

# Henry Tucker

University of California, Riverside  
Department of Mathematics  
900 University Ave.  
Riverside, Calif. 92521

Office: 262B Skye Hall  
Phone: (864) 905-1285  
Email: htucker@ucr.edu  
Homepage: [www.math.ucsd.edu/~hjtucker](http://www.math.ucsd.edu/~hjtucker)

## Education

- 2010 - 2016 Ph.D. Mathematics, University of Southern California  
*Advisor:* M. Susan Montgomery  
*Dissertation:* "Frobenius-Schur indicators for near-group and Haagerup-Izumi fusion categories"
- 2006 - 2010 B.A. Mathematics, University of California, Berkeley  
*Advisor:* Robert F. Coleman  
*Thesis:* "The classification of exceptional polynomials over finite fields"
- 2007 National Outdoor Leadership School, Alaska  
*Certifications:* Outdoor Educator and Leave No Trace Trainer
- 2004 - 2006 South Carolina Governor's School for Science and Mathematics  
*Advisor:* Phelesia Jones-Cooper  
*Thesis:* "Developing a fullerene single-molecule transistor via a regioselective synthetic strategy"

## Employment

- 2019 - 2022 University of California, Riverside  
*Position:* Visiting Assistant Professor
- 2016 - 2019 University of California, San Diego  
*Position:* NSF Research Training Group Postdoctoral Fellow  
*Supervisor:* Daniel Rogalski
- Summer 2016 Kyoto University  
*Position:* Japan Society for the Promotion of Science (JSPS) Fellow  
*Host Researcher:* Masaki Izumi
- 2010 - 2016 University of Southern California  
*Positions:* Teaching Assistant; Research Assistant; Departmental Fellow  
*Research Sponsors:* Susan Montgomery; Robert Guralnick

## Publications

### *In print/to appear:*

Integral modular categories of Frobenius-Perron dimension  $pq^n$  (with Jingcheng Dong), *Algebr. Rep. Theory* 19 (2016) no. 33 (arXiv:1408.3053)

Eigenvalues of rotations and braids in spherical fusion categories (with Daniel Barter & Corey Jones), *J. Algebra* 515 (2018), pages 52–76 (arXiv:1611.00071)

Frobenius-Schur indicators for near group fusion categories, *to appear*, Pacific J. Math. (arXiv:1510.05696)

### Preprints:

Algebraic realization of noncommutative near-group fusion categories (with Masaki Izumi), *submitted*

Modular data for near-group fusion categories (with Marcel Bischoff), *in progress*

Extra-special fusion categories, *in progress*

Pseudo-unitary self-dual fusion categories of rank 4 (with Ryan Johnson, Siu-Hung Ng, David Penneys, Jolie Roat, Scott Morrison, & Matthew Titsworth), *to appear as an appendix*

### Lectures

- August 2019 “Algebraic realization of noncommutative near-group fusion categories”  
Seminario de Grupo de Teoría de Lie  
Facultad de Matemática, Astronomía, Física y Computación (FaMAF)  
Universidad Nacional de Córdoba, Argentina
- May 2019 “Frobenius-Schur Indicators and the Classification of Fusion Categories via Categorification”  
MathConnections 2019  
University of California, Riverside
- Mar. 2019 “Hopf-Galois objects as module categories over equivariantization tensor categories”  
Special Session on Hopf Algebras and Their Applications  
AMS Spring Southeastern Sectional Meeting  
Auburn University, Alabama
- Jan. 2019 “Modular data for centers of near-group fusion categories via modular graft”  
AMS Special Session on Quantum Symmetries: Subfactors and Fusion Categories  
2018 Mathematics Research Communities Session  
2019 Joint Mathematics Meetings, Baltimore, Maryland
- Sept. 2018 “Extra special 2-groups in the classification of quadratic fusion categories”  
Algebra Seminar  
University of Southern California
- June 2018 “Frobenius-Schur indicators for fusion categories arising from subfactors”  
Operator Algebra Seminar  
University of California, Riverside
- Apr. 2018 “Kac quasi-Hopf algebras for group-theoretical fusion categories”  
Special Session on Hopf algebras, Tensor categories, and homological algebra  
AMS Spring Eastern Sectional Meeting  
Northeastern University, Boston, Massachusetts
- Mar. 2018 “Classification and invariants for fusion categories”  
Rocky Mountain Algebraic Combinatorics Seminar  
Colorado State University, Fort Collins
- Mar. 2018 “Classification and invariants for fusion categories (a survey)”  
Workshop: Recent developments in noncommutative algebra and related areas  
University of Washington, Seattle

- Jan. 2018 “Classifying fusion categories by categorification of rings”  
Workshop on Tensor categories, Hopf algebras and quantum groups  
Philipps-Universität Marburg, Marburg, Germany
- Jan. 2018 “Extra-special fusion categories”  
AMS Special Session on Noncommutative algebras and invariant theory  
2018 Joint Mathematics Meetings, San Diego, California
- Nov. 2017 “Near group fusion categories: classification and realizations”  
Algebra & Combinatorics Seminar  
Texas A&M University
- Oct. 2017 “Fusion categories and their invariants”  
Algebra Seminar  
State University of New York at Buffalo
- Aug. 2017 “Classification of fusion categories via invariants”  
Sesión temática sobre Álgebras de Hopf y Categorías Tensoriales  
XXII Coloquio Latinoamericano de Álgebra  
Pontificia Universidad Católica del Ecuador, Quito, Ecuador
- July 2017 “Modular data and Drinfel’d centers for near-group fusion categories”  
Summer School on Fusion Categories  
Nanjing University, China
- Apr. 2017 “Drinfel’d centers of quadratic categories and their associated modular data”  
Special Session on Noncommutative Algebraic Geometry and Related Topics  
AMS Spring Western Sectional Meeting  
Washington State University, Pullman
- Apr. 2017 “Rotations and braids in spherical fusion categories”  
USC Hopf Algebras Workshop  
University of Southern California, Los Angeles
- Apr. 2017 “Invariant rigidity from eigenvalues of rotations and braids in spherical fusion categories”  
Special Session on Fusion Categories and Applications  
AMS Spring Central Sectional Meeting  
Indiana University, Bloomington
- Jan. 2017 “Eigenvalues for rotations and braids in spherical fusion categories”  
Workshop on structure of operator algebras: subfactors & fusion categories  
Programme on Operator Algebras: Subfactors & their Applications  
Isaac Newton Institute for Mathematical Sciences, Cambridge, U.K.
- Jan. 2017 “Eigenvalues for rotations and braids in spherical fusion categories”  
AMS Special Session on New Developments in Noncommutative Algebra and Rep’n Theory  
2017 Joint Mathematics Meetings, Atlanta, Georgia
- Oct. 2016 “Fusion categories and their invariants”  
Algebra Seminar  
University of California, San Diego
- Oct. 2016 “Non-commutative near group fusion categories”  
Special Session on Quantum Algebra  
AMS Fall Western Sectional Meeting  
University of Denver
- Sept. 2016 “Frobenius-Schur indicators and modular data”

- Conference on Hopf Algebras and Tensor Categories  
Chern Institute of Mathematics  
Nankai University, Tianjin, China
- August 2016 “Frobenius-Schur indicators and modular data for singly-generated fusion categories”  
Special seminar  
University of Tsukuba, Japan
- August 2016 “Frobenius-Schur indicators and modular data”  
BIRS-CMO Workshop on Modular Categories  
Casa Matemática Oaxaca, Mexico
- July 2016 “Frobenius-Schur indicators and modular data for singly-generated fusion categories”  
Kyoto Operator Algebra Seminar  
Research Institute for Mathematical Sciences  
Kyoto University, Japan
- July 2016 “Frobenius-Schur indicators and modular data for singly-generated fusion categories”  
Seminars on Tensor Categories and Related Topics  
Nagoya University, Japan
- May 2016 “Frobenius-Schur indicators and modular data for singly-generated fusion categories”  
14th Annual Spring Institute on Noncommutative Geometry and Operator Algebras (NCGOA)  
Hausdorff Research Institute for Mathematics  
Universität Bonn, Germany
- April 2016 “Fusion categories: their invariants and classification”  
Mathematics Colloquium  
California State University, Dominguez Hills
- April 2016 “Operator algebra methods for classification of fusion categories”  
Hopf Algebras and Actions Seattle Workshop, Part II (Lie Theory NSF Workshop series)  
University of Washington, Seattle
- April 2016 “Non-degenerate quotients of pivotal tensor categories”  
Special Session on Fusion Categories and Topological Phases of Matter  
AMS Spring Western Sectional Meeting  
University of Utah, Salt Lake City
- Jan. 2016 “Categories of Cuntz algebra endomorphisms and their Frobenius-Schur indicators”  
Functional Analysis Seminar  
University of California, Los Angeles
- Jan 2016. “Frobenius-Schur indicators for near group and Haagerup-Izumi fusion categories”  
AMS Session on Associative and Nonassociative Algebras and Rings, I  
2016 Joint Mathematics Meetings, Seattle, Washington
- Fall 2015 “Fusion categories and their invariants”  
USC Student Algebra Seminar
- July 2015 “Frobenius-Schur indicators for near group fusion categories and Gauss sums”  
Seattle Non-commutative Algebra Day  
University of Washington, Seattle
- May 2015 “Frobenius-Schur indicators for near group fusion categories and affine general linear groups”  
Hopf Algebras and Tensor Categories Mini-Meeting  
University of Southern California
- Apr. 2015 “Integral modular categories of Frobenius-Perron dimension  $pq^n$ ”

- Special Session on New Developments in Noncommutative Algebra  
AMS Spring Western Sectional Meeting  
University of Nevada, Las Vegas
- Feb. 2015 "Frobenius-Schur indicators for near group fusion categories"  
Algebra and Number Theory Seminar  
Louisiana State University
- Spring 2015 "Frobenius-Schur indicators for compact groups," in two parts  
USC Hopf Working Seminar
- Spring 2015 "Representation theory of compact groups"  
USC Student Algebra Seminar
- Nov. 2014 "Frobenius-Schur indicators for near group fusion categories"  
Hopf Algebras and Actions Seattle Workshop (Lie Theory NSF Workshop series)  
University of Washington, Seattle
- Fall 2014 2-week Mini-course on Hopf Algebras and Tensor Categories  
USC Student Algebra Seminar
- Spring 2014 "Subfactors and fusion categories," in two parts  
USC Hopf Working Seminar
- Spring 2014 "Introduction to subfactors"  
USC Student Algebra Seminar
- Fall 2013 "Frobenius-Schur indicators for pivotal categories," in two parts  
USC Hopf Working Seminar
- Fall 2013 "Fusion categories"  
USC Student Algebra Seminar
- Spring 2013 "Frobenius-Schur indicators for Hopf algebras"  
USC Student Algebra Seminar

## Invited Workshops, etc.

- June-July 2019 Teaching Assistant, Mini-course on finite-dimensional Hopf algebras & their rep'ns  
CIMPA Research School on Quantum Symmetries  
Universidad de los Andes, Bogotá D.C., Colombia
- June 2018 Participant, GeoffFest 2018: Vertex operator algebras, number theory, and related topics  
A conference in honor of Geoffrey Mason  
California State University, Sacramento
- Jan. 2017 Participant, Programme on Operator Algebras: Subfactors & their Applications  
Isaac Newton Institute for Mathematical Sciences, Cambridge, UK
- August 2016 Participant, BIRS-CMO Workshop on Modular Categories (16w5049)  
Casa Matemática Oaxaca, Mexico  
(jt. pres. w/ Banff Int'l Research Station for Mathematical Innovation and Discovery)
- August 2016 Participant, Mathematical Society of Japan Seasonal Institute  
Operator Algebras & Mathematical Physics Summer School and Conference  
Tohoku University, Sendai, Japan
- May-Jun 2016 Visitor, Von Neumann Algebras Trimester Program  
Hausdorff Research Institute for Mathematics  
Universität Bonn, Germany
- June 2014 Member, 2014 AMS Mathematics Research Community, Snowbird, Utah  
*Topic: Mathematics of Quantum Phases of Matter and Quantum Information*
- April 2014 Participant, Subfactors and Fusion Categories Workshop (14w5083)  
Banff International Research Station, Banff, Alberta
- May 2013 Participant, Workshop on Fusion Categories  
Institut de Mathématiques de Bourgogne  
Université de Bourgogne, Dijon, France
- Oct 2012 Fall 2012 AMS Travel Grant Recipient  
Special Session on Quantum Groups and Noncommutative Algebraic Geometry  
AMS Fall Southeastern Sectional Meeting  
Tulane University, New Orleans, Louisiana

## Professional Service

### *Memberships:*

American Mathematical Society  
 Association for Women in Mathematics  
 National Association of Mathematicians

### *Referee work:*

Acta Mathematica Sinica  
 Contemporary Mathematics  
 Journal of Pure & Applied Algebra  
 Communications in Algebra  
 Algebras & Representation Theory

### *Organizational activities:*

- Jan. 2019 Co-organizer, AMS Special Session on Hopf Algebras and Tensor Categories  
 (with Siu-Hung Ng & Julia Plavnik)  
 2019 Joint Mathematics Meetings, Baltimore, Maryland
- Apr. 2018 Co-organizer, Special Session on Tensor Categories and Diagrammatic Methods  
 (with Marcel Bischoff)  
 Spring 2018 AMS Southeastern Sectional Meeting  
 Vanderbilt University, Nashville, Tennessee
- Jan. 2018 Co-organizer, AMS Spec. Sess. on Hopf algebras in honor of Susan Montgomery  
 (with Siu-Hung Ng & Lance Small)  
 2018 Joint Mathematics Meetings, San Diego, California
- Nov. 2017 Co-organizer, Spec. Sess. on Tensor Categories: Bridging Algebra, Topology, & Physics  
 (with Paul Bruillard & Julia Plavnik)  
 Fall 2017 AMS Western Sectional Meeting  
 University of California, Riverside
- June 2017 Co-organizer, Hopf Algebras & Tensor Categories in San Diego  
 (with Susan Montgomery & Dan Rogalski)  
 Summer 2017 NSF West Coast Lie Theory Workshop  
 UC San Diego, La Jolla, California
- Jan. 2017 Co-organizer, AMS Special Session on Hopf algebras and their actions  
 (with Susan Montgomery & Siu-Hung Ng)  
 2017 Joint Mathematics Meetings, Atlanta, Georgia
- May 2015 Co-organizer, Hopf Algebras and Tensor Categories Mini-Meeting  
 (with Susan Montgomery and Guangbin Zhuang)  
 University of Southern California, Los Angeles, Calif.
- Spring 2015 Organizer, Student Algebra Seminar

- University of Southern California, Los Angeles, Calif.
- Jan 2015 Co-organizer, AMS Special Session on Quantum Info. and Fusion Categories (SS 58A)  
2014 Mathematics Research Communities Session  
(with Paul Bruillard and Amanda Young)  
2015 Joint Mathematics Meetings, San Antonio, Texas
- Spring 2012 Organizer, Student Algebra Seminar  
University of Southern California, Los Angeles, Calif.

## Teaching Experience

### *As instructor of record at UC San Diego:*

- Calculus I and II (Math 10A and 10B)
- Multivariable Calculus (Math 10C)
- Calculus I and II for engineering & physical science (Math 20A and 20B)
- Multivariable Calculus for engineering & physical science (Math 20C and 20E)

### *As teaching assistant at USC:*

- Calculus I and II (Math 125 and 126)
- Multivariable Calculus (Math 226)
- Linear Algebra and Differential Equations (Math 225)
- Pre-calculus (Math 117)
- Abstract Algebra (Math 410)
- Number Theory (Math 430)
- Graduate Abstract Algebra (Math 510A-B)

## Grants, Fellowships, Awards

- 2019 UC San Diego Non-Senate Faculty Professional Development Funding recipient
- 2018 AMS Travel Grant for 2018 International Congress of Mathematicians
- 2016-2018 AMS-Simons Travel Grant
- 2016 Harris Research Prize, USC Dept. of Mathematics
- Summer 2016 NSF East Asia and Pacific Summer Institute Fellow
- Summer 2014 AMS Mathematics Research Community
- Oct 2012 AMS Travel Grant
- Fall 2012 USC Departmental Merit Fellowship
- Spring 2012 USC Departmental Merit Fellowship
- Summer 2011 USC Summer Fellowship

## Technical Skills

### *Programming languages:*

Python, Java, C++, HTML/CSS, JavaScript, L<sup>A</sup>T<sub>E</sub>X, Applesoft BASIC, Apple Logo.

### *Software:*

Sage, Mathematica, Octave/MATLAB, Magma, GNU Emacs, GIMP/Adobe Photoshop, Pro Tools

## References

1. Susan Montgomery, University of Southern California – [smontgom@usc.edu](mailto:smontgom@usc.edu)
2. Siu-Hung (Richard) Ng, Louisiana State University – [rng@math.lsu.edu](mailto:rng@math.lsu.edu)
3. Peter Schauenburg, Université de Bourgogne – [peter.schauenburg@u-bourgogne.fr](mailto:peter.schauenburg@u-bourgogne.fr)
4. Hans Wenzl, University of California, San Diego – [hwenzl@ucsd.edu](mailto:hwenzl@ucsd.edu)
5. Daniel Rogalski, University of California, San Diego (for teaching) – [drogalski@ucsd.edu](mailto:drogalski@ucsd.edu)
6. Julia Plavnik, Indiana University, Bloomington – [jplavnik@indiana.edu](mailto:jplavnik@indiana.edu)
7. James Zhang, University of Washington, Seattle – [zhang@math.washington.edu](mailto:zhang@math.washington.edu)
8. Aaron Lauda, University of Southern California – [lauda@usc.edu](mailto:lauda@usc.edu)