



**Audio Engineering Society - Pacific Northwest Section**

*Around the Puget Sound, Seattle, Washington, U.S.A.*

**AES PNW Section  
November Meeting Notice**

**The Acoustic Centre:  
Measurement, Theory and Application**

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**John Vanderkooy  
Professor - University of Waterloo, Canada**

**A joint presentation of Microsoft Research  
and the  
Pacific Northwest Section of the Audio Engineering Society**

**November 8, 2010 - 7:30 PM  
Microsoft Research, Building 99  
Lecture Room C  
14820 NE 36th Street  
Redmond, WA 98052**

[DIRECTIONS...](#)

At low frequencies the acoustic effect of a loudspeaker cabinet becomes simpler as the wavelength of the sound becomes large relative to the cabinet dimensions. One point acoustically acts as the center of the speaker at frequencies below about 300 Hz for a typical box. Measurements and acoustic boundary-element simulations verify the concept. Theoretically, radiation some distance from a source can be expressed as a multipole expansion, consisting essentially of a spherical, monopolar portion and a significant dipolar part. General criteria are presented to give the position of the acoustic center for different geometrical cabinet shapes.

Applying the concept to subwoofers, the acoustic center has an influence on their radiation pattern in a normal room with reflecting walls. A second application that we consider is the effective position of a laboratory microphone, which is necessary if it is to be used for accurate calibration of acoustic pressure. A final application is the effective position of the ears on the head at lower frequencies. Calculations show that the acoustic centers of the ears are well away

from the head, and the effective ear separation is larger than expected. Measurements show good agreement with calculations.

## John Vanderkooy



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. After some years of research in low-temperature physics of metals at the University of Waterloo, his later research interests have been mainly in audio and electroacoustics. He retired in 2006 but keeps active with papers and graduate supervision.

A fellow of the AES, John has contributed a variety of papers at conventions and to the Journal, many in conjunction with his colleague Stanley Lipshitz and a number of graduate and undergraduate students.

John's current interests are measurement of transfer functions with maximum-length sequences, transducers, diffraction, and most things relating to loudspeakers.

This meeting is organized jointly by Microsoft Research and the Pacific Northwest Section of the Audio Engineering Society. The meeting is free and open for AES members, Microsoft employees, and the general public.

## Bob Moses

*AES PNW 2010-2011 Section Chair*

**n.b.** *The material presented at our meetings is the opinion of the presenter and not necessarily that of the Society. You are encouraged to conduct your own research and to form your own opinions before adopting the presented material as Truth.*

**Our meetings are open to anyone interested in Audio. AES membership is NOT required for you to attend our meetings.**

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## November/December Meeting Notices

Presented by  
The Pacific Northwest Section  
of  
The Audio Engineering Society

**An Afternoon with  
Wes Dooley of AEA  
or  
The Care and  
Feeding of Ribbon  
Microphones**

**2:00pm, Sunday,  
November 21st, 2010  
Opus 4 Studios  
Bothell, WA**

[Directions to Opus 4.](#)

Opportunists that we are, an opportunity presented itself to spend an afternoon with Wes Dooley, audio engineer, ribbon microphone and stereo miking wizard. How could we say no?

Wes' specialty is on-location recording, and his experiences around the world led him to develop portable recording tools such as multichannel microphone arrays, mid/side stereo processors, stereo phase displays, and very tall microphone

**Sound Capture  
Applications in  
Entertainment and  
Gaming  
Presented by Dr. Ivan  
Tashev  
Microsoft Research and  
AES PNW Committee**

**7:30pm, Wednesday,  
December 1, 2010.  
Microsoft Research  
Building 99, Lecture Room C**

[Directions to MS Research](#)

Modern entertainment and gaming systems are complex systems where the human-machine interface plays a critical role. Sound capturing and enhancing for such systems poses challenges that are frequently underestimated. In this talk we will present approaches, algorithms, and technologies for ensuring proper handling of the audio part of these high end systems. It will be illustrated with demos, videos,

stands. His company is dedicated to creating products that further the art and science of recording.

It's ribbon microphones that are what Wes has become best known for. He has represented and serviced Coles' 4038 ribbon microphones in the US for the past two decades. During the 1990s he observed that RCA44 "collectors" were taking these microphones out of circulation, making it difficult for recording studios to own or use a 44. Its rebirth became his crusade and resulted in the AEA R44, a faithful recreation of this classic microphone. Introducing a widening circle of modern recordists to ribbon mikes has been a fulfilling task. Another creation, the AEA R84 large geometry ribbon microphone was introduced at the Fall 2002 AES Convention in Los Angeles. At the most recent convention, AEA introduced the KU4 unidirectional ribbon microphone, a modern interpretation of the classic RCA KU3A.

Wes will present a 90-minute structured presentation on ribbon mikes, followed by freeform discussion.

## About Wes Dooley

Wes Dooley is president of Audio Engineering Associates (AEA) located in Pasadena, California. He attended Pomona College and Pacific Oaks College where he received his B.S. degree. He began his audio career in broadcasting at KSPC-FM in 1963. A year later, his work in remote recording led to his employment by Wally Heider.

and examples for practical applications, including Kinect for the Xbox 360.

If you're not familiar with Kinect, be sure to explore their [website](#).

## About Dr. Ivan Tashev

Dr. Tashev has been a software architect in the Speech Technology group at Microsoft Research since 2001. He received his masters (electronics) and PhD (computer science) degrees from the Technical University of Sofia, Bulgaria in 1984 and 1990 respectively. His areas of interest include sound capturing devices, multichannel audio processing and algorithms for arrays of transducers and audio signal enhancement.

Dr. Tashev is the author of *Sound Capture and Processing: Practical Approaches*, Wiley, 2009. He is a senior member of IEEE and IEEE Signal Processing Society, and an AES PNW Section Committee Member. In addition to his most recent book, Dr. Tashev has published two other books, over 50 scientific papers, and is listed as inventor of 11 U.S. Patents, and 40 U.S. Patent applications.

In 1965 he joined Custom Fidelity company, where he was chief engineer, responsible for designing and constructing disk mastering facilities and several of the first 8-track studios in Los Angeles. As recording supervisor for Custom Fidelity, he was responsible for remote recording operations throughout the Western United States. In 1975, he formed AEA which specializes in audio system design and fabrication.

Along with Ron Streicher, Mr. Dooley has coauthored two papers about stereo microphone techniques published in the AES Journal and Stereophonic Techniques Anthology. Mr. Dooley is a Fellow of the AES, a past governor and past vice president of the Western Region of the AES. He remains involved with AES standards work and currently serves on the SC-03-12 Working Group on Forensic Audio, where he heads a writing group on Forensic Audio Standards. He is also a member of the SC-04-04 Working Group on Microphone Measurement and Characterization. Also an amateur audio historian, Mr. Dooley co-chaired the Audio History Room at the Fall 2002 AES convention. He is a member of the Hollywood Sapphire Group, the Society of Broadcast and Communications, and NARAS.

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