



John Bennewitz

Graduate Research Assistant

Department of Mechanical and
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BIO:

John Bennewitz, a Von Braun Propulsion Fellow at the University of Alabama in Huntsville, is currently pursuing a Ph.D. in Mechanical Engineering, which is focused on combustion phenomena for rocket systems. His research aims to demonstrate combustion instability control through the application of high frequency pressure disturbances within a propellant injector. To date, a high frequency instability has been controlled by the use of specific frequency bands of white noise. This work is carried out with the single element combustion instability test facility located at UAHuntsville's Propulsion Research Center.

As an undergraduate at the University of Pittsburgh, Bennewitz had the privilege to participate in two NASA programs: The Reduced Gravity Student Flight Opportunities Program (RGSFOP) & The Undergraduate Student Research Program at NASA JPL. Specifically, for the micro-gravity project, he led a group of students to be the first team selected from the University of Pittsburgh. Over the course of a year, the team designed, built & tested a micro-gravity experiment to investigate bubble topologies in tubing systems of various bend radii. After the project was successfully flown on NASA's C-9 aircraft, the data was presented at AIAA's 49th Aerospace Sciences Meeting.

Upon completing his undergraduate education from Pittsburgh, Bennewitz enrolled at the Georgia Institute of Technology to study aerospace engineering, specializing in combustion research. His primary M.S. work involved developing a suppression technique for combustion instabilities in liquid rocket engines, by utilizing an asymmetric fuel injector spray distribution. This suppression technique was particularly aimed at controlling the first spinning tangential mode by altering the spray of a single fuel injector independently of a group of injectors. This method proved to be effective and as a viable design approach for liquid rocket engine development.

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RELEVANT PUBLICATIONS:

1. Bennewitz, J., Lineberry, D., Frederick, R., "Application of High Frequency Pressure Disturbances as a Control Mechanism for Liquid Rocket Engine Combustion Instabilities", 49th AIAA Joint Propulsion Conference, 2013.
2. Bennewitz, J., Frederick, R., "Overview of Combustion Instabilities in Liquid Rocket Engines – Coupling Mechanisms & Control Techniques", 49th AIAA Joint Propulsion Conference, 2013.
3. Bennewitz, J., Lubarsky, E., Shcherbik, D., Bibik, O., Zinn, B.T., "Asymmetric Injector Distribution for Passive Control of Liquid Rocket Engine Combustion Instabilities", 48th AIAA Aerospace Sciences Meeting, 2010.
4. Bernardo, J., Bennewitz, J., Braun, J., Wick, A., Chrin, M., "Investigation of Bubble Topology in Tubes with Constant Bend Radii in a Microgravity Environment", 49th AIAA Aerospace Sciences Meeting, 2011.
5. Lubarsky, E., Bennewitz, J., Shcherbik, D., Bibik, O., Zinn, B.T., "Control of the Tangential Combustion Instability by Breaking the Symmetry of the Reaction Zone using a Baffle and Asymmetric Injector", 7th U.S. National Combustion Meeting, 2011.
6. Lubarsky, E., Shcherbick, D., Bibik, O., Gopala, Y., Bennewitz, J., Zinn, B.T., "Jet in Cross Flow Experimental Study of Spray Characteristics", 23rd Liquid Atomization and Spray Systems Conference, 2011.