

# Nida Obatake

MATHEMATICS PHD STUDENT · TEXAS A&M UNIVERSITY

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## Education

### Doctor of Philosophy, Mathematics

TEXAS A&M UNIVERSITY – ADVISOR: ANNE SHIU

College Station, Texas

2016 - 2021 (expected)

### Master of Science, Mathematics

SAN JOSÉ STATE UNIVERSITY – ADVISOR: ELIZABETH GROSS

San Jose, California

2013 - 2016

### Bachelor of Science, Mathematics

SANTA CLARA UNIVERSITY – ADVISOR: FRANK FARRIS

Santa Clara, California

2009 - 2013

## Publications

*In Mathematics, authors are listed alphabetically.*

8. *Modeling R-loops with Formal Grammars*, Nataša Jonoska, Nida Obatake, Svetlana Poznanovikj, Candice Price, Manda Riehl, and Mariel Vazquez. Springer Nature, Using Mathematics to Understand Biological Complexity. To appear, 2020.
7. *Identifiability of Linear Compartmental Models: The Effect by Moving Inputs, Outputs, and Leaks*, Seth Gerberding, Anne Shiu, and Nida Obatake. Linear and Multilinear Algebra, pp 1-22 (2020). Available from [Taylor & Francis Online](#).
6. *Oscillations and bistability in a model of ERK regulation*, Nida Obatake, Anne Shiu, Xiaoxian Tang, and Angélica Torres. J. Math. Biol., 79:4, pp 1515–1549 (2019). Available from [SpringerLink](#).
5. *Neural ideals and stimulus space visualization*, Elizabeth Gross, Nida Obatake, and Nora Youngs. Adv. in Appl. Math, 95, pp 65–95 (2018). Available from [ScienceDirect](#).
4. *Drawing place field diagrams of neural codes using toric ideals*, Nida Obatake. San José State University, ProQuest Dissertations Publishing (2016). Available from [ScholarWorks](#).

## Preprints

3. *Mixed volume for small reaction networks*, Nida Obatake, Anne Shiu and Dilruba Sofia. Submitted to *Involve* (in revision). Available from [arXiv:2004.14467](#), 2020.
2. *Dynamics of ERK regulation in the processive limit*, Carsten Conradi, Nida Obatake, Anne Shiu, and Xiaoxian Tang. Submitted to *Journal of Mathematical Biology* (in revision). Available from [arXiv:1910.14452](#), 2019.
1. *On the identification of  $k$ -inductively pierced codes using toric ideals*, Molly Hoch, Samuel Muthiah, and Nida Obatake. Submitted to *Journal of Algebra and its Applications* (in revision). Available from [arXiv:1807.02390](#), 2019.

## Grants

Jul 2019	<b>NSF DMS-1937317</b> , in support of the Texas Women in Math Symposium 2020 PI: Laura Matusevich, co-PIs: Priyanga Ganesan, Nida Obatake, Aleksandra Sobieska, and Elise Walker	\$8000
Apr 2019	<b>College of Science Diversity &amp; Equity Grant</b> , Texas Women in Math Symposium 2020 with Laura Matusevich, Priyanga Ganesan, Aleksandra Sobieska, and Elise Walker	\$2000
Mar 2019	<b>MAA Tensor Women in Mathematics Grant</b> , Texas Women in Math Symposium 2020 with Laura Matusevich, Priyanga Ganesan, Aleksandra Sobieska, and Elise Walker	\$6000
Apr 2018	<b>College of Science Diversity &amp; Equity Grant</b> , Peer Mentoring Program for Mathematics Graduate Students with Laura Matusevich, Changningphaabi Namoiyam, Aleksandra Sobieska, and Elise Walker	\$1960

## Honors & Awards

Jun 2020	<b>2020 Leadership in Equity and Diversity (LEAD) Award</b> , College of Science	TAMU
May 2020	<b>Awardee</b> , 2020 American Dissertation Fellowship	AAUW
Apr 2020	<b>P.E.O. Scholar Award (declined)</b> , International Chapter of the P.E.O. Sisterhood	P.E.O.
Apr 2020	<b>Aggie Leader Scholarship</b> , Sam W and Mary Richards Martin Endowed Scholarship Fund	TAMU
Jan 2020	<b>Honorable Mention</b> , Ford Foundation 2020 Dissertation Fellowship Competition	NASEM
Jan 2020	<b>Ethel Ashworth-Tsutsui Memorial Award for Research</b> , Women In Science and Engineering at Texas A&M	TAMU
Sep 2019	<b>Undergraduate Research Mentoring Award</b> , College of Science	TAMU
Jul 2019	<b>Best poster presentation</b> , SIAM Conference on Applied Algebraic Geometry	Bern, Switzerland
May 2019	<b>Herman F Heep Scholarship &amp; Achievement</b> , Academic Excellence Award	TAMU
May 2019	<b>Outstanding TA Award</b> , Houston A&M Mother's Club	TAMU
Apr 2019	<b>Aggie Leader Scholarship</b> , Sean M. Golden '01 and Heather Sustman Golden '99 Scholarship Fund	TAMU

May 2018	<b>Certificate of recognition for outstanding service and contributions</b> , SIAM Student Chapter Award	SIAM
2016–2018	<b>H.B. Curtis Fellow in Mathematics</b> , Graduate Fellowship	TAMU
May 2016	<b>Franklyn B. Fuller award for exceptional math graduate student</b> , Mathematics Department Scholarship	SJSU
Apr 2015	<b>Kenneth C. Bradshaw award for outstanding teaching associate</b> , Mathematics Department Scholarship	SJSU
Aug 2014	<b>Viola Palmer Memorial Scholarship</b> , Graduate Merit Scholarship	SJSU

## Mentoring

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### Mathematics REU

Texas A&M University

GRADUATE STUDENT RESEARCH MENTOR FOR 2 UNDERGRADUATE STUDENTS

Summer 2019

- Supervised research projects on mixed volume of chemical reaction networks and identifiability in linear compartment models. Held research meetings 1–2 times per week. Resulted in 2 papers co-authored with undergraduates.
- Led presentations for the entire REU cohort (12 undergraduate students) on “How (not) to give a talk” and “Using TikZ in beamer presentations”.
- Critiqued students’ abstracts, manuscripts, beamers, and oral presentations. Provided feedback on content, clarity, and accessibility.
- Met weekly with 4 female undergraduate students to discuss graduate school: applications, exams and coursework, research, and student life.

### Directing Reading Program

Texas A&M University

GRADUATE STUDENT MENTOR FOR 1 UNDERGRADUATE STUDENT

Spring 2019

- Led a reading course on applied algebraic topology and neural codes. Met weekly to discuss reading material. Advised on graduate school applications.
- Helped student prepare her first beamer slides and oral presentation.

### Mathematics REU

Texas A&M University

GRADUATE STUDENT RESEARCH MENTOR FOR 5 UNDERGRADUATE STUDENTS

Summer 2017

- Supervised research projects on toric ideals of neural codes and identifiability in linear compartment models. Held weekly research meetings and advised on research directions. Resulted in 1 paper co-authored with undergraduates.
- Led presentation for the entire REU cohort (13 undergraduate students) on “How (not) to give a talk” and organized a Graduate School panel.
- Critiqued students’ abstracts, manuscripts, beamers, and oral presentations. Provided feedback on content, clarity, and accessibility.

## Teaching Experience

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### Mathematics Department

Texas A&M University

GRADUATE TEACHING ASSISTANT

Aug 2016 - May 2020

- **Week-in-Review Instructor**  
Led weekly review sessions open to all 1100 students of Math for Business and the Social Sciences (Math 140).  
Created [worksheets](#) to illustrate the concepts with meaningful examples and detailed problem solutions. Spring 2020
- **Instructor of record**  
Mathematics for Business and the Social Sciences (Math 140) – 65 students per semester Fall 2018, Fall 2019
- Recitation and Python lab instructor  
Engineering Calculus 1 (Math 151) Spring 2019
- Recitation instructor  
Calculus 1 for Biological Sciences (Math 147) Fall 2017, Spring 2018  
Engineering Calculus 2 (Math 152) Fall 2016
- Grader  
Applied Algebra (Math 433) Spring 2017
- Help session instructor  
Linear Algebra Fall 2016

### Mathematics Department

San José State University

TEACHING ASSOCIATE

Aug 2014 - May 2016

- **Instructor of record**  
College Algebra (Math 8) – 30-40 students per section Fall 2014 (1 section), Spring 2015 (1 section), Fall 2015 (2 sections), Spring 2016 (1 section)
- Workshop Facilitator  
Led workshop for Developmental Math (Math 6B) Spring 2016  
Led workshop for Multivariable Calculus (Math 32) Fall 2014, Spring 2015

### Kumon Math and Reading Center

Multiple locations

ASSISTANT INSTRUCTOR

2008-2014

- Activities included grading, recording, and assisting K-12 students with math and reading worksheets.

### Mathematics Department

Santa Clara University

GRADER

2011-2013

- Graded assignments for Vector Calculus (Calc 3), Discrete Math, and Business Calculus.

## Conference Events Organized

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2020	<b>Minisymposium on “Algebraic, geometric, and combinatorial methods in mathematical biology”</b> , SIAM TX-LA 3rd Annual Meeting, Texas A&M University	Oct 16–18, 2020
2020	<b>Texas Women in Mathematics Symposium (TWIMS)</b> , 112 registered participants, Texas A&M University	Feb 1–2, 2020
2019	<b>Minisymposium on “Algebraic, geometric, and combinatorial methods in mathematical biology”</b> , SIAM TX-LA 2nd Annual Meeting, Southern Methodist University	Nov 1–3, 2019
2017–2019	<b>Industrial and Applied Mathematics Seminar</b> , Texas A&M University	bi-weekly
2018; 2019	<b>TAMU-AMS Gathering in Graduate Expository Mathematics (GIGEM)</b> , Texas A&M University	Mar 4, 2018; Feb 16, 2019

## Talks

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\* = invited talk

<b>Geometry Seminar; Texas A&amp;M University</b> , <i>Polyhedral methods for chemical reaction networks</i>	Nov 4, 2019
<b>SIAM TX-LA Annual Meeting; Southern Methodist University</b> , <i>Dynamics in a model of ERK regulation*</i>	Nov 3, 2019
<b>SIAM AG 2019; University of Bern</b> , <i>Sufficient conditions for 1- and 2- Inductively Pierced Codes*</i>	Jul 10, 2019
<b>Trieste Algebraic Geometry Summer School; ICTP</b> , <i>Polyhedral Methods for Chemical Reaction Networks</i>	Jul 1, 2019
<b>AWM Research Symposium; Rice University</b> , <i>Toric Ideals of Neural Codes*</i>	Apr 7, 2019
<b>AWM Research Symposium; Rice University</b> , <i>Hopf bifurcations in the ERK Network*</i>	Apr 6, 2019
<b>AMS Spring Southeastern Sectional Meeting; Auburn University</b> , <i>Oscillations in the ERK Network*</i>	Mar 16, 2019
<b>Graduate Student Seminar; Texas A&amp;M University</b> , <i>Oscillations in the ERK Network</i>	Mar 7, 2019
<b>TAMU-AMS GIGEM 2019; Texas A&amp;M University</b> , <i>Amoebas!*</i>	Feb 16, 2019
<b>Graduate Student Seminar; Texas A&amp;M University</b> , <i>Chemical Reaction Networks</i>	Sep 13, 2018
<b>ICMS 2018; Notre Dame University</b> , <i>The capacity for Hopf bifurcations in the fully distributive dual-site phosphorylation network</i>	Jul 24, 2018
<b>Joint Mathematics Meeting (JMM)</b> , <i>Place field diagrams of neural codes</i>	Jan 12, 2018
<b>AMS Fall Central Sectional Meeting</b> , <i>Place field diagrams of convex neural codes*</i>	Sep 9, 2017
<b>SIAM Conference on Applied Algebraic Geometry</b> , <i>Toric Ideals of Neural Codes*</i>	Aug 1, 2017
<b>Graduate Student Seminar; Texas A&amp;M University</b> , <i>Rat GPS</i>	Nov 10, 2016
<b>Texas Women in Math Symposium</b> , <i>Drawing place field diagrams of neural codes using toric ideals</i>	Nov 5, 2016
<b>Student Working Seminar in Algebraic Geometry; Texas A&amp;M University</b> , <i>Differential Forms and Manifolds, Integration, Stoke’s Theorem</i>	Nov 1, 2016
<b>Geometry Seminar; Texas A&amp;M University</b> , <i>Drawing place field diagrams of neural codes using toric ideals*</i>	Sep 26, 2016
<b>Master’s thesis defense; San Jose State University</b> , <i>Drawing place field diagrams of neural codes</i>	May 17, 2016
<b>Colloquium; San Jose State University</b> , <i>Algebraic methods for realizing neural codes*</i>	May 4, 2016
<b>Colloquium; Santa Clara University</b> , <i>Algebraic methods for realizing neural codes*</i>	Apr 26, 2016
<b>AMS Fall Western Sectional Meeting</b> , <i>Toric ideals of neural codes</i>	Oct 25, 2015

## Posters

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<b>SCMB Annual Symposium; Georgia Tech</b> , <i>Hopf bifurcations in a model of ERK regulation</i>	Feb 17, 2020
<b>SIAM Conference on Applied Algebraic Geometry; University of Bern</b> , <i>A constructive algorithm for a positive solution to a system of polynomial inequalities</i>	Jul 9, 2019
<b>Southwest Local Algebra Meeting; University of Texas at El Paso</b> , <i>Hopf bifurcations in chemical reaction networks</i>	Feb 23, 2019
<b>TWIMS; University of Houston</b> , <i>Hopf bifurcations in the fully distributive dual-site phosphorylation network</i>	Nov 17, 2018
<b>CBMS, Applications of Polynomial Systems; Texas Christian University</b> , <i>The capacity for Hopf bifurcations in the fully distributive dual-site phosphorylation network</i>	Jun 4, 2018
<b>College of Science Student Research Day; San Jose State University</b> , <i>Drawing Place Field Diagrams of Neural Codes using Toric Ideals</i>	May 6, 2016
<b>MAA Golden Section Meeting; UC Davis</b> , <i>Toric ideals of neural codes</i>	Feb 27, 2016
<b>Biology and Math in the Bay Area (BaMBA); San Jose State University</b> , <i>Toric ideals of neural codes</i>	Oct 17, 2015

## Review Activities

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Refereed articles for Bulletin of Mathematical Biology, FPSAC’19, and Springer Mathematics in Computer Science CASC 2019

## Outreach

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2018–2019	<b>Co-organizer</b> , <u>Peer Mentoring Program group meeting</u> , monthly	<i>Texas A&amp;M University</i>
2017–2019	<b>Co-organizer</b> , <u>Women in Math Mentoring Lunch</u> , monthly	<i>Texas A&amp;M University</i>
Oct 2018	<b>Volunteer</b> , <u>Boonville Days</u> : community activity on geometry and symmetry	<i>Brazos Valley Museum of Natural History</i>
Apr 2018	<b>Panelist</b> , Department Review: Discussion on the Mathematics Graduate Program	<i>Texas A&amp;M University</i>
Feb 2018	<b>Panelist</b> , Graduate school in mathematics informational session	<i>St. Edwards University</i>
Feb 2018	<b>Contributed Talk Session Moderator</b> , CombinaTexas	<i>Texas A&amp;M University</i>
2016–2018	<b>Volunteer</b> , <u>Math Circle</u> : education enrichment for gifted students in grades 5–12	<i>Texas A&amp;M University</i>
Feb 2018	<b>Volunteer: math art room</b> , <u>Math &amp; Stats Fair</u> : Julia Robinson Math Festival for K-12	<i>Texas A&amp;M University</i>
Feb 2018	<b>Organizer: math art room</b> , <u>STEMfest</u> : engaging girls K-12 in STEM	<i>Texas A&amp;M University</i>
Mar 2017	<b>Volunteer</b> , Math & Stats Fair: Julia Robinson Math Festival for K-12	<i>Texas A&amp;M University</i>
Feb 2017	<b>Co-organizer: math art room</b> , <u>STEMfest</u> : engaging girls K-12 in STEM	<i>Texas A&amp;M University</i>
2013	<b>Teen Workshop Leader</b> , Santa Maria Urban Ministry	<i>San Jose, CA</i>

## Leadership

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### Mathematics Department

*Texas A&M University*

#### STUDENT CHAPTER OFFICER

*Fall 2016 - Spring 2019*

- American Mathematical Society (AMS) TAMU Graduate Student Chapter
  - President *2018–2019*
  - Secretary *2017–2018*
- Association for Women in Mathematics (AWM) TAMU Graduate Student Chapter
  - Vice President *2017–2019*
  - Secretary/Webmaster *2016–2017*
- Society for Industrial and Applied Math (SIAM) TAMU Graduate Student Chapter
  - Vice President *2018–2019*
  - Liaison Officer *2017–2018*

## Memberships

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- Association for Women in Mathematics (AWM)
- American Mathematical Society (AMS)
- Society for Industrial and Applied Mathematics (SIAM)
- The EDGE Program - Enhancing Diversity in Graduate Education (2016 cohort)
- Mathematical Association of America (MAA)
- Pi Mu Epsilon (ΠΜΕ) Math Honor Society

## Travel Awards

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Jun 2020	<b>Conference Travel Grant</b> , for SIAM TX-LS	<i>declined</i>
Nov 2019	<b>Conference Travel Grant</b> , for SIAM TX-LA	
Jun 2019	<b>Graduate Student Research and Presentation Travel Award</b> , Texas A&M University Office of Graduate and Professional Studies for SIAM AG 2019	
Jun 2019	<b>SIAM Grant</b> , for Collaborative Workshop for Women in Math Bio	
Mar 2019	<b>SIAM Student Travel Grant</b> , for SIAM AG 2019	
Apr 2019	<b>AWM Student Travel Grant</b> , for AWM Research Symposium 2019	<i>declined</i>
Feb 2019	<b>Conference Travel Grant</b> , for SLAM 2019	
Nov 2018	<b>Conference Travel Grant</b> , for TWIMS 2018	
Jul 2018	<b>Conference Travel Grant</b> , for ICMS 2018	
Jun 2018	<b>Conference Travel Grant</b> , for CBMS conference on Applications for Polynomial Systems	
Jan 2018	<b>EDGE Travel Grant</b> , for JMM 2018 EDGE for Women session	
Sep 2017	<b>AMS Student Travel Grant</b> , for AMS Denton	
Jun 2016	<b>EDGE grant</b> , for EDGE 2016 workshop	
Oct 2015	<b>Conference Travel Grant</b> , for AMS Fall Western Sectional Meeting	

## Conferences & Workshops Attended

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Summer School on Sums of Squares Method in Geometry, Combinatorics and Optimization, MSRI	<i>postponed</i>
Southeast Center for Mathematics and Biology Annual Symposium, Georgia Tech	<i>Feb 2020</i>
Texas Women in Math Symposium, Texas A&M University	<i>Feb 2020</i>
SIAM TX-LA Annual Sectional Meeting, Southern Methodist University	<i>Nov 2019</i>
Graduate Algebra Symposium, Texas A&M University	<i>Oct 2019</i>
Mini Texas Algebraic Geometry Symposium, Texas A&M University	<i>Oct 2019</i>
SIAM Conference on Applied Algebraic Geometry, University of Bern	<i>Jul 2019</i>
Trieste Applied Algebraic Geometry Summer School, ICTP, Trieste, Italy	<i>Jul 2019</i>
Collaborative Workshop for Women in Mathematical Biology, IPAM, UCLA	<i>Jun 2019</i>
AWM Research Symposium, Rice University	<i>Apr 2019</i>
CombinaTexas 2019, Texas A&M University	<i>Mar 2019</i>
AMS Spring Southeastern Sectional Meeting, Auburn University	<i>Mar 2019</i>
Southwest Local Algebra Meeting, University of Texas at El Paso	<i>Feb 2019</i>
TAMU-AMS GIG'EM 2019, Texas A&M University	<i>Feb 2019</i>
Texas Algebraic Geometry Symposium, University of Texas at Austin	<i>Feb 2019</i>
Texas Women in Math Symposium, University of Houston	<i>Nov 2018</i>
2nd Madison Workshop on Mathematics of Reaction Networks, University of Wisconsin–Madison	<i>Aug 2018</i>
SIAM Conference on the Life Sciences 2018, Minneapolis, MN	<i>Aug 2018</i>
ICMS 2018, Notre Dame University	<i>Jul 2018</i>
CBMS Regional Conference on Applications of Polynomial Systems, Texas Christian University	<i>Jun 2018</i>
Texas Algebraic Geometry Symposium, Texas A&M University	<i>Apr 2018</i>
TAMU-AMS Gathering in Graduate Expository Mathematics (GIG 'EM) Conference, Texas A&M University	<i>Mar 2018</i>
Texas Geometry and Topology Conference, University of Houston	<i>Feb 2018</i>
CombinaTexas, Texas A&M University	<i>Feb 2018</i>
Joint Mathematics Meeting (JMM), San Diego, CA	<i>Jan 2018</i>
Texas Women in Math Symposium (TWIMS), Sam Houston State University	<i>Dec 2017</i>
AMS Fall Central Sectional Meeting, University of North Texas	<i>Sep 2017</i>
SIAM Conference on Applied Algebraic Geometry, Georgia Institute of Technology	<i>Jul–Aug 2017</i>
Texas Algebraic Geometry Symposium (TAGS), Rice University	<i>Apr 2017</i>
Texas Women in Math Symposium (TWIMS), UT Austin	<i>Nov 2016</i>
Texas Topology & Geometry Conference (TGTC), Texas A&M University	<i>Nov 2016</i>
MAA Golden Sectional Meeting, UC Davis	<i>Feb 2016</i>
AMS Fall Western Sectional Meeting, CSU Fullerton	<i>Oct 2015</i>
Biology and Mathematics in the Bay Area (BaMBA), San Jose State University	<i>Oct 2015</i>
Bay Area Discrete Math Day (BAD Math), San Francisco State University	<i>Oct 2015</i>
Bay Area Discrete Math Day (BAD Math), Monterey, CA	<i>May 2015</i>
Biology and Mathematics in the Bay Area (BaMBA), UC Davis	<i>Nov 2014</i>