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## Raanan Schul

- **Citizenship:** U.S.A., Israel
- **Education:**

Hebrew University	Jerusalem, Israel.	Math.	B.Sc. (Honors)	1996 - 1999.
Hebrew University	Jerusalem, Israel.	Math.		1999 - 2000.
Yale University	New Haven, CT	Math.	M.S.	2000 - 2002.
Yale University	New Haven, CT	Math.	Ph.D.	2000 - 2005.
- **Current position** (January 2019– ) Professor, Mathematics department, SUNY Stony Brook.
- **Past positions:**
  - Associate Professor, Mathematics department, SUNY Stony Brook (September 2015 - December 2018 ) .
  - Assistant Professor, Mathematics department, SUNY Stony Brook (September 2009 - August 2015).
  - NSF Postdoc / Hedrick Assistant Professor, Mathematics department, UCLA (Fall 2005 - Spring 2009).
- **Area of Mathematics:** Harmonic analysis, geometric measure theory and in particular the theory of quantitative rectifiability. Connections of the above to applied mathematics.
- **Honors, Grants and Fellowships:**
  - Alfred P. Sloan Research Fellow 2010
  - NSF: supported continuously as a PI since 2005 as follows.
    - \* DMS 1763973: 2018-2021.
    - \* DMS 1361473: 2014-2018.
    - \* DMS 1100008: 2011-2014.
    - \* DMS 0965766, DMS 0800837: 2008-2011.
    - \* DMS 0502747 (Postdoctoral Research Fellowship): 2005-2009.
  - Fellow at the Institute for Pure and Applied Mathematics (IPAM) for the Fall 2004, Fall 2007, Spring 2013
- **Papers and Preprints:**

Authors are always in alphabetical order. Papers available at <http://www.math.sunysb.edu/~schul>

  - J. Azzam and R. Schul. An Analyst's Traveling Salesman Theorem for sets of dimension larger than one. *Mathematische Annalen* 370(3), 1389-1476 (2018)..
  - G. C. David and R. Schul. The Analyst's traveling salesman theorem in graph inverse limits. *Ann. Acad. Sci. Fenn. Math.* 42 (2017), 649-692.
  - M. Badger and R. Schul. Multiscale analysis of 1-rectifiable measures II: characterizations. *Anal. Geom. Metr. Spaces*. Volume 5, Issue 1 (Mar 2017).
  - M. Badger and R. Schul. Two sufficient conditions for rectifiable measures. *Proceedings of the Amer. Math. Soc.* vol. 144 (2016), pages 2445-2454.

- S. Li and R. Schul. An upper bound for the length of a Traveling Salesman path in the Heisenberg group. *Rev. Mat. Iberoam.*, vol. 32 (2016), no. 2, pages 391-417.
  - M. Badger and R. Schul. Multiscale analysis of 1-rectifiable measures: necessary conditions. *Mathematische Annalen*, vol. 361, Issue 3-4 (2015), pages 1055-1072.
  - S. Li and R. Schul. The traveling salesman problem in the Heisenberg group: upper curvature bound. *Trans. of the Amer. Math. Soc.* vol. 368, num. 7, July 2016, pages 4585-4620
  - J. Azzam and R. Schul. A quantitative metric differentiation theorem *Proc. Amer. Math. Soc.* vol. 142 (2014), pages 1351-1357.
  - J. Azzam and R. Schul. Hard Sard: Quantitative Implicit Function and Extension Theorems for Lipschitz Maps. *Geometric and Functional Analysis* Volume 22, Issue 5 (2012), Page 1062-1123.
  - J. Azzam and R. Schul. How to take shortcuts in Euclidean space: making a given set into a short quasi-convex set. *Proc. London Math. Soc.* (2012) 105 (2): 367-392.
  - J. Garnett, R. Killip and R. Schul. A doubling measure on  $R^d$  can charge a rectifiable curve. *Proc. Amer. Math. Soc.* vol. 138 (2010), pages 1673-1679 .
  - C. Sormani and S. Wenger. Weak Convergence and Cancellation. Appendix by R. Schul and S. Wenger. *Calculus of Variations and Partial Differential Equations* Volume 38, Issue 1 (2010) , Page 183..
  - Peter W. Jones, Mauro Maggioni, and Raanan Schul. Universal local parametrizations via heat kernels and eigenfunctions of the Laplacian. *Ann. Acad. Sci. Fenn. Math.*, 35(1):131–174, 2010.
  - Peter W. Jones, Mauro Maggioni, and Raanan Schul. Manifold parametrizations by eigenfunctions of the Laplacian and heat kernels. *Proc. Natl. Acad. Sci. USA*, 105(6):1803–1808, 2008.
  - Raanan Schul. Big-Pieces-of-Lipschitz-Images implies a sufficient Carleson estimate in a metric space. [arXiv:0706.2517](https://arxiv.org/abs/0706.2517).
  - Raanan Schul. Bi-Lipschitz decomposition of Lipschitz functions into a metric space. *Rev. Mat. Iberoam.*, 25(2):521–531, 2009.
  - Raanan Schul. Ahlfors-regular curves in metric spaces. *Ann. Acad. Sci. Fenn. Math.*, 32 (2007), 437-460.
  - Raanan Schul. Analyst's traveling salesman theorems. A survey. *In the tradition of Ahlfors and Bers, IV*, volume 432 of *Contemp. Math.*, pages 209-220. Amer. Math. Soc., Providence, RI, 2007.
  - Raanan Schul. Subsets of rectifiable curves in Hilbert space. *Journal d'Analyse Mathématique* 103 (2007), 331-375. (This paper is essentially the same as my PhD thesis).
- **Teaching Experience:** (G=graduate, U=undergraduate)
    - Spring 2017, MAT 533 - *Real analysis II*. Stony Brook. (G)
    - Fall 2016, MAT 532 - *Real analysis I*. Stony Brook. (G)
    - Spring 2016, MAT 550 - *Real analysis II*. Stony Brook. (G)
    - Fall 2014, MAT 123 - *Introduction to Calculus*. Stony Brook. (U)
    - Fall 2014, MAT 638 - *Topics in Real Analysis: Fourier analysis*. Stony Brook. (G)
    - Fall 2013, MAT 401 - *Random Walks (seminar)*. Stony Brook. (U)

- Fall 2012, Fall 2013, Fall 2015, MAT 544 - *Real Analysis I*. Stony Brook. (G)
- Spring 2012, MAT 542 - *Complex Analysis*. Stony Brook. (G)
- Fall 2011, MAT 678 - *Advanced topics in Real Analysis: Analysis on metric spaces*. Stony Brook. (G)
- Fall 2010, MAT 132 - *Calculus II*. Course head. Stony Brook. (U)
- Spring 2010, MAT 639 - *Topics in Real Analysis: Geometric measure theory*. Stony Brook. (G)
- Spring 2010, MAT 322 - *Analysis in Several Dimensions*. Stony Brook. (U)
- Fall 2009, MAT 131 - *Single Variable Calculus*. Stony Brook. (U)
- Spring 2009, Math 133 - *Fourier Analysis*. UCLA. (U)
- Fall 2007, Math 254a - *Topics in Real Analysis: Geometry of Sets and Measures in Euclidean Spaces*. UCLA. (G)
- Winter 2007, Math 31a - *Differential Calculus*. UCLA. (U)
- Fall 2006, Fall 2008 Math 32a - *Calculus of Several Variables*. UCLA. (U)
- Spring 2006, Math 32b - *Calculus of Several Variables*. UCLA. (U)
- Winter 2006, Math 115a - *Linear algebra*. UCLA. (U)
- Fall 2003, Spring 2005, Math 112 - *Calculus of a Single Variable*. Yale university. (U)
- Fall 2002, Math 120 - *Calculus of Several Variables*. Yale university. (U)

- **Conferences co-organized**

- Peter Jones' 65th birthday conference. Seoul, Korea. (together with Christopher J. Bishop, Nam-Gyu Kang, and Ignacio Uriarte-Tuero). NSF DMS 1700209, as well as KIAS, Samsung and Yale support.
- AMS Spring 2016 Eastern Sectional Meeting. SUNY Stony Brook. Special Session on Geometric Measure Theory and Its Applications (together with Matthew Badger, Christopher J. Bishop)
- AMS Fall 2011 Eastern Sectional Meeting. Cornell. Special session on Geometric Aspects of Analysis and Measure Theory. (together with Leonid Kovalev and Jani Onninen)
- Summer school (together with J. Garnett, P. Petersen and C. Thiele): *Analysis on Metric Spaces*, September 09 -September 14, 2007 Lake Arrowhead.

- **Talks:**

- **Conference Talks:**

- \* October 2017, *Harmonic Analysis and Geometric Measure Theory*, a conference celebrating Guy David's 60th birthday. CIRM, Luminy.
- \* September 2017, *Prairie Analysis Seminar*, Kansas State University.
- \* October 2015, *IPAM's 15th Anniversary Event*, (one of 3 talks).
- \* May 2015, *30th Annual Geometry Festival*, Courant Institute.
- \* June 2012, *Connections between analysis and computational geometry*. A workshop at SoCG, UNC, Chapel Hill NC.
- \* June 2012, *Challenges in Geometry, Analysis and Computation: High-Dimensional Synthesis*, Yale University.
- \* October 2010, *Nonlinear Analysis and Geometry* special session at AMS Fall meeting, Eastern Sectional Meeting.

- \* March 2009, *Geometric Function Theory and Analysis on Metric Spaces* special session at AMS Spring meeting, Central Sectional Meeting.
- \* November 2008, *New Mathematical Frontiers in Network Multi-Resolution Analysis* workshop, Institute for Pure and Applied Mathematics (IPAM).
- \* June 2008, *8th International Conference on Harmonic Analysis and Partial Differential Equations*. El Escorial, (Spain).
- \* May 2008, *Operators, Functions and Linear Spaces* special session at AMS Spring meeting, Western section. Claremont McKenna College.
- \* September 2007, *Mathematics of Knowledge and Search Engines* tutorials. IPAM.
- \* June 2007, *Multiscale Geometry and Analysis in High Dimensions*, Reunion - II. IPAM.
- \* June 2006, *Fourier analysis, geometric measure theory, and applications*. CRM-UAM Research Thematic Trimester, Barcelona.
- \* June 2006 *Multiscale Geometry and Analysis in High Dimensions*, Reunion - I. IPAM.
- \* June 2005, *Geometric Methods in Analysis and Probability*. Erwin Schroedinger Institute (ESI), Vienna.
- \* May 2005, *Ahlfors Bers Colloquium* workshop on Conformal and Geometric Analysis.
- \* December 2004, *Multiscale Geometry and Analysis in High Dimensions*. Lake Arrowhead Conference of IPAM
- \* November 2004, *Multiscale Geometry and Analysis in High Dimensions* workshop. IPAM.

– **Seminar and Colloquium Talks:**

- \* November 2015, Geometric Measure Theory seminar, University of Chicago.
- \* September 2015, Colloquium, SUNY Stony Brook.
- \* February 2015, Courant Geometric Analysis and Topology seminar, NYU.
- \* February 2013, Courant Geometry seminar, NYU.
- \* October 2012, Calderon-Zygmund seminar, University of Chicago.
- \* October 2012, Analysis seminar, UI Urbana-Champagne.
- \* April 2011, Analysis seminar, Brown University.
- \* November 2010, ‘Some research experiences’, talk for graduate students. SUNY Stony Brook.
- \* February 2009, Colloquium, SUNY Stony Brook.
- \* February 2009, Analysis seminar, UC San Diego.
- \* January 2009, Analysis seminar, Michigan State University.
- \* January 2009, Geometric Analysis seminar, University of Michigan.
- \* January 2009, Analysis seminar, Brown University.
- \* November 2008, Calderon-Zygmund seminar, University of Chicago.
- \* October 2008, Analysis seminar, Indiana University, Bloomington.
- \* October 2008, Colloquium, Claremont McKenna Colleges.
- \* September 2008, Analysis seminar, University of Wisconsin, Madison.
- \* December 2007, Mathematical Physics Seminar, Caltech.
- \* June 2007, Analysis seminar, Hebrew University, Jerusalem.
- \* March 2007, Applied Math And Analysis seminar, Duke University.
- \* February 2007, Analysis seminar, UCLA.
- \* September 2006, Geometric analysis seminar, University of Helsinki.

- \* September 2006, Geometric analysis seminar, University of Jyvaskila.
  - \* Winter 2006, Analysis seminar, UCLA.
  - \* March 2006, Analysis seminar, UC Irvine.
  - \* November 2005. Caltech CMI.
  - \* October 2005, Real Analysis Seminar, University of Minnesota.
  - \* April 2005, Analysis Seminar, Yale University.
  - \* March 2005, Analysis Seminar, Cornell University.
  - \* January 2005, Talk presented to the Microsoft Research Theory Group.
  - \* October 2004, Analysis Seminar, UCLA.
  - \* Spring 2004, Analysis Seminar, Yale University.
- **Ph.D. Advisor:** Peter Jones (Yale)
  - **Postdoctoral Advisors:** John Garnett, Terence Tao (UCLA).
  - **Advisor for:** Jonas Azzam (UCLA, Ph.D Spring 2011, Co-advised together with John Garnett).  
Silvia Ghinassi.
  - **Postdoctoral mentor for** (past and present): Matthew Badger (NSF postdoc). Yaar Solomon.