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Colorado State University's Information Science and Technology Center (ISTeC)

*Presents two lectures by*



**Dr. Joan Mitchell**

IBM and IEEE Fellow

## **ISTeC Distinguished Lecture**

**in conjunction with the Computer Science Lecture Series**

***“A Cultural History of the Original JPEG Standard”***

**Monday March 7, 2005**

4:10 – 5:00 p.m., Glover 130



**Reception for Dr. Mitchell at 2:30 p.m. in Lory 213**



**Electrical & Computer Engineering  
and Journalism & Technical Communication Lecture  
sponsored by ISTeC**

***“What's Being Added to JPEG-1?”***

**Monday March 7, 2005**

1:30 – 2:30 p.m., LSC 213

## ABSTRACTS

### “What's Being Added to JPEG-1?”

The original JPEG-1 (aka ISO/IEC 10918: Part 1 | CCITT Rec. T.81) was frozen in July 1990 and has not been touched since then. The International JPEG committee has added additional parts (compliance testing, enhancements, and registration) and created new standards (JPEG-LS and JPEG-2000) without changing Part 1. This technical talk will first review the technologies in JPEG-1 (DCT, ADPCM, Huffman, and arithmetic coding). Then it will explain the addendum that has been proposed recently by the speaker. This additional arithmetic coder has minimum latency which makes it particularly suitable for the mobile phone industry. The ITU (International Telecommunications Union) parent of JPEG is on a course to adopt the modified JPEG-1 as an ITU standard by the summer 2005. If adopted by the International JPEG committee too, it is guaranteed to be fee-free since the additional arithmetic coder is just the MQ-coder already used in JPEG-2000 and JBIG-2.

### “A Cultural History of the Original JPEG Standard”

The "J" in JPEG (Joint Photographic Experts Group) acknowledges its two main parent organizations, ISO (International Organization for Standardization) and CCITT (International Telegraph and Telephone Consultative Committee) which is now called ITU (International Telecommunications Union). The JPEG committee was one of the first times these organizations formed a single committee for the purpose of creating a joint standard despite their different histories, cultures and procedures for settling disputes. ISO is a decentralized self-regulating group aimed at industry standards. This non-treaty agency of the United Nations tends to collect experts (hence the term "experts group") to work on standards that are for the "good of the industry." The CCITT is an intergovernmental treaty organization sponsored by the United Nations. Official voting was done by nations. It issues "recommendations" that each country can voluntarily adopt. However, frequently administrations demand rigid conformance with these recommendations for their telecommunications equipment. Rather than trying to meld its parents' cultures or deciding which set of rules to use for settling conflicts, the original JPEG committee adopted a 100% consensus rule. This nontechnical talk will share stories illustrating how achieving complete consensus influenced the definition of this widely-used standard.

**Dr. Joan Mitchell** graduated from Stanford University with a B.S. in physics in 1969. She received her M.S. and PhD. degrees in physics from the University of Illinois at Champaign-Urbana in 1971 and 1974, respectively. She joined the Exploratory Printing Technologies group at the IBM T. J. Watson Research Center immediately after completing her PhD. She was a manager there for nine years. She then worked for three years in IBM Marketing before returning to the IBM Research Division in 1991 to work again in the Image Technologies group as a manager. From 1987 through 1994, she was a member of the ISO and CCITT international Joint Photographic Experts Group which standardized the color image JPEG compression algorithm. She was the final editor of JPEG Part 1, and in 1992, coauthored a book about JPEG. In 1994, she took a two year leave of absence from IBM during which she coauthored a book on MPEG, consulted for IBM Burlington, and was a visiting professor at the University of Illinois for six months. She returned to the IBM T.J. Watson Research Center as a Research Staff Member in the Image Applications Department. For the last three years she was on temporary assignment with the IBM Printing Systems Division in Boulder, CO, transferring there permanently in 2002. Since 1976, Joan has worked in the field of image processing and data compression. She received IBM Outstanding Innovation Awards for Two-Dimensional Data Compression in 1978, for Teleconferencing in 1982, for Image View Facility in 1985, for Resistive Ribbon Thermal Transfer Printing Technology in 1985, for Speed-Optimized Software Implementations of Image Compression Algorithms in 1991, and for the Q-coder in 1991. December 2001, she was awarded an Outstanding Technical Achievement Award for Algorithms for Improved Printer Performance Transferred to IBM's Printing Systems Division and her Twenty-first Invention Achievement Plateau Award. She was elected to the IBM Academy of Technology in 1997, and became an IEEE Fellow in 1999. She is a member of APS, IEEE, IS&T, and Sigma Xi and co-inventor on 40 patents. She was made an IBM Fellow in 2001. In 2002, she initiated a Master Inventor program for PSD in Boulder and became a Master Inventor there. She recently became a certified PADI Dive Master.

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