

IMRE TUBA

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Curriculum Vitae

514 Sandalwood Dr.
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RESEARCH INTERESTS

Braid groups, tensor categories, bioinformatics.

EDUCATION

Sep 2000. **Ph.D. in Mathematics**

University of California, San Diego. Thesis: *Braid Representations and Tensor Categories*.
Advisor: Hans Wenzl.

Jun 1995. **A.B. in Mathematics and Chemistry**

Harvard University, Cambridge, Massachusetts

ACADEMIC APPOINTMENTS

May 2006–present. **Assistant Professor**. Department of Mathematics and Statistics and
Imperial Valley Campus, San Diego State University.

Aug 2005–May 2006. **Visiting Assistant Professor**. Division of Science and Mathematics,
University of Minnesota, Morris.

Aug 2003–Aug 2005. **Postdoctoral Fellow**. Department of Mathematics, Virginia Polytechnic
Institute and State University, Blacksburg, VA.

Jul 2002–Jun 2003. **Visiting Assistant Professor**. Department of Mathematics, University
of California, Santa Barbara.

Jul 2000–Jun 2002. **Regents' Faculty Fellow**. Department of Mathematics, University of
California, Santa Barbara.

PUBLICATIONS

Braid Representations and Tensor Categories. PhD Thesis, University of California, San Diego,
2000. Also posted at www-rohan.sdsu.edu/~ituba.

(with Hans Wenzl) Representations of the braid group B_3 and of $SL(2, \mathbb{Z})$. *Pacific J. Math.*,
197, 2001, 491–510.

Low-dimensional unitary representations of B_3 . *Proc. Amer. Math. Soc.*, **129**, 2001, 2597–2606.
(with Hans Wenzl) On braided tensor categories of type BCD . *J. Reine. Angew. Math.*, **581**,
2005, 31–69.

(with Eric Rowell) Finite linear quotients of B_3 of low dimension. To appear *J. Knot Theory
Ramifications*. Preprint posted at [arXiv:0806.0168v1](https://arxiv.org/abs/0806.0168v1).

(with N. Apkarian, B. Bailey, M. Creek, E.A. Dinsdale, R.A. Edwards, E. Guan, M. Her-
nandez, K. Isaacs, C. Peterson, T. Regh) A large-scale statistical survey of environmental
metagenomes. In preparation.

GRADUATE STUDENTS SUPERVISED

Jonathan Boiser. Computational Problems in the Braid Group. M.S. in Applied Mathematics,
2009.

TALKS

Conference talks

- May 2008. Special Session on Hopf Algebras and Quantum Groups. AMS Western Section Meeting, Claremont, CA. “On finite braid representations.”
- Jul 2007. XVII Coloquio Latinoamericano de Álgebra, Medellín, Colombia. “Finite linear quotients of the braid group B_3 .”
- Aug 2005. XVI Coloquio Latinoamericano de Álgebra, Colonia del Sacramento, Uruguay. “Toward a classification of semisimple braided tensor and ribbon categories.”
- May 2005. Lie Algebras, Vertex Operator Algebras, and Their Applications, Raleigh, NC. “Reconstructing braided semisimple tensor categories.”
- Nov 2004. Mid-Atlantic Algebra Conference, Fairfax, VA. “Braid group actions on semisimple tensor categories.”
- Oct 2004. Special Session on Braids and Knots. AMS Western Section Meeting, Albuquerque, NM. “Braid representations and braided tensor categories.”
- Jun 2004. Tensor Categories in Mathematics and Physics. Ervin Schrödinger International Institute for Mathematical Physics, Vienna, Austria. “Classifying braided semisimple tensor categories.”
- Jul 2002. Interactions between Representation Theories, Knot Theory, Topology, and Mathematical Physics. SUNY Potsdam, NY. “Characterization of tensor categories of classical Lie types.”
- Jun 2002. UC Berkeley/UC Santa Barbara Algebra Day, Berkeley, CA. “Classification of tensor categories of classical Lie types.”
- Jan 2001. Special Session on Braid Groups, AMS National Meeting, New Orleans, LA. “Low-dimensional braid representations.”

Invited talks

- Mar 2009. Algebra Seminar, St. Louis University. “Braid groups, braided tensor categories, and an approach to quantum computation.”
- Feb 2009. Mathematics Colloquium, California Lutheran University, Thousand Oaks, CA. “How can you tell two knots apart and why would you want to?”
- Mar 2006. Invited talk, San Diego State University, Imperial Valley, Calexico, CA. “Braids, knots, and representations.”
- Mar 2006. Mathematics Colloquium, Hobart and William Smith Colleges, Geneva, NY. “Braids, Knots, and Windows.”
- May 2005. Invited talk, University of Minnesota, Morris, MN. “Knots, links, braids, and algebra.”
- Apr 2005. Algebra Seminar, Dept of Math, North Carolina State University, Raleigh, NC. “On the structure of braided, semisimple tensor categories of type BCD.”
- Jul 2004. Operator Algebra Seminar. Università degli Studi di Roma Tor Vergata, Rome, Italy. “Classifying braided semisimple tensor categories.”
- Mar 2004. Topological Quantum Computing Seminar, Dept of Math, Indiana University, Bloomington, IN. “On classifying braided tensor categories of classical Lie type.”
- Mar 2004. Algebra Seminar, Dept of Math, Indiana University, Bloomington, IN. “Braid representations and how the right choice of basis can make your day.”

FUNDING HISTORY

Funded research grants

2008. University Grants Program, SDSU. “Density of images of braid representations and classifying ribbon categories of type ABCD.” Amount: \$5609.

Funded teaching and training grants

- 2006-2008. SDSU Instructionally Related Activity grant to take students to the fall conference of the California Mathematics Council in Palm Springs, CA. Source: SDSU. Amount: \$5172.
- 2007-2011. STRIVE (Supporting Teacher Retention for Imperial Valley Educators) grant to provide professional development of Imperial Valley pre-service and in-service high school teachers. PI. Source: California Mathematics Project. Amount: \$406,820.
- 2007-2008. MELD (Mathematics and English Language Development) grant to provide professional development for Imperial Valley K-2 teachers. Co-PI responsible for content development and evaluation. Source: California Postsecondary Education Commission. Amount: \$971,371.

Funded travel grants

- Mar 2009. Fully funded to attend the conference Modular Categories and Applications in Bloomington, IN. Source: conference funds.
- Sep 2008. Partially funded to attend Braids in Paris conference, Paris, France. Source: conference funds.
- Jul 2007. Partially funded to talk at XVII Coloquio Latinoamericano de Álgebra, Medellín, Colombia. Source: conference funds.
- Feb 2007. Partially funded to attend program on Topological Quantum Computing at Institute for Pure and Applied Mathematics, UCLA. Source: IPAM.
- Sep 2006. Partially funded to attend workshop on Topics on von Neumann Algebras at Banff International Research Station. Source: BIRS.
- Aug 2005. Fully funded to attend short course on Quantum Computation at the Institute for Mathematics and its Applications, Minneapolis, MN. Source: short course funds.
- Aug 2005. Partially funded to talk at XVI Coloquio Latinoamericano de Álgebra, Colonia, Uruguay. Source: conference funds.
- May 2005. Fully funded to attend Third Annual Spring Institute on Noncommutative Geometry and Operator Algebras, Nashville, TN. Source: conference funds.
- Oct 2004. Fully funded to talk at Special Session on Braids and Knots, AMS Western Section Meeting, Albuquerque, NM. Source: Postdoctoral Travel Fund, Virginia Tech.
- Oct 2004. Fully funded to attend Second East Coast Operator Algebra Symposium, Anapolis, MD. Source: conference funds.
- Jun 2004. Fully funded to talk at Tensor Categories in Mathematics and Physics. Ervin Schrödinger International Institute for Mathematical Physics, Vienna, Austria. Source: NSF conference funds and Virginia Tech.
- May 2004. Fully funded to attend Second Annual Spring Institute on Noncommutative Geometry and Operator Algebras, Nashville, TN. Source: conference funds.
- Sep 2003. Fully funded to attend First East Coast Operator Algebra Symposium, Nashville, TN. Source: conference funds.
- Jul 2002. Partially funded to attend Instructional Workshop on Representation Theory at the 10th International Conference on Representations of Algebras and Related Topics, Fields Institute, Toronto. Source: NSF workshop funds.
- Jul 2002. Fully funded to talk at Interactions between Representation Theories, Knot Theory, Topology, and Mathematical Physics, SUNY Potsdam, NY. Source: conference funds.

Other funded grants

- Jul 2000–Jun 2002. Regents' Faculty Fellowship. This is a teaching/research fellowship that provides full academic salary. I was awarded the fellowship for the 2000/2001 academic year, then again for 2001/2002. Source: Regents of the University of California.

Other grant applications

2000. NSF 0309930, "Tensor Categories and Braid Representations." Amount: \$33,193. Rejected.
2002. NSF 0111942, "Tensor Categories and Braid Representations." Amount: \$71,008. Rejected.
2006. University Grants Program application for travel funds to support research activity in 2007. Source: SDSU. Amount: \$3659. Rejected.
2007. NSF 06-591, "Mentoring Biology in the Imperial Valley." Co-mentor. Amount: \$795,906. Rejected.

AWARDS, PRIZES, MEMBERSHIPS

- Sep 1992–Jun 1995. Harvard College Scholar. This is an honorary scholarship Harvard College awards for academic achievement.
- Jul 1989. Bronze medal at the XXI. International Chemistry Olympics in Halle, East-Germany.

REFEREE EXPERIENCE

- Spring, 2001. Reviewer for NSF grant in the topology program.

TEACHING EXPERIENCE

- 2006–present. Assistant Professor. San Diego State University.
- Fall semester 2009. GMS 91, Intermediate Algebra. 8 students.
- Fall semester 2009. Math 303, History of Mathematics. 19 students.
- Fall semester 2009. Math 521A, Abstract Algebra. 9 students.
- Spring semester 2009. Math 302, Transition to Higher Mathematics. 12 students.
- Spring semester 2009. Math 510, Introduction to the Foundations of Geometry. 8 students.
- Fall semester 2008. General Math Studies 91, Intermediate Algebra. 11 students.
- Fall semester 2008. Math 414, Mathematics Curriculum and Instruction. 10 students.
- Fall semester 2008. Math 524, Linear Algebra. 3 students.
- Spring semester 2008. Math 303, History of Mathematics. 11 students.
- Spring semester 2008. Math 521B, Abstract Algebra. 6 students.
- Fall semester 2007. Math 413, Mathematics for the Middle Grades. 10 students.
- Fall semester 2007. Math 521A, Abstract Algebra. 7 students.
- Fall semester 2007. Math 579, Combinatorics. 5 students.
- Spring semester 2007. Math 302, Transition to Higher Mathematics. 18 students.
- Spring semester 2007. Math 510, Introduction to the Foundations of Geometry. 12 students.
- Fall semester 2006. Math 313, Topics in Elementary Mathematics. 25 students.
- Fall semester 2006. Math 524, Linear Algebra. 6 students.
- 2005–2006. Visiting Assistant Professor. University of Minnesota, Morris.
- Spring semester 2005. Math 1101, Calculus I. 16 students.
- Spring semester 2005. Math 1102, Calculus II. 12 students.
- Fall semester 2005. Math 1101, Calculus I. 12 students.
- Fall semester 2005. Math 2111, Linear Algebra. 17 students.
- 2003–2005. Postdoctoral Fellow. Virginia Tech.
- Spring semester 2005. Math 3134, Applied Combinatorics and Graph Theory. 37 students.
- Spring semester 2004. Math 3124, Modern Algebra. 14 students.
- 2002–2003. Visiting Assistant Professor. UCSB.
- Spring quarter 2003. Math 5C, Differential Equations and Fourier Series. 78 students.
- Winter quarter 2003. Math 3C, Calculus with Applications, Third Course. 103 students.
- Winter quarter 2003. Math 34A, Calculus for Social and Life Sciences. 272 students.
- Fall quarter 2002. Math 34A, Calculus for Social and Life Sciences. 188 students.

2000–2002. Regents' Faculty Fellow. UCSB.

Spring quarter 2002. Math 34A, Calculus for Social and Life Sciences. 70 students.

Winter quarter 2002. Math 34B, Calculus for Social and Life Sciences. 93 students.

Fall quarter 2001. Math 3A, Calculus with Applications. 122 students.

Spring quarter 2001. Math 34B, Calculus for Social and Life Sciences. 86 students.

Spring quarter 2001. Math 15, Precalculus. 16 students.

Winter quarter 2001. Math 34A, Calculus for Social and Life Sciences. 110 students.

1995–2000. Teaching Assistant. UCSD.

Assisted a variety of courses from Calculus to graduate Algebra.

1993–1995. Course Assistant (undergraduate TA). Harvard University.

Assisted Multivariable Calculus and Linear Algebra.

LANGUAGES

Hungarian (native), Italian (fluent), German (almost fluent), French (reading).