

## MNDRIVE SEMINAR PRESENTATION

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# REALIZING A MOORE'S LAW FOR FIBERS

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**Abstract:** Fibers and fabrics are among the earliest forms of human expression, and yet they haven't progressed much from a functional standpoint over the course of history. Recently, a new family of fibers composed of conductors, semiconductors and insulators has emerged. These fibers can achieve device attributes, yet are fabricated using scalable preform-based fiber-processing methods, yielding kilometers of functional fiber devices. Moreover, it is expected that the functions of fibers will increase dramatically over the next years creating a fiber equivalent of the "Moore's law". In this talk I will describe the underlying evidence for this "law" and discuss paths to achieving system level behavior on the fabric level. I will also outline progress to date in establishing AFFOA, a DoD-backed national center; its mission is to enable a domestic manufacturing-based revolution by transforming traditional fibers, yarns, and fabrics into highly sophisticated, integrated and networked devices and systems that will see, hear, sense and communicate, store and convert energy, and change color.



**Professor Yoel Fink** received a B.Sc. in Chemical Engineering (1994) and a B.A. degree in Physics (1995) from the Technion, Haifa. In 2000 he was awarded a Ph.D. degree in Materials Science from MIT. That same year, he joined the faculty of the MIT Materials Science and Engineering Department. In 2011 he became a joint professor of electrical engineering and computer science and was appointed as the Director of the Research Laboratory of Electronics. Professor Fink was a recipient of the Weizmann Institute Amos De-Shalit Foundation Scholarship in 1992, was awarded the Hershel Rich Technion Innovation Competition in 1994, was a recipient of the Technology Review Award for the 100 Top Young Innovators in 1999, and was awarded the National Academy of Sciences Initiatives in Research Award for 2004. In 2006 he won the Joseph Lane Award for Excellence in Teaching, and in 2007 was named one of the MIT MacVicar Fellows, an award given in recognition of outstanding teaching abilities.

Professor Fink<sup>1</sup>'s research group (fibers@mit) has pioneered the field of multimaterial multifunctional fibers. His research focuses on extending the frontiers of fiber materials from optical transmission to encompass electronic, optoelectronic and even acoustic properties. Fink recently led a \$317M winning proposal for the creation of AFFOA, the Revolutionary Fiber and Textile Manufacturing Innovation Institute located in Cambridge. AFFOA's mission is to enable a domestic manufacturing-based revolution by transforming traditional fibers, yarns, and fabrics into highly sophisticated, integrated and networked devices and systems. Professor Fink is also a co-founder of OmniGuide, Inc. (2000) and served as its chief executive officer from 2007-2010 and as chairman of the board from 2011-2012. He is the coauthor of over eighty-five scientific journal articles, and holds forty-eight issued U.S. patents.