

Indices

There is an index of terms, of citations (authors of cited references), and of symbols. The index of symbols is subdivided as follows:

Terms general, operations, classes, relations, theories;

Types/Propositions general, operations, classes, relations, theories,
classes of theories;

Assignment theories, derivation;

Models general, operations on, classes, relations, interpretations in;

Miscellaneous general, operations, classes, relations;

Categories general, functors.

The meaning of the main division is as follows. There are objects and relations between these. Using the operations one constructs new objects. By collecting objects one obtains classes, by collecting valid relations one obtains theories. Categories consist of classes of objects together with operations.

Index of terms

- α -avoiding, 413
- α -flexible, 412
- $\dot{\mu}$ -redex, 410
- λ -definable, 40, 193
 - from, 193
- λ -define, 193
- λ -define d from the \vec{e} , 193
- μ -redex, 421
- CPO: complete partial order, 522
- safe
 - $\dot{\mu}$ -type, 412
- abstract reduction system, 55
- Ackermann function, 284
- added, 404
- additive, 656
- adfluent, 306
- adjunction, 402
- admissible
 - rule, 584
- agree
 - with ρ , 690
 - with constraints, 484
- algebra, 44, 439
- algebraic, 44, 44
 - map, 438
- ambiguous, 286
- application operators, 95
- applicative structure, 105
- approximable maps, 651
- approximant
 - \mathcal{T} -, 744
 - direct, 540
 - of a λ -term, 540, 586
 - set of -s, 540
- approximate
 - interpretation, 535
- approximation, 525
 - of a regular tree, 535
 - of a type, 531
 - theorem, 540
- argument, 737
- arity, 15
- assertion
 - \mathcal{S} -, 613
 - \mathcal{T} -, 606
- association
 - to the left, 5
 - to the right, 5
- atom
 - type -, 379, 556
 - type —, 594
- atomic
 - type inequality, 556
- bar condition, 303
- basis, 9, 583
 - X -, 782
 - \mathcal{S} -, 613
 - \mathcal{T} -, 606
- à la de Bruijn*, 19
- binary trees, 43
- binds, 414
- bisimulation, 426, 448
- Boolean
 - interpretation, 77
 - valuation, 77
- bottom, 556, 644, 743
- bound, 5
- bound variable
 - of a μ -type, 408
- canonical form, 624
- captures, 414
- carrier, 439
- Cartesian
 - monoid, 259
 - product, 102
- Cartesian monoid
 - free, 263
- characteristic type, 160
- Church
 - version of λ_{\equiv}^A , 387

- version of λ_{\rightarrow}^A , 16
- Church's numeral, 39
- Church–Rosser, 401
- Church–Rosser property, 56
 - weak —, 56
- Church–Rosser theorem
 - for \Rightarrow_{μ} , 401
 - for $\lambda_{\rightarrow}^{\text{Ch}}$, 29
 - for $\lambda_{\rightarrow}^{\text{dB}}$, 23
 - for $\lambda_{\rightarrow}^{\text{Cu}}$, 22
- Church-Rosser theorem
 - for $\lambda\beta\eta$, 7
- circular, 422
- class
 - of a set of constants, 160
 - of a type, 150
- classically valid, 78
- closed, 407
 - term, 5
 - term model, 320
 - under application, 96
 - under head expansion, 737
 - under reduction, 510
- closure
 - under reduction, 22
- closure ordinal, 290
- co-recursion, 448
- coalgebra
 - T -, 440
 - morphism, 440
- code, 281
- computationally adequate, 717
- combinator, 5
- Combinatory Reduction System, 421
- compact, 587, 644
 - element, 522
- compatible, 597
- complete, 153, 176
 - A -, 176
 - ∇ -uniform, 527
 - for pure terms, 176
 - partial order, 522
 - subset, 527
- complete lattice, 586, 644
- complete partial order
 - category, 523, 523
- completeness, 590, 734
- components, 15, 52, 764
- computable, 64
 - under substitution, 64
- configuration, 775
- confluent, 7, 56
 - from M , 115
- congruence, 381, 395
- consistent, 7, 108
- constant, 107, 233
- constraints, 484
- constructors, 44
- continuous, 315
 - Scott, 646
- contraction
 - of $\dot{\mu}$ -redex, 410
 - of μ -redex, 421
- contractive
 - map, 437
 - type - in a variable, 422
- conversion
 - α - - on types, 409
 - $\dot{\mu}$ - - on types, 410
 - μ - - on types, 421
- Coq, 18
- Curry
 - version of λ_{\rightarrow}^A , 15
- Curry–Howard isomorphism, 356
- cyclic, 484
- de Bruijn
 - version of λ_{\rightarrow}^A , 18
- decidable, 193
- decision problem, 193
- declaration, 9
 - \mathcal{S} -, 613
 - \mathcal{T} -, 606
- deductive closure, 467
- definable
 - functional - by TR_{α} , 299
- defined
 - for partial function, xxii
 - partial semantics, 97
- deflationary
 - set of type inequality, 557
 - type inequality, 556
 - type theory, 557
- degree, 231
- dependence
 - polynomial on variable, 104
- depth, 13
 - of a μ -type, 463
- derivability
 - for subtyping, 556
- derivable
 - R - word, 195
 - from Γ , 9
 - proposition, 80
- derivable from, 108
- derivative, 448
- derived
 - rule, 584
- descendants, 484
 - direct -, 484
- Dialectica interpretation, 319
- Diophantine, 273, 275
 - uniformly in n , 276
- directed, 315, 522, 587, 644
- discharged, 11
- domain, 9, 400

- elementary equivalent, 99
- elementary equivalent at A , 99
- embed, 154
- embeddable, 383
- empty tree, 43
- empty word, 195
- encoded, 196
- enriched, 395
 - set of types, 395
 - syntactic type algebra, 395
- enumeration
 - problem, 68
 - for $\lambda_{\underline{A}}$, 497
- environment
 - term, 97
- environment in \mathcal{D} , 683
- equality
 - strong, 428
 - weak, 428
- equation
 - over \mathcal{D} , 107
- equational, 273
- equational logic
 - extended by \mathcal{E} , 383
- equational version, 248
- equi-recursive, 390
- equivalence of recursive types
 - completeness, 541
- equivalent, 404
 - sets of constraints, 484
 - weakly, 419
- evaluation
 - of a term, 511
- expansive, 115
- extensional, 96, 685
- extensional equality
 - hereditary, 312
- extensionality, 95
- extensionally equivalent, 157
- F-semantics, 566, 717
- favorable, 769
- filter, 587, 614, 614
- filter model
 - for λ , 690
 - for λI , 690
- filter quasi λ -model, 689
- filter structure, 616
- final, 440
- final labels, 767
- finite, 424, 587, 644
 - element, 522
- finite completeness theorem, 155
- finitely generated, 189, 206
- fixed point combinator, 312
- fixed point recursion, 313
- fixed-point combinator, 86
- flat, 479
- fold-unfold, 437
- folding, 403, 421
- forcing
 - $\Gamma \Vdash A$, 82
 - $k \Vdash A$, 82
 - $\mathcal{K} \Vdash A$, 82
 - $\mathcal{K} \Vdash \Gamma$, 82
 - $\Vdash A$, 82
- forgetful map, 25
- formulas-as-types, 780
- free variable
 - of a type, 408
- free variable lemma
 - for $\lambda_{\rightarrow}^{Cu}$, 20
- free variables, 5
- free(ly generated), 44
- fully abstract, 177
- fully eta (*f.e.*) expanded, 52
- function
 - partial, xxii
- functional
 - continuous, 322
 - hereditarily finite, 311
- fundamental theorem
 - for semantic logical relations, 125
 - for syntactic logical relations, 119
- Gödel's \mathcal{T} , 284
- Gödel-number, 89
- Galois connection, 656
- game
 - rules, 768
- game context, 765
- game types, 765
- Gandy hull, 126
- generated by, 587
- gip: inhabitation problem, 771
- global move, 766
 - C_2 , 776
 - C_3 , 776
- good
 - \rightarrow , 732
- grammar
 - 2-level, 33
- graph, 602
- greatest lower bound, 583
- group
 - Thompson–Freyd–Heller, 268, 318
- $h\uparrow$ -closed, 737
- has an Inf, 32
- has index i , 233
- has type, 12
- has type A relative to Γ , 12
- head-reducible to, 151
- height, 726
- hereditarily
 - extensional operators, 321
- hereditarily affluent, 306
- hereditarily finite, 305, 305

- hereditarily monotonic functions, 96
- hereditarily non-trivial, 547
- hereditarily recursive operators, 320
- Hierarchy Theorem, 149
- Hierarchy Theorem Revisited, 153
- higher-order logic, 244
- holds
 - for equations, 383
 - for existential statements, 398
- homogeneous, 557
 - in α , 557
 - type theory, 557
- ideal, 526, 553, 566
- implicational propositional logic, 80
- inconsistent, 7, 7
- inconsistent with, 112
- indeterminates, 397, 400
- induction loading, 65
- inductive, 288, 515
- inductive types, 509
- inductively, 517
- inequality, 226
- inf, 644
- infima, 644
- inflationary
 - set of type inequalities, 557
 - type inequality, 556
 - type theory, 557
- inhabitation
 - for $\lambda_{=}^A$, 497
- inhabitation problem, 68, 762
 - generalized, 771
- inhabited relative to Γ , 12
- initial, 440
- initial label, 767
- initial position, 767
- instance
 - of a problem, 193
- instantaneous description, 775
- interpolation
 - equation, 214
 - problem, 214
 - problem, dual, 214
- interpretation, 106, 430
 - of terms, 588
 - of types, 589
- interpretation of a type A , 511
- interpretation under ρ , 84
- intersection type language, 581
- intersection type theories, 595
- intersection type theory, 581
 - with universe, 595
- invariant, 133
 - μ -, 413
- inversion, 622
- Inversion Lemma, 495
 - for λ_{\rightarrow}^T , 622
 - for $\lambda_{\rightarrow}^{\text{Ch}}$, 22
 - for $\lambda_{\rightarrow}^{\text{dB}}$, 23
 - for $\lambda_{\rightarrow}^{\text{Cu}}$, 20
 - for syntactic type algebras, 495
 - for type algebras, 495
- Inversion lemma
 - for λ_{\leq}^S , 559
 - for invertible type algebras, 560
- invertible, 393, 393, 559
- i-rank, 780
- irrelevant, 215
- is inhabited by, 12
- iso-recursive, 390
- isomorphic, 382
- isomorphic λ -models, 687
- isomorphism, 382
- Jacopini tableau, 111
- justifies
 - set of equations -, 386
 - type algebra -, 386
- kernel, 443
- Kleene application, 320
- Kripke model, 82
- Kripke models, 81
- Kripke type interpretation, 749
- labels, 766
- lambda Galois connection, 658
- lambda structure, 657
- lambda structures, 658
- large, 148
- lattice
 - ω -algebraic, 522
 - algebraic, 522, 645
 - ω -, 587, 645
 - complete -, 522
- layered non-empty subfamily, 96
- lazy, 602, 669, 717
- lazy lists, 450
- lazy zip structure, 663
- lead symbol, 422
- lean, 215
- least fixed point, 289
- left, 195
- left adjoint, 656
- legal, 19
- length, 90
- lifting of S , 126
- limit, 288
- lists, 291
- local move, 766
 - k th, 768
- logical framework, 349
- logical relation
 - semantic, 123
 - syntactic, 114
- logically equivalent, 404
- long-nf, 32
- lower

- approximations, 561
- matching
 - pure — problem, 207
- matrix, 52
- maximal theory, 179
- maximally trivial, 547
- meet semi-lattice, 610
- meet semi-lattice with universe, 611
- minimal model, 179
- model, 109
 - λ , 684, 684
 - η , 685
 - λ_{\rightarrow}^0 , 97
 - of $\lambda_{\mathcal{T}}$, 287
 - of $\lambda_{\mathcal{Y}}$, 314
 - quasi λ -, 683
 - typed λ -, 97
 - untyped λ -, 105
- monotonic, 523
- monster, 37
- morphism, 96, 382, 439
 - for Cartesian monoids, 260
 - of type structures, 555
- most general unifier, 71
- move
 - global, 775
- multi head-reducible to, 151
- multi-sorted, 46
- multiplication of \mathcal{T} -bases, 609
- multiset order, 57
- multiset over ω , 56
- natural, 602, 657
- natural deduction, 11
- natural lambda structures, 658, 670
- natural zip structure, 663
- negative
 - α - in A , 508
 - occurrence, 508
- next instantaneous description function, 775
- nf: normal form, 55
- no, 195
- non-empty
 - logical relation, 123
- norm, 736
- normal form
 - R -, 55
 - Φ -, 52
- normalization theorem
 - strong -
 - for λ_{\rightarrow}^A , 64
 - weak -
 - for λ_{\rightarrow}^A , 61
- normalizing
 - strongly R -, 56
 - weakly R -, 55
- numerals, 276, 285
- observable type, 546
- observationally equivalent, 157, 546
- ogre, 724
- on terms from $\mathcal{D}_1, \dots, \mathcal{D}_n$, 114
- open set
 - Scott -, 523
- order, 13, 207, 717
- ordering on \mathcal{D}_{∞} , 702
- ordinals, 288
- orphan, 479
- output-type, 207
- pairing, 255
 - $A \times A \rightarrow A$, 84
 - R -, 48, 48
 - surjective, 48
- partial, 97
 - CPO of - functions, 523
 - function, xxii
- partial semantics
 - $\llbracket M \rrbracket_{\rho}$ defined, 97
 - $\llbracket M \rrbracket_{\rho}$ undefined, 97
- partial surjective homomorphism, 124
- partial types, 561
- partially ordered set, 522
- pattern matching, 75
- permutation of arguments, 136
- perpetual, 717
- persistently head normalizing, 736
- persistently normalizing, 736
- persistently strongly normalizing, 736
- Platek's \mathcal{Y} , 313
- play
 - in a game, 766
- Plotkin's Model, 724
- polynomial, 440
- polynomial structure, 103
- poor, 190
- poset: partially ordered set, 522
- position, 767
 - next, 769
- positive
 - α - in A , 508
 - occurrence, 508
 - type, 509
- predicate, 9, 606
- preorder
 - intersection type -, 581
- preserves, 732
- prime, 393
- principal, 587
 - recursive basis
 - of a term, 502, 568
 - recursive triple
 - of a term, 502, 568
 - recursive type
 - of a term, 502, 568
 - type algebra
 - of a term, 502, 568
 - type theory

- of a term, 568
- principal pair, 73
- principal type, 73
- Principal type theorem, 74
- problem
 - EQA, 763
 - ETW, 763
 - IHP, 763
 - WTG, 763
- product, 48, 48
 - Cartesian
 - R -, 48
- programming
 - functional, xvi
 - imperative, xvi
- projection, 120, 273
- propositions-as-types, 79
- proper, 51, 400, 602, 670
- proper strict zip structure, 664
- property
 - λK^o -, 66
- protective, 413
- pseudo-negation, 51
- pseudo-terms, 19
- quasi λ -model, 685
- R -exp, 585
- R -red, 585
- rank, 13, 207
- rank of a formula, 253
- realizability interpretation, 600
- recursion
 - bar, 303
 - nested, 319
 - primitive
 - simultaneous, 319
- recursive
 - primitive
 - functionals, 283
 - functions, 282
- recursors, 283
- redex
 - βN , 787
 - l-, 66
 - K-, 66
 - K^+ -, 66
 - K^o -, 66
- reduced form, 423
 - principal, 423
- Reducibility Theorem, 146
- reducible
 - decision problems
 - many one, 193
 - Turing, 194
 - for types, 136
- reduction
 - T , 285
 - α - on types, 409
 - $\dot{\mu}$ - on types, 410
 - μ - on types, 421
 - β -, 6
 - η -, 6
 - \mathcal{R} , 401
- reflexive, 588
- reflexive structure, 524
- regular, 425, 425
- relation
 - semantic, 123
 - syntactic, 114
- relations
 - family of semantic, 123
 - family of syntactic, 114
- relativized, 762
- representable, 589, 695
- represented in, 160
- retract
 - SP, 259
- retraction pair
 - SP, 259
- rewrite rule, 195
- rich, 190
- right, 195
- right adjoint, 656
- right-most redex, 61
- rule
 - admissible, 584
 - derived, 584
- safe
 - forever - $\dot{\mu}$ -type, 412
- satisfaction, 521, 590
 - $\rho \models A$, 78
 - $\rho \models \Gamma$, 78
 - $\mathcal{D}, \rho, \xi \models M : A$, 107
 - $\mathcal{D}, \rho \models M = N$, 106
 - $\mathcal{M}, \rho \models M = N$, 98
 - $\mathcal{M} \models M = N$, 98
 - $\mathcal{M} \models \mathcal{E}$, 109
 - $\Gamma \models M : A$
 - for λ_{\cap}^S , 732
 - in term model, 512
- satisfies, 445
 - existential statement, 398
- saturated, 510
- Scott continuous, 587
- search-type, 207
- Second principal type theorem for λ_{\supset}^{Cu} , 75
- section
 - A -, 176
- self-capturing, 414
- Semantic Satisfiability, 755
- semantics
 - partial, 97
- separable, 268
- separable from, 112
- signature functor, 439
- simple, 400

Index of terms

821

- simple semantics, 731
- simplified syntax, 5
- simulation, 563
- simultaneous recursion
 - over $\mathcal{A}(\vec{X})$, 400
 - over \mathcal{A} , 400
- slantwise λ -definable: λ -definable
 - slantwise, 189
- slantwise enumerates, 190
- small, 148
- smallest congruence extending \mathcal{E} , 383
- SN: strongly normalizing, 56, 735
- solitary game, 767
- solution, 398, 771
- solvable
 - game, 769
- solves, 398
 - M solves P , 771
- sound
 - β , 624
 - η -, 631
 - η^u -, 631
- soundness, 590, 732
- special, 461, 462
- Spector's \mathcal{B} , 304
- stable
 - HN, 737
 - N, 737
 - SN, 737
- standard \Rightarrow_μ -reduction, 457
- statement, 9
 - \mathcal{S} -, 613
 - \mathcal{T} -, 606
- step function, 538, 646
- streams, 446
- strict, 523, 646, 685
- strict lambda structure, 669
- strict lambda structures, 670
- strict zip structure, 663
- string, 264
- strongly normalizing, 56
 - β -, 735
- structure
 - full typed, 95
 - typed, 94
- sub, 595, 595
- subject, 9, 556, 606
- Subject Reduction
 - for $\lambda_{\underline{A}}$, 496
- subject reduction property
 - for $\lambda_{\underline{A}}^{\text{dB}}$, 23
 - for $\lambda_{\rightarrow}^{\text{Cu}}$, 21
- substitution, 426
 - naive, 408
 - smart, 408
 - type
 - in term, 17
 - in type, 9
- substitution Lemma
 - for $\lambda_{\underline{A}}^{\text{dB}}$, 23
- substitution lemma
 - for $\lambda_{\rightarrow}^{\text{Ch}}$, 22
 - for $\lambda_{\rightarrow}^{\text{Cu}}$, 20
- substitutive, 116
 - semantic logical relation, 126
- substitutor, 71
- subtree, 425
- subtree of t at w , 425
- subtyping relation, 562
- successor, 288, 288
- sufficient
 - set of constants, 156
- sup, 644
- sup: supremum, 522
- support, 57
- supremum, 288, 522
- surjective, 190, 256
- surjective pairing, 50
- syntactical type structure, 612
- target, 15
- term
 - $\lambda\Phi$, 743
 - $\lambda\perp$, 743
 - pure, 107
- term environment, 511, 588
- term model, 511
 - closed
 - for $\lambda_{\mathcal{B}}$, 311
 - open, 110
- terms of λ_{SP} , 257
- terms of $\lambda_{\rightarrow}^{\text{Ch}}$, 17
- terms of type A , 16
- the tree functor, 441
- theory
 - consistent, 546
 - theory of \mathcal{M} , 98
- to the right, 61
- top, 556, 583, 644
- topology
 - Scott -, 523
- trace
 - of a under f , 181
- transfinite
 - induction, 295
 - iteration, 289
 - recursion, 298
- tree, 424
- tree game, 766
 - G_0 , 770
 - G_1 , 775
- tree-unfolding, 427
- trivial, 95, 259
- trivial type, 546
- true in \mathcal{D} , 588, 684
- truncation, 426
- trunk, 219

- typability, 68
 - for λ_{\perp}^A , 497
- typable, 12, 583
- typable relative to, 12
- type
 - assignment
 - à la Curry, 10
 - à la de Bruijn, 19
 - atom, 8
 - characteristic, 160
 - checking, 68
 - depth, 463
 - for words, 41
 - function space, 8
 - level, 14
 - natural number, 284
 - of λ_{SP} , 257
 - reconstruction, 68
 - reduction
 - $\beta\eta$, 136
 - $\beta\eta_{SP}$, 272
 - simple, 8
 - trivial, 546
- type algebra, 379
 - equation over, 383
 - free -, 379, 390
 - interpretation of a -, 520
 - quotient of, 383
 - satisfying a set of equations, 383
 - satisfying an equation, 383
 - subalgebra, 390
 - syntactic, 382
- type assignment
 - λ_{Γ}^{BCD} , 583
 - λ_{Γ}^A , 606
- type checking
 - for λ_{\perp}^A , 497
- type environment, 589
- type interpretation, 533, 731
 - approximate —, 531
- type nesting, 719
- type reconstruction
 - for λ_{\perp}^A , 497
- type structure, 554, 611
 - determined by \mathcal{T} , 557
 - full -, 84
 - intersection
 - with universe, 611
 - without universe, 611
- type theory, 595
 - axiomatized by \mathcal{H} , 556
 - for subtyping, 556
 - intersection -
 - with universe, 595
 - without universe, 595
- type tree, 424
- type-semantics theorem, 691
- typed applicative structure, 95, 96
- typed lambda theory, 108
- typed terms
 - of $\lambda_{\perp}^{A, Ch_0}$, 389
 - of $\lambda_{\perp}^{A, Ch}$, 387
- typewriter automaton, 774
- ultrametric space, 437
- undefined
 - for partial function, xxii
 - partial semantics, 97
- unfolding, 421
- unfolding (modulo \mathcal{R}), 403
- unicity of types
 - for $\lambda_{\rightarrow}^{Ch}$, 23
 - for $\lambda_{\rightarrow}^{dB}$, 24
- unification
 - first-order, 72
 - pure — problem, 207
 - system of - problems, 209
 - with constants from Γ , 209
 - with unknowns, 209
- unification theorem, 72
- unifier, 71
- uniform
 - set, 526
- uniformity
 - ∇ , 527
- uniquely closed, 407
- universal n -ary relation, 120
- universal top, 581
- universe, 581, 594
- unknown X , 207
- upper
 - approximations, 561
- upper bound, 522
- useless, 547
- valid, 470
 - k -, 470
- valuation, 84
- valuation in, 97
- variable
 - bound type -, 408
 - free type -, 408
- variant, 72
- weak head expansion, 115
- weakening lemma
 - for $\lambda_{\rightarrow}^{Cu}$, 20
- weakly confluent, 56
- weakly encoded, 196
- well founded, 393
- winning, 767
- witnesses, 111
- WN: weakly normalizing, 55
- word, 195
- yes, 195
- zero, 288
- zip structure, 663

Index of Citations

- Abadi and Cardelli (1996), 573
 Abadi and Fiore (1996), 390
 Abadi and Plotkin (1990), 526, 542, 575
 Abelson et al. (1991), xvii, 332
 Abramsky (1991), 577, 651
 Abramsky and Jung (1994), 314
 Abramsky and Ong (1993), 592, 601, 683, 716,
 717, 717, 742, 742, 743, 757, 757
 Ackermann (1928), 282, 395
 Aczel (1988), 435
 Aho et al. (1986), 574
 Alessi (1991), 682, 682, 694, 705, 706, 723
 Alessi (1993), 699, 725
 Alessi et al. (2003), 622, 627
 Alessi et al. (2004b), 681, 694, 699, 725
 Alessi et al. (2006), 622, 627
 Alessi et al. (2001), 683, 718
 Alessi et al. (2004a), 682, 705
 Alessi and Barbanera (1991), 781
 Allouche and Shallit (2003), 509
 Amadio (1991), 542, 549
 Amadio and Cardelli (1993), 465, 474, 554,
 561, 565, 566, 575
 Amadio and Curien (1998), 542, 742, 742
 Andrews (2002), 349
 Appel and McAllester (2001), 542
 Appel (1992), 333
 Ariola and Klop (1994), 492
 Ariola and Klop (1996), 422, 454, 465, 467,
 474, 474
 Augustson (1999), 340
 Avigad et al. (2007), 349
 Baader and Nipkow (1998), 73
 Baader and Snyder (2001), 73
 Backus (1978), 331
 Baeten and Boerboom (1979), 683, 718
 van Bakel (1992), 742
 van Bakel (1993), 607
 van Bakel et al. (2002), 744
 Baldridge (2002), 374
 Barbanera et al. (1995), 352, 361, 609
 Barendregt (1974), 49, 50, 209, 210, 256
 Barendregt (1984), ix, xi, 5, 5, 6, 39, 53, 56,
 87, 106, 112, 113, 137, 140, 157, 181, 265,
 285, 287, 329, 330, 331, 331, 332, 332,
 351, 412, 427, 453, 524, 526, 526, 527,
 536, 537, 537, 539, 546, 550, 642, 681,
 681, 683, 686, 694, 701, 701, 701, 705,
 715, 715, 718, 742, 742, 742, 743, 789
 Barendregt (1992), 16, 24, 324, 345, 349
 Barendregt and Barendsen (1997), 346
 Barendregt et al. (1993), 351
 Barendregt et al. (1983), 107, 526, 577, 580,
 581, 590, 592, 601, 601, 601, 616, 637,
 681, 682, 728, 729, 731, 734, 743, 757, 757
 Barendregt and Ghilezan (2000), 352, 609
 Barendregt and Rezus (1983), 541
 Barendsen and Smetsers (1993, 1996), 338
 Barendregt and Wiedijk (2005), 346
 Bekič (1984), 452
 van Benthem Jutting (1977), 346
 van Benthem (1995), xx, 373, 374
 van Benthem and ter Meulen (1997), 374
 Berarducci and Böhm (1993), 324, 326
 Berline (2000), 716, 749
 Bernardi (2002), 374
 Bertot and Castéran (2004), 18, 342, 345, 349
 Bezem (1985), 124, 310
 Birkedal and Harper (1999), 542
 Barendregt et al. (2013), 329
 Böhm (1966), 323
 Böhm (1975), 810, 810
 Böhm and Berarducci (1985), 324, 324
 Böhm and Dezani-Ciancaglini (1975), 736
 Böhm and Gross (1966), 323
 Böhm et al. (1994), 324, 326, 329
 Bono et al. (2008), 781
 Bove et al. (2009), 349
 Brandt and Henglein (1998), 465, 465, 466,
 554, 561, 562, 563, 563, 564, 572, 575
 Breazu-Tannen and Meyer (1985), 379
 Bruce et al. (1990), 541, 550

- de Bruijn (1968), 342
 de Bruijn (1970, 1994a), 342
 de Bruijn (1970, 1994b), 344
 de Bruijn (1972), 144, 412
 de Bruijn (1994b), 342
 Buszkowski and Penn (1990), 365
 Capitani et al. (2001), 781
 Capretta and Valentini (1998), 352
 Caprotti and Oostdijk (2001), 348
 Cardone (2002), 553
 Cardone (1989), 542
 Cardelli (1988), 573
 Cardone and Hindley (2009), 1
 Cardone (1991), 575
 Cardone and Coppo (2003), 435, 456, 456, 456, 459
 Cardone and Coppo (1990), 578
 Cardone and Coppo (1991), 526, 535, 539, 541, 541, 574
 Cardone et al. (1994), 575
 Church (1932), xiii
 Church (1933), xiii
 Church (1936), 323
 Church (1940), xvii, 243, 349
 Church (1941), 1, 53, 332
 Church and Rosser (1936), 332
 Coppo and Dezani-Ciancaglini (1980), 580, 592
 Coppo et al. (1984), 622, 680, 682, 682, 699, 706, 716
 Coppo et al. (1983), 682, 716
 Coppo et al. (1979), 592, 595
 Coppo et al. (1981), 592
 Coppo et al. (1987), 592, 682, 706, 742, 743, 757, 757
 Coppo (1985), 526, 539, 539, 541, 575
 Cosmadakis (1989), 545
 Courcelle et al. (1974), 572
 Courcelle (1983), 434, 435, 435, 435, 437, 437, 439, 552
 Cousineau et al. (1987), 334
 Crossley (1975), 1
 Curien (1993), 262, 334
 Curry (1934), xiii, xvii
 Curry (1969), 74, 331, 499, 574
 Curry and Feys (1958), xvii, xx, 349, 627
 Davis (1973), 212
 David and Nour (2007), 509
 Davis et al. (1961), 212
 Dedekind (1901), 440
 Dekkers (1988), 180, 188
 Dekkers et al. (1998), 351
 Dezani-Ciancaglini et al. (2004), 682
 Dezani-Ciancaglini et al. (1997), 781
 Dezani-Ciancaglini et al. (2003), 595, 731, 735
 Dezani-Ciancaglini et al. (2005), 592, 730, 742, 743, 787
 Dezani-Ciancaglini et al. (2001), 730, 743
 Dezani-Ciancaglini and Margaria (1986), 717
 Di Gianantonio and Honsell (1993), 610, 706
 Došen (1992), 364
 van Draanen (1995), 314, 315
 Dyckhoff and Pinto (1999), 362
 van Eekelen and Plasmeyer (1993), xix, 335
 ten Eikelder (1991), 465
 Elbers (1996), 348
 Endrullis et al. (2011), 408, 456, 456, 458, 466, 491
 Engeler (1981), 526, 592, 601, 722, 722
 Euclid of Alexandria (-300), 344
 Fiore (1996), 574
 Fiore (2004), 574
 Flajolet and Sedgewick (1993), 240
 Fortune et al. (1983), 189
 Fox (2003), 350
 Freyd (1990), 574
 Freyd (1991), 574
 Freyd (1992), 574
 Friedman (1975), 124, 125, 142, 155
 Gandy (1980), 55, 61, 66, 89
 Gapeyev et al. (2002), 390, 561, 575
 Gentzen (1969), 344
 Gentzen (1936a), 298
 Gentzen (1936b), 360
 Gentzen (1943), 298
 Ghilezan (2007), 352
 Ghilezan (1996), 742
 Gierz et al. (1980), 643, 701
 Girard (1971), 65, 310, 509
 Girard (1995), 338
 Girard et al. (1989), xxi, 1, 16, 324, 610
 Gödel (1931), 255
 Gödel (1958), 283, 319, 320
 Goguen et al. (1977), 390, 552
 Goldfarb (1981), 208, 228
 Gonthier (2008), 349
 Gordon (1994), 336, 337
 Gordon and Melham (1993), 342, 349
 Grabmayer (2005, 2007), 575
 Grabmayer (2005), 465, 474
 Grabmayer (2007), 422, 493
 Grégoire et al. (2006), 348
 de Groote and Pogodalla (2004), 375
 de Groote (1995), 349, 356
 Grzegorzczuk (1964), 49
 Gunter (1992), 314
 Gunter and Scott (1990), 315, 334, 574
 Hales (2005), 349
 Harrison (2009b), 349
 Harrison (2009a), 349
 Harrop (1958), 83
 Harrington et al. (1985), 811
 Henderson (1980), 333
 Henkin (1950), 94
 Herbelin (1995), 351, 362
 Hilbert and Ackermann (1928), 332

Index of Citations

825

- Hindley (1969), 74, 75, 331, 503, 574
 Hindley (1983), 107, 731
 Hindley (1992), 578
 Hindley (1997), 1, 75, 358
 Hindley and Seldin (1980), 799, 802, 805, 808, 809, 810, 811
 Hinze et al. (2007), 340
 Hodges (1983), 329
 Honsell and Lenisa (1993, 1999), 717
 Honsell and Lenisa (1999), 592, 717, 717, 787
 Honsell and Ronchi Della Rocca (1992), 592, 610, 610, 706, 742, 742, 742, 742, 743, 743, 757, 757, 761
 Howard (1970), 62, 303
 Howard (1980), 349, 356
 Hudak et al. (1999), 572
 Hudak et al. (1992), 335
 Huet (1975), 207
 Hughes (1984), 335
 Hughes (1989), 330, 334
 Hutton (2007), xix
 Hyland (1975/76), 742, 742
 Iverson (1962), 331
 Jacopini (1975), 111, 683, 718
 Jay (2009), 575
 Johnsson (1984), 335
 Johnstone (1986), 654
 Joly (2001a), 183
 Joly (2002), 189, 206
 Joly (2005), 206, 206
 Jones (1982), 211
 Jones (1993), 340
 Kamareddine et al. (2004), 1, 1
 Kanazawa (1998), 366
 Kaufmann et al. (2000), 349
 Kfoury and Wells (1995), 68
 Kleene (1936), 328, 329
 Kleene (1952), xxii
 Kleene (1959a), 311, 322
 Kleene (1959b), 311
 Kleene (1975), 326
 Klein et al. (2009), 350
 Klop (1980), 66, 140, 257
 Klop (1992), 400, 421
 Klop and de Vrijer (1989), 256
 Koopman and Plasmeijer (1999), xix
 Koopman and Plasmeijer (2006), xix
 Klop et al. (1993), 421
 Koster (1969), 465, 468, 473, 572
 Koymans (1982), 334
 Kozen (1977), 490
 Kozen (1997), 763, 774, 775
 Kozen et al. (1995), 465, 575
 Kreisel (1959), 311
 Kripke (1965), 83
 Krivine (1990), 617, 737, 742, 742
 Krivine (1993), 804
 Kurata and Takahashi (1995), 780
 Kurtonina (1995), 364
 Kurtonina and Moortgat (1997), 372, 375
 Kuśmierk (2007), 790, 790
 Lambek (1958, 1961), 365
 Lambek (1958), 369
 Lambek (1961), 369
 Lambek (1980), 259
 Lambek and Scott (1981), 1
 Landau (1960), 346
 Landin (1964), 333
 Lax (2002), xviii
 Moot and Retoré (2012), 374
 Lehmann and Smyth (1981), 544
 Leivant (1983b), 325
 Leivant (1983a), 780
 Leivant (1986), 742
 Leivant (1990), 189
 Leroy (2009), 350
 Lévy (1978), 60, 60, 90
 Liquori and Ronchi Della Rocca (2007), 781
 Loader (2001a), 206
 Loader (2001b), 193
 Loader (2003), 213
 Loader (1997), 230
 Longo (1988), 742
 Lopez-Escobar (1983), 781
 MacQueen et al. (1986), 526, 549, 575
 Mairson (1992), 77
 Makanin (1977), 242
 Martin-Löf (1984), 345, 348, 349
 Marz (1999), 479
 Matiyasevič (1972), 212, 278
 Matiyasevič (1993), 212
 Mayr and Nipkow (1998), 258
 McCarthy et al. (1962), xvii, 332
 McCarthy (1963), 573
 McCracken (1979), 541
 Melliès (1996), 414
 Mendler (1987), 507
 Mendler (1991), 509, 513
 Meyer (1982), 694
 Milner (1978), 331, 333, 571, 574
 Milner et al. (1997), xviii
 Mints (1989), 781
 Mints (1996), 352, 352, 361, 362
 Mitchell (1996), 748
 Mitschke (1976), 718
 Mogensen (1992), 328, 328, 328
 Moller and Smolka (1995), 465
 Montague (1973), xx
 Moot (2002), 373
 Moot (2008), 373
 Morrill (1994), 374
 Muzalewski (1993), 349
 Nadathur and Miller (1988), 330
 Nederpelt (1973), 66
 Nederpelt et al. (1994), xx, 18, 344
 Nerode et al. (In preparation), 1

- Nikhil (2008), 341
 Nipkow et al. (2002), 342, 345, 349
 van Oostrom (2007), 415
 Oostdijk (1996), 348
 Padovani (2000), 208, 213
 Padovani (1996), 230
 Pair (1970), 572
 Parikh (1973), 73
 Parigot (1992), 345
 Park (1976), 545, 592, 681, 743
 Pentus (1993, 2006), 373
 Péter (1967), 89, 284, 319
 Peyton Jones (2003), xix
 Peyton-Jones (1987), 572
 Peyton Jones et al. (2006), 341
 Peyton Jones and Wadler (1993), 335
 Pierce (2002), 377
 Pil (1999), 341
 Pimentel et al. (2012), 781
 Plasmeijer et al. (2007), 340
 Plasmeijer and van Eekelen (2002), xix
 Platek (1966), 312, 315
 Plotkin (1975), 333, 601
 Plotkin (1977), 312, 314
 Plotkin (1982), 544, 705
 Plotkin (1980), 155
 Plotkin (1985), 390
 Plotkin (1993), 592, 669, 706, 722, 724, 724, 724
 Poincaré (1902), 345
 Polonsky (2011), 567
 Post (1947), 195
 Pottinger (1977), 351, 362
 Pottinger (1980), 742
 Pottinger (1981), 140
 Prawitz (1965), 119, 254, 254, 351
 Prawitz (1971), 65
 van Raamsdonk (1996), 314
 van Raamsdonk et al. (1999), 735
 Reynolds (1972), 333
 Reynolds (1993), 333
 Robertson et al. (1997), 349
 Robinson (1965), 72
 Rogers Jr. (1967), 194
 Ronchi Della Rocca (2002), 781
 Ronchi Della Rocca (1988), 742, 757, 757
 Ronchi Della Rocca and Paolini (2004), 610, 743
 Rosser (1984), 1
 Rutten (2000), 440, 442
 Rutten (2005), 449
 Salvati (2009), 781
 Salvati et al. (2012), 786
 Schmidt-Schauß (1999), 230
 Schrijvers et al. (2009), 341
 Schubert (1998), 213, 497
 Schwichtenberg (1975), 303
 Schwichtenberg (1976), 41
 Schwichtenberg (1999), 362
 Schwichtenberg and Berger (1991), 316
 Scott (1970), 345, 348
 Scott (1972), 334, 541, 577, 592, 681, 701, 701, 705, 723, 723, 743
 Scott (1975b), 377, 379, 379, 436
 Scott (1975a), 105, 106, 520, 641, 728, 730, 731, 734
 Scott (1980), 259
 Scott (1976), 541, 550, 551
 Sheeran (2005), xix, 341
 Smyth and Plotkin (1982), 334, 542, 574
 Sørensen (1997), 68
 Sørensen and Urzyczyn (2006), xxi, 16, 80, 349, 356
 Spector (1962), 303, 303, 305
 Statman (2000), 255, 255
 Statman (1982), 41, 155
 Statman (2007), 54
 Statman (1979a), 83, 762
 Statman (1979), 77, 361
 Statman (1980b), 153, 173
 Statman (1980a), 136, 137, 144, 146, 146, 149, 150, 150, 150, 798
 Statman (1981), 211
 Statman (1985), 154
 Statman (1994), 379, 476, 483, 488, 496
 Steedman (2000), 374
 Steele Jr. (1978), 333
 Steele Jr. (1984), 332
 Stenlund (1972), 65
 Stirling (2009), 208, 213
 Støvring (2006), 256
 Sudan (1927), 282
 Szabo (1969), 799
 Tait (1965), 303
 Tait (1967), 64, 65
 Tait (1971), 310
 Tatsuta and Dezani-Ciancaglini (2006), 730, 742, 787
 Terese (2003), 257, 262, 400, 401, 417, 421, 421, 476, 477, 477
 Terlouw (1982), 298
 Thatcher (1973), 93
 Thompson (1995), xix
 Tiede (2001, 2002), 374
 Troelstra (1973), 96, 131, 298, 310, 312, 319
 Troelstra (1999), 362
 Troelstra and Schwichtenberg (1996), 358
 Turner (1976, 1979), 335
 Turner (1981), 330, 334
 Turner (1985), 335
 Urban et al. (2007), 412
 Urban and Tasson (2005), 412
 Urzyczyn (2009), 780
 Urzyczyn (1999), 730, 780
 Venneri (1994), 781
 Venneri (1996), 742

Index of Citations

827

Vermaat (2006), 374
Vogel (1976), 310
Voigtländer (2009), 340
Vouillon and Melliès (2004), 542
de Vrijer (1987a), 62, 89, 256
de Vrijer (1989), 256
de Vrijer (1987b), 68
Wadsworth (1971), 334, 335
Wadsworth (1976), 540, 742, 742, 742, 761
Wand (1987), 73, 499, 574
Wansing (2002), 372
Wells (1999), 16, 24
Wells et al. (1997), 781
Whitehead and Russell (1910-1913), xvii
Wiedijk (2006), 349
van Wijngaarden (1981), 33, 162, 377, 399, 572
Xi (1997), 68
Zeleny and Anderson (2001), 805
Zucker (1974), 351, 362
Zylberajch (1991), 683

Index of symbols

1. Terms

A. general

B_n , 268
 C_0 , 268
 C_{n+1} , 268
 $E \equiv \epsilon$, 43
 E_i^A , 232
 M^- , 30
 M^Γ , 30
 $N \cdot k$, 50
 $Pts :=_\beta p(t, s)$, 43
 P_{ij}^A , 232
 R_A , 283
 Φ , 743
 \perp , 743
 ϵ , 43
 $\langle M_1, \dots, M_n \rangle$, 50
 \bar{z}_i^A , 232
 K^A , 231
 K^∞ , 724
 K_* , 50
 $\text{left}_0^{A,B}$, 49
 $\text{pair}_0^{A,B}$, 49
 proj_k^n , 50
 $\text{right}_0^{A,B}$, 49
 tuple^n , 50
 B , 50, 304
 B^c , 304
 $B_{A,B}^c$, 304
 $B_{(A,B)}$, 304
 CR , 56
 C , 50
 C_* , 50
 WCR , 56
 W , 50
 Y_A , 313
 false , 39
 test , 45
 true , 39
 $\text{empty}_?$, 42

concat, 42

B. operations

$M(x_1, \dots, x_k)$, 305
 $\#M$, 89
 $\Gamma \upharpoonright \text{FV}(M)$, 20
 order , 717
 \square_Φ , 745
 $\{ \}_y^x$, 745
 \square , 744
 \square_L , 744
 \square_Φ , 744
 \square_\perp , 744
 p , 43
 $\mathcal{X}y$, 305
 $\text{pp}(M)$, 73
 $\text{pt}(M)$, 73
 $\text{1th}(M)$, 90

C. classes

T_{CM}^n , 261
 T_{CM} , 261
 $[A]_\Gamma^T$, 747
 Λ , 5
 $\Lambda\Phi$, 743
 $\Lambda\perp$, 539, 743
 Λ_{SP} , 257
 $\Lambda_{\rightarrow}^{\text{Ch}}$, 17
 $\Lambda_{\rightarrow}^{\text{Ch}}(A)$, 16
 $\nabla(\mathcal{D})$, 160, 160
 HN , 736
 N , 736
 PHN , 736
 PN , 736
 $\mathcal{X} \in \mathcal{F}_A$, 305
 $\Lambda_{\rightarrow}^{\text{dB}}$, 19
 $\mathcal{A}(M)$, 586
 $\mathcal{A}_{\mathcal{T}}(M)$, 744
 \mathcal{C}_0 , 161
 \mathcal{C}_1 , 161
 \mathcal{C}_2 , 161
 \mathcal{C}_3 , 161
 \mathcal{C}_4 , 161

- C_5 , 161
 C_{-1} , 161
 $\mathcal{M}_{\Lambda(\beta)}$, 737
 HF, 305
 NF, 26
 $\text{nf}(X)$, 305
 νNF , 26
 V^\top , 16
 WN, 56
 $\mathcal{A}(M)$, 540
 PSN, 736
 SN, 735, 736
- D. relations**
- $M \approx_D^{\text{ext}} N$, 157
 $M \approx_D^{\text{obs}} N$, 157
 $P\#Q$, 7
 $T \vdash M = N$, 7
 $T \vdash \lambda\beta\eta M = N$, 7
 \rightarrow_η , 6
 $\rightarrow_{\beta\eta}$, 6
 \rightarrow_β , 6
 \rightarrow_η , 6
 $\rightarrow_{\beta\eta}$, 6
 \rightarrow_β , 6
 \rightarrow_T , 285
 \rightarrow_{CM} , 261
 \parallel_N , 222
 \simeq , xxii
 \rightarrow_{CM} , 261
- E. theories**
- $\mathcal{E}(A)$, 108
 \mathcal{E}^+ , 108
 $\mathcal{E}_{\beta\eta}$, 108
 $\lambda\beta\eta$, 6
 Th_{max} , 179
- 2. Types/Propositions**
- A. algebras, structures**
- (U_{top}) , 595
 $[a]_{\approx}$, 382
 \mathbf{X} , 402
 A/\approx , 382
 $\mathcal{A}[\mathcal{R}]$, 402
 \mathcal{A}_M , 502
 \mathbb{T}/\approx , 382
 $\mathbb{T}[\mathcal{R}]^*$, 430
 \mathbb{T}^* , 429
 \mathbb{T}_μ^* , 430
 $\mathbb{T}_{\hat{\mu}}^*$, 407
 A/\mathcal{E} , 383
 S_M , 568
 $(-)_\mu^*$, 430
 $(-)_\approx^*$, 429
 $(-)_\mathcal{R}^*$, 430
- B. special types**
- A_i , 230
 $A_{i\ell}$, 231
 A_{ij} , 231
 $[B_1 \dots B_n]$, 230
- $\#A$, 230
 C^A , 232
 \top^2 , 43
 U , 581, 594
 Bool, 39
 Nat, 39
 Sigma_k^* , 41
- C. operations**
- $((\mathcal{R})) \rightarrow A$, 505
 $A(i, j)$, 15
 $A[\alpha := C]$, 9
 $A[\beta := B]$, 408
 $A^k \rightarrow B$, 13
 A^* , 71
 $A_1 \cap \dots \cap A_n$, 597
 A_i , 15
 $A[\beta := B]_{\alpha'}$, 408
 $L(A; \Gamma)$, 33
 $M[\alpha := B]$, 17
 $N(A; \Gamma)$, 34
 S_M , 60
 $[A]$, 80
 $[\Gamma]$, 80
 $[[A]]_\Gamma^T$, 750
 $\#(A)$, 719
 $\Gamma \uplus \Gamma'$, 609
 Γ_A , 80
 $\uparrow A$, 587, 615
 $\uparrow X$, 587, 615
 φ^+ , 248
 n_k , 14
 $[[A]]_\mathcal{E}$, 106
 $[[A]]_\rho$, 78
 depth, 707
 $\text{cf}(A)$, 624
 $\text{class}(A)$, 150
 $\text{dom}(\Gamma)$, 9
 $\text{dpt}(A)$, 13, 463
 $\text{ls}(A)$, 422
 $\text{ord}(A)$, 13
 $\text{rk}(A)$, 13
 $\sim A$, 51
 f , 710
 $[[A]]_\tau$, 511
 $\mathcal{I}^n[[A]]_\eta$, 531
 $\mathcal{I}[[A]]_\eta$, 533
 $SR(A)$, 455
 $\mathcal{T}(A)$, 455
 $\mathcal{T}^n[[t]]_\eta$, 535
 t , 725
- D. classes**
- $[\mathbb{T}]$, 581
 \mathbb{A}^T , 596
 \mathbb{A}^{ABD} , 699
 \mathbb{A}^{BCD} , 580
 \mathbb{A}_∞ , 580
 \mathbb{A}_∞^U , 580

- Typable(\mathcal{X}), 512
 \mathbb{T} , 8, 581, 594, 762
 \mathbb{T}^0 , 8
 \mathbb{T}^∞ , 8
 \mathbb{T}_{\square}^A , 594
 $\mathbb{T}_{\mathcal{T}}$, 596
 \mathbb{T}^A , 594
 $\mathbb{T}^{\text{CDHL}(t)}$, 706
 \mathbb{T}_{\square} , 594
 $\mathbb{T}_{\square}^{\text{BCD}}$, 581
 $SC^+(A)$, 512
 $SC_r^s(A)$, 466
 $SC^s(A)$, 466
E. relations
 $=_\mu$, 421
 $=_{\dot{\mu}}$, 410
 $=_{\mathcal{E}}$, 383
 $=_{\mathcal{R}}^{-1}$, 476
 $A =_\mu B$, 419
 $A <_{\mathcal{T}} B$, 597
 $A = B$, 581
 $A =_{\mathcal{T}} B$, 597
 $A \equiv B$, 581, 597
 $A \leq B$, 581, 595, 595
 $A \leq_{\mathcal{T}} B$, 597
 $A \leq_{\text{BCD}} B$, 581
 $A \leq_{\beta\eta\text{SP}} B$, 272
 $A \leq_{\beta\eta} B$, 136
 $A \sim_{\beta\eta} B$, 136
 $A \triangleleft_{\text{SP}} B$, 259
 $A =_{\text{BCD}} B$, 581
 R_n , 493
 \mapsto_α , 409
 \mapsto_μ , 421
 $\Gamma \vdash A$, 80
 $\Gamma \vdash_{\text{PROP}} A$, 80
 \Rightarrow_α^* , 409
 \Rightarrow_α , 409
 \Rightarrow_μ^n , 421
 \leq , 762
 \leq_μ^* , 562
 \leq_{fm} , 562
 \approx , 381
 \equiv_α , 409
 $\Rightarrow_{\mathcal{R}}$, 401
 \Rightarrow_μ^* , 421
 \Rightarrow_μ , 421
 $\vdash? : A$, 762
 $\vdash A$, 80
 $\vdash_{\text{BCD}} A \leq B$, 581
 $\mapsto_{\dot{\mu}}$, 410
 $\mathcal{E} \vdash^{\text{inv}} a = b$, 488
 $S(\mathcal{H}, A, B)$, 471
 $=_{\mathcal{A}}^*$, 428
 $\mathcal{H} \vdash_{\text{BH}\leq} A \leq B$, 562
 $\mathcal{H} \vdash_{\text{BH}} A = B$, 468
 $\Gamma \subseteq \Gamma'$, 609
F. theories
 (BH \leq), 562
 (μ) , 419
 (\mathcal{E}) , 383
 (\mathcal{R}) , 400
 (\mathcal{R}^*) , 482
 Δ , 244
 $\Delta(n)$, 253
 Δ^- , 253
 δ , 248
 $\delta(n)$, 253
 TT^{U} , 595
 $\lambda\mu^{*\infty}$, 540
 \mathcal{D}_n , 477, 488
 (BH), 468, 468
 ABD, 699
 Alessi, 725
 CDHL(t), 706
 TRS(\mathcal{R}), 401
 TRS $^{-1}$ (\mathcal{R}), 476
 TT, 595
 Krivine, 617
 Krivine $^{\text{U}}$, 618
 AO, 600
 BCD, 581, 600
 CDS, 600
 CDV, 600
 CDZ, 600
 CD, 600
 DHM, 600
 EHR, 610
 Engeler, 600
 HL, 600
 HR, 600
 Park, 600
 Plotkin, 600
 Scott, 600
 \mathcal{I}_n , 477, 488
 ADH(M), 720
 TT $^{-\text{U}}$, 595
G. theories (classes of)
 ADH $_n$ (M), 720
 GTT $^{\text{U}}$, 602
 LTT $^{\text{U}}$, 602
 NTT $^{\text{U}}$, 602
 PTT, 602
3. Assignment
A. theories
 Γ_M , 502, 568
 Γ_M^μ , 507
 $\Gamma_{\mathcal{R}}$, 505
 $\lambda\mu^+$, 509
 $\lambda\mu^*$, 435
 $\lambda\overset{\text{A,dB}}{\rightarrow}$, 18
 $\lambda\mathcal{E}^*$, 435
 $\lambda\mathcal{R}^*$, 435
 $\langle \Gamma_M, \mathcal{A}_M, a_M \rangle$, 502, 568
 a_M , 502, 568
 a_M^μ , 507

- $\Lambda_{\rightarrow}^{A, \text{Ch}_0}(A)$, 389
 $\Lambda_{\rightarrow}^{A, \text{Ch}}(A)$, 387
 $\lambda\mu$, 436
 λ_{\rightarrow}^0 , 14
 $\lambda_{\rightarrow}^{A, \text{Cu}}$, 380
 $\lambda_{\rightarrow}^{A, \text{dB}}$, 388
 $\lambda_{\rightarrow}^{\text{Krivine}}$, 617
 $\lambda_{\rightarrow}^{\text{BCD}}$, 583
 $\lambda_{\rightarrow}^{\text{Krivine}^U}$, 618
 λ_B , 304, 304
 $\lambda_{\mathcal{T}}$, 284
 λ_{\cap} , 607
 $\lambda_{\cap}^{\mathcal{T}}$, 606
 $\lambda_{\cap}^{\text{HR}}$, 745
 $\lambda_{\cap}^{\text{Park}}$, 744
 λ_y , 313
 $\lambda_{\rightarrow}^{\text{Ch}}$, 16, 16
 $\lambda_{\rightarrow}^{\text{dB}}$, 18
 $\lambda_{\rightarrow}^{A, \text{Ch}}$, 16
 $\lambda_{\mathcal{R}}$, 436
 $\lambda_{\mathcal{R}^*}$, 436
 λ_{\approx} , 436
 λ_{\rightarrow}^A , 380
 $\lambda_{\rightarrow}^{A, \text{Ch}_0}$, 389
 $\lambda_{\rightarrow}^{A, \text{Ch}}$, 387
 $\lambda_{\rightarrow}^{\mathbb{T}/\approx}$, 386
 $\lambda_{\rightarrow}^{A, \text{Ch}}$, 16
 $\lambda_{\rightarrow}^{A, \text{Cu}}$, 15
 $\lambda_{\rightarrow}^{\text{Cu}}$, 15
 λ_A , 436
 $\lambda_{\mathcal{E}}$, 436
- B. derivation**
- $\Gamma \vdash M : A$, 583
 $\Gamma \vdash M : A, ,$, 606
 $\Gamma \vdash M : A$, 9
 $\Gamma \vdash ? : A$, 762
 $\Gamma \vdash_{\rightarrow}^{\text{Cu}} M : A$, 9
 $\Gamma \vdash_{\cap}^{\text{BCD}} M : A$, 583
 $\Gamma \vdash_{\cap}^{\mathcal{T}} M : A$, 744
 $\Gamma \vdash_{\cap}^{\mathcal{S}} M : A$, 613
 $\Gamma \vdash_{\cap}^{\mathcal{T}} M : A$, 606
 $\Gamma \vdash_{\rightarrow}^{\lambda} M : A$, 9
 Γ_1^P , 759
 \vdash_A , 380
 \vdash , 607, 762
 $\vdash_{\cap}^{\mathcal{T}}$, 607
 \vdash_{\cap} , 607
 \vdash_{λ^A} , 380
- 4. Models**
- A. general**
- $(\mathcal{M}_{\mathcal{E}}, \cdot)$, 110
 $\perp_{\mathcal{D}}$, 644
 HEO_B , 321
 HRO_B , 320
 $\top_{\mathcal{D}}$, 644
 d^n , 701
- d_n , 701
 C^n , 271
 $\mathcal{D}_0^{\mathcal{T}}$, 712
 $\mathcal{D}_{\infty}^{\mathcal{T}}$, 705
 \mathcal{D}_{n+1} , 701
 $\mathcal{F}^{\mathcal{T}}$, 615, 689, 690
 \mathcal{M}_n , 84
 \mathcal{M}_{\min} , 179
 $\mathcal{Q}(S)$, 665
- B. operations on**
- $\text{init}(\mathcal{T})$, 712
 $F^{\mathcal{T}}$, 616
 F_{∞} , 705
 F_{Pm} , 724
 F_{Em} , 722
 $G^{\mathcal{T}}$, 616
 G_{∞} , 705
 G_{Pm} , 724
 G_{Em} , 722
 $X \Rightarrow Y$, 106, 589, 731, 737
 $[D \rightarrow D']$, 646
 $\Phi_{\infty m}$, 702, 702
 $\Phi_{m\infty}$, 702
 Φ_{mn} , 702
 $\Phi_{m\infty}$, 702
 \cap , 646
 \cap_{\leq} , 646
 $\cdot_{A, B}$, 95
 \cdot_z , 668
 $\cdot_{\text{P}\omega}$, 723
 \bar{f}^R , 657
 $e \mapsto e'$, 646
 $f \cdot_{A, B} x$, 95
 $f \cdot x$, 95
 w_n , 707
 $x \sqcup y$, 644
 $Z_{E, G}(a, b)$, 672
 $\mathbb{K}^{\mathcal{T}}$, 696
 $\mathcal{G}_{\Delta}(\mathcal{M})$, 126
 $\mathcal{K}(\mathcal{D})$, 645
 $\mathcal{K}^s(\mathcal{D})$, 645
 $\mathcal{R}(\mathcal{D})$, 672
 $\text{Th}(\mathcal{M})$, 98
 $i_0^{\mathcal{T}}$, 712
 i_n , 701
 $j_0^{\mathcal{T}}$, 712
 j_n , 701
 m^R , 656
 n^L , 656
 $\bigsqcup \mathcal{X}$, 615
 $\bigsqcup X$, 702
 $\mathcal{M}(\langle \mathcal{D}, Z \rangle)$, 665
- C. classes**
- $[D \rightarrow_s D']$, 646
 $[D \rightarrow \mathcal{E}]$, 587
 $\Theta_{\mathcal{D}Z}(x, y)$, 667
 \mathcal{D}_{∞} , 701
 \mathcal{F} , 587

- \mathcal{F}^T , 616
 \mathcal{F}^{BCD} , 587
 $\mathcal{K}(x)$, 645
 $\mathcal{K}(\mathcal{F}^T)$, 615
 MSL, 611
 MSL^U , 611
 TS, 611
 TS^U , 611
 TS^U , 611
 Pm, 724
 $\mathcal{K}(\mathcal{D})$, 587
 PLS^s, 670
 Em, 722
- D. relations**
- $(m :) D \cong D'$, 687
 $A =_k^* B$, 470
 $E_1 \succ E_2$, 98
 $E_1 \simeq E_2$, 98
 $\Gamma \models M : A$, 512, 590
 $\Gamma \models \rho$, 690
 $\Gamma \models_{\Gamma} M : A$, 732, 755
 $\Gamma \models_A M : a$, 521
 $\Gamma \models_{A, \mathcal{D}} M : a$, 521
 $\Gamma \models_{\mathcal{D}, \rho, h} M : a$, 521
 $\eta \models_k A \leq B$, 565
 $\eta \models_k \mathcal{H}$, 565
 \leq , 645
 $\mathcal{H} \models A \leq B$, 565
 $\mathcal{H} \models_k A \leq B$, 565
 $\models_{\mathcal{D}, \rho, h} M : a$, 521
 $\models_{\mathcal{D}, \rho, h} \Gamma$, 521
 $\sqsubseteq_{\mathcal{D}}$, 645
 $\tau, \rho \models \Gamma$, 512
 $f \sqsubseteq g$, 587, 646
 $\llbracket \rrbracket_{\xi}$, 731
 $A \models \exists X. a = b \rightarrow X$, 398
 $A \models \mathcal{E}$, 383
 $\mathcal{D}, \rho, \xi \models M : A$, 590, 732
 $\mathcal{D}, \rho, \xi \models \Gamma$, 590, 732
 $\mathcal{D} \models M = N$, 588, 684
 $\mathcal{M} \equiv_A \mathcal{N}$, 99
 $\mathcal{M} \equiv \mathcal{N}$, 99
 $\mathcal{M} \times \mathcal{N}$, 102
 $\mathcal{T}, \rho, \Gamma' \models \Gamma$, 755
 $\mathcal{T}, \rho, \Gamma \models M : A$, 755
- E. interpretations in**
- $T \models M = N$, 106
 $\llbracket M \rrbracket_{\rho}$, 755
 $\llbracket \rrbracket^{F, G}$, 685
 $\llbracket \rrbracket^{\mathcal{F}^T}$, 787
 $\llbracket \rrbracket_{\xi^T}$, 787
 $\llbracket \rrbracket^{\Lambda}$, 737
 $\Gamma \Vdash A$, 82
 $\Gamma \models M : A$, 107
 $\Vdash A$, 82
 $\llbracket M \rrbracket_{\rho} \downarrow$, 97
 $\llbracket M \rrbracket_{\rho} \uparrow$, 97
 $\models A$, 78
 $\rho[x := d]$, 97, 588, 683
 $\rho \models A$, 78
 $\rho \models \Gamma$, 78
 $k \Vdash_{\mathcal{K}} A$, 82
 $\llbracket M \rrbracket_{\rho}$, 84, 97
 $\llbracket M \rrbracket_{\rho}^M$, 97
 $\llbracket \rrbracket^D$, 684
 $\llbracket \rrbracket_{\rho}^D$, 588
 $\llbracket \rrbracket_{\xi}$, 589
 $\llbracket \rrbracket^{\mathcal{F}^T}$, 689
 $\llbracket \rrbracket^T$, 733
 $\llbracket \rrbracket_{\rho}$, 684
 $\beta\mathcal{N}$, 787
 $\mathcal{D}, \rho, \xi \models M : A$, 107
 $\mathcal{D}, \rho, \xi \models \Gamma$, 107
 $\mathcal{D}, \rho \models M = N$, 106, 106
 $\mathcal{D} \models T$, 106
 $\mathcal{K} \Vdash \Gamma$, 82
 $\mathcal{K} \Vdash A$, 82
 $\mathcal{M}, \rho \models M = N$, 98
 $\mathcal{M} \models M = N$, 98
 $\text{Env}_{\mathcal{D}}$, 683
 ξ_{BCD}^1 , 738
 ξ_{BCD}^2 , 738
 ξ^T , 733, 786
 ξ_{CDV} , 738
 ξ_{CDZ} , 738
 ξ_{DHM} , 738
 ξ_{HL} , 738
 ξ_{Park} , 787
 ξ_{Scott} , 787
- 5. Miscellaneous**
- A. general**
- (\diamond) , 699
 $::=$, 248
 $a_1 \cdots (\bar{b})^{\otimes i} \cdots a_n$, 232
 B_{β} , 777
 $B_{v, k}$, 768
 C_1 , 770
 C_2 , 770
 G^A , 777
 P_T^G , 772
 Δ_{β} , 777
 Γ_G , 771
 Γ_v , 772
 \equiv , xxii
 \triangleleft , xxii
 $\triangleleft \triangleright$, xxii
 \triangleleft , xxii
 \blacksquare , xxii
 TI, 294
 TI_{α} , 295
 TR, 298
 TR_{α} , 298, 299
 d_n , 525
 $::=$, xxii
 ω , xxii

- EQA, 763
 ETW, 763
 IHP, 763
 WTG, 763
 $\langle \mathcal{D}, \cdot_F, [[\]]^{F,G} \rangle$, 685
B. operations
 2_n , 89
 $E \cdot L$, 248
 $E \cdot R$, 248
 R_A^* , 116
 S^\wedge , 133
 $X \Rightarrow Y$, 520
 $\#X$, 182
 $\exists R$, 120
 \heartsuit , xxii
 $\bar{\varrho}$, 775
 $\sqcup X$, 522
 f^\sharp , 391
 $f^\#$, 391
 $h(a_1 = a_2)$, 384
 $h(\mathcal{E})$, 384
 $h : \mathcal{A} \rightarrow \mathcal{B}$, 382
 $[[M]]_\rho$, 524
 $C_{p_n}(f)$, 278
 $\text{dom}(f)$, xxii
C. classes
 ARS , 55
 C_A^A , 777
 L^A , 775
 T^2 , 43
 X^Y , 95
 \mathcal{F} , 263
 $\mathcal{S}(D)$, 530
 \mathcal{I} , 266
 $\mathcal{K}(D)$, 522
 \mathcal{L} , 266
 \mathcal{N} , 276
 \mathcal{R} , 266
 $\mathcal{F}[\vec{x}]$, 263
 $\text{Env}_{\mathcal{D}}$, 97
 \mathcal{M}_X , 84
 $\mathcal{S}_{\mathcal{T}}$, 557
 \mathcal{T}_{BH} , 562
 $\text{form}(\text{PROP})$, 80
D. relations
 $(X, R) \models R\text{-SN}$, 56
 $(X, R) \models \text{SN}$, 56
 $(X, R) \models \text{WN}$, 56
 $M \in \text{HF}^0$, 305
 $P \leq_T Q$, 194
 $P \leq_m Q$, 193
 $R(*_1, \dots, *_n)$, 116
 R_A^U , 120
 $T \Rightarrow T'$, 769
 $T \Rightarrow^k T'$, 769
 $T \Rightarrow^{C_i} T'$, 769
 $U \vdash_{\mathcal{R}} S$, 195
 \Rightarrow , 33
 \Rightarrow^* , 769
 $\vdash_{\mathcal{T}/\approx}$, 386
 \rightarrow_S , 57
 $\vdash_{\mathcal{T}}$, 558
 $f(x) = y$, xxii
 $x \models R\text{-SN}$, 56
 $x \models R\text{-WN}$, 55
 $x \models \text{SN}$, 56
 $x \models \text{WN}$, 55
 $f(x)\downarrow$, xxii
 $f(x)\uparrow$, xxii
6. Categories
A. general
 ALG_a^s , 648
 ALG_a , 648
 GTS^U , 614
 LLS , 670
 LS , 658, 670
 MSL^{-U} , 613
 MSL^U , 614
 NLS , 658, 670
 NTS^U , 614
 TS^{-U} , 614
 TS^U , 614
 LS^s , 670
 LTS^U , 614
 LZS , 663
 PLS^s , 670
 PTS^{-U} , 614
 PZS^s , 664
 ZS^s , 664
 ZS , 663
 ALG , 587, 646
B. functors
 Cmp , 651
 FZS , 668, 669
 $\text{Flt}_{\text{NTS}^U}$, 659, 660
 \mathcal{R} , 672
 Cmp_s , 655
 Flt_{NLS} , 660, 660
 Flt_{TS^U} , 674
 Flt , 650