
Adrian Herrera-Amaya

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Research interests:
Understanding the interaction between flexible structures and complex flows.

EDUCATION

Ph D., Department of Mechanical Engineering, Pennsylvania State University, 2018-
Dissertation: Ctenophore swimming: understanding metachronal rowing at millimeter scales
Advisor: Dr. Margaret L. Byron

M.S., Department of Mechanical Engineering, University of Guanajuato, 2015-2017

B.S.E., Department of Mechanical Engineering, University of Guanajuato, 2010-2015

PEER-REVIEWED PUBLICATIONS

Herrera-Amaya, A., Seber, E. K., Murphy, D. W., Patry, W. L., Knowles, T.S, Bubel, M. M., Mass, A. E., & Byron, M. L. (2021). Spatiotemporal Asymmetry in Metachronal Rowing at Intermediate Reynolds Numbers. *Integrative and Comparative Biology*, 00(0), 1-15. <https://doi.org/10.1093/ICB/ICAB179>

Lara-Castro, M., **Herrera-Amaya, A.**, Escarola-Rosas, M. A., Vázquez-Toledo, M., López-Huerta, F., Aguilera-Cortés, L.A, & Herrera-May, A.L. (2017). Design and modeling of polysilicon electrothermal actuators for a MEMS mirror with low power consumption. *Micromachines*, 8(7).
<https://doi.org/10.3390/mi8070203>

Manuscripts in preparation

Herrera-Amaya, A., & Byron, M. L. Three-dimensional maneuverability and agility in metachronal swimming. (in prep)

Herrera-Amaya, A., & Byron, M. L. Digital manipulation of the Depth of Correlation in Particle Shadow Velocimetry. (in prep)

CONFERENCE PRESENTATIONS

Herrera-Amaya, A., & Byron, M. L. Measuring metachronal maneuvering at the milliscala: an analysis of ctenophore swimming kinematics. (Oral). *The Society for Integrative and Comparative Biology*. January 2021. Virtual.

Herrera-Amaya, A., & Byron, M. L. Focused tracer detection algorithm for particle shadow velocimetry. (Poster). *American Physical Society: Division of Fluid Dynamics Fall Meeting*. November 2020. Virtual.

Herrera-Amaya, A., Karakas, F., Murphy, D. W., & Byron, M. L. The role of flexibility in sub-inertial swimming: Analysis of millimeter-scale ciliated structures. (Oral). *American Physical Society: Division of Fluid Dynamics Fall Meeting*. November 2019. Seattle, WA.

Herrera-Amaya, A., Vidal-Lesso, A., Aguilera-Cortés, A., Martínez, M. Á., & Malvè, M. Numerical evaluation of the atherosclerosis risk in patient-specific aortas: influence of healthy, diseased, and prosthetic aortic valve. (Oral). *8th World Congress of Biomechanics*. July 2018. Dublin, Ireland.

Herrera-Amaya, A., Vidal-Lesso, A., Aguilera-Cortés, A., Martínez, M. Á., & Malvè, M. Patient-specific simulation of the aortic arc under the fluid-structure interaction approach. (Oral). *23rd Congress of the European Society of Biomechanics*. July 2017. Sevilla, Spain.

TEACHING EXPERIENCE

Teaching Assistant, Fluid Flow (ME320) (for undergraduates). Pennsylvania State University, University Park, PA. Spring 2021.

Instructor, Ordinary Differential Equations, and Solid Mechanics (for undergraduates). Technologic Institute of Abasolo, Guanajuato, Mexico. Spring 2018.

Instructor, Statics & Mechanics of Materials (for undergraduates). University of Guanajuato, Guanajuato, Mexico. Fall 2017.

AWARDS and FELLOWSHIPS

CONACYT Doctoral Research Fellowship (USD 84,067), 2019 – 2022

Keefauver Scholarship in Engineering (USD 5,338), Pennsylvania State University, 2019-2021

CONACYT Graduate Research Fellowship (USD 10,546), 2015 – 2017

Academic Excellence Award, Mechanical Engineering Program of the University of Guanajuato, 2017

Honorary Mentions at the University Alliance Competition 2013 & 2014 by SANDIA National Laboratories

FURTHER RESEARCH EXPERIENCE

July 2019 Graduate Researcher, Bermuda Institute of Ocean Sciences (BIOS), Bermuda. *Fieldwork animal collection and experimentation.*

September 2016 – February 2017 Graduate Researcher, Aragon Institute of Engineering Research, University of Zaragoza, Spain. *Development of an FSI finite element model for the blood flow through a human aorta. (Advisor: Dr. Miguel Ángel Martínez Barca)*

February 2013-April 2013 Undergraduate Research Assistant, Micro, and Nano Research Center, MICRONA, Mexico. *Design and Simulation of a 2D Magnetic Field Sensor with an optical sensing technique. (Advisors: Dr. A. Leobardo Herrera May and Dr. A. Aguilera-Cortés)*

June – July 2012 Undergraduate Research Assistant, University of Texas at Dallas Department of Mechanical Engineering, UTD, Richardson, TX.

SCIENCE OUTREACH

Herrera-Amaya, A., Herrera-May, A.L., & Aguilera-Cortés, L.A. (2016). Microespejos: una mirada a la microingeniería. *CIENCIA*, 67(2). CIENCIA is a science outreach magazine managed by the Mexican Academy of Science.

Herrera-Amaya, A., Aguilera-Cortés, L.A., & Herrera-May, A.L. (2015). Generación de energía eléctrica con micromáquinas. *Elementos*, 22(99). Elementos is a science and cultural outreach magazine managed by the Autonomous University of Puebla, Mexico.

STUDENT SERVICE

President of the Pi Tau Sigma student chapter (University of Guanajuato), 2015.

Treasurer of the ASME student chapter (University of Guanajuato), 2014.

SKILLS

Software: MATLAB, PIVlab, SolidWorks, Mechanical ANSYS, and ADYNA.

Languages: Spanish (native) and English (professional proficiency).