

# VINCENT MEYER COLLOQUIUM

## Professor Robert Calderbank



Professor Robert Calderbank is Director of the Information Initiative at Duke University, where he is Professor of EE, CS, and Mathematics. Before joining Duke he was at Princeton University, where he also directed the Program in Applied and Computational Mathematics, and prior to that was Vice President for Research at AT&T.

At the start of his career at Bell Labs, Prof. Calderbank developed voiceband modem technology that was incorporated in over a billion devices. Later, together with colleagues at AT&T Labs he developed the group theoretic framework for quantum error correction, providing a foundation for fault tolerant quantum computation. He also developed a space-time coding technology which has been incorporated in a broad range of 3G, 4G and 5G wireless standards. Today, Prof. Calderbank works with the Duke Center for Autism and Brain Development, developing information technology that captures a full spectrum of behavior in very young children. Professor Calderbank is an IEEE Fellow and an AT&T Fellow, and was elected to the National Academy of Engineering in 2005 and the National Academy of Inventors in 2014. He received the 2013 IEEE Hamming Medal for contributions to coding theory and communications and the 2015 Shannon Award.

### Shannon in the 21st Century

**Wednesday, May 9, 2018 ■ 12:30 ■ Meyer Bldg., Auditorium 1003**

**[Refreshments at 12:30, the lecture will start at 12:45]**

**Abstract:** The foundation of our Information Age is the transformation of speech, audio, images and video into digital content, and the man who started the digital revolution was Claude Shannon. He arrived at the revolutionary idea of digital representation by sampling the information source at an appropriate rate, and converting the samples to a bit stream. He then characterized the source by a single number, the entropy, which quantifies the information content of the source, and he created coding theory, by introducing redundancy into the digital representation to protect against corruption. Shannon started from the grand challenges of his day, he developed models that captured what made them so difficult, translated these challenges into mathematical terms and then developed fundamental limits. This talk will review some of what Shannon did, and it will speculate about what he might have done if he were among us today.

**Professor Robert Calderbank will also deliver an additional lecture**

**Recent Developments in Quantum Computing**

**Tuesday, May 8, 2018 ■ 15:30 ■ Meyer Bldg. ■ Room 861**

**[Refreshments at 15:15, the lecture will start at 15:30]**

For further information see:

<http://webee.technion.ac.il/Vincent-Meyer-Colloquium>

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