Colton J. Conroy

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Lamont-Doherty Earth Observatory
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Education

2014   Ph.D. Civil Engineering – The Ohio State University, Columbus, Ohio
Dissertation: *"hp discontinuous Galerkin methods for coastal ocean circulation & transport"*
Advisor: Ethan J. Kubatko

2010   M.S. Civil Engineering – The Ohio State University, Columbus, Ohio
Thesis: "ADmesh: An advanced mesh generator for hydrodynamic models"

2008   B.S. Civil Engineering, *magna cum laude* – The Ohio State University, Columbus, Ohio

2004   Rutherford B. Hayes High School, *Valedictorian* – Delaware, Ohio

Research Experience

June 2017 -   Associate Research Scientist – Lamont-Doherty Earth Observatory
October 2018   Columbia University, Palisades, NY

November 2017 -   Postdoctoral Research Scientist – Lamont-Doherty Earth Observatory
May 2017   Columbia University, Palisades, NY

June 2015 -   Postdoctoral Research Scientist – Applied Physics and Applied Mathematics
August 2017   Columbia University in the City of New York, NY

2014   Presidential Fellow – The Ohio State University Graduate School
The Ohio State University, Columbus, Ohio

2009 - 2013   Graduate Research Associate – The Computational Hydrodynamics & Informatics Lab
The Ohio State University, Columbus, Ohio

December 2012   Visiting Fellow – The Isaac Newton Institute for Mathematical Sciences
Cambridge University, Cambridge, United Kingdom

2008   Undergraduate Research Associate
The Ohio State University, Columbus, Ohio

Teaching Experience

Spring 2015	Lecturer – Fluid Mechanics
	Department of Civil, Environmental and Geodetic Engineering
	The Ohio State University, Columbus, Ohio
Spring 2015	Lecturer – Open-Channel Hydraulics
	Department of Civil, Environmental and Geodetic Engineering
	The Ohio State University, Columbus, Ohio

Journal Manuscripts

Published Manuscripts

C.J. Conroy, E.J. Kubatko, and D. West, "ADMESH: An automatic 2D unstructured mesh generator for shallow water models," *Ocean Dynamics Topical Collection on 'Multi-scale Modeling of Coastal, Shelf, and Global Ocean Dynamics'*. 62, 1503–1517, 2012.

C.J. Conroy and E.J. Kubatko, "*hp* discontinuous Galerkin methods for the vertical extent of the water column in coastal settings part I: barotropic forcing," *Journal of Computational Physics*. 305, 1147-1171, 2016.

D. West, E.J. Kubatko, C.J. Conroy, M Yaufman, and D. Wood, "A multidimensional discontinuous Galerkin modeling framework for overland flow and channel routing," *Advances in Water Resources*, 2017, http://dx.doi.org/10.1016/j.advwatres.2017.02.008.

C.J. Conroy, E.J. Kubatko, A. Nappi, R. Sebian, D. West, and K.T. Mandli, "*hp* discontinuous Galerkin methods for parametric, wind-driven water wave models," *Advances in Water Resources*, 119, pp. 70-83, 2018, https://doi.org/10.1016/j.advwatres.2018.04.008

Submitted manuscripts

C.J. Conroy, K.T. Mandli, and E.J. Kubatko, "Fractally homogeneous, air-sea turbulence with Frequency integrated, wind-driven gravity waves part I: theory," Submitted to *Journal of Ocean Modelling*, *available upon request.*

C.J. Conroy, K.T. Mandli, and E.J. Kubatko, "Fractally homogeneous, air-sea turbulence with Frequency integrated, wind-driven gravity waves part II: numerical considerations," Submitted to *Journal of Ocean Modelling*, *available upon request.*

To be submitted

C.J. Conroy and E. Lev, "A numerical method for three-dimensional lava flows," *available upon request.*

C.J. Conroy and E. Lev, "A discontinuous Galerkin finite element model for "high" speed channelized lava flows," *available upon request.*

C.J. Conroy and E. Lev, "A simple thermodynamic model for time-averaged lava flows," *available upon request.*

C.J. Conroy and E.J. Kubatko, "*hp* discontinuous Galerkin methods for the vertical extent of the water column in coastal settings part II: modified basis methods and baroclinic forcing," *available upon request.*

Seminars

"A new interpolation method for geophysical data," MGG-SGT Seminar, Lamont-Doherty Earth Observatory, Palisades, NY, May 9, 2018.

"Fractal air-sea turbulence," NJIT Department of Mathematical Sciences Fluids and Waves Seminar, New Jersey Institute of Technology, Newark, NJ, September 18, 2017.

"Discontinuous Galerkin (DG) finite element methods for coastal dynamics," Davidson Lab Seminar, Stevens Institute of Technology. Hoboken, NJ, June 11, 2014.

Conference Presentations

"Modeling lava flows from the recent eruptions at Kīlauea," VolcaNYC Symposium. New York, NY September 28, 2018.

"Fractally homogeneous, air-sea turbulence and the moment field equations," Frontiers in Applied Mathematics: 60th Birthday Conference of Professor Chi-Wang Shu. Providence, RI, January 4-6, 2017. (POSTER)

"Fractally homogeneous, air-sea turbulence with Frequency-integrated, wind-driven gravity waves," The 15th International Workshop on Multiscale (Un)-structured Mesh Numerical Modeling for Coastal, Shelf, and Global Ocean Dynamics. Toulouse, France, September 27-29, 2016.

"(Two-Layer) Wind-Wave Coastal Ocean Models," SIAM Annual Meeting. Boston, Massachusetts, July 14, 2016.

"Discontinuous Galerkin (DG) modified basis methods for baroclinic flows," 13th US National Congress on Computational Mechanics. San Diego, California, July 26-30, 2015.

"Development and validation of DG–WAVE: a discontinuous Galerkin-based numerical wave prediction model," SIAM Conference on Computational Science and Engineering. Salt Lake City, Utah, March 14-18, 2015.

"A three-dimensional shallow water equation model using high-order discontinuous Galerkin (DG) methods," The 13th International Workshop on Multiscale (Un)-structured Mesh Numerical Modeling for Coastal, Shelf, and Global Ocean Dynamics. Lisbon, Portugal, August 25-27, 2014.

"Applications of a discontinuous Galerkin-based spectral wave model," The 13th International Workshop on Multiscale (Un)-structured Mesh Numerical Modeling for Coastal, Shelf, and Global Ocean Dynamics. Lisbon, Portugal, August 25-27, 2014.

"A high-order, three-dimensional discontinuous Galerkin (DG) coastal ocean circulation and transport model," 11th World Congress on Computational Mechanics. Barcelona, Spain, July 20-25, 2014.

"*hp* DG methods for the vertical extent of the water column," 12$^{\text{th}}$ US National Congress on Computational Mechanics. Raleigh, North Carolina, July 21-24, 2013.

"High order DG coupling of the shallow water equations," 12$^{\text{th}}$ US National Congress on Computational Mechanics. Raleigh, North Carolina, July 21-24, 2013. (POSTER)

"ADMESH: An advanced unstructured mesh generator for ocean models," ADCIRC Workshop 2013. Vicksburg, Mississippi, April 30, 2013.

"A discontinuous Galerkin method for 3D shallow water flow," 10th World Congress on Computational Mechanics. São Paulo, Brazil, July 8-13, 2012.

"Modeling of circulation and transport in the Gulf of Mexico with application to the deepwater horizon oil spill," The 10th International Workshop on Multiscale (Un)-structured Mesh Numerical Modeling for Coastal, Shelf, and Global Ocean Dynamics. Bremerhaven, Germany, August 22-25, 2011. (POSTER)

"Modeling of circulation and transport in the Gulf of Mexico for ninety days following the deepwater horizon oil spill," 11th U.S. National Congress on Computational Mechanics. Minneapolis, MN, July 25-28, 2011.

"An advanced automatic mesh generator for shallow water models," The 9th International Workshop on Multiscale (Un)-structured Mesh Numerical Modeling for Coastal, Shelf, and Global Ocean Dynamics. Cambridge, MA, August 17-20, 2010. (POSTER)

"An advanced automatic mesh generator for hydrodynamic models," 9th World Congress on Computational Mechanics, 4th Asian Pacific Congress on Computational Mechanics. Sydney, Australia, July 19-23, 2010.

"A finite element hydrodynamic model for Lake Erie," 10th U.S. National Congress on Computational Mechanics. Columbus, OH, July 16-19, 2009.

Honors and Awards

2014, 2013, 2012, 2010	Recipient of U.S. Association of Computational Mechanics Travel Award
2012	Recipient of Complex Systems Travel Award
2011	Recipient of Keith W. Bedford Scholarship
2009, 2008	Recipient of Shumate Memorial Scholarship
2008, 2007	Recipient of Moody Civil Engineering Scholarship
2008, 2007, 2006	Recipient of Dr. Warren G. Elliot Scholarship
2008, 2007, 2006, 2005	Recipient of University Scholarship
2006, 2007	Recipient of Cyrus A. Melick Scholarship
2006, 2005	Recipient of Engineering Dean's Award