

# Glossary

$[?, -]$	the internal hom, 277
$\heartsuit$	stands for either PA, AB, PM, or Mod, 294
$(?) _J$	the pull-back associated with the inclusion $J \hookrightarrow I$ , 322
$(?)_J^\heartsuit$	the abbreviation for $Q(X_\bullet, J)_\heartsuit^\#$ , 323
$(?)_{J_1, J}^\heartsuit$	the restriction $\heartsuit(X_\bullet _J) \rightarrow \heartsuit(X_\bullet _{J_1})$ , 323
$(?)_J^{\text{AB}}$	the abbreviation for $Q(X_\bullet, J)_{\text{AB}}^\#$ , 322
$(?)_J^{\text{PA}}$	the abbreviation for $Q(X_\bullet, J)_{\text{PA}}^\#$ , 322
$\otimes$	the product structure, 277
$\otimes_{\mathcal{O}_X}$	the sheaf tensor product, 290
$\otimes_{\mathcal{O}_X}^p$	the presheaf tensor product, 290
$(?)^!$	the equivariant twisted inverse, 417
$(?) _x^\heartsuit$	the restriction functor, 295
$\mathbb{A}$	the ascent functor, 367
$\mathcal{A}$	the category of noetherian $I^{\text{op}}$ -diagrams of schemes and morphisms separated of finite type, 415
$\underline{\text{Ab}}$	the category of abelian groups, 287
$\text{AB}(\mathbb{X})$	the category of sheaves of abelian groups on $\mathbb{X}$ , 287
$\mathcal{A}_G$	the category of noetherian $G$ -schemes and $G$ -morphisms separated of finite type, 445
$\alpha$	the associativity isomorphism, 277
$(\alpha)$	the canonical map $(d_0)^* \rightarrow (?)_{(\Delta)} \circ (?)'$ , 364
$(\alpha^+)$	the canonical map $(d_0^+)^* \rightarrow (?)' \circ (?)_{(\Delta)}$ , 364
$\alpha_\phi^\heartsuit$	the translation map, 322
$\mathcal{A}(R_\bullet)$	the total ring of $R_\bullet$ , 465
$a(\mathbb{X}, \text{AB})$	the sheafification functor $\text{PA}(\mathbb{X}) \rightarrow \text{AB}(\mathbb{X})$ , 287
$a(\mathbb{X}, \text{Mod})$	the sheafification $\text{PM}(\mathbb{X}) \rightarrow \text{Mod}(\mathbb{X})$ , 289
$B_G^M(X)$	the restriction $B_G(X) _{\Delta_M}$ , 446

$B_G(X)$	the simplicial groupoid associated with the action of $G$ on $X$ , 445
$C$	the morphism adjoint to $\eta$ , 281
$\bar{c}$	the canonical isomorphism $f_{\bullet}^! RR_J \rightarrow RR_J(f_{\bullet} _J)^!$ , 428
$c'$	the canonical isomorphism $RR_J(f_{\bullet} _J)^{\times} \rightarrow f_{\bullet}^{\times} RR_J$ , 428
$C(\mathcal{A})$	the category of complexes in $\mathcal{A}$ , 311
$C^b(\mathcal{A})$	the category of bounded complexes in $\mathcal{A}$ , 311
$C^-(\mathcal{A})$	the category of complexes in $\mathcal{A}$ bounded above, 311
$C^+(\mathcal{A})$	the category of complexes in $\mathcal{A}$ bounded below, 311
$\check{C}ech$	the Čech complex, 387
$c = c(f)$	the identification $qf^{\#} = f^{\#}q$ or its inverse, 294
$c_{f,g}$	the canonical isomorphism $(gf)_{\#} \xrightarrow{\cong} g_{\#}f_{\#}$ of an almost-pseudofunctor, 271
$c = c(gf = f'g')$	the isomorphism $g_*f_* \xrightarrow{c^{-1}} (gf)_* = (f'g')_* \xrightarrow{c} f'_*g'_*$ , 271
$\chi(f_{\bullet})$	the canonical map $f_{\bullet}^{\times} \mathbb{F} \otimes_{\mathcal{O}_{X_{\bullet}}}^{\bullet, L} Lf_{\bullet}^* \mathbb{G} \rightarrow f_{\bullet}^{\times} (\mathbb{F} \otimes_{\mathcal{O}_{Y_{\bullet}}}^{\bullet, L} \mathbb{G})$ , 432
$\bar{\chi} = \bar{\chi}(p_{\bullet}, i_{\bullet})$	see page, 433
$c_{I,J,K}^{\heartsuit}$	the canonical isomorphism $(?)_{K,I}^{\heartsuit} \cong (?)_{K,J}^{\heartsuit} \circ (?)_{J,I}^{\heartsuit}$ , 328
$c_{J,f_{\bullet}}^{\heartsuit}$	the canonical isomorphism $(?)_J^{\heartsuit} \circ (f_{\bullet})_*^{\heartsuit} \cong (f_{\bullet} _J)_*^{\heartsuit} \circ (?)_J^{\heartsuit}$ , 328
$\text{Coh}(G, X)$	the category of coherent $(G, \mathcal{O}_X)$ -modules, 446
$\text{Cone}(\varphi)$	the mapping cone of $\varphi$ , 313
$\text{cosk}_J^I$	the right adjoint of $(?) _J$ , 322
$\text{Cos}(\mathcal{M})$	the cosimplicial sheaf associated with $\mathcal{M}$ , 365
$\text{Cos}^+(\mathcal{N})$	the augmented cosimplicial sheaf associated with $\mathcal{N}$ , 365
$\mathbb{D}$	the descent functor, 368
$(d_0)(X_{\bullet})$	the natural map $X_{\bullet}(\delta_0) : X'_{\bullet} _{(\Delta)} = X_{\bullet} \text{shift } \iota \rightarrow X_{\bullet}$ , 363
$(d_0^+)(Y_{\bullet})$	the natural map $(Y_{\bullet} _{(\Delta)})' = Y_{\bullet} \iota \text{shift} \xrightarrow{Y_{\bullet}(\delta_0^+)} Y_{\bullet}$ , 363
$D^?( \mathcal{A})$	the derived category of $\mathcal{A}$ with the boundedness $?$ , 311
$D_{\mathcal{A}'}^?( \mathcal{A})$	the localization of $K_{\mathcal{A}'}^?( \mathcal{A})$ by the épaisse subcategory of exact complexes, 311
$D_{\text{Coh}}^b(\text{Qch}(X_{\bullet}))$	a short for $D_{\text{Coh}(X_{\bullet})}^b(\text{Qch}(X_{\bullet}))$ , 351
$\Delta$	see page, 281
$(\Delta)$	see page, 359
$(\Delta)_S^{\text{mon}}$	see page, 359
$(\Delta^+)$	see page, 359
$(\Delta^+)^{\text{mon}}$	see page, 359
$(\Delta^+)_S^{\text{mon}}$	see page, 359
$(\delta_0)$	the natural map $\text{Id}_{(\Delta)} \rightarrow \text{shift } \iota$ , 363
$(\delta_0^+)$	the standard natural transformation $\text{Id}_{(\Delta^+)} \rightarrow \iota \circ \text{shift}$ , 363
$\Delta_M$	$(\Delta)_{\{0,1,2\}}^{\text{mon}}$ , 359

$\Delta_M^+$	$(\Delta^+)_{\{-1,0,1,2\}}^{\text{mon}}$ , 359
$D_{\text{EM}}^+(X_\bullet)$	a short for $D_{\text{EM}(X_\bullet)}^+(\text{Mod}(X_\bullet))$ , 351
$d_{f,g}$	the natural isomorphism $f^\# g^\# \rightarrow (gf)^\#$ of a contravariant almost-pseudofunctor, 272
$d = d(gf = f'g')$	the isomorphism $(g')^*(f')^* \xrightarrow{d} (f'g')^* = (gf)^* \xrightarrow{d^{-1}} f^*g^*$ , 272
$D(G, X)$	stands for $D(B_G^M(X))$ , 446
$d_{I,J,K}^\heartsuit$	the canonical isomorphism $L_{I,J}^\heartsuit \circ L_{J,K}^\heartsuit \cong L_{I,K}^\heartsuit$ , 328
$d_{J,f_\bullet}^\heartsuit$	the canonical isomorphism $L_J^\heartsuit \circ (f_\bullet _J)^*_{\heartsuit} \cong (f_\bullet)^*_{\heartsuit} \circ L_J^\heartsuit$ , 328
$D_{\text{Qch}}^+(G, X)$	stands for $D_{\text{Qch}(G,X)}^+(\text{Mod}(G, X))$ , 446
$D_{\text{Qch}}^+(X)$	a short for $D_{\text{Qch}(X)}^+(\text{Mod}(X))$ , 351
$D(X_\bullet)$	a short for $D(\text{Mod}(X_\bullet))$ , 351
$\mathcal{D}(X_\bullet)$	stands for $D_{\text{Lqc}}(X_\bullet)$ , 415
$\mathcal{D}^-(X_\bullet)$	locally bounded above derived category of $X_\bullet$ , 408
$\mathcal{D}^+(X_\bullet)$	locally bounded below derived category of $X_\bullet$ , 408
$\mathfrak{D}_{\heartsuit}(X_\bullet)$	the category of structure data, 331
$\text{EM}(G, X)$	the category of equivariant $(G, \mathcal{O}_X)$ -modules, 446
$\text{EM}(X_\bullet)$	the category of equivariant sheaves of $\mathcal{O}_{X_\bullet}$ -modules, 324
$\varepsilon$	the counit map of adjunction, 273
$\eta = \eta(f)$	the map $\mathcal{O}_Y \rightarrow f_*\mathcal{O}_X$ , 278
$\text{ev}$	the evaluation map, 278
$\mathfrak{e}_X$	the isomorphism $\text{Id}_{X^\#} \rightarrow (\text{id}_X)_\#$ , 271
$\mathcal{F}$	the subcategory of $\mathcal{A}$ consisting of objects with flat arrows and cartesian morphisms, 417
$f_\bullet^\natural$	the twisted inverse for a cartesian finite morphism $f_\bullet$ , 437
$(f_\bullet)_\heartsuit^*$	the inverse image functor, 327
$(f_\bullet)_*^\heartsuit$	the direct image functor, 327
$f_\bullet^\times$	the right adjoint of $R(f_\bullet)_*$ , 402
$f^\#$	the pull-back associated with $f$ , 289
$f^\times$	the right adjoint of $Rf_* : D_{\text{Qch}}(X) \rightarrow D(Y)$ , 391
$f_{\text{AB}}^\#$	the pull-back $\text{AB}(\mathbb{X}) \rightarrow \text{AB}(\mathbb{Y})$ , 289
$f_{\#}^{\text{AB}}$	the left adjoint of $f_{\text{AB}}^\#$ , 290
$f_{\#}^{\mathcal{C}}$	the left adjoint of $f_{\mathcal{C}}^\#$ , 290
$(f_\bullet)_*^{\text{Lqc}}$	the direct image functor for Lqc, 349
$\mathcal{F}_M$	see page, 445
$f_{\text{Mod}}^\#$	the pull-back $\text{Mod}(\mathbb{X}) \rightarrow \text{Mod}(\mathbb{Y})$ for a ringed continuous functor $f : (\mathbb{Y}, \mathcal{O}_{\mathbb{Y}}) \rightarrow (\mathbb{X}, \mathcal{O}_{\mathbb{X}})$ , 294
$f_{\#}^{\text{Mod}}$	the left adjoint of $f_{\text{Mod}}^\#$ , 294
$f_{\text{PA}}^\#$	the pull-back $\text{PA}(\mathbb{X}) \rightarrow \text{PA}(\mathbb{Y})$ for $f : \mathbb{Y} \rightarrow \mathbb{X}$ , 289

$f_{\#}^{\text{PA}}$	the left adjoint of $f_{\text{PA}}^{\#}$ , 289
$f_{\flat}^{\text{PM}}$	the right adjoint of $f_{\text{PM}}^{\#}$ , 294
$f_{\text{PM}}^{\#}$	the pull-back $\text{PM}(\mathbb{X}) \rightarrow \text{PM}(\mathbb{Y})$ for a ringed functor $f: (\mathbb{Y}, \mathcal{O}_{\mathbb{Y}}) \rightarrow (\mathbb{X}, \mathcal{O}_{\mathbb{X}})$ , 294
$f_{\#}^{\text{PM}}$	the left adjoint of $f_{\text{PM}}^{\#}$ , 294
$F(\mathbb{X})$	the forgetful functor $\text{Mod}(\mathbb{X}) \rightarrow \text{AB}(\mathbb{X})$ , 289
$\mathfrak{f}_X$	the isomorphism $\text{id}_X^{\#} \rightarrow \text{Id}_{X^{\#}}$ , 272
$\gamma$	the twisting (symmetry) isomorphism, 277
$\Gamma_i$	$L_{I, J_1} \circ R_{J_1, i}$ , 408
$H$	see page, 279
$\text{hocolim}$	the homotopy colimit, 381
$\text{holim } t_i$	the homotopy limit of $(t_i)$ , 381
$\underline{\text{Hom}}_{\heartsuit(\mathbb{X})}(\mathcal{M}, \mathcal{N})$	the sheaf Hom functor, 295
$\iota$	the inclusion $(\Delta) \hookrightarrow (\Delta^+)$ , 363
$I_x^f$	see page, 290
$K^?( \mathcal{A})$	the homotopy category of $\mathcal{A}$ with the boundedness $?$ , 311
$K_{\mathcal{A}'}^?( \mathcal{A})$	the full subcategory of $K^?( \mathcal{A})$ consisting of complexes whose cohomology groups lie in $\mathcal{A}'$ , 311
$\lambda$	the left unit isomorphism, 277
$\lambda_{J, i}$	the canonical isomorphism $(L_J^{\heartsuit}(\mathcal{M}))_i^{\heartsuit} \cong \varinjlim (X_{\phi})_{\heartsuit}^*(\mathcal{M}_j)$ , 334
$\text{Lch}$	the category of locally coherent sheaves, 384
$L_J^{\heartsuit}$	the left induction functor, 327
$L_{J, J_1}^{\heartsuit}$	the left adjoint of $(?)_{J_1, J}^{\heartsuit}$ , 327
$\text{lqc}$	the local quasi-coherator for a diagram of schemes, 385
$\text{Lqc}(G, X)$	the category of locally quasi-coherent $(G, \mathcal{O}_X)$ -modules, 446
$\text{Lqc}(X_{\bullet})$	the full subcategory of locally quasi-coherent sheaves in $\text{Mod}(X_{\bullet})$ , 346
$L_x^{\heartsuit}$	the left adjoint of $(?) _x^{\heartsuit}$ , 295
$\text{Ly}(X)$	the Lyubeznik diagram of $X$ , 463
$\mathcal{M}'$	the pull-back $F_{\text{Mod}}^{\#}(\mathcal{M})$ , 364
$m = m(f)$	the natural map $f_* a \otimes f_* b \rightarrow f_*(a \otimes b)$ , 278
$m_i$	the isomorphism $\mathcal{M}_i \otimes_{\mathcal{O}_{X_i}} \mathcal{N}_i \cong (\mathcal{M} \otimes_{\mathcal{O}_{X_{\bullet}}} \mathcal{N})_i$ , 331
$\text{Mod}(G, X)$	the category of $(G, \mathcal{O}_X)$ -modules, 446
$\text{Mod}(\mathbb{X})$	the category of sheaves of $\mathcal{O}_{\mathbb{X}}$ -modules, 289
$\text{Mod}(X_{\bullet})$	the abbreviation for $\text{Mod}(\text{Zar}(X_{\bullet}))$ , 323
$\text{Mod}(Z)$	the category of $\mathcal{O}_Z$ -modules of a scheme $Z$ , 267
$\mu_{\heartsuit}$	the canonical map $f_{\bullet}^* R_J \rightarrow R_J(f_{\bullet} _J)^*$ , 341
$\mu(g_{\bullet}, J)$	the canonical map $g_{\bullet}^* R R_J \rightarrow R R_J(g_{\bullet} _J)^*$ , 428
$\text{Nerve}(f)$	the Čech nerve of $f$ , 360

$\nu$	the canonical isomorphism $\check{H}^0(\mathcal{U}, f^*\mathcal{M}) \cong \check{H}^0(f\mathcal{U}, \mathcal{M})$ , 295
$\nu$	the canonical isomorphism $\check{H}^0 f^* \mathcal{M} \rightarrow f^* \check{H}^0 \mathcal{M}$ , 296
$\omega_Y$	the $G$ -canonical sheaf of $Y$ , 455
$\mathcal{O}_x$	$L_x^{\text{Mod}}(\mathcal{O}_{\mathbb{X}} _x) \cong a\mathcal{O}_x^p$ , 316
$P$	the canonical map $f^*[a, b] \rightarrow [f^*a, f^*b]$ , 283
$\mathfrak{P}$	the category of strongly $K$ -flat complexes, 316
$\underline{\mathfrak{P}}$	the full subcategory consisting of the direct limits of $\mathfrak{P}$ -special direct systems, 316
$\overline{\mathfrak{P}}$	the full subcategory consisting of the inverse limits of $\mathfrak{P}$ -special inverse systems, 316
$\text{PA}(\mathbb{X})$	the category of presheaves of abelian groups on $\mathbb{X}$ , 287
$\phi_{\heartsuit}^*$	stands for the pull-back $(\mathfrak{R}_{\phi})_{\heartsuit}^{\#} : \heartsuit(\mathbb{X}/y) \rightarrow \heartsuit(\mathbb{X}/x)$ , 295
$\phi_{\star}^{\heartsuit}$	stands for $(\mathfrak{R}_{\phi})_{\#}^{\heartsuit} : \heartsuit(\mathbb{X}/x) \rightarrow \heartsuit(\mathbb{X}/y)$ , 295
$\Phi^{\text{RA}}$	the Radu-André homomorphism, 464
$\mathcal{P}(I, \mathcal{C})$	the category of presheaves over the category $I$ with values in $\mathcal{C}$ , 287
$\Pi(f)$	the canonical map (projection morphism) $f_*a \otimes b \rightarrow f_*(a \otimes f^*b)$ , 431
$\text{PM}(\mathbb{X})$	the category of presheaves of $\mathcal{O}_{\mathbb{X}}$ -modules, 289
$\text{PM}(X_{\bullet})$	the abbreviation for $\text{PM}(\text{Zar}(X_{\bullet}))$ , 323
$\mathcal{P}(X_{\bullet}, \mathcal{C})$	the abbreviation for $\mathcal{P}(\text{Zar}(X_{\bullet}), \mathcal{C})$ , 322
$Q$	the localization $K^?(\mathcal{A}) \rightarrow D^?(\mathcal{A})$ , 311
$\Omega$	the full subcategory of $C(\text{Mod}(\mathbb{X}))$ consisting of bounded above complexes whose terms are direct sums of copies of $\mathcal{O}_x$ , 316
$\text{Qch}(G, X)$	the category of quasi-coherent $(G, \mathcal{O}_X)$ -modules, 446
$\text{qch}(X)$	the quasi-coherator on a scheme $X$ , 385
$\text{Qch}(X_{\bullet})$	the full subcategory of $\text{Mod}(X_{\bullet})$ consisting of quasi-coherent modules, 346
$\text{Qch}(Z)$	the category of quasi-coherent $\mathcal{O}_Z$ -modules of a scheme $Z$ , 267
$q(\mathbb{X}, \text{AB})$	the inclusion $\text{AB}(\mathbb{X}) \rightarrow \text{PA}(\mathbb{X})$ , 287
$Q(X_{\bullet}, J)$	the inclusion $\text{Zar}((X_{\bullet}) _J) \hookrightarrow \text{Zar}(X_{\bullet})$ , 322
$q(\mathbb{X}, \text{Mod})$	the inclusion $\text{Mod}(\mathbb{X}) \rightarrow \text{PM}(\mathbb{X})$ , 289
$R^*$	the set of nonzerodivisors of $R$ , 459
$\rho$	the right unit isomorphism, 282
$\rho^{J,i}$	the canonical isomorphism $(R_J^{\heartsuit}(\mathcal{M}))_i^{\heartsuit} \cong \varprojlim (X_{\phi})_*(\mathcal{M}_j)^{\heartsuit}$ , 337
$R_J^{\heartsuit}$	the right induction functor, 327
$R_{J,J_1}^{\heartsuit}$	the right adjoint of $(?)_{J_1,J}^{\heartsuit}$ , 327

$\mathfrak{R}_\phi$	the canonical functor $\mathbb{X}/x \rightarrow \mathbb{X}/y$ for $\phi : x \rightarrow y$ , 295
$\mathfrak{R}_x$	the canonical functor $\mathbb{X}/x \rightarrow \mathbb{X}$ , 295
$\text{Sch}$	the category of schemes, 321
$\text{Sch}/S$	the category of $S$ -schemes, 321
$\text{Set}$	the category of small sets, 287
shift	the standard shifting functor $(\Delta^+) \rightarrow (\Delta)$ , 363
$\Sigma$	the suspension of a triangulated category, 311
$\Sigma_i$	the right adjoint of $\Gamma_i$ , 408
$\Sigma(X_\bullet)$	the simplicial $S$ -scheme associated with $X_\bullet$ , 376
$\mathcal{S}(\mathbb{X}, \mathcal{C})$	the category of sheaves over $\mathbb{X}$ with values in $\mathcal{C}$ , 287
$\mathcal{S}(X_\bullet, \mathcal{C})$	the abbreviation for $\mathcal{S}(\text{Zar}(X_\bullet), \mathcal{C})$ , 322
$\tau_{\geq n}\mathbb{F}$	the truncation of a complex, 317
$\tau_{\leq n}\mathbb{F}$	the truncation of a complex, 317
$\bar{\theta}$	the canonical map $af^\# \rightarrow f^\#a$ , 296
$\Theta(f)$	the duality isomorphism for schemes, 429
$\Theta(f_\bullet)$	the duality isomorphism, 429
$\theta_\heartsuit(f_\bullet, J)$	the canonical isomorphism $((f_\bullet) _J)_*^\heartsuit \circ (?)_J \rightarrow (?)_J \circ (f_\bullet)_*^\heartsuit$ , 340
$\theta(J, f_\bullet)$	the canonical map $L_J(f_\bullet _J)_* \rightarrow (f_\bullet)_*L_J$ , 340
$\theta(\sigma)$	Lipman's theta, 276
tr	the trace map, 278
$u$	the unit map of adjunction, 273
$\Upsilon$	the independence isomorphism, 397
$X'_\bullet$	the augmented simplicial scheme $\text{shift}^\#(X_\bullet) = X_\bullet.\text{shift}$ , 363
$\Xi$	the canonical map $QF \rightarrow (RF)Q$ , 312
$\bar{\xi}$	the canonical map $R(g_\bullet^X)_*(f'_\bullet)^! \rightarrow f'_\bullet R(g_\bullet)_*$ , 425
$\xi_\heartsuit(f_\bullet, J)$	the isomorphism $(f_\bullet)_*^\heartsuit R_J \rightarrow R_J(f_\bullet _J)_*^\heartsuit$ , 341
$\xi(J, f_\bullet)$	the natural map $(?)_J \circ f_\bullet^\times \rightarrow f_J^\times \circ (?)_J$ , 405
$\bar{\xi}(J, f_\bullet)$	the canonical map $(?)_J f_\bullet^! \rightarrow f_\bullet _J^!(?)_J$ , 419
$\xi(\sigma_2)$	the canonical isomorphism $R(g_\bullet^Z)_*(p'_\bullet)^\times \rightarrow p_\bullet^\times R(g_\bullet)_*$ , 425
$Y(\mathcal{M})$	the canonical map $\mathcal{M} \rightarrow \check{H}^0(\mathcal{M})$ , 288
$\text{Zar}(X_\bullet)$	the Zariski site of $X_\bullet$ , 321
$\zeta(\sigma)$	the canonical map $(g'_\bullet)^* f_\bullet^\times \rightarrow (f'_\bullet)^\times g_\bullet^*$ , 413
$\bar{\zeta}(\sigma)$	the canonical map $(g_\bullet^X)^* f_\bullet^! \rightarrow (f'_\bullet)^! g_\bullet^*$ , 420

# References

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