



IBM Research

Welcome to IBM Research

**Dr. George Chiu,
Senior Manager Blue Gene Hardware
IEEE Fellow**



10/28/2009

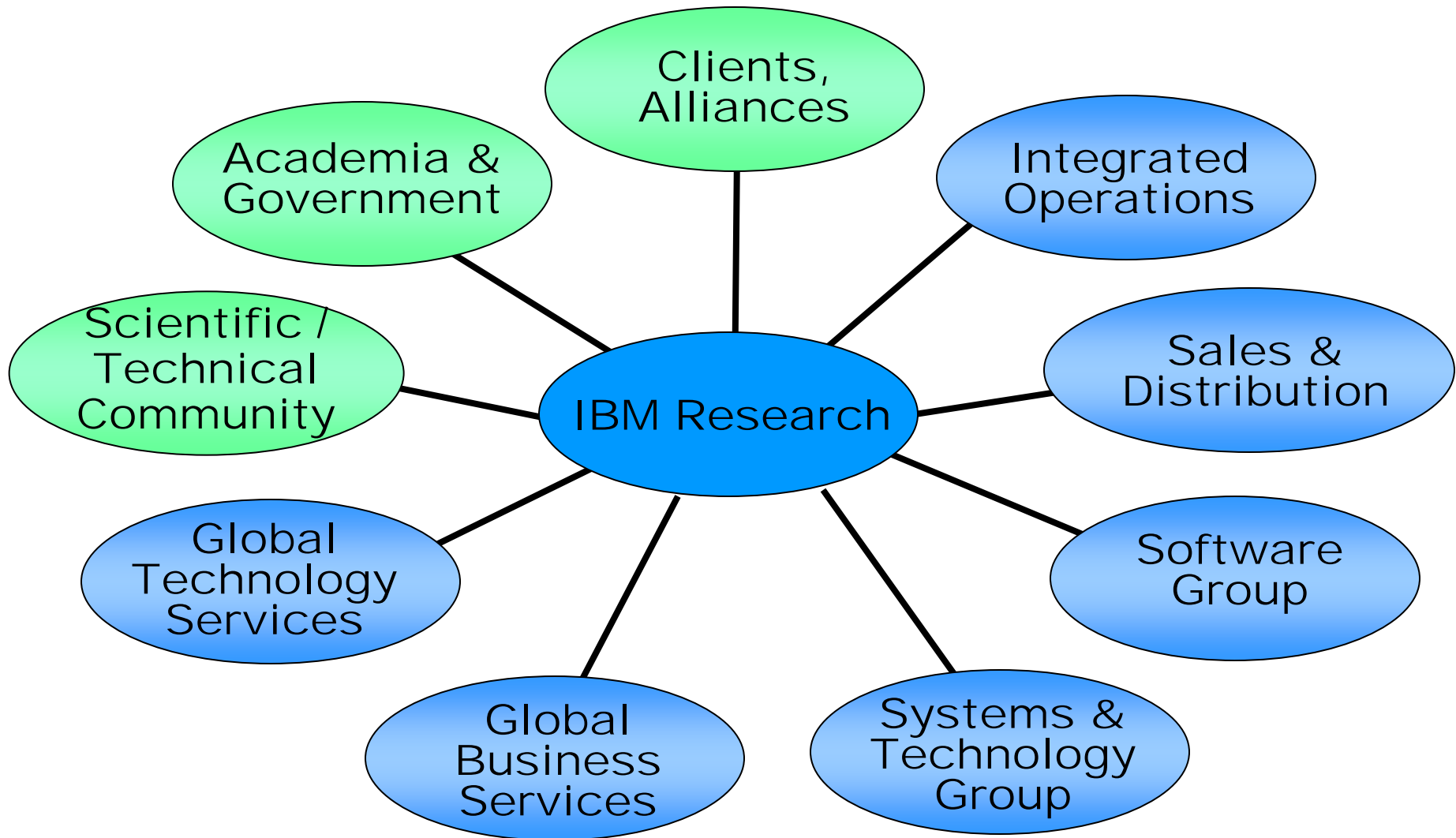
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IBM Research Worldwide






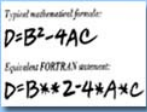














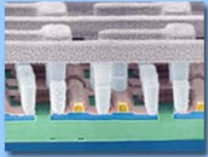

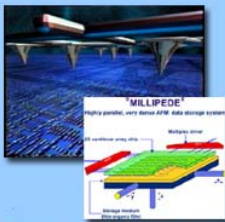

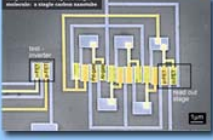

IBM Research Ecosystem

Research at the core of IBM and client relationships



History of Innovations

60+ Years of World Class Research

 1944: Mark 1	 1948: SSEC	 1956: RAMAC	 <i>Typical mathematical formula:</i> $D=B^2-4AC$ <i>Equivalent FORTRAN statement:</i> $D=B**2-4*A*C$ 1957: FORTRAN	 1964: System/360	 1966: One-Device Memory Cell	 1967: Fractals	 1970: Relational Database	 1971: Speech Recognition
 1973: Winchester Disk	 1979: Thin Film Recording Heads	 1980: RISC	 Nobel Prizes: 1986: Scanning Tunneling Microscope		 1987: High Temperature Supercon- ductivity	 1990: Chemically Amplified Photoresists	 1994: SiGe	 1993: RS/6000 SP 1996,97: Deep Blue
 1997: Copper Interconnect Wiring	 1998: Silicon-on-Insulator	 1998: Microdrive	 2002: Millipede		 2004: Blue Gene/L The fastest supercomputer in the world	 2006: 5-stage Carbon Nanotube Ring Oscillator	 2008: World's First Petaflop Supercomputer	

Diversity of Disciplines at IBM Research

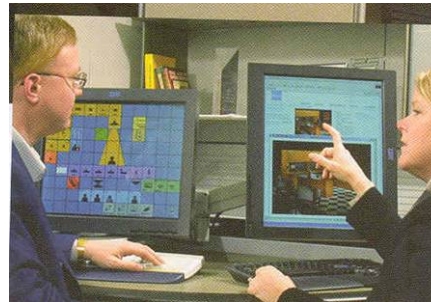
Computational Biology



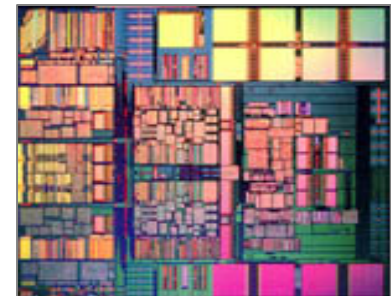
Chemistry



Computer Science



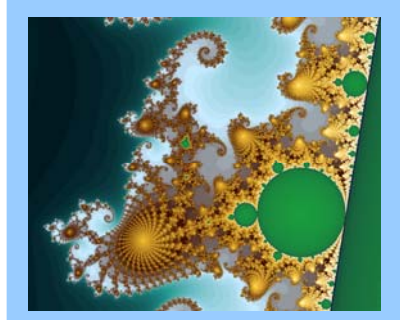
Electrical Engineering



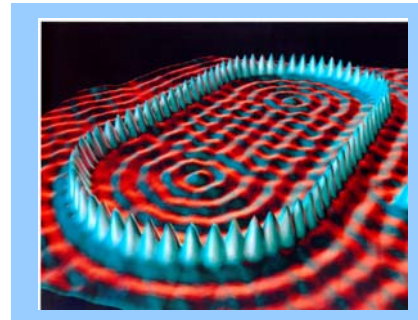
Materials Science



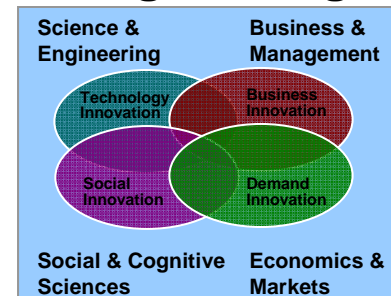
Mathematical Sciences



Physics



Service Science, Management & Engineering



Culture of Innovation

External Recognition

5 Nobel Laureates

Scanning Tunneling Microscope



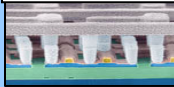
High Temperature Superconductivity Electron Tunneling Effect

8 National Medals of Technology

Copper Chip Technology



Silicon-on-Insulator



SiGe



DRAM

5 National Medals of Science



Nuclear Magnetic Resonance Techniques



Basis for MRI today

6 Turing Awards



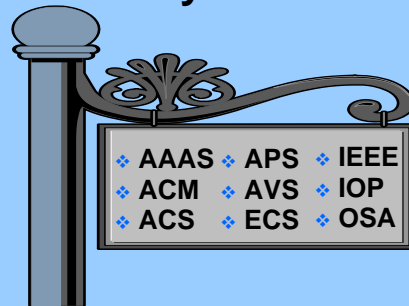
High Performance Computing

First woman recipient in the history of this prestigious ACM award

21 Members in National Academy of Sciences



Over 330 Professional Society Fellows



59 Members in National Academy of Engineering



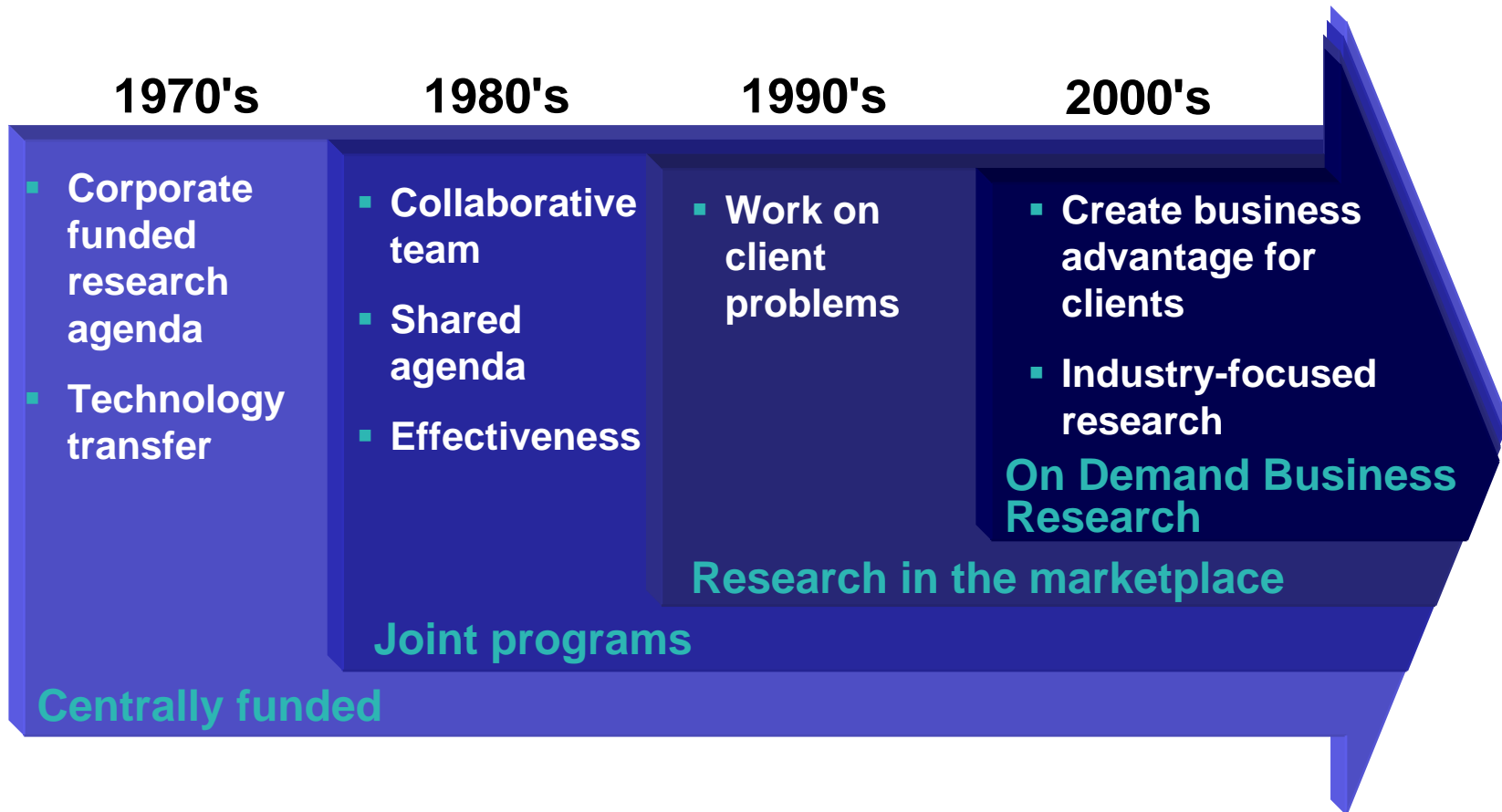
10 Inductees in National Inventors Hall of Fame



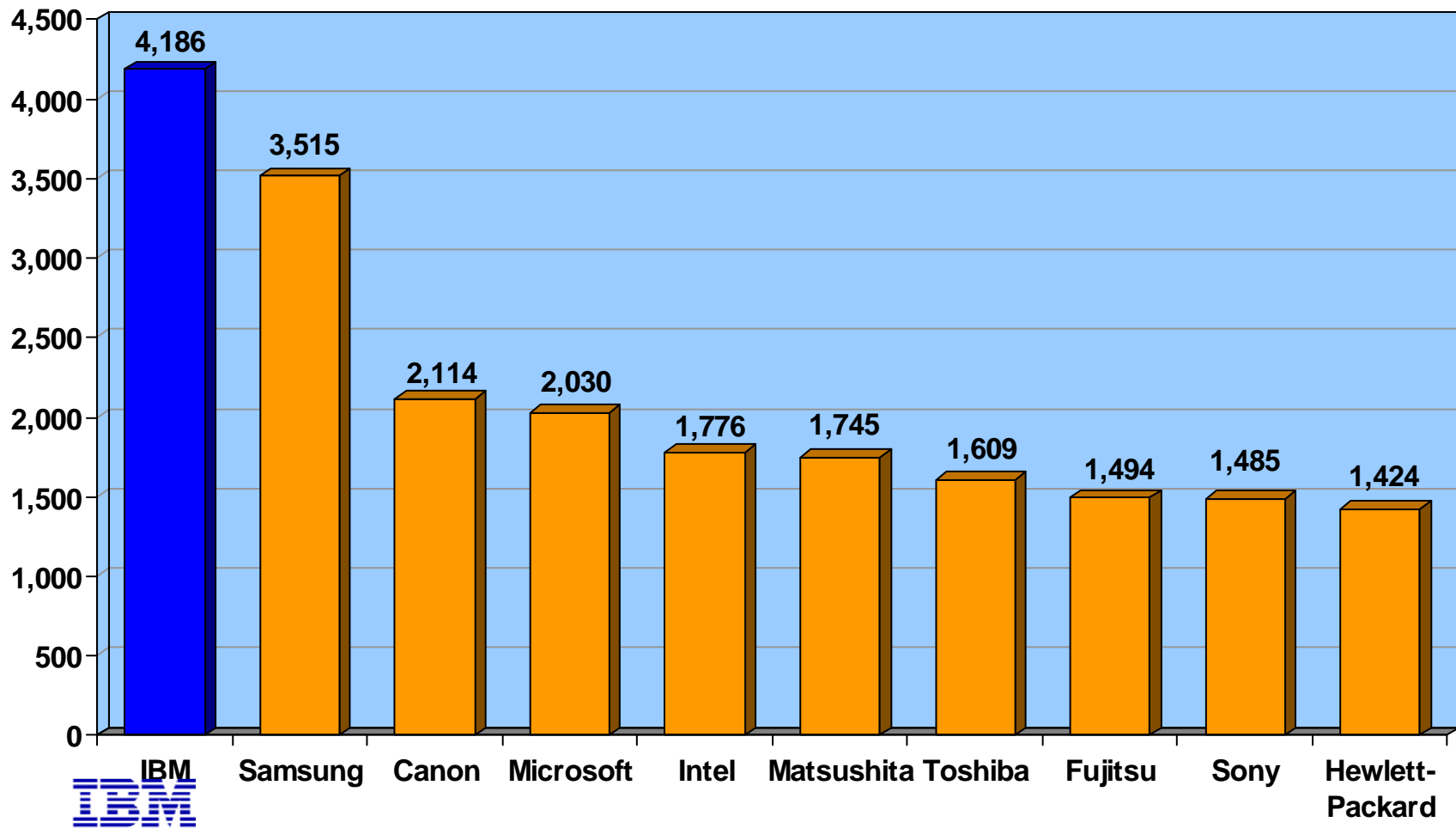
Laser-etched hair based on excimer laser surgery - foundation for LASIK surgery

Evolution of Role

Work on client-specific technology, business problems



IBM Patent Leadership – 2008



Research's Strategic Thrusts

From Technology to Services Research

Business Analytics & Math. Sciences

$$6 \left(\frac{7}{10} \right) 9 \times 9$$
$$K = \frac{5}{2} \sqrt{\frac{5}{2}}$$
$$+ \sqrt{2} = 2$$

Industry Solutions

Services

Software

WebSphere

Systems

Technology

Exploratory