

## Leif Zinn-Brooks

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| CONTACT INFORMATION     | Harvey Mudd College<br>Department of Mathematics<br>320 E Foothill Blvd<br>Claremont, CA 91711<br><br>Email: lzinnbrooks@g.hmc.edu   |
| RESEARCH INTERESTS      | Applied mathematics, mathematical biology, differential equations, developmental biology, cell motility, circadian rhythms, dung beetles   |
| ACADEMIC POSITIONS      | <b>University of California, Los Angeles</b><br><i>Assistant Adjunct Professor (postdoctoral position)</i> 2018–2020<br>Department of Mathematics  |
| EDUCATION               | <b>University of Utah</b> 2018<br><i>Ph.D., Mathematics</i> <ul style="list-style-type: none"><li>• Concentration: Mathematical Biology</li><li>• Advisor: Frederick Adler</li><li>• Dissertation topic: Mathematically modeling development of the zebrafish posterior lateral line</li></ul><br><b>University of California, San Diego</b> 2011<br><i>B.S., Mathematics - Scientific Computation</i> <ul style="list-style-type: none"><li>• Provost Honors</li></ul>  |
| PUBLICATIONS            | <b>LZB</b> and Marcus L. Roper. Stochastic circadian rhythm in a multinucleated cell. (In preparation)<br><br>Yin, Zhanyuan <sup>†</sup> , and <b>LZB</b> . Simulating rolling paths and reorientation behavior of ball-rolling dung beetles. <i>Journal of Theoretical Biology</i> 486 (2020): 110106.<br><br><b>LZB</b> and Frederick R. Adler. Modeling factors that regulate cell cooperativity in the zebrafish posterior lateral line primordium. <i>Journal of Theoretical Biology</i> 444 (2018): 93-99.<br><br><sup>†</sup> denotes undergraduate co-author |
| TALKS AND PRESENTATIONS | <i>Stochastic modeling of circadian rhythm in a syncytium</i> (contributed talk)<br>Joint Mathematics Meetings January 2020<br>Denver, CO<br><br><i>Modeling factors that regulate cell cooperativity in the zebrafish posterior lateral line primordium</i> (contributed talk)<br>Joint Mathematics Meetings January 2019<br>Baltimore, MD<br><br><i>Establishing receptor polarity in the zebrafish posterior lateral line primordium</i> (poster)<br>Society for Mathematical Biology July 2017<br>Salt Lake City, UT   |

*A mathematical model of cell cooperativity in the zebrafish posterior lateral line primordium* (poster)  
 Society for Industrial and Applied Math, Life Sciences July 2016  
 Boston, MA

*Modeling migration of the zebrafish primordium* (invited talk)  
 Leah Edelstein-Keshet research group, UBC October 2015

AWARDS *UCLA Distinguished Teaching Award* 2019-2020

*Travel Award: NSF-RTG Travel Grant for SIAM 2016* 2016  
 \$1000

*NSF Research Training Grant Fellowship RTG-1148230* 2015-2016  
 \$20,457 per year

*RTG Lab Rotation, Huntsman Cancer Institute* (PI: Jody Rosenblatt) Summer 2013  
 \$2,500

SCIENTIFIC RESEARCH EXPERIENCE Huntsman Cancer Institute (PI: Jody Rosenblatt) Summer 2013  
 • Studied cell division in epithelia and zebrafish - investigated the characteristics of a dividing cell (size, shape, movement, etc.)

Los Alamos National Laboratory (PI: Bryan Travis) Fall 2011  
 • Developed tests and implemented improvements to the Levenberg-Marquardt optimization algorithm (applications to inverse problems)

TEACHING EXPERIENCE

**University of California, Los Angeles**

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|--------|------|----------|---|
| Spring | 2020 | Lecturer | Mathematical Modeling [Math 142] (sec. 1 & 2)           |
| Winter | 2020 | Lecturer | Ordinary Differential Equations [Math 135] (sec. 1 & 2) |
| Fall   | 2019 | Lecturer | Ordinary Differential Equations [Math 135]              |
| Fall   | 2019 | Lecturer | Mathematical Modeling [Math 142]                        |
| Spring | 2019 | Lecturer | Mathematical Modeling [Math 142]                        |
| Spring | 2019 | Lecturer | Differential Equations [Math 33B]                       |
| Winter | 2019 | Lecturer | Mathematical Modeling [Math 142]                        |
| Winter | 2019 | Lecturer | Differential Equations [Math 33B]                       |
| Fall   | 2018 | Lecturer | Mathematical Modeling [Math 142]                        |
| Fall   | 2018 | Lecturer | Linear & Nonlinear Systems of Diff. Eqs. [Math 134]     |

**University of Utah**

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|--------|------|--------------------|--|
| Spring | 2018 | Lecturer           | Quantitative Reasoning [Math 1030]       |
| Fall   | 2017 | Lecturer           | Quantitative Reasoning [Math 1030]       |
| Spring | 2017 | Lecturer           | Quantitative Reasoning [Math 1030]       |
| Fall   | 2016 | Lecturer           | Calculus II [Math 1220]                  |
| Spring | 2015 | Lecturer           | College Algebra [Math 1050]              |
| Fall   | 2014 | Lecturer           | Quantitative Reasoning [Math 1030]       |
| Summer | 2014 | Lecturer           | College Algebra [Math 1050]              |
| Spring | 2014 | Teaching Assistant | Calculus II [Math 1220]                  |
| Fall   | 2013 | Lecturer           | Quantitative Reasoning [Math 1030]       |
| Spring | 2013 | Teaching Assistant | Diff. Eq. and Linear Algebra [Math 2250] |
| Fall   | 2012 | Teaching Assistant | Diff. Eq. and Linear Algebra [Math 2250] |

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|                                | <i>Mathematics Teacher's Circle</i>  | 2017–18   |
|                                | Monthly gathering of teachers to discuss interesting math problems and share ideas. Designed and facilitated session on divisibility puzzle.   |   |
| INVITED WORKSHOPS              | Rules of Life in the Context of Future Mathematical Sciences (invited participant)<br>Alexandria, VA   | November 2018   |
| MENTORSHIP OF STUDENT RESEARCH | <i>Undergraduate Research in Mathematics, UCLA</i>   | January 2019–present  |
|                                | <ul style="list-style-type: none"> <li>• Topic: Matlab simulations of rolling paths and reorientation behavior of ball-rolling dung beetles.</li> <li>• Mentee: Zhanyuan Yin</li> </ul>  |   |
|                                | <i>Undergraduate Research in Mathematics, UCLA</i>   | Spring 2019   |
|                                | <ul style="list-style-type: none"> <li>• Topic: Cancer modeling — extended a model in a paper studying the effects of double-strand breaks on tumor growth.</li> <li>• Mentee: Yunfeng Wang</li> </ul>                                       |   |
|                                | <i>Mathematical Biology REU</i> (co-mentor Owen Lewis)   | 2015–16   |
|                                | <ul style="list-style-type: none"> <li>• Topic: Cell migration — students simulated and extended migration model by Gracheva and Othmer (2003).</li> <li>• Mentees: Olivia Dennis, Naveen Rathi, Gerardo Rodriguez, Nathan Willis</li> </ul> |   |
| SERVICE AND OUTREACH           | Co-mentor for students participating in Mathematical Contest in Modeling (MCM) 2020  | November 2019 – present   |
|                                | <i>Establishing receptor polarity in the zebrafish posterior lateral line primordium</i> (poster)  | October 2017  |
|                                | Society for Advancement of Chicanos/Hispanics and Native Americans in Science<br>Poster session for potential future graduate students   |   |
|                                | <i>The princess problem and extensions</i><br>Graduate Student Advisory Committee (Mathematics)  | January 2016  |
|                                | <i>Modeling development of the zebrafish lateral line</i><br>Mathematical Modeling in Health Sciences lightning talks  | October 2014  |
| GRADUATE COURSEWORK            | <ul style="list-style-type: none"> <li>• Numerical analysis</li> <li>• Functional &amp; complex analysis</li> <li>• Mathematical biology</li> </ul>  | <ul style="list-style-type: none"> <li>• Ordinary &amp; partial differential equations</li> <li>• Perturbation methods</li> <li>• Stochastic processes</li> </ul> |