# Curriculum Vitae
## Ben Webster


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| Office Address: | Department of Mathematics<br>Massachusetts Institute of Technology<br>Cambridge, MA 02139 | Email:<br>Website:<br>Phone: | bwebster@math.mit.edu<br>http://math.mit.edu/~bwebster<br>617-852-1387 |
| Date of Birth: | December 6, 1981 | Citizenship: | USA |


### Employment/Education:

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| 2008 – | **C.L.E. Moore Instructor** and **NSF Postdoctoral Fellow**, M.I.T.<br>Sponsoring Scientist: R. Bezrukavnikov. |
| 2007 – 2008 | **Member** and **NSF Postdoctoral Fellow**, Institute for Advanced Study. |
| 2002 – 2007 | **Ph.D. in Mathematics**, University of California, Berkeley.<br>Supervisor: N. Reshetikhin.<br>Thesis: "Algebraic Poisson Geometry in Representation Theory and Combinatorics." |
| 1998 – 2002 | **B.A. in Mathematics**, Simon's Rock College, *summa cum laude*.<br>Supervisor: W. Dunbar |

*As visitor*

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| 2006 Fall | Center for the Topology and Quantization of Moduli Spaces, (Århus, Denmark). |
| 2001 Spring | Budapest Semesters in Mathematics, (Budapest, Hungary). |

### Current Responsibilities:

In my current position as a Moore Instructor, my professional energies are primarily focused on my research, as proposed herein. The research described in my proposal will be my main research focus for the forseeable future.

I do have teaching duties, but these occupy less than 10 hours a week of my time, and have no service commitments. During the next two years, I will likely also spend an academic year on tenure with an NSF postdoctoral fellowship, which would free me entirely from teaching duties, and allow me to focus solely on research. The NSF fellowship is the only outside support I have at the moment, and will only cover 11 months of the next two years.

### Scientific/Academic Honors and Grants:

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| 2007 – | NSF Postdoctoral Research Fellowship |
| 2007 June | Clay Liftoff Fellowship |
| 2003 – 2007 | NSF Graduate Research Fellowship |

### Research Interests:

Knot theory and representation theory via algebraic geometry.

### Publications and Preprints:

available at http://math.mit.edu/~bwebster/publications.html

1. *Categorifications of quantum tangle invariants via quiver varieties.* in preparation.
2. *A geometric construction of colored HOMFLYPT homology* (with G. Williamson). in preparation.
3. *Goresky-MacPherson duality and Koszul duality* (with T. Braden, A. Licata, C. Phan and N. Proudfoot). in preparation.
4. *Gale duality and Koszul duality* (with T. Braden, A. Licata, and N. Proudfoot). arXiv:0806.3256
5. *2-block Springer fibers: convolution algebras, coherent sheaves, and disoriented TQFT* (with C. Stroppel). arXiv:0802.1943

2008 6. *A geometric model for the Hochschild homology of Soergel bimodules* (with G. Williamson). Geometry and Topology, **12** (2008) 1243–1263. arXiv:0707.2003.

7. *Cramped subgroups and generalized Harish-Chandra modules.* Procedings of the AMS, **136** (2008), 3809–3814 arXiv:math.RT/0609846.

2007 8. *Small linearly equivalent G-sets and a construction of Beaulieu.* Journal of Algebra, **317** (2007), no. 1, 306–323. arXiv:math.GR/0610205.

9. *Khovanov-Rozansky homology via a canopolis formalism.* Algebraic and Geometric Topology, **7** (2007), 673-699. arXiv:math.GT/0610650.

10. *A Deodhar type stratification of the double flag variety* (with M. Yakimov). Transformation Groups, **12** (2007), no. 4, 769–785. arXiv:math.SG/0607374.

11. *Intersection cohomolgy of hypertoric varieties* (with N. Proudfoot). Journal of Algebraic Geometry **16** (2007), 39–63. arXiv:math.AG/0411350.

2006 12. *Stabilization phenomena in Kac-Moody algebras and quiver varieties.* International Mathematics Research Notices, vol. 2006, Article ID 36856. arXiv:math.RT/0505619.

**Selected Lectures:**

2008 Oct. **USC** (UCLA/USC Geometry/Topology Seminar): *A geometric model for HOMFLY homology.*

Oct. **WMU** (AMS Sectionals): *Categories coming from symplectic singularities.*

May **U. Georgia** (Georgia Topology Conference): *2-block Springer fibers and disorientions.*

Apr. **U. Mass.** (Valley Geometry Seminar): *2-block Springer fibers and Khovanov's arc algebra.*

Apr. **GWU** (Knots in Washington): *2-block Springer fibers and disoriented cobordisms.*

Apr. **IAS** (Special Lecture): *Hypertoric varieties and Koszul duality.*

2007 Dec. **Princeton** (Topology Seminar): *2-block Springer fibers and Khovanov's arc algebra.*

Nov. **Edinburgh** (Maxwell Colloquium): *A sheaf-theoretic approach to knot homology.*

Oct. **Berkeley** (RTCG Seminar): *2-block Springer fibers and category $\mathcal{O}$.*

Oct. **U. Oregon** (Algebra Seminar): *2-block Springer fibers and category $\mathcal{O}$.*

Aug. **Kahului** (Subfactors in Maui): *A categorification of the Hecke algebra and knot invariants.*

July **Freiburg** (Seminar in Arbeitsgruppe Algebra): *Knot homology and geometric representation theory.*

July **Faro** (Oporto meeting on link homology): *The geometry of Soergel bimodules.*

June **Århus** (Conference on TQFT and Geometry): *The geometry of Soergel bimodules.*

May **Davis** (Quantum Algebra seminar): *Computation in Khovanov-Rozansky homology.*

May **Berkeley** (RTG Workshop on Representation Theory): *The geometry of Soergel bimodules.*

Mar. **AIM** (Representations of Surface Groups): *Fock-Goncharov coordinates.*

Feb. **Stanford** (Symplectic Geometry seminar): *Computation in Khovanov-Rozansky homology.*

2006 Dec. **Sandbjerg, Denmark** (CTQM Retreat): *Computation in Khovanov-Rozansky homology.*

Nov. **Århus, Denmark** (Topology Seminar): *Computation in Khovanov-Rozansky homology.*

July **Reisenburg, Germany** (IRTG Summer School): *Stratifications á la Deodhar.*

Feb. **Columbia** (Gauge Theory seminar): *Computation in Khovanov-Rozansky homology.*

2005 Dec. **GWU** (Knots in Washington): *Khovanov-Rozansky homology and a graphical calculus for tensor products.*

Oct. **Oregon** (Lie Groups, Lie Algebras and their Representations): *Stabilization in Kac-Moody algebras and quiver varieties.*

May **Berkeley** (Workshop on Representation Theory and Geometry): *Stabilization in Kac-Moody algebras and quiver varieties.*

Apr. **Santa Barbara** (AMS Sectionals): *Kazhdan-Lusztig polynomials for hypertoric varieties.*
2003 Mar. **Baton Rouge** (AMS Sectionals):
*Beaulieu's construction/Mackey functors and Sunada's theorem.*

**Professional Activities:**

- Journals refereed:
  Algebraic & Geometric Topology  Banach Center Publications
- *Math Reviews* reviewer

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| 2005 | May | Organizer (with N. Reshetikhin) for workshop "Representation Theory and Geometry" in Berkeley. |
| 2004 | June | Participant in "MRI Spring School on Lie Groups in Analysis, Geometry and Mechanics" in Utrecht, The Netherlands. |
| 2003 | | Co-organizer of weekly graduate student seminar "Many Cheerful Facts" at Berkeley. |
| 2001 | Summer | Participant in "Research Experiences for Undergraduates" at Louisiana State University (supervisor: Robert Perlis) |

**Teaching Activities:**

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| 2008 | Fall | Section leader for multivariable calculus with Prof. Denis Auroux. Taught section 4 hours a week, held office hours, graded exams. |
| 2008 | Sept. | Attended MIT microteaching workshop. |
| 2007 | Feb. | Gave mini-course on "The geometry of category $\mathcal{O}$" in Berkeley. |
| 2006 | Fall | Tutor for graduate students as complement to course "Quantization of Moduli Spaces." |
| 2005 | Fall | Teaching assistant for multivariable calculus with Prof. Alan Weinstein. Taught section 6 hours a week, held office hours, graded exams. |
| 2002 | Fall | Teaching assistant for calculus (second of two semesters) with Prof. Hung-Hsi Wu. Taught section 6 hours a week, held office hours, graded homework and exams. |
| 2002 | Sep. | Attended Berkeley Mathematics Department training course for teaching assistants. |
| 1999 – 2002 | | Tutor for Simon's Rock Tutoring and Writing Center. |

**References:**

**Nicolai Reshetikhin**
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