OUTSTANDING YOUNG ENGINEER AWARD

Anthony Grbic

"For outstanding early career contributions to the microwave profession"

Anthony Grbic (S'00–M'06) received the B.A.Sc., M.A.Sc., and Ph.D. degrees in electrical engineering from the University of Toronto, Canada, in 1998, 2000, and 2005, respectively. In January 2006, Dr. Grbic joined the Department of Electrical Engineering and Computer Science, University of Michigan, where he is currently an Assistant Professor. His research interests include engineered electromagnetic structures (metamaterials, electromagnetic bandgap materials and frequency selective surfaces), microwave circuits, printed antennas, and analytical electromagnetics.

Dr. Grbic was instrumental in the development of the transmission-line approach to metamaterial synthesis. In particular, his research work provided the first experimental demonstration of subdiffraction focusing using a negative refractive index lens. In recognition of his research achievements, Dr. Grbic received the Best Student Paper Award at the 2000 Antenna Technology and Applied Electromagnetics Symposium and an IEEE Microwave Theory and Techniques Society Graduate Fellowship in 2001. In 2008, he was the recipient of an AFOSR Young Investigator Award as well as an NSF Faculty Early Career Development Award. In January 2010, he was awarded a Presidential Early Career Award for Scientists and Engineers, and in March of 2011 a University of Michigan Henry Russel Award. To date, Anthony Grbic has 28 papers that have been accepted/published in prominent, peer-reviewed journals and over 40 conference proceedings or presentations.

Dr. Grbic is the co-inventor (along with Dr. Roberto Merlin) of a novel approach to subwavelength focusing that relies on non-periodic patterned surfaces or near-field arrays. His theoretical and experimental work has demonstrated the feasibility of using these devices to focus electromagnetic energy to extreme subwavelength dimensions. In his recent work, Anthony Grbic has developed novel transmission-line based metamaterials that exhibit tensor material properties. The proposed tensor TL metamaterials combine microwave network theory with transformation optics. Tensor TL metamaterials will allow unprecedented control of electromagnetic fields along a surface / radiating aperture, and therefore the realization of novel microwave devices and antennas. Anthony Grbic's work has also focused on the development of volumetric metamaterials that can overcome the bandwidth and loss limitations, and polarization dependence of current metamaterial designs. The new metamaterial topologies exhibit wide bandwidths of operation and significantly reduced losses. The superior performance of these volumetric metamaterials will allow them to be integrated into practical focusing and antenna systems.

Since September 2007, Dr. Grbic has been Vice Chair of Chapter IV (Antennas and Propagation, Microwave Theory and Techniques and Electron Devices societies) of the IEEE Southeastern Michigan Section. He is also an Associate Editor for IEEE Antennas and Wireless Propagation Letters. Dr. Grbic will serve as Technical Program Co-Chair for the 2012 IEEE International Symposium on Antennas and Propagation to be held in Chicago IL. He has served as the Student Paper Competition Co-Chair for the 2010 IEEE International Symposium on Antennas and Propagation, and as a Technical Program Committee Member for the 2010 International Congress on Advanced Electromagnetic Materials in Microwave and Optics.