Contents 1971

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January 1, 2, 3: More on $p$-groups.

January 12: $K$-groups for a curve over a finite field.

January 15: Cohomology of $GL_n(\Lambda)$ where $\Lambda$ is a discrete valuation ring with $[\Lambda : \mathbb{Z}_p] < \infty$.

January 17: Spectrum of $SL_2(F)$, $[F : \mathbb{Q}_p] < \infty$.

January 24: Notes on a trip to Atlantic City and Institute. Theorem of Borel.

1971-2

February 3: Deformation of Torsors paper.

February 3, 4: Status of stability theorem. Theorem: Let $\Lambda$ be a perfect ring of integers. Then $K_i(\Lambda)$ is uniquely $p$ divisible for $i > 0$.


February 17: Calculation of $R_G(X)$ where $X$ is a curve over a finite field $k$ and $G$ has finite order prime to $p = \text{char}(k)$.

February 20, Projects. Conjectures about $K_a(X)$, $X$ a curve over $\mathbb{F}_q$.

February 21: Conjectures about $K_a(X)$, $X$ a curve over $\mathbb{F}_q$. Projects.

February 22: Review of Mather’s theorem. Problem on elements of $[BG, BGL(A)^+]$ where $G$ is a simplicial group.

February 26 $K$-groups globally.

February 28: Conjecture on Real $K$-theory.

February 27: Stability Theorem. Notes: category of stable trivializations of $(P, Q)$ or stable isomorphisms of $P$ and $Q$; Lichtenbaum letter; acyclicity of the map $f : J \to \Gamma$; outline of proof of cohomological Mather theorem.

1971-3

March 1: Check of conjecture against Tate’s result for $K_2$. Conjecture: If $C$ is a Dedekind subring of a number field $F$ then $K_{\text{odd}}(C) \to K_{\text{odd}}(F)$ in dim $> 1$.

March 6, 8, 14: How Mather deloops $BG$ when $G$ consists of orientation preserving diffeomorphisms of $\mathbb{R}^k$.

March 10: Stasheff classification theorem.

March 12: Principal bundles for a topological groupoid. On Haefliger structures,
March 14: Mather’s theorem on diffeomorphisms with compact support of $\mathbb{R}^n$.
March 15, 18: More Mather.

1971-4
March 20, 22: For a small category $\mathcal{C}$, to define $\mathcal{C}$-bundles over a topos and prove a classifying theorem.
March 26: Summary of problems and progress.
March 30, 31: $\mathcal{C}$-torsors and initial understanding of Mather’s theorem.

1971-5
April 1: Pull back of torsors in Topos $\mathcal{T}$. Mather’s theorem for general stacks.
April 2: Categorical aspects of above.
April 3: Classifying torsors.
April 4: Lubkin coverings and $\mathcal{C}$-torsors when $\mathcal{C}$ is the category associated to a partially ordered set.
April 5: When are the representable $\mathcal{C}$-torsors dense homotopically in $\mathcal{C}$-torsors?
April 6: On the category $\Delta$ of ordered sets $[n] = \{0, 1, \ldots, n\}$ and weakly increasing maps.
April 7: Colombia talk on the $K$-theory of rings.
April 11 False hope and counter example.
April 12: Exact sequences in $K$-theory problem,
April 14 Fibred topos.
April 24: $K$-theory.
April 26 When is $BG$ the ‘homotopy-theoretic’ limit:
\[
\lim_{P \in \mathcal{P}} P/G = BG,
\]
where $\mathcal{P}$ is the category of $G$-spaces.
April 28: Eilenberg-Zilber theorem.

1971-6
Conjectures on algebraic cycles. On the derivation of etale cohomology from $K$-theory.
Generalized Jacobians.

1971-7
May 1: $K$-theory. The category $\mathcal{E}$ of finitely generated projective $R$-modules.

May 3: Category of torsors of $\mathcal{C}$.

May 5: Proof that $\mathcal{E}$ has the homotopy type of $B\Sigma^+_\infty$.

March 7: Model for $BGL(R)^+$.

May 13,14: $K$-theory. New way of defining $K_0$ for small abelian categories.

May 16: Attempt at exact sequence for $K$-theory.

May 17: Mather’s theorem - sheaf theoretic point of view.

May 21,23: More on Mather’s theorem.

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June 2: On group completion.

June 4: Galois cohomology. Diversion on localization.


1971-9

Notes for a paper on $K$-theory

1971-10

June 6: Show that the commutator subgroup $(G,G)$ is perfect when $G$ is the group of diffeomorphisms of compact support on $\mathbb{R}$.

June 12: Kummer theory.

June 14: Summary of work on $K$-theory. Idea about $J$-homomorphism.

June 24: On category finitely generated projective projective $R$-modules.

June 27,28: The Artin-Mazur simplicial set. Let $\mathcal{B}$ be the bicategory and $X$ the associated bisimplicial set, then $AM(X)$ has the homotopy type of $BGL(R)^+$. Acyclicity of the map $f : J \rightarrow \Gamma$. Haefliger structures. Philips-Gromov theorem. The Lie algebra of vector fields with compact support on $\mathbb{R}$. Mather theorem. Theorem of Milnor.

July 9: Friedlander’s thesis. Stability. $BGL(A)^+$ as an infinite loop space.

1971-11

August 4: Relation between $C^\wedge$ and $C'^\wedge$

August 5: Sheaves associated to a simplicial complex. Grothendieck’s filtration.

August 6: Simplicial sheaves over simplicial sets.
August 7: Homotopy $D_{lc}(X)$ (complexes whose homology sheaves $\mathcal{H}^\ell(K)$ are locally constant). Acyclic maps in homotopy theory. Classification of acyclic maps. Cohomology of loop spaces.

August 8: The stability problem.

August 9: Stability. Existence of a stable range for symmetric groups.

August 18: On $H^\ast(GL_3(\mathbb{F}_2), \mathbb{Z}/2)$.

August 24: Review of Thompson’s theorems.

1971-12

September 3: Cancellation.

September 4: Serre’s stability theorem.

September 5: Acyclic maps. Killing perfect subgroup of fundamental group.

September 14: Stability and Reid’s proposition.

September 16: Serre’s theorem.

September 20: $VF = FV = p^d$.


September 29: Theorem of Kaloujnine. Tate’s theorem

October 3: Cohomology theories and $\Sigma_\ast$.

October 18: More on Lang’s theorem.


1971-13

November 1: $PLC$-torsors.

November 2: Formulations of characteristic classes of flat bundles by Borel and Bott.

November 3: Homotopy axiom: $K_\ast(k) \to K_\ast(k[z])$.

November 8: $K$ for vector bundles and coherent sheaves.

November 10: Good $k[z]$-submodules.

November 12, 14: Homotopy axiom: $K_\ast^{coh}(A) \xrightarrow{\sim} K_\ast^{coh}(A[z])$ for noetherian rings.

November 15: Substitute for Tit’s building.
November 17, 19: More on $K$-systems.

November 22: Contractibility of the category with objects $(P, u)$ where $M$ is a fixed $A$-module and $u : P \to M$ surjective.

November 23: Filtrations of $M$.

November 28, 29: Resolution problem.

November 29: Bisimplicial gadgets. Extending definition of class $\rho_E \in [X, BGL(A)]$ to sheaves.

1971-14

December 4: Chern classes of a flat bundle are torsion. Bott’s theorem. Alternative approach using projective geometry.

December 5: Odd classes. Construction of refined Chern classes.

December 12: Odd classes in the $p$-adic case.

December 16: Simplicial complex associated to the $p$-subgroups of a finite group. Odd classes for families of representations.

December 24: Summary ‘Functional Equation for $\zeta$’: I complete non-singular curves; II number fields.