



## **Challenges in Cochlear implant Sound Perception**

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**LECTURE: 10:00AM -11:00AM**

**ENGINEERING CENTER  
ROOM EC 2300  
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### **Abstract:**

A cochlear implant restores a sense of hearing to a person with severe to profound deafness. Most recipients achieve good speech perception under good listening conditions, but the two big challenges are speech perception in noisy conditions, and pitch perception. Signal processing algorithms to address speech in noise include dual-microphone adaptive beam forming, multi-band gain control, and SNR-based noise cancellation. Attempts to improve pitch perception by changing the sound processing and stimulation strategy have not been successful. This is most likely due to our inability to reproduce the spatio-temporal neural firing pattern evoked by resolved harmonics in normal hearing. Research into more focused stimulation may provide improvements.

### **Biography**

Brett Swanson received a Bachelor of Electrical Engineering from the University of New South Wales (Sydney, Australia) in 1985. He joined Cochlear Ltd in Sydney in 1992. He has worked on integrated circuits for cochlear implants and sound processors, clinical software, and digital signal processing (DSP) firmware. In 2008 he received a PhD from the University of Melbourne for a thesis entitled "Pitch Perception with Cochlear Implants". He is presently engaged in research into cochlear implant sound perception, and is collaborating with FIU Professor Ranu Jung on neural-enabled hand prostheses.

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