

Oxford University  
andre.henriques@maths.ox.ac.uk

## Personal details

Name: André G. Henriques  
Nationality: Swiss

## Degrees

- 1999: Diplôme  
University of Geneva  
Title: *La résolution du modèle d'Ising selon la méthode de Baxter.*  
Supervisor: Vaughan Jones
- 2005: Ph.D.  
Massachusetts Institute of Technology  
Title: *Orbispaces.*  
Supervisor: Michael Hopkins<sup>1</sup>

**Current employment:** Oxford University, *Departmental Lecturer.*

## Work experience

- 2005–2007: Münster, SFB postdoc
- 2007–2014: Utrecht University, Universitair Docent (tenured position)
- 2009–2010: Math teacher at a Dutch high school (part-time, 50%)
- 2014 (Jan–May): Research Member of the MSRI program on Algebraic Topology and Visiting Scholar at Berkeley
- 2014–today: Oxford University

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<sup>1</sup>The first 2<sup>1</sup>/<sub>2</sub> years of my Ph.D. were done at Berkeley, under the supervision of Allen Knutson.

## Brief summary of research

**Stacks:** In my Ph.D. thesis, I studied orbispaces (a.k.a. topological stacks) and orbifolds. I identified the homotopy theory of orbispaces with a certain functor category, and studied the existence of principal bundles over orbifolds [3]. Gerbes and stacks later proved useful for understanding the functional equations of the elliptic gamma functions [10].

**Kashiwara crystals:** Kashiwara crystals are a ‘combinatorial skeleton’ for  $\mathfrak{g}$ -modules. In [5], I proved that the cactus group  $\pi_1(\overline{M}_{0n}(\mathbb{R}))$  acts on products of crystals, in the same way that the braid groups act on products of  $U_q(\mathfrak{g})$ -modules. I later studied the topology of  $\overline{M}_{0n}(\mathbb{R})$ , and computed its cohomology [12]. I also showed that the combinatorics of  $\mathfrak{gl}_n$ -crystals is governed by the octahedron recurrence [6]. The latter was further studied in [8], and a closely related combinatorial recurrence was the subject of [13].

**$L_\infty$ -algebras:** These are a sort of differential graded version of Lie algebras. In [11], I answered the question: what does the Lie algebra/Lie group correspondence become when one replaces Lie algebras by  $L_\infty$ -algebras? [11] is my most cited paper (42 citations on MathSciNet; 78 citations on Google Scholar).

**Computations in topology:** I described the equivariant cohomology,  $K$ -theory, and complex cobordism of flag varieties [4] (32 citations on MathSciNet; 70 citations on Google Scholar). I studied cohomology operations on manifolds, and how they interact with Poincaré duality [14]. In my book on elliptic cohomology, I provided the first complete account of the product structure on the ring of topological modular forms [1, Chapt. 13].

**Conformal nets:** Conformal nets are a mathematical model of conformal field theory based on von Neumann algebras. My main result is that conformal nets form a tricategory [19, 24, 21, 29, 25]. On the way, I established a new functoriality for  $L^2$ -spaces of von Neumann algebras [18]. Conformal nets have conjectural applications to the construction of extended TQFTs [28], extended CFTs [17], and topological modular forms [15].

**Categorifying von Neumann algebras:** This is the project I am currently most excited about. Categorified von Neumann algebras are a new type of mathematical object which I introduced in my recent PNAS paper [27]. I call them *bicommutant categories*. Examples of bicommutant categories come from fusion categories, and from conformal nets [22, 31]. If  $G$  is a compact Lie group then  $\text{Rep}(\Omega G)$ , the representation category of its based loop group, is a bicommutant category. I propose the latter as an answer to the question ‘What does Chern-Simons theory assign to a point?’ [27]. The proofs of the results stated in [27] can be found in [26, 31].

**Vertex algebras:** I proved that certain vertex algebras (the chiral WZW models) are in bijection with pairs  $(G, k)$ , where  $G$  is a compact connected Lie group, and  $k$  is in the positive part of  $H^4(BG, \mathbb{Z})$  [23].

**Planar algebras:** I generalised Jones’ planar algebras by internalizing them to a braided tensor category, and proved a classification theorem [20, 30].

## International activities

Invited minicourses/workshops:

- Dec. 14: *Chern-Simons theory and von Neumann algebras*. (3 × two hours)  
Chern-Simons lectures, Berkeley, California, USA.
- Nov. 14: *Topological K-theory*. (4 lectures + exercises)  
QGT colloquium, Zandvoort aan Zee, Netherlands.
- Oct. 14: *Quantum groups and 3-manifold invariants* (16 lectures split with C. Douglas  
— I covered the half about 3-manifold invariants), Copenhagen, Denmark.
- Oct. 13: *The string group via conformal nets*. (4 lectures)  
Field theories, conformal nets and Kac-Moody groups, Münster, Germany.
- Nov. 12: *Topological modular forms*. (4 lectures)  
University of Roma 1, Italy.
- Sep. 12: *Quantum groups and 3-manifold invariants* (12 lectures split with C. Douglas  
— I covered the half about Quantum groups), IMPA, Brazil.
- June 12: *Extended conformal field theories*. (4 lectures)  
Summer School on Topology and Field Theories, Notre Dame, USA.
- Oct 10: *Conformal nets*. (4 lectures)  
Higher Structures School 2010, ESI, Vienna.
- Aug. 10: *Operator algebras and conformal field theory*.  
Six day workshop organized by Nicholas Proudfoot, Oregon, USA.  
(20 assigned talks given by the participants, and 7 by myself).

Invited colloquium talks:

- April 16: *The 576-fold Bott Periodicity of the Majorana Fermions*.  
Perimeter Institute, Toronto, Canada.
- May 15: *Bott Periodicity and Beyond*.  
Oxford, UK.
- Dec. 14: *Bott Periodicity and Beyond*.  
Berkeley, California, USA.
- May 14: *An introduction to conformal field theory*.  
Eugene, Oregon, USA.
- Mar. 12: *What is an elliptic object?*  
Leiden, The Netherlands.
- Aug. 08: *The String group*.  
ETH, Zürich, Switzerland.
- May 07: *Orbifolds from the point of view of the Borel construction*.  
Regensburg, Germany.

Invited presentations at international conferences:

- June 17: *Bicommutant categories.*  
Subfactors, K-theory and conformal field theory, INI, Cambridge, UK.
- Mar. 17: *Higher twisted K-theory à la Dadarlat and Pennig.*  
Subfactors higher twists and almost Calabi-Yau algebras, INI, Cambridge, UK.
- June 16: *What Chern-Simons theory assigns to a point.*  
StringMath, Paris, France.
- May 16: *Conformal nets are factorization algebras.*  
Factorizable structures, Oberwolfach, Germany.
- Aug. 15: *Representations of based loop groups.*  
Lie algebras, vertex operator algebras, and related topics, Notre Dame, USA.
- Aug. 15: *Extended Chern Simons theory.*  
Factorizable structures, Banff, Canada.
- Mar. 15: *Examples of Stolz-Teichner cocycles.*  
Subfactors and conformal field theory, Oberwolfach, Germany.
- Sep. 14: *Conformal nets are factorization algebras.*  
Operator and Geometric Analysis on Quantum Theory, Levico Terme, Italy.
- May 14: *A Categorification of the Notion of Von Neumann Algebra.*  
NCGOA on Subfactors CFT and VOA, Vanderbilt, Nashville, USA.
- Apr. 14: *A  $K(\mathbb{Z}, 4)$  in nature.*  
Reimagining the Foundations of Algebraic Topology, MSRI, California, USA.
- Apr. 13: *The double trace.*  
Higher Structures in Topology and Number Theory, Oxford, UK.
- Feb. 13: *Defects between nets II* (with companion talk by Arthur Bartels).  
Workshop on Field Theories with Defects, Hamburg, Germany.
- Aug. 12: *The double trace.*  
Strings and Automorphic Forms in Topology, Bochum, Germany.
- July 12: *A categorification of the notion of von Neumann algebra.*  
Higher Structures in Topology and Geometry VI, Göttingen, Germany.
- June 12: *The square root of a modular tensor category.*  
FRG Conference on Topology and Field Theories, Notre Dame, USA.
- Jan. 12: *Three-tier CFT.*  
Mathematical Foundations of Quantum Field Theory, Simons center, USA.
- Nov. 11: *Three-tier CFT.*  
Higher Structures in mathematics and physics 2011, Göttingen, Germany.
- Oct. 11: *Fusion of defects.*  
Conformal Field Theory and Von Neumann algebras, Nashville, USA.
- May 11: *Fusion of defects.* (3 talks)  
Higher Structures in Topology and Geometry V, Göttingen, Germany.
- Nov. 10: *Modularity of the representation category of conformal nets: a graphical proof.*  
NRW Topology Meeting, Bonn, Germany.
- June 10: *Higher Bott periodicity: a conjecture.*  
Geometry and Quantum Theory, Nijmegen, The Netherlands.

- Sep. 10: *Local TQFT versus local CFT: results and speculations.*  
Topologie, Oberwolfach, Germany.
- Aug. 10: *Composition of defects.*  
Homotopy Theory and Derived Algebraic Geometry, Fields Institute, Canada
- June 10: *The periodicity of the free fermion: a conjecture.*  
26th Foundations and Constructive Aspects of QFT, Münster, Germany
- June 09: *Invertible conformal nets.*  
Strings, Fields, and Topology, Oberwolfach, Germany.
- May 09: *An Elmendorf's theorem for orbifolds.*  
Manifold perspectives, Oberwolfach, Germany.
- Nov. 08: *3-categories for the working mathematician.*  
Higher structures 2008, Lausanne, Switzerland.
- Sept. 08: *From Elliptic cohomology to conformal nets.*  
Operator Algebras and conformal Field Theory, Vienna, Austria.
- Aug. 08: *Elliptic cohomology and the String group.*  
Moment maps, Lausanne, Switzerland.
- April 08: *A uniform construction of Spin and String.*  
Ninth NRW Topology Meeting, Münster, Germany.
- Jan. 08: *Conformal nets form a tricategory.*  
Foundations and Constructive Aspects of QFT, Göttingen, Germany.
- Oct. 07: *Connections on string bundles.*  
Lie algebroids and Lie groupoids in Differential geometry, Bakewell, UK.
- June 07: *Higher Clifford algebras.*  
Algebraic topology old and new, Bedlewo, Poland.
- May 07: *An action of  $\pi_1(M_{0,n}(\mathbb{R}))$ .*  
Poisson geometry and Applications, Oberwolfach, Germany.
- Oct. 06: *The Dirac construction: a map from  $Rep^\tau(LG)$  to  $K_G^\tau(G)$ .*  
Arbeitsgemeinschaft on Twisted  $K$ -Theory, Oberwolfach, Germany.
- Sept. 06: *Orbivariant  $K$ -theory.*  
Topology, Oberwolfach, Germany.
- Mar. 06: *An operad coming from representation theory.*  
Alpine Operad Workshop, Villars, Switzerland.
- Jan. 06: *Crystals and coboundary categories.*  
 $K$ -Theory, Cyclic homology and Operads, Strasbourg, France.
- June 05: *Vector bundles on orbispaces.*  
Conference on Pure and Applied Topology, Isle of Skye, Scotland.
- June 05: *A model for the String group.*  
Geometric Topology and Quantum Field Theory, Oberwolfach, Germany.
- Sept. 04:  *$T$ -equivariant complex oriented cohomology of generalized flag varieties.*  
Elliptic cohomology and loop spaces, Fields Institute, Canada.
- June 04:  *$T$ -equivariant cohomology of even dimensional cell complexes.*  
Conference in honor of J.C.-Hausmann, Geneva, Switzerland.

Invited talks:

- Feb. 17: *What Chern-Simons theory assigns to a point.*  
Perimeter Institute, Toronto, Canada.
- Feb. 17: *Representations of the based loop group.*  
University of Toronto, Canada.
- Feb. 17: *Representations of the based loop group.*  
Cardiff, UK.
- Oct. 16: *Categorified von Neumann algebras and a conjecture about elliptic curves over number fields.* Cornell, USA.
- Feb. 16: *A model for  $K(\mathbb{Z}, 4)$  and a conjecture about elliptic curves.*  
Oxford, UK.
- April 16: *The classification of chiral WZW models.*  
Perimeter Institute, Toronto, Canada.
- Nov. 15: *Representation theory for fusion categories.*  
Sheffield, UK.
- Nov. 14: *Bott periodicity and beyond.*  
Cardiff, UK.
- Jun. 14: *Chiral CFT and vertex operator algebras.*  
Toronto, Canada.
- Mar. 14: *Topological states of matter.*  
MSRI, California, USA.
- Oct. 13: *A new proof of modularity for representations of conformal nets.*  
Tor Vergata, Rome, Italy.
- Feb. 13: *Progress report on the construction of TMF.*  
MIT, Massachusetts, USA.
- Jan. 13: *Extended conformal field theory.*  
Toronto, Canada.
- Jan. 12: *Three-tier CFT. (2 talks)*  
Oxford, UK.
- May 11: *Higher Bott periodicity: a conjecture.*  
Göttingen, Germany.
- Jan 11: *A sampler of algebraic quantum field theory.*  
Oxford, UK.
- Mar. 09: *Towards a geometric description of elliptic cohomology.*  
Harvard, Massachusetts, USA.
- Mar. 09: *Geometric string structures.*  
Harvard, Massachusetts, USA.
- Mar. 09: *A tricategory of conformal nets.*  
MIT, Massachusetts, USA.
- Jan. 09: *The free fermions: a coordinate free description.*  
Berkeley, California, USA.
- Dec. 08: *A Lie algebra for the String group.*  
Louvain-la-Neuve, Belgium.

- Feb. 08: *Integrable recurrences.*  
Imperial Colledge, Londond, UK.
- July 07: *Les CFT forment une 3-catégorie.*  
Geneva, Switzerland.
- April 07: *Higher Clifford algebras.*  
Austin, Texas, USA.
- Jan. 07: *La périodicité de la récurrence de l'octaèdre.*  
Paris VII, France.
- Dec. 06: *Higher Clifford algebras.*  
EPFL, Lausanne, Switzerland.
- Nov. 06: *The homotopy theory of orbispaces.*  
Stanford, California, USA.
- Nov. 06: *Higher Clifford algebras.*  
Stanford, California, USA.
- June 06: *La périodicité de la récurrence de l'octaèdre.*  
Geneva, Switzerland.
- Feb. 06: *An Adams spectral sequence for computing  $tmf$ -homology at the prime 3.*  
Berkeley, California, USA.
- Feb. 06: *Two models for the String group: a differential geometric and an algebraic geometric.* Berkeley, California, USA.
- Jan. 06: *Crystals and coboundary categories.*  
Strasbourg, France.
- Dec. 05: *The String group and its Lie algebra.*  
Bonn, Germany.
- Nov. 05: *An overgroup of the mapping class group.*  
EPFL, Lausanne, Switzerland.
- Feb. 05: *Orbifolds are global quotients.*  
University of Chicago, Illinois, USA.
- Feb. 05: *The String group and its Lie algebra.*  
Northwestern university, Illinois, USA.

### **Other academic activities**

Organization of international conferences:

- While a graduate student at MIT, I organized the first *Talbot workshop* on elliptic cohomology with Christopher Douglas and Mike Hill. The workshop consisted of four plenary lectures given by Stephan Stolz, and twelve talks by the participants. The next year, we applied for a three year grant (NSF DMS-0512714) and, expanding on our first concept, we founded the *Talbot workshop series*. In total, I ran:

“*Talbot 04*”: 4 day workshop on *Geometric models for elliptic cohomology*

“*Talbot 05*”: 5 day workshop on *Geometric Langlands*

“*Talbot 06*”: 6 day workshop on *Automorphisms of manifolds*

“*Talbot 07*”: 6 day workshop on *Topological modular forms*

The Talbot workshop series has gained international renown and still runs every year (see <http://math.mit.edu/conferences/talbot>).

The Talbot 07 conference led to the publication of the book *Topological modular forms* in the AMS book series Mathematical Surveys and Monographs (349pp).

- In 2010, I was invited by Nicholas Proudfoot to lead a Talbot-inspired workshop, on *Operator algebras and conformal field theory*. This 6 day highly structured workshop had twenty talks given by the participants and seven by myself, see <http://pages.uoregon.edu/njp/CFTschedule.html>.
- I coorganized the meeting “*Higher dimensional algebra in geometry and quantum field theory*” which was held by the AMS the EMS and the Portuguese Mathematical Society in Porto, Portugal, in June 2015.

Editorial work:

I am on the editorial board of the recently launched online journal *Higher Structures*: [https://journals.mq.edu.au/index.php/higher\\_structures](https://journals.mq.edu.au/index.php/higher_structures)

Advising experience:

- Daniel Bruegmann started his PhD in 2015; I share his supervision with Peter Teichner (Max Plank Institute for Mathematics, Bonn). Daniel has been working on the construction of a factorisation algebra (à la Costello) starting from a vertex algebra.
- Shan Shah started his PhD in 2012 under my supervision; he defended in March 2017. His PhD was on *bicolored loop groups*: a generalisation of loop groups where one considers maps from  $S^1$  that send half of the circle to one Lie group, and the other half to another Lie group.
- Since 2008, I have supervised eleven bachelor theses, three of them joint math-physics, and nine master thesis, five of them joint math-physics. The joint math-physics master theses were supervised together with Gleb Arutyunov (integrable systems), Stephan Vandoren (superstring theory and supergravity), and Christiane de Morais-Smith (quantum Hall effect).

Organization of local seminars:

I have organized many semester-long weekly seminars for masters and graduate students. These seminars were all done on a voluntary basis:

- Fall 16 (with Daniele Celoria, Andras Juhasz, and Marc Lackenby):  
Seminar on *Floer theory and Khovanov homology*, Oxford.
- Spring 16: Advanced reading course on *the Kazhdan-Lusztig papers*, Oxford.
- Spring 16 (with Emily Cliff and Kobi Kremnitzer):  
Graduate student seminar on *Quantum groups and affine Lie algebras*, Oxford.



- Spring 14: Graduate student seminar on *Conformal field theory*, Berkeley.
- Fall 13 (with Gleb Arutyunov and Jules Lamers):  
Graduate student seminar on *Quantum integrable systems*, Utrecht.
- Spring 13: Graduate student seminar on *Algebraic quantum field theory*, Utrecht.
- Fall 12: Graduate student seminar on *Quantum groups*, Utrecht.
- Spring 12 (with Johan van de Leur):  
Graduate student seminar on *Vertex operator algebras*, Utrecht.
- Fall 11 (with Tilman Bauer):  
Graduate student seminar on *Algebraic K-theory*, VU and Utrecht.
- Spring 11: Graduate student seminar on *von Neumann algebras*, Utrecht.
- Fall 10: Graduate student seminar on *Topological modular forms*, Utrecht.
- Spring 09 (with Tilman Bauer):  
Graduate student seminar on *Operads*, VU and Utrecht.
- Fall 08 (with Tilman Bauer):  
Graduate student seminar on *Stable homotopy theory*, VU and Utrecht.
- Spring 08 (with Hessel Posthuma):  
Graduate student seminar on *Twisted K-theory*, Utrecht.
- Fall 07: Graduate student seminar on *Infinity categories*, Utrecht.
- Spring 06 (with Michael Joachim):  
Graduate student seminar on *Loop groups and their representation theory*, Münster.
- Fall 04: Graduate student seminar on *Equivariant homotopy theory*, MIT.
- Spring and Fall 01 (with Nicholas Proudfoot):  
Revived and renamed the Berkeley graduate student colloquium “*Many cheerful facts*”.
- Spring 00: Graduate student seminar at the university of Geneva.

Other organizational tasks:

Utrecht staff colloquium (Jan. 2008 – June 2009 & Jan. 2012 – Dec. 2013)

### **Scholarships and prizes**

- Sept. 2014: Leverhulme visiting professorship at Oxford university.
- Sept. 2012: Graduate funding grant from NWO/GQT cluster for the project “The classification of abelian Chern Simons theories”.
- 2005–2007: Two year SFB postdoc fellowship at the university of Münster.
- 2005–2007: NSF grant DMS-0512714, for the organization of the Talbot workshops, joint with C. Douglas and M. Hill.
- May 2002: Charles B. Morrey Jr. award in recognition of exceptional scholarship in mathematics.
- Sept. 1995: Took part in the 7th European Contest for Young Scientists in Newcastle, UK, with the work *Stellated Polyhedra and Tilings*. The participation was reserved to the top finalists of the national contests.

May 1995: Took part in the contest “La Science Appelle les Jeunes” (national Swiss Contest for Young Scientists) with the work *Polyhèdres et pavages étoilés*. Was declared among the top three, across all fields of sciences.

### **Outreach activities and responsibilities**

Talk on *Four dimensional regular polyhedra* at the Berkeley math circles, for talented high school pupils (Mar. 2014).

On the organizational committee of the *Wiskunde B-dag*, a yearly “math day” for high-school pupils that takes place at various high-schools across the country (2012 – 2013).

Member of the editorial board of the mathematical booklet series *Zebra-reeks*, for high-school pupils (2010 – 2011).

Organized an outdoors workshop on ruler-and-compass constructions with pieces of string and wooden sticks planted in the ground, for children 10-12 year old, at a summer camp of *Vierkant voor wiskunde*, a Dutch version of *Mathcamp* (Aug. 2010).

Organized a two-day workshop on the topology of 2-dimensional manifolds, for specially motivated pupils from local high schools (Oct. 2009).

Coordinator at the Belgium-Netherlands-Luxemburg mathematical olympiad for high school pupils (May 2009).

Organized a half-day workshop on Penrose tilings for young children and their parents at the public event *Wetenschapper in één dag* organized by the university (April 2009).

### **Language skills**

French: native, Greek, English, Dutch: fluent,  
German: good, Portugese and Spanish: moderate.

### **Politics**

Following Tim Gower’s public initiative, I boycott Elsevier:  
<http://thecostofknowledge.com>.

## Publication list

### Book

[1]<sup>†</sup> C. Douglas, J. Francis, M. Hill, A. Henriques, editors *Topological Modular Forms* (with contributions by V. Angeltveit, T. Bauer, M. Behrens, C. Douglas, A. Henriques, M. Hill, H. Hohnhold, M. Hopkins, J. Lurie, M. Mahowald, C. Mautner, H. Miller, and C. Redden) *Mathematical Surveys and Monographs*, 201. AMS, 2015. xxxi+318 pp.



<sup>†</sup>I wrote four chapters out of sixteen; one of them contains original research.

### Articles

- [2] Henriques, A. *An analogue of convexity for complements of amoebas of varieties of higher codimension, an answer to a question asked by B. Sturmfels*, *Advances in Geometry* 4 (2004), 61–73.
- [3] Henriques, A.; Metzler, D. *Presentations of noneffective orbifolds*, *Transactions of the A.M.S.* vol 356, number 6 (2004), 2481–2499.
- [4] Harada, M.; Henriques, A.; Holm, T. *Computation of generalized equivariant cohomologies of Kac-Moody flag varieties*, *Advances in Math.* 197 (2005), no. 1, 198–221.
- [5] Henriques, A.; Kamnitzer, J. *Crystals and coboundary categories*, *Duke Mathematical Journal* 132 (2006), no. 2, 191–216.
- [6] Henriques, A.; Kamnitzer, J. *The octahedron recurrence and  $\mathfrak{gl}_n$ -crystals*, *Advances in Mathematics* 206 (2006), no. 1, 211–249.
- [7] Bartholdi, L.; Henriques, A.; Nekrashevych, V. *Automata, groups, limit spaces, and tilings*, *Journal of Algebra* 305 (2006), no. 2, 629–663.
- [8] Henriques, A. *A periodicity theorem for the octahedron recurrence*, *J. Algebraic Combin.* 26 (2007), no. 1, 1–26.
- [9] Ando, M.; Hellerman S.; Henriques, A.; Pantev, T.; Sharpe, E. *Cluster decomposition, T-duality, and gerby CFT's*, *Adv. in Theor. and Math. Phys.* 11 (2007), no. 5, 751–818.
- [10] Felder, G.; Henriques, A.; Rossi, C.; Zhu, C. *A gerbe for the elliptic gamma function*, *Duke Mathematical Journal* 141 (2008), no. 1, 1–74.
- [11] Henriques, A. *Integrating  $L_\infty$ -algebras*, *Compositio Mathematica*, 144 (2008), no. 4, 1017–1045.
- [12] Etingof, P.; Henriques, A.; Kamnitzer, J.; Rains, E. *The cohomology ring of the real locus of the moduli space of stable curves of genus 0 with marked points*, *Annals of Mathematics* 171 (2010), no. 2, 731–777.
- [13] Henriques, A.; Speyer, D. *The multidimensional cube recurrence*, *Advances in Mathematics* 223 (2010), no. 3, 1107–1136.
- [14] Douglas, C.; Hill, M.; Henriques, A. *Homological obstructions to string orientations*, *International Mathematics Research Notices* (2011), no. 18, 4074–4088.
- [15] Douglas, C.; Henriques, A. *Topological modular forms and conformal nets*, in *Mathematical Foundations of Quantum Field and Perturbative String Theory Proceedings of Symposia in Pure Mathematics*, 83. AMS (2011), 341–354.

- [16] Bartholdi, L.; Henriques, A. *Orange peels and Fresnel integrals*, The Mathematical Intelligencer, 34 (2012), no. 3, 1–3.
- [17] Henriques, A. *Three-tier CFTs from Frobenius algebras*, Topology and field theories, 1–40, Contemporary Mathematics, 613, (2014).
- [18] Bartels, A.; Douglas C.; Henriques, A. *Dualizability and index of subfactors*, Quantum Topology 5 (2014), no. 3, 289–345.
- [19] Bartels, A.; Douglas C.; Henriques, A. *Conformal nets I: Coordinate free nets*, International Mathematics Research Notices (2015), no. 13, 4975–5052.
- [20] Henriques, A.; Penneys, D.; Tener, J. *Categorified trace for module tensor categories over braided tensor categories*, Documenta Mathematica 21 (2016), 1089–1149.
- [21] Bartels, A.; Douglas C.; Henriques, A. *Conformal nets II: Conformal blocks*, Communications in Mathematical Physics. 354 (2017), no. 1, 393–458.
- [22] Henriques, A.; Penneys, D. *Bicommutant categories from fusion categories*, Selecta Mathematica, 23, (2017), no. 3, 1669–1708.
- [23] Henriques, A. *The classification of chiral WZW models by  $H_+^4(BG, \mathbb{Z})$* , Lie algebras, vertex operator algebras, and related topics, 99–121, Contemp. Math., 695, (2017).
- [24] Bartels, A.; Douglas C.; Henriques, A. *Fusion of defects* (formerly *Conformal nets III: Fusion of defects*), accepted in Memoirs of the AMS, ( $\geq 2017$ ).
- [25] Bartels, A.; Douglas C.; Henriques, A. *Conformal nets IV: The 3-category*, accepted in Algebraic & Geometric Topology, ( $\geq 2017$ ).
- [26] Henriques, A. *Conformal nets are factorization algebras*, accepted in the Proceedings of the String-Math 2016 conference, ( $\geq 2017$ ).
- [27] Henriques, A. *What Chern-Simons theory assigns to a point*, accepted in PNAS, ( $\geq 2017$ ).

## Preprints

- [28] Bartels, A.; Douglas C.; Henriques, A. *Conformal nets and local field theory*, arXiv:0912.5307 (2010).
- [29] Douglas C.; Henriques, A. *Internal bicategories*, arXiv:1206.4284 (2012).
- [30] Henriques, A.; Penneys, D.; Tener, J. *Planar algebras in braided tensor categories*, arXiv:1607.06041 (2016).
- [31] Henriques, A. *Bicommutant categories from conformal nets*, arXiv:1701.02052 (2017).
- [32] Henriques, A. *Loop groups and diffeomorphism groups of the circle as colimits*, arXiv:1706.08471 (2017).