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## “Listen Up! And Get Involved!”

The first goal of the Women in Acoustics (WIA) Committee (WIAC) of the Acoustical Society of America (ASA; Isakson, 2010; Ronsse, 2017) starts “to consider the special problems of attracting women to acoustics at all levels of the educational process...” (See [womeninacoustics.org](http://womeninacoustics.org) for a complete list of the WIA goals.) In 2008, the WIAC began considering possible outreach activities that its members could do at each national ASA meeting to help local girls. Because the daughters of some of the WIAC members participate in local troops, the Girl Scouts of America was selected as the primary recruitment venue for an acoustics outreach session called “Listen Up! And Get Involved!” These events have now been held with Girl Scouts at 10 national meetings and with the Girl Guides at 2 meetings in Canada.

The “Listen Up! And Get Involved!” session was designed to meet the following goals.

1. Give girls the opportunity to interact with female scientists, engineers, and professors. By giving girls the chance of seeing and working with these women role models, the girls may start to think about pursuing such paths for themselves.
2. Expose girls to the wide range of careers that use acoustics. Most girls have a limited perception of available careers and thus have not considered many of the opportunities that are encompassed by the ASA.
3. Allow the girls to feel the excitement of science as they discover and develop an understanding of basic acoustic principles such as the properties of waves, the power of resonance behavior, and how these apply to their everyday experiences.
4. Promote the girls’ confidence as they successfully conduct small experiments and explore the equipment used to analyze sound.

Since its inauguration at the Spring 2010 ASA Meeting in Baltimore, MD, 12 “Listen Up! And Get Involved!” sessions have relied heavily on the outstanding support of ASA volunteers. Although the volunteers have been primarily members of WIAC, professional and student ASA members (both men and women) from all technical areas have assisted in making these outreach sessions successful. The volunteers have shared their enthusiasm with the girls as they have engaged in conversations about how everyday experiences with sound are part of the larger world of acoustics and the potential for a career exploring these amazing phenomena.

The volunteers help the girls explore topics, which include some physical principle of sound such as resonance, but most of the stations center on real-world applications such as speech, hearing, musical instruments, and echolocation. A full list of the stations and demonstrations is provided by Vongsawad et al. (2014). To offer all 12 topic areas requires a minimum of 15 volunteers. In addition to the ASA-provided demonstrations, members regularly bring their own materials to share specific aspects of their research and interests. Examples of past member-supplied demonstrations include a ripple tank, a soundscape ecology demonstration, whale songs, acoustic levitation, and active noise control (**Figure 1**). (Con-



*Figure 1. Acoustical Society of America (ASA) member Bonnie Schnitta discussing noise cancellation with Girl Scouts at the 173rd meeting in Boston, MA.*

tact Keeta Jones if you have a demonstration you would like to bring to one or more of the upcoming meetings.)

The format for these outreach sessions has evolved over the years. For many years, Uwe Hansen, as part of the Education in Acoustics Committee, organized acoustics outreach at the national meetings, in which a middle-school class would attend his hands-on session. The initial Girl Scout outreach sessions (started in 2010) built on Uwe’s work. Around 2012, the WIAC joined forces with the Education in Acoustics Committee to revamp both of the outreach sessions (see Bradley, 2015 for more Education in Acoustics outreach efforts). Steps were taken to strengthen the pedagogical approach, update the equipment, and increase the efficiency of both outreach sessions (see Vongsawad, 2014 for details). Since 2013, the two outreach sessions have had the same format, discussed below. Currently, ASA Outreach and Education Coordinator Keeta Jones (2017) works with the WIAC to organize the “Listen Up! And Get Involved!” session, held one evening during the national meeting, and with the Education in Acoustics Committee to organize the daytime session for middle-school students.

As with any outreach event, publicity is required to find attendees. As “Listen Up! and Get Involved!” is primarily marketed toward Girl Scouts between the ages of 12 and 15, the local Girl Scout council is contacted at least 6 months before an upcoming ASA meeting to obtain approval and enlist their aid in spreading the word to local troops. When possible, ASA members who have local Girl Scout connections

also help out. At the past two meetings, after the local Girl Scout chapters have registered for the session, additional invitations have been sent to home-school networks, after-school programs, and family event calendars to extend the reach of the event to more families in the area. The goal is to have 50 attendees. Once we have contacted these various groups, ASA member volunteers are recruited to run the demonstrations.

The “Listen Up! And Get Involved!” session involves more than interactive demonstrations. As the guests arrive, we play an entertaining, but homemade, video to get everyone excited and thinking about the sounds in their lives. After the video, our volunteers briefly introduce themselves by saying what area of acoustics they work in before the attendees visit each station in groups of 3 or 4 to spend about 5-7 minutes with each demonstrator. The session closes with an informal Q&A panel about education and careers in acoustics. Participants also have a pizza lunch or dinner for the daytime and evening sessions, respectively. The overall response to the workshops has been very enthusiastic.

Over time, the “Listen Up! And Get Involved!” outreach session will continue to evolve. The Girl Scout local council will still be contacted and Girl Scouts encouraged to come, but the session will no longer be marketed only toward girls. Although it is true that women continue to be underrepresented in the sciences, it doesn’t mean that we should deny the opportunity to learn for other underrepresented groups and interested parties. As an example of things that will likely be modified in the spirit of inclusion is the Girl Scout patch (see **Figure 2**), a kind of reward for participating because Girl Scouts tend to collect patches for all their activities. However, the presentation of a “Girl Scout” patch at the end of the outreach session can make other participants feel like they perhaps should not have attended. As such, the WIAC will consider replacing the patch with something more universally collected, such as enamel pins.

Beyond reaching out to other specific underrepresented groups, it is also critical that we continue to maintain the quality of the stations. The stations have remained largely unchanged for seven years. Some equipment has been replaced, but ideas for upgrading the stations should be explored. For example, the voice and hearing stations could include anatomical models instead of laminated prints of the speech and hearing mechanisms. Another way to improve the educational component of the demonstrations is to add topics and align them to current educational system stan-



**Figure 2.** ASA member Sarah Marley holding the “Listen Up! and Get Involved!” patch. **Inset:** detail of the patch.

dards. When we consider how to improve the demonstrations, it is also critical to think about how we can support our volunteers in how to use the demonstrations.

Although many of the session volunteers are veteran demonstrators, just as many have never done science outreach or informal education or have not performed our specific set of demonstrations. As such, it would great to provide mini-informal education-training sessions for volunteers. This way,

everyone would have practice and experience with ASA-specific stations and even have a chance to move outside their comfort area by trying new demonstrations. One idea is to offer this training during every meeting between the daytime and evening outreach sessions. This could be open to all meeting attendees, not just our session volunteers. This way, we can send meeting attendees home with the ability to do acoustics outreach at their home institutions.

Ideas for the continued implementation and improvement of the acoustics outreach sessions will be discussed at upcoming WIAC meetings. We hope to continue finding ways to increase the efficacy of these outreach efforts to open the minds of youth to the amazing world of acoustics thanks to the wonderful support of ASA members.

## References

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