

# Josh Southerland

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CONTACT INFORMATION	University of Washington Department of Mathematics Box 354350, C-138 Padelford Seattle, WA 98195-4350	<a href="mailto:jsouther@uw.edu">jsouther@uw.edu</a> <a href="http://sub.mersion.cc">http://sub.mersion.cc</a>
RESEARCH INTERESTS	Geometric Analysis, Lie Group Theory, Harmonic Analysis, Semiclassical Analysis, Dynamical systems, Ergodic theory– especially as related to translation surfaces. My research centers around translation surfaces, where I am investigating questions motivated by quantum mechanics (scarring patterns, quantum ergodicity in lieu of ergodicity).	
EDUCATION	<b>University of Washington</b> Ph.D. in Mathematics (expected May 2022) <ul style="list-style-type: none"><li>• Dissertation Topic: Evolving (Translation Surfaces)</li><li>• Advisor: Jayadev Athreya</li></ul> <b>University of Washington</b> M.S. in Mathematics, May 2019 <ul style="list-style-type: none"><li>• Thesis: The Laplacian: An Exploration tailored towards Translation Surfaces</li><li>• Advisor: Jayadev Athreya</li></ul> <b>Columbia University</b> Post Baccalaureate studies in Mathematics, Spring 2014 - Spring 2016 B.S. in Mechanical Engineering, May 2005 <ul style="list-style-type: none"><li>• Dean's List</li><li>• Minor in Music</li></ul>	
MASTER'S THESIS	J. Southerland, <i>The Laplacian: An Exploration and Historical Survey Tailored for Translation Surfaces</i> , 2019	
TALKS	<i>The Laplacian: An Exploration and Historical Survey Tailored for Translation Surfaces</i> , Master Thesis Defense, University of Washington, Seattle. (March 2019)  <i>Complex Exponentials, Eigenfunctions, Algebra Homomorphisms and Invariant Subspaces of <math>L^2(G)</math></i> , Dynamics Seminar, University of Washington, Seattle. (January 2019)  <i>Fourier Analysis on <math>\mathbb{R}^n</math> and the <math>n</math>-Torus</i> , Dynamics Seminar, University of Washington, Seattle. (January 2019)  <i>Lie Algebras and Representation Theory: Engel's Theorem</i> , Dynamics Seminar, University of Washington, Seattle. (October 2018)  <i>The Laplacian on a Graph</i> , Dynamics Seminar, University of Washington, Seattle. (April 2018)  <i>Continued Fractions</i> , Dynamics Seminar, University of Washington, Seattle. (January 2017)	

TEACHING  
EXPERIENCE

Fall 2019 Lecturer, Linear Algebra  
Summer 2019 Lecturer, Linear Algebra  
Spring 2019 Lecturer, Multivariable Calculus  
Winter 2019 Lecturer, Multivariable Calculus  
Fall 2018 Teaching Assistant, Topology  
Summer 2018 Lecturer, Multivariable Calculus  
Spring 2018 Teaching Assistant, Precalculus  
Winter 2018 Teaching Assistant, Introductory Multivariable Calculus  
Fall 2017 Teaching Assistant, Differential Calculus  
Summer 2017 Grader, Real Analysis  
Spring 2017 Teaching Assistant, Introductory Multivariable Calculus  
Winter 2017 Teaching Assistant, Differential Calculus  
Fall 2016 Teaching Assistant, Integral Calculus  
\*Teaching Assistants hold discussion sections twice a week  
\*Graders hold office hours

GRADUATE  
COURSEWORK

<input type="checkbox"/> Real Analysis	<input type="checkbox"/> Complex Manifolds
<input type="checkbox"/> Complex Analysis	<input type="checkbox"/> Ergodic Theory (Reading Course)
<input type="checkbox"/> Algebra	<input type="checkbox"/> Lie Algebras and Representation Theory (Reading Course)
<input type="checkbox"/> Topological Manifolds	<input type="checkbox"/> Laplacian on a Riemannian Manifold (Reading Course)
<input type="checkbox"/> Smooth Manifolds	<input type="checkbox"/> Fuchsian Groups (Reading Course)
<input type="checkbox"/> Differential Topology	
<input type="checkbox"/> Riemannian Geometry	

WORK  
EXPERIENCE

2009–2016 Senior Mechanical Engineer and Sustainability Consultant.  
Buro Happold Consulting Engineers  
New York, NY

REFERENCES

**Jayadev Athreya**, Associate Professor, Department of Mathematics, University of Washington, [jathreya@uw.edu](mailto:jathreya@uw.edu)