Dr. Gerardo Hernández-Dueñas

CONTACT INFORMATION	*Work Address* : National Autonomous University of Mexico Institute of Mathematics UNAM - Juriquilla, Queretaro, Mexico Avenida Juriquilla 3001 Juriquilla, Queretaro, Mexico	*Office Phone:* (52) 442-192-6283 Ext. 302 *Email:* hernandez at im dot unam dot mx *Website:* https://paginas.matem.unam.mx/gerardo/

CITIZENSHIP: Mexican

RESEARCH INTERESTS

Applied Mathematics to Atmospheric Sciences
Turbulence: Theory, Numerics and Computations
Numerical Methods for Hyperbolic Conservation Laws
Geophysical Fluid Dynamics
Semiclassical Analysis

PRESENT POSITION National Autonomous University of Mexico- Juriquilla   Since June, 2014
Institute of Mathematics
Associate Professor

PREVIOUS POSITION University of Wisconsin - Madison   June, 2011 - May 2014
Department of Mathematics
Postdoctoral Fellow
Van Vleck Visiting Assistant Professor

EDUCATION

University of Michigan   April 21, 2011
Ph.D in Mathematics, Rackham Graduate School, Ann Arbor, Michigan.
Thesis title:
Numerical Methods for Porous Media and Shallow Water Flows & An Algebra of
Singular Semiclassical Pseudodifferential Operators
- Advisor in pure mathematics: Professor Alejandro Uribe
Email: uribe at umich dot edu
- Advisor in applied mathematics: Professor Smadar Karni
Email: (karni at umich dot edu)

**University of Guanajuato and
CIMAT (Research Center in Mathematics)**   Aug. 2000 - July 2005
Bachelors Degree in Mathematics: GPA 9.8 / 10.
Guanajuato, Mexico
-Advisor: Xavier Gomez-Mont
Email: gmont at cimat dot mx

OTHER ACADEMIC POSITIONS

- **SIAM Committee on Section Activities**   2024-2026.
  Purpose: Review policy matters related to sections, to assist in overseeing section activities, and to make recommendations to the Board on matters pertaining to sections.

- **SIAM Activity Group Secretary**   2023-2024.
  Secretary of the SIAM Activity Group "Mathematics of Planet Earth Community".

- **SIAM Student Chapter at UNAM**   2021-present
  I participate as the Faculty Adviser together with Dr. Raul Esquivel of the
  first set of officers of the SIAM Student Chapter at UNAM.

- **MexSIAM**   July 1st, 2018 - December 31st, 2021
  President of the Mexico Section of the Society for Industrial and Applied
  Mathematics in the period 2018 - 2021. SIAM was founded in 1951 and has
  more than 11,000 members. The Mexico Section has more than 130 members
  and there are 14 Sections around the world.
  WebPage: http://www.mexsiam.org

Agreements

- UNAM-SIAM Agreement   2019-2024

  As President of MexSIAM, we are negotiating an agreement between UNAM
  and SIAM to organize academic activities in Applied Mathematics.

Undergraduate Academic Programs

- Undergraduate Academic Program in Applied Mathematics at the National
  School for Higher Education ENES-Juriquilla   2019

  Committee member for the creation of the undergraduate program in Applied Mathematics at the Escuela Nacional de Estudios Superiores (ENES) in
  Juriquilla.

Honors

5. **PRIDE C**   January 1, 2020
   Level C at the Bonuses Program for the Academic Personnel Performance
   (PRIDE)

4. **Associate Professorship**   September 26, 2019
   Instituto de Matemáticas - UNAM

3. **Associate Professorship Level A**   August 9, 2018
   Instituto de Matemáticas - UNAM

2. **SNI - Level I**   2017 - Present
   Member of the National (Mexican) System of Researchers

1. **SNI - Nivel I**   2014 - 2016
   Member of the National (Mexican) System of Researchers

and Awards

4. **Youth Prize 2011 in the Academic Category**   Oct. 2011
   Secretaria de la Juventud, Colima. Colima, Col.

3. **Medal for best GPA (9.76/10) of the class of 2005.**   Nov. 2005
   University of Guanajuato, Mexico

2. **Medal for Academic Excellence**   Oct. 2000
   "Ing. Arq. Rodolfo Chávez Carrillo" (GPA 10.0 / 10)
   University of Colima, Mexico.

1. **2nd Place at National Contest, Mexican Mathematics Olympiad**
   Mexican Mathematical Society   Nov. 1999

5. **Teacher recognition - Universidad Privada del Norte - Perú.**
September 28th, 2023.
Dr. Nestor A. Sánchez Goycochea has received this prize for his teaching performance.

4. **SIAM Award - Student Chapter UNAM** March 25, 2022
The student César A. Rosales-Alcantar received an award in recognition of outstanding efforts and accomplishments on behalf of the SIAM Chapter at UNAM. Academic year 2021-2022. Awarded by the Society for Industrial and Applied Mathematics. Signed by the President Susanne C. Brenner and the Executive Director Suzanne L. Weekes.

3. **Award University of Sonora for the Student Academic Achievements**
October 12, 2021
The student David Peña Peralta from the University of Sonora received this award for his academic achievements as a student in the Undergraduate Program in Mathematics. David is working in his undergraduate thesis under my supervision.

2. **Competition: Math Modelling Challenge** September 27, 2019
The student Cesar Rosales Alcantar participated in the competition "Math Modelling Challenge" organized by the Colombia and Mexico Sections of SIAM, where the topic was "The Blue Economy". The competition consisted of solving a problem using mathematics and modelling and the time limit was 10 hours. The event was presented by Gunter Pauli (author of "The Blue Economy") from Japan. In total, 27 teams participated from 13 Universities from both countries. The winner team in the graduate category was the Queretaro team. The team members were Ruth Corona, Elkinn Calderon, Eddel Ojeda and Cesar Rosales. More details at https://mexsiam.org/concursos .

1. **Honorific mention in the Mixbaal award- Best undergraduate thesis in Applied Mathematics** August 27, 2018
The student Olmo Guerrero Medina received an honorific mention at the Mixbaal award for the best thesis in Applied Mathematics. This awards is given by the Mexican Society for Scientific Computing and its Applications (SMCCA).

5. **Mathematical modelling and numerical analysis in fluid dynamics**
Research project: DGAPA-PAPIIT-UNAM IN112222
Period: January 2022 - December 2024.

4. **Inverse and direct problems in Partial Differential Equations**
Research project Conacyt-Sep A1-S-17634
Period: 2018 - 2021

3. **Modelling blood flows and geophysical flows**
Research project: DGAPA-PAPIIT-UNAM IN113019
Period: January 2019 - December 2021.

2. **Convective Instabilities and Hyperbolic Conservation Laws**
Research project: DGAPA-PAPIIT-UNAM IA103015
Period: January 2017 - December 2018

1. **Numerical analysis for hyperbolic conservation laws and geophysical flows**
Research project: DGAPA-PAPIIT-UNAM IA104517
Period: January 2015 - December 2016

PARTICIPATION IN
OTHER GRANTS

1. **NSF Grant Collaborative Research: Global estimates of energy pathways and stirring by internal waves and vortical mode** Period: 2021 - 2024
Participation consisting of visiting the research group at NorthWest Research Associates to collaborate in topics related to horizontal diffusivity in the ocean. It includes a sabbatical visit.

EDITED BOOKS:

1. G- Hernandez-Duenas & M. A. Moreles. **Mathematical and Computational Models of Flows and Waves in Geophysics**. *Springer (Book)* **(1)**, pp 1-195 (2022).
https://doi.org/10.1007/978-3-031-12007-7

PUBLISHED PAPERS

20. N. A. Sánchez-Goycochea & G.- Hernández-Dueñas. **Global well-posedness of a model for precipitating convection with hydrostatic pressure under fast autoconversion and rain evaporation conditions.** Journal of Mathematical Analysis and Applications, **1** (2024), pp. 39.
https://doi.org/10.1016/j.jmaa.2024.128132

19. C. Blachut, C. González-Tokman & G.- Hernández-Dueñas. **A patch in time saves nine: Methods for the identification of localised dynamical behaviour and lifespans of coherent structures.** Journal of Nonlinear Science, **(33)-4** (2023), pp. 1.32. https://doi.org/10.1007/s00332-023-09911-3

18. C.A. Rosales-Alcantar & G.- Hernández-Dueñas. **A new two-dimensional blood flow model with arbitrary cross sections** *ESAIM: Mathematical Modeling and Numerical Analysis*, **(57)-3**, (2023), pp. 1657 - 1690.
https://doi.org/10.1051/m2an/2023030

17. G. Hernandez-Duenas, M.A. Moreles & P. Gonzalez-Casanova **Bathymetry and friction estimation from transient velocity data for one-dimensional shallow water flows in open channels with varying width.** Physics of Fluids, **(35)-2**, 2023. **Editor's Pick**.

16. G. Hernandez-Duenas, S. Pérez-Esteva, A. Uribe & C. Villegas-Blass. **Perturbations of the Landau Hamiltonian: Asymptotics of Eigenvalue Clusters.** *Ann. Henri Poincaré*, **23**, pp 361-391 (2022).
https://doi.org/10.1007/s00023-021-01092-7

15. G- Hernandez-Duenas, P. Lelong & L. Smith. **Impact of wave-vortical interactions on oceanic submesoscale lateral dispersion**. *Journal of Physical Oceanography* **(51)-11**, pp 3495–3511 (2021) . https://doi.org/10.1175/JPO-D-20-0299.1

14. G. Hernandez-Duenas & J. Balbas. **A central-upwind scheme for two-layer shallow-water flows with friction and entrainment along channels**. *ESAIM: Mathematical Modeling and Numerical Analysis*, **(55)-5**, (2021), pp. 2185-2210. https://doi.org/10.1051/m2an/2021052

13. G. Hernandez-Duenas and G. Ramirez-Santiago. **A well-balanced positivity-preserving central-upwind scheme for one-dimensional blood-flow models.** *International Journal for NumericalMethods in Fluids* (2020).

12. G. Hernandez-Duenas, S. Stechmann and L. Smith. **Weak- and Strong-Friction Limits of Parcel Models: Comparisons and Stochastic Convective Initiation Time.** *Quarterly Journal of the Royal Meteorological Society.* Volume 145, No. 722, pp 2272-2291 (2019).

11. G. Hernandez-Duenas, Ulises Velasco-García and Jorge Velasco Hernández. **A positivity-preserving central-upwind scheme for isentropic two-phase flows through deviated pipes**. *ESAIM: Mathematical Modelling and Numerical Analysis* (2019).

10. G. Hernandez-Duenas. **A Hybrid Method to Solve Shallow Water Flows with Horizontal Density Gradients**. *Journal of Scientific Computing*(2017), Volume 73 (2-3) pp 753-782.

9. G. Hernandez-Duenas and A. Beljadid. A central-upwind scheme with artificial viscosity for shallow-water flows in channels. **A central-upwind scheme with artificial viscosity for shallow-water flows in channels.** *Advances in Water Resources*, Volume 96 (2016) 323-338.

8. G. Hernandez-Duenas, L.M. Smith, and S. N. Stechmann. **Stability and instability criteria for idealized precipitating hydrodynamics**, *Journal of Atmospheric Sciences*, Vol 72, No. 6 (2015), pp. 2379-2393

7. G. Hernandez-Duenas and A. Uribe. **Algebras of semiclassical pseudodifferential operators associated with Zoll-type domains in cotangent bundles** *Journal of Functional Analysis*, 268, number 7, (2015) 1755-1807.

6. G. Hernandez-Duenas, L. M. Smith, and S. N. Stechmann. **Investigation of Boussinesq dynamics using intermediate models based on wave-vortical interactions.** *Journal of Fluid Mechanics*, 747, (2014) 247-287

5. J. Balbás and G. Hernandez-Duenas. **A positivity preserving central scheme for shallow water flows in channels with wet-dry states**. *ESAIM: Mathematical Modelling and Numerical Analysis*, Volume 48 (2014), number 3, p 665-696.

4. G. Hernandez-Duenas, A. J. Majda, L. M. Smith, and S. N. Stechmann. **Minimal Models for Precipitating Turbulent Convection** , *Journal of Fluid Mechanics*, 717, (2013) 576-611.

3. G. Hernandez-Duenas and S. Karni. **Shallow Water Flows in Channels**. *Journal of Scientific Computing.* 48 (2011), no. 1-3, p 190-208.

2. S. Karni and G. Hernandez-Duenas. **A Hybrid Algorithm for the Baer-Nunziato Model Using the Riemann Invariants**. *Journal of Scientific Computing*, 45, (2010), p 382-403.

1. S. Karni and G. Hernandez-Duenas. **A Hybrid Scheme for Flows in Porous Media**. *Hyperbolic Problems: Theory, Numerics, Applications.* Proceedings of Simposia in Applied Mathematics, Volume 67, Part 2, (2009), p 715-724. *Amer. Math. Soc., Providence, RI, (2009).*

EXTENDED ABSTRACTS:

1. S. Karni and G. Hernández-Dueñas. **A Scheme for Shallow Water Flow with Area Variation**. *American Institute of Physics.* AIP Conference Proceedings, International Conference on Numerical Analysis and Applied Mathematics, Rethymno, Crete, Greece, 18-22 September 2009. **1168** (2009), p 1433-1436.

SUBMITTED PAPERS

2. Néstor A. Sánchez-Goycochea & G.- Hernandez-Duenas. **Global well-posedness of a model for precipitating convection with hydrostatic pressure under fast autoconversion and rain evaporation conditions.**

1. S. Shah & G.- Hernandez-Duenas. **A weakly-compressible two-layer shallow water model in general channels.**

3. Jeffrey J. Early, Gerardo Hernández-Dueñas, Leslie M. Smith & M.-Pascale Lelong. **Exact expressions for available potential energy and available potential vorticity**

2. O. Guerrero-Medina & G. Hernandez-Dueñas. **Exploring the excess of cloud condensation nuclei and rain suppression using a minimal 3D Boussinesq model with bulk cloud microphysics**

1. N. Sanchez & G.- Hernandez-Duenas. **Global well-posedness for a minimal model for precipitating turbulent convection.**

3. Dra. Sarswati Shah   March 1, 2022 - February 29, 2024
   Project: Two-layer shallow water flows with bottom topography

2. Nestor Abel Sánchez Goycochea   October 1, 2021 - September 30, 2022
   Project: Regularity problems in Geophysical models

1. Ulises Velasco García   February 2017 - February 2019
   Project: Numerical analysis and modelling in hyperbolic conservation laws and geophysical fluid dynamics

Master thesis in progress:

1. Peña Peralta, David
   Master in Mathematics.
   Universidad de Sonora.
   Thesis: Modelo estocástico para propagación de aerosoles en la atmósfera

PhD Thesis:

1. César Rosales Alcantar.   Mrch 31 , 2023
   Posgrado en Ciencias Matemáticas.
   Title: A new two-dimensional blood flow model with arbitrary cross sections & Generalized Quasi-geostrophy for moist spatially anisotropic atmospheric flows with phase change

Master Thesis:

1. José Alfonso Cabrera Sánchez.   October 13, 2023
   Posgrado en Ciencias Matemáticas - UNAM.
   Title: Gas-liquid flows in pipes with general cross sections.

Undergraduate Thesis:

7. Guillermo Alberto Jimenez Frías   July 4 , 2023.
   Undergraduate Program in Mathematics
   University of Guanajuato
   Thesis: A central-upwind scheme for the shallow water equations with density gradients.

6. Peña Peralta, David   December 15 , 2022.
   Undergraduate Program in Mathematics.
   University of Sonora.
   Thesis: Analysis of atmospheric instabilities through stochastic equations.

5. Llaca Sánchez, Brandon Alejandro   January 17 , 2022
   Undergraduate Program in Applied Mathematics.
   Autonomous University of Queretaro
   Thesis: A kinetic numerical scheme for PDEs to model blood flows

4. Brito Interiano, Rodrigo   September , 2021
   Undergraduate Program in Applied Physics and Advanced Technology, UNAM-Juriquilla
   Thesis: "Método numérico central robusto para un modelo de flujo sanguíneo".

3. Flores Mandujano, Verónica   November 10, 2017
   State University of Queretaro.
   Thesis: "Teoría de la parcela de fluidos para el estudio de inestabilidades atmosféricas y distribución de alturas de nubes".

2. Guerrero Medina, Olmo.   June 16, 2017
   Multidisciplinary Unit for Teaching and Research - UNAM Juriquilla
   Thesis: "Exploración numérica sobre el impacto del exceso de núcleos de condensación en la cantidad de lluvia".

1. Claudia Guzmán Guzmán   December 14, 2018
   State University of Queretaro.
   Thesis: "Teoría de Columnas de Fluido para el Desencadenamiento de Convección Atmosférica".

RESEARCH VISITS
TO OTHER
INSTITUTIONS

5. **Sabbatical Visit**   Junio 1 2022 - Mayo 31, 2023
   NorthWest Research Associates
   Additional visit: December 10-14, 2023
   Seattle Washington, USA

4. **IPAM Workshop "Computational Issues in Oil Field Application"**
   Institute for Pure and Applied Mathematics   March 21 - June 9, 2017
   University of California, Los Angeles

3. **NorthWest Research Associates**
   Seattle, Washington   November 20-26, 2019

2. **NorthWest Research Associates**
   Seattle, Washington   November 24-30, 2018

1. **NorthWest Research Associates**
   Seattle, Washington   November, 2017

INVITED
PROFESSORS:

"Sabatical visit of Dr. Arturo Quintanar"   December 1st - May 31, 2020
Project: "Comportamiento multi-scalar de la precipitación en el Valle de México"
Atmospheric Science Center, UNAM
Mexico City

"The TWAS-UNESCO Associateship Scheme"   June 1st - August 31, 2017
Magnetohydrydynamic Peristaltic Transport for non-Newtonian Fluids
Dr. Sara Abdelsalam
The British University of Egypt
Egypt

Editor of Special Issues	3. Invited Co-editor invitado in the special issue "Festschrift on the occasion of the 80th anniversary of the Mathematics Institute of the National Autonomous University of Mexico - UNAM" in Boletín de la Sociedad Matemática Mexicana - Springer. Co-editors: Lara Bossinger, Adrián González-Casanova, Gerardo Hernández Dueñas, Lucía López de Medrano y Juan José Montellano. To be published in 2023.

2. Editors of the book "Mathematical and computational models of flows and waves in Geophysics" in the series "Lecture notes in mathematics sciences" de Birkhauser (2021). In collaboration with Dr. Miguel Angel Moreles. Published in November 2022.

1. Special issue "Modelling and Numerical Simulations with Differential Equations in Biophysics and Engineering" in the Journal *Mathematical Biosciences and Engineering* (2020). In collaboration with Dr. Esteban Hernandez Vargas.

28. International Journal for Numerical Methods in Fluids (2023)

27. Journal of Fluid Mechanics (2023)

26. Physics of Fluids (2023). Two papers reviewed.

25. Numerical Methods for Partial Differential Equations (2023)

24. International Journal of Numerical Analysis and Modeling (2023)

23. Journal of Atmospheric Sciences (2023).

22. Libro de Modelación Matemática, La Universidad Tecnológica de la Mixteca (2023).

21. Journal of Scientific Computing (2022).

20. Journal of Atmospheric Sciences (2022).

19. Journal of Computational Physics: X (2022).

18. SIAM Journal on Scientific Computing (2021)

17. Research in the Mathematical Sciences (2021)

16. Mathematics and Computers in Simulation (2021)

15. Research in the Mathematical Sciences (2020)

14. Boletín de la Sociedad Matemática Mexicana (2020)

13. Mathematics of Climate and Weather Forecasting (2020)

12. International Journal for Numerical Methods in Fluids (2020)

11. Mathematics of Climate and Weather Forecasting (2020)

10. Acta Applicandae Mathematicae

9. Applied Mathematics and Computation (2021)

8. Boletín de la Sociedad Matemática Mexicana

7. Computer Methods in Applied Mechanics and Engineering

6. Computational and Applied Mathematics

5. Journal of Hydraulic Engineering

4. Miscelánea Matemática, Sociedad Matemática Mexicana

3. Memorias de la "3rd International Conference on Mathematical Modelling", CIMM 2018

2. Memorias de la "4rd International Conference on Mathematical Modelling", CIMM 2021

1. Mathematics of Climate and Weather Forecasting

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MATHSCINET
REVIEWS

19. High-order accurate well-balanced energy stable adaptive moving mesh finite difference schemes for the shallow water equations with non-flat bottom topography (2023)

18. Conservative invariant finite-difference schemes for the modified shallow water equations in Lagrangian coordinates (2023)

17. A priori subcell limiting approach for the FR/CPR method on unstructured meshes.

16. Numerical analysis of fractional viscoelastic fluid problem solved by finite difference scheme (2022).

15. MathRev: On the shape of air-liquid interfaces with surface tension that bound rigidly rotating liquids in partially filled containers (2022).

14. MathRev: An efficient phase-field method for turbulent multiphase flows.

13. MathRev: An adaptive difference scheme for parabolic delay differential equation with discontinuous coefficients and interior layers (2021)

12. MathRev: On the Relation between Enhanced Dissipation Timescales and Mixing Rates (2021)

11. MathRev: Lax-Wendroff methods on highly non-uniform meshes. Dedicated to the Memory of Blair Swartz (1932–2019) (2021)

10. MathRev: Stability of semi-Lagrangian schemes of arbitrary odd degree under constant and variable advection speed

9. MathRev: A high-order compact scheme for solving the 2D steady incompressible Navier-Stokes equations in general curvilinear coordinates

8. MathRev : Bi-fidelity approximation for uncertainty quantification and sensitivity analysis of irradiated particle-laden turbulence

7. MathRev : Vortices in stably-stratified rapidly rotating Boussinesq convection

6. MathRev : Convergence analysis of the finite difference ADI scheme for variable coefficient parabolic problems with nonzero Dirichlet boundary conditions

5. MathRev : A second-order energy stable backward differentiation formula method for the epitaxial thin film equation with slope selection

4. MathRev : Entropy stability and the no-slip wall boundary condition

3. MathRev: Numerical study of an anisotropic Vlasov equation arising in Plasma Physics

2. MathRev: Spurious solutions for the advection-diffusion equation using wide stencils for approximating the second derivative

1. MathRev: Fine structures for the solutions of the two-dimensional Riemann problems by high-order WENO schemes

2. **The Mathematics of Layers and Interfases**
Participant
November 8-13, 2015
Casa Matemática Oaxaca (CMO)
BIRS Workshop

1. **Modern algorithm techniques in computer science for big data**
Participant
August 3-7, 2015
Infotec
Mexico, D.F.

4. **MexSIAM Special Session at the en National School in Optimization and Numerical Analysis, ENOAN 2019**   August 26 - 30, 2019
Consejo Zacatecano de Ciencia, Tecnología e Innovación

3. **Mini-simposio en el International Congress on Industrial and Applied Mathematics**   July 14-19, 2019
Tres mini-sesiones
Co-organizadores:
Pedro Gonzalez-Casanova (Imate), Miguel Angel Moreles (Cimat), Héctor Juarez (UAM), Gerardo Hernandez Dueñas (Imate)
Conference: Two-layer blood flows through axi-symmetric vessels

2. **First Joint International Meeting of the Israel Mathematical Union and the Mexican Mathematical Society**   September 7-11, 2015
Oaxaca, Mexico
Special Session: Numerical Analysis
Session Organizers: Alexander Kurganov, Alina Chertock, Gerardo Hernandez-Duenas.

1. **Mathematics and Modelling in Geophysical Fluid Dynamics**
Special Session at the Mathematical Congress of the Americas   August 5-6 2013
Co-organizers:
Paul Milewski (U. Bath), Esteban Tabak (MIT), Pedro Leite Silva Dias (U. São Paulo)

17. **Joint Colloquium of Applied Mathematics**   Bimonthly, 2021
Co-organized by MexSIAM, SMM, SMCCA, AME, and SMIO
Coordinan:
Antonio Capella (Instituto de Matemáticas, UNAM)
Miguel Angel Moreles (Centro de Investigación en Matemáticas)
Leticia Ramírez (Cimat)
Yasmín Ríos (Tecnológico de Monterrey)
María Luisa Sandoval (Universidad Autónoma Metropolitana - Iztapalapa)

16. **CMO-BIRS Workshop: Bound-preserving space and time discretizations for convection-dominated problems**   August 22- 27, 2021
Co-organizers: Manuel Quezada de Luna,
Gerardo Hernandez-Duenas,
Tzanio Kolev, Dmitri Kuzmin
Conference: "Two-layer Shallow-water Flows along Channels with Arbitrary Geometry"

15. **XXIX ENOAN** August 2 - 4, 2021
Faculty of Science, UNAM
Co-organization of the MexSIAM Special Session

14. **MexSIAM Annual Meeting** June 21 - 23, 2021
Mexican Research Center in Mathematics
Co-organizaers MexSIAM: Miguel Angel Moreles (Cimat), Jorge Velasco (Imate), Irma García (UAdeC), Daniel Olmos (UniSon), Gerardo Hernandez-Duenas
More than 140 participants, 94 contributed talks + 6 plenary talks + 12 poster presentations
Conference: Bathymetry and friction estimation from transient velocity data for 1D shallow water flows in open channels with varying width
Conference: Oceanic Sub-mesoscale Wave-Vortical Interactions and Their Effect on Scalar Transport

13. **MexSIAM Annual Meeting** December 9 - 11, 2020
Center for Scientific Research and Graduate Studies in Ensenada, Baja California (Cicese) Co-organizaers MexSIAM: Jorge Velasco (Imate), Irma García (UAdeC), Daniel Olmos (UniSon), Gerardo Hernandez-Duenas
Local co-organizers Selene Solorza (UABC, Cicese), Jonas De Basabe (Cicese)
90 participants, 61 talks + 10 poster presentations

12. **Math Modelling Challenge Colombia - Mexico** September 26 - 27, 2019 MexSIAM & CoSIAM
Different locations in Mexico and Colombia

11. **Workshop on Uncertainty Quantification in Science and Engineering - GUQ2019** January 21 - 25, 2019 Cimat & UNAM
Querétaro, Qro.
Co-organizers:
Tan Bui (Institute for Computational Engineering and Sciences, The University of Texas at Austin)
Antonio Capella (IMATE-UNAM C.U.)
Marcos Capistrán (CIMAT)
Andrés Christen (CIMAT)
Eduardo Gutiérrez-Peña (IIMAS-UNAM C.U.)
Gerardo Hernandez Dueñas, Imate-Juriquilla

10. **VIII Summer School in Mathematics.** July 22 - 27, 2018 Institute of Mathematics, National University of Mexico
Co-organizadores:
Gerardo Hernández Dueñas
Johnny Guzmán, Brown University, Division of Applied Mathematics
Abner Salgado, University of Tennessee, Knoxville

9. **VII Summer School in Mathematics**
Institute of Mathematics, National University of Mexico
Co-organizadores: July 23 - July 28 2017
Jorge Velasco Hernandez, Marco Tulio Angulo

8. **VI Summer School in Mathematics**
Institute of Mathematics, National University of Mexico
Juriquilla, Querétaro, June 12 - June 17 2016
Co-organizers: Gabriel Ruiz , Gerardo Hernandez-Duenas.

7. **3rd International Conference on Mathematical Modelling, CIMM 2018** September 4-6, 2018 Participación como miembro del Comité Científico
Oaxaca

6. **Student seminar** 2018
Co-organizer: Cesar Alberto Rosales Alcantar

5. **CMO-BIRS Workshop: Numerical Analysis of Coupled and Multi-Physics Problems with Dynamic Interfaces** July 29- August 3, 2018
Co-organizers: Johnny Guzman, Brown University, Division of Applied Mathematics
Maxim Olshanskii, Department of Mathematics, University of Houston
Conference: "Water vapour and rain dynamics in precipitating turbulent convection"

4. **Seminario de Matemáticas Aplicadas** since 2017
Co-organizer: Jorge Velasco Hernandez

3. **National Conference for Young Mathematicians ENJIM 2015**
Co-organizers:
Miguel Arturo Ballesteros Montero - IIMAS Nov. 30 - Dec. 4 2015
Noe Bárcenas Torres - CCM
Manuel Domínguez de la Iglesia - IMATE
Gerardo Hernández Dueñas - IMATE
Daniel Labardini Fragoso - IMATE
Adriana Ortiz Rodríguez - IMATE
José Luis Angel Pérez Garmendia - CIMAT
Pablo Suárez Serrato - IMATE

2. **V Summer School in Mathematics** June 28 - July 3 2015
Institute of Mathematics, National University of Mexico
Juriquilla, Querétaro, June 28 -
July 3 2015 Co-organizers: Amanda Montejano, Adolfo Magaldi-Hermosillo, Gabriel Ruiz, Maribel Hernandez, Gerardo Hernandez-Duenas.

1. **Queretaro Colloquium**
Co-organizers: Gabriela Araujo, Gerardo Hernandez-Duenas (2015 - June 30 2020)

<small>TEACHING EXPERIENCE</small>

32. **Introduction to the Mechanics of Continuous Media** January - June 2022
Graduate Program in Mathematics, UNAM
National Autonomous University of Mexico

31. **Numerical Solutions of Partial Differential Equations (Methods in Finite Differences)** August - December 2021
Graduate Program in Mathematics, UNAM
National Autonomous University of Mexico

30. **Numerical Solutions of Ordinary Differential Equations I** February - June 2021
Graduate Program in Mathematics, UNAM
National Autonomous University of Mexico

29. **Terminal VI: Numerical Simulations (54 hours)** July - December 2020
Autonomous University of Queretaro
Faculty of Engineering
Undergraduate Program in Applied Mathematics

28. **Workshop on Numerical Modelling (96 hours)** September 2020 - January 2021
National University of Mexico

Faculty of Sciences
Undergraduate Program in Earth Sciences

27. **Terminal IV: Numerical Simulations**   January - June 2020
Autonomous University of Queretaro
Faculty of Engineering
Undergraduate Program in Applied Mathematics

26. **Real analysis**   January - June 2020
Graduate Program in Mathematics, UNAM
National Autonomous University of Mexico

25. **Partial Differential Equations**   August - December 2019
Master Program in Mathematics
National Autonomous University of Mexico

24. **Calculus II**   January - June 2019
Undergraduate Program in Technology
Escuela Nacional de Estudios Superiores
National Autonomous University of Mexico

23. **Ordinary Differential Equations**   August - December 2018
Master Program in Mathematics
National Autonomous University of Mexico

22. **Complex Analysis I**   January - June 2018
Master Program in Mathematics
National Autonomous University of Mexico

21. **Real Analysis I**   August - December 2017
Master Program in Mathematics
Universidad Nacional Autónoma de México
Curso de maestría

20. **Mathematical principles for material sciences** August - December 2017
Master Program for Material Sciences
Center for Applied Physics and Advanced Technology
National University of Mexico

19. **Terminal IV (Numerical simulations)**   July - November 2017
Undergraduate Studies in Applied Mathematics
Engineering School
State University of Queretaro

18. **Terminal IV (Numerical simulations)**   July - November 2016
Undergraduate Studies in Applied Mathematics
Engineering School
State University of Queretaro

17. **Workshop: Modelling of Complex Environmental Systems**
Undergraduate Studies in Earth Sciences   August - December 2016
Multidisciplinary Unit for Teaching and Research
National University of Mexico, Campus Juriquilla

16. **Terminal III (Numerical simulations)**   January - June 2016
Undergraduate Studies in Applied Mathematics
Engineering School
State University of Queretaro

15. **Workshop: Modelling of Complex Environmental Systems**
Undergraduate Studies in Earth Sciences   February - May 2016
Multidisciplinary Unit for Teaching and Research
National University of Mexico, Campus Juriquilla

14. **Selected Topics in Computer Science** January - May 2015
Undergraduate Studies in Technology
Center for Applied Physics and Advanced Technology
National University of Mexico

13. **Calculus II** January - May 2015
Undergraduate Studies in Technology
Center for Applied Physics and Advanced Technology
National University of Mexico

12. **Mathematics III - Earth Sciences** Sept. - Dec. 2014
Undergraduate Studies in Earth Sciences February - May 2016
Multidisciplinary Unit for Teaching and Research
National University of Mexico, Campus Juriquilla

11. **Ordinary Differential Equations** January - May 2014
University of Wisconsin - Madison
Undergraduate course
Coordinator: Fabian Waleffe *email:* waleffe at math dot wisc dot edu

10. **Applied Mathematical Analysis** January 2013 - April 2013
University of Wisconsin - Madison
Undergraduate course
Coordinator: Fabian Waleffe *email:* waleffe at math dot wisc dot edu

9. **Differential Equations and Linear Algebra** January 2012 - April 2012
University of Wisconsin - Madison
Undergraduate course
Coordinator: Leslie M. Smith *email:* lsmith at math dot wisc dot edu

8. **Graduate Student Instructor (GSI)** January 2011 - April 2011
University of Michigan, Ann Arbor, Michigan.
Calculus I (Primary instructor), Math 115 Section 011
20 weekly hours.
Coordinator: Paul Kessenich *email:* paulkess at umich dot edu

7. **Graduate Student Instructor (GSI)** Sept. 2010 - December 2010
University of Michigan, Ann Arbor, Michigan.
Pre calculus (Primary instructor), Math 105 Section 001
20 weekly hours.
Coordinator: Angela Kubena *email:* akubena at umich dot edu

6. **Teaching Assistant** January 2010 - April 2010
University of Michigan, Ann Arbor, Michigan.
Four weekly hours. Graded the problem sets for
Numerical Methods for Computing Science II.
Professor: Divakar Viswanath *email:* divakar at umich dot edu

5. **Course Assistant** September 2009 - December 2009
University of Michigan, Ann Arbor, Michigan.
Lectures and graded the problem sets for Math 351
Eight weekly hours.
Professor: William Breslin *email:* breslin at umich dot edu

4. **Teaching Assistant** January-May 2008 and January - Apri 2009
University of Michigan, Ann Arbor, Michigan.
Four weekly hours. Graded the problem sets for
Numerical Methods for Computing Science II.
Professor: Smadar Karni. *email:* karni at umich dot edu

3. **Instructor** July 2004, September 2006 and July 2007
University of Colima, Mexico.
A series of five lectures and workshops each year in Number Theory and
Euclidean Geometry. The lectures were given to the contestant students in
the Mexican Mathematics Olympiad.

2. **Teaching Assistant** January - July 2005
University of Guanajuato and CIMAT, Mexico.
Two weekly hours for an undergraduate advanced course in Mathematical
Analysis.
Graded the problem sets. Professor: Helga Fetter. *email:* fetter at cimat dot
mx

1. **Teaching Assistant** June - December 2004
University of Guanajuato and CIMAT, Mexico.
Two weekly hours for an undergraduate advanced course in Topology. Graded
the problem sets, and wrote lecture notes in LaTex.
Professor: Victor Nuñez-Hernández. *email:* victor at cimat.mx

SUMMER/WINTER
SCHOOLS

13. **X Virtual Summer School in Mathematics, UNAM - Juriquilla** June
17, 2020 Juriquilla, Qro.
Conference:
Dynamical Processes in Biophysics

12. **IX Summer School in Mathematics** June 28, 2019
Conference: Numerical methods and PDEs
Imate-Juriquilla

11. **School on Modelling and Numerical Analysis** June 20-22, 2018
Workshop: Navier-Stokes Equations and Derived Models
Cimat, Mérida

10. **National School on Optimization and Numerical Analysis** August
27-31, 2018
Red de Matemáticas y Desarrollo
Conference: An inverse problem for the shallow water equations
Universidad Autónoma de Aguascalientes

9. **Winter School in Dynamical Systems** December 10 - 15, 2017
Faculty of Mathematical Sciences and Mathematics,
Mini-course:
Mathematical systems in atmospheric modelling University of El Salvador

8. **Inauguration of the Graduate Program in Mathematics.** December
13, 2017
Faculty of Mathematical Sciences and Mathematics,
University of El Salvador

7. **X Foro de Matemáticas del Sureste** August 28 - September 1 2017
División Académica de Ciencias Básicas,
UniversidadJuárez Autónoma de Tabasco / Campus Chontalpa
Mini-course:
Modelling complex environmental systems

6. **VII Summer School in Mathematics** July 23 - 28, 2017
Institute of Mathematics, UNAM - Juriquilla
Organizers:
Jorge Velasco Hernández
Marco Tulio Angulo

Gerardo Hernández Dueñas
Course: Hyperbolic conservation laws and fluid dynamics

5. **XXVI ENOAN 2017**   July 3 - 7, 2017
   Universidad Juárez Autónoma de Tabasco
   Mini-course:
   Hyperbolic conservation laws

4. **VI Mathematics Summer School**
   Institute of Mathematics, National University of Mexico
   Juriquilla, Querétaro,   June 12 - June 17 2016
   Co-organizers: Gabriel Ruiz, **Gerardo Hernandez-Duenas**.

3. **V Mathematics Summer School**
   Institute of Mathematics, National University of Mexico
   Juriquilla, Querétaro,   June 28 - July 3 2015
   Co-organizers: Amanda Montejano, Adolfo Magaldi-Hermosillo, Gabriel Ruiz
   , Maribel Hernandez, **Gerardo Hernandez**.
   Course: Mathematical principles for atmospheric modelling

2. **Partial Differential Equations of the Atmosphere**
   School of Mathematics of Latin America and the Caribbean July 21-August
   1, 2014
   Autonomous University of Chiapas
   Tuxtla Gutierrez, Chiapas, Mexico

1. **Partial Differential Equations of the Atmosphere**
   IV Summer School   June 22-27, 2014
   Institute of Mathemacis UNAM - Juriquilla
   Queretaro, Mexico

11. SIAM Travel Grant   August 11-14 2014
    Partial coverage for travel and local expenses to participate in the:
    "SIAM Conference on Nonlinear Waves and Coherent Structures "
    Churchill College, University of Cambridge
    United Kingdom

10. NSF Travel Grant   August 5-9 2013
    Travel and local expenses to participate in the:
    "Mathematical Congress of the Americas"
    Guanajuato, México.

9. SIAM Travel Award
   To attend the International Conference on Industrial and Applied Mathemat-
   ics (ICIAM 2001)   July 18-22, 2011
   Vancouver, Canada.

8. Conacyt Fellowship (Mexican Bureau of Science and Technology)
   For Ph. D. tuition and expenses   Sept. 2005 - Aug. 2010

7. IPAM-NSF Travel Grant   April-May 2010
   Travel and local expenses covered for participation in the program on
   "Model and Data Hierarchies for Simulating and Understanding Climate"
   Institute for Pure and Applied Mathematics (IPAM)
   UCLA. Los Angeles, Ca.

6. Promep Fellowship (Mexican Program for the Quality Improvement of Pro-
   fessor's Teaching)
   Mexican Government   Sept. 2005 - Aug. 2010

5. Graduate Student Research Assistant   Fall 2008, Winter 2009, Summer 2009
-Advisor: Professor Smadar Karni
Grant: NSF DMS # 0609766
Department of Mathematics, University of Michigan

4. NSF Travel Grant   Aug. 2006
XV International Congress on Mathematical Physics.

3. Rackham Travel Grant   Sept. 2007, Dec. 2008, July 2009, June 2010.
University of Michigan, Ann Arbor, Michigan.

2. CIMAT Fellowship (Research Center in Mathematics)
For expenses in the Bachelors Program   Aug. 2000 - June 2005

1. Colima State Government Fellowship
For expenses in the Bachelors Program   Aug. 2000 - June 2005

CONFERENCE
TALKS

89. **56 National Congress of the Mexican Mathematical Society**
Autonomous University of San Luis Potosi, Mexico.   October 23-27, 2023.
Talk 1: Wave propagation in rotating, stratified and non-hydrostatic fluis with topography and free surface.
Charla 2: Mathematical modelling of geophysical phenomena.

88. **Potential Theory Workshop: Intersections in Harmonic Analysis, Partial Differential Equations and Probability**
Mexican Research Center in Mathematics.   September 28-30, 2023.
Guanajuato, México

87. **10th International Congress on Industrial and Applied Mathematics (ICIAM 2023)**
Waseda University, Tokyo, Japan.   August 20-25, 2023.
Talk: Exploring the excess of cloud condensation nuclei and rain suppression using a minimal 3D Boussinesq model with bulk cloud microphysics.

86. **National School of Optimization and Numerical Analysis ENOAN XXXI**
IMUNAM Cuernavaca.   Junio 26-30, 2023.
Talk: Wave propagation in rotating, stratified and non-hydrostatic fluids with topography and free surface

85. **MexSIAM Annual Meeting**
Mexico City.   June 7-10, 2023.
Talk: Wave propagation in rotating, stratified and non-hydrostatic fluids with topography and free surface

84. **55 Congreso Nacional de la Sociedad Matemática Mexicana**
Guadalajara, Jal.   October 24, 2022.
Talk: Modelación matemática de convección con contaminantes y su efecto en la supresión de lluvia.

83. **10th International Conference on Numerical Methods for Multi-Material Fluid Flow.**
University of Zürich   August 22, 2022.
Talk: A new two-dimensional blood flow model with arbitrary cross sections.

82. **Inteligencia Artificial: Primero resultados**
UNAM   August 2, 2022.
Dirección General de Cómputo y de Tecnologías de Información y Comunicación

81. **XVIII International Conference on Hyperbolic Problems: Theory, Numerics, Applications**
Malaga, Spain. June 20, 2022.
Charla: A central-upwind scheme for two-layer shallow-water floes with friction and entrainment along channels.
Talk: A new two-dimensional blood flow model with arbitrary cross sections

80. **Annual Meeting of the SIAM Mexico Section.**
Universidad de Coahuila June 8, 2022.
Talk: A new two-dimensional blood flow model with arbitrary cross sections.

79. **Joint Colloquium in Applied Mathematics**
SMM, MexSIAM, SMCCA, AME, SMIO
Virtual March 31, 2022
Talk: Mathematical modelling in the ocean and the atmosphere

78. **III Workshop in Applied Mathematics**
XXXII Semana Nacional de Investigación y Docencia en las Matemáticas
University of Sonora
Virtual March 29, 2022
Talk: Mathematical modelling in the ocean and the atmosphere

77. **AGU Fall Meeting (American Geophysical Meeting)**
Virtual Diciembre 13 - 20, 2021
Poster: Generalized quasi-geostrophy for moist atmospheric flows with phase changes

76. **School of Mathematics in the Faculty of Natural Sciences and Mathematics**
University of El Salvador
Virtual December 6- 10, 2021
Curso 1: Introduction to Partial Differential Equations
Curso 2: Mathematical Principles of Atmospheric Modelling

75. **Reunión Anual de la Unión Geofísica Mexicana**
Virtual November 1- 5, 2021
Workshop: Understanding JEDI A paradigm shift for educational change
Collaborator: Dr. Padhu Seshaiyer, Chair of the Diversity Advisory Committee at SIAM

74. **Congreso de la Sociedad Matemática Mexicana**
Virtual Octubre 18- 22, 2021
Conferencia:
Modelación oceánica sub-mesoescalar y difusividad horizontal

73. **XVII International Conference on Hyperbolic Problems: Theory, Numerics, Applications** July 2, 2021
Virtual Conference, Originally scheduled in Malaga, Spain.

72. **34th Conference on Hurricanes and Tropical Meteorology** May 10-14, 2021
Virtual Conference Conference:
Weak- and Strong- Friction Limits of Parcel Models: Comparisons and Stochastic Convective Initiation Time

71. **MSRI: Recent Developments in Fluid Dynamics** April 12-23, 2021
Mathematics of Fluid Dynamics program - MSRI, March, 1-5, 2021
MSRI: Introductory Workshop: Mathematical problems in fluid dynamics, Januray 25- February 5, 2021
MSRI: Connections Workshop: Mathematical problems in fluid dynamics,

January 20-22, 2021
Virtual Conference

70. **Annual Meeting**   Noviembre 22-24, 2020
    American Physical Society Division of Fluid Dynamics (APS-DFD)
    Conference: (presented by C. Rosales):
    A Two-dimensional Blood Flow Model with Arbitrary Cross-sections
    Virtual Conference, Originally scheduled in Chicago, Illinois.

69. **National Congress of the Mexican**   October 19-23, 2020
    Mathematical Society (SMM)
    Virtual Conference

68. **The Second Joint SIAM/CAIMS**   July 6-17, 2020
    Annual Meeting (AN20)
    Virtual Conference, Originally scheduled in Toronto, Canada.

67. **MexSIAM Annual Meeting**   December 9-11, 2019
    Conference:
    Oceanic Sub-mesoscale Wave-Vortical Interactions and Their Effect on Scalar
    Transport

66. **Annual Meeting of the American Physical Society**
    Division of Fluid Dynamics   November 23- 26, 2019
    Conference:
    Oceanic Sub-mesoscale Wave-Vortical Interactions and Their Effect on Scalar
    Transport

65. **National Congress of the Mexican Mathematical Society**
    Monterrey   October 20- 25, 2019
    Conference:
    The axiomatic approach in computational mathematics

64. **Third School in Mathematical Modelling**
    with emphasis in Climate Variables
    Universidad San Carlos de Guatemala   August 30- September 4, 2019
    Facultad de Ingeniería
    Course:
    Applied Mathematics in Atmospheric Sciences

63. **National School for Optimization and Numerical Analisis**
    Parallel Session of the Mexico Section of SIAM
    Zacatecas Council for Science and Technology   August 25-30, 2019
    Conference:
    Sub-mesoscale intertia-gravity wave interactions in the ocean and its effect in
    the turbulent diffusivity.

62. **Integrative Think Tank**
    Mexican Research Center in Mathematics   August 5-9, 2019
    Flooding problema

61. **International Congress on Industrial and Applied Mathematics**
    Valencia, España   July 14-19, 2019
    Conference:
    Two-layer blood flows through axi-symmetric vessels

60. **Primer encuentro de las matemáticas con la ciencia, la tecnología y
    la cultura**
    Comisión Estatal para la Planeación de la Educación Superior (COEPES)
    June 5, 2019
    Querétaro, Qro.

Conference:
Applications of math in the study of natural phenomena

59. **7 Congreso Metropolitano de Optimización y Simulación Numérica 2019**
Facultad de Ciencias, UNAM   May 6-9, 2019
Conference:
Sub-mesoscale intertia-gravity wave interactions in the ocean and its effect in the turbulent diffusivity.

58. **Multiscale models: Theory and applications**   December 7, 2018
Conference: Multiscale process in atmospheric convection
Guanajuato, Gto

57. **Biomatesis Workshop**   December 4, 2018
Conference: Multiscale process in atmospheric convection

56. **Congreso Nacional de la Sociedad Matemática Mexicana.**   October 24, 2018
Conference: Two-layer Blood flows in vessels
Villahermosa, Tabasco, Mexico

55. **Hyperbolic Problems: Theory, Numerics and Applications**   June 25-29, 2018
University Park, Pennsylvania State.
Conference: Two-layer blood flows through axi-symmetric vessels

54. **Mexican Mathematicians in the World**   June 10-15, 2018
Casa Matemática Oaxaca
Participation in roundtable.
Oaxaca, México

53. **Workshop on recent trends for the Numerical Solution of Partial Differential Equations**   April 17- 21, 2018
Guanajuato, Gto
Conference: An inverse problem for the shallow water equations

52. **School of Mathematics for Latin America and the Caribbean**   April 9- 13, 2018
Guatemala, Guatemala
6-hr Course: Some applications of the Fourier theory

51. **National Meeting of Young Researchers in Mathematics 2018**
Institute of Mathematics, UNAM   January 19-23, 2018
Conference:
A hybrid method for shallow water flows with horizontal density gradients

50. **Winter School in Dynamical Systems**   December 10 - 15, 2017
Faculty of Mathematical Sciences and Mathematics,
University of El Salvador
Talk:
Turbulence and coherent structures in the atmosphere and ocean

49. **50 National Congress of the Mexican Mathematical Society**
Faculty of Sciences, UNAM   October 23 - 27 2017
Talk:
A hybrid method for shallow water flows with horizontal density gradients

48. **X Foro de Matemáticas del Sureste**   August 28 - September 1 2017
División Académica de Ciencias Básicas,
UniversidadJuárez Autónoma de Tabasco / Campus Chontalpa

Plenary talk:
Numerical analysis of some geophysical flows

47. **VII Summer School in Mathematics**   July 23 - 28, 2017
Institute of Mathematics, UNAM - Juriquilla
Mini-course:
Hyperbolic conservation laws and fluid dynamics

46. **XXVI ENOAN 2017**   July 3 - 7, 2017
Universidad Juárez Autónoma de Tabasco
Talk:
Two-layer shallow water flows in channels

45. **IV Joint Meeting RSME-SMM**
Valladolid, Spain   June 19- 22, 2017
Talks:
A positivity preserving central-upwind scheme for blood flow through compli-
ant vessels, S09 Epidemiología y ecología matemática
A positivity-preserving central scheme for two-layer shallow water flows in
channels, S19 Modelación matemática y simulación numérica con EDP

44. **IPAM Workshop"Computational Issues in Oil Field Application"**
Institute for Pure and Applied Mathematics   March 21 - June 9, 2017
University of California, Los Angeles
Seminar: "A hybrid scheme for flows in porous media", April 25, 2017
Workshop 0 "Tutorials" March 21 - 24, 2017
Workshop 1 "Multiphysics, Multiscale, and Coupled Problems in Subsurface
Physics" April 3 - 7, 2017
Workshop 2 "Full Waveform Inversion and Velocity Analysis" May 1 - 5, 2017
Workshop 3 "Data Assimilation, Uncertainty Reduction, and Optimization
for Subsurface Flow" May 22 - 26, 2017
Workshop 4 "Culminating Workshop at Lake Arrowhead Conference Center
" June 4 - 9, 2017

43. **Uncertainty quantification**
Mexican Research Center in Mathematics   January 16-20, 2017
Guanajuato, Mexico
Talk: "Minimal models for precipitating turbulent convection"

42. **International Conference in Mathematics, 20 Years Unidad Cuer-
navaca del Instituto de Matemáticas UNAM**
Cuernavaca, Morelos   January 12-13, 2017

41. **Frontiers in Applied and Computational Mathematics**
Providence, Rhode Island, United States.   January 4-6, 2017
Poster: "A hybrid algorithm for shallow water flows with horizontal density
gradients"

40. **International Symposium on Mathematical Modelling 2016**
Metropolitan Autonomous University   December 7-9, 2016
Mexico City
Talk: "Two-layer shallow water flows in channels"

39. **XLIX National Congress of the Mexican Mathematical Society**
Autonomous University of Aguascalientes   October 24, 2016
Aguascalientes, Mexico
Talk: "A Quantum scheme for shallow water flows"

38. **XIII Summer school in mathematics**   July 1, 2016
Institute of Mathematics
National University of Mexico

Cuernavaca, Morelos
Talk: "Numerical analysis and weather forecasting"

37. **First summer school in atmospheric sciences**   June 29, 2016
Multidisciplinary Unit for Teaching and Research
Research Center for Atmospheric Science
National University of Mexico
Juriquilla, Querétaro
Talk: "Linear stability analysis of mathematical models for atmospheric flows"

36. **Nonequilibrium statistical physics and fluid dynamics**   May 22-25, 2016
Brigham Young University
Provo, Utah
Talk: "Linear stability analysis of minimal models for precipitating turbulent convection"

35. **Metropolitan congress for modelling and numerical analysis**   May 18-20, 2016
National University of Mexico
Mexico City
Talk: "Numerical methods for the Saint-Venant equations"

34. **American Meteorological Society's 32nd Conference on Hurricanes and Tropical Meteorology**
San Juan, Puerto Rico hfillApril 18-22, 2016
United States
Talk: "Stability and instability criteria for idealized precipitating hydrodynamics"

33. **Math Biology: A multidisciplinary endeavour**   January 11-14, 2016
National University of Mexico
Juriquilla, Queretaro, Mexico
Talk: "Stability analysis for atmospheric dynamics"

32. **Meeting of the Conacyt Research Network in Mathematica Modelling**
Course: Application of the finite volume method to the solution of shallow water equations for flooding problems by M. E. Vázquez-Cendón
Universidad Juárez Autónoma de Tabasco
Villahermosa, Tabasco   November 25-27, 2015
Talk: "Roe schemes for shallow water flows with thermodynamics"

31. **National Congress of the Mexican Mathematical Society**
Hermosilllo, Sonora, México   October 18-23, 2015
Note: Invited Speaker
Talk: "Atmospheric stability criteria with precipitating hydrodynamics"

30. **Mathematical principles in atmospheric modelling** October 5-9 2015
First school in mathematical modelling: water resources and climatology
Engineering school
San Carlos University of Guatemala

29. **Conacyt Research Network, Mathematical Modelling**   July 10 2015
Shallow water and porous media flows
Guanajuato, Mexico

28. **AMS 20th Conference on Atmospheric and Oceanic Fluid Dynamics**
Minneapolis, Minnesota,   June 15-19, 2015
Poster: "Minimal models for precipitating organized convection"

27. **INRIA-Mexico Seminar InMex 2015 @ UNAM**
Institute of Mathematics, National University of Mexico
Mexico City,   June 3,4, 2015
Talk: "A Hybrid Algorithm for Flows in Porous Media"

26. **SIAM Conference on Applications of Dynamical Systems 2015**
Snowbird Ski and Summer Resort,   May 17-21, 2015
Talk: "Dissection of Boussinesq non-linear interactions using intermediate models"

25. **II Meeting of Mexican Mathematicians in the World**
Guanajuato, Mexico   December 15-19, 2014

24. **67th Annual Meeting go the American Physical Society, Division of Fluid Dynamics**
San Francisco, Ca.   November 23-25, 2014
Talk: "Minimal models for precipitating organized convection"

23. **National Congress of the Mexican Mathematica Society**
Universidad Juárez del Estado de Durango.   October 26-31, 2014

22. **SIAM Conference on Nonlinear waves and coherent structures**
Churchill College, University of Cambridge, United Kingdom   August 11-14, 2014
Talk: "Dissection of Boussinesq non-linear interactions using intermediate models"

21. **Mathematical Congress of the Americas**
Guanajuato, México.   August 5-9, 2013
Talk: "Dissection of Boussinesq non-linear interactions using intermediate models"

20. **9th American Institute of Mathematical Sciences Conference**
Orlando, Florida. USA   July 1-5, 2012
Talk: "Minimal models for precipitating organized convection"

19. **30th Conference on Hurricanes and Tropical Meteorology**
Ponte Vedra Beach, Florida. USA   April 15-20, 2012

18. **International Congress on Industrial and Applied Mathematics**
ICIAM 2011, Vancouver, Canada.   July 20, 2011
Talk: " Shallow Water Flows in Channels with Arbitrary Geometry"

17. **NSF-CBMS Conference on Global Harmonic Analysis**
The University of Kentucky, Lexington, Kentucky.   June 20-24, 2011

16. **Mathematical Aspects of Quantization Conference**
University of Notre Dame, Notre Dame, Indiana, USA.   June 6-10, 2011

15. **University of Michigan SIAM Student Conference**
Department of Mathematics, University of Michigan
Ann Arbor, Mi.   Nov. 13 2010
Talk: "A Hybrid Scheme for Flows in Porous Media"

14. **2010 Siam Annual Meeting**
Pittsburgh, Pennsylvania   July 13 2010
Talk: "Shallow Water Flows through Channels"

13. **AMS-SMM Eighth International Meeting.**
University of California, Berkeley.   June 3 2010
Talk: "Quantum Cutting: A Szegö Limit Theorem and Propagation"

12. **Workshop on"Model and Data Hierarchies for Sim. and Understanding Climate."**
Institute for Pure and Applied Mathematics.   May 12 2010
University of California, Los Angeles.
Talk: "Shallow Water Flows through Channels"

11. Series of Seminars and Workshops on:
Model and Data Hierarchies for Simulating and Understanding Climate
May 1-May 31, 2010
Institute for Pure and Applied Mathematics
University of California, Los Angeles.

10. **International Conference on Numerical Analysis and Applied Mathematics**
Rethymno, Crete, Greece, 18-22 September 2009.   September 21 2009
Talk: "A Scheme for Shallow Flow with Area Variation"

9. **12th International Conference on Hyperbolic Problems:**
Theory, Numerics, Applications   June 2008
University of Maryland, College Park. Maryland, USA.

8. **Conference on Mathematical Physics and Geometric Analysis**
Fields Institute. Toronto, Canada.   January 2008

7. **Joint Mathematics Meeting**   January 2008
San Diego, California.

6. **Mathematics School in Latin America and the Caribbean (EMALCA)**
IMUNAM. Cuernavaca, Mexico.   July 2007

5. **XV International Congress on Mathematical Physics**   August 2006
Rio de Janeiro, Brazil.

4. **Second Symposium of Graduate Student FAMAT - CIMAT**
Guanajuato, Mexico   August 2007
Talk: "Numerical methods for hyperbolic conservation laws"

3. **First Symposium of Graduate Student FAMAT - CIMAT**
Guanajuato, Mexico   June 2006
Talk: "Small dispersion limit of the KdV equation"

2. **First Joint International Meeting CIMAT-ICIMAF**
Institute of Cibernetics, Mathematics and Physics
Havanna, Cuba   February 2005
Talk: "Relationship between the Schrdinger operator and the KdV equation"

1. **XXXVII Meeting of the Mexican Mathematical Society**   October
2004
Ensenada, BCS Mexico

COLLOQUIUM AND
SEMINAR TALKS

31. Conference on Mathematical, Computational and Geophysical Modelling
Institute of Geophyscia, UNAM Mexico City.   October 6, 2023.
Charla: Wave propagation in rotating, stratified and non-hydrostatic fluis
with topography and free surface.

30. Colloquium of the Institute of Mathematics,
UNAM Juriquilla.   Septiembre 1, 2023.
Talk: Mathematical modelling of geophysical phenomena.

29. Mathematical Modelling in the Ocean and the Atmosphere
    Seminar of the Undergraduate Program in Applied Mathematics   Frebruary 14, 2022
    Faculty of Science, Autonomous University of San Luis Potosí, México.

28. Mathematical Modelling in the Ocean and the Atmosphere
    Fourth School in Mathematical Modelling   September 23, 2021
    Unidad de Modelación Matemáticas e Investigación
    Facultad de Ingeniería USAC, Guatemala

27. Modelling atmospheric convection through cuasi-geostrophic approximations
    Colloquium of former Demat students   October 6, 2021
    Mexican Research Center in Mathematics
    Guanajuato, Gto.

26. Sub-mesoscale inertia-gravity wave interactions in the ocean and its effect in turbulent diffusivity
    Colloquium at Imate-Cuernavaca   February 12, 2020
    Institute of Mathematics, Unit Cuernavaca
    Morelos, Mexico

25. Turbulence and coherent structures in the ocean and atmosphere
    Colloquim at CIMAT   Octuler 5, 2017
    Mexican Research Center en Mathematics
    Guanajuato, México

24. Computer Science Seminar   May 27, 2016
    On some numerical algorithms for geophysical fluid dynamics
    Mexican Research Center in Mathematics
    Guanajuato, Mexico

23. Colloquium Cimat-UADY   April 5, 2016
    Mexican Research Center in Mathematics
    Merida, Yucatan
    Talk: Atmospheric Modelling and Stability

22. Mathematical and Computational Modelling Conference
    By Ismael Herrera   March 4, 2016
    National University of Mexico
    Mexico City, Mexico.

21. University Seminar on Hydrocarbons   February 19, 2016
    National University of Mexico
    Mexico City, Mexico.
    Talk: Porous media flows and analysis of fractured rocks

20. Colloquium of Applied Mathematics at IIMAS   December 2, 2015
    National University of Mexico
    Mexico City
    Talk: Storm simulations and atmospheric instabilities

19. Conacyt Research Network, Analysis Group   October 15 2015
    Singular pseudo-differential operators and numerical applications
    Cuernavaca, Morelos

18. Colloquium - the Institute of Mathematics - UNAM   August 25, 2015
    National University of Mexico
    Mexico City, Mexico
    Talk: Semiclassical pseudo-differential operators and numerical applications

17. Colloquium - Centers for the Mathematical Sciences   August 21, 2015
    Universidad Nacional Autónoma de México
    Morelia, Michoacan
    Talk: Atmospheric Modelling and Stability

16. Colloquium - Academic Department for Mathematics
    technological Autonomous Institute of Mexico (ITAM),   May 8, 2015
    Mexico City, Mexico
    Talk: Hybrid methods in porous media flows

15. Queretaro Colloquium
    Center for Innovations in Mathematics,   March 18, 2015
    Juriquilla, Querétaro
    Talk:
    "Coherent structures in the atmosphere and their wave-vortical interactions "

14. Seminar for Computational and Applied Mathematics
    Metropolitan Autonomous University , Iztapalapa Unit, March 12, 2015
    Talk:
    "Minimal models for precipitating organized convection and Atmospheric Instabilities"

13. Seminar on Modelling
    Research Center in Mathematics
    Guanajuato, Gto.,   March 2, 2015
    Title:
    "Minimal models for precipitating organized convection and Atmospheric Instabilities"

12. Seminar at the Engineering School, Autonomous University of Queretaro
    Querétaro, Qro.   November 13, 2014
    Talk: "Minimal models for precipitating organized convection"

11. Seminar at UMDI-UNAM
    UNAM-Juriquilla, Juriiquilla, Qro.,   October, 15, 2014
    Talk: "Minimal models for precipitating organized convection"

10. Colloquium at the Institute of Mathematics   August 2, 2013
    UNAM - Querétaro, México
    Talk: "Shallow Water Flows through Channels"

 9. Colloquium at the Institute of Mathematics
    UNAM - Cuernavaca, Morelos, Mexico.   July 31, 2013
    Talk: "Dissection of Boussinesq non-linear interactions using intermediate models"

 8. Colloquium at the Institute of Mathematics
    UNAM - Mexico City   July 30, 2013
    Talk: "Minimal models for precipitating organized convection"

 7. Colloquium at the Departamento de Ingeniería Matemática
    Universidad de Concepción, Concepción, Chile.   January 12, 2012
    Talk: "A Hybrid Method for Flows in Porous Media"

 6. Numerical Analysis Seminar at the Departamento de Ingeniería Matemática
    Universidad de Concepción, Concepción, Chile.   January 10, 2012
    Talk: "Shallow Water Flows through Channels"

 5. Applied and Computational Mathematics Seminar
    University of Wisconsin-Madison   April 6, 2011
    Talk: "Shallow Water Flows through Channels"

4. Seminar at the Department of Mathematics
University of Colima, Mexico   August 27 2009
Talk: "Symplectic Cutting and a Szegö Limit Theorem"

3. Seminar of Mathematical Physics, Institute of Mathematics
Campus Cuernavaca of the National University of Mexico. Morelos, Mexico.
January 9 2009
Talk: "Symplectic Cutting and a Szegö Limit Theorem"

2. Colloquium in Applied Mathematics at
IIMAS (Research Institute in Applied Mathematics)   January 7 2009
National University of Mexico. Mexico City, Mexico
Talk: "A Hybrid Method for Flows in Porous Media"

1. Colloquium at Cimat (Mexican Research Center in Mathematics)
Guanajuato, Mexico.   December 17 2008
Talk: "Oscillatory Integrals with Singular Symbols"

GRADUATE THESIS
DEFENSE
COMMITTEE

11. **Claudia Acosta Diaz.**   Junio, 2023.
Mexican Research Center in Mathematics
Evaluation of thesis: Entropy stable finite difference methods for degenerate
parabolic equations.
Advisor: Silvia Jerez Galiano.

10. **Fabio Andrés Vallejo Narvaez.**   October, 2022.
Graduate Program in Mathematics, UNAM.
Evaluation of thesis: Teoría de Kreiss-Métivier-Lopatinski para sistemas hiper-
bólicos con valores iniciales y de frontera en varias dimensiones espaciales y
sus aplicaciones a ondas sísmicas.
Advisor: Ramón Plaza, IIMAS.

9. **Felipe Ángeles García**   January 14, 2022
Graduate Program in Mathematics, UNAM
Thesis: Local Existence for a Partially Hyperbolic-Parabolic System of Quasi-
linear Equations Through a Non-Contractive Fixed Point Argument
Advisor: Ramón Plaza, IIMAS

8. **Juan Daniel Molina Muñoz**   December 2, 2021
Mexican Research Center in Mathematics
Thesis: Bayesian Uncertainty Quantification en ODE: Application to the
Mathematical Modelling of Greenhouses.
Advisor: José Andrés Christen Gracia.

7. **Nestor Abel Sánchez Goycochea**   September 14, 2021
Programa de Doctorado en Ciencias Aplicadas con Mención en Ingeniería
Matemática,
Universidad de Concepción, Chile,
Thesis: Discontinuous Galerkin methods for non-linear problems in plasma
physics.
Advisors: Manuel Solano Palma (CIIMA), Tonatiuh Sánchez-Vizuet (U. of
Arizona).

6. **Sebastián Gutiérrez Hernández**   July 2, 2021
Mexican Research Center in Mathematics
Thesis: Local discontinuous Galerkin methods for deterministic and stochastic
parabolic conservation laws.
Advisor: Silvia Jerez Galiano (CIMAT).

5. **José Alejandro Butanda Mejía**   March 4, 2021
Mexican Research Center in Mathematics
Thesis: Estimación de la batimetría en las ecuaciones Saint-Venant por el método del sistema adjunto y aproximación con el método Galerkin-Discontinuo.
Advisor: Miguel Ángel Moreles Vázquez (CIMAT).

4. **Hugo Alberto Flores Arguedas**   February 26, 2021
Mexican Research Center in Mathematics
Tesis: On uncertainty quantification of models defined by initial and boundary value problems for differential equations.
Advisor: Marcos Aurelio Capistrán Ocampo (CIMAT).

3. **Fabricio Otoniel Pérez Pérez**   February 29, 2020
Mexican Research Center in Mathematics
Thesis: An ATI-SAR data inversion problem in oceanography. Approximation by a continuous Newton's method approach.
Advisors: Miguel Ángel Moreles Vázquez (CIMAT) and José Héctor Morales Bárcenas (UAM)

2. **Rubén Carrillo**   December 8 , 2020
Mexican Research Center in Mathematics
Thesis: Solución de la Ecuación de Advección-Difusión-Reacción por el Método del Cálculo Exterior Discreto con Estabilización
Advisors: Miguel Ángel Moreles Vázquez (CIMAT) and Rafael Herrera Guzmán (CIMAT)

1. **Harry Fernando Oviedo León**   December 11 , 2020
Mexican Research Center in Mathematics
Thesis: Métodos acelerados de gradiente para optimización no lineal
Advisors: Oscar Susano Dalmau Cedeño (CIMAT) y Rafael Herrera Guzmán (CIMAT)

REVIEWER OF MASTER THESIS:

1. **Gustavo Chinney Herrera.**   August, 2022.
Graduate Program in Mathematics, UNAM.
Reviewer of thesis: "Análisis de severidad en pacientes con SARS-CoV-2 usando el algoritmo Mapper".
Advisor: Esteban Hernández.

UNDERGRADUATE THESIS DEFENSE COMMITTEE

- **Vanessa Ivonne Cruz Martínez**   April 16, 2021
Licenciatura en Tecnología
UNAM, Juriquilla
Thesis: Energía y entropía en la formación de patrones de Turing
Advisor: Aldo Ledesma Durán (UAM).

- **Eder Luis Salazar Díaz**   February 21, 2019
Multidisciplinary Unit for Teaching and Research - UNAM Juriquilla
Faculty of Science, UNAM
Undergraduate thesis: Implementación de Modelo Multivariable de Regresión Lineal con enfoque Bayesiano
Advisor: Adolfo Magaldi, Centro de Ciencias de la Atmósfera, UNAM

PHD QUALIFYING EXAM COMMITTEES

6. **Danalie Azofeifa.**   October 9, 2020.
Mexican Research Center in Mathematics.
Thesis: Coastal ocean modelling by the hybrid discontinuous Galerkin method.

5. **Francisco Medina** June 15, 2020
Mexican Research Center in Mathematics, Merida, Yucatan
Thesis: Solution of Degenerate Convection-diffusion Equations Using Finite
Difference Schemes
Advisor: Miguel Angel Uh Zapata, Cimat-Merida

4. **Felipe Ángeles** January 28, 2019
Graduate Program in Mathematics
Thesis: Hyperbolic-Parabolic Systems of Partial Differential Equations in
Continuum Dynamics
Advisor: Ramón Plaza, IIMAS

3. **Yendry Nairobi Arguedas Flatts** January 2018
Graduate Program in Mathematics
Thesis: Modelación de enfermedades infecciosas por medio de ecuaciones diferenciales parciales integro-diferenciales hiperbólicas
Advisor: Jorge Velasco, Instituto de Matemáticas, UNAM

2. **Hugo Alberto Flores Arguedas** November 22 , 2017
PhD Candidate Exam
Mexican Research Center in Mathematics Thesis: A Data-Informed Uncertainty Quantification Strategy for Magnetic Resonance Elastography (MRE)
Advisor: Marcos Capistrán

1. **Rubén Carrillo** December 4, 2017
PhD Candidate Exam
Mexican Research Center in Mathematics
Thesis: Solutions to Hyperbolic Conservation Laws by the Method of Discrete
Exterior Calculus

TUTORING FOR
GRADUATE
STUDENTS

2. **Christian Jhonny Contreras Rocha.** November 11th, 2023.
Graduate program in Mathematics, UNAM.
Tutor committee

1. **Adolfo Martínez.** July 21st, 2023.
Graduate program in Mathematics, UNAM.
Tutor committee

SCIENTIFIC AND
ACADEMIC
COMMITTEES

6. **4th International Conference on Mathematical Modelling, CIMM
2020** October 4-6, 2020 Member of the Scientific Committee
Oaxaca

5. **Selection Comitttee - IIMAS**
Committee member for selecting candidates in a tenure-track position

4. **ENES**
Member of the committee to create the Undergraduate Program in Applied
Mathematics at the Escuela Nacional de Estudios Superiores (ENES)

3. **Academic Committee at the Juriquilla Unit of Imate**

2. **3rd International Conference on Mathematical Modelling, CIMM
2018** September 4-6, 2018 Member of the Scientific Committee
Oaxaca

1. **UNAM-Juriquilla Building**
Period: January 1, 2017- March 15 , 2018
Reuniones semanales sobre el progreso de la construcción

16. **Minisymposium en ICIAM (2023)**

15. **Reviewer in the call "Ciencia de Frontera 2023, Modalidad: Grupo".** One submission was evaluated.   March 2023.

14. **Reviewer in the call "Ciencia de Frontera 2023, Modalidad: Individual".** Three submissions were evaluated.   January and March 2023.

13. **Member of Selection Committee**. Prociencia/Concytec-Perú. Concurso Proyectos de Investigación Básica 2023. Three proposals were reviews in March 2023.

12. **Member of the Selection Committee**. Prociencia/Concytec-Perú. Tesis de Pregrado y Postgrado en Ciencia, Tecnología e Innovación Tecnológica. One proposal was reviewed in September, 2023.

11. **Member of Selection Committee**. Prociencia/Concytec-Perú. Proyectos de incorporación de investigadores postdoctorales en instituciones peruanas "E067-2022-04". One submission was reviewed in October 2022.

10. **Reviewer in the call "Ciencia Básica y/o Ciencia de Frontera, Modalidad: Individual".** One submission was reviewed.   November 2022.

9. **Evaluation of a Papiit Grant Proposal, Call 2023 - Proyecto Papiit Convocatoria 2021** A grant proposal was reviewed for the Support Program for Research and Technological Innovation Projects at UNAM. August 2022

8. **Reviewer In the 2022 Call "Estancias Posdoctorales por México - Conacyt"** Four submissions evaluated.   September - August 2022

7. **Reviewer in the call "Ciencia Básica y/o Ciencia de Frontera, Modalidad: Paradigmas y Controversias de la Ciencia 2022"** Two submissions were evaluated.   January 2022.

6. **Member of the Selection Committee**. National Fund for Science, Technology and Technological Innovation (Fondecyt) of the National Council for Science, Technology and Technological Innovation (Concytec) in Perú. Grant Proposals in Basic Research i2021-01. One grant proposal was reviewed in March, 2021.

5. **Reviewer in the call 16a Convocatoria de Investigación Científica, Humanística y Tecnológica 2021 - Ibero** One project evaluated. November 2021

4. **Reviewer In the 2021 Call "Estancias Posdoctorales por México - Conacyt"** Four submissions evaluated.   August - November 2021

3. **Evaluation of a Papiit Grant Proposal, Call 2021 - Proyecto Papiit Convocatoria 2021** A grant proposal was reviewed for the Support Program for Research and Technological Innovation Projects at UNAM.

2. **Member of the Selection Committee**. National Fund for Science, Technology and Technological Innovation (Fondecyt) of the National Council for Science, Technology and Technological Innovation (Concytec) in Perú. Grant Proposals in Basic Research in Physics, Mathematics, and Computer and Information Science. Phases 1 and 2. Several grant proposals were reviewed during September and October 2020.

1. **Fondo SEP - CONACYT, CB-2014-01**

**Advisor for a Summer Student Project on "Hyperbolic conservation laws
with applications to the traffic equation"**
Student: July 23- September 8, 2017
Kenett Martínez Ruiz, Universidad del Istmo

Advisor for a Summer Student Project on "Numerical Methods for Hyperbolic Conservation Laws"
Projects followed by the School of Mathematics of Latin America and the Caribbean
August 19-30, 2014
Students:
Nanci Pintor, Universidad Michoacana de San Nicolás de Hidalgo
Rosa Ibeth Bravo Rojas, Benemérita Universidad Autónoma de Puebla

26. Interview with El Universal about applied mathematics and geophysical phenomena
    Juriquilla, Qro.   October 12th, 2023.

25. Presentation en Lakeview Elementary School
    Kirkland, Washing, United States   April 20, 2023.
    Talk: Mathematics and (some of its) applications

24. SIAM Conference on Applied Mathematics Education
    Pittsburgh, Pensylvania.   July 11, 2022.
    Talk: Promoting effective practices in JEDI for Applied Mathematics Education

23. Joint meeting Researchers-Students
    Sciences workshop for youth.   June 30th, 2023.
    Geosciences Center, UNAM Juriquilla, Querétaro, Mexico.

22. Getting to know part of the Mathematics' World in the Pendulum's Museum
    Pendulum's Museum, Querétaro, México   April 30, 2022

21. SIAM Celebrates National Volunteer Month
    Publication about my rol as President of MexSIAM.   April 1, 2022.

20. Open Day, Undergraduate Program in Mathematics
    Institute of Mathematics, UNAM Juriquilla   March 31, 2022
    Talk: Research projects for students

19. Numerical methods applied to the solutions of PDEs
    Activity within the PED class of Prof. Manuel Cruz   January 27, 2022
    Guanajuato, Gto, México

18. SIAM News. "Getting to know the Mexico Section of SIAM"   June 1, 2021
    https://sinews.siam.org/Current-Issue/Issue-Archives/Issue-Archives-ListView/PID/2282/mcat/
    54-|-Number-5-|-June-2021

17. SIAM News. Blog about MexSIAM Annual Meeting   February 19, 2020
    https://sinews.siam.org/Details-Page/2019-Annual-Meeting-of-the-Mexico-Section-of-SIAM

16. Interview with Periodico AM   February 7, 2020
    https://amqueretaro.com/educacion/2020/02/17/aseguran-que-las-matematicas-salvan-vidas-unam-juriquilla/

15. SIAM mentions the new sections to rise funds   February 1, 2020
    https://mailchi.mp/siam/attend-a-local-applied-math-conference-in-your-area-this-fall-1102077?e=2b17c7c041

14. Conacyt announces the MexSIAM Annual Meeting.   December 9, 2019
    https://www.conacyt.gob.mx/index.php/el-conacyt/eventos-de-interes/evento/101-
    reunion-anual-de-la-seccion-mexico-de-la-sociedad-para-las-matematicas-industriales-
    y-aplicadas-mex-siam

13. Imate Press Release. First Annual Meeting of SIAM - Mexico Section
    https://www.matem.unam.mx/acerca-de/noticias/primera-reunion-anual-siam-
    seccion-mexico

12. Publication in SIAM Unwrapped News and in the Imate webpage about la
    revival of MexSIAM.   January 2019
    https://sinews.siam.org/Details-Page/siam-unwrapped-january-2019

11. Entrevista: Radio y Televisión Querétaro.   Sept 9, 2019
    Programa conducido por la Lic. Claudia Ivonne Hernández
    Entrevista sobre temas de investigación en Matemáticas Aplicadas

10. MexSIAM, the Mexico Section of SIAM starts activities
    Press release by the Institute of Matheatics, UNAM
    https://www.matem.unam.mx/acerca-de/noticias/mexsiam-la-seccion-mexico-
    de-siam-reanuda-sus-actividades
    Mexico City

 9. Conacyt Interview
    Interview about the summer school in mathematics 2017   August 4, 2017
    Querétaro, Qro.

 8. Radio Interview
    Research opportunities in Mathematics for young students October 30, 2016
    Program: Romántica
    Radio interviewer: Lorena Portillo
    Durango, Dgo.

 7. Speaker
    Exposition of Science and Technology (Expocyteq 2016)   October 22, 2016
    Queretaro Council for Science and Technology

 6. Radio Interview
    Mathematical modelling of hurricanes   August 30, 2016
    Program: Panorama Informativo de Grupo Acir Radio
    Radio interviewer: Luis del Toro
    Querétaro, Qro.

 5. Radio Interview
    Math applications in preventing natural disasters   December 3, 2014
    Program: Panorama Informativo de Grupo Acir Radio
    Radio interviewers: Luis del Toro y Xaviera Campuzano
    Querétaro, Qro.

 4. Introduction to Hyperbolic Conservation Laws Departamento de Ingeniería
    Matemática   January 9, 2012
    Universidad de Concepción, Concepción, Chile.

 3. Hyperbolic Conservation Laws and their Applications
    Cientítificos Duranguenses   May , 2011

 2. Representation Theory for the Heisenberg Group   November 2006
    Student Analysis Seminar
    Department of Mathematics, University of Michigan.

 1. The Small dispersion limit for the KdV equation   September 2006
    First Symposium of Famat Former Undergraduate Students at CIMAT
    Guanajuato, Mexico.

TECHNICAL REPORTS	**Undergraduate thesis: The Completeness Theorem for the Schrödinger Operator and its Relationship with the KdV Equation** (not published)
	Advisor: Xavier Gomez-Mont June 2005
	University of Guanajuato and CIMAT. Guanajuato GTO, Mexico.

EXTRACURRICULAR ACTIVITIES	4. **Spanish translation of SIAM posters "Math Matters, Apply it!** January 2011
	3. **ELI 994-Teaching and English Language for Classroom Communications**
	The English Language Institute, and July 27 - August 19, 2009
	The Center for Research on Learning and Teaching
	University of Michigan. Ann Arbor, Michigan.
	2. **Spring Internship.** February - June 2004
	Universidad Complutense de Madrid. Madrid, Spain.
	1. **Organization Committee.** November 2002
	XVI Mexican Mathematics Olympiad. Mexican Mathematical Society

COMPUTER SKILLS	- **Mathematical software:** Mathematica, Maple, LaTeX
	- **Programming software:** Fortran, C++ Builder, Matlab.

AFFILIATIONS	11. National(Mexican) System of Researchers - Level - I September 2013 - Present
	10. Sociedad Matemática Mexicana 2017 - Present
	9. Society for Industrial and Applied Mathematics February 2010 - May 2011, January 2018-Present
	8. American Mathematical Society September 2005 - May 2011 , January 2019 - Present
	7. American Physical Society 2019-Present
	6. Mexican Society for Scientific Computing and its Applications (SMCCA) . 2017 - Present
	5. Registro Conacyt de Evaluadores Acreditados (RCEA) April 14, 2014 - Present
	4. Conacyt Research Network, Mathematical Modelling . June 2015 - June 2016
	3. Conacyt Research Network, Analysis and Differential Equations . June 2015 - June 2016
	2. American Metereologial Society 2019 -2020
	1. Royal Meteorological Society January 2019 - 2020

LANGUAGE SKILLS	-Fluent in English and Spanish, basic knowledge of French.