

A Newsletter from **Stewart Acoustical Consultants** and **F.C.Schafer CONSULTING**  
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*Making our World Sound Better Since 1979*

## Happy Holidays

From All of Us at

**Stewart Acoustical  
Consultants**



Joe



David



Rodell



Chris



Noral



Fred



Howard



Mathew



Eric



Richard

## Classroom Acoustics Set to become a Requirement

ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities is a nationally recognized standard of technical requirements for making buildings accessible. Published since 1961, it is referenced by the International Building Code, many federal documents and state accessibility laws. Recently, the body maintaining this standard added requirements of the ANSI S12.60 Classroom Acoustics standard to this standard with a new version to be issued in 2016. Once this is published and new codes and regulations reference it, good classroom acoustics will be a requirement

## Worship Space Acoustics – Three Decades of Design - [A new book to be published by the Acoustical Society of America](#)

around February 2016 will feature 10 projects on worship spaces by Stewart Acoustical Consultants and our affiliated consultants. Featured are:  
Immaculate Conception Catholic Church, Durham  
Judea Reform Congregation, Durham  
Our Lady of Lourdes Catholic Church, Raleigh  
St. Francis of Assisi Catholic Church, Raleigh  
St. Patrick's Episcopal Mission, Mooresville;  
St. Paul's Catholic Church, New Bern (pictured this page)  
St. Mary's Church, Johnson City, TN  
St. Michael's Episcopal Church, Raleigh  
University City United Methodist Church, Charlotte  
Wake Chapel Baptist Church, Raleigh



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## Welcome Chris Eaton

We are very pleased to welcome Chris Eaton to our firm. Chris is a native of Davie County (like Noral Stewart) and an MS graduate of the acoustics program in the Department of Mechanical and Aerospace Engineering at NC State. Chris has had a long and successful career in product acoustics in the automotive and communications industries which has led to 25 issued patents. He has impressed us with his grasp of acoustical fundamentals, and he brings the skills of a seasoned professional with consulting experience. His experience in the automotive industry and with HEAD Acoustics included a strong emphasis on the area of "Sound Quality," a methodology that so far has been applied primarily to products. We look forward to opportunities to



possibly apply some of that experience to the sound quality of buildings and environments. He has also developed successful award winning audio products for telecommunications. Thus, he may assist in audio areas. However, he will be primarily working with Dr. Stewart in the areas of environmental/community noise and sound isolation. He has been doing ASTM isolation testing and environmental sound measurements as he has been learning new applications of his talents. As part of this, he will be accompanying us on many visits with clients which will give you an opportunity to meet him.

## Moving on Up – A new address, Suite 201



We are proud to announce our move to our new larger office. We did not go far, just up a flight of stairs from Suite 101 to Suite 201. Please change your records. The only change in the address is the Suite number from 101 to 201. However, it is a different world in space and appearance, making room for growth and the ability to serve you better. We were suffering from lack of a good conference room and space to store samples to illustrate options to our architectural clients. Our

new conference room is the center of our new space with well treated acoustics, built in marker boards, and closets to be filled with an organized collection of samples and literature. Thanks to Tectum for the Fabritough kerfed panels for our walls and Armstrong Commercial Ceilings for our Ultima High NRC ceiling panels. Come see us!

**And a New Phone System** - As part of our move we set up a new phone system. You no longer have to press the # after the extension to reach your party. We have assigned extensions to our entire SAC Team, including our regular subconsultants who are not in the office. We also have direct dial numbers for staff in the our Raleigh office so you can bypass directory tree. Please listen carefully the next time you call as the options will have changed.



**Welcome David Arabyan – Our Intern for the Fall** We want to recognize our intern David Arabyan who has been with us since September and is now graduating with a masters from Duke University working under Dr. Earl Dowell. Among other things he has been helping us organize and equip our new office.

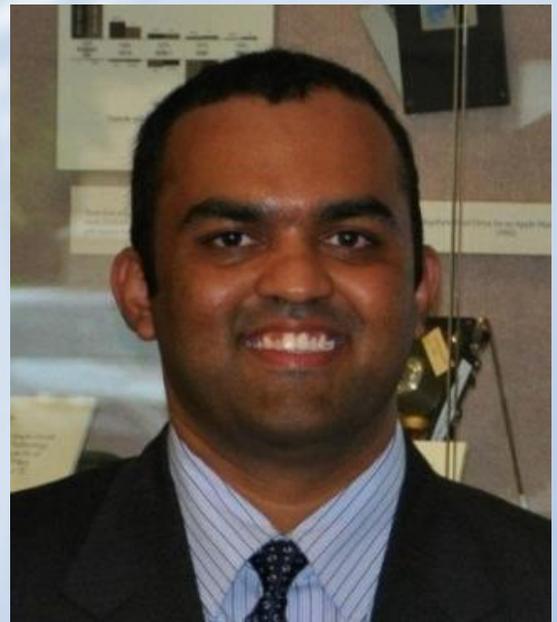
### **Industrial Acoustics Company - IAC Acoustics – Out of Business?**

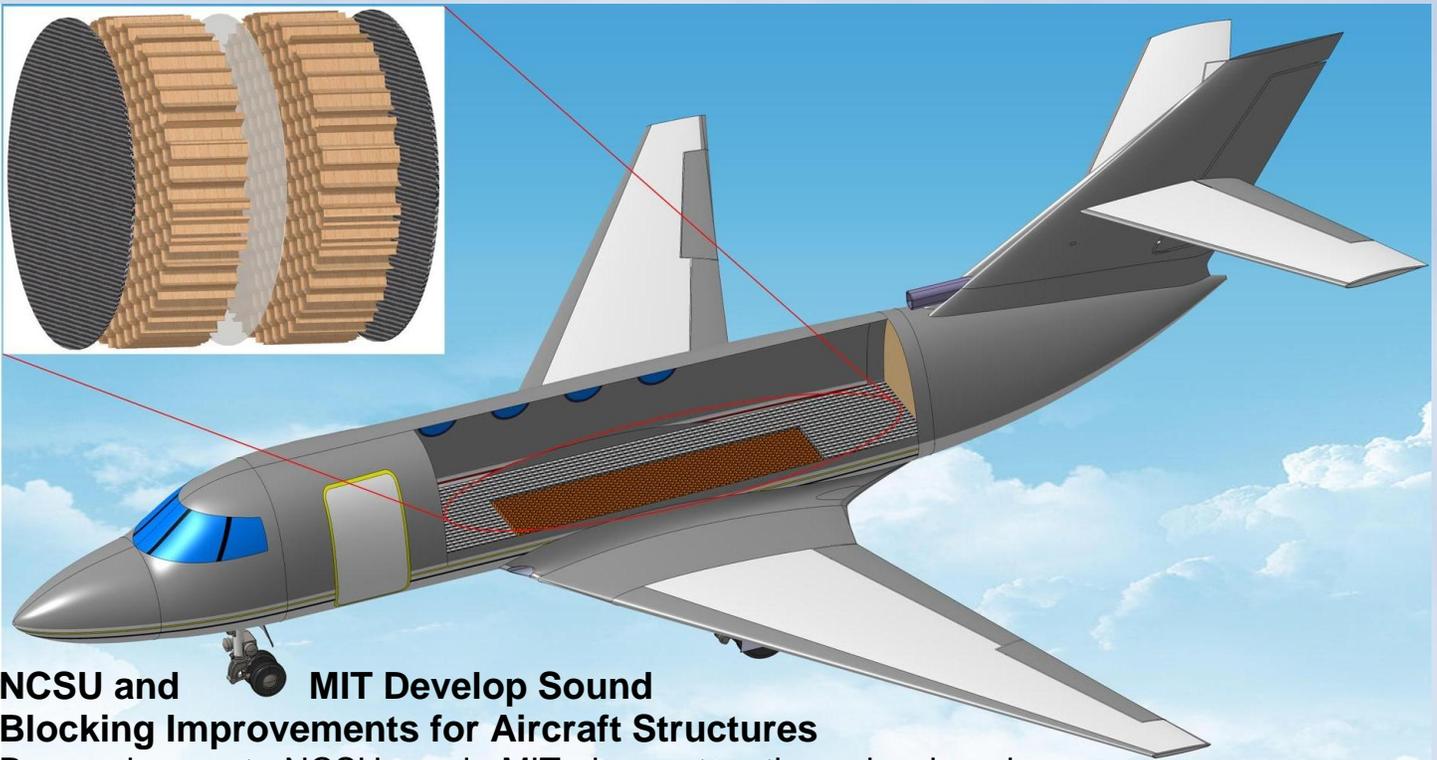
Since its founding by Martin Hirschorn in 1949, Industrial Acoustics Company has been a leader and pioneer in the development and manufacture of many products for noise control: HVAC silencers, louvers, acoustical doors, sound absorption systems, hush-houses for aircraft and on and on. In 1998, Hirschorn sold the company to an investment group. The new managers made many changes, but it appeared the company was growing worldwide. They purchased three of the major manufacturers of engine exhaust silencers, GT Exhaust, Silex, and Maxim. We have multiple reports that the company is shutting down and going out of business. This will leave a major gap in the market, especially for unique HVAC silencers and if affected, for the engine silencers. Hopefully, ways will be found to maintain availability of the unique products not otherwise available.



### **Impulsonic Awarded Small Business Innovation Research Phase II Grant**

Led by Dr. Anish Chandak, Impulsonic in Chapel Hill has been awarded a [Small Business Innovation Research \(SBIR\) Phase II grant worth \\$692,000](#) by the National Science Foundation. The funding obtained through this grant will be used to develop new ways of using cloud computing to accurately model acoustics in buildings. The project will involve developing new algorithms to carefully manage data exchange and evenly distribute the acoustic simulation work across multiple compute nodes. This will allow much faster acoustic simulation, and will also make it practical to reliably model the acoustics of large spaces for all audible sound frequencies. The work will be carried out in conjunction with the University of North Carolina at Chapel Hill.



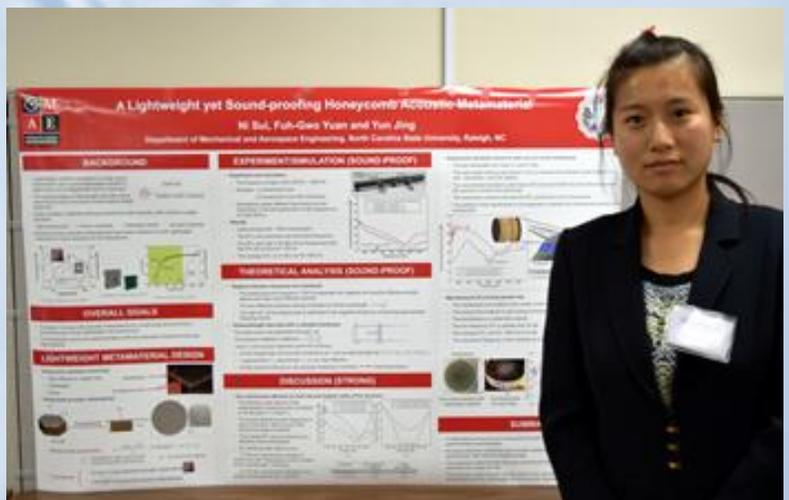


## **NCSU and MIT Develop Sound Blocking Improvements for Aircraft Structures**

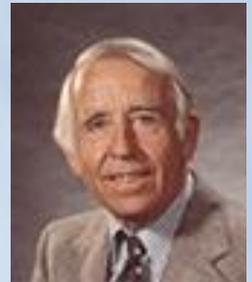
Researchers at NCSU and MIT have together developed an improvement to the sound blocking ability of honeycomb structures used in aircraft bodies. Honeycomb structures are light but have been known for their poor sound isolation qualities. Led by Professor Yun Jing and PhD student Ni Sui, the team developed a metamaterial membrane of rubber that can be inserted between layers of honeycomb material. The material improves the low-frequency sound blockage of such structures by 20 to 30 dB while adding only 6% to the overall weight. The system basically violates the mass law that governs traditional materials. Metamaterials make use of resonant properties in the materials to manipulate the behavior of waves. Many researchers including some at Duke University are working on these concepts. They appear to work best in situations where the impinging sound is steered, which can occur in a honeycomb structure.

## **Royster Student Competition Held at our Office**

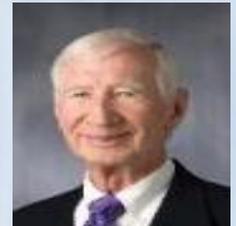
Retired NCSU professor Larry Royster and his wife Julie donated money to the Acoustical Society of America for a graduate student scholarship fund. Competitions are held at various regional and student chapters around the country. One of the two 2015 competitions was held by the NC Chapter at our office on November 20<sup>th</sup> with nine student posters from Duke, UNC Chapel Hill, NC State and Virginia Tech. The awarded went to Ni Sui of NCSU for a poster on her work discussed above.



**Per Bruel 1915-2015 100 years well lived** – Per Bruel, a true pioneer in acoustics and specifically acoustical instrumentation passed away in early April, about one month after celebrating his 100<sup>th</sup> birthday. Per Bruel and his partner Viggo Kjaer founded Bruel & Kjaer in German occupied Denmark in 1942 to build and market the acoustical analyzer and graphic level recorder Bruel had developed. Bruel spent most of the 1940's in Sweden establishing the acoustics laboratory at Chalmers University. On his trips back to Denmark during the war, he secretly carried papers of his friend Niels Bohr hidden among the pages of the draft of his PhD dissertation. To get copper for their instruments, he and another went out to sea and pulled up the cable Hitler had run underwater between Denmark and Germany. Bruel & Kjaer became the premier acoustical instrumentation company in the world, with Bruel flying a company plane around the world to make sales calls and deliver instruments. A book detailing the lives of Bruel and Kjaer and their company is available from Sound and Vibration magazine. <http://www.sandv.com/books/form03.doc>

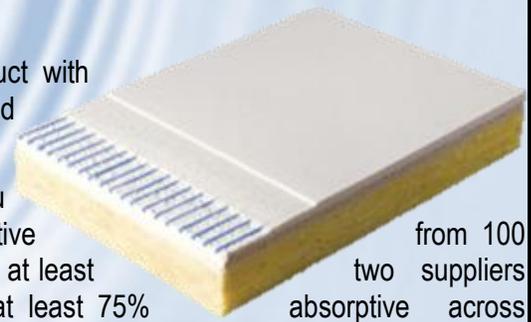


**Dr. Jack Chaddock of Duke University 1924-2015** – Jack Chaddock was chair of mechanical engineering at Duke University from 1966 to 1990, building that program. However, early in his career he was a pioneer in developing methods of noise control in HVAC systems, working with Leo Beranek on the development of the original NC curves in the 1950's. He was a past president of ASHRAE.



## Acoustical Product News

**Baswa Cool** - [Baswaphon](#) has introduced a version of their product with capillary tubes incorporated into the acoustical plaster to carry hot or cold water for heating and cooling of spaces.



**Broad Band Wall Panels** – Until recently if you wanted an absorptive wall panel that was highly absorptive to 4000 Hz, you had to use a 4 inch thick panel. Now at least two suppliers are offering panels around 2 inches thick that are at least 75% absorptive across that range. This is done with multiple densities of fiberglass in the panels. The [Broadsorber](#) from RPG is 2.25 inches thick while the [Sound Absorption Equalizer](#) from G&S is only 2 inches thick but not quite as absorptive at the lower frequencies.

**Rockfon Stone Wool Ceilings** – [Rockfon](#) has been the dominant ceiling provider in Europe, offering a “stone wool” ceiling product unlike the traditional mineral fiber and fiberglass ceilings dominant in North America. They are now offering their products here. These ceilings have properties closer to that of fiberglass but at a lower price more comparable to mineral fiber. Some versions have a higher CAC sound blocking ability than is available in fiberglass.



**USG NRC 90 Mineral Fiber Ceiling** – USG has made a breakthrough in mineral fiber ceilings now offering an NRC 90 version of their Mars product. The [Mars panel](#) is now available in versions ranging from NRC 60-CAC 40 to NRC 90-CAC 30, with intermediate versions. Traditionally a panel such as Mars has been used in closed offices while a fiberglass panel like USG Halcyon has been used in open offices. In tegular edge panels, the edges were not exactly the same. This provides an option for use of the Mars panel in some open office situations, though more data and experience are necessary to approve use in critical open office situations where privacy from immediately adjacent workstations is desired.



**Armstrong New Optima Concealed**.- Armstrong is now offering a [fully concealed fiberglass ceiling](#), similar to [Certaiteed's Ecophon Focus Ds](#). There are several other creative innovations that are worth checking out in video clip shown [here](#).