

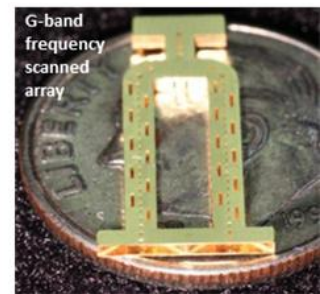
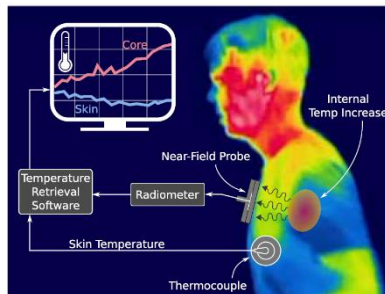
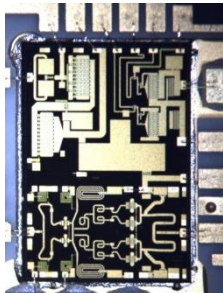
# High-Performance Microwave Circuits

*an overview of research in the Microwave Research Group at the University of Colorado, Boulder*

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This talk presents a brief overview of the activities in the microwave group at the University of Colorado, Boulder, in areas including: (1) high-efficiency microwave and millimeter-wave transmitters; (2) wireless powering; and (3) medical applications of microwaves. Specifically, record high-efficiency GaN amplifier designs at frequencies from 2 to 25GHz will be shown, and efficiency enhancement techniques overviews. The MMIC amplifiers are designed for radar and communication systems that transmit high peak-to-average power ratio (PAPR) signals with wide instantaneous bandwidths ( $>100\text{MHz}$ ), and require new linearization techniques. Related to wireless powering, the talk overviews design of microwave receivers for far-field powering at very low incident power densities ( $<1\mu\text{W}/\text{cm}^2$ ), as well as near-field capacitive phased array for kW powering of cars in the MHz frequency range. Finally, two medical microwave applications are discussed: design of human-size bores for ultra-high field MRI (7, 10.5 and 16.5T); and design of portable radiometers for core-body temperature monitoring operating at low microwave frequencies that enable thermometry of tissue layers several cm under the skin. A few antenna-array projects will also be briefly presented.



**Zoya Popovic** is a Distinguished Professor and the Lockheed Martin Endowed Chair of Electrical Engineering at the University of Colorado. She obtained her Dipl.Eng. degree at the University of Belgrade, Serbia, and her Ph.D. at Caltech. In 2001/03 and 2014, she was a Visiting Professor with the Technical University of Munich, Germany and ISAE in Toulouse, France, respectively. She is currently a Chair of Excellence at Carlos III University in Madrid. She has graduated 60 PhDs and currently advises 14 doctoral students in various areas of microwave engineering. She is a Fellow of the IEEE and the recipient of two IEEE MTT

Microwave Prizes for best journal papers, the White House NSF Presidential Faculty Fellow award, the URSI Issac Koga Gold Medal, the ASEE/HP Terman Medal and the German Humboldt Research Award. She was named IEEE MTT Distinguished Educator in 2013 and the University of Colorado Distinguished Research Lecturer in 2015. She has a husband physicist and three daughters who can all solder.