Curriculum Vitae of Chenchang Zhu

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Positions

Göttingen University — Göttingen, Germany
Professorin (tenured) in Mathematics, since August 2013

Göttingen University — Göttingen, Germany
Juniorprofessorin (tenure-track) in Mathematics, September 2008-August 2013

Institut Fourier — Grenoble, France
Maître de conférences (Assistant professor) in Mathematics, since November 2006, detachment since September 2008

ETH: Eidgenössische Technische Hochschule Zürich — Zürich, Switzerland
Post-doc position in Mathematics, June 2004-October 2006

Education

University of California at Berkeley — Berkeley, CA, 94720
Ph.D. in Mathematics, in May 2004
Advisor: Alan Weinstein

Peking University — Beijing, P. R. China
B.S. in Mathematics, June 1999

Dissertation **Integrating Lie algebroids via stacks and applications to Jacobi manifolds**

Unlike a finite dimensional Lie algebra, a Lie algebroid does not always come from a Lie groupoid. Non-integrability already shows up in the case of infinite dimensional Lie algebras. I found that a Lie algebroid can nevertheless always be integrated into an étale stack with a groupoid structure, which I call a *Weinstein groupoid*. The converse is true too; hence the Lie algebroid version of the 1-1 correspondence between Lie algebras and Lie groups is fully established.

Applying the above to Jacobi manifolds, I prove that the integrating objects of Jacobi manifolds are contact Weinstein groupoids. I also determine when a Jacobi manifold can be integrated by a contact Lie groupoid.

Dissertation Committee: Alan Weinstein (Chair), Allen Knutson, Hitoshi Murayama (outside member)

Research Interests

Poisson geometry, Symplectic geometry, higher structures in differential geometry, such as higher stacks, gerbes, Lie algebroids, higher Lie groupoids, simplicial manifolds.

Publications

Integration of twisted Dirac brackets: H. Bursztyn, M. Crainic, A. Weinstein and C. Zhu, *Duke Mathematical Journal* **123** (2004), no. 3, 549–607.

Contact Reduction and groupoid actions: M. Zambon and C. Zhu, *Trans. AMS.* **358** (2006), 1365–1401.

Integration Lie algebroids via stacks: H. Tseng and C. Zhu, *Compositio Mathematica* **142** (2006), no. 1, 251–270.

Integration Poisson manifolds via stacks: H. Tseng and C. Zhu, *Travaux mathematiques* **15** (2005), 285–297.

Hopfish algebras: A. Weinstein, X. Tang and C. Zhu, *Pacific Journal of Mathematics* **231-1** (2007), 193-216.

Integrability of Jacobi and Poisson structures: M. Crainic and C. Zhu, *Annales de l'institut Fourier* **57-4** (2007), 1181-1216.

On the geometry of prequantization spaces: M. Zambon and C. Zhu, *Journal of Geometry and Physics* **57** (2007), 2372–2397.

Elliptic gamma functions, triptic curves and $SL_3(Z)$: G. Felder, A. Henriques, C.A. Rossi and C. Zhu, preprint math.QA/0601337, *Oberwolfach Reports.*

A gerbe of Gamma functions: G. Felder, A. Henriques, C.A. Rossi, C. Zhu, preprint math.QA/0601337 (2006), *Duke Mathematical Journal* **141-1** (2008).

Morita equivalence of Poisson manifolds via stacky groupoids: H. Bursztyn and C. Zhu, preprint axiv:0707.2575, *Oberwolfach Reports.*

Lie n-groupoids and stacky Lie groupoids: C. Zhu, preprint math.DG/0609420, 2008, *International Mathematics Research Notices* (2009) 2009:4087-4141; arXiv:0801.2057. DOI: 10.1093/imrn/rnp080.

Kan replacement of simplicial manifolds: C. Zhu, preprint, 2008, *Letters in Mathematical Physics*: Volume 90, Issue 1 (2009), Page 383; arXiv:0812.4150.

Semidirect products of representations up to homotopy: Yunhe Sheng, Chenchang Zhu, 2009; arXiv:0910.2147, *Pacific Journal of Mathematics* 249-1 (2011), 211–236. DOI 10.2140/pjm.2011.249.211.

Lie algebroid Fibrations : O. Brahic, Chenchang Zhu, preprint, 2010; *Advances in Mathematics* Volume 226, Issue 4, 1 March 2011, Pages 3105-3135; arXiv:1001.4904.

Omni-Lie 2-algebras and their Dirac structures: Yunhe **Sheng**, Zhangju Liu, Chenchang Zhu, 2010; arXiv:1007.4896, *Journal of Geometry and Physics* 61 (2011), pp. 560-575, DOI:10.1016/j.geomphys.2010.11.005

Non-Hausdorff Symmetries of C*-algebras: Alcides Buss, Chenchang Zhu, Ralf Meyer, arXiv:0907.0339, *Math. Annal.* DOI: 10.1007/s00208-010-0630-3.

Strictification of étale stacky Lie groups: Giorgio Trentinaglia, Chenchang Zhu, preprint 2010, arXiv:1006.1262; *Compositio Mathematica* 2011, doi:10.1112/S0010437X11007020;

A higher category approach to twisted actions on C*-algebras: Alcides Buss, Chenchang Zhu, Ralf Meyer, preprint 2009; arXiv:0908.0455, *Proceedings of the Edinburgh Mathematical Society* (2) 56 (2013), no.2, 387-426.

Higher Lie algebra actions on Lie algebroids: Marco Zambon, Chenchang Zhu, preprint 2010; arXiv:1012.0428, *J. Geom. Phys.* 64 (2013), 155173.

Integration of Lie 2-algebras and their morphism: Yunhe Sheng, Chenchang Zhu, preprint 2011; arXiv:1109.4002, *Lett. Math. Phys.* 102 (2), (2012), 223-244.

Distributions and quotients on degree 1 NQ-manifolds and Lie algebroids: Marco Zambon, Chenchang Zhu, preprint 2012; arXiv:1202.1378, *J. Geom. Mech.* 4 (2012), no. 4, 469485.

Lie 2-bialgebras: Chengming Bai, Yunhe Sheng, Chenchang Zhu, preprint 2011; arXiv:1109.1344, *Comm. Math. Phys.* 320 (2013), no. 1, 149172.

Integration of semidirect product Lie 2-algebras: Yunhe Sheng, Chenchang Zhu, preprint 2010; arXiv:1003.1348, to appear in *International Journal of Geometric Methods in Modern Physics (IJGMMP)*.

Integrating central extensions of Lie algebras via Lie 2-groups: Christoph Wockel, Chenchang Zhu, preprint 2012; arXiv:1204.5583, to appear in *Journal of the European Mathematical Society (JEMS)*.

Submitted

Lie II theorem for Lie algebroids via stacky Lie groupoids : Chenchang Zhu, preprint math.DG/0701024, submitted.

Higher Extensions of Lie Algebroids and Application to Courant Algebroids: Yunhe Sheng, Chenchang Zhu, preprint 2011; arXiv:1103.5920, submitted.

In preparation

Action of topological 2-groupoids: Du Li, Ralf Meyer, Chenchang Zhu

Groupoids in categories with pretopology: Ralf Meyer, Chenchang Zhu

Principal bundles and Morita equivalence of Stacky grouopids: Henrique Bursztyn, Chenchang Zhu.

Honors, Grants, and Fundings

Gold Medal (Full score), in **IMO**: *International Mathematical Olympiad*, 1995 (Top 3% from 73 countries).

Sony Fellowship for Freshmen, 1996.

"Wu Si" Award, the highest annual award at Peking University, 1997.

Honorable Mention, in **MCM**: *The Mathematical Contest in Modeling*, 1998.

Regents Fellowship, Spring 2002.

Liftoff Fellow of Clay Mathematics Institute, June 2004.

Departmental Postdoctoral position in ETH, 2004-2005

Funding from ANR (L'Agence Nationale de la Recherche), 2006.

Funding from CCCI: Commission des colloques et congrès internationaux, to provide myself the travel expense for the thematic program "Geometric Applications of Homotopy Theory" in Fields Institute, Toronto, 400 euros, 30.03.2007.

Funding from DFG (German Science Fundation), Ralf Meyer and Chenchang Zhu; project title: "Actions of 2-groupoids on C*-algebras", Individual Grant (ME 3248/1-1; 2009-2011), with total amount granted: 24 month full E 13 position and 6.000 euros for material expenses and travel expenses; date of approval: 04.03.2009; project duration in months: 01.09.2009 - 31.08.2011.

Extension of ME 3248/1-1, with total amount 124.900 euros granted; date of approval: 20.04.2011; extension length: additional 24 months.

Tang Aoqing Guest Professorship, Chenchang Zhu; project title: "Integration of Courant algebroids", funding provided by: Jilin University.

Teaching Experience

The most recent courses I taught are in German. I will teach discrete math for the first year undergraduate students in winter semester 2012-2013 also in German. I had a sabbatical semester in Beijing during the winter semester 2010-2011, so my teaching in Göttingen is absent. Good pedagogy suggests to make evaluations during the course to improve the teaching behavior. I made such an evaluation and the result is attached at the end of the document. I also attach an evaluation made by the university.

Moreover, let me emphasis that, with the course "Problem Solving", we selected four students at the end of the semester to attend **IMC 2012** (International Mathematics Competition for university students). We obtained three third prizes and one second prize (which was really close to be a first prize). This is a big improvement comparing to the last year (one third prize and one second prize). Regarding the total score, we are the second best in Germany next to Bonn. I plan to continue this course in the future.

For people who are not familiar with IMC, I quote the following information below: "The competition (IMC) is planned for students completing their first, second, third or fourth year of university education and will consist of 2 Sessions of 5 hours each. Problems will be from the fields of Algebra, Analysis (Real and Complex), Geometry and Combinatorics. The working language will be English. Over the previous sixteen competitions we have had participants from over 193 institutions in 44 countries."

Georg-August-Universitt Gttingen Göttingen, Germany

Problem Solving, Summer semester 2014: Lectureship (in German)

Discrete Math, Winter semester 2013: Lectureship (in German)

Problem Solving, Summer semester 2013: Lectureship (in German)

Discrete Math, Winter semester 2012: Lectureship (in German)

Problem Solving, Summer semester 2012: Lectureship (in German)

Poisson Geometry, Summer semester 2011: Lectureship (in German)

Differential Geometry II–Lie group, Summer semester 2010: Lectureship (in German)

Differential Geometry I, Winter semester 2009-2010: Lectureship

Lie groupoids, Spring 2009: Lectureship

symplectic geometry, Fall 2008: Lectureship

UNIVERSITÉ DE GRENOBLE — Grenoble, France

Differential calculus, Spring 2007: Teaching assistant

Bilinear algebra, Spring 2007: Teaching assistant

ETH — Zürich, Switzerland

Generalized complex geometry (undergraduate seminar), Spring 2006: Teaching assistant

MMP(Undergraduate course) *Mathematical method in physics*, Fall 2005 and Spring 2006: Teaching Assistant and organizer of the exercise section.

Problem solving seminar, Fall 2004: Teaching assistant

U.C. BERKELEY — Berkeley, CA, U.S.A.

Math53(Undergraduate course) *Multivariable Calculus*, Fall 2003: Graduate Student Instructor

Math241(Graduate course) *Complex Manifolds*, Spring 2003: Graduate Student Instructor

Math202B(Graduate course) *Real Analysis*, Spring 2002: Graduate Student Instructor

Math1B(Undergraduate course) *Calculus II*, Spring 2000: Graduate Student Instructor

Activities

Organization of the conference series of *Higher Structures in Topology and Geometry I, II, III, IV, V, VI* in Göttingen/Hamburg from 2008 to now.

Organization of the conference series of *Higher Structures in China I, II, III, IV* in China from 2009 to now.

Organization of the conference of *Higher Structures in mathematics and physics* in Göttingen.

Organization of *Graduate Colloquium* in Zürich from October 2005 to June 2006.

Organization of *Journée autour des Groupoides* in Fourier Institute at Grenoble March 2007.

Mitglieder der Prüfungskommission von (thesis committee member of) Ulrich Pennig (Mathematics Institute, Göttingen) on 31.08.2009.

Mitglieder der Prüfungskommission von (thesis committee member of) Antonia Miteva (Physics Institute, Göttingen) on 17.06.2011.

Mitglieder der Prüfungskommission von (thesis committee member of) Nguyen Nhu Thang (Mathematics Institute, Göttingen) on 23.11.2011.

Second Reporter in the thesis committee of Thomas Nikolaus (Mathematics Institute, Hamburg) on 29.06.2011.

Referee of SNF (Swiss National Science Foundation) 2011

Referee of FCT (Portuguese Foundation for Science and Technology) 2011

Referee for peer reviewed journals

Reviewer for mathscinet

A categorized list of graduate students, fellows, or postdoctoral students supervised, including Diploma, Bachelor and Master students

Chris Rogers (Postdoc since 09/2011): we plan to study String-c 2-groups and establish a convenient category of fibrant objects for L_∞-groupoids.

Lucio Cirio (Postdoc since 01/2014): we plan to study a categorified version of Drinfeld twist. It will bring the connection of Cirio's categorification of virtual knots to our categorification of Lie bialgebras.

Giorgio Trentinaglia (Postdoc 10/2008–10/2011): we studied local property of Lie 2-groups and their strictification. This result was published in Comp. Math.

Yunhe Sheng (Postdoc 12/2008–07/2009): we have a long-term and still ongoing collabaration on various projects. These projects are very fruitful and result in a serie of publications, including some in top journals.

Iakovos Androulidakis (Postdoc since 09/2009–08/2011) joined our group as a postdoc fellow in our DFG project "Actions of 2-groupoids on C*-algebras", Individual Grant (ME 3248/1-1; 2009-2011). We plan to develop some higher algebroid theory on singular foliations.

Weiwei Pan (Postdoc since 01/2011) works on higher representation theory of higher group(oid)s. We have held a serie of seminars to learn about higher knot invariants which built much connection to Prof. Schick's group.

Nikolay Ivankov (Postdoc since 09/2011) joined our group as a postdoc fellow in our DFG project "Actions of 2-groupoids on C*-algebras", Individual Grant (ME 3248/1-1; 2011-2013). We plan to study higher KK-theory.

Du Li (PhD student since 01/2010, about to graduate) works currently on higher morphisms between higher Lie groupoids. Lurie views all sorts of higher morphisms between Kan complices as certain Kan fibration over various simplicial simplices. Here we would like to apply this idea to differential geometry (or other sorts of topologies) and realize higher morphisms between higher Lie groupoids (or topological groupoids, groupoid schemes) using Kan fibration since higher Lie groupoids can be viewed as certain Kan complices. Then we would like to apply this to integrate general Courant algebroids via extension (Kan fibration). A standard courant algebroid serves as the tangent bundle of a generalized complex manifold of Hitchin and Gualtieri. Thus the integration helps to understand the global symmetry of generalized complex manifolds. This question remains open ever since the discovery of Courant algebroids. Recently many progresses have been made and the integration of certain sorts of Courant algebroids is known to experts. We plan to deal with the most general situation using Kan fibration.

Geeske Marie Dehling (Bachelor student 2010) works on higher Yang-Mills equations. She is close to an end of her thesis. She read through the paper of Atiyah-Bott on Yang-Mills equations on Riemann surfaces, which is rather difficult for a third-year student. She managed to understand the main problems studied by Atiyah and Bott. She also raised the corresponding questions that one should study in higher geometry of the parallel problem with the help of Baez's paper in this topic. All this not only enriched her knowledge on a

must-read topic in modern geometry, but also trained her ability of independent research, which is really important for her future study.

Malte Dehling (Master student 2010-2011, then Ph.D. student since 10.2011, with advisorship joined with Bruno Vallette): Malte Dehling's Masterarbeit is on the theory of homotopy extensions of Lie bialgebras. This topic is closely related to categorification of Lie bialgebras. Lie bialgebras are semi-classical limits of Drinfeld's quantum groups. Notice that there is much recent interest (e.g. the series of works of Khovanov-Lauda) in categorification of quantum groups motivated by knot theory and representation theory, for example, the series of work of Khovanov and Lauda. This work might have potential application when considering the classical limit of the above categorification. Then Malte plans to study operad theory and the first concrete aim is to build up an explicit model category for L_∞-algebras.

Talks

Central extension of Lie 2-groups, Huanan University of Science and Technology, March 2014.

Higher structures in differential geometry, HUST, Wuhan, Feb. 2014.

Integration of Courant algebroids, Higher Lie Theory, Luxembourg, Dec. 2013.

Integration of Courant algebroids, Sheffield, April 2013.

Proper actions of topological 2-groupoids, XXIXth International Colloquium on Group-Theoretical Methods in Physics, **invited 30 minutes lecture**, at Chern Institute of Mathematics (China), August 20-26, 2012.

Proper actions of topological 2-groupoids, CATS4, Luminy (France), July 2012.

Homotopy 'groups' of Lie algebroids and obstruction of integration, Higher Geometric Structures along the Lower Rhine, Max Plante institute for Mathematics (Bonn), January, 2012.

Integration of Courant algebroids, Utrecht, September 2011.

Integration of Courant algebroids, Higher Structure in China II, August 2011.

Higher structures, Chinese academy of sciences, Beijing, Dec. 2010.

Higher structures, Beijing Normal University, Beijing, Dec. 2010.

Gerbes and its application, Huanan University of Technology, GuangZhou, Dec. 2010.

Higher Lie algebras, Chern Institute of Mathematics, Tianjin, Nov. 2010.

Higher Lie algebroids and Lie groupoids, , Tsinghua University, Beijing, Nov. 2010.

Lie algebroid fibration, in the biyear major conference in Poisson geometry **Poisson 2010**, IMPA, Rio, Brazil, July 2010.

Differentiable stacks and Lie groupoids, **invited lectures** of a mini course in the **conference "Higher Structures"**, Jilin University, Changchun, China, Oct. 2010.

Lie algebroid homotopy theory, , ETH Zurich, May 2010.

Semidirect product of representation up to homotopies, Higher Structure Conference in Zurich, November 2009.

Stacky Lie groups, geometry seminar in IST, Lisbon, May 2009.

Kan replacement, colloquium in University of Hamburg, December 2008.

From local to global, Poisson 2008, Lausanne, July 2008.

Integration of Lie algebroids via higher structures, geometry and topology seminar, University of Fribourg, Febuary 2008.

Integration of Lie algebroids via higher structures, Mathematics departement, University of Göttingen, January 2008.

Integration of Lie algebroids via higher structures, Mathematical physics seminar, ETH Zurich, October 2007.

Principal bundles and Morita equivalence of stacky Lie groupoids, Workshop on Poisson sigma models, Lie algebroids, deformations, and higher analogues, ESI Vienna, August 2007.

Integration of Lie algebroids via higher structures, Mathematical physics seminar, University of Freiburg Germany, July 2007.

A gerbe for elliptic Gamma function, Symplectic seminar, University of Toronto, May 2007.

Integration of Lie algebroids via higher structures, Workshop on stacks in geometry and topology, Fields Institute, May 2007.

Morita equivalence in the category of all Poisson manifolds, Workshop on Poisson geometry, Oberwolfach, May 2007.

Integration of Lie algebroids via higher structures, Geometry seminar, Ecole Polytechnique, April 2007.

Integration of Lie algebroids via higher structures, Geometry seminar, Université de Lyon 1, April 2007.

Integration of Lie algebroids via higher structures, Geometry seminar, Université de Poitiers, March 2007.

Lie n-groupoids and stacky Lie groupoids, Trimester on groupoids and stacks in physics and geometry, IHP, January 2007.

Stacky Lie groupoids and Lie 2-groupoids, Geometry seminar, EPFL, Switzerland, December 2006

Intégration des algèbroides de Lie par l'intermédiaire des champs , Algèbre et Géométries, Institut Fourier, France, December 2006

Symplectic stacky groupoids for poisson manifolds, Aspects géométriques et algèbriques des structures (ou algèbres) de Poisson, Université de Haute Alsace Faculté des Sciences et Technique Laboratoire de Mathématiques, Informatique et Applications, France, November 2006

Gerbe de gamma et son cocycle, Week-end de rentrée de l'Institut Fourier, France, September 2006

A gerbe of the elliptic gamma function, Poisson 2006, Tokyo, June 2006

A gerbe of elliptic gamma functions, Symplectic geometry seminar, *University of California at Berkeley*, March 2006

A gerbe of elliptic gamma functions, Groupe de travail "Systèmes non holonomes", *Institut de Mathématiques de Toulouse, France*, March 2006

Symplectic and contact groupoids, Geometry seminar, *Chinese Academy, Wuhan, China*, September 2005

Principal bundles of stacky groupoids and application in Poisson geometry, GAP-3 (The Séminaire Itinérant Geometry and Physics), *Dipartimento di Matematica e Informatica in Perugia, Italy*, July 2005

Prequantization and Reduction, Summer School and Conference on Poisson Geometry, *Triest, Italy*, July 2005

Integrating Lie algebroid via stacks, Symplectic geometry seminar, *Toronto University*, February, 2005

Weinstein groupoid is a 2-groupoid, Symplectic geometry seminar, *University of California at Berkeley*, February 14, 2005

Integrating Poisson manifolds via stacks, Geometry seminar, *Arizona University, Tucson*, February 10, 2005

Integrating Poisson manifolds via stacks, Mini-conference—Journées de Physique Mathématique, *Université LYON 1* , January 28, 2005

Weinstein groupoid is a 2-groupoid, Geometry seminar, *Geneva University, Switzerland*, January 7, 2005

Integrating Poisson manifolds via stacks, Symplectic geometry seminar, *ETH Zürich, Switzerland*, November 22, 2004

Differentiable stacks and its application in Lie theory, Graduate Colloquium, *ETH Zürich, Switzerland*, October 25, 2004

Poisson sigma model and differentiable stacks, Mathematical and Physical Aspects of String Theory, *Ascona, Switzerland*, July 18-23, 2004

Integrating Lie algebroids via stacks, Groupoids and Stacks in Physics and Geometry, *CIRM-Luminy, France*, June 28 - July 2, 2004

Integrating Poisson manifolds via stacks, Poisson 2004, *University of Luxembourg*, in the poster section, June 7-11, 2004

Integrating Lie algebroids via stacks, Department seminar, *Northwesten University*, May 2004

Integrating Lie algebroids via stacks—II, Symplectic geometry seminar, *University of California at Berkeley*, May 2004

Integrating Lie algebroids via stacks—I, North California symplectic geometry seminar, *University of California at Berkeley*, May 2004

Prequantization of coadjoint orbits and contact (groupoid) reductions, Geometric quantization seminar, *University of California at Berkeley*, October 2003

Contact reduction via groupoids, Symplectic geometry seminar, *University of California at Berkeley*, May 2003

Jacobi manifolds, contact groupoids and prequantizations, Symplectic geometry seminar, *University of California at Berkeley*, November 2002

Jacobi manifolds and their contact groupoids, Research seminar, *Women's program, IAS*, May 2002.

Selected Conferences/Program Invited

UIUC, Poisson 2014, August 2014

Chern Institute, XXIXth International Colloquium on Group-Theoretical Methods in Physics, August, 2012.

Zurich University, Zurich, *Higher Structures*, November 2009

ESI, Vienna, *Poisson sigma models, Lie algebroids, deformations, and higher analogues*, August 2007

Fields Institute, Toronto, Canada, *workshop on stacks in geometry and topology* , May 2007

Oberwolfach, Germany, *workshop on Poisson geometry*, May 2007

IAS, Park City, *String Theory and Stacks*, July 2002

Biographical Born: May 21st, 1977 in Wuhan, HuBei, China, Citizenship: P. R. China, Passport number: 147045609.

Language English (very good, 5 years teaching and research experience in U.S.)

French (good, can teach in French.)

German (good, can teach in German.)

Chinese (native)

References **Prof. Dr. Anton Alekseev**, Section de mathématiques 2-4 rue du Lièvre, Bureau: 14 , Case postale 64, CH-1211 Genève 4, Suisse tel. +41 22 37 91178, fax +41 22 37 91176, Email: Anton.Alekseev@unige.ch,

Prof. Yvette Kosmann-Schwarzbach, Centre de Mathématiques, Ecole Polytechnique, 91128 Palaiseau Cedex, France. Tel: +33 (1) 693 33478, Fax: +33 (1) 693 33019, yks@math.polytechnique.fr

Prof. John Baez, Department of Mathematics, University of California, Riverside, 900 Big Springs Drive, CA 92521, U.S.A. Tel: +1 (951) 827 7372, Fax: +1 (951) 827 7314, baez@math.ucr.edu

Prof. Alan Weinstein (advisor), Mathematics Department, U.C. Berkeley, Berkeley, CA 94720, U.S.A. Tel: +1 (510) 642-3518, Fax: +1 (510) 642-8204, alanw@math.berkeley.edu

Prof. Giovanni Felder, Mathematics Department, ETH, Rämistr. 101, 8092 Zürich, Switzerland. Tel: +41 (44) 632 3409, Fax: +41 (44) 632 1085, felder@math.ethz.ch

Prof. Rui Fenandes, Departamento de Matemática Instituto, Superior Técnico, Av. Rovisco Pais, 1049-001 LISBOA, Portugal. Tel:+351 (21) 841 7113 and +351 (21) 423 3219, Fax: +351 (21) 841 7035, rfern@math.ist.utl.pt

Prof. Dr. Christoph Schweigert, Fachbereich Mathematik, Bereich Algebra und Zahlentheorie, Zentrum für mathematische Physik, Bundesstrasse 55, 20146 Hamburg, Germany, Tel.: +49 40 42838-5170 Secr.Tel.: +49 40 42838-5171 (Ms. A. Dörhöfer, Mo-Fr 9-15) Fax: +49 40 42838-5190 Email: christoph.schweigert@math.uni-hamburg.de