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CHARLES L. BROWN DEPARTMENT *of*  
ELECTRICAL *and* COMPUTER ENGINEERING

*Department  
Research Overview*

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# CHARLES L. BROWN DEPARTMENT *of* ELECTRICAL *and* COMPUTER ENGINEERING

## Goal ----

**to be among the top 10  
research programs in  
microelectronic systems**

- ~ 25 faculty (plus 6 research faculty)
- ~ 210 undergraduate students (2-4 year)
- ~ 115 graduate students (55/58 Masters/PhD)
- ~ 60 electrical/computer engineering undergraduate and 35 graduate degrees/yr
- ~ \$10M external research support

## Concentration Areas:

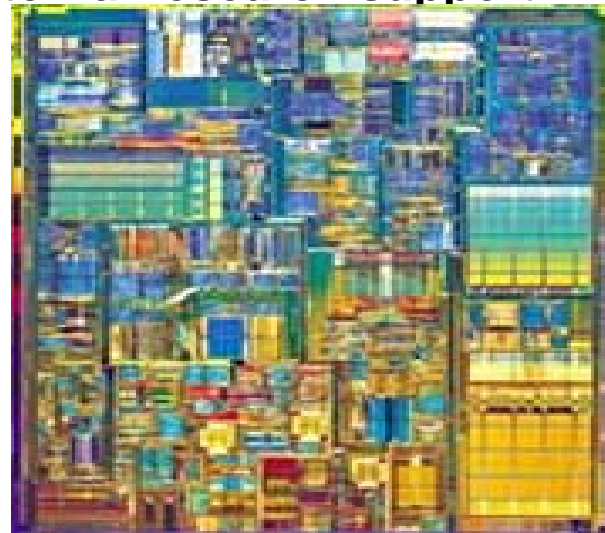
**Applied Electrophysics**

**Microelectronics**

**Communications**

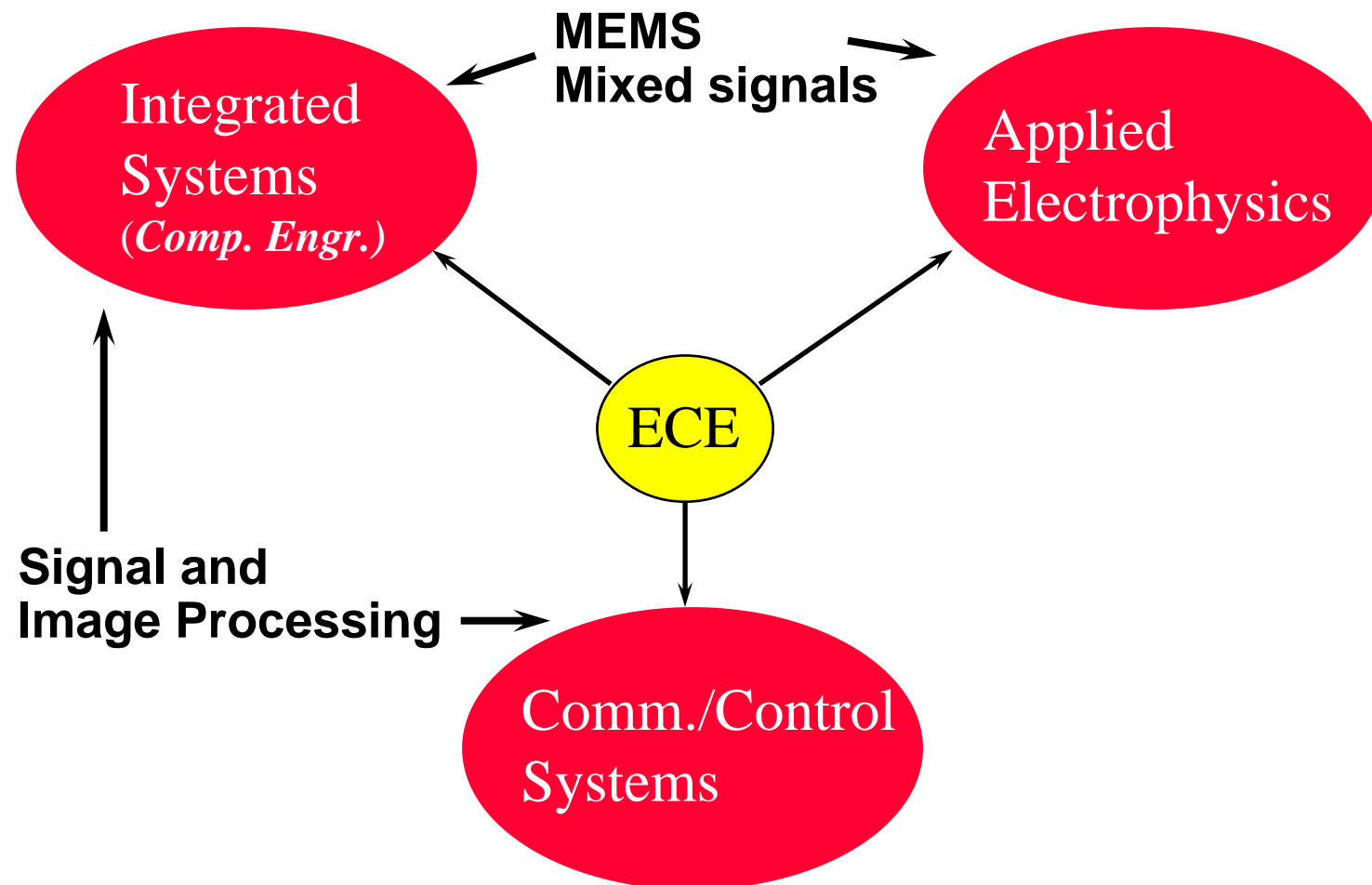
**Control Systems**

**Computer Engineering**



Intel's Pentium 4 contains tens of millions of transistors. Courtesy: Intel

# Research Program





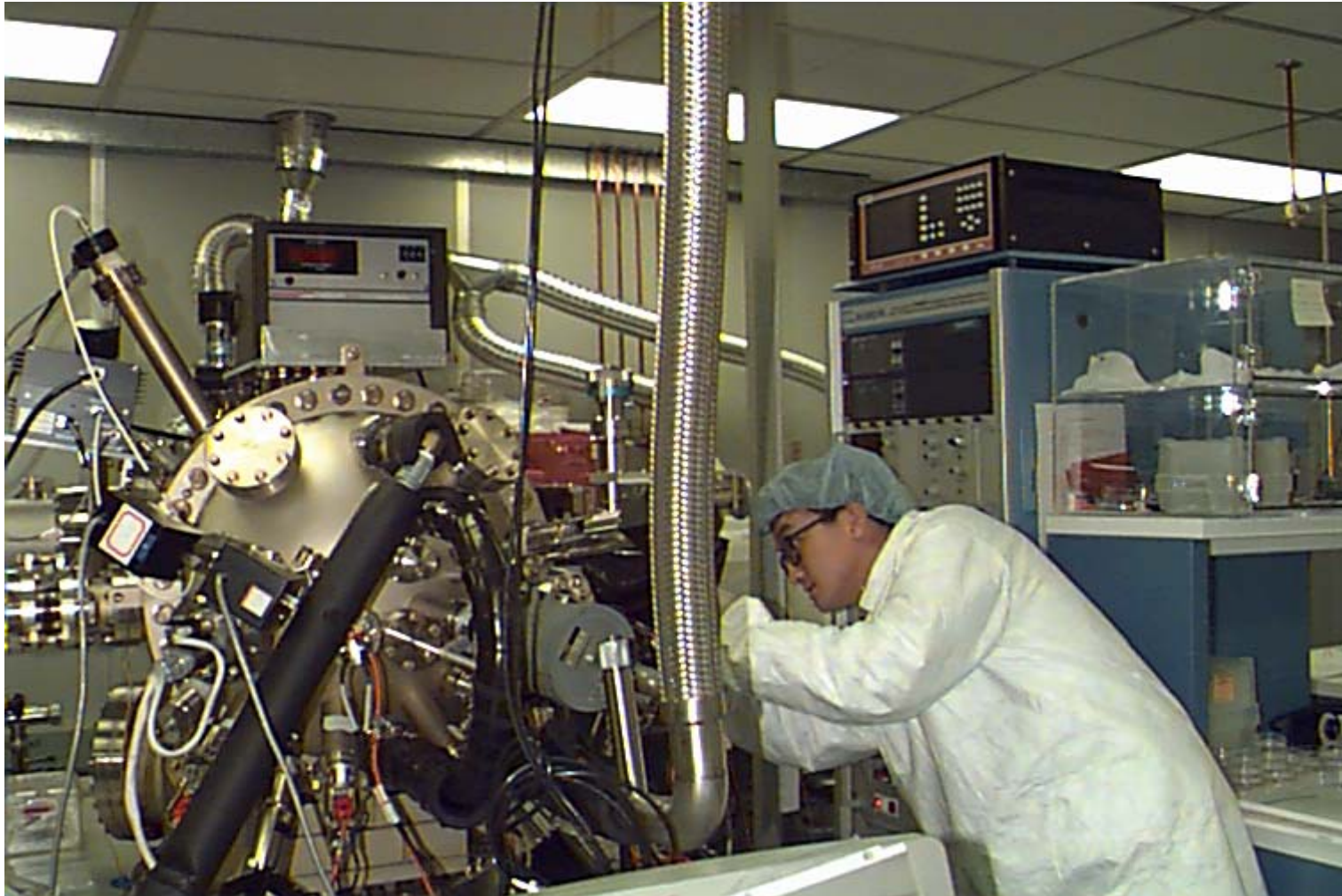
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# Areas of Research Interest

- **Digital and Computer Systems**
  - Fault-tolerant/safety-critical computing
  - Test technology
  - Integrated circuit and system design
  - Design automation
  - Hardware/software codesign
  - Mixed signal design
  - Real-time systems
  - Dependability assesment
- **Applied Electrophysics/Microelectronics**
  - High frequency/high speed solid state devices and circuits
  - Molecular and nano electronics
  - electromagnetics
  - Intelligent sensors/systems
  - RF/wireless circuits
  - MEMS
- **Communication and Control Systems**
  - Signal and image processing
  - Optical and wireless communications
  - Data compression/digital modulation and error control coding
  - Adaptive and nonlinear control
  - Wireless communications



## 3500 sq.ft. Class 10,000 Cleanroom



## Molecular Beam Epitaxy System



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# CHARLES L. BROWN DEPARTMENT *of* ELECTRICAL *and* COMPUTER ENGINEERING

- **Five new faculty hired within last year:**
  - ***Mool Gupta***: Laser Processing, Photonics
  - ***Avik Ghosh***: Theory and modeling of nano devices
  - ***Ben Calhoun***: Low Power CMOS VLSI
  - ***Toby Berger***: Information Theory
  - ***Joe C. Campbell***: Photodetectors, photonics
- **Major equipment upgrade for cleanroom processing**
- **MSENT building near completion (9/06)**
- **IT Building planned**