Contents 1995

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January 10: To define $K_1$ for non-unital idempotent rings.

January 11: Factoring a Morita equivalence $\mathcal{M}(A) \xrightarrow{\sim} \mathcal{M}(B)$ into simpler steps, when $A$ and $B$ are firm.

January 13: Calculating $[M_n(A), M_n(A)]$, $n \geq 2$. A mechanism for Morita invariance of $K_1$. The canonical map $P \overset{L}{\otimes}_A A \overset{L}{\otimes}_A B \to B$ is a quasi-isomorphism $\iff B = P \otimes_A Q$ is $h$-unital.

January 14-February 6: On the Morita invariance of $K_1(A)$.

February 16: From Kucerovsky’s thesis (Cohen’s theorem for $C^*$-algebras and Hilbert modules).

February 18,19: Understanding Kucerovsky’s functional calculus for unbounded regular normal operators.


March 10: Summary of facts for polar decomposition.

March 16: Notes on $C^*$ algebras from Pedersen’s book.

March 25: More on Morita contexts. Problems to be solved, including Morita invariance for higher $K$ groups.

March 27,30: Notes on complexes of finitely generated projective $R$-modules and $K$-theory.

April 2: A different proof of Milnor’s result: $\mathcal{P}(\tilde{A}) \to \mathcal{P}(R) \times \mathcal{P}(R/A) \mathcal{P}(\mathbb{Z})$ is an equivalence ($\mathcal{P}(R)$ denotes finitely generated projective $R$-modules).

April 5-18: Results and calculations for a complex $U$ where the identity operator has a deformation $1 - [d, h]$ which is nuclear. Analysis of homotopy idempotents.

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April 20-25: Continuing the study of a complex where the identity has a nuclear deformation $1 - [d, h]$. Homotopy equivalences.

April 29-May 2: Comments on previous work and further related results.

May 4,5: An inductive construction which refines a homotopy idempotent to an $A^\infty$ idempotent.

May 6: Calculation with a Morita context.

May 11: Length 1 complexes.

May 16: Results for the category of strictly perfect homotopy form complexes.

July 1: Comments on obtaining the higher $K$-theory groups from the category of perfect firm complexes.

July 18,19: Statement of program for obtaining relations between Pedersen-Weibel delooping, cone and desuspension of a ring and John Roe’s finite propagation $C^*$ algebras.

July 28, August 7: On the Grothendieck groups $L_n(R, A)$ generated by finitely generated projective $R$-module complexes supported on degrees $0 \leq k \leq n$ which become contractible modulo $A$.

August 26,28: On establishing Morita invariants for Hochschild homology of $h$-unital rings.
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August 29: Copy of Quillen’s paper: $K_0$ for non-unital rings and Morita invariance. This paper is published as J. Reine Angew. Math., 472, 1996, 197-217, doi:10.1515/crll.1996.472.197, and is reproduced here with the kind permission of the Editor.

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September 5,6: Reducing Morita invariance to simplest steps.
September 8: Inductive limits in a Roos category $\mathcal{M}(A)$, $A$ firm.
September 14: Proving that if $A$ is idempotent, $K \subseteq A$ is an ideal such that $KA = 0$ and $B = A/K$, then $AK = A \Leftrightarrow K_1(A) \sim K_1(B)$.
September 15: Results for a ring $B$, a $B$-module surjection $A \twoheadrightarrow B$ and an ideal $K \subset A$ such that $KA = 0$.
September 16: Example.
September 22: Morita invariance for cyclic homology on $h$-unital rings.
September 24: Multiplier algebras.
October 1: A difficult exercise with adjoint functors and adjunction maps.
October 7,8: Higgin’s thesis on Leibniz algebras. Dialgebras.
October 15: Direct approach to Morita invariance of $K_1$ for firm rings.
October 19,20: Attempt to define $HH$ and $HC$ intrinsically for a Roos category.
October 21: Proof that for $A$ an ideal in ring $B$ and $MaB$-module, $A \otimes_B M \sim M \Rightarrow B \otimes_B M \sim M$.

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October 24: Bimodule approach to $HC$.
October 5-November 9: Further calculations related to recent work.
November 26: Proof that for $\left( \begin{array}{cc} A & Q \\ P & B \end{array} \right)$ a completely firm unital context over a ground ring $k$ and $A$ a $h$-unital and $k$-fit ring, $B$ is $h$-unital iff $P \overset{L}{\otimes}_A L \otimes_A Q \rightarrow B$ is a quasi-isomorphism.
December 1: More on multipliers and Morita contexts.
December 7: Record of observations made while working on ring homomorphisms which induce Morita equivalences.
December 8: New ideas for handling whether a ring homomorphism induces a Morita equivalence.
December 10: More results on Morita contexts.
December 17: Discussion of the problem of defining iterated tensor products of bimodules.
December 22: More on adjoint functors.