



Rīgas Techniskā universitāte



Biomedicīnas inženierijas un  
nanotehnoloģiju institūts

## Nanotehnoloģijas un nedzirdība

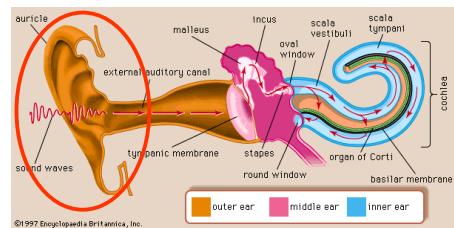
Prof. Jurijs Dehtjars  
tālr. 67089383

1

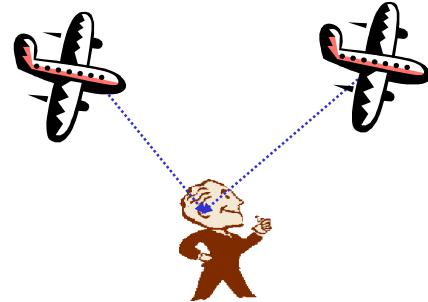
## Dzirdes aparāts



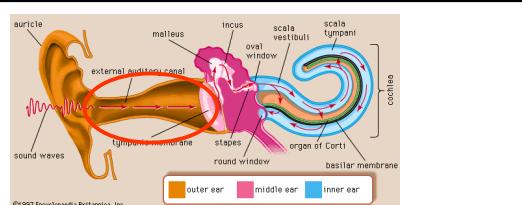
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3



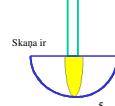
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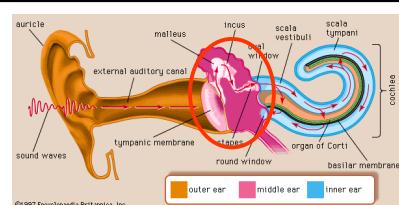
- Skaņas vads
- Rezonators



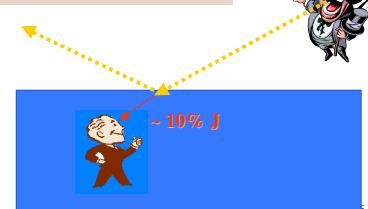
Rezonators

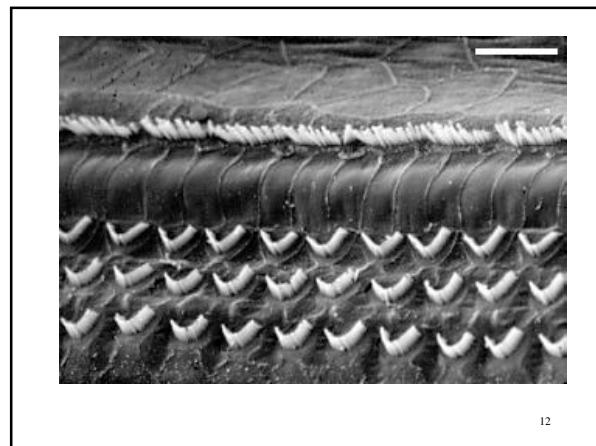
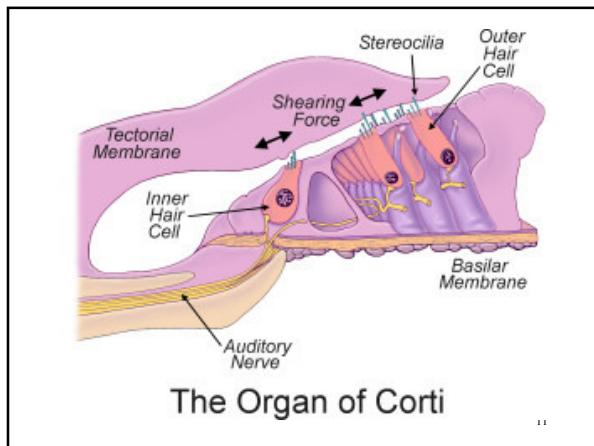
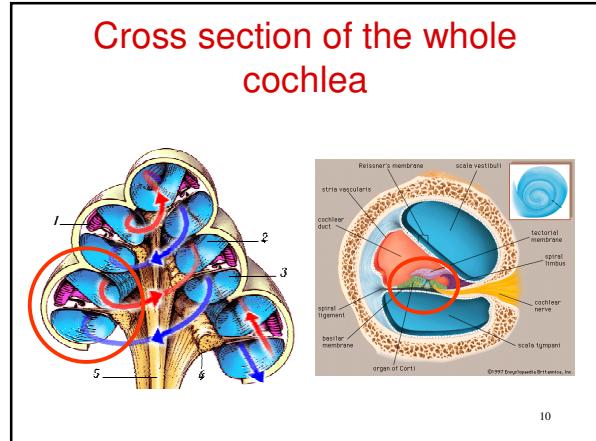
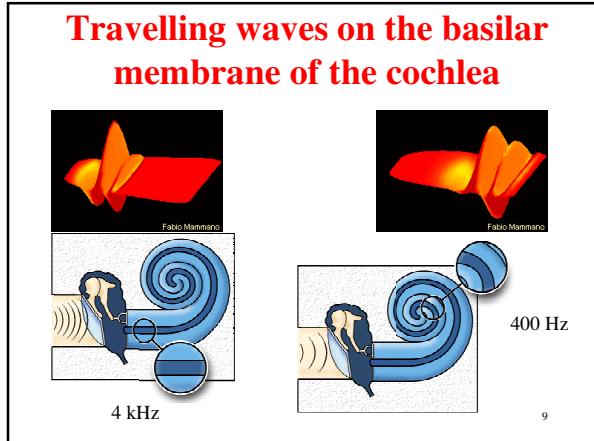
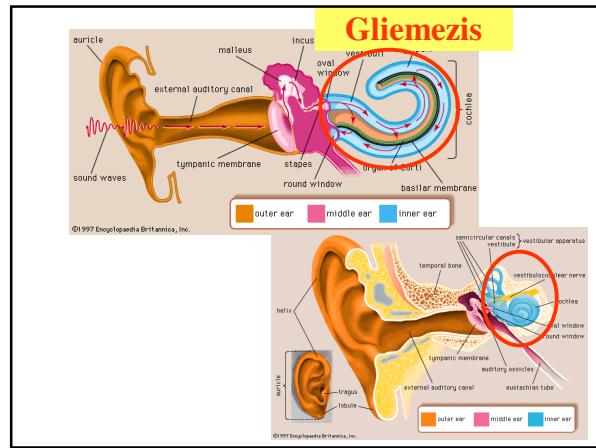
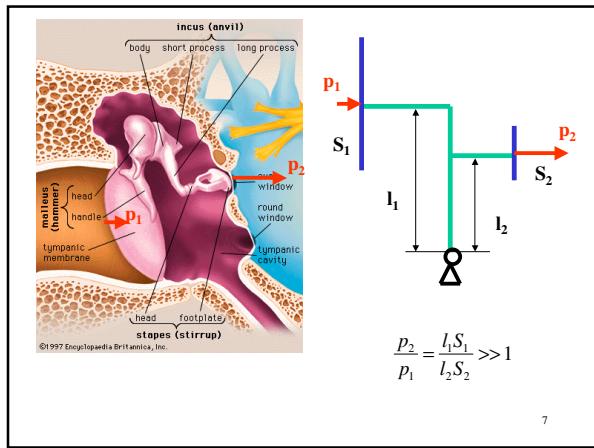


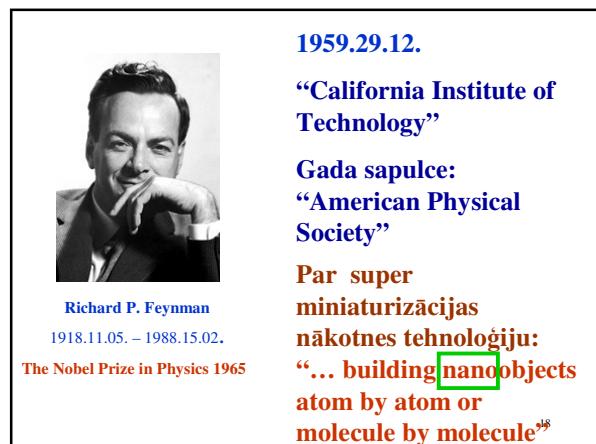
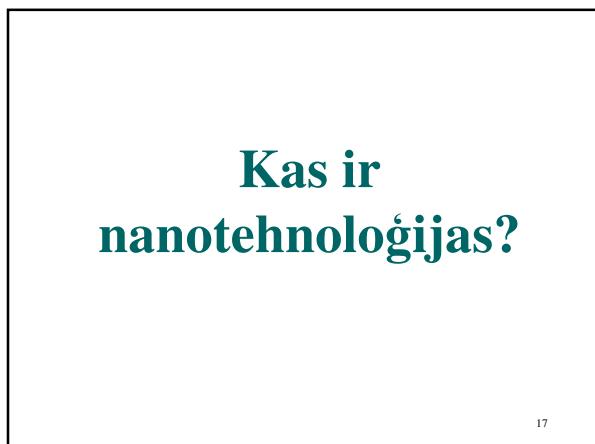
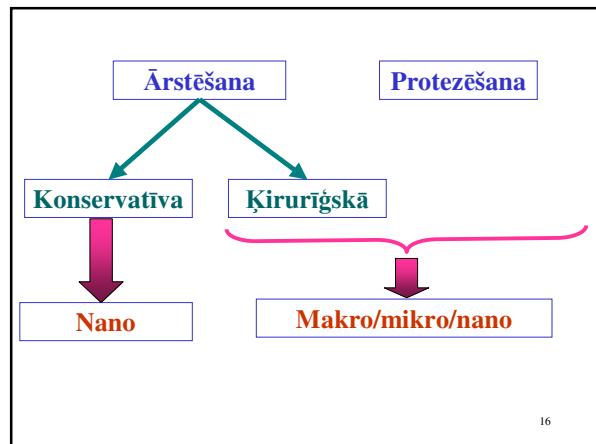
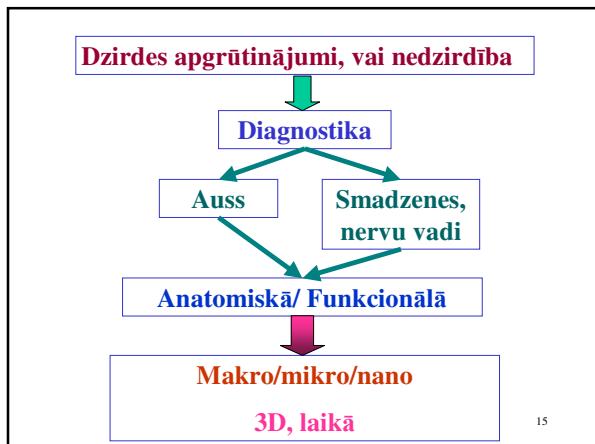
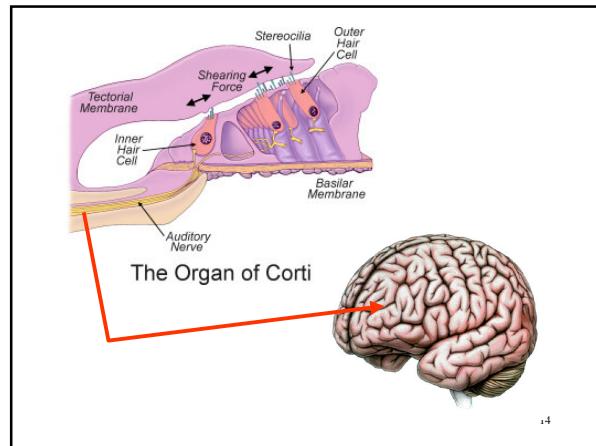
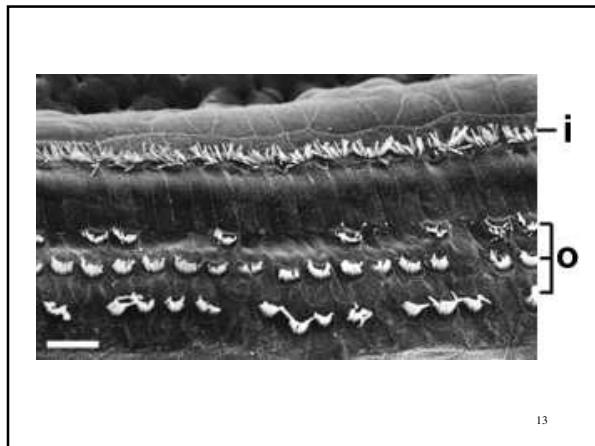
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- Mehāniskais pastiprinātais







**Nano →  $10^{-9}$**

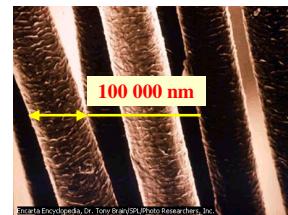
**1 nanometrs →  $10^{-9}$  m**

$$10^{-9} \text{ m} = \frac{1}{1\,000\,000\,000} \text{ m}$$

**atoms → 0,1 nm**

**Nanoobjekts → 10 atomi**

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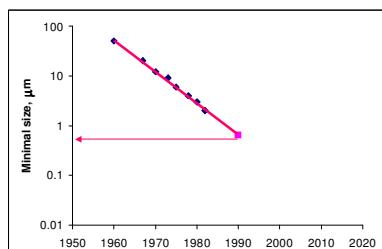


Cilveka mati

## Nanotehnoloģija – fantāzija?

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**Tendences tehnoloģijās**  
G.E. Mūra likums  
(“Intel” kompānijas līdzdibinātais)

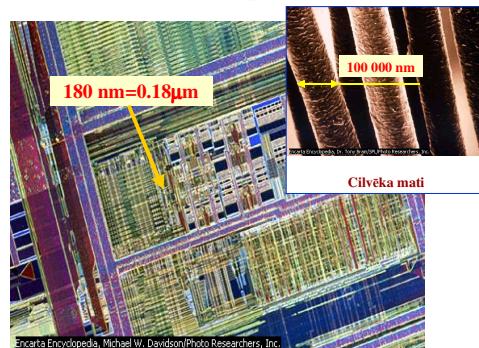


1929.03.01.

[Moor G. VLSI. What does the future hold. Electron. Aust 1980. 42.14]

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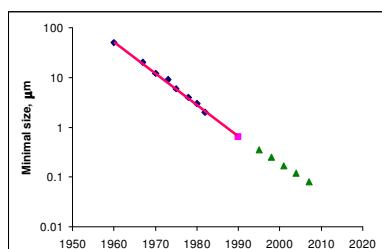
## “Pentium MMX” mikroprocesors (1996.)



Cilveka mati

22

**Tendences tehnoloģijās**  
G.E. Mūra likums  
(“Intel” kompānijas līdzdibinātais)

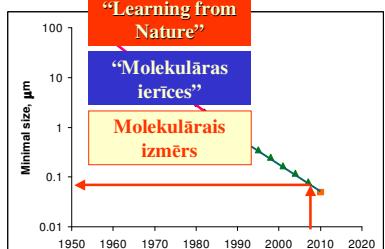


1929.03.01.

[Moor G. VLSI. What does the future hold. Electron. Aust 1980. 42.14]  
[http://www.intel.com/technology/silicon/mooreslaw/index.htm; 2007.14.07.]

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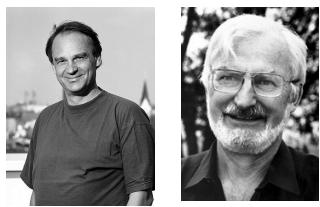
**Tendences tehnoloģijās**  
G.E. Mūra likums  
(“Intel” kompānijas līdzdibinātais)



1929.03.01.

[Moor G. VLSI. What does the future hold. Electron. Aust 1980. 42.14]  
[http://www.intel.com/technology/silicon/mooreslaw/index.htm; 2007.14.07.]

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Gerd Binnig  
1947.20.07.

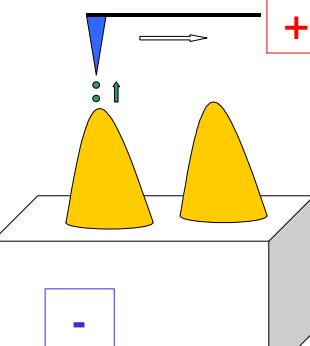
Heinrich Rohrer  
1933.06.06.

Scanning tunneling microscope (STM) – 1981.

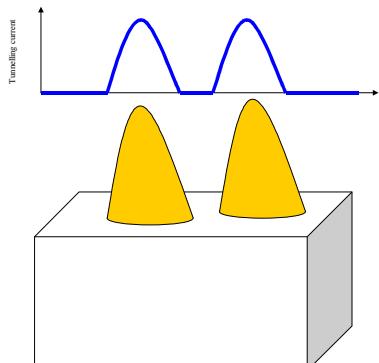
IBM Zürich Research Laboratory

The Nobel Prize for Physics – 1986.

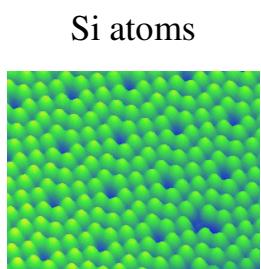
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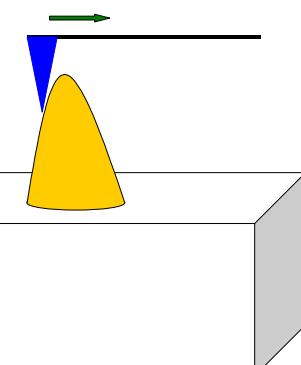
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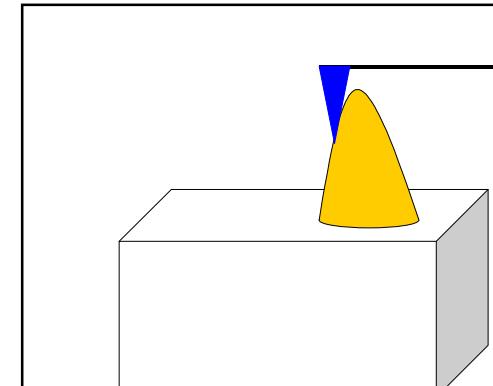
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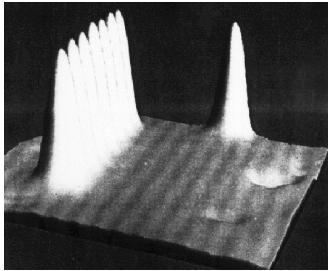
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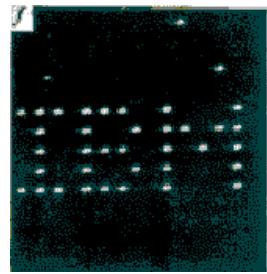
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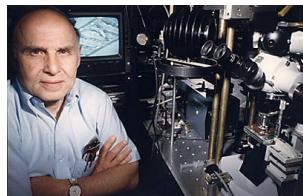
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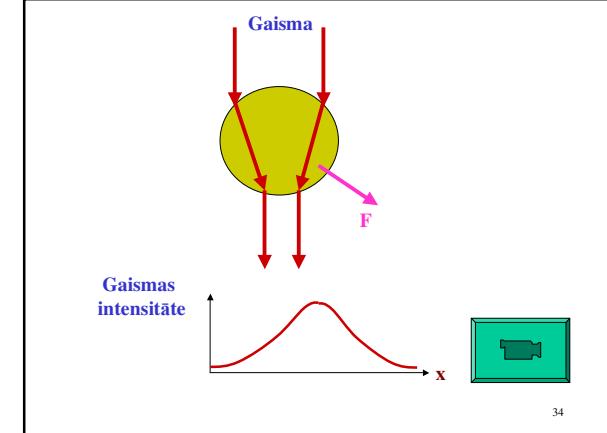


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Arthur Ashkin  
(1922.02.09.)  
Bell Labs  
1986. – optiskā pincete

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2000. 01.  
ASV prezidents “William J. Clinton”  
pasludināja:

“National Nanotechnology Initiative”  
\$ 497 miljn. 2001.

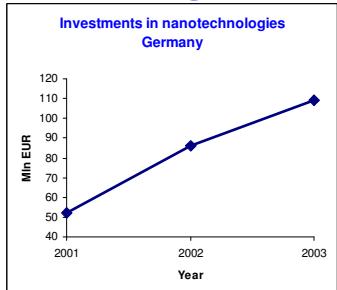
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Nanotehnoloģijas - nākotnes industriāla  
revolūcija:

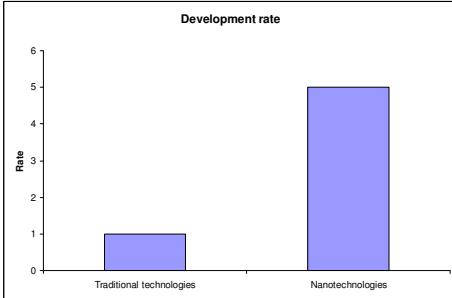
- Materiālu ražošanā
- Nanoelektronikā
- Enerģētikā
- Biotehnoloģijā
- Informācijas tehnoloģijā
- Nacionālā drošībā

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## Vai nanotehnoloģijas ir izdevīgas?

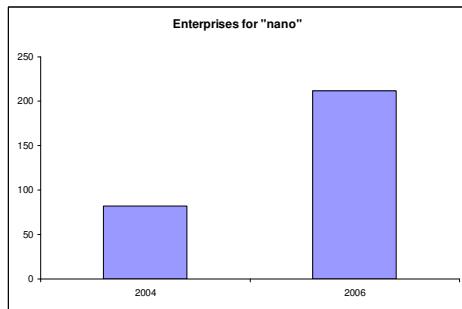


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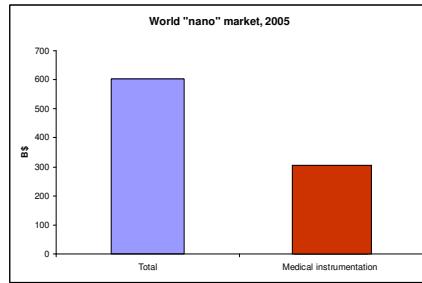
[M. Puolamaa, EC, Nanotech, Northern Europe, 2007]

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[Royal Swedish Academy of Engineering Sciences, 2006]

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[N. Dellyanakis, EC, Nanotech, Northern Europe, 2007]

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