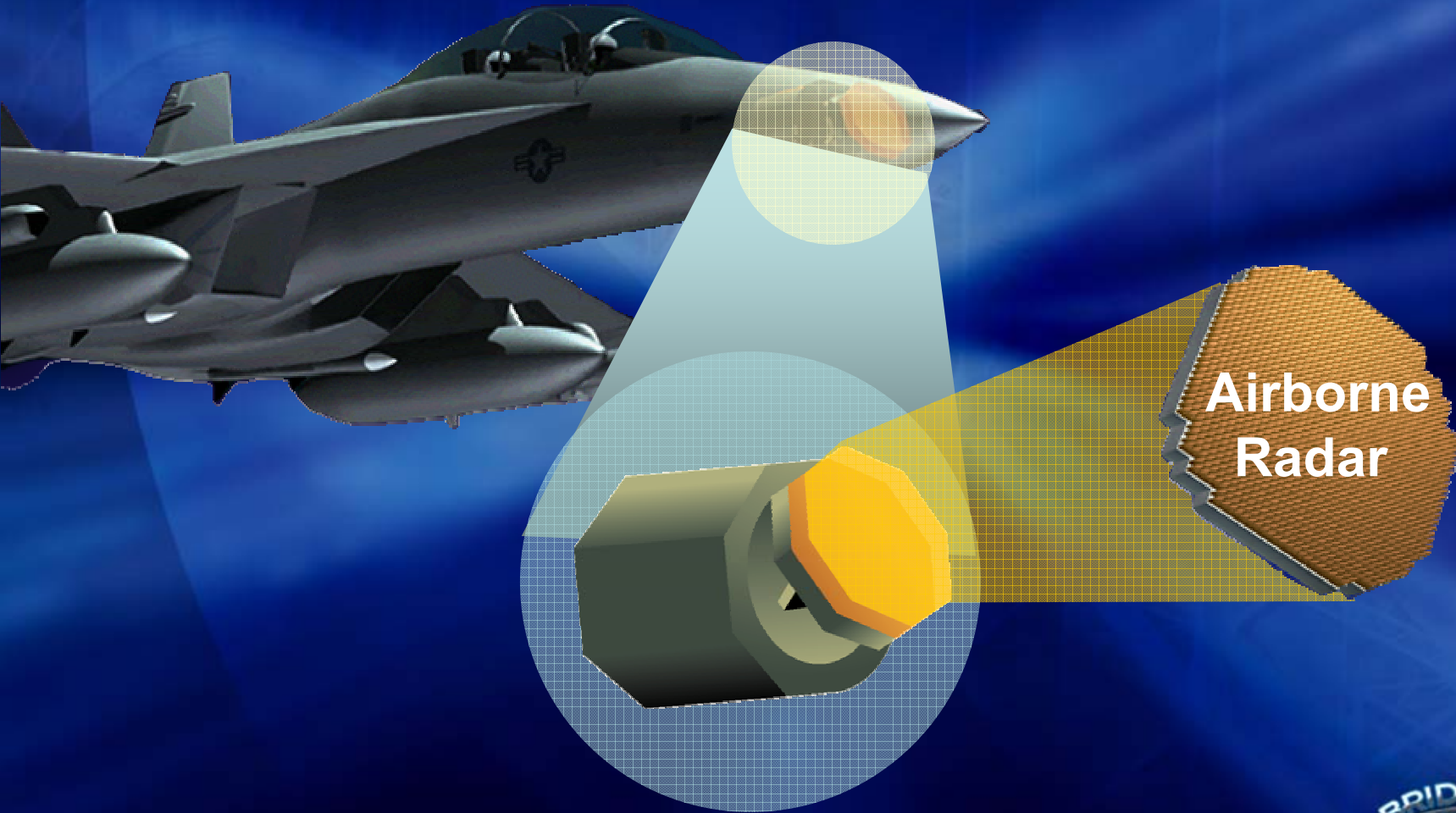


Electronics in Integrated Microsystems for Battlespace Information Dominance

Dr. John Zolper
Deputy Director, DARPA/MTO



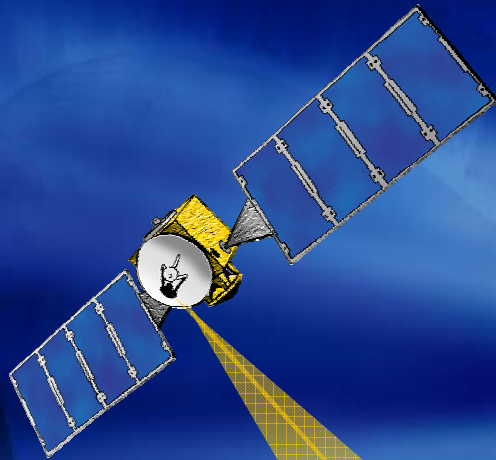
High Sensitivity Radar



Wireless Networks



Satellite Reconnaissance

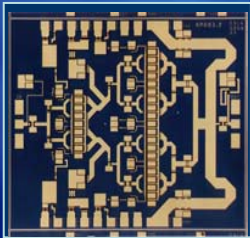


GPS Guided Munitions

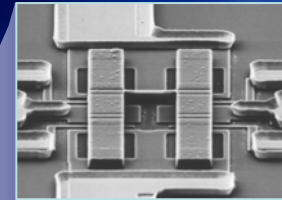
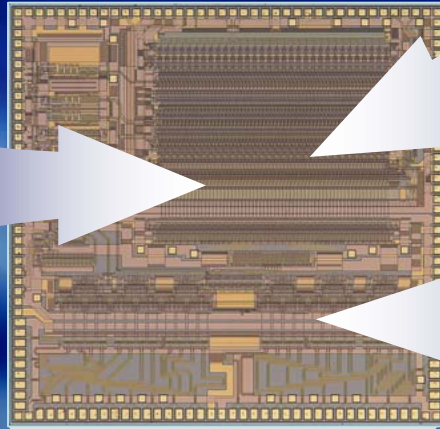


Integrated Microsystems

Integrated
Microsystems



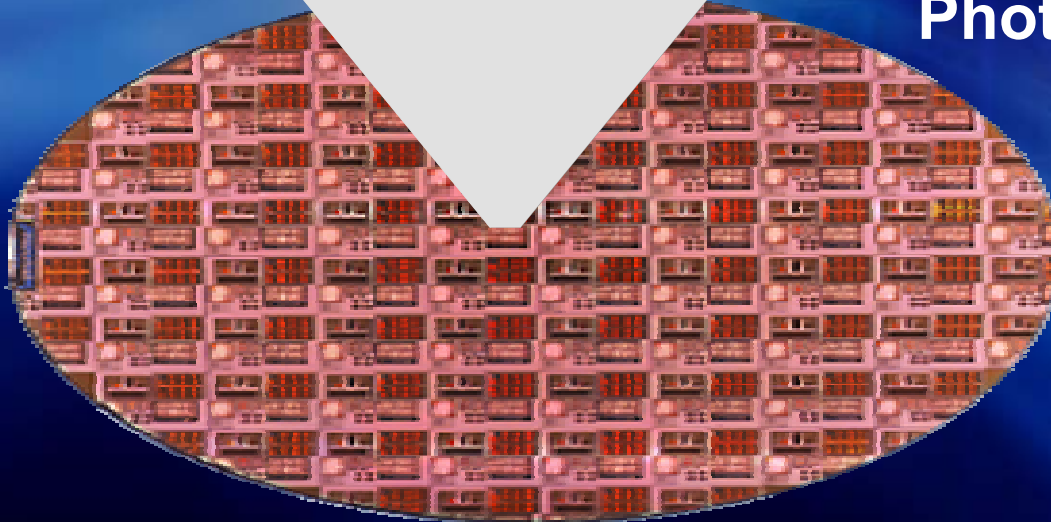
Electronics



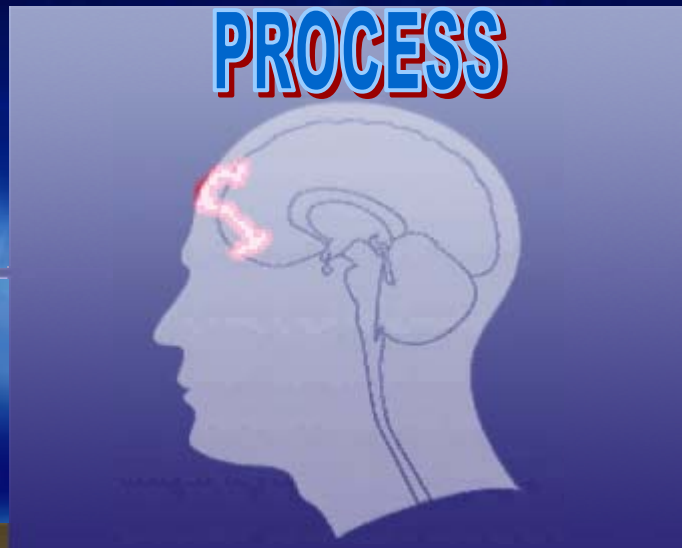
MEMS



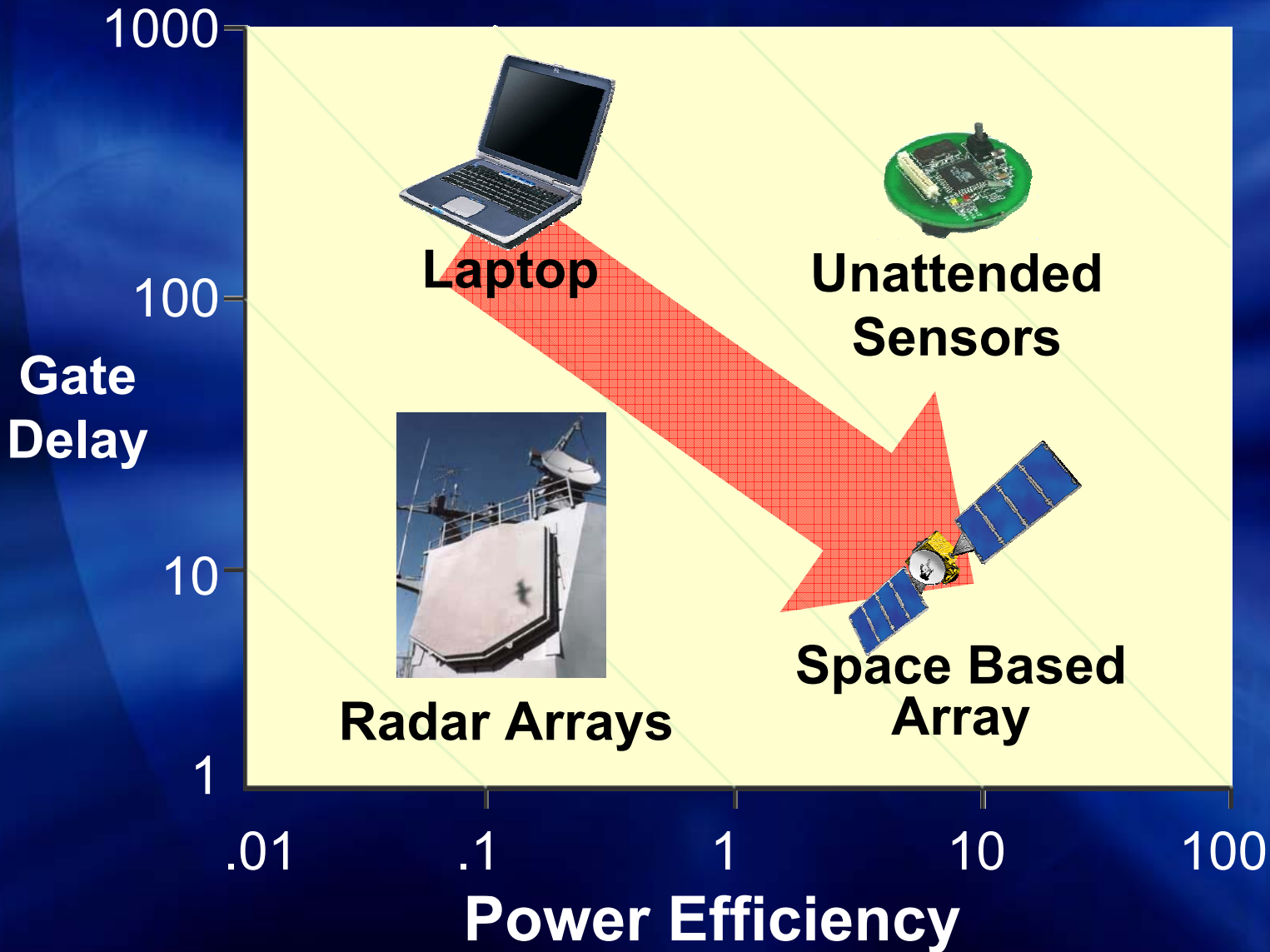
Photonics



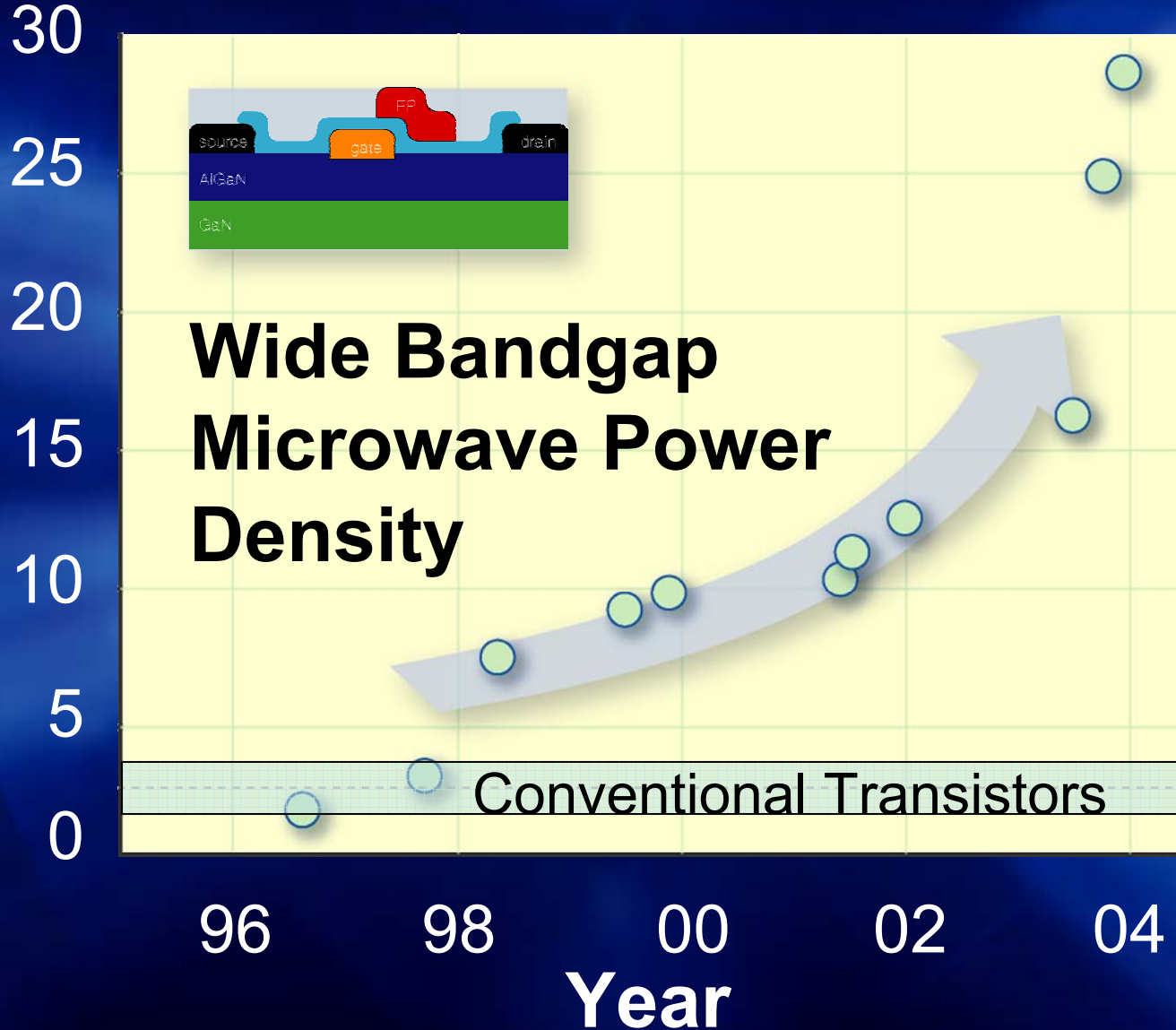
Microsystem Architecture



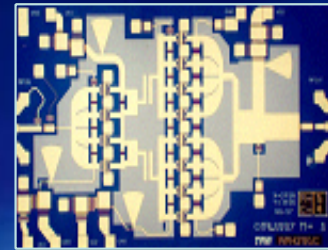
Gate Delay versus Power Efficiency



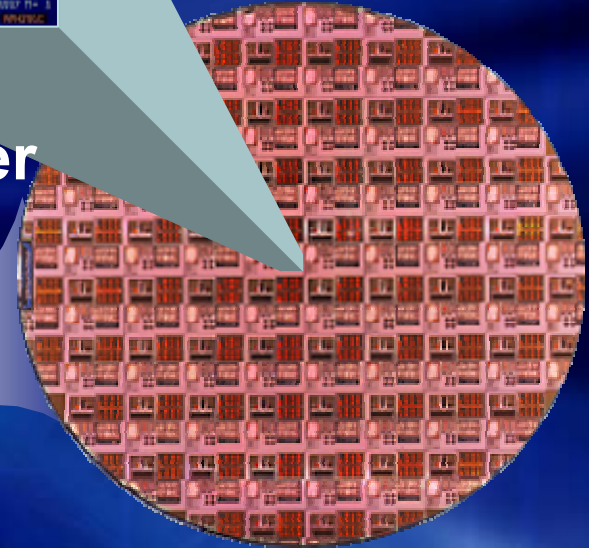
Progression in Power Density



Progression in RF Power Performance



Power Amplifier



Future Systems



Moore's Law



4004

23K

transistors

1971

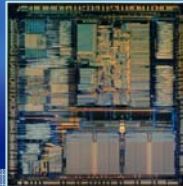


8080

35K

transistors

1974

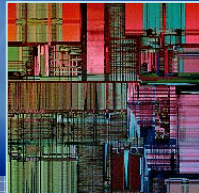


Intel 386

275K

transistors

1987

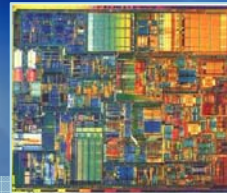


Pentium

3.2M

transistors

1994

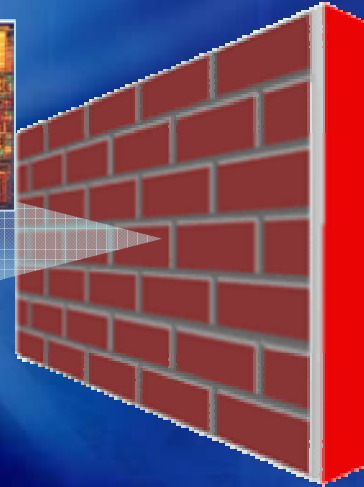


Pentium 4

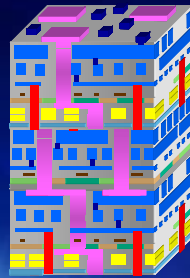
42M

transistors

2000



Moore's Law



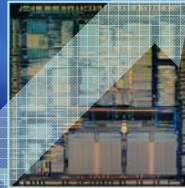
3D
Electronics



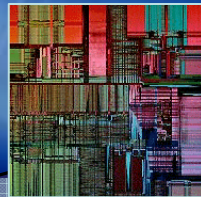
4004
23K
1971



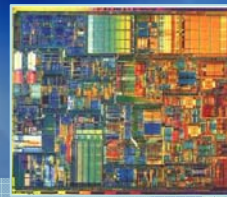
8080
35K
1974



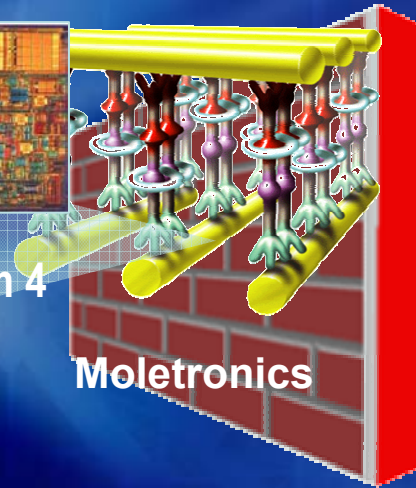
Intel 386
275K
1987



Pentium
3.2.M
1994



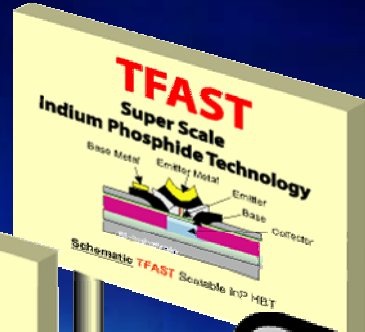
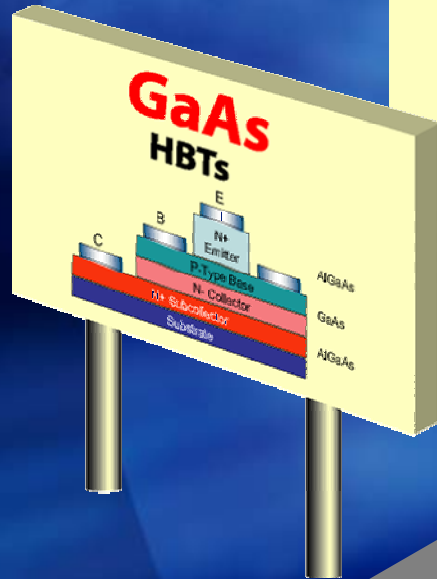
Pentium 4
42M
2000



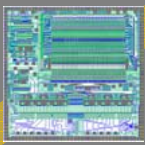
Moletronics



Mixed Signal Circuit Clock Speed



Mixed Signal
Circuits
Technology
Progression



~~Clock
Speed
50 GHz~~

Clock
Speed
150 GHz



Wafer Scale Integrated System

