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INTAS 93-2618-Ext: Final Report

for the period of May 1, 1997, till December 31, 1999

Initial remark:

It should be mentioned that the group of scientists supported by this Intas Project is co-sponsored by other sources and projects as well, namely by:

1. *Sonderforschungsbereich 343 "Diskrete Strukturen in der Mathematik"* at the University of Bielefeld (Short and long term visits of foreign Scientists, supported by Deutsche Forschungsgemeinschaft).

2. *Humboldt Stiftung Bonn* (Individual grants, Prize)

3. *TMR-Network ERB FMRX CT-97-0107 "Algebraic K-Theory, Linear Algebraic Groups and Related Structures"* (Short and long term visits of foreign Scientists)

4. *INTAS-99-00817* "Linear Algebraic Groups and Related Linear and Homological Structures." This Intas Project contains the same NIS partners and the same Western partners as INTAS-93-2618-Ext plus another Western partner in Gent. It starts this year and will continue the successful work of the project INTAS-93-2618-Ext.

Since the latter project was a definite forerunner of the current one, some remarks below will also mention some of its results.

1. Title, Reference Number

Title:	Linear Algebraic Groups, Algebraic K-Theory, and related Structures in Algebra and Topology
Ref.-Nr.:	INTAS-93-2618-Ext
Project Co-ordinator:	Ulf Rehmann
Period time:	May 1, 1997, till December 31, 1999

2. Research

2.1 Scientific Objectives:

The research of this project is concentrated on:

Investigation of the rationality linear algebraic groups, the splitting behavior of linear algebraic groups and their projective homogeneous varieties, the study of anisotropic groups, further investigation of splitting properties of quadratic forms, study of algebras with involution, investigation of central simple algebras with involution, descent and decomposability questions on such algebras, investigation of Lie algebras and their cohomology groups and their non-split and central extensions, in particular the computation of those groups, investigation of central simple algebras with involution, Properties of the Brauer group for certain function field extension, K-theory of varieties, K-theory of normed algebras, Mac-Lane cohomology.

The scientific objectives of this project is to perform research in areas related to these fields.

2.2 Research Activities

The main activities of the project were done by individual research in the above mentioned fields. Interim results have been reported on the occasion of several international conferences mentioned below, also on the occasion some individual visits of the NIS participants at various western universities. All fields mentioned in section 2.1 (Objectives) have been investigated intensively. This is documented in the Annex of this report (page 6 ff.)
The work was in accordance with the work programme.

2.3 Scientific Results

We are proud to mention here that Teimuraz Pirashvili, the local coordinator of our Tbilisi node, was awarded the Humboldt Research Award of the German Alexander von Humboldt Foundation. He received this award because of his achievements in Mac Lane- and topological Hochschild homology.

The results of the project are or will be documented by at least 82 publications (see Annex). Out of these publications, 56 have already been published or are accepted for publication in refereed international journals. This shows the significance of the research results achieved by this project.
8 publications are mentioned (in the Annex) as being in preparation.
Detailed discussions of the research topics are given in the Annexes (section 8).

Summarization of the scientific output:

Scientific Output	published	in press/accepted	submitted	in preparation
Paper in an International Journal	56	7	4	8
Paper in a National Journal				
Paper in proceedings of a conference		1		
Paper in Book, Monograph	0			
Internal Report	0			
Thesis (Msc Phd etc.)	2			
Oral Presentation, Public Lecture	5			

It should be mentioned here that the "Internal reports" are just preprints, most of which will be submitted for publication in a refereed journal also later, perhaps after slight revision.

3. Management

3.1 Meetings and visits

Participants met on the occasion of some international conferences, which were of particular importance for the topic of this project, and the the visits of these conferences were partially financed by this project. Several participating individuals reported their results. These conferences were:

[C1] Summer School on "K-Theory and algebraic groups", June 28 – July 3, 1998 (Levico Terme Italy, organized by C. Pedrini with a scientific committee from two other participants. This had a particular training effect, since high level curses for researchers on the postdoc level have been given. There have been two sessions: a morning session where the following 4 series of lecture have been given: 1) An introduction to K-Theory and its recent developments. 2) K-Theory and Algebraic Groups. 3) K-Theory of algebraic integers. 4) K-theory and quadratic forms over fields. Written notes of these curses were distributed to all participants. In the afternoon sessions there have been 11 research talks given by young researchers on topics concerning K-theory, algebraic groups, number theory, algebraic geometry, quadratic forms, Brauer groups etc.

[C2] Conference on "Linear Algebraic Groups and Related Structures", August 9 – 15, 1998 (University of Bielefeld, Germany), organized by I. Kersten and U. Rehmann. 32 Talks were given (45-60 min each), 67 participants from 17 countries attended the conference. This conference was funded by SFB 343 "Diskrete

Strukturen in der Mathematik" at the University of Bielefeld, by this TMR project, and by INTAS project INTAS-93-2618-EXT. See `http://www.mathematik.uni-bielefeld.de/lag/`

[C3] International Congress of Mathematicians 1998, August 18 – 27, 1998 (Berlin). See `http://elib.zib.de/ICM98/`

[C4] Conference on "Algèbre homotopique", Strasbourg, March 25 - 28, 1999, was organized by Jean-Louis Loday (Strasbourg) and Teimuraz Pirashvili (Tbilisi)

[C5] Oberwolfach Conference: "Quadratic and Hermitean Forms", May 16 - 22, 1999, organized by Albrecht Pfister (Mainz), Winfried Scharlau (Münster), Jean-Pierre Tignol (Louvain-la-Neuve)

[C6] Conference on "Quadratic Forms and Related Topics", Besançon, May 25 -28, 1999, organized by Eva Bayer-Fluckiger and Detlev Hoffmann,

[C7] Conference on "Quadratic Forms and their Applications" in Dublin, July 4-10, 1999, organized by E. Bayer (Besançon), D. Lewis (Dublin) and A. Ranicki (Edinburgh)

[C8] Oberwolfach Conference: "Algebraic K-Theory", Sept. 26 - Oct. 2, 1999, organized by Daniel R. Grayson (Urbana), Uwe Jannsen (Regensburg), Bruno Kahn (Paris)
Besides these conferences there are various research activities of the single labs, partially in interaction with each other, which are described separately for each participant of the project in the Appendix.
The conferences C2 and C5 have been used for co-ordination meetings. In the Appendix, the program of C2 together with its participants is given, and the contributions given by scientists from institutes supported by this project are marked by a *. The program and the participants of C5 are documented at `http://mathsa.ucd.ie/TMR/quadconf.html`

There were many exchanges or mutual visits of scientists between the partners, financed not always nor totally by this project, but also by the other sources mentioned in the beginning.

Summarization of meetings and visits:

Visits	Number of Scientists	Number of person days
West $\Longrightarrow$ East	0	0
East $\Longrightarrow$ West	8	140
West $\Longrightarrow$ West	6	37
East $\Longrightarrow$ East	0	0

There was and there will be more exchange than indicated here, sponsored by the Sonderforschungsbereich 343 "Diskrete Strukturen in der Mathematik", by the Humboldt Foundation, and by the TMR-Network ERB FMRX CT-97-0107. Several scientists from the Eastern partner institutes spent some months at Bielefeld and at Besançon on the basis of these and other programs, besides from the figures mentioned in the table above. Also there were visits from the Western sites at Western and Eastern partners, but supported by different grants.

In particular, the conferences mentioned in section 3.5 will be used for further co-ordination of this project.

3.2 Collaboration

Intensity of Collaboration	high	rather high	rather low	low
West $\Longleftrightarrow$ East	$*$			
West $\Longleftrightarrow$ West	$*$			
East $\Longleftrightarrow$ East	$*$			

3.3 Time Schedule

The time schedule was mainly in accordance with the Work Programme. Reporting was delayed because of the fact that the Project Coordinator was engaged in many research activities.

3.4 Problems encountered

No serious problems were encountered, neither in cooperation of team members nor in transfer of funds nor in telecommunications.

Problems encountered	major	minor	none	not applicable
Cooperation of team members			*	
Transfer of funds			*	
Telecommunication			*	
Transfer of goods				*
Other				*

3.5 Actions required

From the point of view of this project, there are no actions required by Intas.

3.6 Manpower invested

Is is estimated that the number of person months invested is roughly 180.
This is computed by taking the number of researchers involved (28) times the number of project months (32), and then it is assumed that each researcher spent 20 % of his time on this project, as most of them have teaching duties and are engaged in other projects as well.

4. Finances (in Euro)

4.1 This grant:

The money was spent on personal grants, on travel for attending the conferences mentioned above and on short term visits at the participating Universities.
In the table below, the overhead for the NIS participants was computed by taking 10 % from the sum of the Labour and Travel+Subsistence costs.

Participant		**Cost Category**						TOTAL
#	Name of Part.	Individ. Grants Labour Costs	Overheads	Travel and Subsistence	Equipment	Consum-ables	Other	(Euro)
1	Bielefeld		500	2000				2500
2	Besançon		500	2000				2500
3	St. Petersburg	9960	1615	6192				17767
4	Minsk	5862	745	1585				8192
5	Alma-Ata	2645	548	2836				6029
6	Tbilisi	9200	1236	3162				13598
Total:		27667	5144	17775				50586

The spending in all categories was essentially in accordance with the planning.

4.2 Other funding:

Additional funding was obtained from several sources, which supported the work in categories for which Intas does not provide funds: Long term visits, visits of scientists from non-European and non-NIS countries etc.
The numbers are estimates, as the supported programs do only partially overlap the research of this Intas project.
But, of course, when several research projects can be combined then this usually means a significant synergy.

- Deutsche Forschungsgemeinschaft: 20000 Euro
- TMR-Network ERB FMRX CT-97-0107: 12000 Euro
- A. v. Humboldt Foundation: 25000 Euro

5. Summary of Results and Key References !- a) Title: Linear Algebraic Groups, Algebraic K-Theory, and related Structures in Algebra and Topology
b) INTAS Reference Number: INTAS-93-2618-Ext
c) Period Time: May 1, 1997, till December 31, 1999.
d) Project Co-ordinator: Ulf Rehmann Fakultt fr Mathematik Universitt Bielefeld Postfach 100131 33501 Bielefeld Germany Tel: (+49) 521 106 50 39 (Office) Fax: (+49) 521 106 64 61 (Office) Tel: (+49) 521 10 54 91 (Home) email: rehmann@mathematik.uni-bielefeld.de
!+ *We are proud to mention here that Teimuraz Pirashvili, the local coordinator of our Tbilisi node, was awarded the Humboldt Research Award of the German Alexander von Humboldt Foundation. He received this award because of his achievements in Mac Lane- and topological Hochschild homology.*

The results of the project are or will be documented by at least 82 publications (see Annex). Out of these publications, 56 have already been published or are accepted for publication in refereed international journals. This shows the significance of the research results achieved by this project.
8 publications are mentioned (in the Annex) as being in preparation.
Detailed discussions of the research topics are given in the Annexes (section 8).

The results concern the rationality of linear algebraic groups, the splitting behavior of linear algebraic groups and their projective homogeneous varieties, the behaviour of anisotropic groups, splitting properties of quadratic forms, properties of algebras with involution, and in particular of central simple algebras with involution, descent and decomposability of such algebras, results about Lie algebras and their cohomology groups as well their non-split and central extensions, in particular the computation of those groups, investigation of central simple algebras with involution, Properties of the Brauer group for certain function field extension, K-theory of varieties, K-theory of normed algebras, Mac-Lane cohomology and results on homology and cohomology of the structures mentioned above.

Key References !-

These key references describe to some extent the variety of topics and results discussed in the publications and conferences of the project.

M. Knebusch, U. Rehmann: Generic Splitting Towers and Generic Splitting Preparation of Quadratic Forms, to appear in "Contemporary Mathematics".

E. Bayer–Fluckiger, R. Parimala, Classical groups and the Hasse Principle, Ann. of Math., 150 (1998), 651–693.

Panin, I. A.; Suslin, A. A. On a conjecture of Grothendieck concerning Azumaya algebras. (Russian) Algebra i Analiz 9 (1997), no. 4,215–223; translation in St. Petersburg Math. J. 9 (1998), no. 4, 851–858.

V.I. Guletskii , V.I. Yanchevskii. Reciprocity laws for simple algebras over function fields of number curves. Accepted for publication in "Communications in Algebra".

A.S. Dzhumadil'daev, Minimal polynomials for right-symmetric algebras, J.Algebra, 225 (2000), 201-230.

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6. Role and Impact of INTAS

Role of INTAS	definitely yes	rather yes	rather not	definitely not
Would the project have been started without funding by INTAS				*
Would the project have been carried out without funding from Intas				*

Main achievement of the project	very important	quite important	less important	not important
exiting science	*			
new international contacts	*			
additional prestige for my lab	*			
additional funds for my lab	*			
helping scientists in NIS	*			

• The project will be continued on the basis of a new Network: INTAS-99-00817 "Linear Algebraic Groups and Related Linear and Homological Structures"

• In the new network INTAS-99-00817, all partners of this one will participate as well. In addition, Scientists form the University of Gent will participate as well.

7. Recommendations to INTAS

• What was particularly good and should not be changed?

i) Flexible ways to transfer money to NIS

ii) Easy and lean reporting (little bureaucracy)

iii) Help and support from INTAS (phone, email)

• What was particularly bad and should be changed?

Choice of acceptable electronic text formats for diskette:

All these formats depend on one company, and this is a very disputed one.

That can easily be changed:

Allow as well formating based on TEX – some dialect at least). This is definitely independent of any proprietary data format.

Alternatively or additionally: Allow as well html text. This is similarly independent.

8. Annexes

The annex consists of three parts:
1. Scientific reports by the single participants of the project
2. Program and List of Participants of the Conference C2 on "Linear Algebraic Groups and Related Structures" at Bielefeld. Talks by speakers from this project and participants from institutes sponsored by this project are marked by a *****
3. Reprints of some relevant publications.

Participant 1 – Bielefeld:

Activities: Organization of conference [C2]; Research in linear algebraic groups and related structures, in collaboration with I. Panin (St. Petersburg), V. Yanchevski, who both visited Bielefeld a few times.
I. Kersten and U. Rehmann participated in the conferences C1, C3, U. Rehmann participated as well in [C5], [C7], C[8].
Publications:
[HR-I] J. Hurrelbrink and U. Rehmann, Splitting patterns of trace forms, Canad. Math. Bull 41 (1998), no. 1, 71-78.
Abstract: The splitting pattern of a quadratic form q over a field k consists of all distinct Witt indices that occur for q over extension fields of k. In small dimensions, the complete list of splitting patterns of quadratic forms is known. It is shown that *all* splitting patterns of quadratic forms of dimension at most nine can be realized by trace forms.
[HR-II] J. Hurrelbrink and U. Rehmann, Splitting patterns and linear combinations of two Pfister forms, J. Reine Angew. Math. 495, (1998), 163–174.
Abstract: A criterion for anisotropy of forms of arbitrary degree over polynomial rings or polynomial fields is given. Also, quadratic forms which are linear combinations of two Pfister forms are characterized, and the dependency of classical invariants and splitting patterns of quadratic forms is studied.
[KnR] Knebusch, Manfred; Rehmann, Ulf: Generic Splitting Towers and Generic Splitting Preparation of Quadratic Forms, to appear in "Contemporary Mathematics" Abstract: It is shown that the higher anisotropic kernels of a regular quadratic form over any field are already defined over purely transcendental extensions of the ground field. A new theory of specializations concerning this fact is developed.
[KR] I. Kersten and U. Rehmann, Excellence properties of semi-simple algebraic groups, J. Algebra 200 (1998), no. 1, 334–346.
Abstract: A semi-simple algebraic group over a field k is called excellent, when for every field extension K of k, the anisotropic kernel of G_K is defined over k. This parallels the definition of excellent quadratic forms as given by Knebusch, however, it is not true that a quadratic form is excellent if and only if its orthogonal group is excellent. The excellence of a form implies the excellence of its orthogonal group, but the converse is false. The excellent groups of inner type A_n are determined, in parallel an excellence condition for Azumaya algebras is formulated, and it is proved that exactly those Azumaya algebras are excellent which have square-free index.
[MRY] G. Margolin, U. Rehmann, V. Yanchevskii, Quaternion generation of the 2-torsion part of the Brauer group of a local quintic, to appear in: H. Bass, A.O.Kuku, and C. Pedrini. (Ed). Algebraic K-theory and its Applications. Proceedings of the Workshop and Symposium,(1997), ICTP, Trieste, Italy. WORLD SCIENTIFIC, Singapore, New Jersey, London, Hongkong (1999)
Abstract: The splitting behavior of the Brauer group for the field extension given by the function field K of a quintic over some local field k is determined by giving the elements of the kernel of the natural map of Brauer groups $\mathrm{Br}(k) \to \mathrm{Br}(K)$.
[GR] Nick Gordeev and Ulf Rehmann: On Multicommutators for Simple Algebraic Groups
Abstract: The question is investigated under which condition every n-tuple of commutators in a group G can be written as commutators with one joint entry.

Participant 2 – Besançon:

Quadratic forms and invariants of fields Let k be a field of characteristic $\neq 2$. The *u–invariant* of k, denoted by $u(k)$, is the maximal dimension of anisotropic quadratic forms over k. The *Pythagoras number* $p(k)$ is the least integer p such that every sum of squares in k is a sum of p squares. A basic problem in quadratic

form theory is to determine these invariants. One of our research objectives is to make a progress on this question.

Galois cohomology of linear algebraic groups Let G be a smooth linear algebraic group defined over k. The first Galois cohomology set $H^1(k, G)$ has important signification in many classification problems. Serre conjectured in 1962 that if the cohomological dimension of k is at most 2 and if G is semi–simple and simply connected, then $H^1(k, G) = 0$. More recently, Colliot–Thélène made a conjecture concerning the Hasse principle over fields of virtual cohomological dimension at most two. We propose to prove these conjectures.

Trace forms of Galois algebras

Let L/k be a finite Galois extension (or more generally, Galois algebra). We propose to determine the structure of the trace form of this extension as equivariant form.

Symmetric and skew–symmetric matrices with given eigenvalues

The eigenvalues of a symmetric matrix are totally real, those of a skew–symmetric matrix are totally imaginary. We would like to find the minimal dimension of a symmetric (respectively skew–symmetric) matrix with given eigenvalues.

2.2. Research activities.

Intensive research activities were carried out in all the above topics. The most important results of this research are listed below.

2.3. Scientific results

Detlev Hoffmann (jointly with Jan van Geel) have proved that the u–invariant of $\mathbf{Q}_p$ is *finite*, and less than 20. On the other hand, Hoffmann proved that any positive integer can be realized as the Pythagoras number of a formally real field. Both questions have been open for several years. These results have considerable importance in the theory of quadratic forms.

Eva Bayer–Fluckiger (jointly with R. Parimala) proved Serre's conjecture and Colliot–Thélène's conjecture for the classical groups.

Eva Bayer–Fluckiger and Marina Monsurro gave a criterion for the orthogonal sum of two copies of trace forms to be isomorphic over a field of virtual cohomological dimension at most 2.

Grégory Berhuy characterized the rational quadratic forms which arise as hermitian trace forms.

Pascale Koulmann gave upper bounds for the dimensions of skew–symmetric matrices with given minimal polynomial.

Publications

E. Bayer–Fluckiger, Local–global principles and linear algebraic groups, in *Number Theory*, Walter de Gruyter (1998), 45–53.

E. Bayer–Fluckiger, R. Parimala, Classical groups ad the Hasse Principle, *Ann. of Math.*, 150 (1998), 651–693.

G. Berhuy, Characterization of hermitian trace forms, J. Algebra, to appear.

D. Hoffmann, On the dimensions of anisotropic quadratic forms in I^4, *Invent. Math.* **131** (1998), 185–198.

D. Hoffmann, On Elman and Lam's filtration of the u–invariant, *J. reine angew. Math.* **495** (1998), 175–186.

P. Koulmann, Dimensions minimales de matrices antisymériques de polynôme minimal donné, *Comm. in Alg.*, to appear.

Presentations E. Bayer–Fluckiger : Oberwolfach, June 1997 (Galois groups and fundamental groups); European Research Conference, San Feliu de Xuichols, October 1997; Oberwolfach, April 1998 (Linear algebraic groups).

G. Berhuy : seminar talk, Lausanne, December 1997
D. Hoffmann : seminar talks, Bordeaux, December 1997; Paris 13, March 1998.
P. Koulmann : seminar talks, Bordeaux, November 1997, Caen, St. Etienne, April 1998.
M. Monsurro : seminar talk, Rome, january 1998.

PhD thesis Pascale Koulmann, Dimensions minimales de matrices symétriques et antisymétriques, November 1997 (advisors : Eva Bayer–Fluckiger, Jean–Pierre Tignol).

Diplom thesis Gregory Berhuy, Le u–invariant d'un corps, June 1997 (advisor : Eva Bayer–Fluckiger).

Visit of I. Panin in Besançon, 2 weeks in November, one month in May.
Visit of J–P. Tignol in Besançon,1 week in December.
Visit of V. Chernousov in Besançon,3 months (March, April and May).

Participant 3 – St. Petersburg:

N. Gordeev, O. Izhboldin, A. Merkurjev, I. Panin, A. Suslin, and S.Yagunov from St. Petersburg contributed by writing several research papers (see below).

`(1) Suslin, A. A.`
In [1] we compare different Ext-groups related to the category of polynomial functors. In particular, it was proved the equality of the $\mathrm{Ext}_{Fo(F_q)}$-groups and $\mathrm{Ext}_{GL_\infty(F_q)}$-groups associated to strict polynomial functors of finite degree. These results complement the important work of E. Cline, B. Parshall, L. Scott, and W. van der Kallen. In [2] it was presented a survey of the main methods and innovations of Voevodsky in his proof of the Milnor conjecture. In [3] a conjecture of Grothendieck concerning Azumaya algebras was proved. In [4, 5, 6] cohomology ring of a finite group schemes are investigated. Among many other results it was proved the finite generation of cohomology for a finite group scheme (or equivalently a finite-dimensional cocommutative Hopf algebra). This is far generalization of a famous Quillen theorem on cohomology of finite group.
[1] Franjou, V.; Friedlander, E. M.; Scorichenko, A.; Suslin, A. *General linear and functor cohomology over finite fields.* Ann. of Math. (2) 150 (1999), no. 2, 663–728.
[2] Suslin, A., *Voevodsky's proof of the Milnor conjecture.* Current developments in mathematics, 1997 (Cambridge, MA), 173–188, Int. Press, Boston, MA, 1999.
[3] Panin, I. A.; Suslin, A. A. *On a conjecture of Grothendieck concerning Azumaya algebras.* (Russian) Algebra i Analiz 9 (1997), no. 4,215–223; translation in St. Petersburg Math. J. 9 (1998), no. 4, 851–858.
[4] Suslin, Andrei; Friedlander, Eric M.; Bendel, Christopher P. *Support varieties for infinitesimal group schemes.* J. Amer. Math. Soc. 10 (1997), no. 3, 729–759.
[5] Suslin, Andrei; Friedlander, Eric M.; Bendel, Christopher P. *Infinitesimal 1-parameter subgroups and cohomology.* J. Amer. Math. Soc. 10 (1997), no. 3, 693–728.
[6] Friedlander, Eric M.; Suslin, Andrei *Cohomology of finite group schemes over a field.* Invent. Math. 127 (1997), no. 2, 209–270.

`(2) Gordeev, N.`
In [1], we give some description of the intersections of noncentral conjugacy classes of with certain Gauss cells, which we call Coxeter cells. It is the basis of yet another generalization of the same result involving weight functions on conjugacy classes. In [3] the well-known theorem of Sourour was generalized. It was proved that under certain generic position condition, the subgroup of a simple algebraic group generated by a given finite collection of elements is necessarily freely generated by this collection (see [4]). In [5], Thompson's conjecture and Ore's conjecture were proved for all finite simple groups of Lie type over fields with more than 8 elements.
[1] Ellers, Erich W.; Gordeev, Nikolai *Intersection of conjugacy classes of Chevalley groups with Gauss cells.* J. Algebra 220 (1999), no. 2, 591–611.
[2] Ellers, Erich W.; Gordeev, Nikolai; Herzog, Marcel *Covering numbers for Chevalley groups.* Israel J. Math. 111 (1999), 339–372.
[3] Ellers, Erich W.; Gordeev, Nikolai A *generalization of Sourour's theorem.* Linear Algebra Appl. 286 (1999), no. 1-3, 187–196.

[4] Gordeev, N. L. *Freedom in conjugacy classes of simple algebraic groups and identities with constants.* Algebra i Analiz 9 (1997), no. 4,63–78; translation in St. Petersburg Math. J. 9 (1998), no. 4, 709–723.
[5] Ellers, Erich W.; Gordeev, Nikolai *On the conjectures of J. Thompson and O. Ore.* Trans. Amer. Math. Soc. 350 (1998), no. 9, 3657–3671.

(3) Izhboldin, O.

In a series of papers [1,3,5,6], we study the problem of isotropy of quadratic forms over the function fields of quadrics. In particular, we solve this problem completely for all forms of dimension ≤ 6 and for 8-dimensional forms with trivial discriminant. The second Chow group was computed for a wide class of homogeneous varieties. In [2], for a Severi–Brauer variety X a complete description of all the cases when the function field $F(X)/F$ is universally excellent is given. In [4], it was proved that that odd-dimensional forms are motivically equivalent if and only if the forms are similar. Besides, we give the negative a question posed by T. Y. Lam concerning generalized Albert forms.

[1] Izhboldin, Oleg; Karpenko, Nikita *Isotropy of virtual Albert forms over function fields of quadrics.* Math. Nachr. 206 (1999), 111–122.
[2] Izhboldin, Oleg T.; Karpenko, Nikita A. *Generic splitting fields of central simple algebras: Galois cohomology and nonexcellence.* Algebr. Represent. Theory 2 (1999), no. 1, 19–59.
[3] Izhboldin, Oleg T.; Karpenko, Nikita A. *Isotropy of 8-dimensional quadratic forms over function fields of quadrics.* Comm. Algebra 27 (1999), no. 4, 1823–1841.
[4] Izhboldin, Oleg T. *Motivic equivalence of quadratic forms.* Doc. Math. 3 (1998), 341–351.
[5] Izhboldin, Oleg T.; Karpenko, Nikita A. *Isotropy of six-dimensional quadratic forms over function fields of quadrics.* J. Algebra 209 (1998), no. 1, 65–93.
[6] Izhboldin, O. T. *On the isotropy of quadratic forms over the function field of a quadric.* (Russian) Algebra i Analiz 10 (1998), no. 1,32–57; translation in St. Petersburg Math. J. 10 (1999), no. 1, 25–43.
[7] Izhboldin, Oleg T.; Karpenko, Nikita A. *On the group $H^3(F(\psi, D)/F)$.* Doc. Math. 2 (1997), 297–311.
[8] Izhboldin, Oleg T. *Fields of U-Invariant 9* SFB-Preprint 00-036, Bielefeld (2000).

(4) Merkurev, A.

The main publication is the "Book of involution" (see [2]). This book records many of the significant advances in the theory of algebras with involution that have taken place in recent years. Much of the material has not previously appeared in a book before; indeed, there is a substantial amount that has not appeared anywhere before.

Various invariants of algebraic groups were investigated in [1] and [3]. In [5], index reduction formula for twisted flag varieties was obtained. In [6], it is proved that for a reductive group G the natural homomorphism $K'0(G; X) \to K'0(X)$ is surjective for any quasi-projective scheme X on which G acts if and only if the Picard group of G is trivial over all finite field extensions of F. If G splits, a spectral sequence with the E_2-term related to the equivariant K'-theory of X, which converges to the ordinary K'-groups of X, is constructed. In [7], a very general Index reduction formula was proved. More precisely, it was considered the case of arbitrary homogeneous variety under an algebraic group G. In [8], the K-theory of a projective toric variety is identified with the K-theory of semisimple algebra. As an application, the authors re-prove Saltman's index reduction theorem for the index of a simple algebra over the function field of a principal homogeneous space for a torus.

[1] Merkurjev, Alexander *Invariants of algebraic groups.* J. Reine Angew. Math. 508 (1999), 127–156.
[2] Knus, Max-Albert; Merkurjev, Alexander; Rost, Markus; Tignol, Jean-Pierre *The book of involutions.* With a preface in French by J. Tits. American Mathematical Society Colloquium Publications, 44. American Mathematical Society, Providence, RI, 1998.
[3] Chernousov, V.; Merkurjev, A. *R-equivalence and special unitary groups.* J. Algebra 209 (1998), no. 1, 175–198.
[4] Merkurjev, A. S. *K-theory and algebraic groups.* European Congress of Mathematics, Vol. II, 43–72, Progr. Math., 169, Birkhuser, Basel, 1998.
[5] Merkurjev, A. S.; Panin, I. A.; Wadsworth, A. R. *Index reduction formulas for twisted flag varieties. II.* K-Theory 14 (1998), no. 2, 101–196.
[6] Merkurjev, A. S. *Comparison of the equivariant and the standard K-theory of algebraic varieties.* (Russian) Algebra i Analiz 9 (1997), no. 4,175–214; translation in St. Petersburg Math. J. 9 (1998), no. 4, 815–850

[7] Merkurjev, A. S. *Index reduction formula.* J. Ramanujan Math. Soc. 12 (1997), no. 1, 49–95.
[8] Merkurjev, A. S.; Panin, I. A. *K-theory of algebraic tori and toric varieties.* K-Theory 12 (1997), no. 2, 101–143.
[9] Chernousov, V.; Merkurjev, A. R-Equivalences in Spinor Groups SFB-Preprint (Bielefeld) 00-016 (2000)

(5) Nenashev, A.

In [1,2], the description of the K_1-group of an arbitrary exact category was given in terms of explicit generators and relations. This description is much more elementary and useful in comparison with all other descriptions.

[1] Nenashev, A. K_1 by generators and relations. J. Pure Appl. Algebra 131 (1998), no. 2, 195–212.
[2] Nenashev, Alexander *Double short exact sequences and K_1 of an exact category.* K-Theory 14 (1998), no. 1, 23–41.

(6) Panin, I.

The main result of [1] is that every unramified form over field of quotients K of a regular local ring R is Witt equivalent to a diagonal form with coefficients from R_m, i.e. that purity holds for R. The proof is based on the approximation of the regular ring by essentially smooth local algebras over a field and the trace formula for the Witt groups of rings. In [2], K-theory of simply connected semi-simple group was calculated. This generalize the well-known results of Levine and Suslin.

[1] Ojanguren, Manuel; Panin, Ivan *A purity theorem for the Witt group.* Ann. Sci. École Norm. Sup. (4) 32 (1999), no. 1, 71–86.
[2] Panin, I. A. *Splitting principle and K-theory of simply connected semisimple algebraic groups.* (Russian) Algebra i Analiz 10 (1998), no. 1,88–131; translation in St. Petersburg Math. J. 10 (1999), no. 1, 69–101.

(7) Yagunov, S.

In [1] we obtained an affirmative answer on the conjecture of Suslin stated in 1985. This conjecture claims that the homology of bi-Grassmannian complex over an infinite field may be decomposed as a direct sum of homology of General Linear Groups. In [2] we investigated problems related to the homological metastability of General Linear Groups. In order to do that we generalized the well-known construction of the Bloch group to higher dimensions. Besides the investigation of the homology of Linear Groups these higher Bloch groups seem to be rather important objects in the investigation of Motivic Cohomology.

[1] Yagunov, S. *Homology of bi-Grassmannian complexes. K-*Theory 12 (1997), no. 3, 277–292.
[2] Yagunov, S. *On the homology of GL_n and pre-Bloch groups.* to appear in Canadian Journal of Math.

3.1. Activity

Meetings

1. K.Zainoulline, S.Jukhovitski and S.Yagunov participated in the conference "Quadratic Forms and Their Applications" (July 5-9, 1999, Dublin). They gave short talks.
2. O.Izhboldin and I.Panin participated in the conference on K-Theory (Oberwolfach, Sept.26 - Oct.2, 1999). Each of them gave a 1 hour talk.
3. O.Izhboldin participated in the Conference on Quadratic and Hermitian Forms (Oberrwolfach, May 16 - 22, 1999) with 1 hour talk.
4. S.Yagunov, A.Nenashev, and A.Merkurev participated in "SUMMER SCHOOL on "K-Theory and Algebraic Groups" (June 28-July 3 1998, in Trento). A. Merkurev was an invited lecturer.
5. O.Izhboldin, A.Nenashev, and I. Panin participated in the "Conference on Linear Algebraic Groups and Related Structures" (Aug. 9-15, 1998 in Bielefeld). A. Merkurev was one of the organizers of this conference.

Who visited whom:

1. O.Izhboldin and I.Panin (Team 3, St.Petersburg) visited Bielefeld for the period 1 month during November-December of 1998 to collaborate with U.Rehmann (Team 1, Bielefeld).
2. O.Izhboldin (Team 3, St.Petersburg) got the fellowship of the Humbold Fond. He was 1 year visitor of the Bielefeld University collaborating with U.Rehmann (Team 1, Bielefeld).
3. V. Guletskii (Team 4, Minsk) visited I.Panin (Team 3, St.Petersburg) for 1 month (Nov.8 - Dec.8, 1999). They work on 0-cycles. Guletskii inputs his preprint on the Server K-theory.

Participant 4 – Minsk:

2.1 Scientific objectives:

(A) description of Brauer groups of elliptic and hyperelliptic curves over arbitrary fields (especially over local and global fields), (B) investigation of reciprocity laws in Brauer groups of curves over number fields, (C) investigation R-equivalence and the rationality of linear algebraic groups, Serre's Conjecture II and the Hasse principle .

2.2 Research activities:

The item (A) was investigated by V.I. Yanchevskiĭ and V.I. Chernousov. The item (B) was investigated by V.I. Yanchevskiĭ. The item (C) was investigated by V.I. Chernousov.

2.3 Scientific results:

Abstracts od manuscripts:

[1] The paper is devoted to the problem of local invariants of central simple algebras over function field of an algebraic curve defined over a number field. We compute the obstruction group for the realization of collections of characters satisfying the reciprocity law as a systems of local invariants of simple algebras over function field of a curve. Also we prove the splitness of local invariants inside the group of characters sytisfying the reciprocity law. All results are obtained for a curve of an arbitrary genus defined over arbitrary nuber field. [2] - [3] We discuss the problem of calculation of index of a local hyperelliptic curve defined by an equation $y^2 = f(x)$, where $f(x)$ is an irreducible polynomial over field of definition of the curve. An explicit calculations are given in the case of double coverings of genus one over p-adic fields.

[4] We give an exposition of results on description of torsion Brauer groups of local elliptic and hyperelliptic curves over local fields by unramified division algebras over their function fields.

[5] We construct a norm homomorphism for the group of R-equivalence classes for all simply connected semisimple algebraic groups of classical types and study its functorial properties. The group of R-equivalence classes for special unitary groups is computed. It is proved that the variety of a special unitary group $SU(B, \tau)$ is rational if $ind\, B \leq 3$ and the stable birational type of $SU(B, \tau)$ depends only on the Brauer class of B and does not depend on the involution τ.

[6] We study the property of K-rationality for isotropic simple group varieties defined over an arbitrary field K. We prove that many of these varieties are K-rational; in particular, we show that the variety of any K-isotropic simple group of type G_2, F_4, ${}^{3,6}D_4$, E_6 is rational over K. As a corollary of our results we prove that the variety of any simple algebraic group defined over either a p-adic or totally imaginary number field or global function field of positive characteristic is K-rational.

[7] We give an alternative proof of of Scheiderer's theorem on the Hasse principle for principal homogeneous spaces defined over a field of virtual cohomological dimension at most 1. In the forthcoming paper we generalize this theorem for inner and outer strong forms defined over a field of virtual cohomological dimension at most 2.

[8] This paper supplements results [2]. We investigate the group of R-equivalence classes of linear algebraic groups defined over number fields. A special emphasize is made on groups of exceptional types. In particular, we compute the group of R-equivalence classes of anisotropic trialitarian groups.

[9] We give a uniform and short proof of the fact that the intersection of every non-central conjugacy class in a Chevalley group and a big Gauss cell is non-empty and that this intersection contains elements with any prescribed semisimple part. The interest in this property stems at least in part from its application in a proof of Ore's and Thompson's conjectures in the theory of finite groups which were open for many years.

[10] We describe explicitly the 2-torsion of the Brauer group ${}_2Br\, E$ of an elliptic curve E defined over an arbitrary field K. Our description is given in terms of generators, which are quaternion algebras of a very specific form, and relations between them.

Our methods can been also applied for study the Brauer group of hyperelliptic curves with rational points.

[11] - [12] The paper [12] is devoted to the problem of the description of n-torsion part in the Brauer group of algebraic curve defined over a field k of zero characteristic. It is proved that any element of n-torsion part in the Brauer group can be presented by a

tensor product of cyclic algebras of a special type under the condition of k-rationality of n-torsion points of the corresponding Jacobian variety. These cyclic algebras are closely connected with n-torsion points on the Jacobian. The special case where $n = 2$ was considered in [11].

[13] We obtain estimates of the length of a cyclic algebra presentation of the primary torsion in the Brauer group of curves defined over a multidimensional local field. This result is obtained under the condition of rationality of the corresponding primary torsion on the Jacobian variety of a curve.
[14] The abstract of a talk given by V.I. Yanchevskiĭ at the XXI Journnées Arithmetiques. Vatican. July 12 - 16, 1999. It was devoted to description of P-primary torsion of Brauer groups of local elliptic curves with bad reduction and unramified division algebras over their function fields.
* Which papers and presentations (talks on conferences) have resulted from the project? (Send key papers to me by email or otherwise!!) Please list and mark if published or accepted or submitted or in preparation, according to the following categories:
Papers in International Journals and proceedings of conferences
[1] V.I. Guletskiĭ, V.I. Yanchevskiĭ. Reciprocity laws for simple algebras over function fields of number curves. Accepted for publication in "Communications in Algebra".
[2] J. Van Geel, V.I. Yanchevskiĭ Indices of hyperelliptic curves over p-adic fields. Manuscripta Math. 96 (1998) 317 - 333
[3] J. Van Geel, V.I. Yanchevskiĭ Indices of double coverings of genus 1 over p-adic fields. Annales de la Faculté des Sciences de Toulouse, Vol. 8, no. 1 (1999), pp. 155 - 172.
[4] V.I. Yanchevskiĭ Brauer groups of curves and reciprocity laws in Brauer groups of their function fields. Algebra. Proc. Intern. Algebraic Conference on the Occasion of the 90th birthday of A.G. Kurosh, Moscow, May 25 - 30, 1998. Walter de Gruyter. Berlin, New York 2000, pp. 378 - 396.
[5] V. Chernousov, A. Merkurjev, R-equivalence and special unitary groups, J. Algebra, 209, 175-198 (1998).
[6] V. Chernousov, V. Platonov, The Rationality problem for semisimple group varieties, J. Reine Angew. Math. 504 (1998), 1-28.
[7] V. Chernousov, An alternative proof of Scheiderer's theorem on the Hasse principle for principal homogeneous spaces, Documenta Mathematica 3 (1998), 135-148.
[8] V. Chernousov, L. Timoshenko, On the group of R-equivalence classes of semisimple groups over arithmetic fields, Algebra and Analiz, vol. 11 (1999), N 6, 1-26.
[9] V. Chernousov, E. Ellers, N. Gordeev, Gauss decomposition with prescribed semisimple part: short proof, accepted for publication in J. of Algebra.
[10] V. Chernousov, V. Guletskii, Algebras of exponent 2 over an elliptic curve, in preparation.
Papers in national Journals
[11] V.I.Guletskiĭ, G.L.Margolin, V.I.Yanchevskiĭ. Presentation of two-torsion part in Brauer groups of curves by quaternion algebras. (In Russian). Dokl. NANB. Vol. 41 (1997), no. 6, pp. 4 - 8.
[12] V.I.Guletskiĭ, V.I.Yanchevskiĭ. Presentation of torsion in Brauer group of curves by cyclic algebras. (In Russian). Dokl. NANB. Vol. 42 (1998), no. 2, pp. 52 - 55.
[13] V.I.Guletskiĭ, V.I.Yanchevskiĭ. Torsion in Brauer group of curves defined over multidimensional local fields. (In Russian). Dokl. NANB. Vol. 42 (1998), no. 4, pp. 5 - 8.
Abstracts in Proceedings
[14] V.I.Yanchevskiĭ. P-primary torsion of Brauer groups of local elliptic curves with bad reduction and unramified division algebras over their function fields. XXI Journnées Arithmetiques. Vatican. July 12 - 16, 1999, p. 63.
3.1 Meetings and visits
a) V.I.Yanchevskiĭ has been visited U. Rehmann (30 days). Supported by Sonderforschungsbereich 343 "Diskrete Strukturen in der Mathematik".
b) V.I.Yanchevskiĭ participated in the conference XXI Journnées Arithmetiques. Vatican. July 12 - 16, 1999. Supported by TMR ERB FMRX CT-97-010
c) Visit in Besancon (March, April, May, 1998) was supported by other program.
d) V.I. Yanchevski is visiting Bielefeld right now supported by the Sonderforschungsbereich 343 "Diskrete Strukturen in der Mathematik".
e) Participation in a conference "Linear Algebraic groups and related structures", Bielefeld, August 10-14, 1998, a talk "An alternative proof of Scheiderer's theorem on the Hasse principle for principal homogeneous spaces" f) Participation in a workshop "Quadratic forms and related topics" (Besancon, May 25-28, 1999), a talk "R-equivalence for linear algebraic groups" g) Participation in a Mini-Summer-School "Involutions et groupes algebriques, Lens, June 7-9, 1999.

Participant 5 – Alma Ata:

Participants: A.S. Dzhumadil'daev, R.Kerimbaev, S. Abukasimova, S.Ibraev
During 1993-99 we have worked in the following problems:
– Defining relations of Cartan Type Lie algebras (A. Dzhumadil'daev, R. Kerimbaev)
– Defining relations of classical Lie algebras in characteristic p (A. Dzhumadil'daev, R. Kerimbaev, S. Ibraev)
– Defining relations and nonsplit extensions of Zassenhaus algebra in characteristic $p = 2$ (A. Dzhumadil'daev)
– Simple Lie algebras in characteristic 5 (A. Dzhumadil'daev)
– Simple Leibniz algebras (A. Dzhumadil'daev, S. Abdukasimova)
– Representations of simple Lie algebras in characteristic $p > 3$ (S. Ibraev)
– Polynomial identities of right-symmetric algebras (A. Dzhumadil'daev)
In [1] we describe nonsplit extensions by irreducible tensor modules of Cartan Type Lie algebras. We construct all 2-cocycles and calculate dimensions of irreducible modules with nontrivial cohomology.
In [2] we give one method for calculating of the cohomology group $H^*(L+M, L+M)$. This method is used for description of quantum deformations of Witt algebras in characteristic p. Nontrivial classical doubles for W_1 can appear only in the cases of $p = 5, 7$.
In [3] we introduce symmetric cohomologies as an analog of cyclic cohomology for Lie algebras. We construct a cohomological sequence connecting cohomologies of trivial module, coadjoint module and symmetric cohomology.
In [4] we give definition of simplicity for Leibniz algebras and describe all simple Lie algebras with Lie factor isomorphic to Cartan Type Lie algebras and with 1-dimensional annulator. We notice that there are exactly two simple pure Leibniz algebras with 1-dimesional annulator: they have Lie factor isomorphic to special algebra or to hamiltonian algebra .
In [5] we have calculated second homology group for maximal nilpotent subalgebra of classical Lie algebras. As it turned out defining relations of these algebras are Serre relations, if $p > 3$, and in small characteristics $p = 2, 3$ they should be completed by some new relations.
In [6] we prove a right-symmetric analog of Amitsur-Levitski theorem. We prove that Witt algebra as a right-symmetric algebra satisfies standard polynomial identity of degree $2n + 1$.
In [7] we give a list of cocyles of Zassenhaus algebras in characteristic 2. In this paper we give realisation of Melikyan algebra, $p = 5$, as a deformation of Hamiltonian algebra.
In [8] Leibniz 2-cohomologies of maximal nilpotent subalgebra of Zassenhaus algebra is calculated.
These results was (and will be) main part of Ph.D thesises of the following participants: – R. Kerimbaev (1995) "Defining relations of nilpotent subalgebras of Cartan Type Lie algebras", – S. Abdukasimova (we hope that defence will be in 2000) "Simple Leibniz algebras of rank 1".
Salaries, trips and overheads: A.S. Dzhumadil'daev has visited Bielefeld (1999), A. Dzhumadil'daev, R. Kerimbaev, S. Ibraev, S. Abdukasimova received a salary.
Publications:
2. A.S. Dzhumadil'daev, *Cohomologies and deformations of semidirect sums of Lie algebras*, Doklady Russian Acad. Sci. **355**(1997), No.5, 586-588.
3. A.S. Dzhumadil'daev, *Symmetric (co)homologies of Lie algebras*, Comptes Rendus Acad.Sci. Paris, Ser. Mathem., **324**(1997), p.497-502.
4. A.S. Dzhumadil'daev, *Noncommutative Lie algebras*, Group 21 Physical applications and mathematical aspects of Geometry, Groups and Algebras, World Scientific, 1997, v.1, 108-112,
5. S. Ibraev, A.S. Dzhumadil'daev, *Defining relations of nilpotent subalgebras of modular Lie algebras,* Uspechi Mat. Nauk, **53**(5), 1998, p.233-234.
6. A.S. Dzhumadil'daev, *Minimal polynomials for right-symmetric algebras,* J.Algebra, **225**(2000), 201-230.
7. A.I. Kostrikin, A.S. Dzhumadil'daev, *Modular Lie algebras: new trends,* Algebra (Proc. Kurosh Conf. may, 1998), Walter de Gruyter, p.181-203, 2000.
8. S. Abdukasimova, *Leibniz 2-cohomologies of nilpotent subalgebras of Zassenhaus algebra,* Izvestia Akademii Nauk Respubliki Kazakhstan, ser. fiz-mat.nauk, 2000, No.1, p.?

Participant 6 – Tbilisi:

Participating researchers: H. Inassaridze, M. Jibladze, T. Kandelaki, D. Pataria, T. Pirashvili, M. Uridia.

Research activities and results:
H.Inassaridze, and T.Pirashvili have visited the University of Strasbourg. They attanded the conference on "Homotopical algebra". T. Pirashvili was a co-organizer with J.-L. Loday of this meeting. T. Pirashvili was also visited University of Bielefeld for several months.
Results:
1) T. Datuashvili and T. Pirashvili. Homology of crossed modules and two-tipes (in preparation).
The homology theory of 2-types is considered via a certain spectral sequence having enough trivial terms to perform effective computations on one hand and on the other hand it relates different homology theories of crossed modules.
3) M. Jibladze, T.Pirashvili. Central extensions and nilpotence of Maltsev theories.
The relationship between different approach of nilpotency for algebraic theories is etablished. The main technical tool is our cohomology of algebraic theories, which is an algebraic counterpart of topological Hochschild homology.
4) M. Jibladze, H.-J. Baues. Lax Models (in preparation).
2-groupoids are used to find a combinatorial description of differentials in the E_2 term of the homotopy operation spectral sequence and other related spectral sequences.
5) S. Kurdiani. Universal central extensions of restriced Lie algebras. (Proc. Razmadze Math. Inst. to appear).
The universal central extension of restricted Lie algebra $sl(A)$ is constructed. The kernel of it is computed. Moreover if $\mathbf{g}$ is a restricted Lie algebra, which is perfect as a Lie algebra it is computed the kernel of the restricted universal central extension using the kernel of the universal central extension in the category of Lie algebras. As a consequence one gets computations of the second homology groups for some class of restricted Lie algebras.
6) H. Inassaridze. Algebraic K-theory of normed algebras. (submitted in "K-theory")
The isomorphism betweeen algebraic K-functors and topological K-theory is proved for polynomial extensions of stable C^*-algebras.
7) V. Lomadze. On canonical resolutions over projective spaces, submited in "Commun. in Algebra".
For certain important class of coherent sheaves over projective spaces locally free canonical resolutions are constructed in a simple explicit way.
8) T. Pirashvili. Dold-Kan type theorem for Γ-groups. submitted in "Math. Ann".
It is well-known that any functor from pointed finite sets to the category of groups defines a spectrum. A spectral sequence is constructed, whose abutment is the stable homotopy of corresponding spectra and which gives a nice link to the homology of the symmetric. The explicit computation is given in the case when the degree of functors is at most four.
9) T. Pirashvili (together with V. Franjou and H.-J. Baues). Polynomial Mackey functors. (in preparation)
Polynomial endofunctors of the category of abelian groups plays an important role in topological Hochschild homology. Wegive a new describtion of this category. The main technical tool is the Dold-Kan type theorem for Γ-groups and a bridge between polynomial functors and pre Mackey functors.
10) T. Pirashvili. Hodge decomposion of higher order Hochschild homology (to appear in "Ann. Ec. Norm. Sup.").
Hochschild homology of order d of commutative algebras is constructed. Here d is a nonnegative integer. For d=1 this theory coincides with the classical Hochschild homology. In the characteristic 0 case Hochschild homology of order d of the DeRham complex of a d-connected manifold is isomorphic to the cohomology of the space of continuous maps of the d-dimensional sphere to the manifold. We prove that for higher order Hochschild homology there exists a natural decomposition, which for $d = 1$ coinsides with the classical Hodge decomposition due to Quillen and Gerstenhaber. The striking point is, that the knowledge of the decomposition for usual Hochschild homology (resp. order 2 Hochschild homology) completely determines the decomposition of all higher order homologies of odd (resp. even) order.

Linear Algebraic Groups and Related Structures

Satellite Conference of ICM 1998, August 10 – 14, 1998

Universität Bielefeld, Fakultät für Mathematik, SFB 343 "Diskrete Strukturen in der Mathematik"

Organizers: Ina Kersten office: V4-238, phone: (0521) 106-4997
Ulf Rehmann office: V5-239, phone: (0521) 106-5039, priv. (0521) 105491
Secretary: Britta Heidrich office: V5-228, phone: (0521) 106-5022

Schedule of Talks as of August 10, 1998

All talks in Lecture Room "Hörsaal 15" Main Hall University Building
Talks given by participants from an INTAS-93-2618 partner are marked by *

Monday, August 10:

Opening session		9.30 – 9.45
R. Parimala:	u-Invariant of function fields in one variable over p-adic fields	9.45 – 10.45
M. Knebusch:	Generic splitting in the presence of bad reduction	11.00 – 12.00
G. Soifer:	Auslander conjecture - new progress	13.30 – 14.15
R. Sujatha:	Sums of squares in function fields	14.30 – 15.15
* D. Hoffmann:	On the pythagoras number of formally real fields	15.45 – 16.30
M. Monsurro:	Doubling trace forms	16.45 – 17.30

Tuesday, August 11:

E. Vinberg:	Weakly symmetric spaces and spherical varieties	9.30 – 10.15
B. Kahn:	The motive of a reductive group	10.30 – 11.15
N. Karpenko:	A direct construction of the Rost motive	11.30 – 12.15
B. Kunyavski:	Rationality problem for generic tori in simple groups	14.30 – 15.15
R. S. Garibaldi:	Exotic algebraic structures and groups of type E_6 and E_7	15.45 – 16.30
A. Steinbach:	Subgroups of $F_4(K)$ generated by long root elements	16.45 – 17.30

Wednesday, August 12:

V. Suresh:	Principal bundles over the plane	9.30 – 10.15
* A. Dzhumadild'aev:	Cohomologies and deformations of right symmetric algebras	10.30 – 11.15
S. Pumplün:	Quaternion algebras over elliptic curves	11.30 – 12.15
T. Ton-That:	Projective limits of invariants of the infinite dimensional classical groups and their applications to physics	14.30 – 15.15
J. Morita/E. Plotkin:	Results (old & new) and problems on Kac-Moody groups	15.45 – 16.45
P. Abramenko:	Economical presentations of Kac-Moody groups over fields	17.00 – 17.45
	Conference Dinner, Lotus-See Restaurant, Werther Str. 274	19.00

Thursday, August 13:

* I. Panin:	On a conjecture of Grothendieck about principal homogeneous spaces	9.30 – 10.15
* V. Chernousov:	An alternative proof of Scheiderer's theorem of Hasse principle	10.30 – 11.15
* L. Fainsilber:	Integral versus rational equivalence for Hermitean forms over local orders	11.30 – 12.15
* O. I. Tavgen:	Free Products of cyclic groups in the $PSL(2, C)$	13.45 – 14.30
V. Benyash-Krivetz:	On decomposing some finitely generated groups into amalgamated free products	14.45 – 15.15
S. Akbari:	Maximal subgroups of $\mathrm{GL}_1(D)$	15.45 – 16.30
Y. Flicker:	Orbital integrals via perverse sheaves	16.45 – 17.30

Friday, August 14:

P. Gille:	Applications of Rost's invariants	9.30 – 10.15
P. Balmer:	Derived Witt groups	10.30 – 11.15
* P. Koulmann:	Dimension of symmetric or skew-symmetric matrices with given minimal polynomial	11.30 – 12.15
* O. Izhboldin:	$H^3(F(q_1, q_2)/F)$ for a pair of quadratic forms	13.30 – 14.15
M. Mahdavi-H.:	Commutators in division rings revisited	14.30 – 15.15
A. Wadsworth:	Valued and graded divison algebras	15.45 – 16.30
J. Winkelmann:	Quotients of complex Lie groups by lattices	16.45 – 17.30

Conference on Linear Algebraic Groups and Related Structures
University of Bielefeld, August 10 – 14, 1998
List of Participants
Participants from an INTAS-93-2618 partner are marked by *

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