

History of FEM inventions

Dr.S.Raghavan¹ and Prof.S.Suganthi²

- 1.National Institute of Technology, Dept. of ECE, Tiruchirappalli, Tamilnadu 620015, India
2. Shri Angalamman College of Engg. and Tech., Dept. of ECE, Tiruchirappalli, Tamilnadu 621105, India

INTERNATIONAL WOMEN PIONEERS in MICROWAVES!!!

Once many women were supposed to be just mothers, few individuals became mothers of microwaves and RF inventions. Today, women feature more prominently in the industry, providing ideas, skills, and leadership/ executive roles.

- 1.Katherine Blodgett, 2.Beatrice Alice Hicks, 3.Erna Schneider Hoover, 4.Dr. Betsy Ancker-Johnson, 5. Screen siren Hedy Lamarr, 6.Celeste Baranski, 7.Zoya Popovic, 8.Dana Weinstein, 9.Linda P.B. Katehi, 10.Dalma Novak, 11.Kawthar Zaki, 12.Randice-Lisa Altschul, 13.Dominique Schreurs, 14.Almudena Surez, 15.Yulia Averyanova, 16.Sandra Cruz-Pol, 17.Natalia Nikolova, 18.Magdalena SALAZAR PALMA, 19.Parveen Wahid, 20.Nancy Friedrich



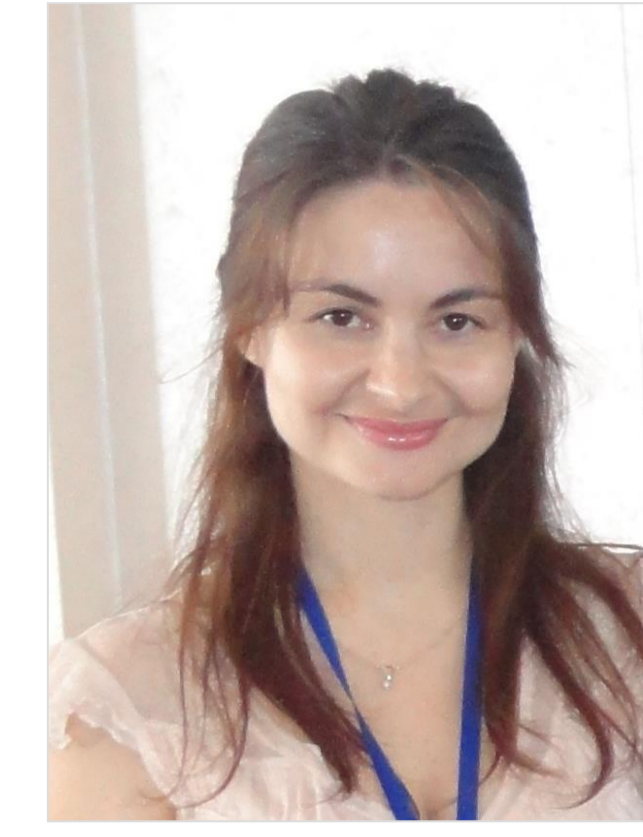
Dr.Katherine Blodgett

January 10, 1898 – October 12, 1979 Schenectady, New York
First woman awarded a Ph.D. in Physics from the University of Cambridge in 1926.
Physicist and Inventor, first woman research scientist for General Electric's Laboratory Schenectady, NY in 1917.
Together with Irving Langmuir she found a way to apply coatings layer by layer to glass and metal.
Recipient of eight U.S. patents most famously for inventing low-reflectance "invisible" glass prepared by applying thin film coatings layer by layer to glass and metal thereby cancelling out reflections from surface underneath.



Dr.Dana Weinstein

She received her B.A. in Physics from UC Berkeley in 2004. She completed her Ph.D. in Applied Physics in 2009, working on RF Micro Electro-Mechanical Systems (MEMS) from Cornell University.
Recipient of the NSF CAREER Award, the DARPA Young Faculty Award, the Intel Early Career Award, and the IEEE IEDM.
Faculty member of the Microsystems Technology Laboratories (MTL) at Massachusetts Institute of Technology (MIT).
Head of research group focused on the development of hybrid microelectromechanical-systems integrated-circuit (MEMS-IC) devices for low-power wireless communication for microprocessor cloaking and sensing applications.



Dr.Yulia Averyanova Keiv, Ukraine

Professor in the National Aviation University (NAU), Kiev, Ukraine.
Top researcher (2012), IEEE Senior member, member of EuMA, Chair of IEEE Chapter, Organizer of International MRRS Conferences (2005, 2008 & 2011).
Contributor of Radar Navigation and air traffic management.
Current Research Focus on Aviation Meteorology, Radar and Remote Sensing, Doppler Polarimetry, Detection and Recognition of Dangerous Weather Phenomena

Beatrice Alice Hicks

Jan 2, 1919 – Oct 21, 1979 Orange, New Jersey

Received her Master's degree in physics, in 1949 and she stayed at Newark College of Engineering for three years as a research assistant. American Engineer employed in Western Electric in 1942 as first female engineer.

Worked on long-distance telephone technology and developed a crystal oscillator.

Co-founded the Society of Women Engineers (SWE) in 1952 which has now numbers more than 16,000.

Hicks held a variety of leadership positions and eventually became the owner of an engineering firm. There she developed a gas density switch that would be used in the U.S. space program, including Apollo moon landing mission.



Dr.Linda P.B. Katehi

Jan 30, 1954 (age 59) Born in Athens and grown in Greece

She received a bachelor's degree in electrical engineering from National Technical University of Athens in 1977 and master's degree and doctorate in electrical engineering at the University of California, Los Angeles in 1981-84. Has been the sixth Chancellor of the University of California, Davis, since 2009.
Recipient of 19 US patents and has submitted five more applications.
Her areas of expertise are the development and characterization of microwave, millimeterwave printed circuits and the computer-aided design of VLSI interconnects.



Dr. Sandra Cruz-Pol

Professor of Electrical and Computer Engineering at University of Puerto Rico at Mayaguez.

She is involved in the CASA Center to predict ubad weather. The Center for Collaborative Adaptive Sensing of the Atmosphere, seeks to revolutionize the way we detect, monitor and predict atmospheric phenomena by creating a distributed collaborative adaptive sensor network that sample the atmosphere where and when end user needs are greatest.

Her group develops little radars will be so cheap that they'll be mounted across the country, like cell phone sites.



Nancy Friedrich

Editor-in-Chief in Microwaves & RF .

Nancy Friedrich began her career in technical publishing in 1998.

After a stint with sister publication Electronic Design as Chief Copy Editor, Nancy worked as Managing Editor of Embedded Systems Development.

She then became a Technology Editor at Wireless Systems Design, an offshoot of Microwaves & RF. Nancy has called the microwave space "home" since 2005.



Dr.Parveen wahid

Department of Electrical Engineering and Computer Science
University of Central Florida
Orlando, USA FL 32816-2362

Areas of Interest:
Antenna design and analysis, electromagnetics, microwaves

Dr.Natalia Nikolova

Distinguished Microwave Professor

Currently Professor in Electrical and Computer Science in McMaster University, in Hamilton, ON, Canada.

Received the Dipl. Eng. (Radioelectronics) degree from the Technical University of Varna, Bulgaria, in 1989, and the Ph.D. (Electrical Engineering) degree from the University of Electro-Communications, Tokyo, Japan, in 1997 and received scholarship from Japan Govt. for Ph.D.

Worked in Microwave Laboratory in Canada.

Published in more than 85 Journal papers and 115 International Conferences.

Fellow in IEEE and member in ACES.



Dr. Betsy Ancker-Johnson Born in April 29, 1927, Age 85 American

Plasma Physicist

She was the first female Presidential appointee in the U.S. Department of Commerce .

Awardee of patent for "signal generators" in 1966.

She is the fourth woman elected to the National Academy of Engineering.

In 1968 she released the first observation on microwave emission from an electron-hole plasma without the presence of an external field.

Discovered the generation of very-high-frequency signals with low-density plasma established in semiconductor material in the presence of both a high-intensity electric field and low-intensity parallel magnetic field.



Screen siren Hedy Lamarr

July 28, 1896 -Jan30, 1926 (aged 29)
Yakima, Washington, USA

A legendary actress of Hollywood played as Sex Symbol, Scientist, Actress and Inventor of Wi-Fi Technology
"Most Beautiful Woman in the World" Invented a System for Remote-Controlling Torpedoes at her Austrian husband Fritz Mandl's armament company

Famously developed the concept of frequency hopping.
The "Secret Communications System," which she co-invented with George Anthiel, manipulated radio frequencies at irregular intervals between transmission and reception.

She received a patent for a radio system that was virtually jam-proof, constantly skipping signals in 1941.



Randice-Lisa Altschul Born in 1960- Died in 2009

Randice-Lisa (Randi) Altschul, a toy inventor from New Jersey. It was in 1996 that Altschul came up with the idea that would make her famous by the world's first disposable cell phone. In 1999, she was awarded a series of patents for the world's first disposable cell phone. It was trademarked as the "Phone-Card-Phone" with a retail price of \$20 and 60 minutes of outgoing call time. She designed it with engineer Lee Volte, a former research and development executive from Tyco.



Dr.Kawthar Zaki

She received the B.S. degree (with honors) from Ain Shams University, Cairo, Egypt, in 1962 and the M.S. and Ph.D. degrees from the University of California at Berkeley, in 1966 and 1969 respectively all in electrical engineering.

Since 1970 she serves as Professor Emeritus, Electrical & Computer Engineering Department at the University of Maryland, College Park, MD.

Awardee of six patents and numerous honors. She is a Fellow of the IEEE

Dr.Rajeswari Chatterjee

Jan 1922 - Sep 2010, 88 years
Bangalore, India

•Received B.Sc.(Hons- Mumtaz Krishna Raju Wodeyar Award), M.Sc. (Narayana Iyengar Prize and the Walters Memorial Prize) from Central College Bangalore; First rank in both in 1939

•Received M.S. EE Dept. and Ph.D. From University of Michigan, Ann Arbor, USA

•Professor and Chairman in Department of Electrical Communication Engineering at IISc, Bangalore

•Guided 20 Ph.D students, published over 100 research papers and 7 books in Microwave Engineering and Antennas



Dr.Erna Schneider Hoover

June 19, 1926, Age 86
Irvington, New Jersey, USA

She started working in Bell Laboratories in 1954 She created the principles of the computerized telephone switching system to avoid network overloads.

Many communications companies still rely on this principle.

First female supervisor of a technical department.

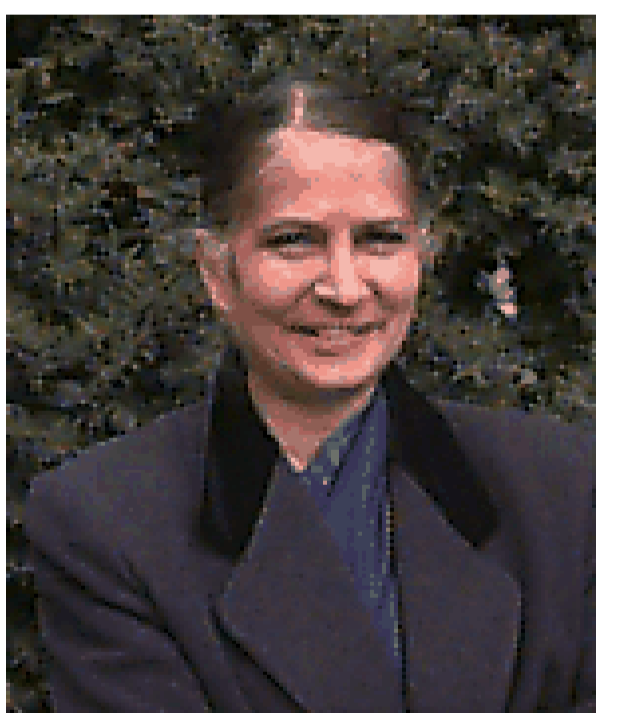


Dr.Sheila Prasad, India

She received her B.Sc. degree from the University of Mysore, India and the M.S. and Ph.D. degrees from Harvard University, Cambridge, Massachusetts. She has done research in electromagnetic theory and applications including antennas.

She is co-author with R. W. P. King of the book "Fundamental electromagnetic theory and applications," which was published by Prentice-Hall in 1986.

Her current research areas are: microwave and high speed semiconductor devices and circuits and optoelectronic circuits.



Prof. Magdalena SALAZAR PALMA President of IEEE Antennas and Propagation Society

She has developed her research in the areas of electromagnetic field theory; computation and numerical methods for microwave passive components and antenna analysis; network and filter theory and history of telecommunications.



Celeste Baranski

She developed an integrated cellular phone, facsimile (fax), and pen input device in 1993 together with Alain Rossman.

This device became the basis for many personal digital assistants (PDAs) later.



Dr.Dalma Novak Australia

Received the degrees of Bachelor of Engineering (Electrical) with First Class Honours (1887) and PhD from the University of Queensland, Australia, in 1992.

Vice President at Pharad LLC a firm that is developing antenna and RF-over-fiber technologies since 2004.

Previously Novak spent 12 years as a member of the academic staff in the Department of Electrical and Electronic Engineering at the University of Melbourne, Australia



Dr.Almudena Surez Santander, Spain

She received Electronics Physics (1987) and Ph.D. (1997) from University of Cantabria Santander Spain.

Joined the Electronics Department at Spain's University of Cantabria, Santander, in 1987.

She was involved with nonlinear simulation of microwave circuits.

Since 1993, she has been an Associate Professor with the university's Communications Engineering Department.

Surez co-authored Stability Analysis of Microwave Circuits (Artech House, 2003).



Dr.Zoya Popovic

Dipl.Ing. (B.S.), Electrical Engineering, University of Belgrade, Serbia, Yugoslavia, 1985 .

M.S., Electrical Engineering, (1986) and Ph.D., Electrical Engineering (1990) from the California Institute of Technology, Pasadena, in 1990.

A distinguished Professor/Hudson Moore Jr. Endowed Chair at the Department of Electrical, Computer, and Energy Engineering at the University of Colorado, Boulder.

She is one of the microwave Gurus in the University

