Clarinet acoustics: in search of quality markers for musical instrument

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Abstract

The original design of the clarinet was conceived over 300 years ago not by scientists, but by musicians and artisans. As such, the complicated physics of the instrument has yet to be completely described. This presentation will cover the basics of clarinet acoustics then offer a glimpse into the acoustics research labs at Rollins College. The work being done to determine quantitative quality markers for an instrument, including how using an artificial mouth and instrumented mouthpiece aids in studying the instrument objectively, will be discussed. The talk will conclude by detailing current acoustics projects at Rollins: articulation classifications, flow visualization inside instruments, and improving analytical models in order to better mathematically describe instruments.
Biography

Whitney Coyle is an Assistant Professor of Physics at Rollins College in Winter Park, Florida. Coyle found her calling in acoustics, the science of sound. She studied clarinet performance and mathematics at Murray State University her MS and PhD in acoustics from the Penn State University in 2016. Her PhD research was performed primarily in Marseille, France, and focused on analytical models to describe acoustical characteristics of the clarinet. Her current research aims to better the understanding of the complicated mechanisms that contribute to the playability (or lack thereof) of a particular instrument. Dr. Coyle joined the Rollins faculty in 2015 and is passionate about education and teaching through research with undergraduate students. She is active in the Acoustical Society of America, the Association of Physics Teachers, and the International Clarinet Association, and is an enthusiastic amateur clarinetist in the Rollins College Wind Ensemble and the Orlando Concert Band.