Information and Communication Technologies Category
Premios Fundación BBVA Fronteras del Conocimiento 2009

2009 BBVA Foundation Frontiers of Knowledge Awards
Prof. Andrea Goldsmith:

- Professor of Electrical Engineering at Stanford University
- Junior Past President of the Information Theory Society of the IEEE (Institute of Electrical and Electronic Engineers, the most influential professional association in the world of advanced technology, which she chaired in 2009)
Prof. Ramón López de Mántaras:

- Research Professor of the Spanish National Research Council (CSIC) and Director of its Artificial Intelligence Research Institute
- Associate editor of the journal “Artificial Intelligence”
- Former chair of the Board of Trustees of the International Joint Conferences on Artificial Intelligence

Premios Fundación BBVA Fronteras del Conocimiento 2009
2009 BBVA Foundation Frontiers of Knowledge Awards
Dr. Ronald Ho:

- Distinguished Engineer and Director on the VLSI Research Project at Sun Microsystems Laboratories
- Senior member of the IEEE (Institute of Electrical and Electronic Engineers)
- Assistant Professor at Stanford University
Prof. Oussama Khatib:

- Professor of Computer Science in the Artificial Intelligence Laboratory at Stanford University, where he heads the Robotics Research Group
- President of the International Foundation of Robotics Research (IFRR)
- Fellow of the IEEE
- Honorary Professor at the Harbin Institute of Technology (Heilongjiang), one of China’s leading center of R&D
Prof. Nico De Rooij:

- Director of the Institute of Microengineering at the École Polytechnique Fédérale of Lausanne (EPFL), Switzerland, where he also heads the Institute of Sensors, Actuators and Microsystems
- Fellow of the IEEE
- Fellow of the Institute of Physics (United Kingdom)
Premios Fundación BBVA Fronteras del Conocimiento 2009

2009 BBVA Foundation Frontiers of Knowledge Awards

Information and Communication Technologies Category

Fundación BBVA

Con la colaboración de
With the collaboration of

CSIC
Prof. Thomas Kailath

Hitachi America Professor of Engineering (emeritus)
Information Systems Laboratory
Department of Electrical Engineering
Stanford University, USA

Premios Fundación BBVA Fronteras del Conocimiento 2009
2009 BBVA Foundation Frontiers of Knowledge Awards
1935 · Born in Poone (India). Naturalized US citizen (1976)

1959 · S.M. in Electrical Engineering, MIT

1961 · Sc. D. in Electrical Engineering, MIT

1963 - present · Hitachi America Professor of Engineering, Stanford University
Extraordinary wide-ranging research:

- 50’s - 60’s. Communications
- 70’s. Control theory
- 80’s. Better signal detection by antenna arrays and problems in very-large-scale integration chips
- 90’s. Semiconductor manufacturing

Recipient of outstanding awards and honors:

- US National Academy of Engineering, US National Academy of Sciences, American Academy of Arts and Sciences, Padma Bhushan (3rd highest civilian honor from Government of India), IEEE Medal of Honor...
Deep contributions across a broad range of information and communication technologies

Repeatedly created

- New subjects of scientific endeavor
- New insights and ways of understanding basic properties
- New domains of applications
Examples of contributions

- Recognized and illuminated special structures of equations ("low displacement rank") to enable fast and accurate computation

- This ability underlies voice coding in GSM cellphones, the use of multiple antennas to improve reliability and range of wireless systems, simulation of complex natural processes, and much more
Invented methods to pattern integrated circuits finer than the wavelength of the available light source. This has enabled Moore’s Law scaling of technology beyond these very basic limits. Without these ideas, the ongoing scaling of integrated circuits would have slowed or stopped. Computer performance would be much lower.
Kailath illuminated threads and connections among many diverse fields

He created fundamental and transcendent understanding across engineering

His work led to a wealth of insights and solutions to formerly intractable problems