

# Érika Roldán Roa, Ph.D.

---

**Max Planck Fellow**  
Research Group Leader  
Stochastic Topology

**Max-Planck-Institut für Mathematik  
in den Naturwissenschaften**  
Inselstraße 22  
D - 04103 Leipzig

**Email:** roldan@mis.mpi.de  
**Voice:** +49-173-6961192  
**Web:** erikaroldan.net

## Academic Positions

---

July 2022 - present	<a href="#">Max Planck Fellow: Research Group Leader Stochastic Topology</a> Max Planck Institute for Mathematics in the Sciences, Leipzig (DE)
Apr 2022 - July 2022	<a href="#">Research Visitor (Postdoc)</a> EPFL Lausanne (CH)
Feb 2020 - Apr 2022	<a href="#">Marie Skłodowska-Curie Fellow (Postdoc)</a> TU München (DE) and EPFL Lausanne (CH)
Jan 2019 - Jan 2020	<a href="#">Visiting Assistant Professor and Director of Outreach</a> The Ohio State University (OSU), Columbus, Ohio (US)
May 2018 - Dec 2018	<a href="#">Lecturer</a> The Ohio State University, Columbus, Ohio (US)
Aug 2017 - May 2018	<a href="#">Visiting Research Scholar</a> The Ohio State University, Columbus, Ohio (US)
Autumn 2016	<a href="#">Visiting Research Scholar</a> ICERM, Brown University, Providence, Rhode Island (US)
Spring 2014	<a href="#">Fulltime Lecturer</a> Universidad Juárez del Estado de Durango (UJED) (Mx)

## Education

---

May 2018	<a href="#">Ph.D. in Probability and Statistics</a> Centro de Investigación en Matemáticas, A.C. (CIMAT), Guanajuato (Mx) Thesis advisors: Prof. Víctor Pérez-Abreu, CIMAT (Mx) Prof. Matthew Kahle, OSU (US)
Jan 2014	<a href="#">M.S. in Mathematics</a> Centro de Investigación en Matemáticas, A.C. (CIMAT), Guanajuato (Mx)
Aug 2010	<a href="#">B.S. in Mathematics</a> Universidad de Guanajuato, Guanajuato (Mx) Thesis Advisor: Prof. Daniel Hernández Hernández, CIMAT (Mx)
Summer 2004	<a href="#">Science Summer School 2004</a> University of Cambridge, Cambridge (UK)

## Fellowships, Grants & Awards

---

Feb 2020 - Apr 2022	<a href="#">Marie Skłodowska-Curie Fellowship</a> , EuroTechPostdoc Programme, European Union's Horizon 2020 research and innovation programme
2021	<a href="#">MAA Dolciani Mathematics Enrichment Grant 2021</a> (for the OSU Beyond the Classroom outreach program)

2021	<a href="#">OSU Development Grant</a> (for developing the Service Learning Course on Recreational Mathematics)
2019	<a href="#">Best Research and Practice Project Award</a> , *Music Math project, EAPRIL 2019
2019	<a href="#">Aranda-Ordaz Prize</a> best Latin-American Ph.D. Thesis in Probability and Statistics, Honorable Mention, Bernoulli Society for Mathematical Statistics and Probability
2019	<a href="#">Sofia Kovalevskaja Prize</a> , Sociedad Matemática Mexicana (Mexican Mathematical Society)
2014 - 2018	<a href="#">CONACYT-Graduate Fellowship</a> (367369), PhD Program, Mexican National Science and Technology Council
2010 - 2012	<a href="#">CONACYT-Graduate Fellowship</a> (302953), Master Program, Mexican National Science and Technology Council
2004 - 2009	<a href="#">CIMAT-Undergraduate Fellowship</a> , full tuition scholarship and monthly stipend CIMAT (Center for Research in Mathematics)

## Publications & Preprints

---

### Research Papers & Preprints

13. [Complexity of Chess Domination Problems](#) (with Alexis Langlois-Rémillard and Christoph Müssig)  
Submitted, preprint arXiv:2211.05651
12. [Isoperimetric Formulas for Hyperbolic Animals](#) (with R. Toalá-Enríquez)  
Submitted, preprint arXiv:2206.14910
11. [Parity Property of Hexagonal Sliding Puzzles](#) (with R. Karpman)  
Submitted, preprint arXiv:2201.00919.
10. [Extremal  \$\{p,q\}\$ -Animals](#) (with G. Malen and R. Toalá-Enríquez)  
Submitted, preprint arXiv:2109.05331.
09. [High-dimensional holeyominoes](#) (with G. Malen and F. Manin)  
Submitted, preprint arXiv:2104.04558.
08. [Topology and local geometry of the Eden model](#) (with F. Manin and B. Schweinhart)  
Accepted in Discrete and Computational Geometry, preprint arXiv:2005.12349.
07. [Topology of random 2-dimensional cubical complexes](#) (with M. Kahle and E. Paquette)  
Forum of Mathematics, Sigma, Volume 9:e76, 1-24, Nov 2021.
06. [Isotopy graphs of Latin tableaux](#) (with R. Karpman)  
Advances in Applied Mathematics 130, 102204, Sep 2021.
05. [Art gallery problem with rook and queen vision](#) (with H. Alpert)  
Graphs and Combinatorics, 37(2), 621-642, Feb 2021.
04. [Polyiamonds Attaining Extremal Topological Properties, Part II](#) (with G. Malen)  
Geombinatorics, Volume XXX, Issue 2, pages 63-76, Oct 2020.
03. [Polyiamonds Attaining Extremal Topological Properties, Part I](#) (with G. Malen)  
Geombinatorics, Volume XXX, Issue 1, pages 14-24, July 2020.
02. [Extremal topological and geometric problems for polyominoes](#) (with G. Malen)  
Electronic Journal of Combinatorics, June 2020.
01. [Polyominoes with maximally many holes](#) (with M. Kahle)  
Geombinatorics, Volume XXIX, Issue 1, pages 5-15, July 2019.

## Proceedings & Book Chapters

03. [Supporting Education in Marginalized Communities With Workshops Combining Music and Mathematics](#) (with Eric Roldán and Doris Kristina Raave)  
Handbook of Integrating ICTs in STEAM Education, IGI Global, Chapter 15, pages 320-343, 2022.
02. [Learning music and math, together as one: Towards a collaborative approach for practicing math skills with music](#) (with Eric Roldán and I. Chounta)  
International Conference on Collaboration Technologies and Social Computing, Springer, pages 143-156, Sep 2020.
01. [The Mutando of Insanity](#)  
G4G 12 Exchange Book, Proceedings of the 12 biennial conference Gathering for Gardner, 2017.

## Software

03. [Discrete configuration spaces of sliding with hexagonal tiles](#) (with R. Karpman)  
GitHub; License: GNU General Public License (Jan 2022)
02. [Homology and Geometry of the Plaquette Eden Model](#) (with A. Krymova)  
GitHub; License: GNU General Public License (May 2021)
01. [Topology and Geometry of the Eden Model](#) (with A. Krymova, F. Manin, and B. Schweinhart)  
GitHub; License: GNU General Public License (Dec 2020)

## Theses

02. [Topological, geometric, and combinatorial properties of random polyominoes](#)  
PhD Thesis (May 2018)
01. [On the Generalization of the Perron Frobenius Theorem for homogeneous and monotone functions.](#)  
Bachelor Thesis (Aug 2010)

## Outreach

03. [Mathematical Outreach](#)  
Newsletter, Mathematics Department, The Ohio State University, Autumn 2019.
02. [Buckeye Aha! Math Moments](#)  
Newsletter, Mathematics Department, The Ohio State University, Spring 2019.
01. [Mary Somerville: a passion for science](#)  
¿Cómo ves? UNAM science popularization magazine. Volume 175, 2013.

## Research Talks, Workshops & Presentations

---

### Workshops and Lecture Series

04. [TES Block Course in Stochastic Topology \(Cubical Random Complexes\)](#)  
Thematic Einstein Semester Summer 2020 Geometric and Topological Structure of Materials  
TU Berlin, Germany (rescheduled to Sep 20-21, 2021)
03. [TDA and Stochastic Topology Conference](#) (three lectures)  
CIMAT, Guanajuato, México (Jan 20-24, 2020)
02. [Workshop in Combinatorial Game Theory](#) (5-days workshop)  
The Ohio State University, Columbus, USA (June 03-07, 2019)
01. [Stochastic topology and topological data analysis with Python](#) (three lectures)  
IV School of TDA and Stochastic Topology, CCM Morelia, México (week of July 31, 2017)

## Invited Research Talks (2016 – present)

56. [Recreational Mathematics Research Cluster Seminar](#)  
Sheffield Hallam University, UK (June 08, 2022)
55. [Applied Mathematics Seminar](#)  
Universidad Autónoma de Aguascalientes, México (May 27, 2022)
54. [Copenhagen-Jerusalem Combinatorics Seminar](#)  
University of Copenhagen, Hebrew University of Jerusalem (May 19, 2022)
53. [XXXVII Coloquio Víctor Neumann-Lara on Graph Theory, Combinatorics and their Applications Plenary Talk](#)  
Universidad Autónoma Metropolitana, México City, México (May 02-04, 2022)
52. [Combinatorics, Algebra and Geometry Seminar \(CAGS\)](#)  
George Mason University, Fairfax, VA, USA (April 22, 2022)
51. [Mini-Course Probability and Statistics School](#)  
CIMAT, México (April 18-22, 2022)
50. [Virtual Colloquium for Women in Combinatorics](#)  
virtual (Mar 30, 2022)
49. [OSU Combinatorics Seminar](#)  
Ohio State University OSU, Columbus, USA (Mar 10, 2022)
48. [Applied Geometry and Topology Seminar](#)  
CIMAT, México (Mar 03, 2022)
47. [CAAGT Combinatorial Algorithms and Algorithmic Graph Theory Seminar](#)  
Universiteit Gent, Belgium (Feb 25, 2022)
46. [Algebra and Combinatorics Seminar](#)  
Université Libre de Bruxelles, Belgium (Feb 17, 2022)
45. [Discrete Mathematics Seminar](#)  
UNAM Universidad Autónoma de México (Feb 04, 2022)
44. [Colloquium](#)  
George Mason University, Fairfax, VA, USA (Nov 19, 2021)
43. [MPI-MIS Networks Seminar](#)  
Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany (Nov 11, 2021)
42. [EPFL Applied Topology Seminar](#)  
EPFL, Lausanne, Switzerland (Oct 12, 2021)
41. [Algebra and Combinatorics Seminar](#)  
Université Libre de Bruxelles (Sep 16, 2021)
40. [ANT-CoG Seminar](#)  
The University of North Carolina, Greensboro, North Carolina, USA (Sep 3, 2021)
39. [TDA Seminar](#)  
The University of Tennessee, Knoxville, USA (Sep 2, 2021)
38. [GEMS of Combinatorics – Gender Equity in the Mathematical Study of Combinatorics](#)  
Virtual Event (Sep 2, 2021)
37. [CIMAT/TRIPODS 2021 Summer Conference – Session on Topological Data Analysis](#)  
CIMAT, México, and The University of Arizona, USA, virtual (Aug 2-4, 2021)
36. [G4G-CoM Gathering4Gardner Celebration of Minds Virtual Events 2021 - - - \(> Video\)](#)  
Virtual Event (June 21, 2021)
35. [37<sup>th</sup> Symposium on Computational Geometry](#)  
Virtual Online Conference, University at Buffalo, USA (June 07-11, 2021)
34. [Applied Topology in Albany \(ATiA\) Seminar](#)  
University at Albany, State University of New York, USA (May 07, 2021)

33. [Combinatorics Seminar](#)  
Dartmouth College, Hanover, New Hampshire, USA (Apr 20, 2021)
32. [What Is A Seminar](#)  
Emory University, Atlanta, Georgia, USA (Apr 8, 2021)
31. [Mathematics Colloquium](#)  
CIMAT - Center for Research in Mathematics, Guanajuato, México (Oct 28, 2020)
30. [Applied Algebraic Topology Network - - - \(> Video\)](#)  
Virtual (July 13, 2020)
29. [Women in Combinatorics Virtual Colloquium](#)  
Virtual (June 4, 2020)
28. [Applied Algebraic Topology Network](#)  
Virtual (Mar 11, 2020)
27. [Applied Topology Seminar](#)  
University of Aberdeen, Scotland, UK (Jan 29, 2020)
26. [JMM, AMS Special Session on Applied Topology](#)  
Denver, Colorado, USA (Jan 17, 2020)
25. [Topology Seminar](#)  
UC Santa Barbara, Santa Barbara, California, USA (Jan 10, 2020)
24. [Mathematics of Data and Decisions at Davis Seminar](#)  
UC DAVIS, Davis, California, USA (Nov 5, 2019)
23. [Union College Mathematics Conference](#)  
Union College, Schenectady, New York, USA (Sep 13-15, 2019)
22. [Minisymposium for SIAM AG19: From algebraic geometry to geometric topology](#)  
Universität Bern, Switzerland (July 9-13, 2019)
21. [Conference in Geometry, Topology, and Dynamics](#)  
University of Michigan, Michigan, USA (June 10-14, 2019)
20. [Statistical and Biomathematics Seminar](#)  
Göteborgs Universitet, Chalmers, Sweden (Apr 12, 2019)
19. [Discrete Mathematics and Geometry Seminar](#)  
Technische Universität Berlin, Berlin, Germany (Apr 10, 2019)
18. [Computational Topology Seminar](#)  
Technische Universität München, München, Germany (Apr 2, 2019)
17. [Topology Seminar](#)  
Colorado State University, Fort Collins, Colorado, USA (Mar 12, 2019)
16. [Pattern Analysis Lab Seminar](#)  
Colorado State University, Fort Collins, Colorado, USA (Mar 6, 2019)
15. [Topological Data Analysis Seminar](#)  
CIMAT - Center for Research in Mathematics, Guanajuato, México (Mar 1, 2019)
14. [Mathematics Colloquium](#)  
Mathematical Institute of the Serbian Academy of Sciences and Arts, Belgrade, Serbia (Dec 18, 2018)
13. [Seminar for Combinatorics, Geometry, Algebra and Topology](#)  
Mathematical Institute of the Serbian Academy of Sciences and Arts, Belgrade, Serbia (Dec 11, 2018)
12. [Topology Geometry and Data Analysis Seminar](#)  
The Ohio State University (OSU), Columbus, Ohio, USA (Oct 16, 2018)
11. [Probability and Physics Seminar](#)  
Duke University, Durham, North Carolina, USA (Oct 11, 2018)
10. [Geometry Seminar](#)  
Université Libre de Bruxelles, Belgium (Aug 13, 2018)
09. [Probability Seminar](#)  
CIMAT- Center for Research in Mathematics, Guanajuato, México (June 28, 2018)

08. [Session on TDA Applications](#)  
Colombia and México Meetings, Barranquilla, Colombia (May 30, 2018)
07. [Combinatorics Seminar](#)  
The Ohio State University (OSU), Columbus, Ohio, USA (Jan 25, 2018)
06. [Configuration Spaces Seminar](#)  
The Ohio State University (OSU), Columbus, Ohio, USA (Nov 20, 2017)
05. [Configuration Spaces Seminar](#)  
The Ohio State University (OSU), Columbus, Ohio, USA (Sep 11, 2017)
04. [Undergraduate Math Seminar](#)  
Brown University, Providence, USA (Dec 7, 2016)
03. [ICERM's Grad Student/Postdoc Seminar](#)  
Brown University, Providence, USA (Nov 20, 2016)
02. [Applied Mathematics and Scientific Computing Conference](#)  
Papaloapan, México (May 20, 2016)
01. [Combinatorics Seminar](#)  
UNAM, Juriquilla, México (Feb 9, 2016)

## Contributed Research Talks (2016 - present)

07. [G4G14 - Gathering4Gardner 14<sup>th</sup> Conference](#)  
Atlanta, Georgia, USA (Apr 6-10, 2022)
06. [QTMC Queer and Trans Mathematicians in Combinatorics Conference](#)  
The Fields Institute - online, Toronto, Canada (June 24-25, 2021)
05. [7th Bavarian Geometry and Topology Meeting](#)  
Virtual (Dec 4, 2020)
04. [XV Latin American Congress of Probability and Mathematical Statistics](#)  
Mérida, México (Dec 4, 2019)
03. [G4G13 - Gathering4Gardner 13<sup>th</sup> Conference - - - \(> Video\)](#)  
Atlanta, Georgia, USA (Apr, 2018)
02. [Graduate Student Combinatorics Conference](#)  
UT Dallas, Dallas, Texas, USA (Apr 6-8, 2018)
01. [G4G12 - Gathering4Gardner 12<sup>th</sup> Conference - - - \(> Video\)](#)  
Atlanta, Georgia, USA (Apr, 2016)

## Posters

09. [Women in Computational Topology](#)  
Australian National University, Canberra, Australia (July 1-5, 2019)
08. [Structure in the Microworld](#)  
The Ohio State University (OSU), Columbus, Ohio, USA (May 2019)
07. [Geometric Data Analysis Conference](#)  
University of Chicago, Chicago, Illinois, USA (May 2019)
06. [Multiparameter Persistent Homology Conference](#)  
Banff International Research Station, Oaxaca, México (Aug 2018)
05. [12th Annual International Scholar Research Exposition](#)  
The Ohio State University (OSU), Columbus, Ohio, USA (Nov 2017)
04. [47th Barrett Memorial Lectures](#)  
University of Tennessee, Knoxville, Tennessee, USA (May 2017)
03. [3rd TDA and Stochastic Topology Conference](#)  
UNAM, Toluca, México (Jan 2017)

02. [Topology and Geometry in a Discrete Setting Workshop](#)  
ICERM, Brown University, Providence, Rhode Island, USA (Nov 2016)
01. [Stochastic Topology and Thermodynamic Limits Workshop](#)  
ICERM, Brown University, Providence, Rhode Island, USA (Oct 2016)

## Organising

---

### Upcoming Events

- o [Geometry and Topology Special Session](#)  
[LatinX in Mathematical Sciences Conference](#)  
Institute for Pure and Applied Mathematics, UCLA California, USA (Mar 3-6, 2022 - postponed)

### Past Events

04. [Research group on Applied and Computational Geometry and Topology](#)  
Latin American and Caribbean Workshop on Mathematics and Gender  
Banff International Research Station, Casa Matemática Oaxaca, México (May 15-20, 2022)
03. [VG4G14 - 14<sup>th</sup> Gathering 4 Gardner Conference: Organiser of the Youth Initiative](#)  
Atlanta, USA (April 6-10, 2022)
02. [VIth Mexican Workshop on Geometric and Topologic Data Analysis](#)  
CIMAT, Guanajuato, GTO, México (Sept 22-28, 2021)
01. [GTDAML 2021 - Geometry and Topology meet Data Analysis and Machine Learning](#)  
Fully online graduate student conference (July 30 - Aug 1, 2021)  
(Member of the organising committee)

## Teaching & Advising

---

### Teaching

Technische Universität München (Germany)

- o [The Probabilistic Method](#) (Graduate-Seminare, Sommersemester 2021)
- o [Die Mathematik hinter Spielen und Puzzles](#) (Bachelor Workshops, Sommersemester 2021 + 2022)

George Mason University (USA)

- o [Random 3D Polyforms - Mason Experimental Geometry Lab](#) (Workshops, Spring 2022)

University at Albany (USA)

- o [The Probabilistic Method](#) (Spring 2021)

The Ohio State University (USA)

- o [Recreational Mathematics](#) (graduate and undergraduate course (4194), Fall 2019)
- o [Math for Architects](#) (undergraduate course (1118), Fall 2018 and Fall 2019)
- o [Logic gates workshop at OSU](#). (For students of the Fundamentals of Higher Mathematics course (3345) to explore and construct logic gates, January 19, 2018)

Universidad Juárez del Estado de Durango (México)

- o [Statistical Inference](#) (graduate course, Spring 2014)
- o [Sampling](#) (graduate course, Spring 2014)

CIMAT – Center for Research in Mathematics (México)

Several graduate and undergraduate courses as teaching assistant:

- o [Linear Algebra I](#) (Spring 2010)
- o [Analysis I](#) (Autumn 2009)
- o [Calculus Problem Solving Workshop](#) (July 2009, July 2012, July 2013, July 2014)
- o [Second Probability Problem Solving Workshop](#) (July 2008)
- o [Foundation Course for Master Students in Probability and Statistics](#) (Spring 2008, June 2012, Apr 2013)
- o [First Probability Problem Solving Workshop](#) (Jan 2008)

## Advising

Graduate Theses

02. [Anna Krymova](#), M.S. Mathematics in Data Science, Technical University of Munich (May 2021)  
Thesis Title: [Topology of the Plaquette Eden Model](#).  
*During her thesis, she developed the software [Homology and Geometry of the Plaquette Eden Model](#). She is now working as data engineer for [Tekaris GmbH](#).*
01. [Ana L. Trujillo N.](#), M.S. in Mathematics, Universidad Autónoma de Zacatecas (Jan 2017)  
Thesis Title: [On some parameters of Token Graphs](#).  
*She is currently studying a Ph.D. program in mathematics at the Center for Research and Advanced Studies of the National Polytechnic Institute, México.*

Undergraduate Theses

06. [Christoph Müßig](#), B.S. Mathematics, Technical University of Munich (in progress)  
Thesis title: [Developing a Game based on the Art Gallery Problem with Rook and Queen Vision](#)
05. [Iancarlo Espinosa](#), B.S. Mathematics, Universidad de Guanajuato/CIMAT (in progress)  
Thesis title: [Topological properties of some discrete geometric stochastic processes and The Game of Life](#).
04. [Froylan Hernandez A.](#), B.S. Philosophy, Universidad de Zacatecas (in progress)  
Thesis Title: [Paradox, ambiguity and contradiction in logic systems](#).
03. [Sergio Valles Q.](#), B. S. Applied Math, Universidad Juárez del Estado de Durango (UJED) (Mar 2017)  
Thesis Title: [Tessellations generated by interference patterns of mechanical and electromagnetic waves](#).  
*He is currently studying an M.S. program in statistics at Universidad Juárez del Estado de Durango.*
02. [Sergio Fernández O.](#), B.S. Applied Mathematics, UJED (June 2016)  
Thesis Title: [Analyzing the Instant Insanity puzzle with graph theory and number theory](#).
01. [Ana L. Trujillo N.](#), B.S. Applied Mathematics, UJED (July 2015)  
Thesis Title: [A structural property of planar drawings of graphs that achieve the minimum crossing number](#).



## Outreach & Education

---

### Outreach Projects (founded and co-founded)

05. [Hypothesis](#) (co-founder, project started in Jan 2020)  
With the purpose of making mathematics more accessible and universally interesting.  
Webpage: <https://hypothesisnyc.org/>
04. [Outreach and Popularization of Mathematics OSU Group](#) (founder, started in Dec 2018)  
The group is formed by undergraduate students, graduate students, and faculty to increase and develop the public awareness of mathematics and its relationship with arts, engineering, and other sciences. We design and implement workshops, talks, exhibitions, hands-on activities and other formats of popularization and outreach of mathematics related activities.  
Webpage: <https://u.osu.edu/mathoutreach/>
03. [Beyond the Classroom \(BtC\)](#) (founder, started July 2018)  
Yearly summer program for unrepresented minorities in STEAM that are middle- and high-school students who want to explore mathematics and programming beyond their high school programs. *Jointly supported by the Math Department and STEAM Factory.*  
Webpage: <https://u.osu.edu/mathoutreach/btc/>
02. [Music Math](#) (co-founder, project started in 2013)  
Learning Math and Music together. The Project has been implemented in elementary and middle schools in México, Serbia, and Estonia.  
*This project received the EAPRIL award 2019\*.*  
Webpage: <https://musicmath.mx/en/home>
01. [Matemorfosis](#) (co-founder, project started in 2011)  
Each year, thousands of Mexicans experience the excitement of mathematics thanks to Matemorfosis. Outreach initiative of Center for Research in Mathematics (CIMAT), México.  
*This year: 10<sup>th</sup> Anniversary!*

### Outreach Workshops, Talks and Exhibitions (selected)

- o [Music Math Methodology: Fractions Ensemble - Workshop for Teachers](#)  
EuroMath & EuroScience 2021 Hybrid Conference, Paphos, Cyprus (June 21-26, 2021)
- o [Music Math Methodology: Fractions Ensemble - Workshop for Highschool Students](#)  
EuroMath & EuroScience 2021 Hybrid Conference, Paphos, Cyprus (June 21-26, 2021)
- o [Recreational Mathematics is Creative Mathematics - - - \(> Video\)](#)  
(Las Matemáticas Recreativas son Matemáticas Creativas) at Workshop on the occasion of the 10<sup>th</sup> anniversary of Matemorfosis, CIMAT, México, online (Apr 2021)
- o [Creating tons of holes](#) (Creando un monton de agujeros). FundaPromat, online (Aug 2020)
- o [Hands-on Exhibition of the OSU outreach initiative BAMM](#) at COSI Science Festival, the largest annual science event in Ohio State, USA (2019)
- o [Art Gallery Problem with Rook and Queen Vision](#). Upper Arlington High School, Columbus, USA (Mar 2019)
- o [Polyominoes with Maximally Many Holes](#). Upper Arlington High School, Columbus, USA (Mar 2019)
- o [Platonic and Archimedian Solids](#). Red Oak Community School (k5 students), Columbus, USA (Feb 2019)
- o [Mathematics and Architecture](#). Kreativno Pero High School, Belgrade, Serbia (Dec 2018)
- o [Drawing Stars Polygons](#) (combinatorics). Julia Robinson Math Festival, Columbus, USA (Apr 2018)
- o [Tower of Hanoi](#). Science Summer for Middle-School Students, CIMAT, Gto., México (July 2017)
- o [Mayan arithmetic workshop](#). Given in three different high schools: Paul Cuffee School, Jacqueline M. Walsh School, and Davies Tech. Sponsored by ICERM, Brown University, Providence, USA (Dec 2016)  
*Animated videos co-created with Eric Roldán*

- o [Dominoes: a combinatorial approach](#). Network of Elementary Education Annual Meeting, Leon, México (Dec 2012)
- o [Puzzles with Dominoes](#). Science Workshop for Elementary School Students, CIMAT, Gto., México (Oct 2012)
- o [Mathematics and Magic Show](#). Mathematical Festival, México City, México (Feb 2012)
- o [Prime numbers and Goldbach conjecture](#). Three-day workshop at Benito Juárez Middle School, Gto., México (Jan 2012)
- o [Shongos: a graph theoretic approach](#). Three-day workshop at Benito Juárez Middle School, Gto., México (Sep 2011)

## Media: Interviews and Articles

- o [Kevin Knudson & Evelyn Lamb: My favourite Theoreme - - - \(> Podcast\)](#)  
Podcast Episode 66: Érika Roldán (May 15, 2021)
- o [The Dancing Mathematician: Interview by Rafaella Mulas - - - \(> Video\)](#)  
Hosted by Madd Maths Youtube Channel (Feb 26, 2021)
- o [Outreach group aims to inspire mathematical interest - - - \(> Article\)](#)  
College News - College of Arts and Sciences @ Ohio State University (Nov 20, 2019)
- o [Mathematics outreach program teaches youth about the joy of maths - - - \(> Article\)](#)  
College News - College of Arts and Sciences @ Ohio State University (Apr 23, 2019)
- o [Faculty Spotlight: Érika Roldán Roa - - - \(> Article\)](#)  
OSU Mathematics Newsletter @ Ohio State University (Spring 2019)

## Coding, CAD, and Dital Art Projects

---

*I use coding in my research, for computational experiments, simulations, data analysis, mathematical modelling, and also for art related projects, game development, and as an educational and outreach resource.*

Coding Skills: SAGE, Python, R, Matlab, Sonic-Pi, C#, Java, JavaS, HTML, CSS

Note: Software development for research can be found under: Publications & Preprints > Software

### App Development

----- [Java, JavaS, HTML, CSS]

- o Polyominoes with Maximally many Holes
- o Topology and Geometry of the Eden Growth Model

### Microcontrollers & Internet of Things

----- [Arduino, Raspberry Pi, micro:bit, Gamebuino]

- o [Logic gates workshop](#): designed and implemented a workshop for undergraduate students using electronic gadgets given at:
  - o Fundamentals of Higher Mathematics course (3345) for students, OSU (Jan 2018)
  - o Training sessions for the National Logic Olympiad at Universidad Autonoma de Zacatecas, México (2016 and 2017)

## Game Development & Digital Arts

----- [Unity (coding in C#)]

- "Broken Brecht" Film, directed and produced by [Caroline Kapp](#) and Manon Haase, for the Brechtfestival Augsburg, Germany (Mar 2021)

*My first game with Unity was developed for the Film.*

- [Art Gallery Problem with Rook and Queen Vision](#)  
Bachelor Thesis Christoph Müßig, Technische Universität München (in progress)

## Computer-aided Design and 3D Printing

----- [Maya with Python, Marmoset, Blender, Slinder]

- *Have a look at a selected collection of my 3D models on [Scetchfab!](#)*

## Exhibitions and Collections

- [Curated outreach poster collection](#). Design together with Eric Roldán and the Outreach Initiative team at OSU. Open source: You can download and print the posters for free use [here](#).

## Memberships

---

- [Gathering4Gardner Foundation](#) - Advisory Council
- [Spectra in Math](#) - The Association for LGBTQ+ Mathematicians
- [Women in Probability](#)
- [Women in Computational Topology \(WinComTop\) Network](#)
- [Applied Algebraic Topology Research Network](#)
- [Women in Combinatorics Network](#)
- [Mexican Mathematical Society \(SMM - Sociedad Matemática Mexicana\)](#)
- [Sociedad Latinoamericana de Probabilidad y Estadística Matemática \(SLAPEM-S.BERNOULLI\)](#)

## Refereeing

---

- [Games of No Chance 5](#), MSRI publications, Cambridge University Press, Cambridge.
- [Random Structures and Algorithms](#), Wiley Periodicals LLC.
- [Israel Science Foundation](#) (grant reviewer)

## Languages

---

- [English](#) (fluent)
- [French](#) (intermediate level)
- [German](#) (intermediate level)
- [Japanese](#) (basic level)
- [Spanish](#) (native language)