



DECEMBER 2004

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*Presentation and Christmas Social*

# Loudspeakers 101

**What do you think is important for a loudspeaker?**

*with Paul Barton and John Vanderkooy*

**Date:** Tuesday, December 7, 2004

**Time:** 7:30 pm

**Where:** Harris Institute for the Arts  
118 Sherbourne Street  
Toronto, Ontario

*For a map, goto [www.harrisinstitute.com](http://www.harrisinstitute.com)*

After the meeting, stay for the Toronto AES's annual Christmas social.

### Basic Acoustics of Loudspeakers

John Vanderkooy will present a tutorial which outlines the essential acoustics needed to understand direct-radiator loudspeakers. Topics range from the gas law to the diffraction of a loudspeaker cabinet.

Acoustic pressure and particle velocity concepts for plane waves and for spreading 3D waves will be explained. Demonstrations of some acoustic effects for speakers will be shown.

A major conclusion is that the acoustic output is related to the acceleration of the diaphragm for a baffled system. These points will be illustrated with experiments and measurements with a MLSSA system. The results can form the basis for a group discussion.

At higher frequencies sound from drivers tends to beam, and tweeters are necessary. The splitting of the bands by a crossover allows different drivers to properly disperse the sound radiation.

### PSB Speakers Past, Present and Future

Paul Barton of PSB Speakers will present an overview of the company's loudspeaker lineage of 32 years with a focus on design and design techniques.

A look at how the changes in technology, the consumer market demands and listener's listening habits have impacted product development will be included.

**PLEASE POST - MEMBERS AND GUESTS WELCOME**

## About this month's presenters...

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**Paul Barton**, founder and chief designer of PSB Speakers, began designing speakers more than 30 years ago for a Grade 10 Physics project. His engineering bent coupled nicely (for speaker designer purposes) with his abilities as a violinist who as a young musician played with Canada's National Youth Orchestra and the University of Toronto's Repertoire Orchestra. His two passions converged permanently in 1972, when he founded PSB Speakers. [www.psbSpeakers.com](http://www.psbSpeakers.com)

One of the first to use the anechoic chamber at Canada's renowned National Research Council facilities in Ottawa and other facilities there, Paul has combined research into the correlation of measurements and audible performance with testing of successive modifications of every speaker-in-process.

In the mid 1980s, PSB became part of the Lenbrook Group of Companies whose expertise in marketing specialized electronic products along with their widespread distribution in North America has established PSB Speakers as one of the most respected loudspeaker manufacturers in the North America as well as in 43 other countries around the world.

**John Vanderkooy** was born in The Netherlands in 1941, but received all of his education in Canada, with a B. Eng. degree in engineering physics in 1963 and Ph.D. in physics in 1967, both from McMaster University in Hamilton, Ontario. For some years he followed his doctoral interests in low-temperature physics of metals at the University of Waterloo, where he is currently a professor of physics. However, since the late 1970s, his research interests have been mainly in audio and electroacoustics.

A fellow of the AES, current member of its Board of Governors, and a member of the IEEE, Dr. Vanderkooy has contributed a variety of papers at conventions and to the Journal. Together with his colleague Stanley Lipshitz and a number of graduate and undergraduate students, they formed the Audio Research Group at the University of Waterloo.

Dr. Vanderkooy's current interests are digital audio signal processing, measurement of transfer functions with maximum-length sequences, transducers, diffraction of loudspeaker cabinet edges, and most recently sub-surface analysis techniques using maximum-length sequences.

## October Meeting Review

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### The Weird Ear

Date: Tuesday, October 26, 2004

Time: 7:30 pm

Where: Room 307, Image Arts Building, Ryerson University

**Dr Marshall Chasin** spoke about the physiology of the hearing system and its effects on altering the signal in sometimes weird and unexpected ways. This has ramifications for hearing aid fitting, hearing protection fitting, and earphone/ear monitor use facility. For those wishing to understand how their ears work, and how best to look after them, this was ideal presentation. An in-depth review of the meeting by Toronto AES Secretary Robert Breen is available at [www.vex.net/TorontoAES](http://www.vex.net/TorontoAES).

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