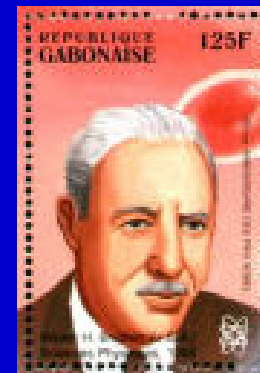
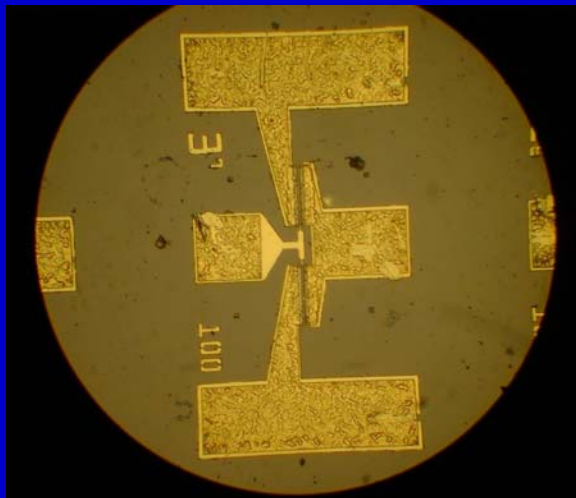


# BJT - FET comparison

1947: Bardeen, Brattain, and Shockley discovered a Bipolar Junction transistor and MODERN AGE BEGAN



# By All means Quarrel - But Discreetly

Alexander Pushkin, Ruslan and Ludmila,  
translated by Walter Arndt



# Comparison

## BJT

Transconductance

$$q I / k T$$

Maximum Current

Higher

Cutoff Frequency

Higher for HBTs

## FET

Transconductance

$$g_m = \epsilon v_s W/d$$

Maximum Current

Smaller

Cutoff Frequency

Somewhat smaller

## Comparison (continued)

	BJT	FET
Linearity	Better	Worse
Integration scale	Much smaller	Much larger
Temperature tolerance	Worse	Better
Market share	Small	Huge

# BJT versus FET (continued)

## Tranconductance

$$g_m = \varepsilon v_s W/d$$

## Cutoff frequency

$$f_T = g_m / (2\pi C_{gs})$$

## Tranconductance

$$g_m = q I_e / k_B T$$

## Cutoff frequency

$$f_T = 2D_n / W_B^2$$