CLAUDIA CASTRO-CASTRO

PERSONAL INFORMATION

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QUALIFICATIONS

Recent Ph.D. in Applied and Computational Mathematics from Southern Methodist University. Passionate about science and innovation with leadership and team work experience in technical environments.
Led research analyzing the control of light in fiber optic cables. Worked with engineers and physicists performing data analysis and building numerical models to improve the design of optical fibers.

RESEARCH INTERESTS

Nonlinear wave phenomena · Nonlinearity and disorder in fiber arrays · Perturbation theory and asymptotics · Statistical Mechanics

EDUCATION

2013-2017 **Southern Methodist University**

SMU

Dallas, TX
Ph. D. Applied and Computational Mathematics
Thesis: Nonlinearity, PT-symmetry, twist, and disorder in Discrete Nonlinear Schroedinger Equation

2011-2013 **Center for Research in Mathematics**

CIMAT

Guanajuato, Mexico
M. S. Applied Mathematics
Thesis: Modulation equations of the Peyrard-Bishop model of DNA dynamics

2006-2010 **Autonomous University of Baja California**

UABC

Ensenada, Mexico
B. S. Applied Mathematics

WORK EXPERIENCE

Sep. 2017-present **Postdoctoral Fellow, University of Texas at Austin**

UT Austin

- Study how significant are the effects of absorption and reflection in a regime with scattering at a random boundary of an ultra-thin metasurface coat.
- Study the effects of disorder and nonlinearity of wave localization in parity-time symmetric granular crystals.

2014-2017 **Research Assistant, Southern Methodist University**

SMU

- Utilized mathematical modeling and numerical simulations to specifically show how nonlinearity, coupling, geometric twists, and balanced gain-loss relate to the existence, stability, and dynamic character of nonlinear optical modes.
- Explored the effects of the inherent variability on the fiber core diameter (randomness) by building a statistical understanding of the formation of low or high amplitude (localized) states.

Summer 2015 **Intern, Los Alamos National Laboratory**

LANL

- Developed computer code to compute solutions of the one-dimensional Discrete Nonlinear Schroedinger equations. Met with faculty mentors on a semiweekly basis to discuss theoretical implications and limitations of computational results.
- Demonstrated theoretical rates of dispersion via the second moment when including the effect of randomness using high-order symplectic integration methods.

2013-2016 **Teaching Assistant, Southern Methodist University**

SMU

- Led Matlab projects and held discussions on assignments for undergraduate scientific computing.
- Guest lecturer for undergraduates in the Discrete Mathematics class.
- Graded homework and proctored exams for various professors.
    - Advanced Math for Science and Engineering, Fall 2013.
    - Functions of a Complex Variable, Spring 2014.
    - Introduction to Discrete Mathematics, Spring 2015.
    - Linear algebra, Spring 2013-Fall 2015.
    - Introduction to Scientific Computing, Fall 2014-Spring 2016.

PUBLICATIONS

C. Castro-Castro and A. B. Aceves, "Optical mode stability and dynamics in nonlinear twisted PT-symmetric structures, to appear American Institute of Physics, Conference Proceedings, 2017.

C. Castro-Castro, Y. Shen, G. Srinivasan, P.G. Kevrekidis, and A.B. Aceves, Light dynamics in nonlinear trimers and twisted multicore fibers, Journal of Nonlinear Optical Physics & Materials, Volume No.25, Issue No. 04. 2017 arXiv

A. B. Aceves, C. Castro-Castro, C. Shtyrina, A. Rubenchik, M. P. Fedoruk, and S. K. Turitsyn, Optical bullets in 2-dimensional fiber arrays, Photonics and Fiber Technology 2016 (ACOFT, BGPP, NP), OSA Technical Digest (online) Optical Society of America, 2016 OSA

TECHNICAL AND PERSONAL SKILLS

Programming Languages Proficient: C++, Matlab, Python, LaTeX, Mathematica; Intermediate: Bash, Maple, R; Novice: MySQL, HTML5

Environments Windows Microsoft, Linux

Spoken Languages French (elementary reading and conversation). Spanish (native speaker)

Leadership Vice-president of Society of Industrial and Applied Mathematics student chapter Member of Toastmasters International since Oct. 2015 (Treasurer since Oct. 2016-April 2017) Co-organizer Graduate Student Seminar, Aug. 2016-May 2017

HONORS & AWARDS

2017-2018 Postdoctoral Research Fellowship

ConTeX, (CONACyT and University of Texas at Austin)

2016-2017 Dissertation Fellowship

School of Graduate Studies, Southern Methodist University

May 2016 Edwin & Carrie Mouzon Teaching Award

Department of Mathematics, Department Southern Methodist University

Aug. 2011-Jul. 2013 National Scholarship for a Master's Degree

National Council for Science and Technology (CONACyT)

Spring 2010 Santander Bank Scholarship of National Mobility

Santander Group

CONFERENCES & WORKSHOPS

March 2017 Novel optical materials Workshop

Presented poster IMA, University of Minnesota, Minneapolis, Minnesota

July 2016 2016 SIAM Conference Annual Meeting

Boston, Massachusetts

April 2016 Workshop for Women in Math Sciences

Presented poster at SAMSI Spring Opportunities , Research Triangle Park, NC.

Sep. 2015 Conference on Waves, Spectral Theory & Applications

Presented poster, Princeton University

Summer 2014 SMU High Performance Computing Summer Workshop

SMU, Dallas, TX

Oct. 2013 Conference on Integrable Systems, Random Matrix Theory, and Combinatorics

The University of Arizona at Tucson,AZ

TALKS

Nov. 2016 Nonlinearity, disorder, and uncertainty quantification in dDNLS

Graduate Student Seminar, Department of Mathematics, SMU

Aug. 2015 Nonlinearity, disorder, and uncertainty quantification in discrete models

Student Seminar, CNLS, Los Alamos National Laboratory

Sep. 2014 Modulation equations of the Peyrard-Bishop model of DNA dynamics

Graduate Student Seminar, Department of Mathematics, SMU

Oct. 2011 Vector fields on the upper triangular algebra

XLIV National Meeting of the Mexican Mathematical Society, San Luis Potosí, Mexico, 2011.

GRADUATE COURSES

Real analysis	Dynamical Systems
Numerical methods	Linear and Nonlinear waves
Linear Algebra Ordinary Differential equations I	Finite Element Analysis
	Numerical Linear Algebra
Applied Mathematics I	Mathematical Models in Biology
Modeling I	Numerical Solution of Ordinary Differential Equations
Partial Differential Equations	
Selected topics of Differential equations: Completely Integrable Evolution Equations	Topics in Applied Mathematics: Photonics Modeling and Simulations

OTHER INFORMATION

Other interests Toastmasters International · Women who code

October 2017