

LUIS ‘TONY’ MARTÍNEZ TOSSAS

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[Google Scholar](#)

787-518-9811

Highly motivated, innovative, and bilingual research engineer (Ph.D.) with a strong background in computational fluid dynamics (CFD) using high performance computing (HPC) applied to wind energy. I use a combination of CFD, mathematics and experiments to develop theoretical models that help us understand the fundamentals of aerodynamics and turbulence. My work has had a strong influence in the fluid dynamics field resulting in collaborations with researchers around the world and a collection of highly cited journal publications. Excellent programming and version control skills with experience in Fortran, OpenFOAM (C++), MPI, Python, subversion and git.

Education

Johns Hopkins University, Baltimore, MD

- *Ph.D. in Mechanical Engineering* 2012-2017
Thesis Topic: Large Eddy Simulations and Theoretical Analysis of Wind Turbine Aerodynamics Using an Actuator Line Model
Advisor: Charles Meneveau

University of Puerto Rico, Mayagüez Campus

- *M.S. in Mechanical Engineering* May 2012
Thesis Topic: Wind turbine modeling for computational fluid dynamics
Advisors: Stefano Leonardi and Matthew J. Churchfield (NREL)
- *B.S. in Mechanical Engineering* August 2010

Experience

National Renewable Energy Laboratory, Golden, CO

August 2017 – Present

Research Engineer

- Perform numerical simulations of turbulent flow over wind turbines
- Develop new computational tools for next generation of wind farm flow simulations
- Lead scientific publications

Tony’s Geeky Shirts www.tonyageekyshirts.com

June 2016 – Present

Business Owner

- Founded a business that sells scientific apparel.
- Create designs and web tools for the store.
- Manage and operate the on-line store.

National Renewable Energy Laboratory, Golden, CO

June – August 2011

Researcher

- Performed grid resolution study on wind turbine CFD models.
- Performed validation on OpenFOAM using DNS of channel flow.

National Renewable Energy Laboratory, Golden, CO

June – August 2010

SULI Intern

- Implemented numerical model to simulate wind turbines into CFD solver.
- Validated numerical model against empirical data.

GE Energy Wind Turbines, Greenville, SC

June – August 2009

EID Intern

- Member of the Wind Configuration Management Team.
- Documented function descriptions for all the components in a 2.5 MW wind turbine.

GE Energy Gas Turbines, Greenville, SC

June – August 2008

EID Intern

- Organized and conducted different tests on a rotor with an RCA team to obtain temperature gradients used to predict stresses that caused the material to yield.
- Wrote a final report on a series of tests being held to better understand the temperature distributions on the turbine rotor of a 7H gas turbine.

Scholar Visits

- WINDINSPIRE NSF Student Exchange** June – August 2015
École Polytechnique Fédérale de Lausanne (EPFL) Switzerland
Denmark Technical University (DTU), Lyngby, Denmark
Katholieke Universiteit Leuven, Belgium
- WINDINSPIRE NSF Student Exchange** June – August 2013
Denmark Technical University (DTU), Lyngby, Denmark

Teaching and Mentoring

- Center for Educational Outreach** July 2016
Johns Hopkins University, Baltimore, MD
Engineering Innovation (EN.500.110.01)
Lecturer
– Lectured about engineering topics (dimensional analysis, digital logic, and materials).
- Johns Hopkins University, Baltimore, MD** August – December 2015
Introduction to Fluid Mechanics (EN.530.327)
Teaching Assistant under Prof. Dennice Gayme
– Prepared homework assignments, graded midterms and held office hours.
- Johns Hopkins University, Baltimore, MD** January – May 2015
Heat Transfer (EN.530.334)
Teaching Assistant under Prof. Cila Herman
– Prepared homework assignments, graded midterms and held office hours.
- University of Puerto Rico, Río Piedras Campus** June 2012
NASA Summer STEM Academy
Group Leader
– Supervised students while going through STEM activities.
- University of Puerto Rico, Mayagüez Campus** January – May 2012
Creative Design II (INME 3810)
Teaching Assistant under Prof. Jayanta Banerjee
– Lectured mechanical engineering first year students.
– Assigned and graded homework and projects and held office hours.
- University of Puerto Rico, Mayagüez Campus** August – December 2010
Thermal Sciences Laboratory (INME 4032)
Instructor
– Lectured heat transfer and thermodynamic concepts to senior mechanical engineering students.
– Organized and supervised laboratory experiments.

Awards/Acomplishments

- Article Highlighted by Journal and Selected for Cover**
[Comparison of four large-eddy simulation research codes and effects of model coefficient and inflow turbulence in actuator-line-based wind turbine modeling](#)
- NSF IGERT Fellowship**
2012-2015 Trainee, Johns Hopkins University, Baltimore, MD
- First Place Engineering & Computational Science**
2010 Science & Energy Research Challenge November 14-15, 2010, Argonne, IL

Skills

Software: *Advanced:* Linux (Ubuntu, Debian, Fedora & Arch), Fortran, Python, subversion, git, L^AT_EX, OpenFOAM, Paraview, Vapor, CGNS. *Intermediate:* MPI, HDF5, Matlab, Octave. *Basic:* Inkscape, OpenShot, C++, bash

Languages: Fluent in English and Spanish

Selected Publications

- Martínez-Tossas L.A., Annoni, J.K., Fleming, P.A., Churchfield M.J. (2019) [The aerodynamics of the curled wake: a simplified model in view of flow control](#). *Wind Energy Science*
- Martínez-Tossas L.A. and Meneveau C. (2019) [Filtered lifting line theory and application to the actuator line model](#). *Journal of Fluid Mechanics*
- Martínez-Tossas L.A., Churchfield M.J., Meneveau C. (2017) [Optimal smoothing length scale for actuator line models of wind turbine blades based on Gaussian body force distribution](#). *Wind Energy*
- Howland M.F., Bossuyt J., Martínez-Tossas L.A., Meyers J., Meneveau C. (2016) [Wake structure in actuator disk models of wind turbines in yaw under uniform inflow conditions](#) *Journal of Renewable and Sustainable Energy*
- Martínez-Tossas L.A., Churchfield M.J., Leonardi S. (2014) [Large eddy simulations of the flow past wind turbines: actuator line and disk modeling](#). *Wind Energy*

Scientific Visualization

- Martínez-Tossas L.A., Howland M.F. and Meneveau C. (2015) [Large Eddy Simulation of Wind Turbine Wakes with Yaw Effects](#)