

## Annual Progress Report 1.12.2000 – 30.11.2001

### Algebraic $K$ -Theory, Linear Algebraic Groups and Related Structures

Network Short Title:  $K$ -Theory and Algebraic Groups

Contract Number: TMR ERB FMRX CT-97-0107

#### Section 1. Progress of the Network

##### 1.1 Research Actually Accomplished

Team 1: Bielefeld

Research was done in quadratic forms ([KR], [IZ-KE]), Brauer groups ([R-T-Y]), algebraic groups ([GR], homotopy theory ([SCHWE2], [SCHWE3], [SCHWE-SH2]), loop spaces ([FI-VO]), algebraic  $K$ -theory ([HU-KL-V-W-W], [HU-KL-V-W-W2])

Highlight: Essential editorial work in the framework of the network was done at this node: In March 2001, the Mathematics Department of the Louisiana State University (Baton Rouge, USA) performed a conference on Quadratic Forms and Related Topics. In spite of the fact that this conference was not supported by this network (as being outside the EC), many scientists of the nodes of this network participated in this conference (11 contributed by giving a talk), and the proceedings of this conference were edited in Bielefeld [L-R-S]. These proceedings contain 5 contributions of network scientists, among them two contributions of the network's young researchers: [BECH1], [CHE-GU], [D-H-M], [L-S-U], [HO5]. The editorial process involved persons from many nodes of the network. See also below under 1.3.

Team 2a: Duisburg

Research was performed on the following: Sums of squares in local rings ([SCHE], [KR]). Duality theorems for tori over  $p$ -adic curves (Scheiderer, joint with van Hamel, in preparation). Applications to local-global principles for rational varieties over function fields of  $p$ -adic curves (Scheiderer, in preparation). Local-global principles for algebras with involutions and hermitian forms [L-S-U], [L-U]. Model categories [MAU].

Team 2b: Regensburg Research was done on quadratic forms ([AS2]), vector bundles over curves ([PU]), projective homogeneous spaces ([KU-TA]), abelian varieties ([KU2]), algebras over rings [AS-PU]).

Team 3a: Besançon

Research was performed on the following topics:

Quadratic forms: [BECH2], [BECH3], [BECH4], [HO1], [HO5] [MHAM],

Number theory: [BEL-VOS], [BEL-NG1], [BEL-NG3], [BEL], [BEL-OU], [BEN-NG], [FL-TH1], [NG], [LAN-NG][NG2],

Theory of linear algebraic groups: [BES-BON-ROU]<sub>xs</sub>, [BON1], [BON2], [BON3], of rings and semisimple algebras ([CO-TI], [KOS1], [KOS2], [KOS3], [KOS4])

Team 3b: Lausanne

*The team leader, Eva Bayer-Fluckiger, was awarded the "Maria Sybilla Merian-Award".*

Research topics were: Discriminants of integral ideal lattices, Pfister involutions, Euclidean minima, essential dimensions of functors, central simple algebras, Brauer groups, CM-fields (see [BAY-BER-CHU],[BAY-MO-PA-SC-2], [BAY6], [BAY7], [BAY8], [BER-LE])

Team 4: Paris

Research in various topics performed:

K-theory and topology: [KA2], [KA5], [KA6], [KA7], [KA8], [KA9], [KA10],[KA11], [KA12], [KA13], [OL1], [B-L-O], [MI1], [MI2], [MI3], [MI4], [MI5].

Algebraic geometry, algebraic cobordism, motivic cohomology: [LE-MO1], [LE-MO2], [K-S2], [K9], [K7], [AN-KA1] [AN-KA2], [SOU7],

Cohomology: [VIG], [SCHWAR3], [K10], [K11],

Team 5: Strasbourg

Research was performed in the following fields:

Leibniz algebras, operad theory, dialgebras: [LFCG], [L2], [L-R1], [L-R2], [GN-WA], [B-F], [C-L], [FR1], [FR2], [FR3], [FR-WA], [CAS-LOD-PI] .

Algebraic K-theory and functor homology: [BR1], [BR2], [PI-RI2], [RI], [RI2], [RI3],

Team 6: Louvain-La-Neuve

Research was done in the fields of hyperelliptic curves, central division algebras, quadratic forms, and central simple algebras with involution, as well as in related topics, see [C-V1], [C-V2], [VOL1], [VOL2], [M-P-T], [S-T], [GE], [E-T], [BE-MO-TI], [GQT], [QT].

Team 7: Genova

Cooperation was performed with nodes Minsk (team 10) [GU-PE], Oslo (team 9) [OS-RO], Paris (team 4). Research topics were from K-theory and Algebraic Geometry (e.g., on Motives and Bloch's Conjecture for some classes of surfaces of general type), see: [PE1], [PE-WE1], [PE-WE2], [PE-WE3], [BAR-RO-SA], [RO], [SA-RO], [RO2], [LA].

Team 8: Dublin

Research on K-theory, number theory, algebras with involution, group representation theory (publications [HUT],[LEW2], [MCG2], [QU], [U2], [U3]), on closed 1-forms (publications [SCH1], [SCH2]), and existential theories of rings and fields (publications [ZAH1], [ZAH2], [ZAH3], [ZAH4]). There was research in surgery theory in Edinburgh (publications [PA-RA], [RA2], [RA3], [RA4], [RA5], [SHEI]) and research in K-theory and Galois modules (publications [SN], [SN2], [SN3]).

Team 9: Odense

Research was done in the areas of  $C^*$ -Categories ([MI3], [MI4]), homology theories and algebraic K-theory ([MI2], [DUN], [DUP], [KNUD], [MU-PR], [ROG]).

Team 10: Minsk

Research was done on: Brauer Groups, Hyperelliptic curves, invariants of algebraic groups, surfaces of general type, see [R-T-Y], [V-G-Y], [CHE-GU] [CHE-ME].

Team 11: Tbilisi:

(Joint publications between two nodes: [BA-DR-FR-PI], [PI-RI2], and [CAS-LOD-PI].) T. Pirashvili together with B. Richter proved among other things that classical homology theories like André-Quillen homology, Hochschild homology or cyclic homology has a nice interpretation in terms of functor homology (see [PI-RI2] and

[CAS-LOD-PI]). J. Gubeladze proved in [GUB3] that if unimodular row can be reduced after elementary transformation in a bigger ring, then it can be reduced in smaller one also, provided the ring extension is subintegral. This fact is important for computations of  $K_1$  for monoid algebras. See [DA-PI], [BA-DR-FR-PI], [GUB3], [B-F-J-S], [PI4], [LOM2], [PI-RI2], [CAS-LOD-PI], [HUR-PI], [PI7].

Team 12: St. Petersburg Research was done in algebraic groups ([GR]), Rigidity of Functors ([PA-YA], [ZAI2]), on quadratic forms and algebraic geometry ([PA-SM]).

### 1.2 Scientific Highlights

- The team leader of the Lausanne team (and former team leader of our Besancon team), Eva Bayer-Fluckiger, has been awarded the Maria Sibylla Merian-Preis. We quote from the award document:

*The award is given every two years to an outstanding woman scientist for her achievements in natural and engineering science, economics or medicine.*

- An international conference (“K-Theory and Linear Algebraic Groups”) was organized by the Duisburg team and held in Duisburg, September 9-15, 2001. Researchers from all network nodes participated in that conference, and many postdoctoral scientists from the network have contributed by giving talks. The conference was cofounded by the DFG and had 61 participants. 31 talks were given.
- During the months Dec 2000 -May 2001 there has been a recursive seminar on K-theory, Algebraic Cycles and Motives at the Department of Mathematics of Genova organized by C. Pedrini. The seminar has been intended mainly for training students and young researchers. In particular M. Lattarulo, A. Rosenschon, P. Arne Ostvaer and G. Vezzosi have given talks in the seminar.
- (The following was already mentioned in the last report, however, the proceedings formally were published in this reporting period.) The proceedings of the 1999 Dublin conference on “Quadratic forms and their applications” has been edited jointly by D.W.Lewis (Dublin), A. Ranicki (Edinburgh) and E.Bayer-Fluckiger (Besancon) and was published in December 2000. (Publication [BAY-LE-RA] below). This conference and its proceedings involved participants from almost all nodes of the network.
- An international conference of importance for this network with the title “Up to Homotopy” had been organized at CIRM (Luminy, France) 19.6.2000 – 23.6.2000 by the Strasbourg team. It gathered 53 mathematicians from Europe and US.
- Etat de la recherche: Polynomial functors, unstable modules and the cohomology of finite group schemes, Nantes, Dec. 12-15, 2001, organized by Vincent Franjou (Nantes) & Lionel Schwartz (Paris 13)

- Workshop on K-theory and algebraic cycles, Bologna, Feb. 7-9, 2002, organized by M. Manaresi (Bologna), C. Pedrini (Genova), G. Vezzosi (Bologna), A. Vistoli (Bologna)

### *1.3 Principal Networking and Coordinating Activities*

March 26–30, 2001: Conference on Quadratic Forms and related topics in Baton Rouge (Louisiana, USA). This conference was not supported by the network, as it took place outside the EC. However, among its 67 participants there were 16 from six nodes of the network, six participants were young researchers employed at some time by the network. From the 48 scientific talks given at the conference, 13 were delivered by network members, one was given by a young researcher of the network, and four contributions in the conference proceedings of that conference were supplied by scientists from network nodes.

Moreover, this conference was used to prepare a successful application for a network continuation in the RTN programme of the European Commission.

September 10-15, 2001:

### *1.4 Appointment of Young Researchers*

12 young researchers have been appointed by this network during the reporting period, some of them worked at several nodes. The total number of person months of appointment for young researchers given by the network was 101.

Many of them participated in the scientific conferences organized at Baton Rouge and Duisburg, by giving a talk on their research and/or by the scientific discussion. This gave a good feedback to both, the senior scientists and the young researchers about the training aspects of the network.

### *1.5 Interaction with Industry*

— Not applicable for this project. —

### *1.6 Difficulties Encountered*

No serious difficulties were encountered.

## Section 2. Factual Information on each participant

This is given on separate forms (Annex B forms) for each participant. We here give the list of publications of the young scientists employed by the network, which are referred to on the Annex B forms by their reference number ([AS1] etc.).

### List of Refereed Publications of Postdocs

*Items which were not listed in an earlier report are marked by '!' (26 items). Items which have been listed earlier as a preprint and which have been published now are marked by '\*' (3 items).*

- [AS1] Vincent Astier, Quelques propriétés-modèle théoriques des groupes spéciaux réduits. C. R. Acad. Sci. Paris (Sér. I) 326 (1998), 403–406.
- [AS2] \* Vincent Astier, Some model-theoretic results in the algebraic theory of quadratic forms, Ann. Pure Appl. Logic 112 (2001), no. 2-3, 189–223.
- [AS-PU] ! V. Astier, S. Pumpluen, Nonassociative algebras over rings, Seminaire de Structure Algebriques Ordonnees, 2001-2002, eds. F. Delon, M.A. Dickmann, D. Gondard. (Feb. 2002).
- [BAR-RO] L. Barbieri-Viale, A. Rosenschon "On algebraic mixed Hodge substructures of  $H^2$ ", to appear.
- [BAR-RO-SA] ! L. Barbieri Viale, A. Rosenschon, M. Saito: Deligne's conjecture on 1-motives. (2001) <http://arXiv.org/abs/math/0102150>.
- [BAY-BER-CHU] ! E. Bayer-Fluckiger, G. Berhuy and P. Chuard–Koulmann, CM-fields and skew-symmetric matrices, to appear.
- [BAY-MO] E. Bayer-Fluckiger, Marina Monsurro, Doubling trace forms. Algebra i Analiz 11 (1999), 1–19; English translation in St. Petersburg Math. J. 11 (2000), 405–417.
- [BAY-MO-PA-SC] E. Bayer, M. Monsurro, R. Parimala and R. Schoof, Trace forms of  $G$ -Galois algebras over fields of cohomological dimension 1 and 2. To appear.
- [BAY-MO-PA-SC-2] ! E. Bayer, M. Monsurro, R. Parimala and R. Schoof, Multiples of trace forms of  $G$ -Galois algebras over fields of virtual cohomological dimension 1 and 2. To appear.
- [BECH1] ! Karim J. Becher, On the number of Square Classes of a Field of Finite Level, in: A.K. Louis, U. Rehmann, P. Schneider (eds.), Proceedings of the Conference on Quadratic Forms and Related Topics, Baton Rouge, Extra Volume of Documenta Mathematica 2001, p. 65–84.

- [BO-OT] Bökstedt, Marcel, Ottosen, Iver, Homotopy orbits of free loop spaces. *Fund. Math.* 162 (1999), no. 3, 251–275.
- [BOU-VIT] J. Boutros, E. Viterbo: Signal Space Diversity: a power and bandwidth efficient diversity technique for the Rayleigh fading channel, Published in *IEEE Trans. Inform. Theory* 44 (1998), no. 4, 1453–1467.
- [BR1] Brun, Morton, Topological Hochschild homology of  $Z/p^n$ , *J. Pure Appl. Algebra* 148 (2000), no. 1, 29–76.
- [BR2] ! Brun, Morten Filtered topological cyclic homology and relative  $K$ -theory of nilpotent ideals. *Algebr. Geom. Topol.* 1 (2001), 201–230
- [EL] Ellwood, D. A. (Strasbourg) A new characterisation of principal actions. *J. Funct. Anal.* 173 (2000), no. 1, 49–60.
- [L-U] ! D.W. Lewis, Th. Unger: A local-global principle for algebras with involution and hermitian forms. (submitted)
- [LU1] ! Lundström, Patrik, Normal bases for infinite Galois ring extensions. *Colloq. Math.* 79 (1999), no. 2, 235–240.
- [LU2] ! Lundström, Patrik, Normal integral bases for infinite abelian extensions. *Acta Arith.* 100 (2001), no. 1, 79–83.
- [MAU] ! L. Mauri: Fibration models and localisation of categories. (submitted)
- [MAU-TIE] Mauri, Luca, Tierney, Myles, Two-descent, two-torsors and local equivalence *J. Pure Appl. Algebra* 143 (1999), no. 1-3, 313–327.
- [MAU2] ! Mauri, Luca, Thomason models for homotopy, Preprint Montpellier (2000), 8 p.
- [MI1] ! P. Mitchener,  $C^*$ -categories, *Proc. London Math. Soc.*, vol. 84 (2002), p. 375-404
- [MI2] \* Paul D. Mitchener, Coarse Homology Theories, *Alg. and Geom. Topology*, vol. 1 (2001), p. 271-297
- [MI3] ! P. Mitchener, Symmetric  $K$ -theory spectra of  $C^*$ -categories, *K-theory*, vol. 24 (2001), p. 157-201
- [MO1] M. Monsurro, Trace forms over Pfister forms (submitted to *Communications in Algebra*)
- [MO2] M. Monsurro, Invariants cohomologiques d’algèbres à involution symplectiques (with G. Berhuy and J-P. Tignol). In preparation.
- [OT1] Ottosen, Iver, Higher cyclic reduced powers. *J. Pure Appl. Algebra* 151 (2000), no. 3, 239–272.

- [OT2] I. Ottosen, Equivariant evaluation on free loop spaces. *Math. Z.* (accepted).
- [PI-RI] Pirashvili, T.; Richter, B. Robinson-Whitehouse complex and stable homotopy. *Topology* 39 (2000), no. 3, 525–530.
- [PI-RI2] ! T. Pirashvili and B. Richter. Hochschild and cyclic homology via functor homology. *K-theory*, accepted for publ.
- [PU] ! S. Pumpluen, Curves of Genus 1 and Arbitrary Index: Their Vector Bundles, Witt Rings and Quaternion Algebras, preprint 2001.
- [RI] Richter, Birgit,  $E_\infty$ -structure for  $Q_*(R)$ , *Math. Ann.* 316 (2000), no. 3, 547–564.
- [RI2] ! Richter, Birgit, An Atiyah-Hirzebruch spectral sequence for topological André-Quillen homology, to appear in *J. Pure Applied Alg.*
- [RI3] ! Richter, Birgit, Symmetry properties of the Dold–Kan correspondence, to appear in *Math. Proc. of the Cambridge Ph. Soc.* (2003).
- [RI-RO] ! Richter, B., Robinson, A. Gamma-homology of polynomial algebras and of group algebras, submitted to *Topology and its applications*.
- [RO] A. Rosenschon, Indecomposable Elements in  $K_1$  of smooth projective varieties”, *K-theory* 16, 185-199, (1999)
- [SA-RO] ! M.Saito, A.Rosenschon: Cycle map for Strictly Decomposable Cycles preprint (2001)
- [RO2] ! A.Rosenschon: A Note on Arithmetic mixed Hodge structures, preprint (2001)
- [OS-RO] ! P.Ostvaer, A.Rosenschon : ”K-theory of curves over number fields” preprint(2000).
- [SCH1] ! D.Schütz, “Gradient flows of closed 1-forms, to appear in *Forum Mathematicum*.
- [SCH2] ! D.Schütz, “One parameter fixed point theory and gradient flows of closed 1-forms”, to appear in *K-theory*.
- [U1] Thomas Unger, Genetic Algorithms: a survey of some mathematical models — Part I, *Irish Math. Soc. Bull.* No. 41 (1998), 57–71.
- [U2] \* Thomas Unger, Clifford algebra periodicity for central simple algebras with an involution, *Comm. in Algebra*, **29** (3), 1141–1152 (2001).
- [U3] \* Thomas Unger, A note on surrogate forms of central simple algebras, to appear in *Math.Proc.Royal Irish Academy* **101** (2001).

- [ZAH1] ! K.Zahidi (with T.Pheidas), “Undecidability of existential theories of rings and fields - a survey”, Hilbert’s tenth problem : relations with arithmetic and geometry (Ghent 1999), Contemporary Mathematics **270** (2000), 49-05.
- [ZAH2] ! K.Zahidi (with G.Cornelissen), “Topology of Diophantine sets : remarks on Mazur’s conjecture”, Hilbert’s tenth problem : relations with arithmetic and geometry (Ghent 1999), Contemporary Mathematics **270** (2000), 250-263.
- [ZAH3] ! K.Zahidi, “The existential theory of hyperelliptic function fields”, J.Algebra **233** (2000), 65-86.
- [ZAH4] ! K.Zahidi, “Elementary equivalence and field invariants”, to appear.
- [ZA1] Leonardo Zapponi, Dessins d’enfants en genre 1. In: Geometric Galois actions, 2, pp 79–116, London Math. Soc. Lect. Notes 243, Cambridge Univ. Press, Cambridge, 1997.
- [ZA2] Leonardo Zapponi, Fleurs, arbres et cellules: un invariant galoisien pour une famille d’arbres. Compositio Math. 122 (2000), 113–133.

### Section 3. List of Joint Publications

*Items which were not listed in an earlier report are marked by ‘!’ (8 items). Items which have been listed earlier as a preprint and which have been published now are marked by ‘\*’ (4 items).*

- [BA-DR-FR-PI] H.-J. Baues, W. Dreckmann, V. Franjou, T. Pirashvili, Foncteurs Polynomiaux et Foncteurs de Mackey Non Linéaires Bull. Soc. Math. France.129(2001), 237-257 (Participants 5+11)
- [BAY-LE-RA] E. Bayer-Fluckiger, D. W. Lewis and A. A. Ranicki, Proceedings of the Conference on “Quadratic Forms and their Applications” in Dublin, July 4-10, 1999. Contemp. Math. 272 (2000). (Participants 3+8)
- [BE-MO-TI] ! G. Berhuy, M. Monsurrò, J.-P. Tignol, The discriminant of a symplectic involution, in preparation. (Participants 3+6)
- [CAS-LOD-PI] Casas J.M., Loday J.-L. (Strasbourg), Pirashvili T. (Tbilisi) Leibniz n-algebras, Forum Mathematicum, accepted for publication (20 pages). (Participants 5+11)
- [CH-EL-GO] V.Chernousov, E.Ellers; N.Gordeev. *Gauss Decomposition with Prescribed Semisimple Part: Short Proof*. J.Algebra 229(2000), pp.314-332. (Participants 10+12)
- [CH-ME] V.Chernousov, A. Merkurjev; *R-Equivalence in Spinor Groups*, accepted by Journal of Am. Math. Soc. (Participants 10+12)

- [CO-TI] \* A. Cortella, J.-P. Tignol: The asymmetry of an anti-automorphism, to appear in J. Pure App. Algebra. (Participants 3+6)
- [DLT] I. Dejaiffe, D.W. Lewis, J.-P. Tignol: Witt equivalence of central simple algebras with involution, Rend. Circ. Mat. Palermo, Ser. 2, 49 (2000) 325–342. (Participants 6+8)
- [GQT] \* S. Garibaldi, A. Quéguiner–Mathieu, J.-P. Tignol: Involutions and trace forms on exterior powers of a central simple algebra, Documenta Math. 6, 97–118, 2001. (Participants 4+6)
- [GR] \* Nikolai Gordeev and Ulf Rehmann: On Multicommutators for Simple Algebraic Groups Journal of Algebra 2001. (Participants 1+12)
- [GU-PE] ! V.Guletskii, C.Pedrini: The Chow motive of the Godeaux Surface, preprint (to appear on :Proceedings of the International Conference on Algebraic geometry (sept 2001) W.De Gruyter Pub.Co.) (Participants 7+10)
- [GU-S] \* T. Gunnarsson, R. Schwänzl, Coherence of Operations in  $A$ -Theory J. Pure Appl. Algebra, accepted. (Participants 1+9)
- [HI] D.W. Hoffmann, O.T. Izhboldin, *Embeddability of quadratic forms in Pfister forms*, Indag. Math. **11** (2000), 219–237 (Participants 3+12)
- [IZ-RE] O.Izhboldin; U.Rehmann. *Excellent special orthogonal groups*. In preparation, 2000. (Participants 1+12)
- [IZ-KE] ! Oleg H. Izhboldin and Ina Kersten Excellent Special Orthogonal Groups Documenta Math. 6 (2001) 385–412
- [KR] Knebusch, Manfred; Rehmann, Ulf: Generic Splitting Towers and Generic Splitting Preparation of Quadratic Forms, LAG-Preprint 23, Feb. 2000, published in: E. Bayer-Fluckiger e.a., Proceedings of the Conference on “Quadratic Forms and their Applications” in Dublin, July 4-10, 1999. Contemp. Math. 272 (2000), 173-199. (Participants 1+2b)
- [KUMA] Klaus Künnemann, Vincent Maillot, Theoremes de Lefschetz et de Hodge arithmetiques pour les varietes admettant une decomposition cellulaire. In: Regulators in Analysis, Geometry and Number Theory (Jerusalem, 1996), N. Schapacher, A. Reznikov (ed.), Progr. Math. Vol. 171, Birkhäuser 2000, 197–205 (Participants 2b+4)
- [L-S-U] ! D.W. Lewis, C. Scheiderer, Th. Unger: A weak Hasse principle for central simple algebras with an involution. *Doc. Math.* Extra Volume: Proceedings of the conference on quadratic forms anmd related topics, Baton Rouge, 2001, p. 241–251. (Participants 2b+6)

- [L-T] D.W.Lewis and J-P.Tignol, “Classification theorems for central simple algebras with involution”, *Manuscripta Mathematica* **100** (2000), 259-276. (Participants 6+8)
- [L-U: see sect. 2] ! D.W. Lewis, Th. Unger: A local-global principle for algebras with involution and hermitian forms. (submitted) (Participants 2a+6)
- [L-R-S] ! A.K. Louis, U. Rehmann, P. Schneider (eds.), *Proceedings of the Conference on Quadratic Forms and Related Topics*, Baton Rouge, Extra Volume of *Documenta Mathematica* 2001, (250 p.) (Participants 1, 2a, 3a, 8, 10)
- [PA-RE] I. Panin, U. Rehmann. *Springer’s Theorem on Local Rings*. In preparation. (Participants 1+12)
- [PI-RI2, see sect. 2] ! T. Pirashvili and B. Richter. Hochschild and cyclic homology via functor homology. K-theory, accepted for publ. (Participants 5+11)
- [QT] \* A. Quéguiner–Mathieu, J.-P. Tignol: Discriminant and Clifford algebras, to appear in *Math. Zeit.* (Participants 4+6)
- [R-T-Y] ! Rehmann U., Tikhonov S.V., Yanchevskii V.I. Two-torsion of the Brauer groups of hyperelliptic curves and unramified algebras over their function fields. *Communications in Algebra*. 2001. Vol. 29, No. 9. P. 3971–3981 (Participants 1+10)
- [V-G-Y] ! Van Geel J., Yanchevskii V.I. The index of certain hyperelliptic curves over  $p$ -adic fields, preprint. (Participants 6+10)

#### Section 4. Other relevant publications and preprints

*Items which were not listed in an earlier report are marked by ‘!’ (85 items). Items which have been listed earlier as a preprint and which have been published now are marked by ‘\*’ (22 items).*

- [A-M] D. Anderson and H. J. Munkholm, Continuously controlled  $K$ -theory with variable coefficients. *J. Pure Appl. Algebra* 145 (2000), no. 3, 215–266.
- [AU-RO] C. Ausoni and J. Rognes, Algebraic  $K$ -theory of topological  $K$ -theory, to appear in *Acta. Math.*
- [BV] ! L. Barbieri-Viale ”Albanese and Picard 1-motives” , ”Les Memoires de la SMF”, preprint.
- [BA-JI1] H.-J. Baues and M. Jibladze. Categories enriched in groupoids. (I): linearity. Accepted for publications in  $K$ -theory.
- [BA-JI2] H.-J. Baues and M. Jibladze. Categories enriched in groupoids. (II): Representability.

- [BA-JI3] H.-J. Baues and M. Jibladze. Categories enriched in groupoids. (III): Sigma and Omega theories.
- [BA-JI4] H.-J. Baues and M. Jibladze. Categories enriched in groupoids. (III): Omega theories associated to Hopf algebras.
- [BA-PI1] H.-J. Baues, T. Pirashvili, Quadratic endofunctors of the category of groups. *Adv. Math.* 141 (1999), 167-206.
- [BA-PI2] H.-J. Baues, T. Pirashvili, A universal coefficient theorem for quadratic functors. *J. Pure Appl. Algebra* 148 (2000), 1-15.
- [BAL-FI-S-V] C. Balteanu, Z. Fiedorowicz, R. Schwänzl, R. Vogt, Iterated Monoidal Categories. *Advances in Mathematics* (accepted).
- [BAY1] E. Bayer-Fluckiger, *Cyclotomic modular lattices*, *J. Th. Nombres Bordeaux* **12** (2000), 273–280
- [BAY2] \* E. Bayer-Fluckiger, *Self-dual normal bases and related topics*, Proceedings of the conference *Finite Fields and Applications* (Augsburg, 1999), *Springer Verlag*, 25–36.
- [BAY3] E. Bayer-Fluckiger, *Galois Cohomology and the Classical Groups*, *Contemp. Math.* (to appear)
- [BAY4] E. Bayer-Fluckiger, *Ideal Lattices*, Cambridge University Press (to appear)
- [BAY5] \* E. Bayer-Fluckiger, *Théorie des Noeuds*, Actes de l'Université de tous les savoirs, Vol.4, *Odile Jacob* (2001), 67–76.
- [BAY6] ! E. Bayer-Fluckiger, Determinants of integral ideal lattices and automorphisms of even unimodular lattices, to appear.
- [BAY7] ! E. Bayer-Fluckiger, R. Parimala, Pfister involutions (with R. Parimala), to appear.
- [BAY8] ! E. Bayer-Fluckiger, Thin fields, to appear.
- [BE-BO-RO] D. Bessis, C. Bonnafé, R. Rouquier, *Extensions de groupes de réflexions complexes*, Preprint (1999).
- [BECH2] Karim J. Becher, On the Kaplansky Radical, in preparation
- [BECH3] Karim J. Becher, Algèbres simples centrales à involution de première espèce, in preparation
- [BECH4] ! Supreme Pfister Forms, in preparation.
- [BEL-VOS] ! T.B. Beliaeva, S.V. Vostokov, *Hilbert symbol in a complete multidimensional field for an arbitrary prime number*, *Zap. Nauchn. Semin. St-Peterburg. Otd. Mat. Inst. Steklov. (POMI)*, (to appear)

- [BEL-NG1] \* J.-R. Belliard, T. Nguyen Quang Do, *Formules de classes pour les corps abéliens réels*, Ann. Inst. Fourier (Grenoble) **51**:(4) (2000) 903–937
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