2001 Microwave Application Award

James C. Rautio

The Microwave Application Award recognizes an individual or team for outstanding application of microwave theory and techniques. This year's recipient is James C. Rautio, whose citation reads "**For Development of Widely-Used Full-Wave Electromagnetic Solution Software for the Computation of Printed Circuit Characteristics.**"

Jim Rautio

James C. Rautio started life on a farm and might still be there but for amateur radio. His father had a pre-World War II "rig" and James was intensely curious. This lead to getting a ham license in 1969 and to his decision to become an electrical engineer even though no one in his family had ever been to college. After high school, he worked for two years. Then, using savings, scholarships, and loans, he put himself through Cornell receiving a BSEE in 1978. He then worked for General Electric Space Systems while completing a MS in Systems Engineering from University of Pennsylvania. While at Space Systems, James designed microwave circuits on alumina, developed millimeter wave measurement equipment, and wrote circuit analysis software.

In 1982, James transferred to GE Electronics Laboratory in Syracuse. Here he designed monolithic GaAs microwave integrated circuits. Software development was pursued at home by starting Sonnet Software in 1983, and developing a simple antenna analysis program, Annie. Annie ran on the Apple II, Commodore 64, and IBM-PC. On the first two computers, the program was written entirely in assembly language, including floating point routines. A series of five articles about Annie in QST magazine won the 1984 ARRL technical excellence award. Selling Annie commercially provided an entrepreneurial education critical for later commercial success.

In 1986, James completed a Ph.D. at Syracuse University under Roger Harrington. His research on the electromagnetic analysis of planar circuits was prompted by his microwave design experience, especially GaAs, where "tweaking" a design was no longer possible. Inspired by the early work of Rolf Jansen, he felt the solution might be found in numerical electromagnetics.

After completing his Ph.D., he worked for several years as a visiting professor at Syracuse and at Cornell, while continuing to develop the software started during his Ph.D. research. Then, in 1988, he took Sonnet full time. Sonnet's first major sale was in 1989, the same year Sonnet incorporated and hired it's first employee. The following decade was devoted to promoting the acceptance of numerical electromagnetics in the high frequency design cycle. As part of this effort, Sonnet was listed on the 1995 Inc. 500 list of the fastest growing privately held US companies, the only high frequency software company ever so listed.

James' other interests include ham radio; astronomy; geology; fern, tree, and bird song identification; ecology; philately; Japanese culture and language; and distance running. A recent project was the conversion of an 1882 biography of James C. Maxwell to electronic form, available on the web.