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PROFILE

Dr. Jose Castillo is a Professor in the Department of Mathematics and Statistics at San Diego State University (SDSU). He joined the SDSU faculty in 1987 after he received his Ph.D. in Applied Mathematics from the University of New Mexico. He has a Master's Degree in Mathematics with a Minor in Computer Science from the University of Texas at Austin (1984). His Bachelor of Science in Mathematics is from the Universidad Central de Venezuela (1978). Dr. Castillo has a wide range of interests in applied mathematics with emphasis on the numerical solution of partial differential equations, scientific computing, and modeling. He has a long history of working with Los Alamos National Laboratory (CNLS and T7 group), and is now collaborating with Lawrence Berkeley Laboratory, Lawrence Livermore and Oak Ridge National Laboratories.

He has been the PI and co-PI on numerous grants and contracts at SDSU and has brought in \$20,483,311 from the National Institute of Health, the National Science Foundation, the Department of Energy and other various agencies and foundations. His research in mimetic discretization methods have been applied to problems in oil exploration, coastal ocean modeling and carbon sequestration. His training grants (NIH and NSF) have helped increase the number of STEMS students from under represented populations. Dr. Castillo has been awarded \$445,980 which has made possible the organization of a number of international workshops, conferences and in applied mathematics, computational science and engineering in Peru, Brazil, Argentina, Venezuela, Honduras, Mexico and Columbia. Dr. Castillo advocates in-depth computational science and engineering knowledge, encourages training, and fosters international cooperation among researchers, lecturers, and students.

Dr. Castillo is the Founder and Director of the Computational Science Research Center and the Computational Science Program at SDSU. The Center, founded in 1999, facilitates cooperation between the university and industry as well as national laboratories. The center involves participation of researchers from applied mathematics, astronomy, biology, chemistry/biochemistry, computer science, geology, mathematics and statistics, physics, geophysics, and engineering. Dr. Castillo also created the MS in Computational Science in 1999 and the Ph.D in Computational Science in 2002 respectively. The Ph.D program has graduated 77 students, and the MS has graduated 52 students. He continues to build partnerships with regional industry and national science laboratories for campus research efforts through the Applied Computational Science and Engineering Student Support (ACSESS) program.

Dr. Castillo has been named twice to the top 25 most influential people at SDSU (2003 and 2008). He has graduated eight (8) doctoral and 12 masters students. He is currently directing three (3) doctoral and two (2) masters' students. Dr. Castillo has presented and organized sessions at numerous SIAM conferences. He is the founder, faculty and advisor of a SIAM student chapter at SDSU and represents SIAM in the Mathematical Council of the Americas (MCoFA). He has also chaired the Pan American Advanced Studies Institute in Computational Science and Engineering four times and has given many invited talks at various international conferences as well. Dr. Castillo is currently an associate editor for three (3) journals, and has been a guest editor for several Elsevier Journals (i.e. Applied Numerical Mathematics, Computer and Mathematical Modeling, Computational and Applied Mathematics).

PROFESSIONAL PREPARATION

University of New Mexico	Applied Mathematics	Doctor of Philosophy, 1987
University of Texas at Austin	Mathematics, Minor in Computer Science	Master of Arts, 1984
Universidad Central de Venezuela	Mathematics	Licenciatura en Matematicas, 1978 (Bachelor of Science with Thesis)

ACADEMIC APPOINTMENTS

2001-Present	Chair, Joint Doctoral Program in Computational Science
2000-Present	Professor, Department of Mathematics, San Diego State University
1999-Present	Director, Computational Science Research Center
1992-1999	Associate Professor, San Diego State University
1987-1992	Assistant Professor, San Diego State University
1984-1987	Teaching Associate, University of New Mexico (lecturer)
1984-1985	Research Associate, Ecodynamics Research Associates, Albuquerque, New Mexico
1983-1984	Research Assistant, University of Texas at Austin

SERVICES

1999-Present	Director CSRC Applied Computational Science & Engineering Student Support (ACSESS) Program
1999-Present	Founder and Director CSRC Data Science Center
2000-2003	Member of the SDSU Faculty Senate
2002-Present	Director of the CSRC Implementation of the Joint PhD program with CGU
2007-2012	Member of the SDSU Graduate Research Council
2017-Present	Director of the CSRC Implementation of the Joint PhD program with UCI
2019-Present	Member of the Data Center Working Group
2019-Present	Member of the Resource Management & Procurement Working Group

MEMBERSHIPS

Society for Industrial and Applied Mathematics (SIAM)
International Association for Mathematics and Computers in Simulation (IMACS)
Society of Exploration Geophysicists (SEG)

INTERNATIONAL ACTIVITIES

Organized eight (8) Pan American Workshops and four (4) Pan American Advanced Studies Institutes (PASI) in Applied Mathematics and Computational Science promoting collaboration among researchers in Latin America and the U.S.

Participated as an organizer in the Mini-symposia: “Mimetic Finite Difference Methods and Applications – Part 1,” during the 9th International Congress on Industrial and Applied Mathematics (ICIAM), Valencia, Spain, July 15 – 19, 2019, the North American High Order Methods Conference, (NAHOMCon19), San Diego, California, June 2-5, 2019, the International Conference on Spectral and

High Order Methods (ICOSAHOM), London, United Kingdom, July 9-13, 2018, and in the 8th International Congress on Industrial and Applied Mathematics (ICIAM), Beijing, China, August 10 – 14, 2015.

PUBLICATIONS

Books:

Castillo, J.E., & Miranda, G. F. (2013). *Mimetic Discretization Methods*, CRC Press.

Castillo, J.E. (1991). *Mathematical Aspects of Numerical Grid Generation*, SIAM Frontiers Series in Applied Mathematics Vol. 8.

Research Papers:

Corbino, J. & **Castillo, J.E.** (2019). High-Order Mimetic Finite-Difference Operators Satisfying the Extended Gauss Divergence Theorem. *Journal of Computational and Applied Mathematics*, Vol. 364.

Valera, M., Thomas, M.P., Garcia, M. and **Castillo, J.E.** (2019). Parallel Implementation of a PETSc-Based Framework for the General Curvilinear Coastal Ocean Model. *J. Mar. Sci Eng.*, 7(6), 185.

Garcia, M., Choboter, P.F., Walter, R.K. & **Castillo, J.E.** (2019). Validation of the nonhydrostatic General Curvilinear Coastal Ocean Model (GCCOM) for stratified flows. *Journal of Computational Science*, 30, 143-156.

Castillo, J.E. & Miranda, G.F. Mimetic Finite-Difference Operators and High-Order Quadratures. Submitted for publication (2018).

Corbino, J. & **Castillo, J.E.** (2018). High-Order Mimetic Finite Difference Operators satisfying a Gauss Divergence Theorem. *Journal of Applied and Computational Mathematics*, 7:1.

Castillo, J.E. & Miranda, G.F. (2017) High-Order Compact Mimetic Differences and Discrete Energy Decay in 2D Wave Motions. *Lecture Notes in Computational Science and Engineering book series*, LNCSE, Vol. 119:293-304, Springer, Cham. Spectral and High Order Methods for Partial Differential Equations, ICOSAHOM Conference, Rio de Janeiro, Brazil, June 27-July 1, 2016.

Sanchez, E.J., Miranda, G.F., Cela, J.M. & **Castillo, J.E.** (2017). Supercritical-Order Mimetic Operators on Higher-Dimensional Staggered Grids. *Lecture Notes in Computational Science and Engineering book series*, LNCSE, Vol. 119:669-679, Springer, Cham. Spectral and High Order Methods for Partial Differential Equations, ICOSAHOM Conference, Rio de Janeiro, Brazil, June 27-July 1, 2016.

Abouali, M. & **Castillo, J.E.** (2017). Solving Poisson equation with Robin boundary condition on a curvilinear mesh using high order mimetic discretization methods. *Mathematics and Computers in Simulation*, 139, 23-26.

Castillo, J.E. & Grone, R.D. (2017). Using Kronecker Products to Construct Mimetic Gradients. *Linear and Multilinear Algebra*, 65:10, 2031-2045.

De Guenni, L.B., Garcia, M., Munoz, A.G., Santos, J.L., Cedeno, A., Perugachi, C. & **Castillo, J.E.** (2017). Predicting Monthly Precipitation along Coastal Ecuador: ENSO and Transfer Function Models. *Theoretical and Applied Climatology*, 129:3-4, 1059-1073.

Hernandez-Walls, R., Martin-Atienza, B., Salinas-Matus, M. & **Castillo, J.E.** (2017). Solving the Linear Inviscid Shallow Water Equations in One Dimension, with Variable Depth, Using a Recursion Formula, *European Journal of Physics*, 38:6.

Garcia, M., Hoar, T., Thomas, M.P. Bailey, B. & **Castillo, J.E.** (2016). Interfacing an ensemble Data Assimilation system with a 3D nonhydrostatic Coastal Ocean Model, an OSSE experiment. OCEANS 2016 MTS/IEEE, Monterey, CA, September 19-September 23, 2016. 1-11.

Choboter, P.F., Garcia, M., De Cecchis, D., Thomas, M.P., Walter, R.K. & **Castillo, J.E.** (2016). Nesting nonhydrostatic GCCOM within hydrostatic ROMS for multiscale Coastal Ocean Modeling. OCEANS 2016 MTS/IEEE, Monterey, CA, September 19-September 23, 2016. 1-4.

Córdova, L., Rojas, O., Otero, B. & **Castillo, J.E.** (2016). Compact Finite Difference Schemes for the Acoustic Wave Equation. 78th EAGE Conference and Exhibition 2016-Workshops, Vienna, Austria, May 30-June 2, 2016.

Sanchez, E. & **Castillo, J.E.** (2016). Mimetic finite differences and interpolation methods to simulate subsurface mass transport of injected CO₂. International Conference and Exhibition, Barcelona, Spain, April 3-April 6, 2016. 58-58.

Matthews, J., Paolini, C. & **Castillo, J.E.** (2016). Simulation of fluid pressure and fracturing in CO₂ sequestration. ICOSAHOM Conference, Rio de Janeiro, Brazil, June 27-July 1, 2016. 59-59.

Corbino, J., Paolini, C. & **Castillo, J.E.** (2016). Subflow – An Open-Source, Object-Oriented Application for Modeling Geologic Storage of CO₂. ICOSAHOM Conference, Rio de Janeiro, Brazil, June 27-July 1, 2016. 60-60.

Castillo, J.E. & Miranda, G.F. (2016). High-Order Compact Mimetic Differences and Discrete Energy Decay in 2D Wave Motions. Spectral and High Order Methods for Partial Differential Equations, ICOSAHOM Conference, Rio de Janeiro, Brazil, June 27-July 1, 2016. 293–304.

(2016). VIII Pan-American Workshop. In the *Journal of Computational and Applied Mathematics*. **J. Castillo**, V. Pereyra, G. Scherer (Eds). Vol. 295, pp 1-184. [doi:10.1016/j.cam.2015.10.001](https://doi.org/10.1016/j.cam.2015.10.001)

Castillo, J.E. (2015). Coastal Ocean Dynamics: Addressing the Challenge of 3D High Resolution. *SIAM NEWS*. October 30, 2015 issue. <https://lnkd.in/bXbh9Nw>

Córdova, L.J., Rojas, O., Otero, B., & **Castillo, J.E.** (2015). Compact finite difference modeling of 2-D acoustic wave propagation.. *Journal of Computational and Applied Mathematics*. Available online 19 February 2015, <http://www.sciencedirect.com/science/article/pii/S0377042715000618>

Paolini, C., Matthews, J., Sanchez, E., Corbino, J., Clarke, G., & **Castillo, J.E.** (2015). *Effect of Aqueous Electrolytic Reactions on Reservoir Temperature During CO₂ Injection*, The 14th Annual Carbon Capture, Utilization & Storage Conference, Pittsburgh, Pennsylvania.

Paolini, C., Matthews, J., Sanchez, E., Corbino, J., Clarke, G., Dominguez, J., & **Castillo, J. E.**, (2014). *Thermal-Mechanical Model Coupling in Geologic CO₂ Sequestration Simulation*, 2014 Carbon Storage RD Project Review Meeting, U.S. Department of Energy, National Energy Technology Laboratory, Pittsburgh, PA.

- Hernández-Walls, R. **Castillo, J.E.**, Rojas-Mayoral, E.M. & Girón Nava, J.A. (2014). Semi-discrete numeric solution for the non-stationary heat equation using mimetic techniques. *European Journal of Physics*, 35(6):065013.
- Garcia, M., Ramirez, I., Verlaan, M., & **Castillo, J.E.** (2014). Application of a Three-Dimensional Hydrodynamic Model for San Quintin Bay, B.C., Mexico. Validation and Calibration Using OpenDA. *Journal of Computational and Applied Mathematics*, 273, 428-437.
- Rojas, O., Otero, B., **Castillo, J.E.**, & Day, S.M. (2014). Low Dispersive Modeling of Rayleigh Waves on Partly-Staggered Grids. *Journal of Computational Geosciences*, 18:1, 29-43.
- Sanchez, E., Paolini, C., & **Castillo, J.E.** (2014). *Analyzing Diffusive-Advective-Reactive Processes Using Mimetic Finite Differences with Implications in Carbon Dioxide Geologic Storage*, 13th Annual Conference on Carbon Capture Utilization & Storage, Pittsburgh, Pennsylvania.
- Sanchez, E., Paolini, C., & **Castillo, J.E.** (2014). The Mimetic Methods Toolkit: An object-oriented API for Mimetic Finite Differences. *Journal of Computational and Applied Mathematics*. Available online 4 January 2014, ISSN 0377-0427, <http://dx.doi.org/10.1016/j.cam.2013.12.046>.
- De la Puente, J., Ferrer, M., Hanzich, M., **Castillo, J. E.**, & Cela, J. M. (2014). Mimetic Seismic Wave Modeling Including Topography on Deformed Staggered Grids. *Geophysics*, 79, T125-T141.
- Abouali, M. & **Castillo, J.E.** (2013.) Solving Poisson Equation with Robin Boundary Condition on a Curvilinear Mesh Using High Order Mimetic Discretization Methods. *Mathematics and Computers in Simulation*. Available online 3 December 2014, <http://doi:10.1016/j.matcom.2014.10.004>.
- Sanchez, E., Blomgren, P., & **Castillo, J.E.** (2013). On the Role of Constrained Linear Optimization to Construct Higher-Order Mimetic Divergence Operators. *Journal of Computational and Applied Mathematics* (under review).
- Sanchez, E., Paolini, C., Park, A., & **Castillo, J.E.** (2013). A Block-defined, Global and Sparse (BloGS) Matrix Storage Scheme for the Numerical Resolution of Many Partial Differential Equations on Distributed-Memory Computers. *Journal of Computational and Applied Mathematics* (under review).
- Paolini, C., Binter, C., Sanchez, E., & **Castillo, J.E.** (2013). *Using the Helgeson-Kirkham-Flowers Model to Predict Reservoir Temperature During CO₂ Injection*, 2013 Carbon Storage RD Project Review Meeting, U.S. Department of Energy National Energy Technology Laboratory, Pittsburgh, PA.
- Sanchez, E., Paolini, C., & **Castillo, J.E.** (2013). *High-Performance Computing in Simulating Carbon Dioxide Geologic Sequestration*, 4th International Congress on Computational Engineering and Sciences (FEMTEC 2013), Las Vegas.
- Sanchez, E., Paolini, C., Park, A., & **Castillo, J.E.** (2013). *High-Performance Computing in Simulating Carbon Dioxide Geologic Sequestration*, 2013 SIAM Conference on Computational Science and Engineering, Boston, Massachusetts, February 25-March 1, 2013.
- Matthews, J., Paolini, C., & **Castillo, J.E.** (2013). *Numerical Simulation of Poroelastic Pressure Diffusion in CO₂ Sequestration*, 7th Annual Applied Computational Science and Engineering Student Support (ACSESS) Meeting, March 1, 2013.
- Abouali, M., Timmerman, J., **Castillo, J.E.**, & Su, Z. (2013). A High Performance GPU Implementation of Surface Energy Balance System (SEBS) Based on CUDA-C. *Environmental Modeling and Software*, 41, 134-138.

Abouali, M., & **Castillo, J.E.** (2013). Stability and Performance Analysis of the Castillo-Grone Mimetic Operators in Conjunction with RK3 Time Discretization in Solving Advective Equations. *Procedia Computer Science*, 18, 465-472.

Abouali M. & Castillo J.E. (2012). *Solving Navier-Stokes' Equation Using Castillo-Grone's Mimetic difference operators on GPUs*. 65th Annual Meeting of the APS Division of Fluid Dynamics.

Abouali M. & **Castillo J.E.** (2012). *The Castillo-Grone's Mimetic Difference Operators in 2D and 3D Fully Curvilinear Grids: Case Study of Poisson's Equation*. MASCOT&ISGG 2012 Workshops.

Thomas, M.P. & **Castillo, J.E.** (2012). *Parallelization of the 3D Unified Curvilinear Coastal Ocean Model: Initial Results*. ICCSA Workshops, 88-96.

Thomas M.P., **Castillo, J.E.** (2012). Parallelization of the 3D Unified Curvilinear Coastal Ocean Model: Initial Results, *Proceedings of the 2012 12th International Conference on Computational Science and Its Applications, IEEE*: pp. 88-96.

Paolini, C., Park, A. J., Binter, C., & **Castillo, J. E.** (2011). *An Investigation of the Variation in the Sweep and Diffusion Front Displacement as a Function of Reservoir Temperature and Seepage Velocity with Implications in CO₂ Sequestration*. 47th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit and the 9th Annual International Energy Conversion Engineering Conference.

Binter, C., Paolini, C., Park, A. J., & **Castillo, J. E.** (2011). *Utilization of Reaction-Transport Modeling Software to Study the Effects of Reservoir Temperature and Seepage Velocity on the Sweep Diffusion Front Displacement Formed after CO₂-Rich Water Injection*. Tenth Annual Conference on Carbon Capture and Sequestration.

Binter, C., Park, A. J., **Castillo, J. E.**, & Paolini, C. (2011). *Incorporation of New Web-based Technology to Expand the Accessibility and Flexibility of RTM Software for use in Modeling CO₂ Sequestration*, Tenth Annual Conference on Carbon Capture and Sequestration, Pittsburgh, Pennsylvania.

Sanchez Peiro, E., Park, A. J., **Castillo, J. E.**, & Paolini, C. (2011). *Mimetic Finite Difference Methods: An Application in Modeling Geological Sequestration of Carbon Dioxide*, Tenth Annual Conference on Carbon Capture and Sequestration, Pittsburgh, Pennsylvania.

Paolini, C., Sanchez Peiro, E., Park, A. J., & **Castillo, J. E.** (2011). *A Distributed Mimetic Approach to Simulating Water-Rock Interaction following CO₂ Injection in Sedimentary Basins*, 2011 SIAM Conference on Analysis of Partial Differential Equations, San Diego, California.

Bazan, C., Abouali, M., **Castillo, J.**, & Blomgren, P. (2011). Mimetic Finite Difference PDE-Based Models in Image Processing. *Journal of Computational & Applied Mathematics*, 30:3, 1-20, ISSN 0101-8205.

De Cecchis, D., Drummond, L.A., & **Castillo, J.E.** (2011). Design of a Distributed Coupling Toolkit for High Performance Computing Environment. *Journal of Mathematical and Computer Modelling*, doi:10.1016/j.mcm.2011.07.002.

Abouali M., & **Castillo J.E.** (2011). Unified Curvilinear Ocean Atmosphere Model (UCOAM): A Vertical Velocity Case Study. *Journal of Mathematical and Computer Modelling*, doi:10.1016/j.mcm.2011.03.023.

Pereyra, V., **Castillo, J.E.**, & Saunders, M. (2011). Equispaced Pareto Front Construction for Constrained Bi-Objective Optimization. *Journal of Mathematical and Computer Modelling*, doi:10.1016/j.mcm.2010.12.044.

Paolini, C., Mellors, R. J., **Castillo, J. E.** & Park, A. J. (2009). *Running a Reaction-Transport-Mechanical Simulator on a Web-based Platform: Putting Together Water-Rock Interaction, Multi-phase and Heat flow, a Composite Petrophysics Model, and a Fracture Mechanics Region*, 2009 American Geophysical Union (AGU) Fall Meeting, San Francisco ,California.

Rojas, O., Dunham, E., Day, S., Dalguer, L., & **Castillo, J.E.** (2009). Finite Difference Modeling of Rupture Propagation with Strong Velocity-Weakening Friction. *Geophysical Journal International Seismology*, 179, 1831-1858.

Batista, E.B., & **Castillo, J.E.** (2009). Mimetic Schemes on Non-Uniform Structured Meshes. *Electronic Transactions of Numerical Analysis*, 34, 152-162.

Torres, C., De Cecchis, D., Larrazabal, G., **Castillo, J.E.** (2009). Numerical Study of a Descending Sphere in a Low Reynolds Number Flow, *Electronic Transactions of Numerical Analysis*, V. 34, pp. 119-124.

Rojas, O., Day, S., **Castillo, J.E.** & Dalguer, L.A. (2008). Modeling of Rupture Propagation using High-Order Mimetic Finite Differences. *Geophysical Journal International Seismology*, 172, 631-650.

Hernandez, F.F., **Castillo, J.E.** & Larrazabal, G.A. (2007). Large Sparse Linear Systems Arising From Mimetic Discretization. *Computers and Mathematics with Applications*, 53, 1-11.

Guevara-Jordan, J.M., Rojas, S., Freytes-Villegas, M. & **Castillo, J.E.** (2007). Convergence of a Mimetic Finite Difference Method for Static Diffusion Equation. *Advances in Difference Equations*, Article ID 12303, 1-12.

Torres, C. R., G. Larrazabal & **Castillo, J. E.** (2006). Understanding Three-Dimensional Circulation in Lake Valencia, Venezuela: A Numerical Approach. In *Simulación y Modelado en Ingeniería y Ciencias*. B. Gámez, D. Ojeda, G. Larrazabal, M. Cerrolaza (Eds). Ed. SVMNI, pp. MF-49 a MF-56. ISBN:980-00-2315-1.

Castillo, J.E., & Yasuda, M. (2005). Linear Systems Arising for Second-Order Mimetic Divergence and Gradient Discretizations. *Journal of Mathematical Modeling and Algorithms*, 4, 67-82.

Castillo, J.E., & Yasuda, M. (2005). *On the Solvability of the Castillo-Grone Mimetic Discretization*, International Conference on Numerical Analysis and Applied Mathematics, T.E Simos, G. Psihoyios, Ch. Tsitouras (Eds). ICNAAM 2005, Rhodes, Greece.

Torres C.R., Mascarenhas A. S., & **Castillo J.E.** (2004). Three-dimensional stratified flow over the Alarcon Seamount, entrance to the Gulf of California. *Deep-Sea Res.*, 51 (6-9), 647-657.

Torres C.R., & **Castillo J. E.** (2003). Stratified Rotating Flow Over Complex Terrain. *Journal Applied Numerical Mathematics*, 47, 531-541.

Larrazabal, G., Torres C.R., & **Castillo J.E.** (2003). An Efficient and Robust Algorithm for 2D Stratified Fluid Flow Calculations. *Journal of Applied Numerical Mathematics*, 47, 493-502.

- Castillo, J.E.**, & Yasuda, M. (2003). *A Comparison of Two Matrix Operator Formulations for Mimetic Divergence and Gradient Discretizations*. Proceedings of the International Conference on Parallel and Distributed Processing Techniques and Applications, Volume III, Las Vegas, NV, 1281-1285.
- Castillo, J.E.**, & Grone, R.D. (2003). A Matrix Analysis Approach to High-Order Approximations for Divergence and Gradient Satisfying a Global Conservation Law, *SIAM Journal of Matrix Analysis and Applications*, 25, 128-142.
- Castillo, J.E.**, & McGuinness, T. (2002). Steady State Diffusion Problems on Non-Trivial Domains: Support Operator Method Integrated with Direct Optimized Grid Generation, *Journal Applied Mathematics*, 40, 207-218.
- Torres, C.R., & **Castillo, J.E.** (2002). A New 3D Curvilinear Coordinates Numerical Model for Oceanic Flow Over Arbitrary Bathymetry (*In Spanish*). In *Desarrollos Recientes en Métodos Numéricos*, C. M. Muller-Karger, M. Lentini, M. Cerrolaza (Eds). MF, pp. 105-112.
- Torres, C.R., Ochoa, J., **Castillo, J.E.**, & Van Woert, M.L. (2002). Initial Flow Field of Stratified Flow Pass an Impulsive Started Sphere. *Journal of Applied Numerical Mathematics*, 40/1-2 , 235-244.
- Bohner, M., & **Castillo, J.E.** (2001). Mimetic Methods on Measure Chains. *Journal of Computers and Mathematics Application*, 42, 705-710.
- Torres, C.R., **Castillo, J.E.**, & Rangel, R.H. (2001). *Numerical Study of Stratified Flow Past a Sphere Inside a Cylinder*. V Latin American and Caribbean Congress on Fluid Mechanics, Caracas, Venezuela.
- Rangel, R.H., Trollinger, J.D., Coimbra, C.F.M., **Castillo, J.E.**, & Torres, C. (2001). *Studies of Fundamental Particle Dynamics in Micro gravity*, in Proceedings of the Micro gravity Transport Processes in Fluid, Thermal, Biological and Materials Science II, Banff, Alberta, Canada.
- Castillo, J.E.**, Shashkov, M., Hyman, J.M., & Steinberg, S. (2001). Fourth and Sixth-Order Conservative Finite-Difference Approximations of the Divergence and Gradient. *Applied Numerical Mathematics*, 37, 171-187.
- Castillo, J.E.**, & Otto, J.S. (2000). Numerical Techniques for the Transformation to an Orthogonal Coordinate System Aligned with a Vector Field, *Journal of Computers and Mathematics Applications*, 40, 523-535.
- Torres-Navarrete, C.R., Hanazaki, H., Ochoa, J., **Castillo, J.E.**, & Woert, M.V. (2000). Flow Past a Sphere Moving Vertically in a Stratified Diffusive Fluid. *Journal of Fluid Mechanics*, 417, 211-236.
- Castillo, J.E.**, & Otto, J.S. (1999). A Practical Guide to Planar Grid Generation. *Journal Computers and Mathematics Applications*, 37, 123-156.
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- Castillo, J.E.**, & Otto, J.S. (1997). A Generalized Length Strategy for Direct Optimization in Planar Grid Generation. *Math. Comp. in Simulation*, 44, 441-456.
- Castillo, J.E.**, & Pedersen, E. (1996). Solution Adaptive Discrete Variational Grid Generation for Fluid Flow Calculations. *Journal of Computational and Applied Mathematics*, 67, 343-370.

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Castillo, J.E., Shashkov, M., Hyman, J.M., & Steinberg, S. (1995). The Sensitivity and Accuracy of Fourth Order Finite-Difference Schemes on Nonuniform Grids in One Dimension, *Journal of Computers and Mathematics Applications*, 30:8, 41-55.

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Castillo, J.E., & Shashkov, M. (1994). Grids Consistent with Finite Difference Schemes, In *Numerical Grid Generation in Computational Fluid Dynamics and Related Fluids*, North Holland.

Castillo, J.E., McEachern, M., Richardson, J., & Steinberg, S. (1994). Modeling the Membrane Using Boundary-Fitted Coordinates. *Applied Mathematical Modeling*, 18.

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Castillo, J.E. (1991). An Adaptive Direct Variational Grid Generation Method. *Journal Computers and Mathematics Applications*, 4:1.

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Castillo, J.E., Steinberg, S., & Roache, P. (1988). On the Folding of Numerically Generated Grids: Use of Reference Grids. *Communications in Applied Numerical Methods*, 4, 471-481.

Castillo, J.E. (1988). *A Direct Variational Grid Generation Method: Orthogonality Control*. In Numerical Grid Generation and Fluid Mechanics '88, Pineridge Press Limited, Swansea.

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Castillo, J.E. (1987). *A Direct Variational Grid Generation Method*. In Proceedings of 6th IMACS Inter. Symp. On Computer Methods for Partial Differential Equations, Lehigh University, Bethlehem, PA.

Castillo, J.E. (1986). *Mathematical Aspects of Variational Grid Generation I*. In Numerical Grid Generation in Computational Fluid Dynamics, Pineridge Press Limited, Swansea.

Milfeld, K.F., **Castillo, J.E.**, & Wyatt, R.E. (1985). Dynamics of Eigenstate Transitions Induced by External Fields: A New Approach. *Journal of Chemical Physics*, 83:4.

Castillo, J.E., & Wyatt, R.E. (1985). Recursive Residue Generation Method for Laser-Molecule Interaction: Utilization of Structured Sparsity. *Journal of Computational Physics*, 59:1.

Technical Reports:

Abouali M., & **Castillo J.E.** (2010). *General Curvilinear Ocean Model: Next Generation – Theory and Implementation*. CSRC Publication, CSRCR 2010-02.

Carlos B., Abouali M., **Castillo J.E.**, & Blomgren P. (2003). *Mimetic Finite Difference PDE-based Models in Image Processing*. CSRCR 2009-03.

Castillo, J.E., Shashkov, M., Hyman, J.M., & Steinberg, S. (1995). *High-Order Finite-Difference Methods on Nonuniform Grids*. Los Alamos National Laboratory, CNLS Report, LA-UR-95-583.

Castillo, J.E., & Otto, J.S. (1995). *On the Transformation to an Orthogonal Coordinate System Aligned with a Vector Field, Part Two: Variational Grid Generation*. CNLS Report, LA-UR-95-3407.

Castillo, J.E., Shashkov, M., Hyman, J.M., & Steinberg, S. (1994). *The Sensitivity and Accuracy of Fourth Order Finite-Difference Schemes on Nonuniform Grids in One Dimension*. Los Alamos National Laboratory, CNLS Report, LA-UR-94-3621.

Castillo, J.E., & Shashkov, M. (1993). *Grid Generation Methods Consistent with Finite-Difference Schemes*. Los Alamos National Laboratory, CNLS Report, LA-UR-93-2932.

Castillo, J.E., Steinberg, S., & Roache, P. (1987). *On the Folding of Numerically Generated Grids*. Technical Report No. 2, Institute for Computational Research, Department of Mathematics and Statistics University of New Mexico, Albuquerque, NM.

PROFESSIONAL PRESENTATIONS

Sanchez, E.J., Miranda, G.F., Cela, J.M. & **Castillo, J.E.** (2017). Supercritical-Order Mimetic Operators on Higher-Dimensional Staggered Grids. Spectral and High Order Methods for Partial Differential Equations, ICOSAHOM Conference, Rio de Janeiro, Brazil, June 27-July 1, 2016. 669-679.

- Garcia, M., Hoar, T., Thomas, M.P. Bailey, B. & **Castillo, J.E.** (2016). Interfacing an ensemble Data Assimilation system with a 3D nonhydrostatic Coastal Ocean Model, an OSSE experiment. OCEANS 2016 MTS/IEEE, Monterey, CA, September 19-September 23, 2016. 1-11.
- Choboter, P.F., Garcia, M., De Cecchis, D., Thomas, M.P., Walter, R.K. & **Castillo, J.E.** (2016). Nesting nonhydrostatic GCCOM within hydrostatic ROMS for multiscale Coastal Ocean Modeling. OCEANS 2016 MTS/IEEE, Monterey, CA, September 19-September 23, 2016. 1-4.
- Córdova, L., Rojas, O., Otero, B. & **Castillo, J.E.** (2016). Compact Finite Difference Schemes for the Acoustic Wave Equation. 78th EAGE Conference and Exhibition 2016-Workshops, Vienna, Austria, May 30-June 2, 2016.
- Sanchez, E. & **Castillo, J.E.** (2016). Mimetic finite differences and interpolation methods to simulate subsurface mass transport of injected CO₂. International Conference and Exhibition, Barcelona, Spain, April 3-April 6, 2016. 58-58.
- Castillo, J.E.** & Miranda, G.F. (2016). High-Order Compact Mimetic Differences and Discrete Energy Decay in 2D Wave Motions. Spectral and High Order Methods for Partial Differential Equations, ICOSAHOM Conference, Rio de Janeiro, Brazil, June 27-July 1, 2016. 293–304.
- Paolini, C., Matthews, J., Sanchez, E., Corbino, J., Clarke, G., & **Castillo, J.E.** (2015). *Effect of Aqueous Electrolytic Reactions on Reservoir Temperature During CO₂ Injection*, The 14th Annual Carbon Capture, Utilization & Storage Conference, Pittsburgh, Pennsylvania.
- Paolini, C., Matthews, J., Sanchez, E., Corbino, J., Clarke, G., Dominguez, J., & **Castillo, J. E.**, (2014). *Thermal-Mechanical Model Coupling in Geologic CO₂ Sequestration Simulation*, 2014 Carbon Storage RD Project Review Meeting, U.S. Department of Energy, National Energy Technology Laboratory, Pittsburgh, PA.
- Sanchez, E., Paolini, C., & **Castillo, J.E.** (2014). *Analyzing Diffusive-Advective-Reactive Processes Using Mimetic Finite Differences with Implications in Carbon Dioxide Geologic Storage*, 13th Annual Conference on Carbon Capture Utilization & Storage, Pittsburgh, Pennsylvania.
- Córdova, L.J., Rojas, O., Otero, B. & **Castillo, J.E.** (2014). *A Comparative Study of Two Compact Finite Difference Methods: Standard vs. Mimetic*. XII International Congress on Numerical Methods in Engineering and Applied Sciences, Pampatar, Margarita Island, Venezuela.
- Paolini, C., Binter, C., Sanchez, E., & **Castillo, J.E.** (2013). *Using the Helgeson-Kirkham-Flowers Model to Predict Reservoir Temperature During CO₂ Injection*, 2013 Carbon Storage RD Project Review Meeting, U.S. Department of Energy National Energy Technology Laboratory, Pittsburgh, PA.
- Sanchez, E., Paolini, C., & **Castillo, J.E.** (2013). *High-Performance Computing in Simulating Carbon Dioxide Geologic Sequestration*, 4th International Congress on Computational Engineering and Sciences (FEMTEC 2013), Las Vegas.
- Sanchez, E., Paolini, C., Park, A., & **Castillo, J.E.** (2013). *High-Performance Computing in Simulating Carbon Dioxide Geologic Sequestration*, 2013 SIAM Conference on Computational Science and Engineering, Boston, Massachusetts, February 25-March 1, 2013.
- Castillo, J.E.**, & Sanchez, E. J. (2013). *Mimetic Methods Toolkit (MTK), An Object-Oriented API Implementing Mimetic Discretization Methods*. SIAM Conference in Computational Science and Engineering (CSDE-13), Boston, MA.

Castillo, J.E., & E. J. Sanchez (2012). *Mimetic Methods Toolkit (MTK), An Object-Oriented API Implementing Mimetic Discretization Methods*. SIAM Conference in Computational Science and Engineering (CSDE-13), Minneapolis, MN.

Paolini, C., Park, A. J., Binter, C., & **Castillo, J. E.** (2011). *An Investigation of the Variation in the Sweep and Diffusion Front Displacement as a Function of Reservoir Temperature and Seepage Velocity with Implications in CO₂ Sequestration*. 47th AIAA/ASME/SAE/ASEE Joint Propulsion Conference and Exhibit and the 9th Annual International Energy Conversion Engineering Conference.

Binter, C., Paolini, C., Park, A. J., & **Castillo, J. E.** (2011). *Utilization of Reaction-Transport Modeling Software to Study the Effects of Reservoir Temperature and Seepage Velocity on the Sweep Diffusion Front Displacement Formed after CO₂-Rich Water Injection*. Tenth Annual Conference on Carbon Capture and Sequestration.

Binter, C., Park, A. J., **Castillo, J. E.**, & Paolini, C. (2011). *Incorporation of New Web-based Technology to Expand the Accessibility and Flexibility of RTM Software for use in Modeling CO₂ Sequestration*, Tenth Annual Conference on Carbon Capture and Sequestration, Pittsburgh, Pennsylvania.

Sanchez Peiro, E., Park, A. J., **Castillo, J. E.**, & Paolini, C. (2011). *Mimetic Finite Difference Methods: An Application in Modeling Geological Sequestration of Carbon Dioxide*, Tenth Annual Conference on Carbon Capture and Sequestration, Pittsburgh, Pennsylvania.

Paolini, C., Sanchez Peiro, E., Park, A. J., & **Castillo, J. E.** (2011). *A Distributed Mimetic Approach to Simulating Water-Rock Interaction following CO₂ Injection in Sedimentary Basins*, 2011 SIAM Conference on Analysis of Partial Differential Equations, San Diego, California.

Paolini, C., Mellors, R. J., **Castillo, J. E.** & Park, A. J. (2009). *Running a Reaction-Transport-Mechanical Simulator on a Web-based Platform: Putting Together Water-Rock Interaction, Multi-phase and Heat flow, a Composite Petrophysics Model, and a Fracture Mechanics Region*, 2009 American Geophysical Union (AGU) Fall Meeting, San Francisco, California.

Castillo, J.E. (2009). *High Order Mimetic Discretizations on Nonuniform Grids*. SIAM Annual Meeting, Denver, CO.

Castillo, J.E. (2008). *High Order Mimetic Differential Operators and Applications*. SIAM Annual Meeting, San Diego, CA.

Castillo, J.E. (2006). *Mimetic Discretizations for Elliptic Problems with Tensor Coefficients*. SIAM Annual Meeting, Boston, MA.

Castillo, J.E. (2005). *Fourth Order Mimetic Finite Difference Modeling of 2D Elastic P-Sv*. SIAM Annual Meeting, New Orleans, LA.

Castillo, J.E. (2005). *On the Solvability of the Castillo-Grone Mimetic Discretization*. International Conference in Numerical Analysis and Applied Mathematics, Rhodes, Greece.

Castillo, J.E. (1996). *Adaptive Direct Optimization Grid Generation Methods*. SIAM Annual Meeting, Kansas City.

Castillo, J.E. (1994). *Direct Optimization Grid Generation Methods*. SIAM Annual Meeting, San Diego, CA.

Castillo, J.E. (1991, July). *The Discrete Grid Generation Method on Curves and Surfaces*. Mini Symposium ICIAM Meeting, Washington D.C.

Castillo, J.E. (1991, June). *The Discrete Grid Generation Method on Curves and Surfaces*. International Conference, Numerical Grid Generation in Computational Fluid Dynamics, Barcelona, Spain.

Castillo, J.E. (1990, July). *Discrete Grid Generation on Curves*. Contributed paper presented at the SIAM meeting, Chicago, IL.

Castillo, J.E. (1990, April). *Discrete Variational Grid Generation*. Contributed paper presented to the American Mathematical Society.

Castillo, J.E., & Hansen, L.K. (1989, July). *Adaptive Grids for Surface Interpolation*. Contributed paper presented at the SIAM Meeting, San Diego, CA.

Castillo, J.E. (1988). *The Volume Integral in Variational Grid Generation*, Mini Symposia at the SIAM Conference at Minneapolis, Minnesota.

Barrera-Sanchez, P., & **Castillo, J.E.** (1987). *A Large-scale Non-Linear Optimization Problem Arising From Grid Generation I*. Contributed paper presented at the SIAM conference in Optimization at Houston, TX.

Barrera-Sanchez, P., and **Castillo, J.E.** (1987, October). *A Large-scale Non-Linear Optimization Problem Arising From Grid Generation II*. Contributed paper presented at the SIAM Conference at Denver, Colorado.

Castillo, J.E. (1986, March). *Folding of Numerical Grids: Use of Reference Grids*. Conference presented at the ACM Rio Grande Chapter SIGNUM Meeting. Albuquerque, NM.

Castillo, J.E., Steinberg, S., and Roache, P. (1986, June). *On the Folding of Numerically Generated Grids: Use of Reference Grids*. Contributed paper presented at 10th U.S. National Congress of Applied Mechanics, Austin, TX.

Castillo, J.E. (1986, July). *Mathematical Aspects of Variational Grid Generation I*. Contributed paper presented at the International Conference, Numerical Grid Generation in Computational Fluid Dynamics, Landshut, W. Germany.

Castillo, J.E., Steinberg, S., and Roache, P. (1986, July). *Mathematical Aspects of Variational Grid Generation II*. Contributed paper presented at the International Congress on Computational and Applied Mathematics, University of Leuven, Belgium.

Castillo, J.E. (1986, December). *A Large-scale Non-Linear Optimization Problem Arising From Grid Generation*. Conference presented at the ACM Rio Grande Chapter SIGNUM Meeting. Albuquerque, New Mexico.

Castillo, J.E., Steinberg, S., and Roache, P. (1985). *On Folding of Numerical Grids*. Paper presented at SIAM Fall Meeting, Tempe, Arizona.

INVITED PRESENTATIONS

“High Order Mimetic Difference Operators.” Mathematical Sciences Colloquium, Rensselaer Polytechnic Institute, Troy, NY, November 5, 2018.

“High Order Difference Operators.” Applied Math Colloquium, University of Arizona, Tucson, AZ, October 19, 2018.

“Time Space High Order Mimetic Finite Differences.” International Conference on Spectral and High Order Methods, ICOSAHOM 2018, London, United Kingdom, June 9-13, 2018.

<http://www.icosahom2018.org/>

“Mimetic Discretization Methods.” ICERM Conference, Brown University, Providence, RI, August 2018.

“Mimetic Difference Operators and Symplectic Integration.” BIRS Workshop, Banff International Research Station for Mathematical Innovation and Discovery, Calgary, CN, June 11, 2017.

“Interfacing an Ensemble Data Assimilation System with a 3D Nonhydrostatic Coastal Ocean Model, an OSSE Experiment.” OCEANS 2016 MTS/IEEE, Monterey, CA, September 19, 2016.

“Nesting Nonhydrostatic GCCOM within Hydrostatic ROMS for Multiscale Coastal Ocean Modeling.” OCEANS 2016 MTS/IEEE, Monterey, CA, September 19, 2016.

“High-Order Compact Mimetic Differences and Discrete Energy Decay in 2D Wave Motions.” International Conference on Spectral and High Order Methods, ICOSAHOM 2016, Rio de Janeiro, Brazil, June 27 – July 1, 2016.

“Supercritical-Order Mimetic Operators on Higher-Dimensional Staggered Grids.” International Conference on Spectral and High Order Methods, ICOSAHOM 2016, Rio de Janeiro, Brazil, June 27 – July 1, 2016.

“Compact Finite Difference Schemes for the Acoustic Wave Equation.” 78th EAGE Conference and Exhibition 2016-Workshops, Vienna, Austria, May 30, 2016.

“Mimetic finite differences and interpolation methods to simulate subsurface mass transport of injected CO₂.” International Conference and Exhibition, Barcelona, Spain, April 3, 2016.

“Effect of Aqueous Electrolytic Reactions on Reservoir Temperature During CO₂ Injection.” The 14th Annual Carbon Capture, Utilization & Storage Conference, Pittsburgh, PA, 2015.

The 8th International Congress on Industrial and Applied Mathematics (ICIAM), Beijing, China, August 10-14, 2015. <http://www.iciam2015.cn/>

The 20th Colombian Mathematics 2015 Conference, Universidad Nacional De Colombia, 2015. <http://www.xxcongresocolombianodematematicas.co/>

“Studying the Coastal Ocean Dynamics with GCCOM, a 3D Model of High Reproduction in Coordenadas Curvilineas.” Venezuelan Oceanology Congress, Venezuela, 2015. <http://icvo.udo.edu.ve/icvo/index.php>

SIAM Conference on Mathematical and Computational Issues in the Geosciences, Stanford University, Stanford, California, June 29 – July 2, 2015. <https://www.siam.org/meetings/gsl5/>

“Ocean Mathematical Technology.” Summer workshop at the Ocean University of China, Qingdao, China, April 17-20, 2015.

“Viscoelastic Anisotropic Seismic Modeling with High-Order Mimetic Finite-Differences.” International Conference on Spectral and High Order Methods, ICOSAHOM 2014, Salt Lake City, Utah, June 23-27, 2014. <http://www.icosahom2014.org/>

“Mimetic Discretization Methods.” VIII Pan-American Workshop, Applied and Computational Mathematics, Universidad del Norte, Barranquilla, Colombia, July 21-25, 2014. <http://www.csrc.sdsu.edu/panam2014/index.html>

“High Order Mimetic Differential Operators.” SCTC 2012, Caracas, Venezuela, May 7-18, 2012.

“The General Curvilinear Environmental Model (GCEM).” Caracas, Venezuela, January 2-6, 2012.

“High Order Mimetic Discretization Methods.” ICIAM 2011, Vancouver, British Columbia, Canada, July 18-22, 2011.

“Mimetic Differential Operators.” Costa Rica Institute of Technology, June 19-24, 2011.

“A High Order Mimetic Discretization Scheme.” Conference on Applied, Computational & Industrial Mathematics, Buenos Aires, Argentina, May 7-15, 2011.

“The General Curvilinear Environmental Model.” First North American Meeting on Industrial and Applied Mathematics, Universidad del Mar, Huatulco, Oaxaca México, December 7-10, 2010.

“Development of a Cyberinfrastructure-based Computational Environment for the General Curvilinear Coastal Ocean Model,” 2010 International Congress on Computer Applications and Computational Science, Singapore, December 4-6, 2010.

“High Order Mimetic Differential Operators.” Berkeley Lab – Computing Sciences Seminar, Lawrence Berkeley National Laboratory, Berkeley, CA, October 28, 2011.

“High Order Mimetic Discretizations of Continuum Mechanics.” Department of Mathematics Colloquium, University of Texas at Arlington, September 17, 2010.

“High Order Mimetic Discretizations of Continuum Mechanics.” IV Pan-American Advanced Studies Institute, Choroní, Venezuela, June 6-11, 2010.

“Challenges in Creating Sustainable International Programs.” Colloquium on International Engineering Education, San Diego, CA, May 20, 2009.

“High Order Mimetic Discretizations of Continuum Mechanics.” Computational and Applied Math Seminar, Purdue, IN, April 24-25, 2009.

“Financing your Graduate Stud.,” Supercomputing Conference 2008, Austin, TX, November 15-21, 2008.

“High Order Mimetic Differential Operators,: First International Workshop on Dynamic Equations on Time Scales.” University of Bahçeşehir, Istanbul, Turkey, June 27-July 1, 2005.

“Mimetic Discretization of Continuum Mechanics.” 37th National Congress of the Mexican Mathematical Society, Ensenada, Baja California, Mexico, October 10-15, 2004.

“High Order Mimetic Discretizations.” Second Venezuelan Workshop on Mimetic Discretizations, Universidad de Carabobo, Valencia, Venezuela, April 13-15, 2004.

“Numerical Solutions of Partial Differential Equations.” 36th National Congress of the Mexican Mathematical Society, Pachuca, Mexico, October 12-17, 2003.

“High Order Mimetic Schemes Including Boundary Conditions.” IV Pan-American Workshop in Applied and Computational Mathematics, Universidad de Cordoba, Argentina, July 5, 2002.

“High Order Mimetic Differential Operators on Nonuniform Grids.” Stanford, Scientific Computing Seminar, October 19, 1998.

“High Order Mimetic Differential Operators.” UCSD Numerical Analysis Seminar, October 6, 1998.

“High Order Mimetic Differential.” Center for Nonlinear Studies Seminar, Los Alamos National Laboratory, March 1998.

“Direct Optimization Grid Generation Methods.” Second Pan-American Workshop in Applied and Computational Mathematics, Gramado, Brazil, 1997.

“Numerical Solutions of Partial Differential Equations.” International Conference on Numerical Methods in Engineering, Merida, Venezuela, 1996.

“Grid Generation and Numerical Solutions to Partial Differential Equations, Seminar.” Center for Nonlinear Studies, Los Alamos National Laboratory, July 1993.

“Grid Generation and Large Scale Optimization, Colloquium.” Rice University, November 1991.

“Adaptive Grids for Surface Interpolations and Visualization.” Seminar, NOSC, San Diego, CA, November 1991.

“Automatic Grid Generation, Colloquium.” University of Essen, Germany, June 1991.

“Numerical Grids for Solving Partial Differential Equations.” Howard University, March 1991.

“Grid Generation and Large Scale Optimization.” National Institute of Standards and Technology (NIST), March 1991.

“The Interdisciplinary Research Center at San Diego State University.” NOSC, San Diego, CA, February 1991.

“Numerical Solutions of Partial Differential Equations on Irregular Regions.” NOSC, San Diego, CA, October 1990.

“Numerical Grids for Solving Partial Differential Equations.” University of Southern California, November 8, 1989.

PRINCIPAL INVESTIGATOR/CO-INVESTIGATOR-FUNDED RESEARCH GRANTS

“Academic Support, Career Training, and Professional Development to Improve Interdisciplinary Graduate Education for the Next Generation of Computational Scientists and Engineers,” NSF Directorate for Education and Human Resources, 2019-2024.

“Web Archiving Service,” Henry Ford Foundation, 2019 – 2021.

“Surface Expression Risk Assessment Physiography (SERAPh) for Midway Sunset Oil Field, San Joaquin Valley, California,” California Department of Conservation, 2019-2020.

“Building Capacity and Infrastructure for Population Health and Health Disparities Research,” DHHS National Center on Minority Health and Health Disparities, 2018-2023.

“Broadening Opportunities for Interdisciplinary Computational Science and Engineering Research Training” (ICSERT), National Science Foundation Directorate for Education and Human Resources, DUE-1259951, 2013-2019.

“Web Archiving Service,” Henry Ford Foundation, 2010 – 2014.

“ARRA: San Diego Bridges to the Baccalaureate,” National Institutes of Health, R25 GM050106-10S1, 2012-2017.

“CC-NIE Network Infrastructure: Implementation of a Science DMZ at San Diego State University to Facilitate High-Performance Data Transfer for Scientific Applications,” National Science Foundation, G00009724, 2012-2013.

“ARRA: Science Master's Program Integrating Regulatory Affairs in BioScience and Biomedical Physics: A Scalable, Replicable Modeling Addressing Current and Emerging Workforce Needs,” National Science Foundation, DGE-1011440, 2010-2013.

“Embedded Boundary Methods Projects,” University of California Office of the President, 2010-2011.

“ARRA: Web-based CO2 Subsurface Modeling,” US Department of Energy, DE-FE0002069, 2009-2012.

“Dengue Prevention Consortium,” Gates Foundation, 200911270-01, 2009-2014.

“MRI: Acquisition of a High Speed Network Infrastructure for Computation in the Colleges of Science and Engineering,” National Science Foundation, OCI-0922702, 2009-2011.

“Undergraduate Student Scholarships for Participation in Interdisciplinary Computational Science and Engineering Research,” National Science Foundation, DUE-0850283, 2009-2014.

“CyberBridge,” National Science Foundation/University of California San Diego, DRL-0737714, 2007-2011.

“San Diego Bridges to the Baccalaureate,” National Institutes of Health, R25 GM050106, 2007-2012.

“Producing Scientific Professionals: Developing and Enhancing Professional Master of Science Degrees at San Diego State University,” The Alfred P. Sloan Foundation, 2001-2002.

“Numerical Solutions of Elliptic Partial Differential Equations on Irregular Regions, Parallel Aspects of Grid Generation,” San Diego State University Research, Scholarship, and Creative Activity Program, 1993-1996.

“Combat Modeling and Optimization,” ARO Research Grant, (with D. Lutz), 1992-1993. “Extending the Capabilities of Emulation of Soviet Mathematical Models of Combat,” U.S. Army Research Contract, (with D. Lutz), 1990-1991.

“An Analysis of the Chuyev Model for Combat in One Spatial Dimension,” U.S. Army Research Contract, (with D. Lutz), 1989-1990.

“Solving Large Scale Minimization Problems in Grid Generation,” San Diego State University Faculty Development Program, 1989-1990.

“Numerical Solutions of Elliptic Partial Differential Equations on Irregular Regions,” San Diego State University Research, Scholarship, and Creative Activity Program, 1989-1990.

“Discrete Variational Grid Generation: Orthogonality Control,” San Diego State University Faculty Development Program, 1987-1988.

PRINCIPAL INVESTIGATOR-INTERNATIONAL PROGRAMS GRANTS

“IV Pan-American Advanced Studies Institute,” National Science Foundation Award, 2010.

“Seventh Pan-American Workshop on Applied and Computational Mathematics,” National Science Foundation, Valencia, Venezuela, 2010.

“Fifth Pan-American Workshop on Applied and Computational Mathematics,” National Science Foundation, Tegucigalpa, Honduras, 2004.

“II Pan-American Advanced Studies Institute,” National Science Foundation Award, 2004.

“I Pan-American Advanced Studies Institute,” National Science Foundation Award, 2002.

“Fourth Pan-American Workshop on Applied and Computational Mathematics,” National Science Foundation, Cordoba, Argentina, 2002.

“Third Pan-American Workshop on Computational and Applied Mathematics,” National Science Foundation Award, Trujillo, Peru, 2000.

“Second Pan-American Workshop on Computational Science and Applied Mathematics,” National Science Foundation Award, Gramado, Brazil, 1997.

“First Pan-American Workshop on Computational and Applied Mathematics,” National Science Foundation Award, Caracas, Venezuela, 1993.

FORMER POSTDOCTORAL SCHOLARS

Chao Jen Wong, Ph.D. (2008-2009), San Diego State University

Fernando Uson, Ph.D. (2000-2003), San Diego State University

Carlos Torres, Ph.D. (1998-2000), San Diego State University

FORMER DOCTORAL STUDENTS

Johnny Corbino, Ph.D. (2018), Computational Science, San Diego State University

Mariangel Garcia, Ph.D. (2015), Computational Science, San Diego State University

Eduardo Sanchez, Ph.D. (2015), Computational Science, San Diego State University

Mohammad Abouali, Ph.D. (2014), Computational Science, San Diego State University

Mary Thomas, Ph.D. (2014), Computational Science, San Diego State University

Dany De Cecchis, Ph.D. (2012), Computational Science, Co-Advised with T. Drummond, Lawrence Berkeley Lab

Otilio Rojas, Ph.D. (2009), Computational Science, Co-Advised with S. Day, San Diego State University

Carlos Torres, Ph.D. (1998), Computational Science, Co-Advised with Jose Ochoa, (CICESE, Ensenada, Mexico)

CURRENT DOCTORAL STUDENTS

Jared Brzenski (2019-present), Computational Science, San Diego State University

Chris Lehnig (2018-present), Computational Science, San Diego State University

Angel Boada (2015-present), Computational Science, San Diego State University

Manuel Valera (2015-present), Computational Science, San Diego State University

FORMER MASTERS STUDENTS

Randy Bucciarelli, (2018), Computational Science, San Diego State University

Raul Vargas Navarro, (2015), Computational Science, San Diego State University

Terrence McGuinness, (2000), Computational Science, San Diego State University

Sharon Won, (1997), Computer Science, San Diego State University

Johnathan Richardson, (1997), Applied Math, San Diego State University

Marc McEachern, (1993), Computer Science, San Diego State University

Erik Pedersen, (1993), Aerospace Engineering, San Diego State University

Daria Bounassissi, (1992), Applied Math, San Diego State University

Hsiufang Chen, (1991), Computer Science, San Diego State University

Lynne Tablewski, (1990), Applied Math, San Diego State University

Marjaneh Gustafson, (1989), Computer Science, San Diego State University

Brian Nguyen, (1989), Aerospace Engineering, San Diego State University

SYNERGISTIC ACTIVITIES

- Director of the Computational Science Research Center, College of Sciences, SDSU.
- Founder of the SDSU Applied Computational Science and Engineering Student Support Program (ACSESS), March 2004.
- Responsible for the organization efforts and implementation of the PhD Program in Computational Science offered jointly with Claremont Graduate University, and the first of its kind in California.
- Chair, Joint Doctoral Program in Computational Science, SDSU and Claremont Graduate University.
- Honored as one of the “25 Most Influential SDSU People in 2003 & 2007.”
- Professor of Mathematics, SDSU. Specialist on direct variational grid generation, the applications of these methods, and the implementation of these techniques to fluid-flow problems and problems in biology. Conducts work in high-order mimetic finite-difference schemes, sensitivity of finite difference schemes to grid qualities and, parallel algorithms for elliptic problems. Current work consists of combining direct-optimization grid-generation methods with multigrid techniques.
- Chair, First Pan American Advanced Studies Institute in Computational Science and Engineering held in Cordoba, Argentina, June-July 2002 (Funded by NSF and DOE).
- Chair, Second Pan American Advanced Studies Institute in Computational Science and Engineering held in Tegucigalpa, Honduras, June-July 2004 (Funded by NSF and DOE).

- Chair of the Pan American Workshops held in Caracas, Venezuela; Gramado, Brazil; Trujillo, Peru; Cordoba, Argentina; and Tegucigalpa, Honduras.