

Alessandro Valentino

General Information

Full Name	Alessandro Valentino
Date of birth	30.05.1980
Place of birth	Avellino(AV)-Italy
Citizenship	Italian
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Spoken Languages	Italian(native)-English(fluent)-French(fluent)-German(good)
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Education

Type	Year	Institution	Notes
Ph.D.	2008	Heriot-Watt University, Edinburgh (UK)	Mathematics; Thesis “K-theory, D-branes and Ramond-Ramond fields”; Advisor: Prof. R. Szabo; Thesis defence: September 2008.
Post-graduate studies	2005-2008	Heriot-Watt University, Edinburgh (UK)	Mathematics
Graduation	2004	University of Naples “Federico II”	Physics; Thesis “Spazi Non-commutativi e Limiti di Algebre di Matrici”; Advisor: Prof. F. Lizzi; 110/110 e lode (full marks and honors); Thesis defence: 14 July 2004.

█ Appointments

Academic Appointments

Start	End	Institution	Position
2016	present	Institut für Mathematik, UZH	Oberassistent, with A. Cattaneo
2014	2016	Max Planck Institut für Mathematik	Post-Doc, with P. Teichner (Stipendium)
2013	2014	Hamburg Universität	Post-Doc, with C. Schweigert (SFB)
2012	2013	Hamburg Universität	“Vertretungsprofessur” (Temporary Lecturer)
2010	2012	Hamburg Universität	Post-Doc, with C. Schweigert (SFB)
2008	2010	Göttingen Universität	Post-Doc, with D. Bahns (Courant Center)

Other Appointments

Start	End	Institution	Position
1/2015	1/2015	ESI Vienna	Visiting researcher
10/2014	10/2014	ESI Vienna	Visiting researcher
03/2013	03/2013	MPIM Bonn	Visiting researcher

█ Teaching experience

Year	Institution	Lecture/Course
2017	UZH	An Introduction to Category Theory and its Applications categories, functors, natural transformations; adjoints, representables and limits; monads and their algebras; presheaves and topoi
2016	UZH	Differential Forms in Algebraic Topology de Rham cohomology; vector bundles; spectral sequences; homotopy theory
2014	ESI (Vienna)	Lectures on Topological Quantum Field Theory via Higher Category Theory (Minicourse) cobordism categories; simplicial sets; higher categories and ∞ -categories; Cobordism Hypothesis
2012	Hamburg Universität	Software Praktikum introduction to elementary analysis and linear algebra using Maple; introduction to programming
2012	Hamburg Universität	Concepts and Methods of Mathematical Physics abstract algebra; Lie algebras; manifolds; differential forms

2010	Göttingen Universität	Geometrical Methods in Algebraic Topology: an introduction de Rham cohomology; vector bundles; characteristic classes; classifying spaces
2009	Göttingen Universität	Microlocal Analysis (tutoring) Fréchet spaces; distributions; wave front sets; Fourier transform; pseudodifferential operators
2008	Heriot-Watt University	Algebra 3 (tutoring) elementary graph theory
2007	Heriot-Watt University	Algebra 2 (tutoring) matrices; determinants; vector spaces
2007	Heriot-Watt University	Algebra 1 (tutoring) set theory; number theory; complex numbers and polynomials

Selected Activities as Organizer

Year	Title
2018	Research Seminar “ <i>Reflection Positivity and Invertible Topological Phases</i> ”, University of Zurich
2015	Research Seminar “ <i>Topology in Condensed Matter Physics</i> ”, MPIM, Bonn (together with O. Gwilliam)
2013	Research Seminar “ <i>Two-dimensional Yang-Mills theory</i> ”, Hamburg Universität
2012	Research Seminar “ <i>Extended topological field theories and n-categories</i> ”, Hamburg Universität (together with J. Morton)
2010	School “ <i>Higher index Theory and Differential K-theory</i> ”, Universität Göttingen (together with A. Kahle and T. Schick)

Society memberships, Awards and Honors

Year	Title
2005-2008	Graduate scholarship, Heriot Watt University, Edinburgh, UK
1999-2004	Undergraduate scholarships, E.DI.SU., Naples

Additional Qualifications

Type	Year	Description
Habilitation	2018	Habilitation with thesis "Higher Structures in Topological Quantum Field Theory", University of Zürich
Habilitation	2017	Abilitazione Scientifica Nazionale in Matematica (Italian habilitation for Associate Professor in Mathematics)
Habilitation	2014	Qualification à la fonction de maître de conférences en Mathématiques (French habilitation for Lecturer in Mathematics)

■ Funding Information [grants as PI-principal investigator or I-investigator]

Year	Title	Program
2010-2014	Particle, Strings, and the Early Universe	SFB - I (Collaborative research project from German Research Foundation(DFG))

■ Research Activities

Keywords	Brief Description
Topological Quantum Field Theory	The study of cobordism categories and its higher versions (extended cobordism) via linear representations
Higher algebra	The investigation of algebraic structures which are required to satisfy identities only up to coherence laws
Smooth stacks	The study of sheaves and higher sheaves over manifolds, which provide a suitable language to describe geometric objects and structures naturally appearing in modern theoretical physics

Publications

- (1) *The Serre Automorphism via Homotopy Actions and the Cobordism Hypothesis for Oriented Manifolds*(with J. Hesse), to be published on *Cahiers de Top. et Diff. Geom. Cat.*, [arXiv:1701.03895]
- (2) *Frobenius Algebras and Homotopy Fixed Points of Group Actions on Bicategories* (with J. Hesse and C. Schweigert), T.A.C.(2017), Vol. 32, No. 18, 652, [arXiv:1607.05148]
- (3) *Central Extensions of Mapping Class Groups from Characteristic Classes* (with D. Fiorenza and U. Schreiber), to be published on *Cahiers de Top. et Diff. Geom. Cat.*, [arXiv:1503.00888]
- (4) *On the Brauer Groups of Symmetries of Abelian Dijkgraaf–Witten Theories* (with J. Fuchs, J.Priel and C. Schweigert), *Comm. Math. Phys.* (2015), Vol. 339, Issue 2, pp 385–405
- (5) *Boundary Conditions for Topological Quantum Field Theories, Anomalies and Projective Modular Functors* (with D. Fiorenza), *Comm. Math. Phys.* (2015), Vol. 338, Issue 3, pp 1043–1074
- (6) *A Serre-Swan theorem for gerbe modules on étale Lie groupoids* (with C. Schweigert and C. Tropp), *Theory and Applications of Categories* (2014), Vol. 29, No. 28, pp. 819-835
- (7) *A geometric approach to boundaries and surface defects in Dijkgraaf-Witten theories* (with J. Fuchs and C. Schweigert), *Comm. Math. Phys.*(2014), Vol. 332, Issue 3, pp 981-1015
- (8) *T-duality and Differential K-theory* (with A. Kahle), *Commun. Contemp. Math.* (2014), 16, 1350014
- (9) *Bicategories for Boundary Conditions and for Surface Defects in 3-d TFT* (with J. Fuchs and C. Schweigert), *Comm. Math. Phys.* (2013), 321, no. 2, pp. 543-575
- (10) *Ramond-Ramond Fields, Fractional Branes and Orbifold Differential K-theory* (with R. Szabo), *Comm. Math. Phys.* (2010), 294, pp. 647–702
- (11) *KO-Homology and Type I String Theory* (with R. Reis and R. Szabo), *Rev. Math. Phys.*(2009), 21, pp. 1091–1143
- (12) *Reduction and Unfolding for Quantum Systems: the Hydrogen Atom* (with A. D’Avanzo and G. Marmo), *Int. J. Geom. Meth. Mod. Phys.*(2005), 2, pp. 1043–1062

In preparation

- (1) *Equivariant Factorization Algebras from Abelian Chern-Simons theory*, with C. Keller
- (2) *Dijkgraaf-Witten TQFT from Factorization Algebras*
- (3) *Cobordism Categories with Constraints*, with C. Scheimbauer

Selected Seminars

Year	Title
2018	Talk “Equivariant Factorization Algebras from Abelian Chern-Simons theory”, QGM, Aarhus
2018	Talk “Deformation theory for moduli spaces”, QGM, Aarhus
2017	Talk “Topological Quantum Field Theories and Higher Categories”, Séminaire de Physique mathématique, Lyon
2017	Talk “Frobenius algebras, categorification and 2d TQFTs”, Séminaire Topologies, Montpellier
2016	Talk “Frobenius algebras, categorification and 2d TQFTs”, Algebra, Geometry and Physics Seminar, MPIM, Bonn
2015	Talk “Central extensions of mapping class groups from characteristic classes”, Algebra and Geometry Seminar, Rome La Sapienza, Italy
2015	Talk “Boundary conditions for extended TQFTs and anomalies”, ESI, Vienna
2014	Talk “Boundary conditions for extended TQFTs, anomalies and representations of the mapping class group”, ETH, Zurich
2014	Talk “Defects and symmetries in three-dimensional topological quantum field theories”, Institut Camille Jordan , Lyon
2014	Mini-course “Lectures on Topological Quantum Field Theory via Higher Category Theory”, ESI, Vienna
2014	Talk “Boundary conditions for extended TQFTs and anomalies”, MPIM, Bonn
2014	Talk “Boundary conditions for 3d TQFTs and module categories” in <i>Modern trends in topological quantum field theory</i> , Vienna
2013	Talk “Boundary conditions for 3d TQFTs and module categories”, Algebra and Geometry Seminar, Rome La Sapienza
2011	Talk “T-duality and differential K-theory” in <i>Quarterly Seminar on Topology and Geometry</i> , Utrecht
2010	Talk “Differential Cohomology and Quantum Gauge Fields” in <i>Workshop on Deligne Cohomology and differential characters</i> , University of Copenhagen
2009	Talk “Differential Cohomology and Quantum Gauge Fields” in <i>Oberseminar Globale Analysis</i> , Regensburg

- 2008 Talk “Mathematical topics on D-branes and Ramond-Ramond fields”,
Graduiertenkolleg, Mathematisches Institut, Göttingen
- 2007 Talk “Orbifold differential K-theory from String Theory” in *22nd British Topology Meeting*, Sheffield

■■■■■ Refereeing Activities

- *Referee for*: Geometry and Topology, Quantum Topology, Communications in Mathematical Physics, Communications in Modern Mathematics, Theory and Applications of Categories, Letters in Mathematical Physics, Advances in Mathematics, Journal of Mathematics and Music.

■■■■■ Activity as Advisor

- Nino Scalbi, University of Zürich (Master, co-advised with A. Cattaneo, 2017)
- Corina Keller, University of Zürich (Master, co-advised with A. Cattaneo, 2017)
- Jan Hesse, University of Hamburg (Ph.D., co-advised with C. Schweigert, Thesis defense: July 2017)
- Christopher Tropp, University of Hamburg (Master, co-advised with C. Schweigert, 2012)

Referees

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