 5.1
- group cohomology groups* in 56.2
- group of infinitesimal automorphisms of x' over x* in 19.1
- group of infinitesimal automorphisms of x_0* in 19.2
- group scheme over S* in 4.1
- groupoid in algebraic spaces over B* in 11.1
- groupoid in functors on \mathcal{C}* in 21.1
- groupoid over S* in 13.1
- groupoid scheme over S* in 13.1
- groupoid* in 2.5
- Gysin homomorphism* in 28.1
- H -projective* in 41.1
- H -quasi-projective* in 38.1
- has coproducts of pairs of objects* in 5.2
- has enough points* in 37.1
- has fibre products* in 6.3
- has products of pairs of objects* in 4.2
- has property (β)* in 16.1
- has property (β)* in 16.1
- has property \mathcal{P} at x* in 7.5
- has property \mathcal{P} at x* in 7.5
- has property \mathcal{P}* in 7.2
- has property \mathcal{P}* in 22.2
- has property \mathcal{P}* in 7.2
- has property \mathcal{P}* in 16.2
- has property \mathcal{P}* in 33.2
- has property \mathcal{Q} at x* in 22.6
- Hausdorff* in 6.6
- height* in 59.2
- henselian local ring of X at x* in 11.5
- henselian pair* in 10.1
- henselian* in 148.1
- henselian* in 32.2
- henselization of $\mathcal{O}_{S,s}$* in 33.2
- henselization of S at s* in 33.2
- henselization* in 150.3
- Herbrand quotient* in 3.2
- higher direct images* in 35.4
- Hilbert function* in 25.2
- Hilbert polynomial* in 58.6
- Hilbert polynomial* in 34.14
- Hilbert polynomial* in 25.2
- homogeneous spectrum $\text{Proj}(R)$* in 26.2
- homogeneous spectrum of \mathcal{A} over S* in 16.7
- homogeneous spectrum of \mathcal{A} over X* in 9.3
- homogeneous spectrum* in 56.1
- homogeneous spectrum* in 8.3
- homogeneous* in 26.1
- homological* in 3.5
- homology of K* in 4.1
- homology* in 19.3
- homomorphism of differential graded algebras* in 3.2
- homomorphism of differential graded modules* in 4.1
- homomorphism of divided power rings* in 3.1
- homomorphism of divided power thickenings* in 5.2
- homomorphism of systems* in 8.6

- homomorphism of topological groups* in 30.1
- homomorphism of topological modules* in 30.10
- homomorphism of topological modules* in 33.1
- homomorphism of topological rings* in 30.7
- homomorphism of topological rings* in 33.1
- homomorphisms of graded modules/rings* in 25.3
- homotopic* in 26.1
- homotopic* in 28.1
- homotopic* in 5.1
- homotopy between f and g* in 5.1
- homotopy category of \mathcal{A}* in 19.3
- homotopy category* in 5.3
- homotopy colimit* in 31.1
- homotopy connecting a and b* in 28.1
- homotopy connecting a to b* in 26.1
- homotopy equivalence* in 12.2
- homotopy equivalence* in 12.8
- homotopy equivalence* in 26.6
- homotopy equivalent* in 12.2
- homotopy equivalent* in 12.8
- homotopy equivalent* in 26.6
- homotopy limit* in 32.1
- horizontal* in 27.1
- horizontal* in 28.1
- hypercovering of \mathcal{G}* in 6.1
- hypercovering of X* in 3.3
- hypercovering* in 6.1
- ideal of definition* in 33.1
- ideal sheaf of denominators of s* in 23.15
- identifies local rings* in 3.1
- image of φ* in 3.5
- image of f* in 3.9
- image of the short exact sequence under the given δ -functor* in 3.6
- immediate specialization* in 20.1
- immersion* in 10.2
- immersion* in 12.1
- immersion* in 9.1
- impurity of \mathcal{F} above s* in 15.2
- impurity of \mathcal{F} above y* in 2.2
- ind-étale* in 7.1
- ind-quasi-affine* in 55.1
- ind-quasi-affine* in 55.1
- ind-Zariski* in 4.1
- indecomposable* in 5.5
- induced filtration* in 16.1
- induced filtration* in 20.4
- induced filtration* in 21.5
- inductive system over I in \mathcal{C}* in 21.2
- inertia fibred category $\mathcal{I}_{\mathcal{S}}$ of \mathcal{S}* in 33.2
- inertia group of \mathfrak{m}* in 93.10
- initial* in 12.1
- initial* in 17.3
- injective hull* in 5.1
- injective resolution of A* in 18.1
- injective resolution of K^\bullet* in 18.1
- injective-amplitude in $[a, b]$* in 64.1
- injective* in 16.2
- injective* in 16.2
- injective* in 3.1
- injective* in 11.1
- injective* in 5.3
- injective* in 24.1
- injective* in 52.1
- inseparable degree* in 14.7
- integral closure of \mathcal{O}_X in \mathcal{A}* in 50.2
- integral closure of \mathcal{O}_X in \mathcal{A}* in 46.2
- integral closure* in 35.9
- integral domain* in 2.2
- integral over I* in 37.1
- integral over R* in 35.1
- integrally closed* in 35.9
- integral* in 35.1
- integral* in 3.1
- integral* in 42.1
- integral* in 44.2
- integral* in 4.1
- integral* in 10.1
- integral* in 32.12
- interior* in 21.1
- intersect properly* in 13.5
- intersect properly* in 13.5
- intersection number* in 44.3
- intersection with the j th chern class of \mathcal{E}* in 35.1
- intersection with the first chern class of \mathcal{L}* in 24.1
- inverse image $f^{-1}(Z)$ of the closed subscheme Z* in 17.7

- inverse image $f^{-1}(Z)$ of the closed subspace Z* in 13.2
- inverse image* in 36.1
- inverse system over I in \mathcal{C}* in 21.2
- invertible \mathcal{O}_X -module* in 22.1
- invertible \mathcal{O}_X -module* in 39.1
- invertible module M* in 39.4
- invertible module* in 21.1
- invertible sheaf $\mathcal{O}_S(D)$ associated to D* in 14.1
- invertible sheaf $\mathcal{O}_X(D)$ associated to D* in 7.1
- invertible* in 96.1
- invertible* in 31.1
- irreducible component* in 8.1
- irreducible component* in 6.18
- irreducible* in 8.1
- irreducible* in 119.1
- irreducible* in 6.9
- irreducible* in 6.9
- is essentially constant* in 22.1
- isolated point* in 27.2
- isomorphism* in 2.4
- J -0* in 44.1
- J -1* in 44.1
- J -2* in 44.1
- J -2* in 18.1
- Jacobson ring* in 34.1
- Jacobson* in 18.1
- Jacobson* in 6.1
- Japanese* in 155.1
- Japanese* in 13.1
- K -flat* in 55.3
- K -flat* in 27.2
- K -flat* in 18.2
- K -injective* in 29.1
- Kähler different* in 6.1
- Kan complex* in 31.1
- Kan fibration* in 31.1
- Kaplansky dévissage* in 83.1
- Karoubian* in 4.1
- kernel of F* in 6.5
- kernel of H* in 6.5
- kernel of the functor F* in 9.5
- kernel* in 3.9
- Kolmogorov* in 8.4
- Koszul at x* in 51.2
- Koszul at x* in 46.1
- Koszul complex on f_1, \dots, f_r* in 26.2
- Koszul complex on f_1, \dots, f_r* in 21.2
- Koszul complex* in 26.1
- Koszul complex* in 21.1
- Koszul morphism* in 51.2
- Koszul morphism* in 46.1
- Koszul-regular ideal* in 29.1
- Koszul-regular immersion* in 21.1
- Koszul-regular immersion* in 42.2
- Koszul-regular* in 27.1
- Koszul-regular* in 20.2
- Koszul* in 43.1
- Krull dimension of X at x* in 10.1
- Krull dimension* in 10.1
- Krull dimension* in 59.1
- lattice in V* in 120.3
- left acyclic for F* in 16.3
- left adjoint* in 24.1
- left derivable* in 15.9
- left derived functor LF is defined at* in 15.2
- left derived functors of F* in 16.3
- left exact* in 23.1
- left multiplicative system* in 26.1
- Leibniz rule* in 130.1
- Leibniz rule* in 25.1
- Leibniz rule* in 32.1
- length* in 10.1
- length* in 51.1
- length* in 9.1
- lies over* in 29.1
- lies over* in 9.1
- lift of x along f* in 17.1
- lift* in 31.2
- lift* in 31.2
- limit preserving* in 3.1
- limit preserving* in 3.1
- limit preserving* in 11.1
- limit preserving* in 3.1
- limit* in 14.1
- limit* in 17.2
- limp* in 14.4
- linear series of degree d and dimension r* in 3.1
- linearly adequate* in 3.2
- linearly disjoint over k in Ω* in 27.2
- linearly topologized* in 33.1
- linearly topologized* in 33.1

- lisse-étale site* in 11.1
- lisse* in 102.1
- lisse* in 24.1
- local complete intersection morphism* in 51.2
- local complete intersection morphism* in 46.1
- local complete intersection morphism* in 43.1
- local complete intersection over k* in 133.1
- local complete intersection over k* in 29.1
- local complete intersection* in 30.2
- local complete intersection* in 8.5
- local homomorphism of local rings* in 17.1
- local in the τ -topology* in 12.1
- local isomorphism* in 3.1
- local Lefschetz number* in 98.2
- local on the base for the τ -topology* in 19.1
- local on the base for the τ -topology* in 9.1
- local on the source for the τ -topology* in 23.1
- local on the source for the τ -topology* in 13.1
- local ring map $\varphi : R \rightarrow S$* in 17.1
- local ring of X at x* in 2.1
- local ring of the fibre at \mathfrak{q}* in 111.5
- local ring* in 17.1
- localization morphism* in 24.1
- localization morphism* in 29.4
- localization morphism* in 19.1
- localization morphism* in 21.2
- localization of A with respect to S* in 9.2
- localization of the ringed site $(\mathcal{C}, \mathcal{O})$ at the object U* in 19.1
- localization of the ringed topos $(Sh(\mathcal{C}), \mathcal{O})$ at \mathcal{F}* in 21.2
- localization of the site \mathcal{C} at the object U* in 24.1
- localization of the topos $Sh(\mathcal{C})$ at \mathcal{F}* in 29.4
- localization* in 9.6
- locally P* in 4.2
- locally adic** in 15.5
- locally algebraic k -scheme* in 20.1
- locally closed immersion* in 10.2
- locally closed subspace* in 12.1
- locally closed substack* in 9.8
- locally connected* in 7.9
- locally constant* in 42.1
- locally constant* in 63.1
- locally constant* in 63.1
- locally constant* in 63.1
- locally constructible* in 15.1
- locally countably indexed* in 15.5
- locally finite* in 28.4
- locally finite* in 25.2
- locally finite* in 25.2
- locally free* in 77.1
- locally free* in 14.1
- locally free* in 23.1
- locally generated by r sections* in 23.1
- locally generated by sections* in 8.1
- locally generated by sections* in 23.1
- locally has finite tor dimension* in 42.1
- locally has finite tor dimension* in 38.1
- locally nilpotent* in 31.1
- locally Noetherian* in 9.1
- locally Noetherian* in 5.1
- locally Noetherian* in 15.5
- locally Noetherian* in 35.5
- locally of finite presentation over S* in 3.1
- locally of finite presentation* in 20.1
- locally of finite presentation* in 28.1
- locally of finite presentation* in 3.1
- locally of finite presentation* in 3.1
- locally of finite presentation* in 26.1
- locally of finite type* in 14.1
- locally of finite type* in 23.1
- locally of finite type* in 18.1
- locally of finite type* in 17.1
- locally of type P* in 13.2
- locally principal closed subscheme* in 13.1
- locally principal closed subspace* in 6.1
- locally projective* in 21.1
- locally projective* in 41.1
- locally projective* in 30.2
- locally quasi-coherent* in 11.1
- locally quasi-coherent* in 11.4
- locally quasi-compact* in 13.1
- locally quasi-finite* in 19.1
- locally quasi-finite* in 27.1
- locally quasi-finite* in 23.2
- locally quasi-projective* in 38.1
- locally ringed site* in 39.4

- locally ringed space* (X, \mathcal{O}_X) in 2.1
- locally ringed* in 39.6
- locally separated over S* in 13.2
- locally separated* in 3.1
- locally separated* in 3.1
- locally separated* in 4.2
- locally trivial* in 11.3
- locally trivial* in 9.3
- local* in 4.1
- local* in 13.1
- maximal Cohen-Macaulay* in 102.8
- McQuillan* in 5.7
- meromorphic function* in 23.1
- meromorphic section of \mathcal{F}* in 23.5
- minimal model* in 8.4
- minimal polynomial* in 9.1
- minimal* in 3.12
- minimal* in 14.4
- minimal* in 27.1
- miniversal* in 14.4
- Mittag-Leffler condition* in 28.2
- Mittag-Leffler directed system of modules* in 87.1
- Mittag-Leffler inverse system* in 85.1
- Mittag-Leffler* in 87.7
- mixed characteristic* in 94.3
- ML* in 28.2
- modification of X* in 48.11
- modification of X* in 5.1
- module of differentials* in 130.2
- module of differentials* in 25.3
- module of differentials* in 32.3
- module of Kähler differentials* in 130.2
- module of principal parts of order k* in 131.4
- module of principal parts of order k* in 33.4
- module-valued functor* in 3.1
- moduli stack of smooth proper curves of genus g* in 16.4
- moduli stack of smooth proper curves* in 16.4
- moduli stack of stable curves of genus g* in 22.4
- moduli stack of stable curves* in 22.4
- monomorphism* in 13.1
- monomorphism* in 23.1
- monomorphism* in 10.1
- monomorphism* in 19.1
- monomorphism* in 8.1
- morphism* $(A, F) \rightarrow (B, F)$ of filtered objects in 16.1
- morphism* $(N, \varphi) \rightarrow (N', \varphi')$ of descent data in 3.1
- morphism* $(U, R, s, t, c) \rightarrow (U', R', s', t', c')$ of groupoids in functors on \mathcal{C} in 21.1
- morphism* $\psi : (\mathcal{F}_i, \varphi_{ij}) \rightarrow (\mathcal{F}'_i, \varphi'_{ij})$ of descent data in 2.1
- morphism* $\psi : (\mathcal{F}_i, \varphi_{ij}) \rightarrow (\mathcal{F}'_i, \varphi'_{ij})$ of descent data in 3.1
- morphism* $\psi : (G, m) \rightarrow (G', m')$ of group algebraic spaces over B in 5.1
- morphism* $\psi : (G, m) \rightarrow (G', m')$ of group schemes over S in 4.1
- morphism* $\psi : (V_i, \varphi_{ij}) \rightarrow (V'_i, \varphi'_{ij})$ of descent data in 31.3
- morphism* $\psi : (V_i, \varphi_{ij}) \rightarrow (V'_i, \varphi'_{ij})$ of descent data in 21.3
- morphism* $\psi : (X_i, \varphi_{ij}) \rightarrow (X'_i, \varphi'_{ij})$ of descent data in 3.1
- morphism* $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves of \mathcal{O} -modules on \mathcal{B} in 30.11
- morphism* $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves of \mathcal{O} -modules in 6.1
- morphism* $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves of \mathcal{O} -modules in 9.1
- morphism* $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves of sets on \mathcal{B} in 30.1
- morphism* $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves of sets on X in 3.1
- morphism* $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves with value in \mathcal{C} in 5.1
- morphism* $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves with values in \mathcal{C} on \mathcal{B} in 30.8
- morphism* $a : \xi \rightarrow \eta$ of formal objects in 7.1
- morphism* $f : (U, R, s, t, c) \rightarrow (U', R', s', t', c')$ of groupoid schemes over S in 13.1
- morphism* $f : (U, R, s, t, c) \rightarrow (U', R', s', t', c')$ of groupoids in algebraic spaces over B in 11.1
- morphism* $f : (V/X, \varphi) \rightarrow (V'/X, \varphi')$ of descent data relative to $X \rightarrow S$ in 31.1
- morphism* $f : (V/Y, \varphi) \rightarrow (V'/Y, \varphi')$ of descent data relative to $Y \rightarrow X$ in 21.1

- morphism $f : F \rightarrow F'$ of algebraic spaces over S* in 6.3
- morphism $f : p \rightarrow p'$* in 36.2
- morphism $f : X \rightarrow Y$ of schemes over S* in 18.1
- morphism from \mathcal{U} to \mathcal{V}* in 8.1
- morphism of δ -functors from F to G* in 11.2
- morphism of \mathcal{G} -torsors* in 5.1
- morphism of G -modules* in 56.1
- morphism of G -sets* in 2.1
- morphism of G -torsors* in 5.1
- morphism of n -truncated simplicial objects* in 12.1
- morphism of R - G -modules* in 56.1
- morphism of étale neighborhoods* in 29.1
- morphism of étale neighborhoods* in 18.2
- morphism of étale neighbourhoods* in 31.1
- morphism of abelian presheaves over X* in 4.4
- morphism of affine formal algebraic spaces* in 5.1
- morphism of affine schemes* in 5.5
- morphism of cones* in 7.2
- morphism of cosimplicial objects $U \rightarrow U'$* in 5.1
- morphism of differential objects* in 19.1
- morphism of divided power schemes* in 7.2
- morphism of divided power thickenings of X relative to (S, \mathcal{I}, γ)* in 8.1
- morphism of dotted arrows* in 38.1
- morphism of elementary étale neighbourhoods* in 11.3
- morphism of exact couples* in 18.1
- morphism of extensions* in 6.1
- morphism of families of maps with fixed target of \mathcal{C} from \mathcal{U} to \mathcal{V}* in 8.1
- morphism of formal algebraic spaces* in 7.1
- morphism of formal objects* in 9.1
- morphism of functors* in 2.15
- morphism of germs* in 17.1
- morphism of groupoid schemes cartesian over (U, R, s, t, c)* in 21.1
- morphism of lifts* in 17.1
- morphism of locally ringed sites* in 39.9
- morphism of locally ringed spaces* in 2.1
- morphism of locally ringed topoi* in 39.9
- morphism of module-valued functors* in 3.1
- morphism of Postnikov systems* in 37.1
- morphism of predeformation categories* in 6.2
- morphism of presheaves on \mathcal{X}* in 3.1
- morphism of pseudo \mathcal{G} -torsors* in 5.1
- morphism of ringed sites* in 6.1
- morphism of ringed spaces* in 25.1
- morphism of ringed topoi* in 7.1
- morphism of schemes* in 9.1
- morphism of sheaves of \mathcal{O} -modules* in 10.1
- morphism of sheaves of \mathcal{O} -modules* in 10.1
- morphism of sheaves of sets on \mathcal{B}* in 30.2
- morphism of sheaves of sets* in 7.1
- morphism of simplicial objects $U \rightarrow U'$* in 3.1
- morphism of simplicial systems of the derived category of modules* in 15.1
- morphism of simplicial systems of the derived category* in 14.1
- morphism of sites* in 14.1
- morphism of spectral sequences* in 17.1
- morphism of thickenings* in 2.1
- morphism of thickenings* in 9.1
- morphism of thickenings* in 3.1
- morphism of topoi* in 15.1
- morphism of triangles* in 3.1
- morphism of vector bundles over S* in 6.2
- Morphisms of presheaves* in 2.1
- morphisms of thickenings over \mathcal{Z}* in 3.1
- morphisms of thickenings over B* in 9.1
- morphisms of thickenings over S* in 2.1
- morphisms of type \mathcal{P} satisfy descent for τ -coverings* in 33.1
- morphism* in 2.2
- morphism* in 102.1
- multicross singularity* in 16.2
- multiplicative subset of R* in 9.1
- multiplicative system* in 26.1
- multiplicity of M for the ideal of definition I* in 15.1
- multiplicity of Z' in \mathcal{F}* in 11.2
- multiplicity of Z' in Z* in 10.2

- multiplicity of a formal branch of \mathcal{X} through x_0* in 4.3
- multiplicity* in 3.2
- multiplicity* in 3.4
- N-1* in 155.1
- N-2* in 155.1
- Nagata ring* in 156.1
- Nagata* in 13.1
- naive cotangent complex of f* in 13.1
- naive cotangent complex of f* in 21.1
- naive cotangent complex* in 132.1
- naive cotangent complex* in 26.1
- naive cotangent complex* in 26.6
- naive cotangent complex* in 34.1
- naive cotangent complex* in 34.4
- naive obstruction theory* in 22.5
- natural transformation* in 2.15
- nilpotent* in 31.1
- node* in 16.2
- node* in 19.1
- Noetherian* in 9.1
- Noetherian* in 5.1
- Noetherian* in 23.1
- Noetherian* in 5.7
- Noetherian* in 8.1
- Noetherian* in 6.16
- Noetherian* in 35.5
- nondegenerate* in 26.2
- nonsingular projective model of X* in 2.7
- nonsingular* in 9.1
- nontrivial solution* in 66.5
- normal at x* in 18.1
- normal bundle* in 19.5
- normal bundle* in 6.5
- normal closure E over F* in 16.4
- normal cone $C_Z X$* in 19.5
- normal cone $C_Z X$* in 6.5
- normal crossings divisor* in 21.4
- normal morphism* in 18.1
- normalization of X in Y* in 50.3
- normalization of X in Y* in 46.3
- normalization* in 51.1
- normalization* in 47.3
- normalized blowup of X at x* in 5.1
- normalized blowup of X at x* in 5.1
- normalized* in 27.1
- normal* in 15.1
- normal* in 28.1
- normal* in 36.1
- normal* in 36.11
- normal* in 7.1
- norm* in 20.1
- nowhere dense* in 21.1
- number field* in 7.8
- number of branches of A* in 89.6
- number of branches of X at x* in 15.4
- number of branches of X at x* in 23.4
- number of geometric branches of \mathcal{X} at x* in 13.1
- number of geometric branches of A* in 89.6
- number of geometric branches of X at x* in 15.4
- number of geometric branches of X at x* in 22.4
- numerical polynomial* in 57.3
- numerical polynomial* in 25.1
- numerical type associated to X* in 11.4
- numerical type of genus g* in 3.4
- numerical type* in 3.1
- obstruction modules* in 21.1
- obstruction theory* in 21.1
- obstruction* in 21.1
- of finite presentation relative to S* in 47.1
- of finite presentation* in 23.1
- of finite presentation* in 28.1
- of finite presentation* in 26.1
- of finite type* in 23.1
- of finite type* in 23.1
- of finite type* in 17.1
- Oka family* in 27.2
- one step dévissage of $\mathcal{F}/X/S$ at x* in 4.2
- one step dévissage of $\mathcal{F}/X/S$ over s* in 4.1
- open immersion* in 42.7
- open immersion* in 3.1
- open immersion* in 10.2
- open immersion* in 12.1
- open immersion* in 9.1
- open subgroup scheme* in 4.3
- open subscheme* in 10.2
- open subspace of (X, \mathcal{O}) associated to U* in 31.2
- open subspace of X associated to U* in 3.3
- open subspace* in 12.1

- open substack* in 9.8
- open subtopos* in 42.4
- openness of versality* in 13.1
- openness of versality* in 13.1
- open* in 22.1
- open* in 111.1
- open* in 6.2
- open* in 11.2
- opposite algebra* in 2.5
- opposite category* in 3.1
- opposite differential graded algebra* in 3.3
- orbit space for R* in 5.18
- orbit* in 5.1
- orbit* in 5.4
- order of vanishing along R* in 120.2
- order of vanishing of f along Z* in 24.3
- order of vanishing of s along Z* in 25.1
- ordered Čech complex* in 24.2
- ordinary double point* in 16.2
- ordinary double point* in 19.1
- p -basis of K over k* in 43.1
- p -independent over k* in 43.1
- parasitic for the τ -topology* in 9.1
- parasitic* in 9.1
- parasitic* in 8.1
- partial order* in 21.1
- partially ordered set* in 21.1
- partition* in 28.1
- parts* in 28.1
- perfect at x* in 45.1
- perfect closure* in 44.5
- perfect relative to R* in 74.1
- perfect relative to S* in 31.1
- perfect relative to Y* in 50.1
- perfect ring map* in 73.1
- perfect* in 44.1
- perfect* in 67.1
- perfect* in 67.1
- perfect* in 43.1
- perfect* in 43.1
- perfect* in 39.1
- perfect* in 39.1
- perfect* in 50.2
- perfect* in 93.1
- perfect* in 45.1
- ph covering of T* in 8.4
- ph covering of X* in 8.1
- Picard functor* in 4.1
- Picard group of A* in 21.3
- Picard group of T* in 4.1
- Picard group of X* in 39.7
- Picard group* in 22.9
- Picard group* in 31.6
- PID* in 119.12
- point p of the site \mathcal{C}* in 31.2
- point p* in 51.1
- point of the topos $Sh(\mathcal{C})$* in 31.1
- point* in 4.1
- point* in 4.2
- Postnikov system* in 37.1
- pre-adic* in 33.1
- pre-admissible* in 33.1
- pre-equivalence relation* in 3.1
- pre-equivalence relation* in 4.1
- pre-relation* in 3.1
- pre-relation* in 4.1
- pre-triangulated category* in 3.2
- pre-triangulated subcategory* in 3.4
- preadditive* in 3.1
- predeformation category* in 6.2
- preordered set* in 21.1
- preorder* in 21.1
- presentation of \mathcal{F} by (U, R, s, t, c)* in 25.1
- presentation* in 9.3
- presentation* in 16.5
- preserved under arbitrary base change* in 18.3
- preserved under arbitrary base change* in 18.3
- preserved under base change* in 18.3
- preserved under base change* in 18.3
- presheaf \mathcal{F} of sets on \mathcal{B}* in 30.1
- presheaf \mathcal{F} of sets on X* in 3.1
- presheaf \mathcal{F} on X with values in \mathcal{C}* in 5.1
- presheaf \mathcal{F} with values in \mathcal{C} on \mathcal{B}* in 30.8
- presheaf of \mathcal{O} -modules \mathcal{F} on \mathcal{B}* in 30.11
- presheaf of \mathcal{O} -modules* in 6.1
- presheaf of \mathcal{O} -modules* in 9.1
- presheaf of abelian groups on X* in 4.4
- presheaf of isomorphisms from x to y* in 2.2
- presheaf of modules on \mathcal{X}* in 7.1
- presheaf of morphisms from x to y* in 2.2
- presheaf of sets on \mathcal{C}* in 3.3
- presheaf of sets* in 2.1
- presheaf of sets* in 9.1

- presheaf on \mathcal{X}* in 3.1
- presheaf* in 3.3
- presheaf* in 2.2
- prestable family of curves* in 20.1
- prime divisor* in 24.2
- prime divisor* in 46.1
- prime subfield of F* in 5.1
- prime* in 119.1
- principal divisor associated to f* in 18.1
- principal homogeneous G -space over B* in 9.3
- principal homogeneous space* in 11.3
- principal homogeneous space* in 9.3
- principal ideal domain* in 119.12
- principal Weil divisor associated to f* in 24.5
- pro-étale covering of T* in 11.1
- product $U \times V$ exists* in 13.1
- product $U \times V$ of U and V* in 13.1
- product category* in 2.20
- product of U and V* in 6.1
- product of U and V* in 9.1
- product* in 4.1
- product* in 14.5
- profinite group* in 30.5
- profinite* in 22.1
- projective n -space over \mathbf{Z}* in 13.2
- projective n -space over R* in 13.2
- projective n -space over S* in 13.2
- projective bundle associated to \mathcal{E}* in 21.1
- projective cover* in 4.1
- projective dimension* in 108.2
- projective envelope* in 4.1
- projective resolution of A* in 19.1
- projective resolution of K^\bullet* in 19.1
- projective system over I in \mathcal{C}* in 21.2
- projective variety* in 26.1
- projective-amplitude in $[a, b]$* in 63.1
- projective* in 76.1
- projective* in 25.1
- projective* in 41.1
- projective* in 90.1
- proper variety* in 26.1
- property \mathcal{P}* in 5.1
- property \mathcal{P}* in 4.1
- property \mathcal{P}* in 10.1
- proper* in 17.2
- proper* in 39.1
- proper* in 39.1
- proper* in 24.1
- proper* in 36.1
- prorepresentable* in 6.1
- prorepresentable* in 22.1
- pseudo \mathcal{G} -torsor* in 5.1
- pseudo G -torsor* in 11.1
- pseudo G -torsor* in 9.1
- pseudo functor* in 28.5
- pseudo torsor* in 5.1
- pseudo-catenary* in 5.14
- pseudo-coherent at x* in 44.1
- pseudo-coherent relative to R* in 72.4
- pseudo-coherent relative to R* in 72.4
- pseudo-coherent relative to S* in 48.2
- pseudo-coherent relative to S* in 48.2
- pseudo-coherent relative to Y* in 43.3
- pseudo-coherent relative to Y* in 43.3
- pseudo-coherent ring map* in 73.1
- pseudo-coherent* in 60.1
- pseudo-coherent* in 60.1
- pseudo-coherent* in 41.1
- pseudo-coherent* in 41.1
- pseudo-coherent* in 37.1
- pseudo-coherent* in 37.1
- pseudo-coherent* in 49.2
- pseudo-coherent* in 44.1
- pullback $x^{-1}\mathcal{F}$ of \mathcal{F}* in 9.2
- pullback functor* in 32.6
- pullback functor* in 3.4
- pullback functor* in 31.7
- pullback functor* in 31.9
- pullback functor* in 21.7
- pullback functor* in 21.9
- pullback of \mathcal{S} along f* in 12.9
- pullback of D by f is defined* in 13.12
- pullback of D by f is defined* in 6.10
- pullback of S by f* in 46.4
- pullback of the effective Cartier divisor* in 13.12
- pullback of the effective Cartier divisor* in 6.10
- pullbacks of meromorphic functions are defined for f* in 23.3
- pullback* in 26.1
- pullback* in 13.1
- pullback* in 3.3
- pullback* in 36.1

- pullback* in 4.3
- pure above y* in 3.1
- pure above y* in 3.1
- pure along X_s* in 16.1
- pure along X_s* in 16.1
- pure extension module* in 8.8
- pure injective resolution* in 8.5
- pure injective* in 8.1
- pure projective resolution* in 8.5
- pure projective* in 8.1
- pure relative to S* in 16.1
- pure relative to S* in 16.1
- pure relative to Y* in 3.1
- pure relative to Y* in 3.1
- purely inseparable* in 14.1
- purely inseparable* in 14.1
- purely inseparable* in 28.1
- purely transcendental extension* in 26.1
- pure* in 107.1
- pushforward of \mathcal{S} along f* in 12.4
- pushforward* in 26.1
- pushforward* in 43.1
- pushforward* in 13.1
- pushforward* in 13.1
- pushforward* in 35.1
- pushforward* in 35.3
- pushout of V and W over U* in 8.1
- pushout* in 9.1
- qc covering* in 25.2
- quasi-affine* in 18.1
- quasi-affine* in 12.1
- quasi-affine* in 21.2
- quasi-coherent \mathcal{O}_X -module* in 11.1
- quasi-coherent module on (U, R, s, t, c)* in 14.1
- quasi-coherent module on (U, R, s, t, c)* in 12.1
- quasi-coherent module on X* in 11.1
- quasi-coherent sheaf of \mathcal{O}_X -modules* in 10.1
- quasi-coherent* in 23.1
- quasi-coherent* in 17.2
- quasi-coherent* in 11.1
- quasi-coherent* in 28.1
- quasi-coherent* in 35.1
- quasi-compact* in 12.1
- quasi-compact* in 12.1
- quasi-compact* in 17.1
- quasi-compact* in 17.4
- quasi-compact* in 17.4
- quasi-compact* in 19.1
- quasi-compact* in 5.1
- quasi-compact* in 8.2
- quasi-compact* in 12.2
- quasi-compact* in 12.4
- quasi-compact* in 6.1
- quasi-compact* in 7.2
- quasi-compact* in 6.4
- quasi-DM over S* in 4.2
- quasi-DM* in 4.1
- quasi-DM* in 4.2
- quasi-excellent* in 49.1
- quasi-finite at \mathfrak{q}* in 121.3
- quasi-finite at x* in 27.1
- quasi-finite at a point $x \in X$* in 19.1
- quasi-finite* in 121.3
- quasi-finite* in 19.1
- quasi-finite* in 27.1
- quasi-inverse* in 2.17
- quasi-isomorphism* in 12.4
- quasi-isomorphism* in 12.10
- quasi-isotrivial* in 11.3
- quasi-isotrivial* in 9.3
- quasi-projective variety* in 26.1
- quasi-projective* in 38.1
- quasi-proper* in 17.2
- quasi-regular ideal* in 29.1
- quasi-regular immersion* in 21.1
- quasi-regular immersion* in 42.2
- quasi-regular sequence* in 68.1
- quasi-regular* in 20.2
- quasi-separated over S* in 13.2
- quasi-separated over S* in 4.2
- quasi-separated* in 21.3
- quasi-separated* in 21.3
- quasi-separated* in 3.1
- quasi-separated* in 3.1
- quasi-separated* in 4.2
- quasi-separated* in 11.3
- quasi-separated* in 23.1
- quasi-separated* in 4.1
- quasi-separated* in 4.2
- quasi-sober* in 8.4
- quasi-split over u* in 15.1
- quasi-splitting of R over u* in 15.1
- quotient category \mathcal{D}/\mathcal{B}* in 6.7

- quotient category cofibered in groupoids*
- $[U/R] \rightarrow \mathcal{C}$ in 21.9
- quotient filtration* in 16.1
- quotient functor* in 6.7
- quotient morphism* $U \rightarrow [U/R]$ in 21.9
- quotient of U by G* in 14.4
- quotient representable by an algebraic space* in 18.3
- quotient representable by an algebraic space* in 18.3
- quotient sheaf U/R* in 20.1
- quotient sheaf U/R* in 18.1
- quotient stack* in 19.1
- quotient stack* in 19.1
- quotient* in 5.3
- radicial* in 10.1
- radicial* in 3.1
- ramification index* in 93.1
- rank r* in 31.1
- rank* in 101.5
- rank* in 45.1
- rank* in 45.2
- rational function on X* in 46.3
- rational map from X to Y* in 46.1
- rationally equivalent to zero* in 20.1
- rationally equivalent* in 20.1
- reasonable* in 6.1
- reasonable* in 16.1
- reduced induced algebraic space structure* in 11.6
- reduced induced algebraic stack structure* in 10.4
- reduced induced scheme structure* in 12.5
- reduced* in 12.1
- reduction \mathcal{X}_{red} of \mathcal{X}* in 10.4
- reduction X_{red} of X* in 12.5
- reduction X_{red} of X* in 11.6
- reduction to rational singularities is possible for A* in 8.3
- Rees algebra* in 69.1
- refinement* in 8.1
- refines* in 28.1
- reflexive hull* in 21.7
- reflexive hull* in 12.1
- reflexive* in 21.1
- reflexive* in 12.1
- regular at x* in 19.1
- regular ideal* in 29.1
- regular immersion* in 21.1
- regular in codimension $\leq k$* in 151.1
- regular in codimension k* in 12.1
- regular local ring* in 59.9
- regular locus* in 14.1
- regular morphism* in 19.1
- regular section* in 14.6
- regular section* in 7.4
- regular sequence* in 67.1
- regular system of parameters* in 59.9
- regular* in 109.7
- regular* in 21.7
- regular* in 38.1
- regular* in 9.1
- regular* in 20.2
- regular* in 23.11
- relation* in 8.11
- relation* in 3.1
- relation* in 4.1
- relative H_1 -regular immersion* in 22.2
- relative assassin of \mathcal{F} in X over S* in 7.1
- relative assassin of N over S/R* in 64.2
- relative cotangent space* in 3.6
- relative dimension $\leq d$ at x* in 28.1
- relative dimension $\leq d$* in 28.1
- relative dimension $\leq d$* in 32.2
- relative dimension d* in 28.1
- relative dimension d* in 32.2
- relative dimension of S/R at \mathfrak{q}* in 124.1
- relative dimension of* in 124.1
- relative dimension* in 5.7
- relative dualizing complex* in 26.1
- relative dualizing complex* in 28.1
- relative dualizing complex* in 9.1
- relative dualizing sheaf* in 19.2
- relative effective Cartier divisor* in 18.2
- relative Frobenius morphism of X/S* in 35.4
- relative global complete intersection* in 134.5
- relative homogeneous spectrum of \mathcal{A} over S* in 16.7
- relative homogeneous spectrum of \mathcal{A} over X* in 9.3
- relative inertia of \mathcal{S} over \mathcal{S}'* in 33.2
- relative Proj of \mathcal{A} over S* in 16.7
- relative Proj of \mathcal{A} over X* in 9.3
- relative quasi-regular immersion* in 22.2

- relative sheaf of automorphisms of x in* 5.3
- relative sheaf of isomorphisms from x_1 to x_2 in* 5.3
- relative spectrum of \mathcal{A} over S in* 4.5
- relative spectrum of \mathcal{A} over X in* 20.8
- relative weak assassin of \mathcal{F} in X over S in* 8.1
- relative weak assassin of \mathcal{F} in X over Y in* 4.5
- relatively ample in* 35.1
- relatively ample in* 12.1
- relatively limit preserving in* 3.1
- relatively prime in* 11.1
- relatively very ample in* 36.1
- representable by a scheme in* 15.1
- representable by algebraic spaces in* 3.1
- representable by algebraic spaces in* 9.1
- representable by an algebraic space over S in* 8.1
- representable by open immersions in* 15.3
- representable quotient in* 20.2
- representable quotient in* 20.2
- representable quotient in* 18.3
- representable quotient in* 18.3
- representable sheaves in* 12.3
- representable in* 3.6
- representable in* 6.4
- representable in* 8.2
- representable in* 39.1
- representable in* 40.5
- representable in* 15.1
- representable in* 21.4
- residual degree in* 93.1
- residual degree in* 97.1
- residual gerbe of \mathcal{X} at x exists in* 11.8
- residual gerbe of \mathcal{X} at x in* 11.8
- residual space of X at x in* 12.6
- residue degree in* 93.1
- residue degree in* 97.1
- residue field of X at x in* 2.1
- resolution functor in* 23.2
- resolution of M by finite free R -modules in* 70.2
- resolution of M by free R -modules in* 70.2
- resolution of singularities by normalized blowups in* 14.2
- resolution of singularities by normalized blowups in* 8.2
- resolution of singularities in* 14.1
- resolution of singularities in* 8.1
- resolution in* 70.2
- restriction $(U, R, s, t, c)|_{\mathcal{C}'}$ of (U, R, s, t, c) to \mathcal{C}' in* 21.7
- restriction of (U, R, s, t, c) to U' in* 18.2
- restriction of (U, R, s, t, c) to U' in* 16.2
- restriction of \mathcal{F} to \mathcal{C}/U in* 24.1
- restriction of \mathcal{F} to \mathcal{C}/U in* 19.1
- restriction of \mathcal{F} to $U_{\text{étale}}$ in* 9.2
- restriction of \mathcal{G} to U in* 31.2
- restriction of \mathcal{G} to U in* 31.2
- restriction of \mathcal{G} to U in* 31.2
- restriction to the small étale site in* 4.14
- restriction to the small étale site in* 4.9
- restriction to the small pro-étale site in* 11.18
- restriction to the small Zariski site in* 3.14
- restriction in* 3.3
- restriction in* 4.3
- retrocompact in* 12.1
- rig-étale in* 5.2
- rig-surjective in* 9.1
- right acyclic for F in* 16.3
- right adjoint in* 24.1
- right derivable in* 15.9
- right derived functor RF is defined at in* 15.2
- right derived functors of F in* 16.3
- right exact in* 23.1
- right multiplicative system in* 26.1
- ring of rational functions on X in* 46.4
- ringed site in* 6.1
- ringed site in* 17.2
- ringed space in* 25.1
- ringed topos in* 7.1
- satisfies the existence part of the valuative criterion in* 20.3
- satisfies the existence part of the valuative criterion in* 40.1
- satisfies the sheaf property for the fpqc topology in* 9.12
- satisfies the sheaf property for the fpqc topology in* 15.5

- satisfies the sheaf property for the given family* in 9.12
- satisfies the sheaf property for the Zariski topology* in 15.3
- satisfies the uniqueness part of the valuative criterion* in 20.3
- satisfies the uniqueness part of the valuative criterion* in 40.1
- satisfies the valuative criterion* in 40.1
- saturated* in 26.20
- saturated* in 6.1
- scheme over R* in 18.1
- scheme over S* in 18.1
- scheme structure on Z* in 12.5
- scheme theoretic closure of U in X* in 7.1
- scheme theoretic closure of U in X* in 17.3
- scheme theoretic fibre X_s of f over s* in 18.4
- scheme theoretic image* in 6.2
- scheme theoretic image* in 16.2
- scheme theoretic image* in 37.1
- scheme theoretic intersection* in 4.4
- scheme theoretic intersection* in 14.4
- scheme theoretic support of \mathcal{F}* in 5.5
- scheme theoretic support of \mathcal{F}* in 15.4
- scheme theoretic union* in 4.4
- scheme theoretic union* in 14.4
- scheme theoretically dense in X* in 7.1
- scheme theoretically dense in X* in 17.3
- scheme* in 9.1
- semi-representable objects over X* in 2.1
- semi-representable objects* in 2.1
- semistable family of curves* in 21.2
- semistable reduction* in 14.6
- separable degree* in 12.6
- separable degree* in 14.7
- separable over k* in 41.1
- separable solution* in 95.2
- separable* in 12.2
- separable* in 12.2
- separable* in 12.2
- separable* in 28.1
- separably generated over k* in 41.1
- separated group scheme* in 4.4
- separated over S* in 13.2
- separated over S* in 4.2
- separated presheaf* in 11.1
- separated* in 4.1
- separated* in 11.2
- separated* in 10.9
- separated* in 48.2
- separated* in 16.1
- separated* in 21.3
- separated* in 21.3
- separated* in 3.1
- separated* in 3.1
- separated* in 4.2
- separated* in 11.3
- separated* in 23.1
- separated* in 4.1
- separated* in 4.2
- separates R -orbits* in 5.8
- separates orbits* in 5.8
- Serre subcategory* in 9.1
- set-theoretic equivalence relation* in 5.13
- set-theoretic pre-equivalence relation* in 5.13
- set-theoretically R -invariant* in 19.1
- set-theoretically R -invariant* in 5.8
- setoid* in 38.1
- sheaf \mathcal{F} of \mathcal{O} -modules on \mathcal{B}* in 30.11
- sheaf \mathcal{F} of sets on \mathcal{B}* in 30.2
- sheaf \mathcal{F} of sets on X* in 7.1
- sheaf \mathcal{F} with values in \mathcal{C} on \mathcal{B}* in 30.8
- sheaf associated to \mathcal{F}* in 10.11
- sheaf associated to \mathcal{F}* in 48.4
- sheaf associated to the module M and the ring map α* in 10.6
- sheaf associated to the module M* in 10.6
- sheaf for the étale topology* in 4.3
- sheaf for the fppf topology* in 4.3
- sheaf for the smooth topology* in 4.3
- sheaf for the syntomic topology* in 4.3
- sheaf for the Zariski topology* in 4.3
- sheaf of \mathcal{O} -modules associated to \mathcal{F}* in 8.2
- sheaf of \mathcal{O} -modules associated to \mathcal{F}* in 8.2
- sheaf of \mathcal{O} -modules* in 10.1
- sheaf of \mathcal{O} -modules* in 10.1
- sheaf of $\mathcal{O}_{\mathcal{X}}$ -modules* in 7.1
- sheaf of R -invariant functions on X* in 8.1
- sheaf of abelian groups on X* in 8.1
- sheaf of automorphisms of x* in 5.3
- sheaf of differentials $\Omega_{X/S}$ of X over S* in 25.10

- sheaf of differentials* $\Omega_{X/S}$ of X over S in 31.1
- sheaf of differentials* $\Omega_{X/Y}$ of X over Y in 32.10
- sheaf of differentials* $\Omega_{X/Y}$ of X over Y in 7.2
- sheaf of isomorphisms from x_1 to x_2* in 5.3
- sheaf of meromorphic functions on X* in 23.1
- sheaf of total quotient rings \mathcal{K}_S* in 46.1
- sheaf theoretically empty* in 41.1
- sheaf* in 9.1
- sheaf* in 7.1
- sheaf* in 7.6
- sheaf* in 46.10
- sheaf* in 11.1
- sheaf* in 4.3
- shift* in 15.4
- short exact sequence* in 5.7
- sieve on U generated by the morphisms f_i* in 46.3
- sieve S on U* in 46.1
- similar* in 60.3
- simple* in 51.9
- simple* in 2.3
- simple* in 2.3
- simplicial \mathcal{A}_\bullet -module* in 34.1
- simplicial abelian group* in 3.1
- simplicial object U of \mathcal{C}* in 3.1
- simplicial scheme associated to f* in 28.3
- simplicial set* in 3.1
- simplicial sheaf of \mathcal{A}_\bullet -modules* in 34.1
- simplicial system of the derived category of modules* in 15.1
- simplicial system of the derived category* in 14.1
- singular ideal of A over R* in 2.1
- singular locus* in 14.1
- singularities of X are at-worst-nodal* in 19.1
- site* in 6.2
- site* in 10.2
- size* in 11.2
- skew field* in 2.2
- skyscraper sheaf at x with value A* in 27.1
- skyscraper sheaf* in 27.1
- skyscraper sheaf* in 27.1
- skyscraper sheaf* in 27.1
- skyscraper sheaf* in 27.1
- skyscraper sheaf* in 31.6
- small τ -site of S* in 20.4
- small étale site $X_{\text{étale}}$* in 17.1
- small étale site of S* in 4.8
- small étale site over S* in 27.3
- small étale site* in 27.1
- small étale topos* in 21.1
- small étale topos* in 17.6
- small extension* in 139.1
- small extension* in 3.2
- small pro-étale site of S* in 11.12
- small Zariski site F_{Zar}* in 12.6
- small Zariski site of S* in 3.7
- small Zariski sites* in 27.3
- small Zariski topos* in 21.1
- smooth at \mathfrak{q}* in 135.11
- smooth at $x \in X$* in 32.1
- smooth at x* in 36.1
- smooth covering of T* in 5.1
- smooth covering of X* in 5.1
- smooth group scheme* in 4.4
- smooth groupoid* in 16.4
- smooth local on source-and-target* in 19.1
- smooth local* in 18.1
- smooth of relative dimension d* in 32.13
- smooth sheaf* in 4.3
- smooth variety* in 26.1
- smooth* in 135.1
- smooth* in 32.1
- smooth* in 17.2
- smooth* in 36.1
- smooth* in 8.1
- smooth* in 9.1
- smooth* in 23.1
- smooth* in 32.1
- smooth* in 4.3
- sober* in 8.4
- solution for $A \subset B$* in 95.2
- special cocontinuous functor u from \mathcal{C} to \mathcal{D}* in 28.2
- specializations lift along f* in 19.3
- specialization* in 19.1
- specialization* in 6.22
- specialization* in 35.2
- specializing* in 19.3

- spectral sequence associated to (A, d, α)* in 19.5
- spectral sequence associated to the exact couple* in 18.3
- spectral sequence in \mathcal{A}* in 17.1
- spectral* in 23.1
- spectral* in 23.1
- spectrum of \mathcal{A} over S* in 4.5
- spectrum of \mathcal{A} over X* in 20.8
- spectrum* in 16.1
- spectrum* in 5.3
- split category fibred in groupoids* in 36.2
- split equalizer* in 4.2
- split fibred category* in 35.2
- split node* in 19.10
- split over u* in 15.1
- splits* in 8.1
- splitting field of P over F* in 16.2
- splitting field* in 8.1
- splitting of R over u* in 15.1
- split* in 5.9
- split* in 18.1
- split* in 18.1
- stabilizer of the groupoid in algebraic spaces (U, R, s, t, c)* in 15.2
- stabilizer of the groupoid scheme (U, R, s, t, c)* in 17.2
- stable family of curves* in 22.2
- stable under base change* in 13.1
- stable under composition* in 13.1
- stable under generalization* in 19.1
- stable under specialization* in 19.1
- stably free* in 3.1
- stably isomorphic* in 3.1
- stack in discrete categories* in 6.1
- stack in groupoids* in 5.1
- stack in setoids* in 6.1
- stack in sets* in 6.1
- stack* in 4.1
- stalk* in 29.6
- stalk* in 102.6
- stalk* in 18.6
- standard τ -covering* in 20.2
- standard étale covering* in 4.5
- standard étale* in 141.13
- standard étale* in 34.1
- standard étale* in 26.3
- standard fppf covering* in 7.5
- standard fpqc covering* in 9.9
- standard open covering* in 5.2
- standard open covering* in 5.2
- standard open covering* in 8.2
- standard opens* in 16.3
- standard ph covering* in 8.1
- standard pro-étale covering* in 11.6
- standard resolution of \mathcal{B} over \mathcal{A}* in 17.1
- standard resolution of B over A* in 3.1
- standard shrinking* in 4.6
- standard shrinking* in 5.5
- standard smooth algebra over R* in 135.6
- standard smooth covering* in 5.5
- standard smooth* in 32.1
- standard syntomic covering* in 6.5
- standard syntomic* in 29.1
- standard Zariski covering* in 3.4
- strata* in 28.3
- stratification* in 28.3
- strict henselization of $\mathcal{O}_{S,s}$* in 33.2
- strict henselization of R with respect to $\kappa \subset \kappa^{sep}$* in 150.3
- strict henselization of S at \bar{s}* in 33.2
- strict henselization of X at \bar{x}* in 21.2
- strict henselization* in 150.3
- strict map of topological spaces* in 6.3
- strict morphism of thickenings* in 3.2
- strict morphism of thickenings* in 9.2
- strict normal crossings divisor* in 21.1
- strict transform of M along $R \rightarrow R'$* in 24.1
- strict transform* in 30.1
- strict transform* in 30.1
- strict transform* in 16.1
- strict transform* in 16.1
- strictly commutative* in 3.4
- strictly full* in 2.10
- strictly henselian* in 148.1
- strictly henselian* in 32.6
- strictly perfect* in 40.1
- strictly perfect* in 36.1
- strictly standard in A over R* in 2.3
- strict* in 16.3
- strong generator* in 33.2
- strong splitting of R over u* in 15.1
- strongly \mathcal{C} -cartesian morphism* in 32.1
- strongly cartesian morphism* in 32.1
- strongly split over u* in 15.1

- strongly transcendental over R* in 122.8
- structure morphism* in 18.1
- structure of site on \mathcal{S} inherited from \mathcal{C}* in 10.2
- structure sheaf $\mathcal{O}_{\text{Spec}(R)}$ of the spectrum of R* in 5.3
- structure sheaf $\mathcal{O}_{\text{Proj}(S)}$ of the homogeneous spectrum of S* in 8.3
- structure sheaf of \mathcal{X}* in 6.1
- structure sheaf of the big site $(\text{Sch}/S)_\tau$* in 8.2
- structure sheaf* in 6.1
- structure sheaf* in 7.1
- structure sheaf* in 23.3
- structure sheaf* in 20.2
- sub 2-category* in 28.2
- subbase for the topology on X* in 5.4
- subbasis for the topology on X* in 5.4
- subcanonical* in 12.2
- subcategory* in 2.10
- subfield* in 2.1
- subfunctor $H \subset F$* in 15.3
- submersive* in 6.3
- submersive* in 23.1
- submersive* in 7.2
- submersive* in 12.2
- subobject* in 5.3
- subpresheaf* in 16.2
- subpresheaf* in 3.3
- subsheaf generated by the s_i* in 4.5
- subsheaf of sections annihilated by \mathcal{I}* in 24.3
- subsheaf of sections annihilated by \mathcal{I}* in 14.3
- subsheaf of sections supported on T* in 24.6
- subsheaf of sections supported on T* in 14.6
- subsheaf* in 16.2
- subtopos* in 42.2
- sum of the effective Cartier divisors D_1 and D_2* in 13.6
- sum of the effective Cartier divisors D_1 and D_2* in 6.6
- sum of the effective Cartier divisors* in 43.17
- support of \mathcal{F}* in 5.1
- support of \mathcal{F}* in 31.3
- support of \mathcal{F}* in 19.3
- support of σ* in 31.3
- support of σ* in 19.3
- support of M* in 39.1
- support of s* in 5.1
- supported on T* in 6.4
- supported on T* in 3.2
- surjective* in 16.2
- surjective* in 16.2
- surjective* in 3.1
- surjective* in 11.1
- surjective* in 5.3
- surjective* in 9.1
- surjective* in 5.2
- surjective* in 5.1
- symbol associated to M, a, b* in 5.3
- symbolic power* in 63.1
- symbol* in 2.1
- syntomic at $x \in X$* in 29.1
- syntomic at x* in 35.1
- syntomic covering of T* in 6.1
- syntomic covering of X* in 6.1
- syntomic of relative dimension d* in 29.15
- syntomic sheaf* in 4.3
- syntomic* in 134.1
- syntomic* in 29.1
- syntomic* in 35.1
- system (M_i, μ_{ij}) of R -modules over I* in 8.1
- system of parameters of R* in 59.9
- system of rings* in 2.1
- system over I in \mathcal{C}* in 21.2
- tame inertia group of \mathfrak{m}* in 93.13
- tame symbol* in 5.5
- tamely ramified with respect to A* in 93.7
- tangent space $T\mathcal{F}$ of \mathcal{F}* in 12.1
- tangent space TF of F* in 11.9
- tangent space of X over S at x* in 16.3
- tangent space of X over S* in 34.3
- tangent vector* in 16.3
- tangent vector* in 34.3
- tautologically equivalent* in 8.2
- taut* in 4.10
- tensor power* in 22.6
- tensor product differential graded algebra* in 3.5
- tensor product* in 4.6

- termwise split injection* $\alpha : A^\bullet \rightarrow B^\bullet$ in 9.4
- termwise split sequence of complexes of* \mathcal{A} in 9.9
- termwise split surjection* $\beta : B^\bullet \rightarrow C^\bullet$ in 9.4
- the fibre of* $f : X \rightarrow Y$ *at* y *is geometrically reduced* in 29.2
- the fibre of* f *over* y *is locally Noetherian* in 4.2
- the fibre of* X *over* z *is flat at* x *over the fibre of* Y *over* z in 23.2
- the fibre of* X *over* z *is flat over the fibre of* Y *over* z in 23.2
- the fibres of* f *are locally Noetherian* in 4.2
- the functions on* X *are the* R -*invariant functions on* U in 8.1
- the relative dimension* in 5.2
- the restriction of* \mathcal{F} *to its fibre over* z *is flat at* x *over the fibre of* Y *over* z in 23.2
- thickenings over* \mathcal{Z} in 3.1
- thickenings over* B in 9.1
- thickenings over* S in 2.1
- thickening* in 2.1
- thickening* in 9.1
- thickening* in 3.1
- topological genus of* T in 3.11
- topological group* in 30.1
- topological module* in 30.10
- topological module* in 33.1
- topological ring* in 30.7
- topological ring* in 33.1
- topological space* in 4.7
- topological space* in 4.8
- topologically nilpotent* in 4.7
- topologically of finite type over* in 22.1
- topology associated to* \mathcal{C} in 47.2
- topology on* \mathcal{C} in 46.6
- topos* in 15.1
- tor dimension* $\leq d$ in 61.1
- Tor independent over* B in 20.2
- Tor independent over* R in 57.1
- Tor independent over* S in 21.2
- tor-amplitude in* $[a, b]$ in 61.1
- tor-amplitude in* $[a, b]$ in 42.1
- tor-amplitude in* $[a, b]$ in 38.1
- torsion free* in 20.1
- torsion free* in 11.2
- torsion* in 20.1
- torsion* in 11.2
- torsion* in 102.6
- torsor* in 5.1
- torsor* in 5.1
- Tor* in 27.14
- Tor* in 18.13
- total chern class of* \mathcal{E} *on* X in 34.1
- total right derived functor of* F in 89.4
- total right derived functor of* G in 89.4
- totally disconnected* in 7.7
- totally ramified with respect to* A in 93.7
- tower* in 6.3
- trace element* in 4.1
- trace pairing* in 20.6
- trace* in 20.1
- trace* in 65.1
- trace* in 87.1
- transcendence basis* in 26.1
- transcendence degree of* $x/f(x)$ in 32.1
- transcendence degree* in 26.4
- transition maps* in 21.2
- triangle associated to* $0 \rightarrow K \rightarrow L \rightarrow M \rightarrow 0$ in 8.2
- triangle associated to the termwise split sequence of complexes* in 9.9
- triangle* in 3.1
- triangulated category* in 3.2
- triangulated functor* in 3.3
- triangulated subcategory* in 3.4
- trivial* \mathcal{G} -*torsor* in 5.1
- trivial* \mathcal{G} -*torsor* in 5.1
- trivial descent datum* in 3.5
- trivial descent datum* in 2.3
- trivial descent datum* in 31.10
- trivial descent datum* in 3.3
- trivial descent datum* in 21.10
- trivial Kan fibration* in 30.1
- trivial* in 96.1
- trivial* in 22.1
- trivial* in 11.1
- trivial* in 9.1
- trivial* in 39.4
- twist of the structure sheaf of* $\text{Proj}(S)$ in 10.1
- twist of the structure sheaf* in 21.1
- type of algebraic structure* in 15.1

- UFD* in 119.4
- underlying presheaf of sets of \mathcal{F}* in 5.2
- unibranch at x* in 15.1
- unibranch at x* in 23.2
- unibranch* in 89.1
- unibranch* in 15.1
- unibranch* in 23.2
- uniform categorical moduli space in \mathcal{C}* in 12.1
- uniform categorical moduli space* in 12.1
- uniform categorical quotient* in 4.4
- uniformizer* in 118.8
- uniformly* in 7.1
- unique factorization domain* in 119.4
- uniqueness part of the valuative criterion* in 38.6
- universal δ -functor* in 11.3
- universal φ -derivation* in 25.3
- universal φ -derivation* in 32.3
- universal S -derivation* in 31.1
- universal Y -derivation* in 32.10
- universal Y -derivation* in 7.2
- universal categorical quotient* in 4.4
- universal effective epimorphism* in 12.1
- universal first order thickening* in 145.2
- universal first order thickening* in 7.2
- universal first order thickening* in 15.5
- universal flattening of \mathcal{F} exists* in 21.1
- universal flattening of \mathcal{F} exists* in 11.1
- universal flattening of X exists* in 21.1
- universal flattening of X exists* in 11.1
- universal homeomorphism* in 43.1
- universal homeomorphism* in 51.2
- universal homeomorphism* in 15.2
- universally S -pure* in 16.1
- universally Y -pure* in 3.1
- universally catenary* in 104.3
- universally catenary* in 16.1
- universally closed* in 17.2
- universally closed* in 20.1
- universally closed* in 9.2
- universally closed* in 13.2
- universally exact* in 81.1
- universally injective* in 81.1
- universally injective* in 10.1
- universally injective* in 4.5
- universally injective* in 19.3
- universally injective* in 14.2
- universally Japanese* in 156.1
- universally Japanese* in 13.1
- universally open* in 22.1
- universally open* in 6.2
- universally open* in 11.2
- universally pure above y* in 3.1
- universally pure along X_s* in 16.1
- universally pure relative to S* in 16.1
- universally pure relative to Y* in 3.1
- universally submersive* in 23.1
- universally submersive* in 7.2
- universally submersive* in 12.2
- universally* in 7.1
- unobstructed* in 9.1
- unramified at \mathfrak{q}* in 147.1
- unramified at $x \in X$* in 33.1
- unramified at x* in 3.5
- unramified at x* in 37.1
- unramified cusp form on $GL_2(\mathbf{A})$ with values in Λ* in 115.1
- unramified homomorphism of local rings* in 3.1
- unramified with respect to A* in 93.7
- unramified* in 147.1
- unramified* in 33.1
- unramified* in 3.5
- unramified* in 37.1
- unramified* in 35.1
- valuation ring* in 49.1
- valuation* in 49.13
- value group* in 49.13
- value of LF at X* in 15.2
- value of RF at X* in 15.2
- value* in 22.1
- value* in 22.1
- variety* in 3.1
- variety* in 66.9
- vector bundle $\pi : V \rightarrow S$ over S* in 6.2
- vector bundle associated to \mathcal{E}* in 6.1
- versal ring to \mathcal{X} at x_0* in 2.2
- versal* in 8.9
- versal* in 12.1
- versal* in 12.2
- vertical* in 28.1
- very ample on X/S* in 36.1
- very reasonable* in 6.1
- very reasonable* in 16.1

viewed as an algebraic space over S' in 16.2
viewed as an algebraic stack over S' in 19.2
w-contractible in 10.1
w-local in 2.3
w-local in 2.3
weak R -orbit in 5.4
weak dimension $\leq d$ in 87.3
weak functor in 28.5
weak generator in 33.2
weak ideal of definition in 4.7
weak orbit in 5.4
weak Serre subcategory in 9.1
weak solution for $A \subset B$ in 95.2
weaker than the canonical topology in 12.2
weakly R -equivalent in 5.4
weakly étale in 87.1
weakly étale in 53.1
weakly admissible in 4.7
weakly associated points of X in 5.1
weakly associated points of X in 2.2
weakly associated in 65.1
weakly associated in 5.1
weakly associated in 2.2
weakly contractible in 39.2
weakly converges to $H(K)$ in 20.6
weakly converges to $H^(K^\bullet)$* in 21.9
weakly converges to $H^n(sK^\bullet)$ in 22.5
weakly converges to $H^n(sK^\bullet)$ in 22.5
weakly pre-admissible in 4.7
weakly unramified in 93.1
weakly unramified in 97.1
Weil divisor $[D]$ associated to an effective Cartier divisor $D \subset X$ in 46.1
Weil divisor associated to \mathcal{L} in 23.1
Weil divisor associated to s in 25.4
Weil divisor associated to s in 23.1
Weil divisor associated to a Cartier divisor in 46.1
Weil divisor associated to a rational function $f \in K(X)^$* in 46.1
Weil divisor class associated to \mathcal{L} in 25.4
Weil divisor class group in 24.7
Weil divisor in 24.2
Weil divisor in 46.1
well-nigh affine in 13.1
which associates a presheaf to a semi-representable object in 2.2
wild inertia group of \mathfrak{m} in 93.13
Yoneda extension in 27.4
Zariski covering of T in 3.1
Zariski covering of X in 3.1
Zariski covering in 12.5
Zariski locally quasi-separated over S in 13.2
Zariski locally quasi-separated in 3.1
Zariski locally quasi-separated in 3.1
Zariski sheaf in 4.3
Zariski topos in 21.1
Zariski, étale, smooth, syntomic, or fppf covering in 8.4
Zariski in 16.3
zero object in 3.3
zero scheme in 14.8
zero scheme in 7.6
zeroth K -group of \mathcal{A} in 10.1
zeroth Čech cohomology group in 13.1
Čech cohomology groups in 10.1
Čech cohomology groups in 9.1
Čech cohomology groups in 18.1
Čech complex in 10.1
Čech complex in 9.1
Čech complex in 18.1

2. Definitions listed per chapter

Introduction	In 2.1: <i>category</i>
	In 2.4: <i>isomorphism</i>
Conventions	In 2.5: <i>groupoid</i>
	In 2.8: <i>functor</i>
Set Theory	In 2.9: <i>faithful, fully faithful, essentially surjective</i>
Categories	

- In 2.10: *subcategory, full subcategory, strictly full*
- In 2.15: *natural transformation, morphism of functors*
- In 2.17: *equivalence of categories, quasi-inverse*
- In 2.20: *product category*
- In 3.1: *opposite category*
- In 3.2: *contravariant*
- In 3.3: *presheaf of sets on \mathcal{C} , presheaf*
- In 3.6: *representable*
- In 4.1: *product*
- In 4.2: *has products of pairs of objects*
- In 5.1: *coproduct, amalgamated sum*
- In 5.2: *has coproducts of pairs of objects*
- In 6.1: *fibre product*
- In 6.2: *cartesian*
- In 6.3: *has fibre products*
- In 6.4: *representable*
- In 8.2: *representable, F is relatively representable over G*
- In 9.1: *pushout*
- In 9.2: *cocartesian*
- In 10.1: *equalizer*
- In 11.1: *coequalizer*
- In 12.1: *initial, final*
- In 13.1: *monomorphism, epimorphism*
- In 14.1: *limit*
- In 14.2: *colimit*
- In 14.5: *product*
- In 14.6: *coproduct*
- In 16.1: *connected*
- In 17.1: *\mathcal{I} is cofinal in \mathcal{J} , cofinal*
- In 17.3: *\mathcal{I} is initial in \mathcal{J} , initial*
- In 19.1: *directed, filtered, directed, filtered*
- In 20.1: *codirected, cofiltered, codirected, cofiltered*
- In 21.1: *preorder, preordered set, directed set, partial order, partially ordered set, directed partially ordered set*
- In 21.2: *system over I in \mathcal{C} , inductive system over I in \mathcal{C} , inverse system over I in \mathcal{C} , projective system over I in \mathcal{C} , transition maps*
- In 21.4: *directed system, directed inverse system*
- In 22.1: *is essentially constant, value, essentially constant, value*
- In 22.2: *essentially constant system, essentially constant inverse system*
- In 23.1: *left exact, right exact, exact*
- In 24.1: *left adjoint, right adjoint*
- In 26.1: *left multiplicative system, right multiplicative system, multiplicative system*
- In 26.4: *$s^{-1}f$*
- In 26.12: *fs^{-1}*
- In 26.20: *saturated*
- In 27.1: *horizontal*
- In 28.1: *2-category, 1-morphisms, 2-morphisms, vertical, composition, horizontal*
- In 28.2: *sub 2-category*
- In 28.4: *equivalent*
- In 28.5: *functor, weak functor, pseudo functor*
- In 29.1: *(2,1)-category*
- In 30.1: *final object*
- In 30.2: *2-fibre product of f and g*
- In 31.1: *2-category of categories over \mathcal{C}*
- In 31.2: *fibre category, lift, x lies over U , lift, ϕ lies over f*
- In 32.1: *strongly cartesian morphism, strongly \mathcal{C} -cartesian morphism*
- In 32.5: *fibred category over \mathcal{C}*
- In 32.6: *choice of pullbacks, pullback functor*
- In 32.9: *2-category of fibred categories over \mathcal{C}*
- In 33.2: *relative inertia of \mathcal{S} over \mathcal{S}' , inertia fibred category $\mathcal{I}_{\mathcal{S}}$ of \mathcal{S}*
- In 34.1: *fibred in groupoids*
- In 34.6: *2-category of categories fibred in groupoids over \mathcal{C}*
- In 35.2: *split fibred category, \mathcal{S}_F*
- In 36.2: *split category fibred in groupoids, \mathcal{S}_F*
- In 37.1: *discrete*
- In 37.2: *category fibred in sets, category fibred in discrete categories*
- In 37.3: *2-category of categories fibred in sets over \mathcal{C}*
- In 38.1: *setoid*
- In 38.2: *category fibred in setoids*
- In 38.3: *2-category of categories fibred in setoids over \mathcal{C}*

- In 39.1: *representable*
- In 40.5: *representable, \mathcal{X} is relatively representable over \mathcal{Y}*
- Topology**
- In 4.1: *separated*
- In 5.1: *base for the topology on X , basis for the topology on X*
- In 5.4: *subbase for the topology on X , subbasis for the topology on X*
- In 6.3: *strict map of topological spaces, submersive*
- In 7.1: *connected, connected component*
- In 7.7: *totally disconnected*
- In 7.9: *locally connected*
- In 8.1: *irreducible, irreducible component*
- In 8.4: *generic point, Kolmogorov, quasi-sober, sober*
- In 9.1: *Noetherian, locally Noetherian*
- In 10.1: *chain of irreducible closed subsets, length, dimension, Krull dimension, Krull dimension of X at x*
- In 10.5: *equidimensional*
- In 11.1: *codimension*
- In 11.4: *catenary*
- In 12.1: *quasi-compact, quasi-compact, retrocompact*
- In 13.1: *locally quasi-compact*
- In 15.1: *constructible, locally constructible*
- In 17.2: *closed, proper, quasi-proper, universally closed*
- In 18.1: *Jacobson*
- In 19.1: *specialization, generalization, stable under specialization, stable under generalization*
- In 19.3: *specializations lift along f , specializing, generalizations lift along f , generalizing*
- In 20.1: *immediate specialization, dimension function*
- In 21.1: *interior, nowhere dense*
- In 22.1: *profinite*
- In 23.1: *spectral, spectral*
- In 26.1: *extremally disconnected*
- In 27.2: *isolated point*
- In 28.1: *partition, parts, refines*
- In 28.2: *good stratification*
- In 28.3: *stratification, strata*
- In 28.4: *locally finite*
- In 30.1: *topological group, homomorphism of topological groups*
- In 30.5: *profinite group*
- In 30.7: *topological ring, homomorphism of topological rings*
- In 30.10: *topological module, homomorphism of topological modules*
- Sheaves on Spaces**
- In 3.1: *presheaf \mathcal{F} of sets on X , morphism $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves of sets on X*
- In 3.2: *constant presheaf with value A*
- In 4.4: *presheaf of abelian groups on X , abelian presheaf over X , morphism of abelian presheaves over X*
- In 5.1: *presheaf \mathcal{F} on X with values in \mathcal{C} , morphism $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves with value in \mathcal{C}*
- In 5.2: *underlying presheaf of sets of \mathcal{F}*
- In 6.1: *presheaf of \mathcal{O} -modules, morphism $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves of \mathcal{O} -modules*
- In 7.1: *sheaf \mathcal{F} of sets on X , morphism of sheaves of sets*
- In 7.4: *constant sheaf with value A*
- In 8.1: *abelian sheaf on X , sheaf of abelian groups on X*
- In 9.1: *sheaf*
- In 10.1: *sheaf of \mathcal{O} -modules, morphism of sheaves of \mathcal{O} -modules*
- In 11.2: *separated*
- In 15.1: *type of algebraic structure*
- In 16.2: *subpresheaf, subsheaf, injective, surjective, injective, surjective*
- In 21.7: *f -map $\xi : \mathcal{G} \rightarrow \mathcal{F}$*
- In 21.9: *composition of φ and ψ*
- In 25.1: *ringed space, morphism of ringed spaces*
- In 25.3: *composition of morphisms of ringed spaces*
- In 26.1: *pushforward, pullback*
- In 27.1: *skyscraper sheaf at x with value A , skyscraper sheaf, skyscraper sheaf, skyscraper sheaf, skyscraper sheaf*
- In 30.1: *presheaf \mathcal{F} of sets on \mathcal{B} , morphism $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves of sets on \mathcal{B}*

- In 30.2: sheaf \mathcal{F} of sets on \mathcal{B} , morphism of sheaves of sets on \mathcal{B}
- In 30.8: presheaf \mathcal{F} with values in \mathcal{C} on \mathcal{B} , morphism $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves with values in \mathcal{C} on \mathcal{B} , sheaf \mathcal{F} with values in \mathcal{C} on \mathcal{B}
- In 30.11: presheaf of \mathcal{O} -modules \mathcal{F} on \mathcal{B} , morphism $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves of \mathcal{O} -modules on \mathcal{B} , sheaf \mathcal{F} of \mathcal{O} -modules on \mathcal{B}
- In 31.2: restriction of \mathcal{G} to U , restriction of \mathcal{G} to U , open subspace of (X, \mathcal{O}) associated to U , restriction of \mathcal{G} to U
- In 31.3: extension of \mathcal{F} by the empty set $j_{p!}\mathcal{F}$, extension of \mathcal{F} by the empty set $j_!\mathcal{F}$
- In 31.5: extension $j_{p!}\mathcal{F}$ of \mathcal{F} by 0, extension $j_!\mathcal{F}$ of \mathcal{F} by 0, extension $j_{p!}\mathcal{F}$ of \mathcal{F} by e , extension $j_!\mathcal{F}$ of \mathcal{F} by e , extension by 0, extension by 0
- Sites and Sheaves**
- In 2.1: presheaf of sets, Morphisms of presheaves
- In 2.2: presheaf, morphism
- In 3.1: injective, surjective
- In 3.3: subpresheaf
- In 3.5: image of φ
- In 6.1: family of morphisms with fixed target
- In 6.2: site, coverings of \mathcal{C}
- In 7.1: sheaf
- In 7.5: $Sh(\mathcal{C})$
- In 7.6: sheaf
- In 8.1: morphism of families of maps with fixed target of \mathcal{C} from \mathcal{U} to \mathcal{V} , morphism from \mathcal{U} to \mathcal{V} , refinement
- In 8.2: combinatorially equivalent, tautologically equivalent
- In 10.9: separated
- In 10.11: sheaf associated to \mathcal{F}
- In 11.1: injective, surjective
- In 12.1: effective epimorphism, universal effective epimorphism
- In 12.2: weaker than the canonical topology, subcanonical
- In 12.3: representable sheaves, \underline{U}
- In 13.1: continuous
- In 14.1: morphism of sites
- In 14.4: composition
- In 15.1: topos, morphism of topoi, composition $f \circ g$
- In 17.1: quasi-compact
- In 17.4: quasi-compact, quasi-compact
- In 19.1: cocontinuous
- In 24.1: localization of the site \mathcal{C} at the object U , localization morphism, direct image functor, restriction of \mathcal{F} to \mathcal{C}/U , extension of \mathcal{G} by the empty set
- In 28.2: special cocontinuous functor u from \mathcal{C} to \mathcal{D}
- In 29.4: localization of the topos $Sh(\mathcal{C})$ at \mathcal{F} , localization morphism
- In 31.1: point of the topos $Sh(\mathcal{C})$
- In 31.2: point p of the site \mathcal{C}
- In 31.6: skyscraper sheaf
- In 35.1: 2-morphism from f to g
- In 36.2: morphism $f : p \rightarrow p'$
- In 37.1: conservative, has enough points
- In 39.2: weakly contractible, enough weakly contractible objects, enough P objects
- In 41.1: sheaf theoretically empty
- In 41.3: almost cocontinuous
- In 42.1: embedding
- In 42.2: subtopos
- In 42.4: open subtopos
- In 42.6: closed subtopos
- In 42.7: open immersion, closed immersion
- In 43.1: pushforward
- In 44.1: global sections
- In 46.1: sieve S on U
- In 46.3: sieve on U generated by the morphisms f_i
- In 46.4: pullback of S by f
- In 46.6: topology on \mathcal{C}
- In 46.8: finer
- In 46.10: sheaf
- In 46.12: canonical topology
- In 47.2: topology associated to \mathcal{C}
- In 48.2: separated
- In 48.4: sheaf associated to \mathcal{F}
- In 51.1: point p
- Stacks**
- In 2.2: presheaf of morphisms from x to y , presheaf of isomorphisms from x to y

- In 3.1: *descent datum (X_i, φ_{ij}) in \mathcal{S} relative to the family $\{f_i : U_i \rightarrow U\}$, cocycle condition, morphism $\psi : (X_i, \varphi_{ij}) \rightarrow (X'_i, \varphi'_{ij})$ of descent data*
- In 3.4: *pullback functor*
- In 3.5: *trivial descent datum, canonical descent datum, effective*
- In 4.1: *stack*
- In 4.5: *2-category of stacks over \mathcal{C}*
- In 5.1: *stack in groupoids*
- In 5.5: *2-category of stacks in groupoids over \mathcal{C}*
- In 6.1: *stack in setoids, stack in sets, stack in discrete categories*
- In 6.5: *2-category of stacks in setoids over \mathcal{C}*
- In 10.2: *structure of site on \mathcal{S} inherited from \mathcal{C} , \mathcal{S} is endowed with the topology inherited from \mathcal{C}*
- In 11.1: *gerbe*
- In 11.4: *gerbe over*
- In 12.4: *$f_*\mathcal{S}$, pushforward of \mathcal{S} along f*
- In 12.9: *$f^{-1}\mathcal{S}$, pullback of \mathcal{S} along f*
- Fields**
- In 2.1: *field, subfield*
- In 2.2: *domain, integral domain*
- In 5.1: *characteristic, prime subfield of F*
- In 6.2: *field extension*
- In 6.3: *tower*
- In 6.6: *generates the field extension, finitely generated field extension*
- In 7.1: *degree, finite*
- In 7.8: *number field*
- In 8.1: *algebraic, algebraic extension*
- In 9.1: *minimal polynomial*
- In 10.1: *algebraically closed*
- In 10.3: *algebraically closed, algebraic closure*
- In 11.1: *relatively prime*
- In 12.2: *separable, separable, separable*
- In 12.6: *separable degree*
- In 14.1: *purely inseparable, purely inseparable*
- In 14.7: *separable degree, inseparable degree, degree of inseparability*
- In 15.1: *normal*
- In 15.7: *automorphisms of E over F , automorphisms of E/F*
- In 16.2: *splitting field of P over F*
- In 16.4: *normal closure E over F*
- In 20.1: *trace, norm*
- In 20.6: *trace pairing*
- In 20.8: *discriminant of L/K*
- In 21.1: *Galois*
- In 21.3: *Galois group*
- In 26.1: *algebraically independent, purely transcendental extension, transcendence basis*
- In 26.4: *transcendence degree*
- In 26.9: *algebraic closure of k in K , algebraically closed in K*
- In 27.1: *compositum of K and L in Ω*
- In 27.2: *linearly disjoint over k in Ω*
- In 28.1: *algebraic, separable, purely inseparable, normal, Galois*
- Commutative Algebra**
- In 5.1: *finite R -module, finitely generated R -module, finitely presented R -module, R -module of finite presentation*
- In 6.1: *finite type, S is a finite type R -algebra, finite presentation*
- In 7.1: *finite*
- In 8.1: *system (M_i, μ_{ij}) of R -modules over I , directed system*
- In 8.6: *homomorphism of systems*
- In 8.11: *relation*
- In 9.1: *multiplicative subset of R*
- In 9.2: *localization of A with respect to S*
- In 9.6: *localization*
- In 11.1: *R -bilinear*
- In 11.6: *(A, B) -bimodule*
- In 13.1: *base change, base change*
- In 16.1: *spectrum*
- In 16.3: *Zariski, standard opens*
- In 17.1: *local ring, local homomorphism of local rings, local ring map $\varphi : R \rightarrow S$*
- In 27.2: *Oka family*
- In 31.1: *locally nilpotent, nilpotent*
- In 34.1: *Jacobson ring*
- In 35.1: *integral over R , integral*
- In 35.9: *integral closure, integrally closed*
- In 36.1: *normal*
- In 36.3: *almost integral over R , completely normal*
- In 36.11: *normal*
- In 37.1: *integral over I*

- In 38.1: *flat, faithfully flat, flat, faithfully flat*
- In 39.1: *support of M*
- In 39.3: *annihilator of m , annihilator of M*
- In 40.1: *going up, going down*
- In 41.1: *separably generated over k , separable over k*
- In 42.1: *geometrically reduced over k*
- In 44.1: *perfect*
- In 44.5: *perfect closure*
- In 46.4: *geometrically irreducible over k*
- In 47.3: *geometrically connected over k*
- In 48.1: *geometrically integral over k*
- In 49.1: *dominates, valuation ring, centered*
- In 49.13: *value group, valuation, discrete valuation ring*
- In 51.1: *length*
- In 51.9: *simple*
- In 52.1: *Artinian*
- In 53.1: *essentially of finite type, essentially of finite presentation*
- In 56.1: *homogeneous spectrum*
- In 57.3: *numerical polynomial*
- In 58.1: *an ideal of definition of R*
- In 58.6: *Hilbert polynomial*
- In 58.8: *$d(M)$*
- In 59.1: *Krull dimension*
- In 59.2: *height*
- In 59.9: *system of parameters of R , regular local ring, regular system of parameters*
- In 62.1: *associated*
- In 63.1: *symbolic power*
- In 64.2: *relative assassin of N over S/R*
- In 65.1: *weakly associated*
- In 66.1: *embedded associated primes, embedded primes of R*
- In 67.1: *M -regular sequence, M -regular sequence in I , regular sequence*
- In 68.1: *M -quasi-regular, quasi-regular sequence*
- In 69.1: *blowup algebra, Rees algebra, affine blowup algebra*
- In 70.2: *resolution, resolution of M by free R -modules, resolution of M by finite free R -modules*
- In 71.1: *I -depth, depth*
- In 76.1: *projective*
- In 77.1: *locally free, finite locally free, finite locally free of rank r*
- In 81.1: *universally injective, universally exact*
- In 83.1: *direct sum dévissage, Kaplansky dévissage*
- In 85.1: *Mittag-Leffler inverse system*
- In 87.1: *Mittag-Leffler directed system of modules*
- In 87.2: *dominates*
- In 87.7: *Mittag-Leffler*
- In 89.1: *coherent module, coherent ring*
- In 95.2: *I -adically complete, I -adically complete*
- In 101.5: *rank*
- In 102.1: *Cohen-Macaulay*
- In 102.8: *maximal Cohen-Macaulay*
- In 102.12: *Cohen-Macaulay*
- In 103.1: *Cohen-Macaulay*
- In 103.6: *Cohen-Macaulay*
- In 104.1: *catenary*
- In 104.3: *universally catenary*
- In 107.1: *pure*
- In 108.2: *finite projective dimension, projective dimension*
- In 108.10: *finite global dimension, global dimension*
- In 109.7: *regular*
- In 111.5: *local ring of the fibre at \mathfrak{q}*
- In 118.8: *uniformizer*
- In 119.1: *associates, irreducible, prime*
- In 119.4: *unique factorization domain, UFD*
- In 119.12: *principal ideal domain, PID*
- In 119.14: *Dedekind domain*
- In 120.2: *order of vanishing along R*
- In 120.3: *lattice in V*
- In 120.5: *distance between M and M'*
- In 121.3: *quasi-finite at \mathfrak{q} , quasi-finite*
- In 122.8: *strongly transcendental over R*
- In 124.1: *relative dimension of S/R at \mathfrak{q} , relative dimension of*
- In 130.1: *derivation, R -derivation, Leibniz rule*
- In 130.2: *module of Kähler differentials, module of differentials*

- In 131.1: *differential operator $D : M \rightarrow N$ of order k*
 - In 131.4: *module of principal parts of order k*
 - In 132.1: *naive cotangent complex*
 - In 133.1: *global complete intersection over k , local complete intersection over k*
 - In 133.5: *complete intersection (over k)*
 - In 134.1: *syntomic, flat local complete intersection over R*
 - In 134.5: *relative global complete intersection*
 - In 135.1: *smooth*
 - In 135.6: *standard smooth algebra over R*
 - In 135.11: *smooth at \mathfrak{q}*
 - In 136.1: *formally smooth over R*
 - In 139.1: *small extension*
 - In 141.1: *étale, étale at \mathfrak{q}*
 - In 141.13: *standard étale*
 - In 144.1: *formally unramified over R*
 - In 145.2: *universal first order thickening, conormal module, $C_{S/R}$*
 - In 146.1: *formally étale over R*
 - In 147.1: *unramified, G -unramified, unramified at \mathfrak{q} , G -unramified at \mathfrak{q}*
 - In 148.1: *henselian, strictly henselian*
 - In 150.3: *henselization, strict henselization of R with respect to $\kappa \subset \kappa^{sep}$, strict henselization*
 - In 151.1: *(R_k) , regular in codimension $\leq k$, (S_k)*
 - In 154.1: *complete local ring*
 - In 154.4: *coefficient ring*
 - In 154.5: *Cohen ring*
 - In 155.1: *$N-1$, $N-2$, Japanese*
 - In 156.1: *universally Japanese, Nagata ring*
 - In 156.9: *analytically unramified, analytically unramified*
 - In 159.2: *geometrically normal*
 - In 160.2: *geometrically regular*
- Brauer groups**
- In 2.1: *finite*
 - In 2.2: *skew field*
 - In 2.3: *simple, simple*
 - In 2.4: *central*
 - In 2.5: *opposite algebra*
- In 5.2: *Brauer group*
 - In 8.1: *splits, splitting field*
- Homological Algebra**
- In 3.1: *preadditive, additive*
 - In 3.3: *zero object*
 - In 3.5: *direct sum*
 - In 3.8: *additive*
 - In 3.9: *kernel, cokernel, coimage of f , image of f*
 - In 4.1: *Karoubian*
 - In 5.1: *abelian*
 - In 5.3: *injective, surjective, subobject, quotient*
 - In 5.7: *complex, exact at y , exact, short exact sequence*
 - In 5.9: *split*
 - In 6.1: *extension E of B by A , morphism of extensions*
 - In 6.2: *Ext-group*
 - In 9.1: *Serre subcategory, weak Serre subcategory*
 - In 9.5: *kernel of the functor F*
 - In 10.1: *zeroth K -group of \mathcal{A}*
 - In 11.1: *cohomological δ -functor, δ -functor*
 - In 11.2: *morphism of δ -functors from F to G*
 - In 11.3: *universal δ -functor*
 - In 12.2: *homotopy equivalence, homotopy equivalent*
 - In 12.4: *quasi-isomorphism, acyclic*
 - In 12.8: *homotopy equivalence, homotopy equivalent*
 - In 12.10: *quasi-isomorphism, acyclic*
 - In 13.1: *k -shifted chain complex $A[k]_\bullet$*
 - In 13.2: *$H_{i+k}(A_\bullet) \rightarrow H_i(A[k]_\bullet)$*
 - In 13.7: *k -shifted cochain complex $A[k]^\bullet$*
 - In 13.8: *$H^{i+k}(A^\bullet) \rightarrow H^i(A[k]^\bullet)$*
 - In 15.1: *category of graded objects of \mathcal{A}*
 - In 15.4: *shift*
 - In 16.1: *decreasing filtration, filtered object of \mathcal{A} , morphism $(A, F) \rightarrow (B, F)$ of filtered objects, induced filtration, quotient filtration, finite, separated, exhaustive*
 - In 16.3: *strict*
 - In 17.1: *spectral sequence in \mathcal{A} , morphism of spectral sequences*

- In 17.2: *limit, degenerates at E_r*
 - In 18.1: *exact couple, morphism of exact couples*
 - In 18.3: *spectral sequence associated to the exact couple*
 - In 19.1: *differential object, morphism of differential objects*
 - In 19.3: *homology*
 - In 19.5: *spectral sequence associated to (A, d, α)*
 - In 20.1: *filtered differential object*
 - In 20.4: *induced filtration*
 - In 20.6: *weakly converges to $H(K)$, abuts to $H(K)$*
 - In 21.1: *filtered complex K^\bullet of \mathcal{A}*
 - In 21.5: *induced filtration*
 - In 21.7: *regular, coregular, bounded, bounded below, bounded above*
 - In 21.9: *weakly converges to $H^*(K^\bullet)$, abuts to $H^*(K^\bullet)$, converges to $H^*(K^\bullet)$*
 - In 22.1: *double complex*
 - In 22.3: *associated simple complex sA^\bullet , associated total complex*
 - In 22.5: *weakly converges to $H^n(sK^\bullet)$, abuts to $H^n(sK^\bullet)$, converges to $H^n(sK^\bullet)$, weakly converges to $H^n(sK^\bullet)$, abuts to $H^n(sK^\bullet)$, converges to $H^n(sK^\bullet)$*
 - In 24.1: *injective*
 - In 24.4: *enough injectives*
 - In 24.5: *functorial injective embeddings*
 - In 25.1: *projective*
 - In 25.4: *enough projectives*
 - In 25.5: *functorial projective surjections*
 - In 28.2: *Mittag-Leffler condition, ML*
- Derived Categories**
- In 3.1: *triangle, morphism of triangles*
 - In 3.2: *triangulated category, distinguished triangles, pre-triangulated category*
 - In 3.3: *exact functor, triangulated functor*
 - In 3.4: *pre-triangulated subcategory, triangulated subcategory*
 - In 3.5: *homological, cohomological*
 - In 3.6: *δ -functor from \mathcal{A} to \mathcal{D} , image of the short exact sequence under the given δ -functor*
 - In 5.1: *compatible with the triangulated structure*
 - In 6.1: *saturated*
 - In 6.5: *kernel of F , kernel of H*
 - In 6.7: *quotient category \mathcal{D}/\mathcal{B} , quotient functor*
 - In 8.1: *category of (cochain) complexes, bounded below, bounded above, bounded*
 - In 9.1: *cone*
 - In 9.4: *termwise split injection $\alpha : A^\bullet \rightarrow B^\bullet$, termwise split surjection $\beta : B^\bullet \rightarrow C^\bullet$*
 - In 9.9: *termwise split sequence of complexes of \mathcal{A} , triangle associated to the termwise split sequence of complexes*
 - In 10.1: *distinguished triangle of $K(\mathcal{A})$*
 - In 11.3: *derived category of \mathcal{A} , bounded derived category*
 - In 14.1: *category of finite filtered objects of \mathcal{A}*
 - In 14.2: *filtered quasi-isomorphism, filtered acyclic*
 - In 14.5: *filtered derived category of \mathcal{A}*
 - In 14.7: *bounded filtered derived category*
 - In 15.2: *right derived functor RF is defined at, value of RF at X , left derived functor LF is defined at, value of LF at X*
 - In 15.9: *right derivable, everywhere defined, left derivable, everywhere defined*
 - In 15.10: *computes, computes*
 - In 16.3: *right derived functors of F , left derived functors of F , right acyclic for F , acyclic for RF , left acyclic for F , acyclic for LF*
 - In 17.2: *i th right derived functor R^iF of F*
 - In 18.1: *injective resolution of A , injective resolution of K^\bullet*
 - In 19.1: *projective resolution of A , projective resolution of K^\bullet*
 - In 21.1: *Cartan-Eilenberg resolution*
 - In 23.2: *resolution functor*
 - In 26.1: *filtered injective*
 - In 27.1: *i th extension group*
 - In 27.4: *Yoneda extension, equivalent*
 - In 29.1: *K -injective*

- In 31.1: *derived colimit, homotopy colimit*
- In 32.1: *derived limit, homotopy limit*
- In 33.2: *classical generator, strong generator, weak generator, generator*
- In 34.1: *compact object*
- In 34.5: *compactly generated*
- In 37.1: *Postnikov system, morphism of Postnikov systems*
- Simplicial Methods**
- In 2.1: $\delta_j^n : [n - 1] \rightarrow [n]$, $\sigma_j^n : [n + 1] \rightarrow [n]$
- In 3.1: *simplicial object U of \mathcal{C} , simplicial set, simplicial abelian group, morphism of simplicial objects $U \rightarrow U'$, category of simplicial objects of \mathcal{C}*
- In 5.1: *cosimplicial object U of \mathcal{C} , cosimplicial set, cosimplicial abelian group, morphism of cosimplicial objects $U \rightarrow U'$, category of cosimplicial objects of \mathcal{C}*
- In 6.1: *product of U and V*
- In 7.1: *fibre product of V and W over U*
- In 8.1: *pushout of V and W over U*
- In 9.1: *product of U and V*
- In 10.1: *fibre product of V and W over U*
- In 11.1: *n -simplex of U , face of x , degeneracy of x , degenerate*
- In 12.1: *n -truncated simplicial object of \mathcal{C} , morphism of n -truncated simplicial objects*
- In 13.1: *product $U \times V$ of U and V , product $U \times V$ exists*
- In 14.1: $\text{Hom}(U, V)$
- In 15.1: $\text{Hom}(U, V)$
- In 17.1: $\text{Hom}(U, V)$
- In 18.1: *split, split*
- In 20.1: *augmentation $\epsilon : U \rightarrow X$ of U towards an object X of \mathcal{C}*
- In 22.3: *Eilenberg-MacLane object $K(A, k)$*
- In 26.1: *homotopy connecting a to b , homotopic*
- In 26.6: *homotopy equivalence, homotopy equivalent*
- In 28.1: *homotopic, homotopy connecting a and b*
- In 30.1: *trivial Kan fibration*
- In 31.1: *Kan fibration, Kan complex*
- More on Algebra**
- In 3.1: *stably isomorphic, stably free*
- In 8.3: *k th Fitting ideal*
- In 10.1: *henselian pair*
- In 12.1: *absolutely integrally closed*
- In 13.1: *auto-associated*
- In 20.1: *torsion, torsion free*
- In 21.1: *reflexive*
- In 21.7: *reflexive hull*
- In 22.1: *content ideal of x*
- In 24.1: *strict transform of M along $R \rightarrow R'$*
- In 26.1: *Koszul complex*
- In 26.2: *Koszul complex on f_1, \dots, f_r*
- In 27.1: *M -Koszul-regular, M - H_1 -regular, Koszul-regular, H_1 -Koszul-regular*
- In 29.1: *regular ideal, Koszul-regular ideal, H_1 -regular ideal, quasi-regular ideal*
- In 30.2: *local complete intersection*
- In 33.1: *topological ring, topological module, homomorphism of topological modules, homomorphism of topological rings, linearly topologized, linearly topologized, ideal of definition, pre-admissible, admissible, pre-adic, adic*
- In 34.1: *formally smooth over R*
- In 34.3: *formally smooth for the \mathfrak{n} -adic topology*
- In 38.1: *regular*
- In 43.1: *p -independent over k , p -basis of K over k*
- In 44.1: *J -0, J -1, J -2*
- In 47.1: *G -ring*
- In 49.1: *quasi-excellent, excellent*
- In 52.1: *injective*
- In 52.5: $M \mapsto M^\vee$, *free module*
- In 55.3: *K -flat*
- In 55.15: *derived tensor product*
- In 57.1: *Tor independent over R*
- In 60.1: *m -pseudo-coherent, pseudo-coherent, m -pseudo-coherent, pseudo-coherent*
- In 61.1: *tor-amplitude in $[a, b]$, finite tor dimension, tor dimension $\leq d$, finite tor dimension*

- In 63.1: *finite projective dimension, projective-amplitude in $[a, b]$*
- In 64.1: *finite injective dimension, injective-amplitude in $[a, b]$*
- In 67.1: *perfect, perfect*
- In 71.2: *finitely presented relative to R*
- In 72.4: *m -pseudo-coherent relative to R , pseudo-coherent relative to R , m -pseudo-coherent relative to R , pseudo-coherent relative to R*
- In 73.1: *pseudo-coherent ring map, perfect ring map*
- In 74.1: *R -perfect, perfect relative to R*
- In 77.1: *I -power torsion module, an f -power torsion module*
- In 80.4: *derived complete with respect to I , derived complete with respect to I*
- In 87.1: *absolutely flat, weakly étale, absolutely flat*
- In 87.3: *weak dimension $\leq d$*
- In 89.1: *unibranch, geometrically unibranch*
- In 89.6: *number of branches of A , number of geometric branches of A*
- In 91.1: *formally catenary*
- In 93.1: *extension of discrete valuation rings, ramification index, weakly unramified, residual degree, residue degree*
- In 93.7: *unramified with respect to A , tamely ramified with respect to A , totally ramified with respect to A*
- In 93.10: *decomposition group of \mathfrak{m} , inertia group of \mathfrak{m}*
- In 93.13: *wild inertia group of \mathfrak{m} , tame inertia group of \mathfrak{m}*
- In 94.3: *mixed characteristic, absolute ramification index*
- In 95.2: *weak solution for $A \subset B$, solution for $A \subset B$, separable solution*
- In 96.1: *invertible, trivial*
- In 97.1: *extension of valuation rings, weakly unramified, residual degree, residue degree*
- In 98.5: *Bézout domain, elementary divisor domain*
- In 2.3: *elementary standard in A over R , strictly standard in A over R*

Sheaves of Modules

- In 4.1: *generated by global sections, generate*
- In 4.5: *subsheaf generated by the s_i*
- In 5.1: *support of \mathcal{F} , support of s*
- In 8.1: *locally generated by sections*
- In 9.1: *finite type*
- In 10.1: *quasi-coherent sheaf of \mathcal{O}_X -modules*
- In 10.6: *sheaf associated to the module M and the ring map α , sheaf associated to the module M*
- In 11.1: *finite presentation*
- In 12.1: *coherent \mathcal{O}_X -module*
- In 13.1: *closed immersion of ringed spaces*
- In 14.1: *locally free, finite locally free, finite locally free of rank r*
- In 16.1: *flat*
- In 16.3: *flat at x*
- In 18.1: *flat at x , flat*
- In 18.3: *flat over Y at a point $x \in X$, flat over Y*
- In 21.1: *Koszul complex*
- In 21.2: *Koszul complex on f_1, \dots, f_r*
- In 22.1: *invertible \mathcal{O}_X -module, trivial*
- In 22.6: *tensor power*
- In 22.7: *associated graded ring*
- In 22.9: *Picard group*
- In 25.1: *\mathcal{O}_1 -derivation, φ -derivation, Leibniz rule*
- In 25.3: *module of differentials, universal φ -derivation*
- In 25.10: *S -derivation, sheaf of differentials $\Omega_{X/S}$ of X over S*
- In 26.1: *naive cotangent complex*
- In 26.6: *naive cotangent complex*

Modules on Sites

- In 4.1: *free abelian presheaf*
- In 5.1: *free abelian sheaf*
- In 6.1: *ringed site, structure sheaf, morphism of ringed sites, composition of morphisms of ringed sites*

Smoothing Ring Maps

- In 2.1: *singular ideal of A over R*

- In 7.1: *ringed topoi, structure sheaf, morphism of ringed topoi, composition of morphisms of ringed topoi*
 - In 8.1: *2-morphism from f to g*
 - In 9.1: *presheaf of \mathcal{O} -modules, morphism $\varphi : \mathcal{F} \rightarrow \mathcal{G}$ of presheaves of \mathcal{O} -modules*
 - In 10.1: *sheaf of \mathcal{O} -modules, morphism of sheaves of \mathcal{O} -modules*
 - In 13.1: *pushforward, pullback*
 - In 16.1: *$g_{p!}\mathcal{F}$, $g_!\mathcal{F} = (g_{p!}\mathcal{F})^\#$*
 - In 17.1: *free \mathcal{O} -module, finite free, generated by global sections, generated by r global sections, generated by finitely many global sections, global presentation, global finite presentation*
 - In 19.1: *localization of the ringed site $(\mathcal{C}, \mathcal{O})$ at the object U , localization morphism, direct image functor, restriction of \mathcal{F} to \mathcal{C}/U , extension by zero*
 - In 21.2: *localization of the ringed topos $(Sh(\mathcal{C}), \mathcal{O})$ at \mathcal{F} , localization morphism*
 - In 23.1: *locally free, finite locally free, locally generated by sections, locally generated by r sections, of finite type, quasi-coherent, of finite presentation, coherent*
 - In 28.1: *flat, flat, flat, flat*
 - In 30.1: *flat, flat*
 - In 30.3: *flat over $(Sh(\mathcal{D}), \mathcal{O}')$*
 - In 31.1: *rank r , invertible, \mathcal{O}^**
 - In 31.6: *Picard group*
 - In 32.1: *\mathcal{O}_1 -derivation, φ -derivation, Leibniz rule*
 - In 32.3: *module of differentials, universal φ -derivation*
 - In 32.10: *Y -derivation, sheaf of differentials $\Omega_{X/Y}$ of X over Y , universal Y -derivation*
 - In 33.1: *differential operator $D : \mathcal{F} \rightarrow \mathcal{G}$ of order k*
 - In 33.4: *module of principal parts of order k*
 - In 34.1: *naive cotangent complex*
 - In 34.4: *naive cotangent complex*
 - In 39.4: *locally ringed site*
 - In 39.6: *locally ringed*
 - In 39.9: *morphism of locally ringed topoi, morphism of locally ringed sites*
 - In 42.1: *constant sheaf, locally constant, finite locally constant*
- Injectives**
- In 2.4: *α -small with respect to I*
 - In 10.1: *generator, Grothendieck abelian category*
 - In 11.2: *size*
- Cohomology of Sheaves**
- In 5.1: *torsor, \mathcal{G} -torsor, morphism of \mathcal{G} -torsors, trivial \mathcal{G} -torsor*
 - In 10.1: *Čech complex, Čech cohomology groups*
 - In 13.1: *flasque, flabby*
 - In 24.1: *alternating Čech complex*
 - In 24.2: *ordered Čech complex*
 - In 25.2: *locally finite*
 - In 27.2: *K -flat*
 - In 27.13: *derived tensor product*
 - In 27.14: *Tor*
 - In 40.1: *strictly perfect*
 - In 41.1: *m -pseudo-coherent, pseudo-coherent, m -pseudo-coherent, pseudo-coherent*
 - In 42.1: *tor-amplitude in $[a, b]$, finite tor dimension, locally has finite tor dimension*
 - In 43.1: *perfect, perfect*
- Cohomology on Sites**
- In 5.1: *pseudo torsor, pseudo \mathcal{G} -torsor, morphism of pseudo \mathcal{G} -torsors, torsor, \mathcal{G} -torsor, morphism of \mathcal{G} -torsors, trivial \mathcal{G} -torsor*
 - In 9.1: *Čech complex, Čech cohomology groups*
 - In 14.4: *limp*
 - In 18.2: *K -flat*
 - In 18.12: *derived tensor product*
 - In 18.13: *Tor*
 - In 25.2: *qc covering*
 - In 34.1: *simplicial \mathcal{A}_\bullet -module, simplicial sheaf of \mathcal{A}_\bullet -modules*
 - In 36.1: *strictly perfect*
 - In 37.1: *m -pseudo-coherent, pseudo-coherent, m -pseudo-coherent, pseudo-coherent*

In 38.1: *tor-amplitude in $[a, b]$, finite tor dimension, locally has finite tor dimension*

In 39.1: *perfect, perfect*

Differential Graded Algebra

In 3.1: *differential graded algebra over R*

In 3.2: *homomorphism of differential graded algebras*

In 3.3: *opposite differential graded algebra*

In 3.4: *commutative, strictly commutative*

In 3.5: *tensor product differential graded algebra*

In 4.1: *differential graded module, homomorphism of differential graded modules*

In 4.3: *k -shifted module*

In 5.1: *homotopy between f and g , homotopic*

In 5.3: *homotopy category*

In 6.1: *cone*

In 7.1: *admissible monomorphism, admissible epimorphism, admissible short exact sequence*

In 8.2: *triangle associated to $0 \rightarrow K \rightarrow L \rightarrow M \rightarrow 0$, distinguished triangle*

In 15.2: *derived category of (A, d)*

In 17.1: *R -linear category \mathcal{A}*

In 17.2: *functor of R -linear categories, R -linear*

In 18.1: *graded category \mathcal{A} over R*

In 18.2: *functor of graded categories over R , graded functor*

In 18.3: \mathcal{A}^0

In 18.4: *graded direct sum*

In 19.1: *differential graded category \mathcal{A} over R*

In 19.2: *functor of differential graded categories over R*

In 19.3: *category of complexes of \mathcal{A} , homotopy category of \mathcal{A}*

In 19.4: *differential graded direct sum*

Divided Power Algebra

In 2.1: *divided power structure*

In 3.1: *divided power ring, homomorphism of divided power rings*

In 4.1: *extends*

In 6.1: *divided power structure*

In 6.4: *compatible with the differential graded structure*

In 8.5: *complete intersection, local complete intersection*

Hypercoverings

In 2.1: *semi-representable objects, semi-representable objects over X*

In 2.2: *which associates a presheaf to a semi-representable object*

In 3.1: *covering, covering*

In 3.3: *hypercovering of X*

In 4.1: *homology of K*

In 6.1: *hypercovering of \mathcal{G} , hypercovering*

Schemes

In 2.1: *locally ringed space (X, \mathcal{O}_X) , local ring of X at x , residue field of X at x , morphism of locally ringed spaces*

In 3.1: *open immersion*

In 3.3: *open subspace of X associated to U*

In 4.1: *closed immersion*

In 4.4: *closed subspace of X associated to the sheaf of ideals \mathcal{I}*

In 5.2: *standard open covering, standard open covering*

In 5.3: *structure sheaf $\mathcal{O}_{\text{Spec}(R)}$ of the spectrum of R , spectrum*

In 5.5: *affine scheme, morphism of affine schemes*

In 9.1: *scheme, morphism of schemes*

In 10.2: *open immersion, open subscheme, closed immersion, closed subscheme, immersion, locally closed immersion*

In 12.1: *reduced*

In 12.5: *scheme structure on Z , reduced induced scheme structure, reduction X_{red} of X*

In 15.1: *representable by a scheme, representable*

In 15.3: *satisfies the sheaf property for the Zariski topology, subfunctor $H \subset F$, representable by open immersions, covers F*

In 17.1: *fibre product*

In 17.7: *inverse image $f^{-1}(Z)$ of the closed subscheme Z*

In 18.1: *scheme over S , structure morphism, scheme over R , morphism $f : X \rightarrow Y$ of schemes over S , base change, base change, base change*

In 18.3: *preserved under arbitrary base change, preserved under base change, preserved under arbitrary base change, preserved under base change*

In 18.4: *scheme theoretic fibre X_s of f over s , fibre of f over s*

In 19.1: *quasi-compact*

In 20.1: *universally closed*

In 20.3: *satisfies the existence part of the valuative criterion, satisfies the uniqueness part of the valuative criterion*

In 21.3: *separated, quasi-separated, separated, quasi-separated*

In 23.1: *monomorphism*

Constructions of Schemes

In 4.5: *relative spectrum of \mathcal{A} over S , spectrum of \mathcal{A} over S*

In 5.1: *affine n -space over S , affine n -space over R*

In 6.1: *vector bundle associated to \mathcal{E}*

In 6.2: *vector bundle $\pi : V \rightarrow S$ over S , morphism of vector bundles over S*

In 7.1: *cone associated to \mathcal{A} , affine cone associated to \mathcal{A}*

In 7.2: *cone $\pi : C \rightarrow S$ over S , morphism of cones*

In 8.2: *standard open covering*

In 8.3: *structure sheaf $\mathcal{O}_{\text{Proj}(S)}$ of the homogeneous spectrum of S , homogeneous spectrum*

In 10.1: *twist of the structure sheaf of $\text{Proj}(S)$*

In 13.2: *projective n -space over \mathbf{Z} , projective n -space over S , projective n -space over R*

In 16.7: *relative homogeneous spectrum of \mathcal{A} over S , homogeneous spectrum of \mathcal{A} over S , relative Proj of \mathcal{A} over S*

In 21.1: *projective bundle associated to \mathcal{E} , twist of the structure sheaf*

In 22.2: *Grassmannian over \mathbf{Z} , Grassmannian over S , Grassmannian over R*

Properties of Schemes

In 3.1: *integral*

In 4.1: *local*

In 4.2: *locally P*

In 5.1: *locally Noetherian, Noetherian*

In 6.1: *Jacobson*

In 7.1: *normal*

In 8.1: *Cohen-Macaulay*

In 9.1: *regular, nonsingular*

In 10.1: *dimension, dimension of X at x*

In 11.1: *catenary*

In 12.1: *regular in codimension k , (R_k) , (S_k)*

In 13.1: *Japanese, universally Japanese, Nagata*

In 14.1: *regular locus, singular locus*

In 15.1: *unibranch at x , geometrically unibranch at x , unibranch, geometrically unibranch*

In 15.4: *number of branches of X at x , number of geometric branches of X at x*

In 18.1: *quasi-affine*

In 21.1: *locally projective*

In 23.1: *κ -generated*

In 24.3: *subsheaf of sections annihilated by \mathcal{I}*

In 24.6: *subsheaf of sections supported on T*

In 26.1: *ample*

Morphisms of Schemes

In 4.4: *scheme theoretic intersection, scheme theoretic union*

In 5.5: *scheme theoretic support of \mathcal{F}*

In 6.2: *scheme theoretic image*

In 7.1: *scheme theoretic closure of U in X , scheme theoretically dense in X*

In 8.1: *dominant*

In 9.1: *surjective*

In 10.1: *universally injective, radicial*

In 11.1: *affine*

In 12.1: *quasi-affine*

In 13.1: *local, stable under base change, stable under composition*

In 13.2: *locally of type P*

In 14.1: *finite type at $x \in X$, locally of finite type, finite type*

In 15.3: *finite type point*

- In 16.1: *universally catenary*
 - In 18.1: *J-2*
 - In 19.1: *quasi-finite at a point $x \in X$, locally quasi-finite, quasi-finite*
 - In 20.1: *finite presentation at $x \in X$, locally of finite presentation, finite presentation*
 - In 22.1: *open, universally open*
 - In 23.1: *submersive, universally submersive*
 - In 24.1: *flat at a point $x \in X$, flat over S at a point $x \in X$, flat, flat over S*
 - In 25.3: *canonical scheme structure on T*
 - In 28.1: *relative dimension $\leq d$ at x , relative dimension $\leq d$, relative dimension d*
 - In 29.1: *syntomic at $x \in X$, syntomic, local complete intersection over k , standard syntomic*
 - In 29.15: *syntomic of relative dimension d*
 - In 30.1: *conormal sheaf $\mathcal{C}_{Z/X}$ of Z in X , conormal sheaf of i*
 - In 31.1: *sheaf of differentials $\Omega_{X/S}$ of X over S , universal S -derivation*
 - In 32.1: *smooth at $x \in X$, smooth, standard smooth*
 - In 32.13: *smooth of relative dimension d*
 - In 33.1: *unramified at $x \in X$, G -unramified at $x \in X$, unramified, G -unramified*
 - In 34.1: *étale at $x \in X$, étale, standard étale*
 - In 35.1: *relatively ample, f -relatively ample, ample on X/S , f -ample*
 - In 36.1: *relatively very ample, f -relatively very ample, very ample on X/S , f -very ample*
 - In 38.1: *quasi-projective, H -quasi-projective, locally quasi-projective*
 - In 39.1: *proper*
 - In 41.1: *projective, H -projective, locally projective*
 - In 42.1: *integral, finite*
 - In 43.1: *universal homeomorphism*
 - In 45.1: *finite locally free, rank, degree*
 - In 46.1: *equivalent, rational map from X to Y , S -rational map from X to Y*
 - In 46.3: *rational function on X*
 - In 46.4: *ring of rational functions on X*
 - In 46.6: *function field, field of rational functions*
 - In 46.8: *defined in a point $x \in X$, domain of definition*
 - In 46.10: *dominant*
 - In 46.11: *birational, S -birational*
 - In 47.1: *birational*
 - In 48.8: *degree of X over Y*
 - In 48.11: *modification of X*
 - In 48.12: *alteration of X*
 - In 50.2: *integral closure of \mathcal{O}_X in \mathcal{A}*
 - In 50.3: *normalization of X in Y*
 - In 51.1: *normalization*
 - In 53.1: *bounds the degrees of the fibres of f , fibres of f are universally bounded*
- Cohomology of Schemes**
- In 11.1: *depth k at a point, depth k at a point, (S_k) , (S_k)*
 - In 11.2: *Cohen-Macaulay*
 - In 25.2: *Z is proper over S*
- Divisors**
- In 2.1: *associated, associated points of X*
 - In 4.1: *embedded associated point, embedded point, embedded component*
 - In 5.1: *weakly associated, weakly associated points of X*
 - In 7.1: *relative assassin of \mathcal{F} in X over S*
 - In 8.1: *relative weak assassin of \mathcal{F} in X over S*
 - In 11.2: *torsion, torsion free*
 - In 12.1: *reflexive hull, reflexive*
 - In 13.1: *locally principal closed subscheme, effective Cartier divisor*
 - In 13.6: *sum of the effective Cartier divisors D_1 and D_2*
 - In 13.12: *pullback of D by f is defined, pullback of the effective Cartier divisor*
 - In 14.1: *invertible sheaf $\mathcal{O}_S(D)$ associated to D , canonical section*
 - In 14.6: *regular section*
 - In 14.8: *zero scheme*
 - In 18.2: *relative effective Cartier divisor*
 - In 19.1: *conormal algebra $\mathcal{C}_{Z/X,*}$ of Z in X , conormal algebra of f*

In 19.5: *normal cone $C_Z X$, normal bundle*
 In 20.2: *regular, Koszul-regular, H_1 -regular, quasi-regular*
 In 21.1: *regular immersion, Koszul-regular immersion, H_1 -regular immersion, quasi-regular immersion*
 In 22.2: *relative quasi-regular immersion, relative H_1 -regular immersion*
 In 23.1: *sheaf of meromorphic functions on X , \mathcal{K}_X , meromorphic function*
 In 23.3: *pullbacks of meromorphic functions are defined for f*
 In 23.5: *meromorphic section of \mathcal{F}*
 In 23.11: *regular*
 In 23.15: *ideal sheaf of denominators of s*
 In 24.2: *prime divisor, Weil divisor*
 In 24.3: *order of vanishing of f along Z*
 In 24.5: *principal Weil divisor associated to f*
 In 24.7: *Weil divisor class group*
 In 25.1: *order of vanishing of s along Z*
 In 25.4: *Weil divisor associated to s , Weil divisor class associated to \mathcal{L}*
 In 29.1: *blowing up of X along Z , blowing up of X in the ideal sheaf \mathcal{I} , exceptional divisor, center*
 In 30.1: *strict transform, strict transform*
 In 31.1: *U -admissible blowup*

Limits of Schemes

Varieties

In 3.1: *variety*
 In 6.1: *geometrically reduced at x , geometrically reduced*
 In 7.1: *geometrically connected*
 In 8.1: *geometrically irreducible*
 In 9.1: *geometrically pointwise integral at x , geometrically pointwise integral, geometrically integral*
 In 10.1: *geometrically normal at x , geometrically normal*
 In 12.1: *geometrically regular at x , geometrically regular over k*
 In 16.1: *dual numbers*
 In 16.3: *tangent space of X over S at x , tangent vector*

In 20.1: *algebraic k -scheme, locally algebraic k -scheme*
 In 26.1: *affine variety, projective variety, quasi-projective variety, proper variety, smooth variety*
 In 32.1: *Euler characteristic of \mathcal{F}*
 In 34.6: *m -regular*
 In 34.14: *Hilbert polynomial*
 In 35.1: *absolute Frobenius of X*
 In 35.4: *relative Frobenius morphism of X/S*
 In 38.3: *δ -invariant of A*
 In 38.7: *δ -invariant of X at x*
 In 39.4: *A is a wedge of A_1, \dots, A_n*
 In 42.1: *curve*
 In 43.1: *degree, degree*
 In 44.3: *intersection number*
 In 44.10: *degree of Z with respect to \mathcal{L}*
 In 45.1: *embedding dimension of X at x*
 In 45.2: *embedding dimension of X/k at x*

Topologies on Schemes

In 3.1: *Zariski covering of T*
 In 3.4: *standard Zariski covering*
 In 3.5: *big Zariski site*
 In 3.7: *big Zariski site of S , small Zariski site of S , big affine Zariski site of S*
 In 3.14: *restriction to the small Zariski site*
 In 4.1: *étale covering of T*
 In 4.5: *standard étale covering*
 In 4.6: *big étale site*
 In 4.8: *big étale site of S , small étale site of S , big affine étale site of S*
 In 4.14: *restriction to the small étale site*
 In 5.1: *smooth covering of T*
 In 5.5: *standard smooth covering*
 In 5.6: *big smooth site*
 In 5.8: *big smooth site of S , big affine smooth site of S*
 In 6.1: *syntomic covering of T*
 In 6.5: *standard syntomic covering*
 In 6.6: *big syntomic site*
 In 6.8: *big syntomic site of S , big affine syntomic site of S*
 In 7.1: *fppf covering of T*
 In 7.5: *standard fppf covering*
 In 7.6: *big fppf site*

- In 7.8: *big fppf site of S , big affine fppf site of S*
- In 8.1: *standard ph covering*
- In 8.4: *ph covering of T*
- In 8.8: *big ph site*
- In 8.10: *big ph site of S , big affine ph site of S*
- In 9.1: *fppc covering of T*
- In 9.9: *standard fppc covering*
- In 9.12: *satisfies the sheaf property for the given family, satisfies the sheaf property for the fppc topology*
- In 30.1: *étale local on the source-and-target*
- In 31.1: *descent datum for $V/X/S$, cocycle condition, descent datum relative to $X \rightarrow S$, morphism $f : (V/X, \varphi) \rightarrow (V'/X, \varphi')$ of descent data relative to $X \rightarrow S$*
- In 31.3: *descent datum (V_i, φ_{ij}) relative to the family $\{X_i \rightarrow S\}$, morphism $\psi : (V_i, \varphi_{ij}) \rightarrow (V'_i, \varphi'_{ij})$ of descent data*
- In 31.7: *pullback functor*
- In 31.9: *pullback functor*
- In 31.10: *trivial descent datum, canonical descent datum, effective*
- In 31.11: *canonical descent datum, effective*

Descent

- In 2.1: *descent datum $(\mathcal{F}_i, \varphi_{ij})$ for quasi-coherent sheaves, cocycle condition, morphism $\psi : (\mathcal{F}_i, \varphi_{ij}) \rightarrow (\mathcal{F}'_i, \varphi'_{ij})$ of descent data*
- In 2.3: *trivial descent datum, canonical descent datum, effective*
- In 3.1: *descent datum (N, φ) for modules with respect to $R \rightarrow A$, cocycle condition, morphism $(N, \varphi) \rightarrow (N', \varphi')$ of descent data*
- In 3.4: *effective*
- In 4.2: *split equalizer*
- In 4.5: *universally injective*
- In 4.9: *C*
- In 4.15: *base extension along f , descent morphism for modules, effective descent morphism for modules*
- In 4.19: *f_**
- In 8.2: *structure sheaf of the big site $(Sch/S)_\tau$, sheaf of \mathcal{O} -modules associated to \mathcal{F} , sheaf of \mathcal{O} -modules associated to \mathcal{F}*
- In 9.1: *parasitic, parasitic for the τ -topology*
- In 12.1: *local in the τ -topology*
- In 17.1: *germ of X at x , morphism of germs, composition of morphisms of germs*
- In 17.2: *étale, smooth*
- In 18.1: *étale local, smooth local*
- In 19.1: *τ local on the base, τ local on the target, local on the base for the τ -topology*
- In 23.1: *τ local on the source, local on the source for the τ -topology*
- In 29.3: *étale local on source-and-target*

Derived Categories of Schemes

- In 6.4: *supported on T*
- In 13.1: *approximation holds for the triple*
- In 13.2: *approximation by perfect complexes holds*
- In 21.2: *Tor independent over S*
- In 31.1: *perfect relative to S , S -perfect*

More on Morphisms

- In 2.1: *thickening, first order thickening, morphism of thickenings, thickenings over S , morphisms of thickenings over S*
- In 5.1: *first order infinitesimal neighbourhood*
- In 6.1: *formally unramified*
- In 7.2: *universal first order thickening, conormal sheaf of Z over X*
- In 8.1: *formally étale*
- In 11.1: *formally smooth*
- In 13.1: *naive cotangent complex of f*
- In 18.1: *normal at x , normal morphism*
- In 19.1: *regular at x , regular morphism*
- In 20.1: *Cohen-Macaulay at x , Cohen-Macaulay morphism*
- In 31.1: *étale neighbourhood of (S, s) , morphism of étale neighbourhoods, elementary étale neighbourhood*

In 47.1: *finitely presented relative to S , of finite presentation relative to S*
 In 48.2: *m -pseudo-coherent relative to S , pseudo-coherent relative to S , m -pseudo-coherent relative to S , pseudo-coherent relative to S*
 In 49.2: *pseudo-coherent*
 In 50.2: *perfect*
 In 51.2: *Koszul at x , Koszul morphism, local complete intersection morphism*
 In 53.1: *weakly étale, absolutely flat*
 In 55.1: *ind-quasi-affine, ind-quasi-affine*

More on Flatness

In 4.1: *one step dévissage of $\mathcal{F}/X/S$ over s*
 In 4.2: *one step dévissage of $\mathcal{F}/X/S$ at x*
 In 4.6: *standard shrinking*
 In 5.1: *complete dévissage of $\mathcal{F}/X/S$ over s*
 In 5.2: *complete dévissage of $\mathcal{F}/X/S$ at x*
 In 5.5: *standard shrinking*
 In 6.1: *elementary étale localization of the ring map $R \rightarrow S$ at \mathfrak{q}*
 In 6.2: *complete dévissage of $N/S/R$ over \mathfrak{r}*
 In 6.4: *complete dévissage of $N/S/R$ at \mathfrak{q}*
 In 15.2: *impurity of \mathcal{F} above s*
 In 16.1: *pure along X_s , universally pure along X_s , pure along X_s , universally S -pure, universally pure relative to S , S -pure, pure relative to S , S -pure, pure relative to S*
 In 20.10: *\mathcal{F} is flat over S in dimensions $\geq n$*
 In 21.1: *universal flattening of \mathcal{F} exists, universal flattening of X exists*
 In 21.2: *flattening stratification, flattening stratification*

Groupoid Schemes

In 3.1: *pre-relation, relation, pre-equivalence relation, equivalence relation on U over S*
 In 3.3: *restriction, pullback*

In 4.1: *group scheme over S , morphism $\psi : (G, m) \rightarrow (G', m')$ of group schemes over S*
 In 4.3: *closed subgroup scheme, open subgroup scheme*
 In 4.4: *smooth group scheme, flat group scheme, separated group scheme*
 In 9.1: *abelian variety*
 In 10.1: *action of G on the scheme X/S , equivariant, G -equivariant*
 In 10.2: *free*
 In 11.1: *pseudo G -torsor, formally principally homogeneous under G , trivial*
 In 11.3: *principal homogeneous space, G -torsor, G -torsor in the τ topology, τ G -torsor, τ torsor, quasi-isotrivial, locally trivial*
 In 12.1: *G -equivariant quasi-coherent \mathcal{O}_X -module, equivariant quasi-coherent \mathcal{O}_X -module*
 In 13.1: *groupoid scheme over S , groupoid over S , morphism $f : (U, R, s, t, c) \rightarrow (U', R', s', t', c')$ of groupoid schemes over S*
 In 14.1: *quasi-coherent module on (U, R, s, t, c)*
 In 17.2: *stabilizer of the groupoid scheme (U, R, s, t, c)*
 In 18.2: *restriction of (U, R, s, t, c) to U'*
 In 19.1: *set-theoretically R -invariant, R -invariant, R -invariant*
 In 20.1: *quotient sheaf U/R*
 In 20.2: *representable quotient, representable quotient*
 In 21.1: *cartesian, (U', R', s', t', c') is cartesian over (U, R, s, t, c) , morphism of groupoid schemes cartesian over (U, R, s, t, c)*

More on Groupoid Schemes

Étale Morphisms of Schemes

In 3.1: *unramified homomorphism of local rings*
 In 3.5: *unramified at x , unramified*
 In 9.1: *flat, faithfully flat, flat (resp. faithfully flat)*
 In 9.3: *flat over Y at $x \in X$, flat at $x \in X$, flat, faithfully flat*

- In 11.1: *étale homomorphism of local rings*
- In 11.4: *étale at $x \in X$, étale*
- In 21.1: *strict normal crossings divisor*
- In 21.4: *normal crossings divisor*
- In 13.5: *intersect properly, intersect properly*
- In 15.1: *multiplicity of M for the ideal of definition I*

Picard Schemes of Curves

- In 4.1: *Picard functor*
- In 6.3: *genus*

Chow Homology and Chern Classes

- In 2.1: *admissible, symbol, admissible relation, determinant of the finite length R -module M*
- In 3.1: *2-periodic complex, cohomology modules, exact, $(2,1)$ -periodic complex, cohomology modules*
- In 3.2: *multiplicity, Herbrand quotient*
- In 4.1: *determinant of (M, φ, ψ)*
- In 5.3: *symbol associated to M, a, b*
- In 5.5: *tame symbol*
- In 8.5: *δ -dimension of Z*
- In 9.1: *cycle on X , k -cycle*
- In 10.2: *multiplicity of Z' in Z , k -cycle associated to Z*
- In 11.2: *multiplicity of Z' in \mathcal{F} , k -cycle associated to \mathcal{F}*
- In 13.1: *pushforward*
- In 15.1: *flat pullback of α by f*
- In 18.1: *principal divisor associated to f*
- In 20.1: *rationally equivalent to zero, rationally equivalent, Chow group of k -cycles on X , Chow group of k -cycles modulo rational equivalence on X*
- In 23.1: *Weil divisor associated to s , Weil divisor associated to \mathcal{L}*
- In 24.1: *intersection with the first chern class of \mathcal{L}*
- In 28.1: *Gysin homomorphism*
- In 32.1: *bivariant class c of degree p for f*
- In 32.2: *Chow cohomology*
- In 34.1: *chern classes of \mathcal{E} on X , total chern class of \mathcal{E} on X*
- In 35.1: *intersection with the j th chern class of \mathcal{E}*
- In 41.1: *degree of a zero cycle*
- In 43.15: *ϵ -invariant*
- In 43.17: *sum of the effective Cartier divisors*

Intersection Theory

Adequate Modules

- In 3.1: *module-valued functor, morphism of module-valued functors*
- In 3.2: *adequate, linearly adequate*
- In 5.1: *adequate*
- In 5.7: *$Adeq(\mathcal{O})$, $Adeq((Sch/S)_\tau, \mathcal{O})$, $Adeq(S)$*
- In 8.1: *pure projective, pure injective*
- In 8.5: *pure projective resolution, pure injective resolution*
- In 8.8: *pure extension module*

Dualizing Complexes

- In 2.1: *essential, essential extension of, essential*
- In 4.1: *projective cover, projective envelope*
- In 5.1: *injective hull*
- In 5.5: *indecomposable*
- In 15.1: *dualizing complex*
- In 21.1: *Gorenstein, Gorenstein*
- In 26.1: *relative dualizing complex*

Duality for Schemes

- In 2.2: *dualizing complex*
- In 21.5: *dualizing complex normalized relative to ω_S^\bullet*
- In 25.1: *Gorenstein*
- In 26.2: *Gorenstein at x , Gorenstein morphism*
- In 28.1: *relative dualizing complex*

Discriminants and Differents

- In 4.1: *trace element*
- In 6.1: *Kähler different*
- In 8.1: *different*

Local Cohomology

- In 9.2: *cohomological dimension of I in A*

In 11.4: *derived complete with respect to \mathcal{I}*

Algebraic Curves

In 2.7: *nonsingular projective model of X*

In 3.1: *linear series of degree d and dimension r , \mathfrak{g}_d^r*

In 8.1: *genus*

In 11.1: *geometric genus*

In 16.2: *multicross singularity, node, ordinary double point, defines a nodal singularity*

In 19.1: *node, ordinary double point, defines a nodal singularity, singularities of X are at-worst-nodal*

In 19.10: *split node*

In 20.2: *at-worst-nodal of relative dimension 1*

Resolution of Surfaces

In 5.1: *normalized blowup of X at x*

In 8.3: *defines a rational singularity, reduction to rational singularities is possible for A*

In 14.1: *resolution of singularities*

In 14.2: *resolution of singularities by normalized blowups*

Semistable Reduction

In 3.1: *numerical type*

In 3.2: *equivalent types*

In 3.4: *numerical type of genus g*

In 3.8: *(-1) -index*

In 3.11: *topological genus of T*

In 3.12: *minimal*

In 3.16: *(-2) -index*

In 4.1: *Picard group of T*

In 8.4: *minimal model*

In 11.4: *numerical type associated to X*

In 14.6: *semistable reduction*

In 14.8: *good reduction*

Fundamental Groups of Schemes

In 2.1: *G -set, discrete G -set, morphism of G -sets, G -Sets*

In 3.6: *Galois category*

In 6.1: *fundamental group, base point*

Étale Cohomology

In 4.1: *étale covering*

In 9.1: *presheaf of sets, abelian presheaf*

In 10.1: *family of morphisms with fixed target*

In 10.2: *site, coverings*

In 11.1: *separated presheaf, sheaf*

In 11.4: *category of sheaves of sets, abelian sheaves*

In 13.1: *zeroth Čech cohomology group*

In 15.1: *fpqc covering*

In 15.5: *satisfies the sheaf property for the fpqc topology*

In 16.1: *descent datum, effective*

In 16.5: *descent datum*

In 16.6: *effective*

In 17.2: *ringed site, quasi-coherent*

In 18.1: *Čech complex, Čech cohomology groups*

In 18.4: *free abelian presheaf on \mathcal{G}*

In 20.1: *τ -covering*

In 20.2: *standard τ -covering*

In 20.4: *big τ -site of S , small τ -site of S*

In 21.1: *étale topos, small étale topos, Zariski topos, small Zariski topos, big τ -topos*

In 23.1: *constant sheaf*

In 23.3: *structure sheaf*

In 26.1: *étale*

In 26.3: *standard étale*

In 27.1: *étale covering*

In 27.3: *big étale site over S , small étale site over S , big, small Zariski sites*

In 29.1: *geometric point, lies over, étale neighborhood, morphism of étale neighborhoods*

In 29.6: *stalk*

In 31.3: *support of \mathcal{F} , support of σ*

In 32.2: *henselian*

In 32.6: *strictly henselian*

In 33.2: *étale local ring of S at \bar{s} , strict henselization of $\mathcal{O}_{S,s}$, henselization of $\mathcal{O}_{S,s}$, strict henselization of S at \bar{s} , henselization of S at s*

In 35.1: *direct image, pushforward*

In 35.3: *direct image, pushforward*

In 35.4: *higher direct images*

In 36.1: *inverse image, pullback*

In 55.1: *absolute Galois group, algebraic*

- In 56.1: *G*-module, discrete *G*-module, morphism of *G*-modules, *R*-*G*-module, morphism of *R*-*G*-modules
- In 56.2: continuous group cohomology groups, group cohomology groups, Galois cohomology groups, Galois cohomology groups of *K* with coefficients in *M*
- In 60.3: similar, equivalent
- In 60.4: Brauer group
- In 63.1: constant sheaf with value *E*, constant sheaf, locally constant, finite locally constant, constant sheaf with value *A*, constant sheaf, locally constant, finite locally constant, constant sheaf with value *M*, constant sheaf, locally constant
- In 65.1: trace
- In 66.5: C_r , nontrivial solution
- In 66.9: variety, curve
- In 69.1: extension by zero, extension by zero
- In 70.1: constructible, constructible, constructible
- In 86.4: geometric frobenius
- In 86.8: arithmetic frobenius
- In 86.10: geometric frobenius
- In 87.1: trace
- In 89.4: total right derived functor of *F*, total right derived functor of *G*
- In 90.1: filtered injective, projective, filtered quasi-isomorphism
- In 91.1: filtered derived functor
- In 93.1: perfect
- In 95.1: finite Tor-dimension
- In 96.1: $D_c(X, \Lambda)$
- In 96.7: $D_{ctf}(X, \Lambda)$
- In 98.1: global Lefschetz number
- In 98.2: local Lefschetz number
- In 99.2: *G*-trace of *f* on *P*
- In 102.1: \mathbf{Z}_ℓ -sheaf, ℓ -adic sheaf, lisse, morphism
- In 102.6: torsion, stalk
- In 102.8: ℓ -adic cohomology
- In 103.1: *L*-function of \mathcal{F}
- In 103.3: *L*-function of \mathcal{F}
- In 111.1: open
- In 115.1: unramified cusp form on $GL_2(\mathbf{A})$ with values in Λ
- In 2.2: divided power envelope of *J* in *B* relative to (A, I, γ)
- In 4.1: δ is compatible with γ
- In 5.2: divided power thickening, homomorphism of divided power thickenings
- In 6.1: divided power *A*-derivation
- In 7.1: divided power structure γ
- In 7.2: divided power scheme, morphism of divided power schemes
- In 7.3: divided power thickening
- In 8.1: divided power thickening of *X* relative to (S, \mathcal{I}, γ) , morphism of divided power thickenings of *X* relative to (S, \mathcal{I}, γ)
- In 8.4: Zariski, étale, smooth, syntomic, or fppf covering, big crystalline site
- In 9.1: crystalline site
- In 11.1: locally quasi-coherent, quasi-coherent, crystal in $\mathcal{O}_{X/S}$ -modules
- In 11.3: crystal in quasi-coherent modules, crystal in finite locally free modules
- In 12.1: *S*-derivation $D : \mathcal{O}_{X/S} \rightarrow \mathcal{F}$
- In 26.2: *F*-crystal on *X/S* (relative to σ), nondegenerate

Pro-étale Cohomology

- In 2.3: *w*-local, *w*-local
- In 3.1: local isomorphism, identifies local rings
- In 4.1: ind-Zariski
- In 7.1: ind-étale
- In 10.1: *w*-contractible
- In 11.1: pro-étale covering of *T*
- In 11.6: standard pro-étale covering
- In 11.8: big pro-étale site
- In 11.12: big pro-étale site of *S*, small pro-étale site of *S*, big affine pro-étale site of *S*
- In 11.18: restriction to the small pro-étale site
- In 22.1: extension by zero, extension by zero
- In 23.1: constructible
- In 24.1: constructible Λ -sheaf, lisse, adic lisse, adic constructible
- In 25.1: constructible
- In 25.4: adic lisse, adic constructible

Crystalline Cohomology

Algebraic Spaces

In 5.1: *property \mathcal{P}*
 In 6.1: *algebraic space over S*
 In 6.3: *morphism $f : F \rightarrow F'$ of algebraic spaces over S*
 In 9.2: *étale equivalence relation*
 In 9.3: *presentation*
 In 12.1: *open immersion, open subspace, closed immersion, closed subspace, immersion, locally closed subspace*
 In 12.5: *Zariski covering*
 In 12.6: *small Zariski site F_{Zar}*
 In 13.2: *separated over S , locally separated over S , quasi-separated over S , Zariski locally quasi-separated over S*
 In 14.4: *acts freely, quotient of U by G*
 In 16.2: *base change of F' to S , viewed as an algebraic space over S'*

Properties of Algebraic Spaces

In 3.1: *separated, locally separated, quasi-separated, Zariski locally quasi-separated, separated, locally separated, quasi-separated, Zariski locally quasi-separated*
 In 4.1: *point*
 In 4.7: *topological space*
 In 5.1: *quasi-compact*
 In 7.2: *has property \mathcal{P}*
 In 7.5: *has property \mathcal{P} at x*
 In 8.1: *dimension of X at x*
 In 8.2: *dimension*
 In 9.2: *dimension of the local ring of X at x , x is a point of codimension d on X*
 In 11.6: *algebraic space structure on Z , reduced induced algebraic space structure, reduction X_{red} of X*
 In 15.2: *étale*
 In 17.1: *small étale site $X_{étale}$*
 In 17.2: *$X_{spaces,étale}$*
 In 17.6: *étale topoi, small étale topoi*
 In 17.8: *f -map $\varphi : \mathcal{G} \rightarrow \mathcal{F}$*
 In 18.1: *geometric point, geometric point lying over x*
 In 18.2: *étale neighborhood, morphism of étale neighborhoods*
 In 18.6: *stalk*
 In 19.3: *support of \mathcal{F} , support of σ*
 In 20.2: *structure sheaf*

In 21.2: *étale local ring of X at \bar{x} , strict henselization of X at \bar{x}*
 In 22.2: *geometrically unibranch at x , geometrically unibranch*
 In 22.4: *number of geometric branches of X at x*
 In 23.1: *Noetherian*
 In 24.2: *X is regular at x*
 In 28.1: *quasi-coherent*
 In 30.2: *locally projective*

Morphisms of Algebraic Spaces

In 4.2: *separated, locally separated, quasi-separated*
 In 5.2: *surjective*
 In 6.2: *open, universally open*
 In 7.2: *submersive, universally submersive*
 In 8.2: *quasi-compact*
 In 9.2: *closed, universally closed*
 In 10.1: *monomorphism*
 In 13.2: *inverse image $f^{-1}(Z)$ of the closed subspace Z*
 In 14.4: *scheme theoretic intersection, scheme theoretic union*
 In 15.4: *scheme theoretic support of \mathcal{F}*
 In 16.2: *scheme theoretic image*
 In 17.3: *scheme theoretic closure of U in X , scheme theoretically dense in X*
 In 18.1: *dominant*
 In 19.3: *universally injective*
 In 20.2: *affine*
 In 20.8: *relative spectrum of \mathcal{A} over X , spectrum of \mathcal{A} over X*
 In 21.2: *quasi-affine*
 In 22.2: *has property \mathcal{P}*
 In 22.6: *has property \mathcal{Q} at x*
 In 23.1: *locally of finite type, finite type at x , of finite type*
 In 25.2: *finite type point*
 In 27.1: *locally quasi-finite, quasi-finite at x , quasi-finite*
 In 28.1: *locally of finite presentation, finite presentation at x , of finite presentation*
 In 29.1: *flat, flat at x*
 In 30.2: *flat at x over Y , flat over Y*
 In 32.1: *dimension of the local ring of the fibre of f at x , transcendence degree*

of $x/f(x)$, f has relative dimension d at x

In 32.2: relative dimension $\leq d$, relative dimension d

In 35.1: syntomic, syntomic at x

In 36.1: smooth, smooth at x

In 37.1: unramified, unramified at x , G -unramified, G -unramified at x

In 38.1: étale at x

In 39.1: proper

In 40.1: satisfies the uniqueness part of the valuative criterion, satisfies the existence part of the valuative criterion, satisfies the valuative criterion

In 44.2: integral, finite

In 45.2: finite locally free, rank, degree

In 46.2: integral closure of \mathcal{O}_X in \mathcal{A}

In 46.3: normalization of X in Y

In 47.3: normalization

In 51.2: universal homeomorphism

Decent Algebraic Spaces

In 3.1: fibres of f are universally bounded

In 6.1: decent, reasonable, very reasonable

In 11.3: elementary étale neighbourhood, morphism of elementary étale neighbourhoods

In 11.5: henselian local ring of X at x

In 12.6: residual space of X at x

In 16.1: has property (β) , has property (β) , decent, reasonable, very reasonable

In 21.1: birational

In 23.2: unibranch at x , unibranch

In 23.4: number of branches of X at x

Cohomology of Algebraic Spaces

In 6.2: alternating Čech complex

In 12.1: coherent

Limits of Algebraic Spaces

In 3.1: limit preserving, locally of finite presentation, locally of finite presentation over S , limit preserving, locally of finite presentation, relatively limit preserving

In 14.3: subsheaf of sections annihilated by \mathcal{I}

In 14.6: subsheaf of sections supported on T

Divisors on Algebraic Spaces

In 2.2: weakly associated, weakly associated points of X , x is associated to \mathcal{F} , x is an associated point of X

In 4.2: the fibre of f over y is locally Noetherian, the fibres of f are locally Noetherian

In 4.5: relative weak assassin of \mathcal{F} in X over Y

In 6.1: locally principal closed subspace, effective Cartier divisor

In 6.6: sum of the effective Cartier divisors D_1 and D_2

In 6.10: pullback of D by f is defined, pullback of the effective Cartier divisor

In 7.1: invertible sheaf $\mathcal{O}_X(D)$ associated to D

In 7.4: regular section

In 7.6: zero scheme

In 9.3: relative homogeneous spectrum of \mathcal{A} over X , homogeneous spectrum of \mathcal{A} over X , relative Proj of \mathcal{A} over X

In 12.1: relatively ample, f -relatively ample, ample on X/Y , f -ample

In 15.1: blowing up of X along Z , blowing up of X in the ideal sheaf \mathcal{I} , exceptional divisor, center

In 16.1: strict transform, strict transform

In 17.1: U -admissible blowup

Algebraic Spaces over Fields

In 4.1: integral

In 4.4: degree of X over Y

In 5.1: modification of X

In 5.3: alteration of X

In 8.1: geometrically reduced at x , geometrically reduced

In 9.1: geometrically connected

In 10.1: geometrically irreducible

In 11.1: geometrically integral

In 13.1: Euler characteristic of \mathcal{F}

Topologies on Algebraic Spaces

In 3.1: Zariski covering of X

In 4.1: étale covering of X

In 4.5: $(\text{Spaces}/S)_{\text{étale}}$

In 4.6: $(Spaces/X)_{\acute{e}tale}$
 In 4.9: restriction to the small étale site
 In 5.1: smooth covering of X
 In 6.1: syntomic covering of X
 In 7.1: fppf covering of X
 In 7.6: $(Spaces/S)_{fppf}$
 In 7.7: $(Spaces/X)_{fppf}$
 In 8.1: ph covering of X
 In 8.5: $(Spaces/S)_{ph}$
 In 8.6: $(Spaces/X)_{ph}$
 In 9.1: fpqc covering of X

Descent and Algebraic Spaces

In 3.1: descent datum $(\mathcal{F}_i, \varphi_{ij})$ for quasi-coherent sheaves, cocycle condition, morphism $\psi : (\mathcal{F}_i, \varphi_{ij}) \rightarrow (\mathcal{F}'_i, \varphi'_{ij})$ of descent data
 In 3.3: trivial descent datum, canonical descent datum, effective
 In 9.1: τ local on the base, τ local on the target, local on the base for the τ -topology
 In 13.1: τ local on the source, local on the source for the τ -topology
 In 19.1: smooth local on source-and-target
 In 20.1: étale-smooth local on source-and-target
 In 21.1: descent datum for $V/Y/X$, cocycle condition, descent datum relative to $Y \rightarrow X$, morphism $f : (V/Y, \varphi) \rightarrow (V'/Y, \varphi')$ of descent data relative to $Y \rightarrow X$
 In 21.3: descent datum (V_i, φ_{ij}) relative to the family $\{X_i \rightarrow X\}$, morphism $\psi : (V_i, \varphi_{ij}) \rightarrow (V'_i, \varphi'_{ij})$ of descent data
 In 21.7: pullback functor
 In 21.9: pullback functor
 In 21.10: trivial descent datum, canonical descent datum, effective
 In 21.11: canonical descent datum, effective

Derived Categories of Spaces

In 3.2: supported on T
 In 5.1: derived category of \mathcal{O}_X -modules with quasi-coherent cohomology sheaves
 In 7.2: T is proper over Y
 In 9.1: elementary distinguished square

In 14.1: approximation holds for the triple
 In 14.2: approximation by perfect complexes holds
 In 20.2: Tor independent over B

More on Morphisms of Spaces

In 3.1: radicial
 In 5.1: conormal sheaf $\mathcal{C}_{Z/X}$ of Z in X , conormal sheaf of i
 In 6.1: conormal algebra $\mathcal{C}_{Z/X,*}$ of Z in X , conormal algebra of i
 In 6.5: normal cone $C_Z X$, normal bundle
 In 7.2: sheaf of differentials $\Omega_{X/Y}$ of X over Y , universal Y -derivation
 In 9.1: thickening, first order thickening, morphism of thickenings, thickenings over B , morphisms of thickenings over B
 In 12.1: first order infinitesimal neighbourhood
 In 13.1: formally smooth, formally étale, formally unramified
 In 14.1: formally unramified
 In 15.5: universal first order thickening, conormal sheaf of Z over X
 In 16.1: formally étale
 In 19.1: formally smooth
 In 21.1: naive cotangent complex of f
 In 23.2: the restriction of \mathcal{F} to its fibre over z is flat at x over the fibre of Y over z , the fibre of X over z is flat at x over the fibre of Y over z , the fibre of X over z is flat over the fibre of Y over z
 In 26.2: Cohen-Macaulay at x , Cohen-Macaulay morphism
 In 27.2: Gorenstein at x , Gorenstein morphism
 In 29.2: the fibre of $f : X \rightarrow Y$ at y is geometrically reduced
 In 42.2: Koszul-regular immersion, H_1 -regular immersion, quasi-regular immersion
 In 43.3: m -pseudo-coherent relative to Y , pseudo-coherent relative to Y , m -pseudo-coherent relative to Y , pseudo-coherent relative to Y
 In 44.1: pseudo-coherent, pseudo-coherent at x

In 45.1: *perfect, perfect at x*
 In 46.1: *Koszul morphism, local complete intersection morphism, Koszul at x*
 In 50.1: *perfect relative to Y , Y -perfect*
 In 53.1: *at-worst-nodal of relative dimension 1*

Flatness on Algebraic Spaces

In 2.2: *impurity of \mathcal{F} above y*
 In 3.1: *pure above y , universally pure above y , pure above y , universally Y -pure, universally pure relative to Y , Y -pure, pure relative to Y , Y -pure, pure relative to Y*
 In 11.1: *universal flattening of \mathcal{F} exists, universal flattening of X exists*
 In 11.3: *\mathcal{F} is flat over Y in dimensions $\geq n$*

Groupoids in Algebraic Spaces

In 4.1: *pre-relation, relation, pre-equivalence relation, equivalence relation on U over B*
 In 4.3: *restriction, pullback*
 In 5.1: *group algebraic space over B , morphism $\psi : (G, m) \rightarrow (G', m')$ of group algebraic spaces over B*
 In 8.1: *action of G on the algebraic space X/B , equivariant, G -equivariant*
 In 8.2: *free*
 In 9.1: *pseudo G -torsor, formally principally homogeneous under G , trivial*
 In 9.3: *principal homogeneous space, principal homogeneous G -space over B , G -torsor in the τ topology, τ G -torsor, τ torsor, quasi-isotrivial, locally trivial*
 In 10.1: *G -equivariant quasi-coherent \mathcal{O}_X -module, equivariant quasi-coherent \mathcal{O}_X -module*
 In 11.1: *groupoid in algebraic spaces over B , morphism $f : (U, R, s, t, c) \rightarrow (U', R', s', t', c')$ of groupoids in algebraic spaces over B*
 In 12.1: *quasi-coherent module on (U, R, s, t, c)*
 In 15.2: *stabilizer of the groupoid in algebraic spaces (U, R, s, t, c)*
 In 16.2: *restriction of (U, R, s, t, c) to U'*

In 17.1: *R -invariant, R -invariant, R -invariant*
 In 18.1: *quotient sheaf U/R*
 In 18.3: *quotient representable by an algebraic space, representable quotient, representable quotient, quotient representable by an algebraic space*
 In 19.1: *quotient stack, quotient stack*

More on Groupoids in Spaces

In 15.1: *strongly split over u , strong splitting of R over u , split over u , splitting of R over u , quasi-split over u , quasi-splitting of R over u*

Bootstrap

In 3.1: *representable by algebraic spaces*
 In 4.1: *property \mathcal{P}*

Pushouts of Algebraic Spaces

Quotients of Groupoids

In 3.1: *R -invariant, G -invariant*
 In 3.4: *base change, flat base change*
 In 4.1: *categorical quotient, categorical quotient in \mathcal{C} , categorical quotient in the category of schemes, categorical quotient in schemes*
 In 4.4: *universal categorical quotient, uniform categorical quotient*
 In 5.1: *orbit, R -orbit*
 In 5.4: *weakly R -equivalent, R -equivalent, weak orbit, weak R -orbit, orbit, R -orbit*
 In 5.8: *set-theoretically R -invariant, separates orbits, separates R -orbits*
 In 5.13: *set-theoretic pre-equivalence relation, set-theoretic equivalence relation*
 In 5.18: *orbit space for R*
 In 6.1: *coarse quotient, coarse quotient in schemes*
 In 7.1: *uniformly, universally*
 In 8.1: *sheaf of R -invariant functions on X , the functions on X are the R -invariant functions on U*
 In 9.1: *good quotient*
 In 10.1: *geometric quotient*

More on Cohomology of Spaces

Simplicial Spaces

- In 12.1: *cartesian, cartesian, cartesian, cartesian*
- In 14.1: *simplicial system of the derived category, cartesian, morphism of simplicial systems of the derived category*
- In 15.1: *simplicial system of the derived category of modules, cartesian, morphism of simplicial systems of the derived category of modules*
- In 28.1: *cartesian, Y is cartesian over X*
- In 28.3: *simplicial scheme associated to f*

Duality for Spaces

- In 2.2: *dualizing complex*
- In 9.1: *relative dualizing complex*

Formal Algebraic Spaces

- In 4.6: *tensor product, completed tensor product*
- In 4.7: *topologically nilpotent, weak ideal of definition, weakly pre-admissible, weakly admissible*
- In 4.10: *taut*
- In 5.1: *affine formal algebraic space, morphism of affine formal algebraic spaces*
- In 5.7: *McQuillan, classical, adic, adic*, Noetherian*
- In 5.9: *formal spectrum*
- In 6.2: *countably indexed*
- In 7.1: *formal algebraic space, morphism of formal algebraic spaces*
- In 9.3: *completion of X along T*
- In 11.3: *quasi-separated, separated*
- In 12.2: *quasi-compact*
- In 12.4: *quasi-compact*
- In 15.5: *locally countably indexed, locally adic*, locally Noetherian*
- In 17.1: *adic morphism*
- In 18.1: *locally of finite type, finite type*
- In 19.1: *monomorphism*
- In 20.1: *closed immersion*
- In 22.1: *topologically of finite type over*
- In 23.1: *separated, quasi-separated*
- In 24.1: *proper*
- In 27.1: *small étale site*

Restricted Power Series

- In 5.2: *rig-étale*
- In 9.1: *rig-surjective*

Resolution of Surfaces Revisited

- In 4.1: *blowing up $X' \rightarrow X$ of X at x*
- In 5.1: *normalized blowup of X at x*
- In 8.1: *resolution of singularities*
- In 8.2: *resolution of singularities by normalized blowups*

Formal Deformation Theory

- In 3.1: \mathcal{C}_Λ , *classical case*
- In 3.2: *small extension*
- In 3.6: *relative cotangent space*
- In 3.9: *essential surjection*
- In 4.1: $\hat{\mathcal{C}}_\Lambda$
- In 5.1: *category cofibered in groupoids over C*
- In 6.1: *prorepresentable*
- In 6.2: *predeformation category, morphism of predeformation categories*
- In 7.1: *category $\hat{\mathcal{F}}$ of formal objects of \mathcal{F} , formal object $\xi = (R, \xi_n, f_n)$ of \mathcal{F} , morphism $a : \xi \rightarrow \eta$ of formal objects*
- In 7.3: *completion of \mathcal{F}*
- In 8.1: *smooth*
- In 8.9: *versal*
- In 9.1: *smooth, unobstructed*
- In 10.1: *conditions (S1) and (S2)*
- In 11.1: *R-linear*
- In 11.9: *tangent space TF of F*
- In 12.1: *tangent space $T\mathcal{F}$ of \mathcal{F}*
- In 12.3: *differential $d\varphi : T\mathcal{F} \rightarrow T\mathcal{G}$ of φ*
- In 14.4: *minimal, miniversal*
- In 16.1: *condition (RS)*
- In 16.8: *deformation category*
- In 17.1: *lift of x along f, morphism of lifts*
- In 19.1: *group of infinitesimal automorphisms of x' over x*
- In 19.2: *group of infinitesimal automorphisms of x_0*
- In 19.5: *automorphism functor of x*
- In 21.1: *category of groupoids in functors on C, groupoid in functors on C, morphism $(U, R, s, t, c) \rightarrow (U', R', s', t', c')$ of groupoids in functors on C*

- In 21.4: *representable*
- In 21.7: *restriction $(U, R, s, t, c)|_{\mathcal{C}'}$ of (U, R, s, t, c) to \mathcal{C}'*
- In 21.9: *quotient category cofibered in groupoids $[U/R] \rightarrow \mathcal{C}$, quotient morphism $U \rightarrow [U/R]$*
- In 22.1: *prorepresentable*
- In 22.2: *completion $(U, R, s, t, c)^\wedge$ of (U, R, s, t, c)*
- In 23.1: *smooth*
- In 25.1: *presentation of \mathcal{F} by (U, R, s, t, c)*
- In 27.1: *normalized, minimal*

Deformation Theory

- In 3.2: *strict morphism of thickenings*
- In 9.2: *strict morphism of thickenings*

The Cotangent Complex

- In 3.1: *standard resolution of B over A*
- In 3.2: *cotangent complex*
- In 12.1: *A -biderivation*
- In 16.1: *Atiyah class*
- In 17.1: *standard resolution of \mathcal{B} over \mathcal{A}*
- In 17.2: *cotangent complex*
- In 18.1: *Atiyah class*
- In 19.1: *cotangent complex*
- In 21.1: *cotangent complex*
- In 23.1: *cotangent complex $L_{X/Y}$ of X over Y*
- In 25.1: *cotangent complex $L_{X/Y}$ of X over Y*

Deformation Problems

Algebraic Stacks

- In 8.1: *representable by an algebraic space over S*
- In 9.1: *representable by algebraic spaces*
- In 10.1: *property \mathcal{P}*
- In 12.1: *algebraic stack over S*
- In 12.2: *Deligne-Mumford stack*
- In 12.3: *2-category of algebraic stacks over S*
- In 16.4: *smooth groupoid*
- In 16.5: *presentation*
- In 19.2: *viewed as an algebraic stack over S'*
- In 19.3: *change of base of \mathcal{X}'*

Examples of Stacks

- In 18.2: *degree d finite Hilbert stack of \mathcal{X} over \mathcal{Y}*

Sheaves on Algebraic Stacks

- In 3.1: *presheaf on \mathcal{X} , morphism of presheaves on \mathcal{X}*
- In 4.1: *associated Zariski site, associated étale site, associated smooth site, associated syntomic site, associated fppf site*
- In 4.3: *Zariski sheaf, sheaf for the Zariski topology, étale sheaf, sheaf for the étale topology, smooth sheaf, sheaf for the smooth topology, syntomic sheaf, sheaf for the syntomic topology, fppf sheaf, sheaf, sheaf for the fppf topology*
- In 4.5: *associated morphism of fppf topoi*
- In 6.1: *structure sheaf of \mathcal{X}*
- In 7.1: *presheaf of modules on \mathcal{X} , $\mathcal{O}_{\mathcal{X}}$ -module, sheaf of $\mathcal{O}_{\mathcal{X}}$ -modules*
- In 9.2: *pullback $x^{-1}\mathcal{F}$ of \mathcal{F} , restriction of \mathcal{F} to $U_{\text{étale}}$*
- In 11.1: *quasi-coherent module on \mathcal{X} , quasi-coherent $\mathcal{O}_{\mathcal{X}}$ -module*
- In 11.4: *locally quasi-coherent*

Criteria for Representability

- In 8.1: *algebraic*

Artin's axioms

- In 5.1: *condition (RS)*
- In 9.1: *formal object, morphism of formal objects, lies over*
- In 9.4: *effective*
- In 11.1: *limit preserving*
- In 12.1: *versal*
- In 12.2: *versal*
- In 13.1: *openness of versality, openness of versality*
- In 18.1: *condition (RS*)*
- In 21.1: *obstruction theory, obstruction modules, obstruction*
- In 22.5: *naive obstruction theory*

Quot and Hilbert Spaces

Properties of Algebraic Stacks

- In 4.2: *point*
- In 4.8: *topological space*

- In 5.1: *surjective*
- In 6.1: *quasi-compact*
- In 7.2: *has property \mathcal{P}*
- In 7.5: *has property \mathcal{P} at x*
- In 8.1: *monomorphism*
- In 9.1: *open immersion, closed immersion, immersion*
- In 9.8: *open substack, closed substack, locally closed substack*
- In 10.4: *algebraic stack structure on Z , reduced induced algebraic stack structure, reduction \mathcal{X}_{red} of \mathcal{X}*
- In 11.8: *residual gerbe of \mathcal{X} at x exists, residual gerbe of \mathcal{X} at x*
- In 12.2: *dimension of \mathcal{X} at x*
- In 12.3: *dimension*
- In 13.1: *number of geometric branches of \mathcal{X} at x , geometrically unibranch at x*
- Morphisms of Algebraic Stacks**
- In 4.1: *DM, quasi-DM, separated, quasi-separated*
- In 4.2: *DM over S , quasi-DM over S , separated over S , quasi-separated over S , DM, quasi-DM, separated, quasi-separated*
- In 5.3: *relative sheaf of automorphisms of x , relative sheaf of isomorphisms from x_1 to x_2 , sheaf of automorphisms of x , sheaf of isomorphisms from x_1 to x_2*
- In 7.2: *quasi-compact*
- In 8.1: *Noetherian*
- In 9.1: *affine*
- In 10.1: *integral, finite*
- In 11.2: *open, universally open*
- In 12.2: *submersive, universally submersive*
- In 13.2: *closed, universally closed*
- In 14.2: *universally injective*
- In 15.2: *universal homeomorphism*
- In 16.2: *has property \mathcal{P}*
- In 17.1: *locally of finite type, of finite type*
- In 18.2: *finite type point*
- In 23.2: *locally quasi-finite*
- In 24.1: *flat*
- In 25.2: *flat at x*
- In 26.1: *locally of finite presentation, of finite presentation*
- In 27.1: *gerbe over, gerbe*
- In 32.1: *smooth*
- In 33.2: *has property \mathcal{P}*
- In 34.1: *étale*
- In 35.1: *unramified*
- In 36.1: *proper*
- In 37.1: *scheme theoretic image*
- In 38.1: *dotted arrow, morphism of dotted arrows*
- In 38.6: *uniqueness part of the valuative criterion*
- In 38.10: *existence part of the valuative criterion*
- In 43.1: *local complete intersection morphism, Koszul*
- Limits of Algebraic Stacks**
- In 3.1: *limit preserving*
- Cohomology of Algebraic Stacks**
- In 7.1: *flat base change property*
- In 8.1: *parasitic*
- In 11.1: *lisse-étale site, flat-fppf site*
- Derived Categories of Stacks**
- In 4.1: *derived category of $\mathcal{O}_{\mathcal{X}}$ -modules with quasi-coherent cohomology sheaves*
- Introducing Algebraic Stacks**
- In 4.3: *smooth*
- In 5.1: *algebraic stack*
- More on Morphisms of Stacks**
- In 3.1: *thickening, morphism of thickenings, thickenings over \mathcal{Z} , morphisms of thickenings over \mathcal{Z}*
- In 3.3: *first order thickening*
- In 8.1: *formally smooth*
- In 12.1: *categorical moduli space, uniform categorical moduli space, categorical moduli space in \mathcal{C} , uniform categorical moduli space in \mathcal{C}*
- In 13.1: *well-nigh affine*
- The Geometry of Algebraic Stacks**
- In 2.2: *versal ring to \mathcal{X} at x_0*
- In 3.4: *multiplicity*
- In 4.1: *formal branches of \mathcal{X} through x_0*
- In 4.3: *multiplicity of a formal branch of \mathcal{X} through x_0*
- In 5.2: *the relative dimension*

In 5.7: *relative dimension*
 In 5.14: *pseudo-catenary*
 In 6.3: *dimension of the local ring of \mathcal{X} at x*

Moduli Stacks

Moduli of Curves

In 16.4: *moduli stack of smooth proper curves, moduli stack of smooth proper curves of genus g*
 In 19.2: *relative dualizing sheaf*
 In 20.1: *prestable family of curves*
 In 21.2: *semistable family of curves*
 In 22.2: *stable family of curves*
 In 22.4: *moduli stack of stable curves, moduli stack of stable curves of genus g*

Examples

Exercises

In 2.1: *directed set, system of rings*
 In 2.3: *colimit*
 In 2.8: *finite presentation*
 In 6.4: *quasi-compact*
 In 6.6: *Hausdorff*
 In 6.9: *irreducible, irreducible*
 In 6.12: *generic point*
 In 6.16: *Noetherian, Artinian*
 In 6.18: *irreducible component*
 In 6.22: *closed, specialization, generalization*
 In 6.26: *connected, connected component*
 In 9.1: *length*
 In 17.1: *catenary, catenary*
 In 21.1: *finite locally free, invertible module*
 In 21.3: *class group of A , Picard group of A*
 In 23.1: *going-up theorem, going-down theorem*
 In 25.1: *numerical polynomial*

In 25.2: *graded module, locally finite, Euler-Poincaré function, Hilbert function, Hilbert polynomial*
 In 25.3: *graded A -algebra, graded module M over a graded A -algebra B , homomorphisms of graded modules/rings, graded submodules, graded ideals, exact sequences of graded modules*
 In 26.1: *homogeneous*
 In 26.2: *homogeneous spectrum $\text{Proj}(R)$*
 In 26.3: $R_{(f)}$
 In 27.1: *Cohen-Macaulay*
 In 29.3: *filtered injective*
 In 29.4: $\text{Fil}^f(\mathcal{A})$
 In 29.6: *filtered quasi-isomorphism*
 In 29.7: *filtered acyclic*
 In 32.12: *integral*
 In 34.1: *dual numbers*
 In 34.3: *tangent space of X over S , tangent vector*
 In 35.1: *quasi-coherent*
 In 35.2: *specialization*
 In 35.5: *locally Noetherian, Noetherian*
 In 35.6: *coherent*
 In 39.1: *invertible \mathcal{O}_X -module*
 In 39.4: *invertible module M , trivial*
 In 39.7: *Picard group of X*
 In 40.2: $\delta(\tau)$
 In 46.1: *Weil divisor, prime divisor, Weil divisor associated to a rational function $f \in K(X)^*$, effective Cartier divisor, Weil divisor $[D]$ associated to an effective Cartier divisor $D \subset X$, sheaf of total quotient rings \mathcal{K}_S , Cartier divisor, Weil divisor associated to a Cartier divisor*

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3. Other chapters

Preliminaries

(1) Introduction

(2) Conventions

(3) Set Theory

- (4) Categories
- (5) Topology
- (6) Sheaves on Spaces
- (7) Sites and Sheaves
- (8) Stacks
- (9) Fields
- (10) Commutative Algebra
- (11) Brauer Groups
- (12) Homological Algebra
- (13) Derived Categories
- (14) Simplicial Methods
- (15) More on Algebra
- (16) Smoothing Ring Maps
- (17) Sheaves of Modules
- (18) Modules on Sites
- (19) Injectives
- (20) Cohomology of Sheaves
- (21) Cohomology on Sites
- (22) Differential Graded Algebra
- (23) Divided Power Algebra
- (24) Hypercoverings
- Schemes
 - (25) Schemes
 - (26) Constructions of Schemes
 - (27) Properties of Schemes
 - (28) Morphisms of Schemes
 - (29) Cohomology of Schemes
 - (30) Divisors
 - (31) Limits of Schemes
 - (32) Varieties
 - (33) Topologies on Schemes
 - (34) Descent
 - (35) Derived Categories of Schemes
 - (36) More on Morphisms
 - (37) More on Flatness
 - (38) Groupoid Schemes
 - (39) More on Groupoid Schemes
 - (40) Étale Morphisms of Schemes
- Topics in Scheme Theory
 - (41) Chow Homology
 - (42) Intersection Theory
 - (43) Picard Schemes of Curves
 - (44) Adequate Modules
 - (45) Dualizing Complexes
 - (46) Duality for Schemes
 - (47) Discriminants and Differents
 - (48) Local Cohomology
 - (49) Algebraic Curves
- (50) Resolution of Surfaces
- (51) Semistable Reduction
- (52) Fundamental Groups of Schemes
- (53) Étale Cohomology
- (54) Crystalline Cohomology
- (55) Pro-étale Cohomology
- Algebraic Spaces
 - (56) Algebraic Spaces
 - (57) Properties of Algebraic Spaces
 - (58) Morphisms of Algebraic Spaces
 - (59) Decent Algebraic Spaces
 - (60) Cohomology of Algebraic Spaces
 - (61) Limits of Algebraic Spaces
 - (62) Divisors on Algebraic Spaces
 - (63) Algebraic Spaces over Fields
 - (64) Topologies on Algebraic Spaces
 - (65) Descent and Algebraic Spaces
 - (66) Derived Categories of Spaces
 - (67) More on Morphisms of Spaces
 - (68) Flatness on Algebraic Spaces
 - (69) Groupoids in Algebraic Spaces
 - (70) More on Groupoids in Spaces
 - (71) Bootstrap
 - (72) Pushouts of Algebraic Spaces
- Topics in Geometry
 - (73) Quotients of Groupoids
 - (74) More on Cohomology of Spaces
 - (75) Simplicial Spaces
 - (76) Duality for Spaces
 - (77) Formal Algebraic Spaces
 - (78) Restricted Power Series
 - (79) Resolution of Surfaces Revisited
- Deformation Theory
 - (80) Formal Deformation Theory
 - (81) Deformation Theory
 - (82) The Cotangent Complex
 - (83) Deformation Problems
- Algebraic Stacks
 - (84) Algebraic Stacks
 - (85) Examples of Stacks
 - (86) Sheaves on Algebraic Stacks
 - (87) Criteria for Representability
 - (88) Artin's Axioms
 - (89) Quot and Hilbert Spaces
 - (90) Properties of Algebraic Stacks
 - (91) Morphisms of Algebraic Stacks
 - (92) Limits of Algebraic Stacks

- (93) Cohomology of Algebraic Stacks
- (94) Derived Categories of Stacks
- (95) Introducing Algebraic Stacks
- (96) More on Morphisms of Stacks
- (97) The Geometry of Stacks
- Topics in Moduli Theory
 - (98) Moduli Stacks
 - (99) Moduli of Curves
- Miscellany
 - (100) Examples
 - (101) Exercises
 - (102) Guide to Literature
 - (103) Desirables
 - (104) Coding Style
 - (105) Obsolete
 - (106) GNU Free Documentation License
 - (107) Auto Generated Index