

# WHY ET MIGHT WRITE NOT RADIATE

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## Abstract

It is well known that electromagnetic radiation – radio waves – can be used to communicate at distances from terrestrial to interstellar. In contrast, sending physical artifacts has seemed extravagantly wasteful of energy. However, the key consideration has always been the perceived need to deliver the message as quickly as possible. Using fundamental communications theory, we show that if haste is unimportant, sending messages inscribed in some material can be strikingly more energy efficient than communicating by electromagnetic waves for distances both small (such as communication between "motes" in a sensor network) and large (such as interstellar or intergalactic signaling). Most surprisingly, the results suggest that our initial contact by extraterrestrial civilizations may be more likely to occur through physical artifacts – essentially messages in a bottle – than via electromagnetic communication.

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## Bio

**Dr. Christopher Rose** received the B.S. (1979), M.S. (1981) and Ph.D. (1985) degrees all from the Massachusetts Institute of Technology in Cambridge, Massachusetts. Following graduate school, Dr. Rose joined AT&T Bell Laboratories in Holmdel, N.J. as a member of the Network Systems Research Department. Dr. Rose is currently a Professor of Electrical and Computer Engineering at Rutgers University in New Jersey, an Associate Director of the Wireless Information Networks Laboratory (WINLAB), as well as a Henry Rutgers Research Fellow. He has served as editor for the IEEE Transactions on Vehicular Technology, the ACM Wireless Networks Journal (WINET), the Elsevier Computer Networks Journal, and also on many conference technical program committees as technical program chair: Co-Chair MobiCom'97, the WINLAB Focus'98 on the U-NII, the WINLAB Berkeley Focus'99 on Radio Networks for Everything and the Berkeley WINLAB Focus 2000 on Picoradio Networks. Dr. Rose, a past member of the ACM SIGMobile Executive Committee is currently a member of the ACM MobiCom Steering Committee and has also served as General Chair of ACM SIGMobile MobiCom 2001 (Rome, July 2001). In December 1999 and 2003 he served on an international panel to evaluate engineering teaching and research in Portugal. Closer to home Dr. Rose has served on the Scientific Fields Advisory Committee of the New Jersey Commission on Science and Technology. His current technical interests include novel mobile communications networks, applications of genetic algorithms to control problems in communications networks and most recently interference avoidance methods using universal radios to foster peaceful coexistence in what will be the wireless ecology of 5GHz U-NII bands. This work has received the 2003 IEEE Guglielmo Marconi Prize Paper Award in Wireless Communications.

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