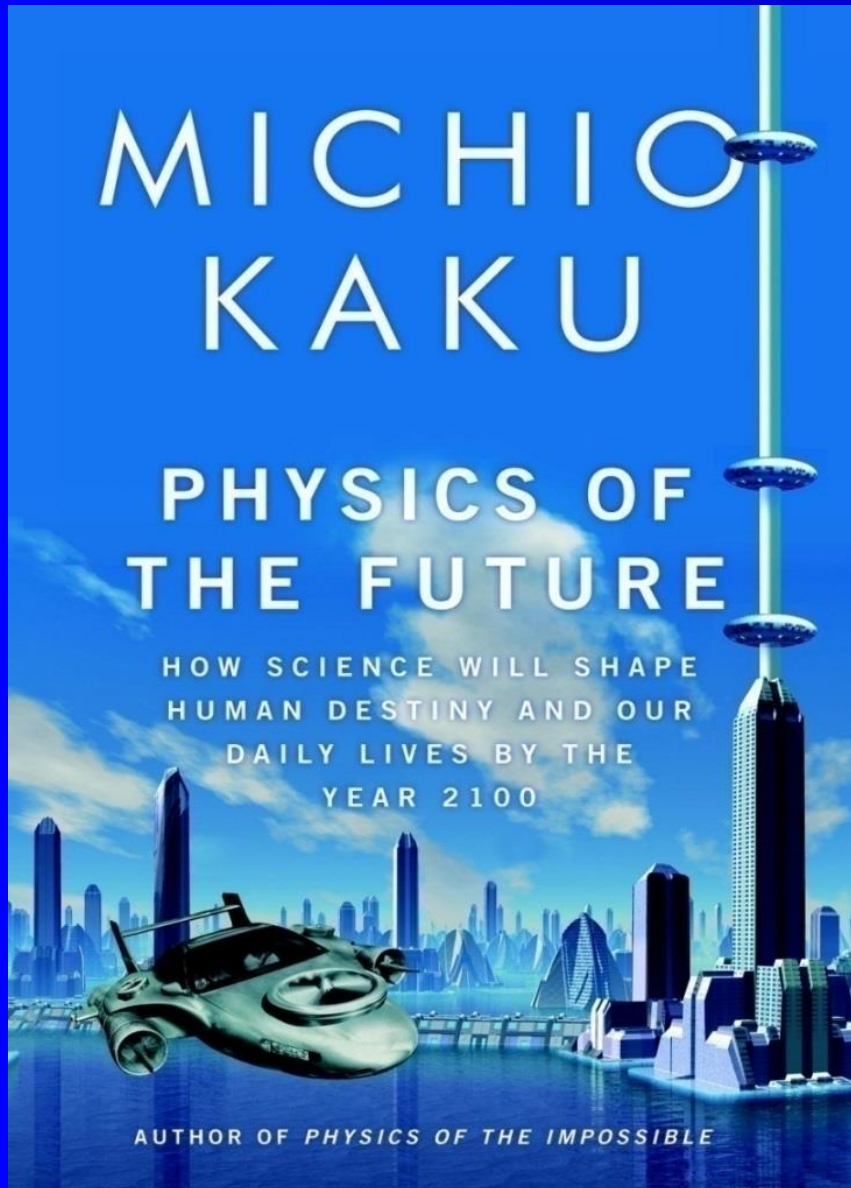




**MICHIO KAKU**  
*Renowned Scientist*

**COMMERCIAL VEHICLE**  
**OUTLOOK**

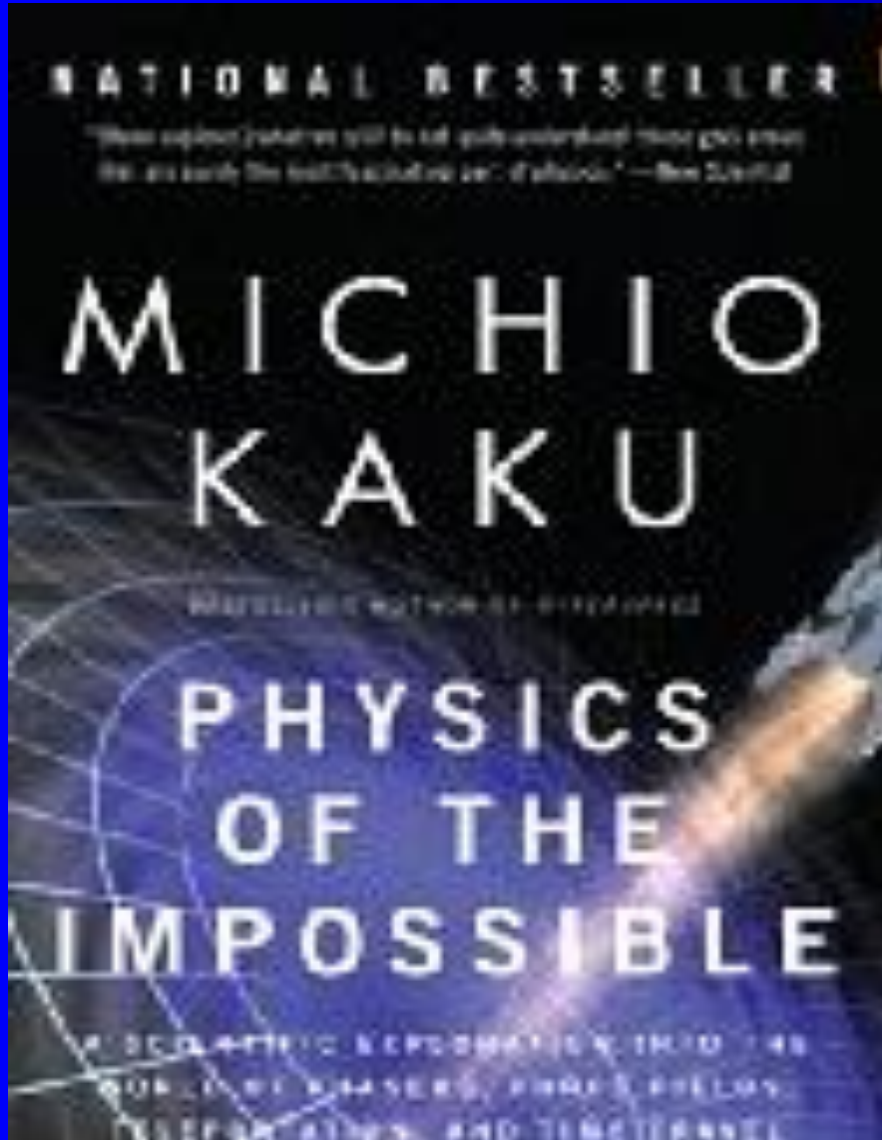
# The Next 20 Years



- By Dr. Michio Kaku
- Prof. of Theoretical Physics
- City Univ. of New York
- Author: Visions: How Science Will Revolutionize the 21<sup>st</sup> Century, Hyperspace, Parallel Worlds, Physics of the Impossible
- Co-founder of string field theory
- Interviewed 300 of the world's top scientists.
- NY Times Best Seller

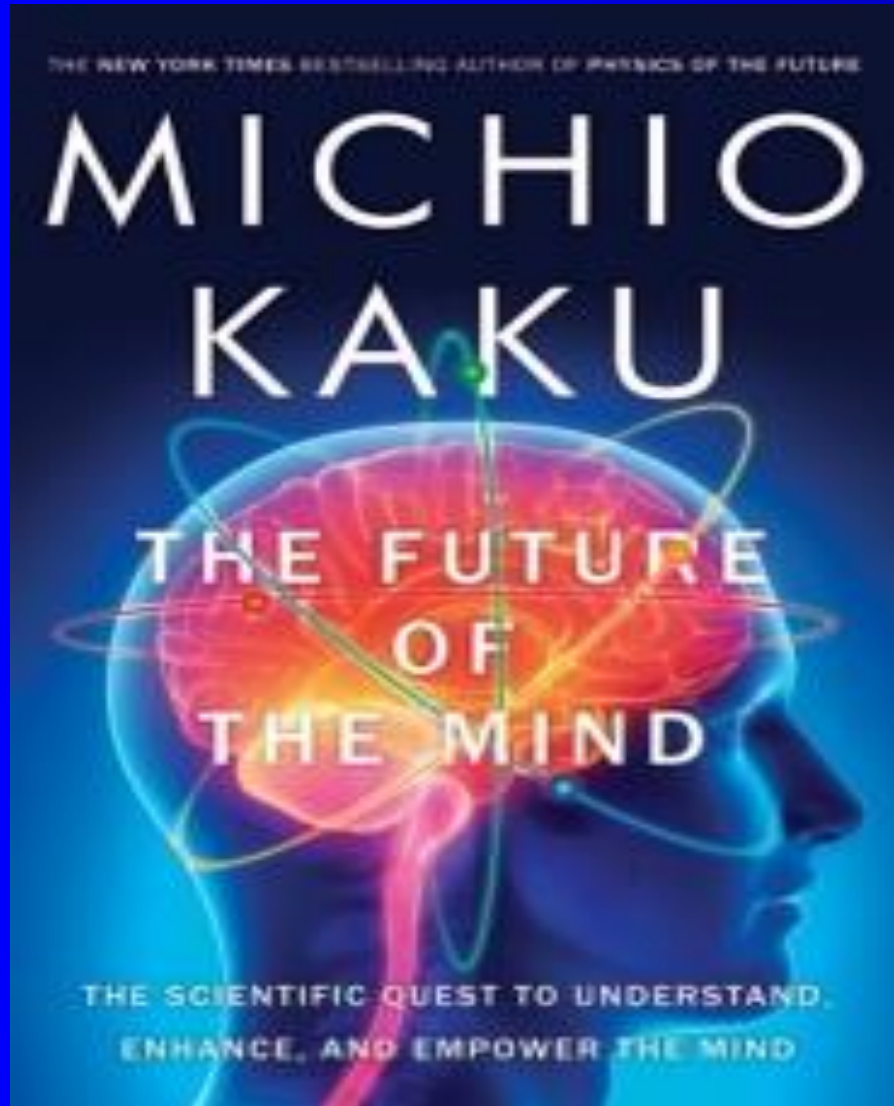


# Physics of the Impossible



- “Invisibility
- Teleportation
- Telepathy
- Psychokinesis
- Star ships
- Time travel
- Faster than light travel via wormholes
- NY Times Best Seller

# The Future of the Mind



#1 New York Times Best Seller

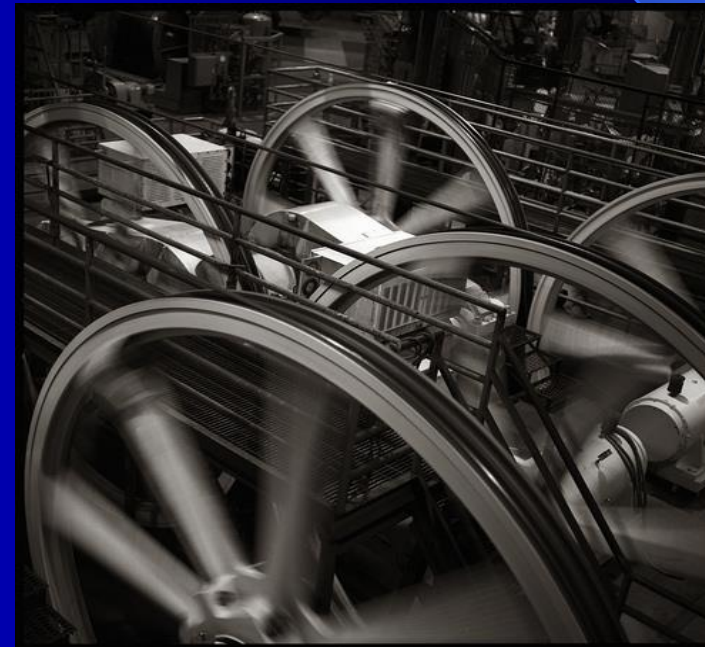
The next frontier of science:

- Telepathy
- Telekinesis
- Uploading Memories
- Photographing dreams
- Replacing the internet with a brain net
- Making a back-up copy of the brain



# First Wave of Technology – 1800s: Steam Power

Machines and the locomotive of the 1800s create the excess wealth of the industrial revolution, leading to a bubble on the London Stock Exchange and the Crash of 1850.



# Second Wave – Electricity and Automobiles and Crash of 1929

- Advances in electricity and automobiles create fabulous wealth, leads to wild speculation, which cannot be sustained.





# Third Wave: High Tech and Crash of 2008

wealth created by computers, satellites, lasers,  
telecommunications, the internet, create a bubble,  
which cannot be sustained, leading to a crash





# The next 100 years: What is the Fourth Wave?

- **First wave:** Steam power and locomotive
- **Second Wave:** Electricity and automobile
- **Third Wave:** High tech
- **What is the Fourth Wave??**

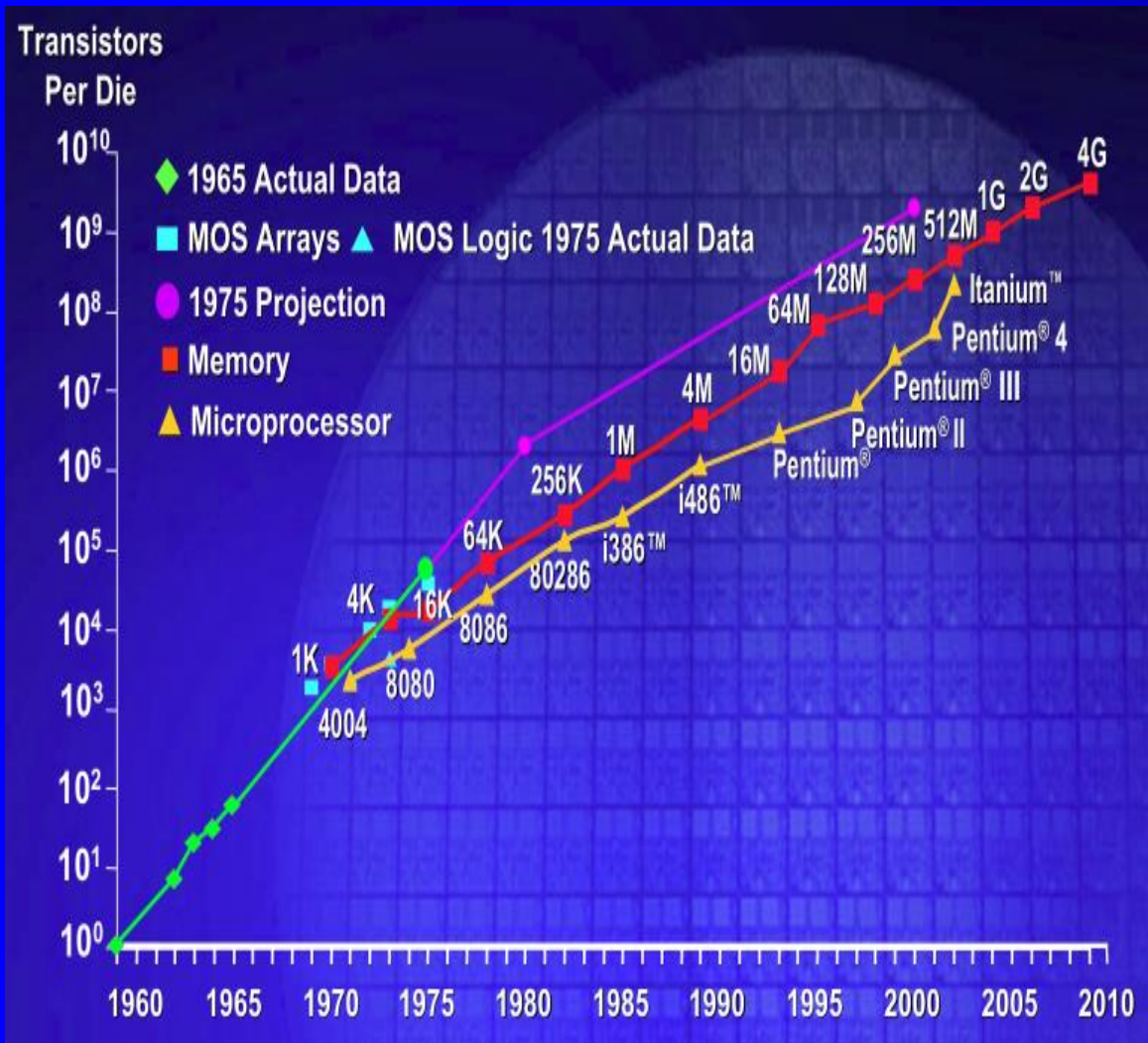
Telecommunications and computers

Biotechnology

Artificial Intelligence

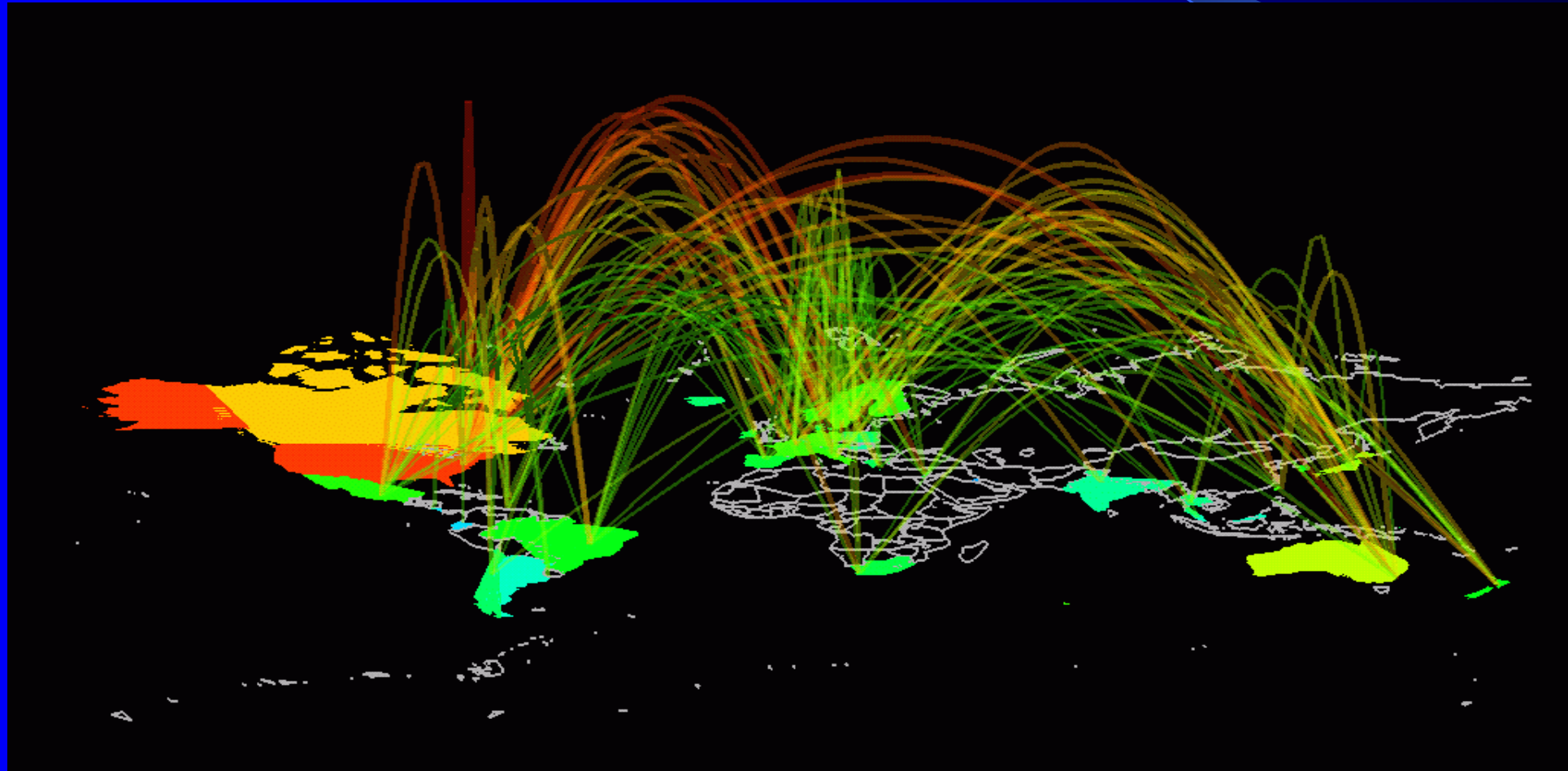
Nanotechnology

# Moore's Law



- Doubling time for computer power is 18 months
- Future can be reasonably predicted out to 2020
- By 2020, chips may cost a penny
- Millions of chips will be scattered into our world
- The computer will be everywhere, and nowhere
- After 2020: Post-silicon era: Quantum computing - Artificial intelligence – jobs and society

The Internet: The Magic  
Mirror-the internet will be  
everywhere, including glasses



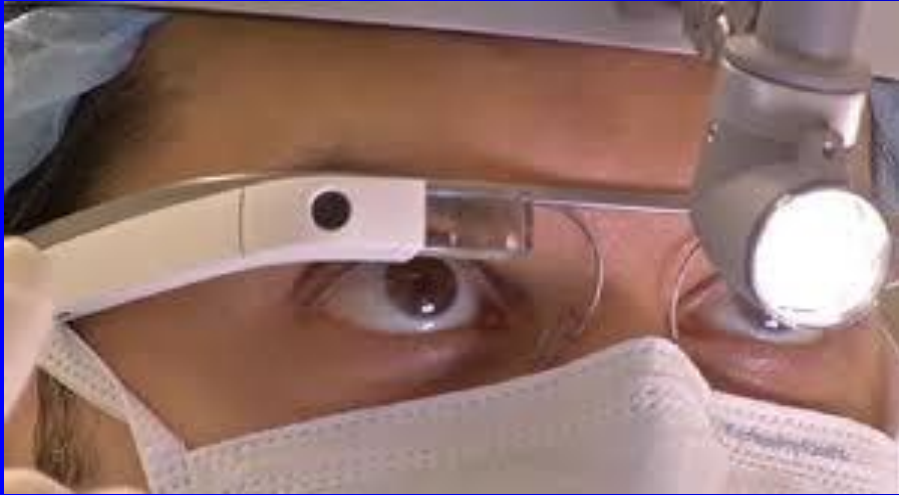




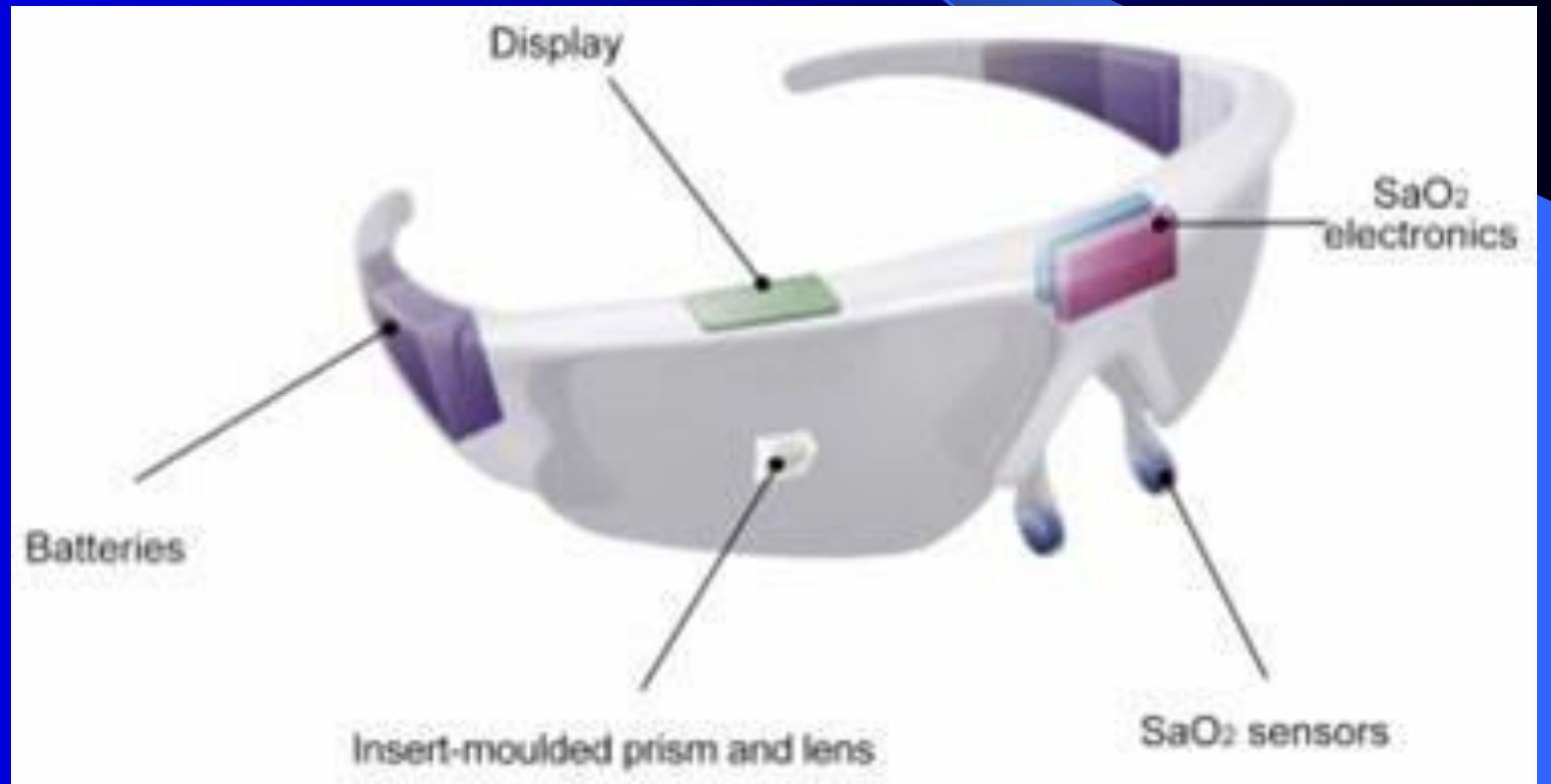
Advances in pattern recognition will make possible internet glasses which recognize people's faces, and print subtitles beneath their image if they speak a foreign language.



# Internet everywhere and nowhere



Today, surgeons use the internet to see X-rays and MRI scans during surgery. Tomorrow, workers will use them to see blueprints, instructions, layouts, diagrams. You will always be able to communicate with passengers, no matter what language they speak.

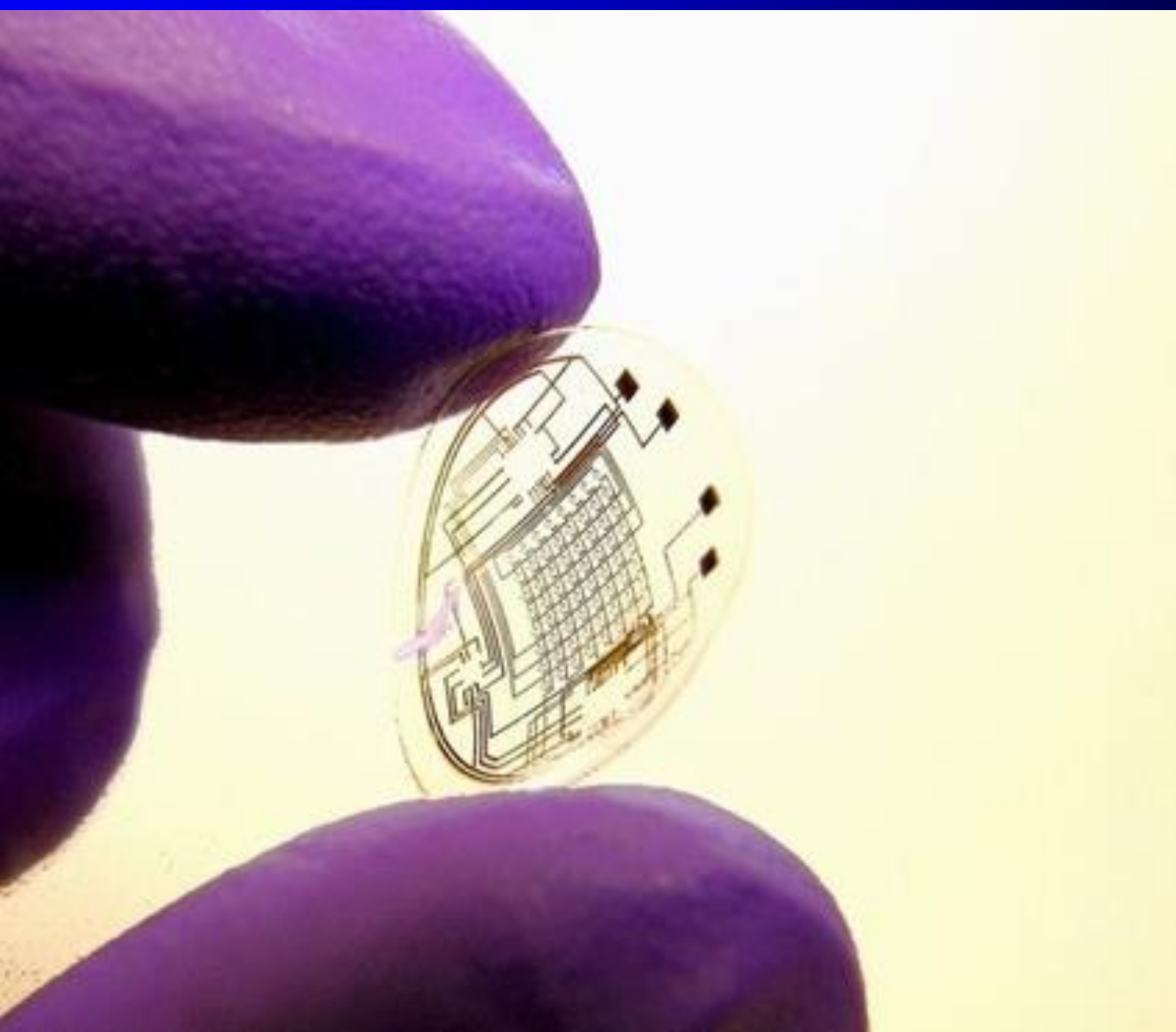


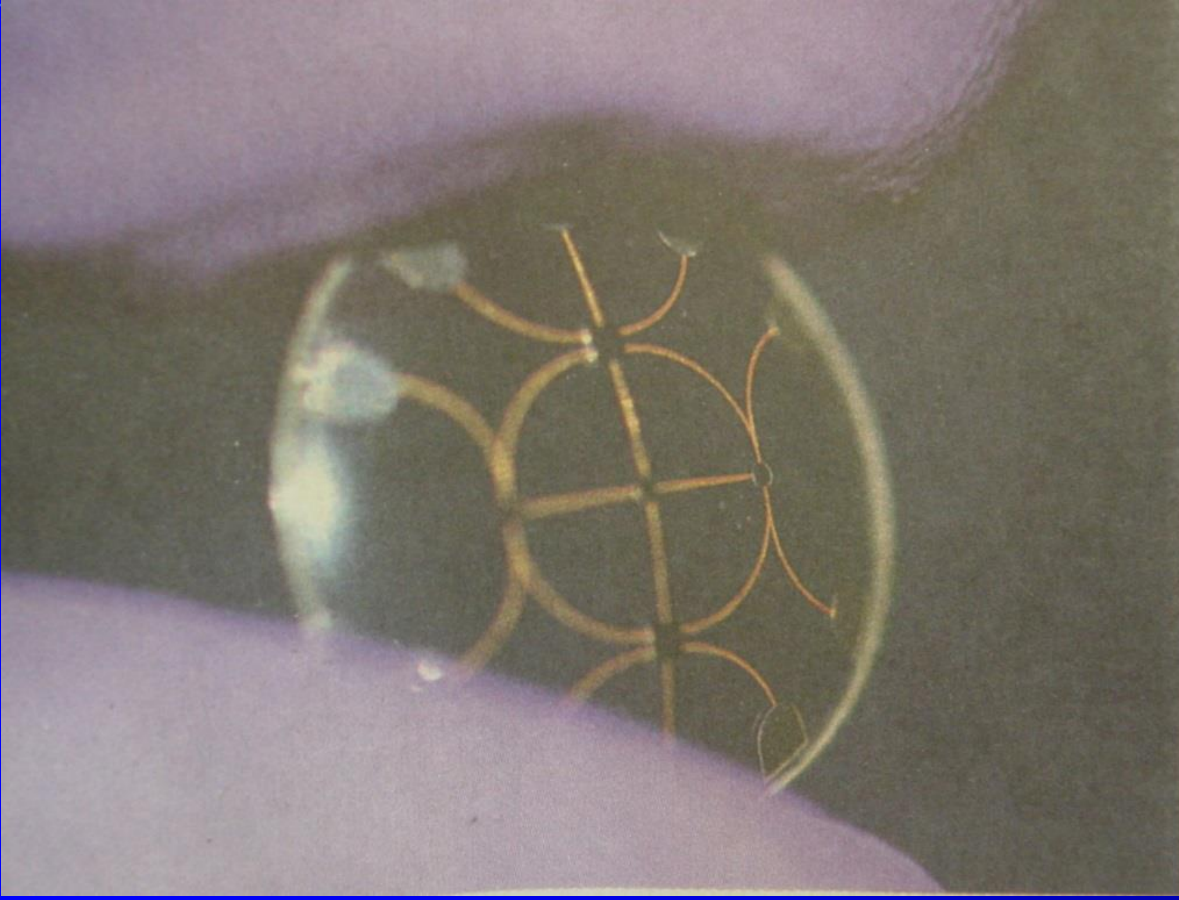




## Internet glasses will:

- Recognize faces
- Display their bios
- Translate sub-titles
- Teleconference
- Watch movies
- Edit files
- GPS
- Scan for the best prices and goods
- This is your home entertainment center
- Your home office of the future.
- The internet will be in your contact lenses

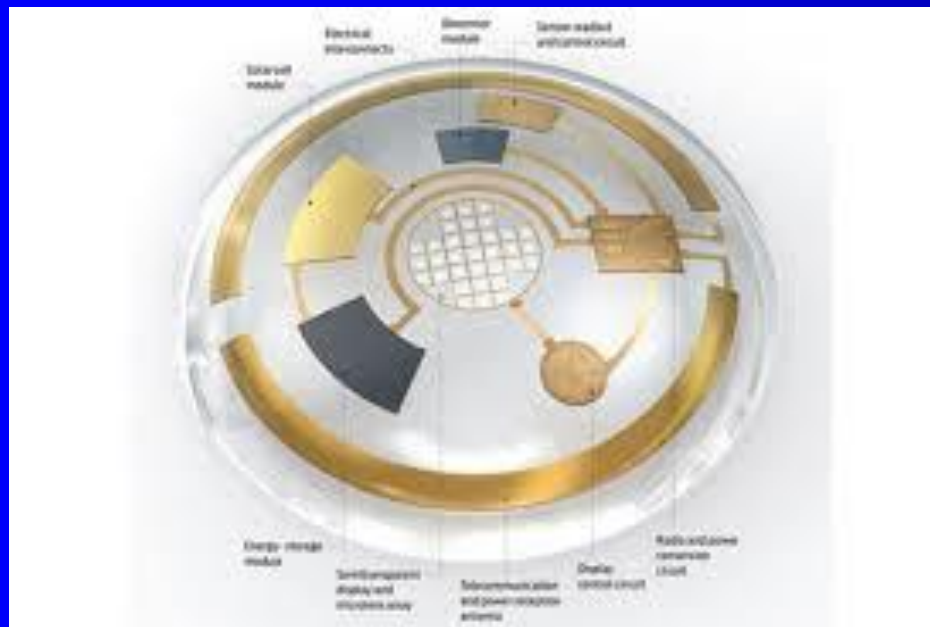




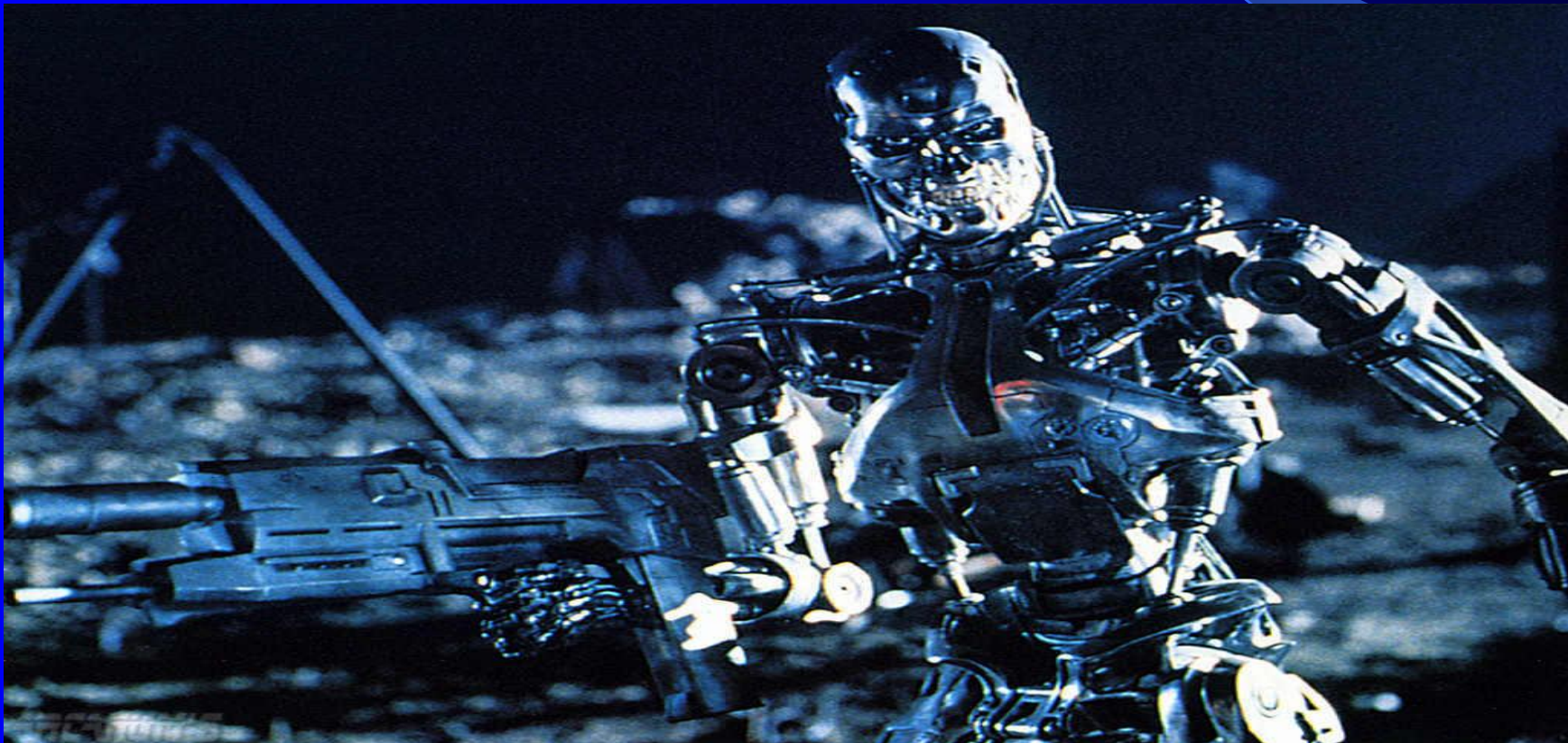
Tourists will be able to “see” the great works of the past. Workers will see blueprints as they build buildings. You will always know who you are talking to. You will be able to “speak” in any language via subtitles.



# Augmented Reality – When unlimited virtual information is imposed on reality



Virtual reality is putting on a helmet and seeing a cartoon. But augmented reality is for adults who want instant information. What Hollywood movie pioneered this technology?





# Augmented Reality and Supervision



- 1) Seeing people's biography and even subtitles as they speak in different languages
- 2) Seeing through objects – 360 degree vision
- 3) Recreating ancient tourist attractions – great for tourism
- 4) Architects will see their buildings in 3D without having to construct them.
- 5) Workers, soldiers, prospectors, astronauts, etc. will use this to create “supervision”
- 6) Supervisors will see what the sales force and workers see through their contact lens

# The Future of Money: How to buy a plane ticket – The Digitalization of Money



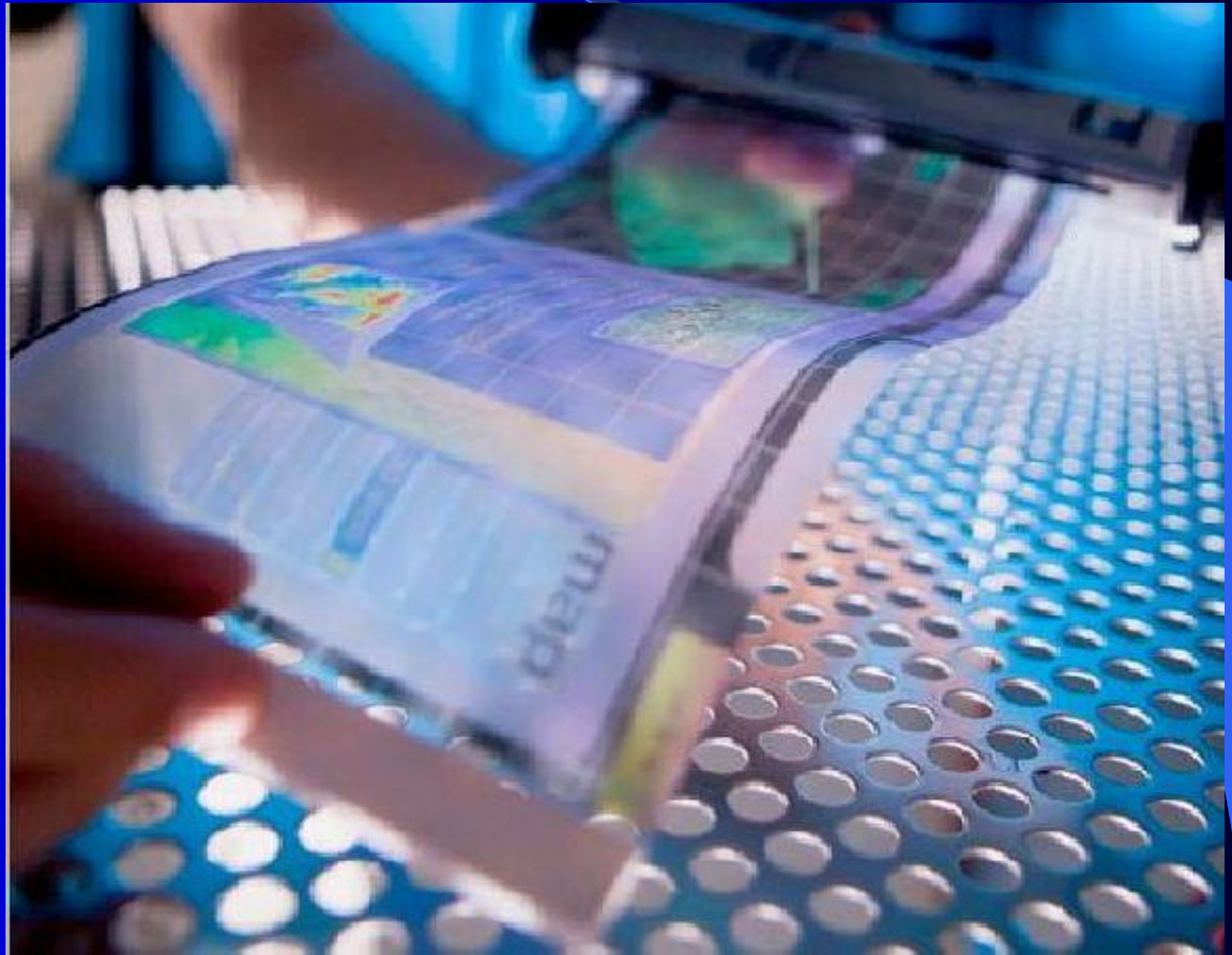


# Cell phones with flexible AI screens





# Flexible Screens – Future of Wall Paper – computers as thin and cheap as paper



# “Robo-doc” and “Robo-lawyer” in your car and wall paper



An animated intelligent “robo-doc” or “robo-engineer” will appear in your wall paper, contact lens, or car windshield, and answer 99% of all medical and engineering questions anytime, anyplace. This will vastly decrease the cost of medical care and repairs. It will answer all specialized mechanical questions.



# The digitalization of capitalism

- The music bosses refused to listen to the scientists. They said, people will always buy music the old fashioned way.
- Now, Apple computers controls the industry.





# Digitalization of Media



Today, media is being digitalized. Newspapers and magazines which did not prepare for the digitalization process are going bankrupt.

# Next to be Digitalized

- Transportation



- Medicine

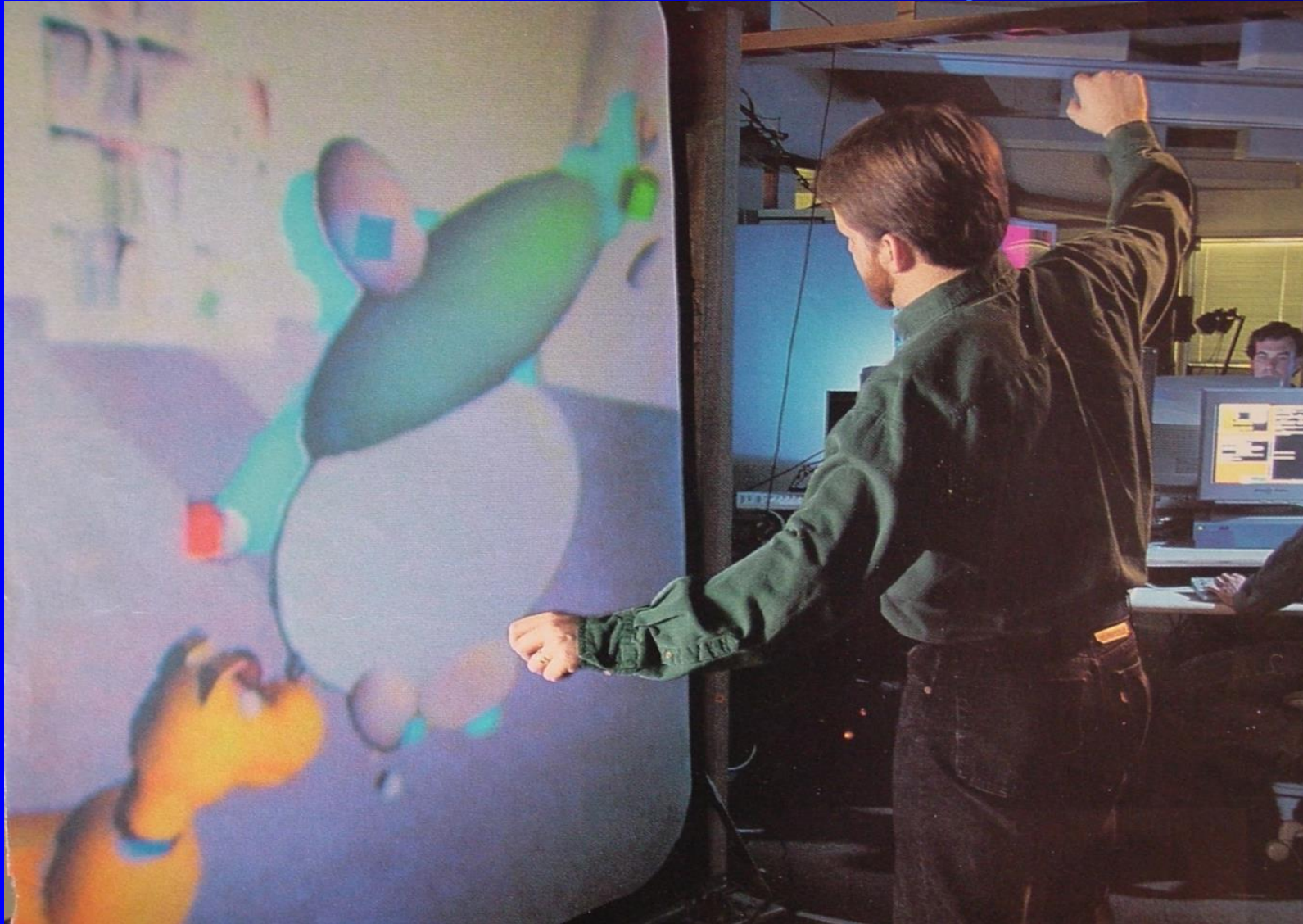


- Education





# Your Living Room of the Future

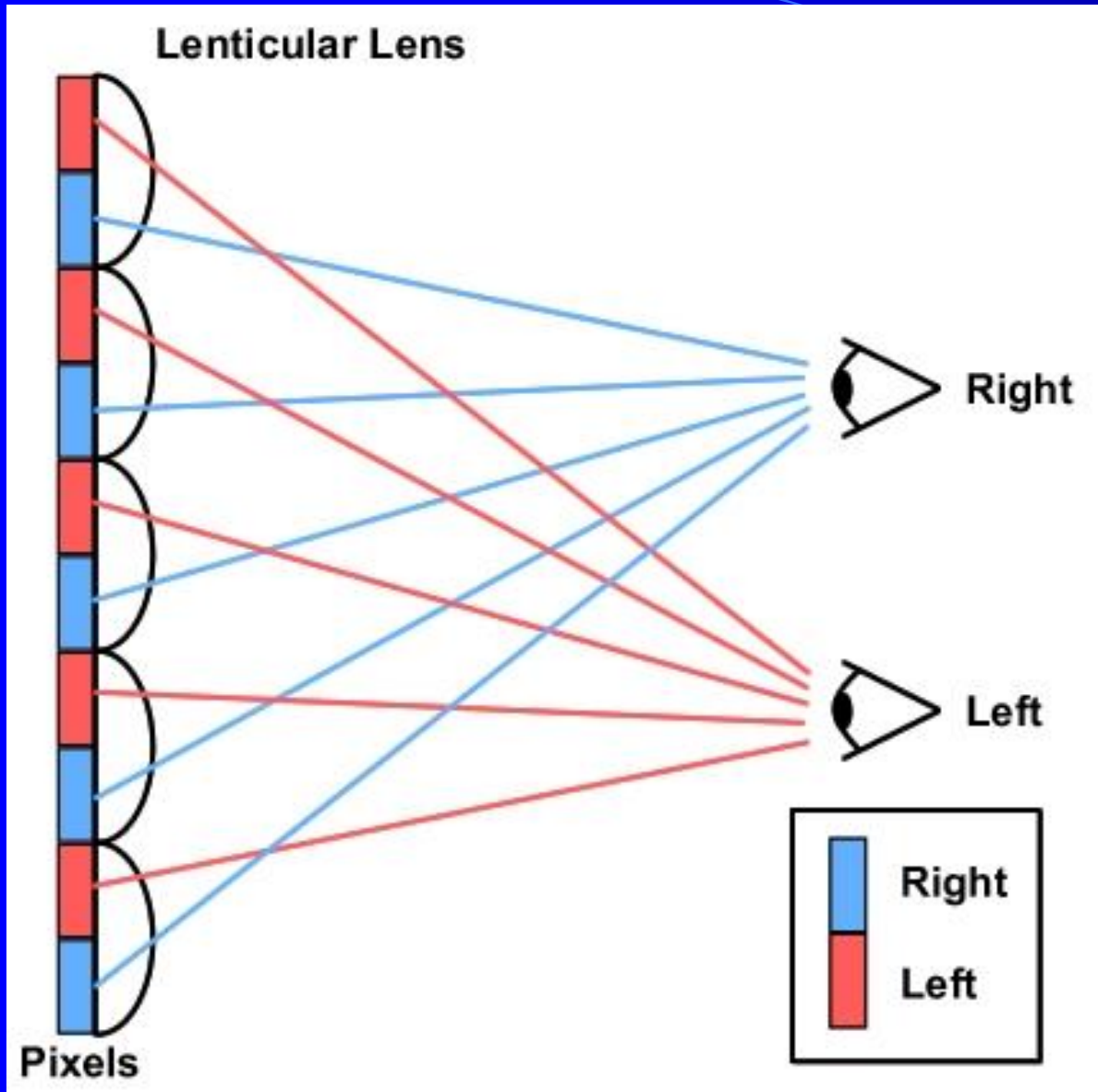


- Living room of the future – 360 degree wall screens which act as a doctor, secretary, match-maker, etc. You will celebrate holidays around the wall screen.



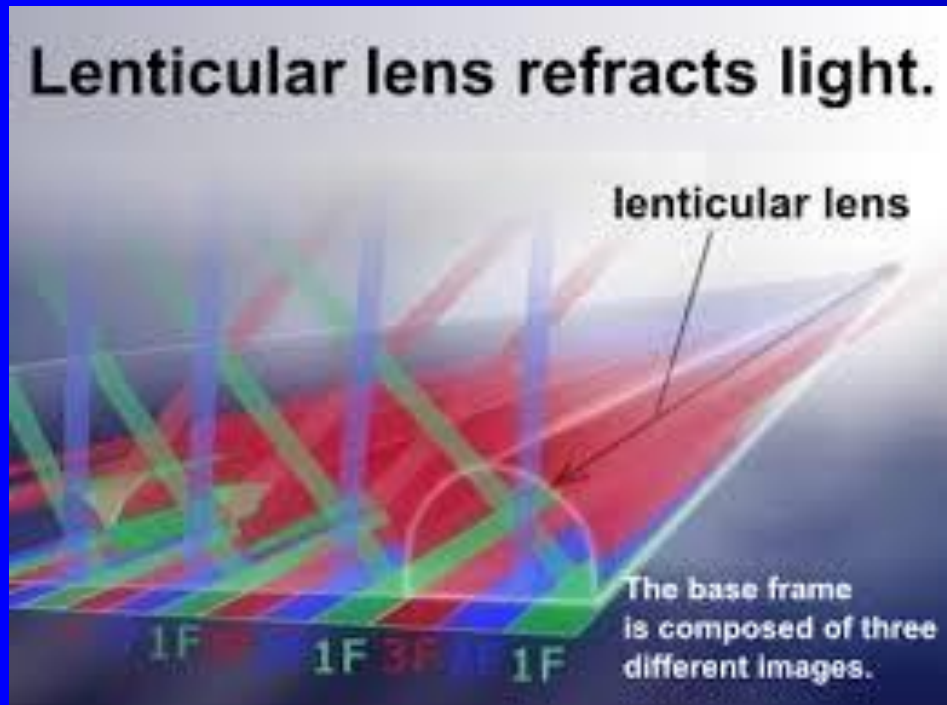
# 3D-TV (Without Glasses)





The secret of 3D without glasses is in the screen. The screen consists of thousands of vertical lines, each a prism, which cuts the image in half. One half goes to the left eye, one half goes to the right now.

# Lenticular 3D

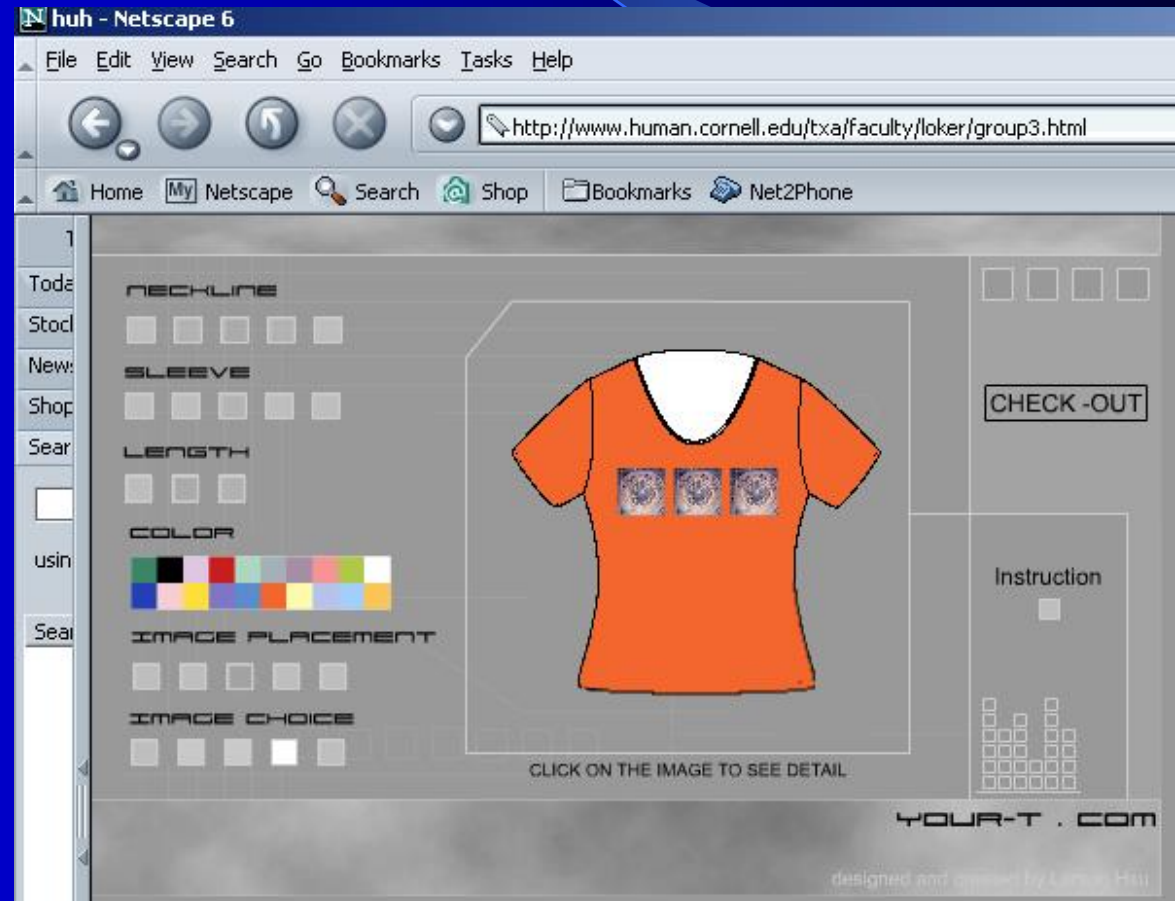


The secret is in the screen, which has thousands of vertical lines, each one a prism which cuts the image in half; one to the left eye, the other to the right eye.

Passengers of the future will enjoy their movies in 3D



# From Mass Production to Mass Customization – the digitalization of commerce





Today, clothes that don't fit cannot be sold; in the future, all garments will fit, all products will fit our tastes.

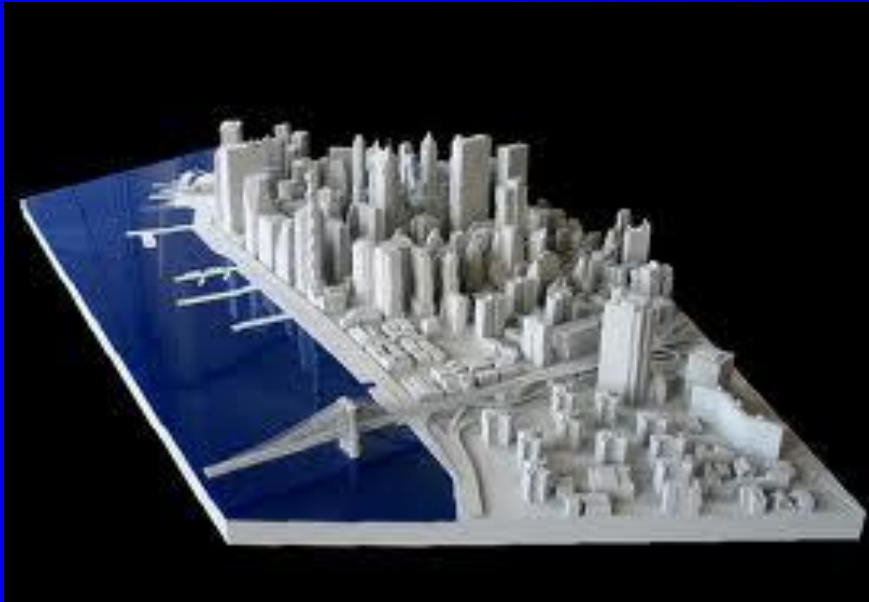


# Digitalization of manufacturing with 3D Printers



In the future, we will e-mail presents and blueprints, and then print them out at home. Also, body organs and mechanical parts for cars may be printed to order.

# 3D Printing for architecture and machine parts







# Surrogates in the Classroom



In the future, you will never miss a day of class, since your surrogate will attend class, and you will be visible to the teacher. There will be a mix of e-instruction and live instruction.



# Digitalization of Transportation: The Car of the Future



Cars which drive by themselves – the words “traffic jams and accidents” may disappear from the English language.

# Driverless Cars, Using GPS, radar, and chips

AI required to recognize objects and avoid them in a split second.





# Seamless transfer of information



Information will be seamlessly and effortlessly transferred, from office, to home, to car, to window display, to eyeglasses, back to office. The car will be seamlessly connected to your home, office, school.

# Digitalization of jet travel



NASA has set 2025 as the target for a new type of jet aircraft, which will be quieter, supersonic, more fuel efficient, and faster than jets of today.





Boeing and Lockheed-Martin are in competition for the jet airplane of the future.



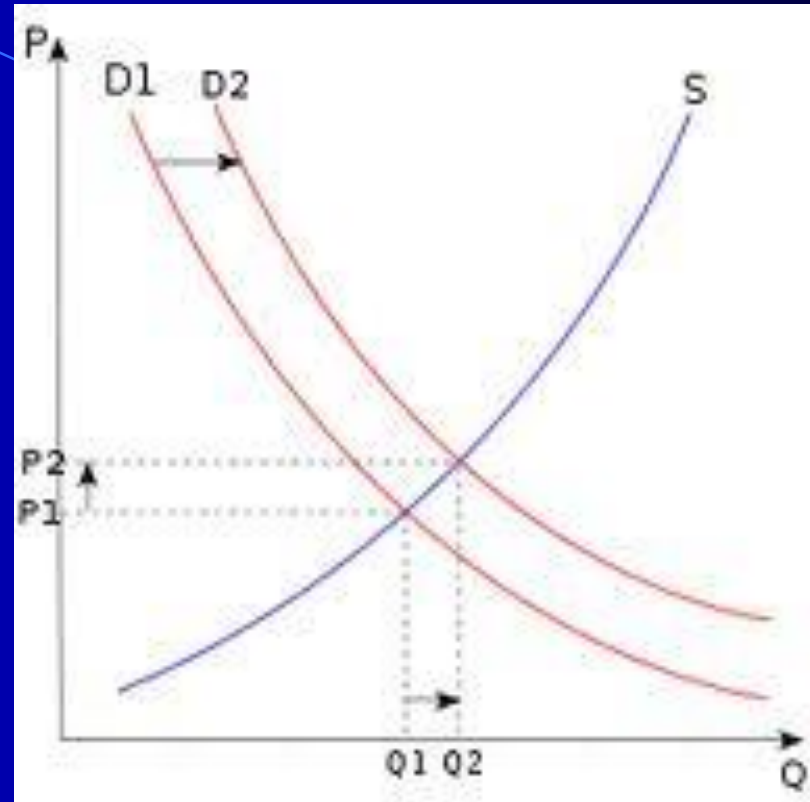
Box wing designs reduce the noise of supersonic flight, making them more acceptable to the public.





The box wing aircraft avoids the problem of the Concorde, which was noisy and fuel inefficient.

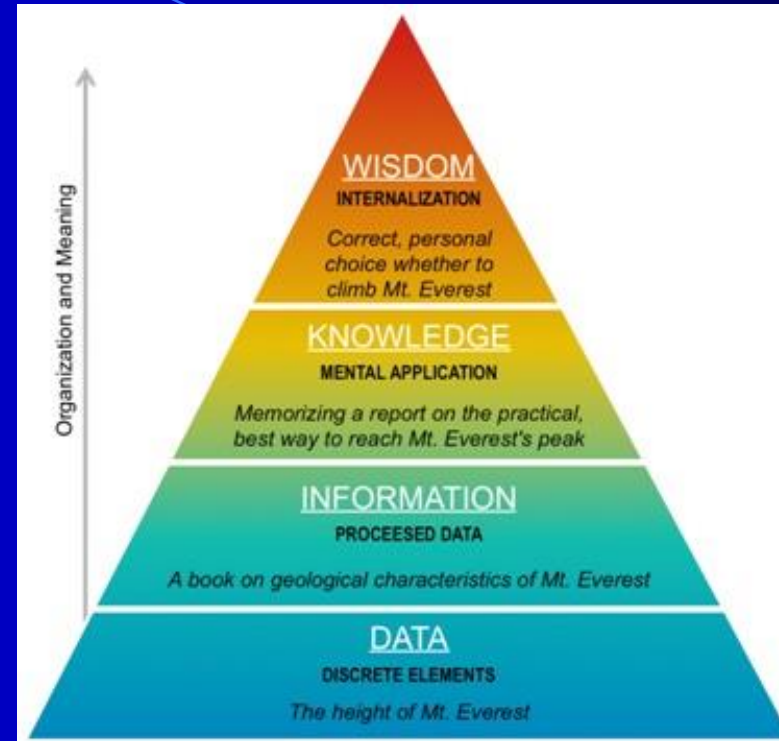
# Perfect Capitalism



What does all this mean? We are headed toward perfect capitalism, when the consumer knows everything about a product. We will have infinite knowledge of supply and demand, via our cell phones and contact lenses.  
Result: More competition, more choice.



# How does the company fight back?



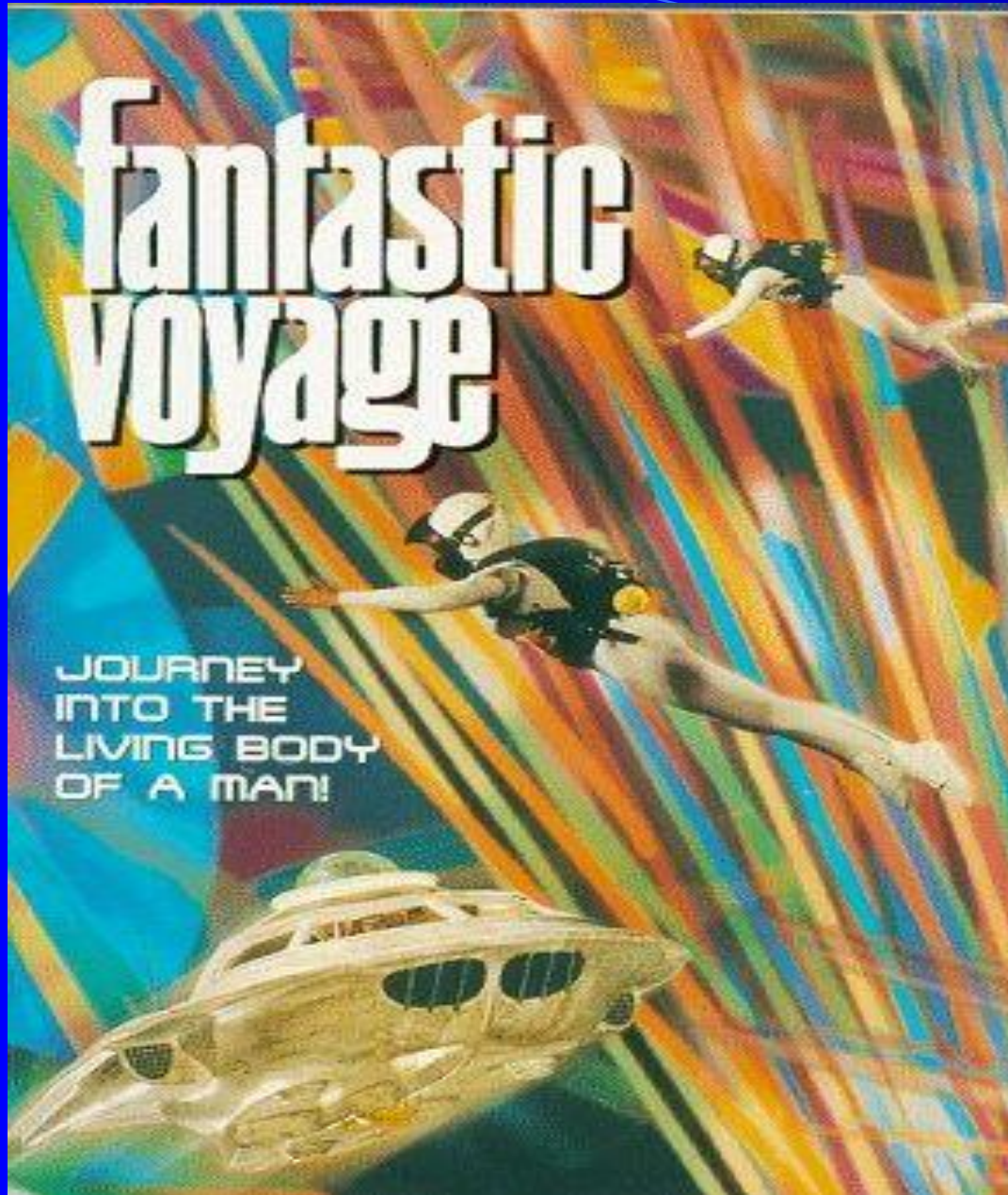
When the client or customer knows **EVERYTHING** about your product, you can fight back via: Data Mining, Big Data, Targeted Marketing, Branding.

# Winners and Losers under Perfect Capitalism

**Winners:** Consumers and society, which will benefit from cheaper prices and more efficient market.

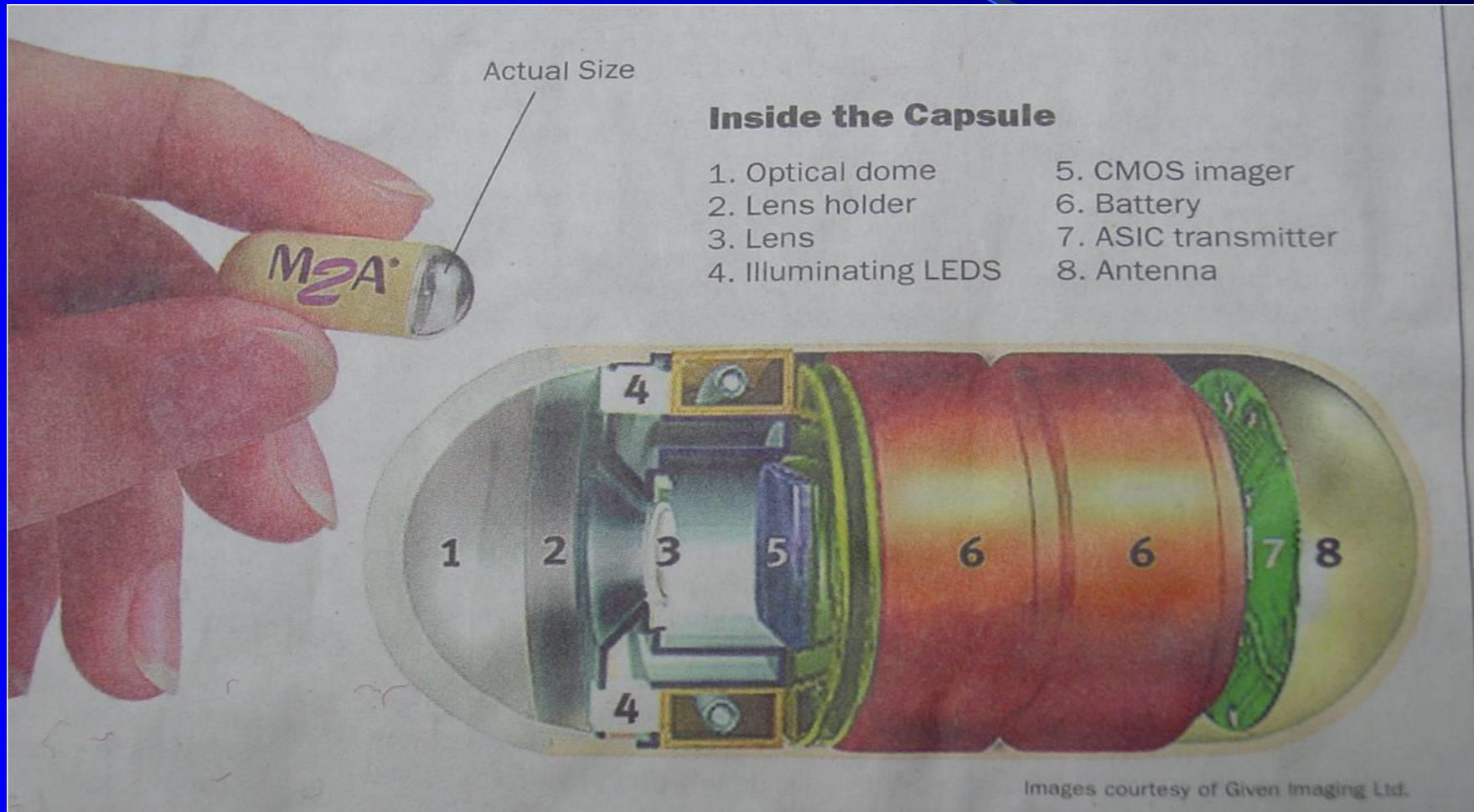
**Losers:** strictly repetitive workers, and middle men who do not understand intellectual capitalism.



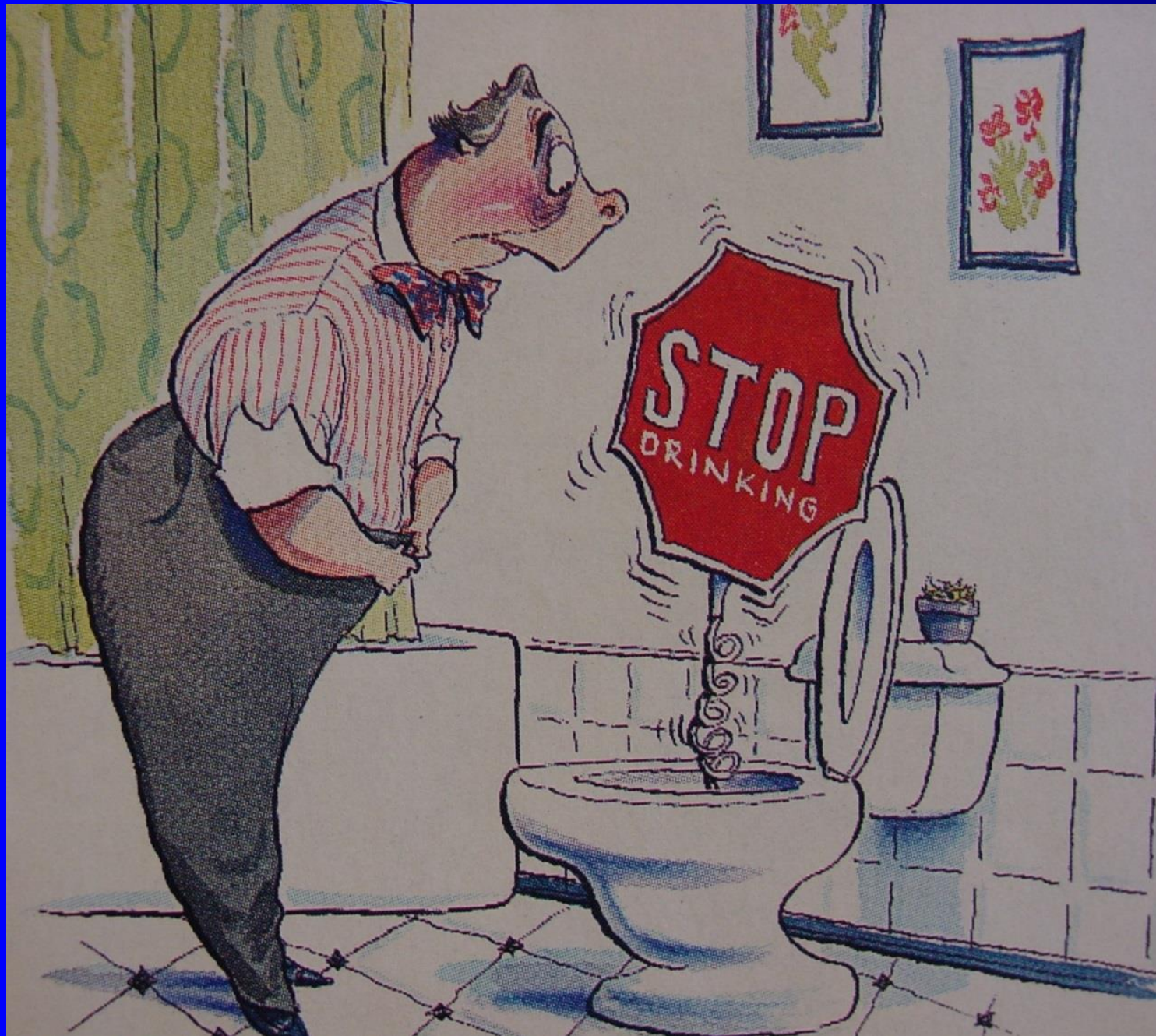


The digitalization of medicine. This will reduce costs and vastly improve medical care.

# Digitalization of Diagnostics Chips You Swallow

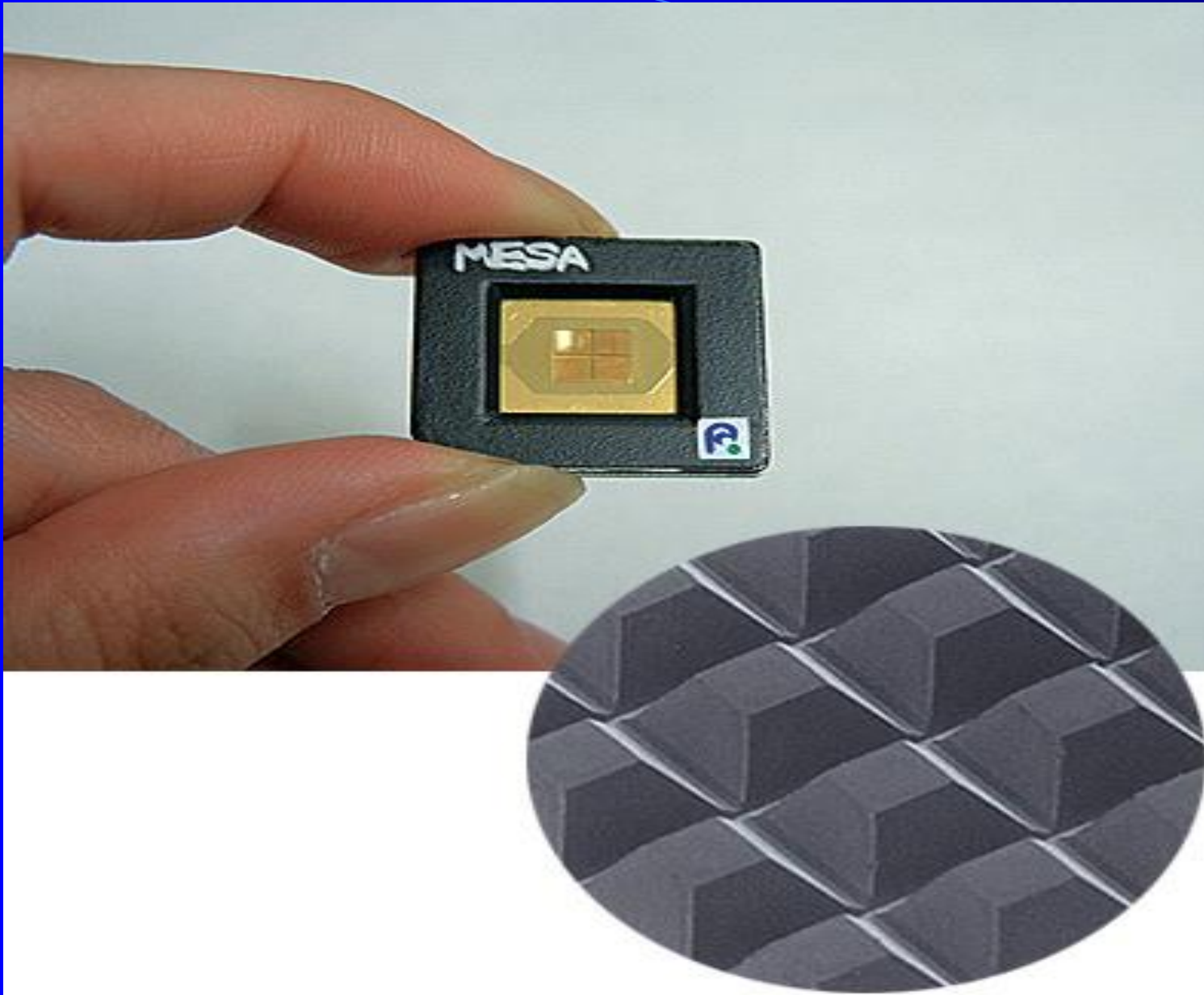






Smart toilets will monitor your health three times a day – the word “tumor” may disappear from the English language.





DNA chips: able to rapidly scan for cancer from your bathroom. Within minutes, AI will scan your body for cancer colonies, 10 years before they become a tumor

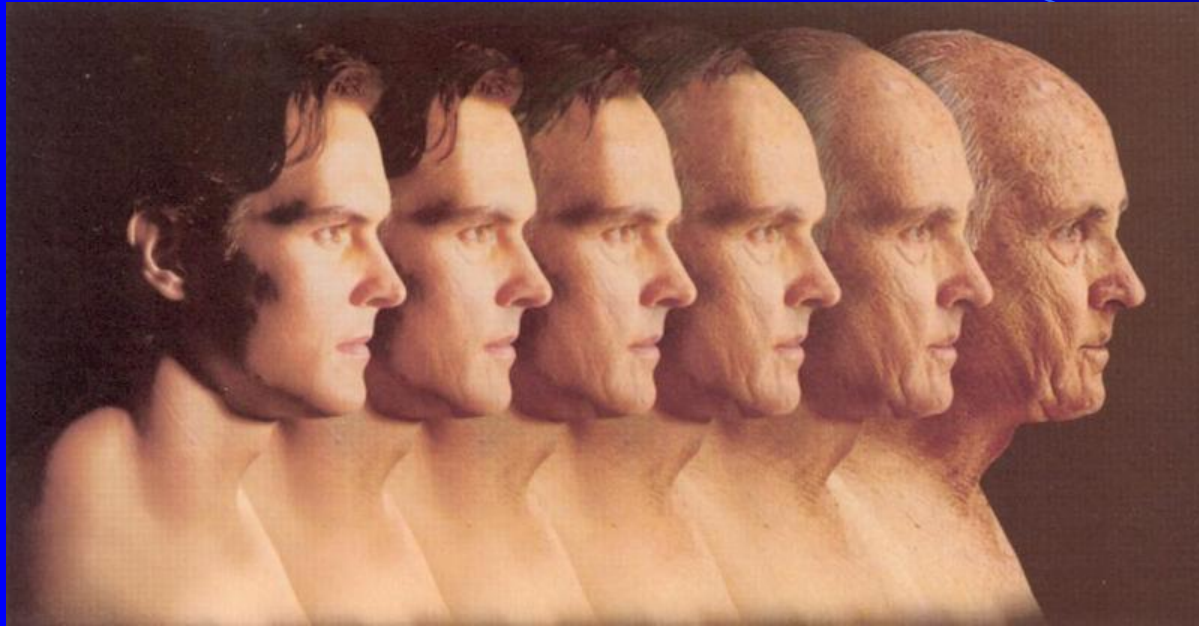
# MRI to the “tricorder”



World's smallest MRI is the size of a briefcase. The future: the size of a cell phone!

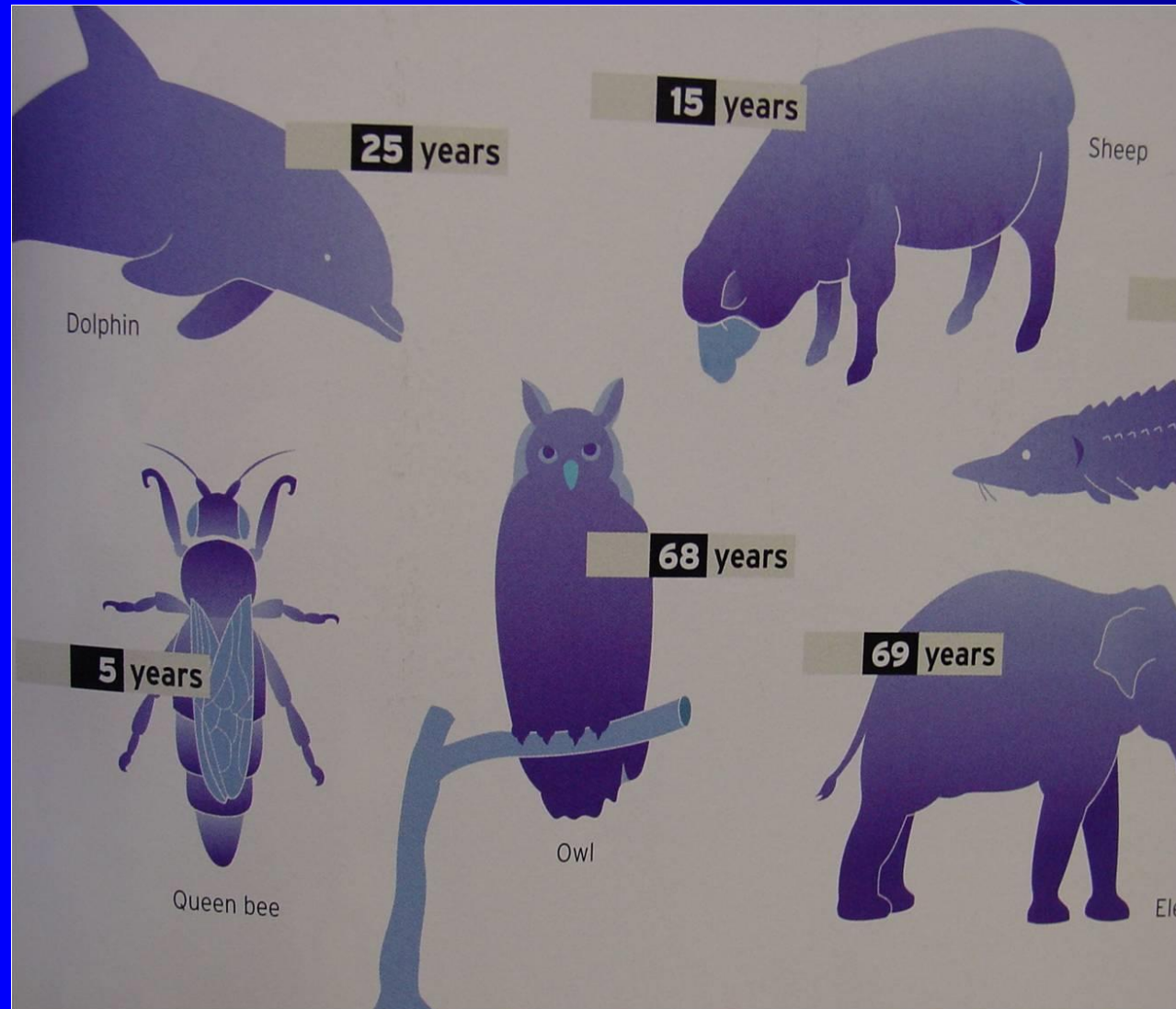


# Retard the aging process?



What is aging?  
Aging is the build-up  
of errors, genetic,  
molecular, and  
cellular in the body.  
Can it be reversed?

# Genetic basis of aging

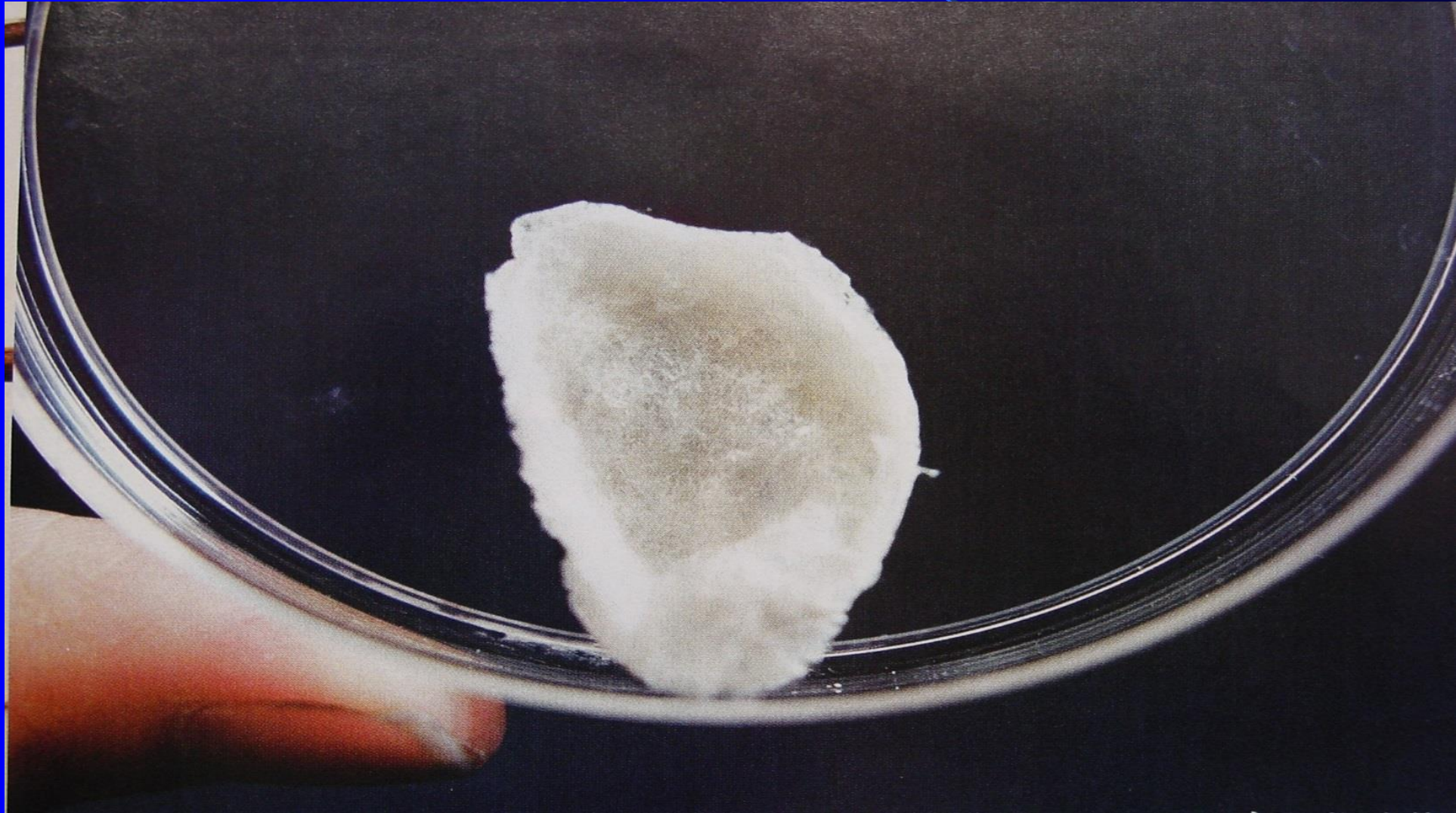


Different animals age at different rates, determined by genetics.



# The Human Body Shop

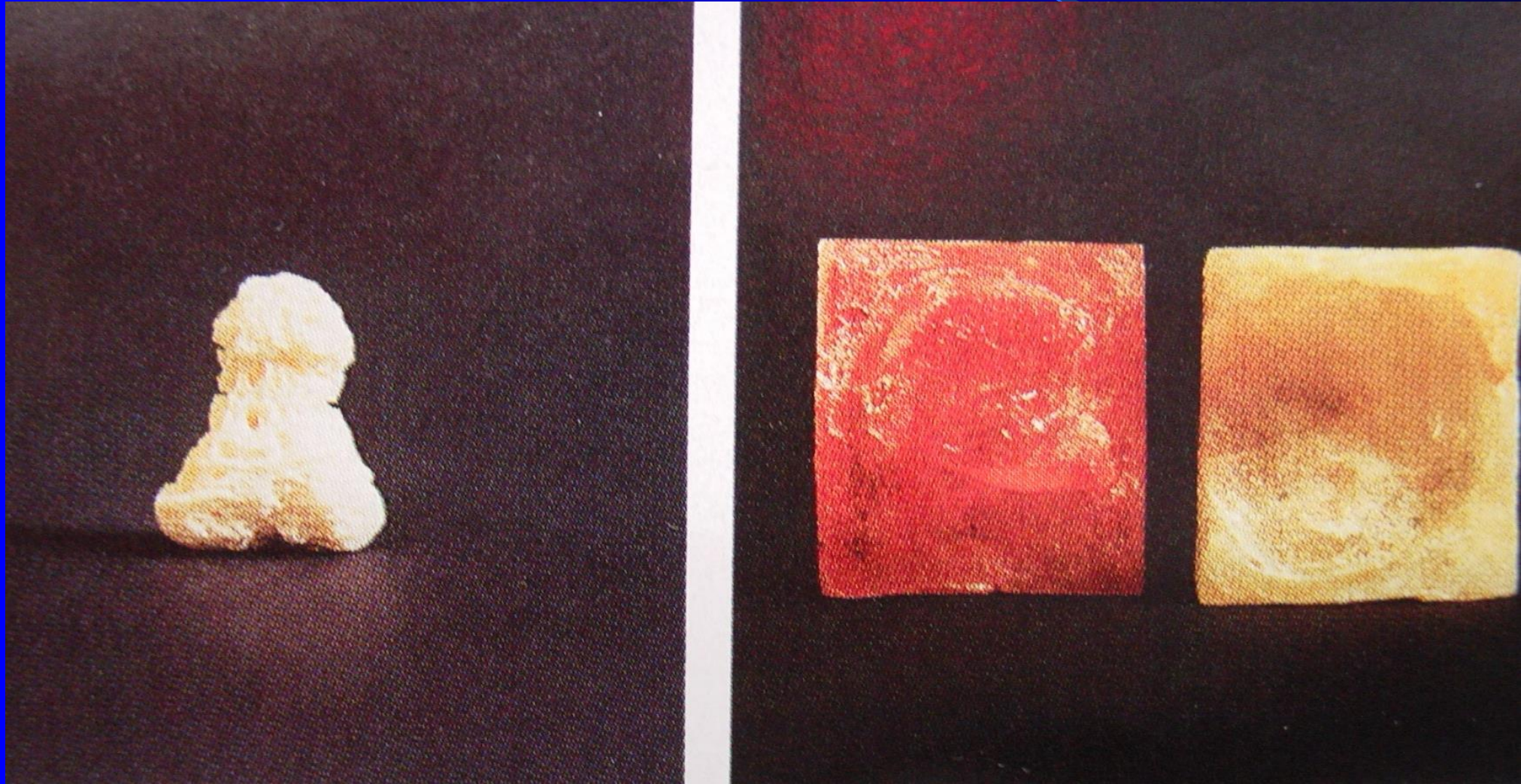
growing new organs from your own cells as they wear out  
- the digitalization of the human body





# Growing Ears and Bone

(and heart valves, blood vessels, skin, cartilage can be grown today)





# Growing Human Bladders



Today, we can grow skin, blood, heart valves, blood vessels, bone, noses, ears, from your own cells. “Organ failure: may disappear from the English language. Next: the human liver and pancreas.

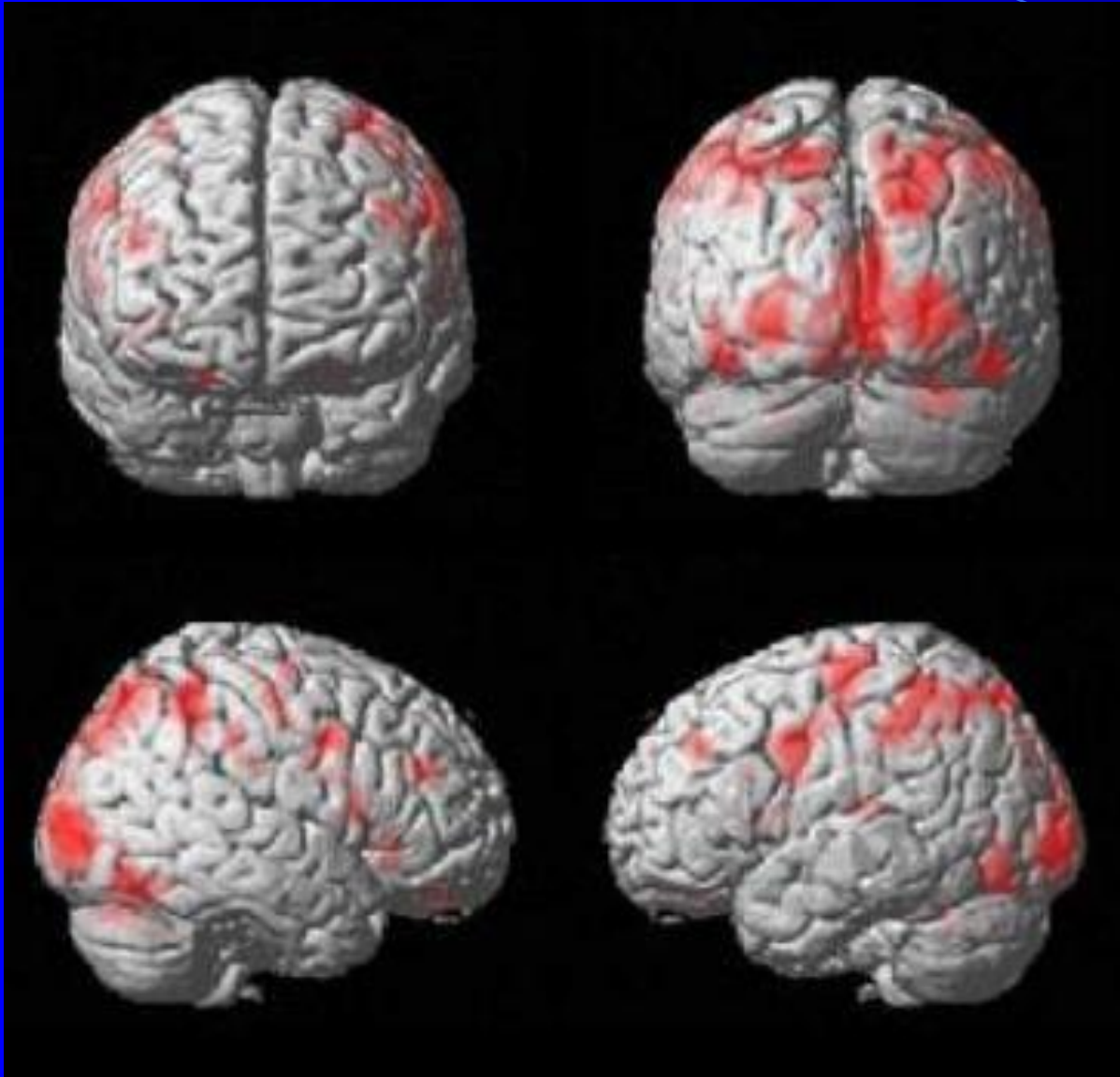
# Growing windpipes via stem cells



Complete, beating hearts have been grown for mice using stem cells.

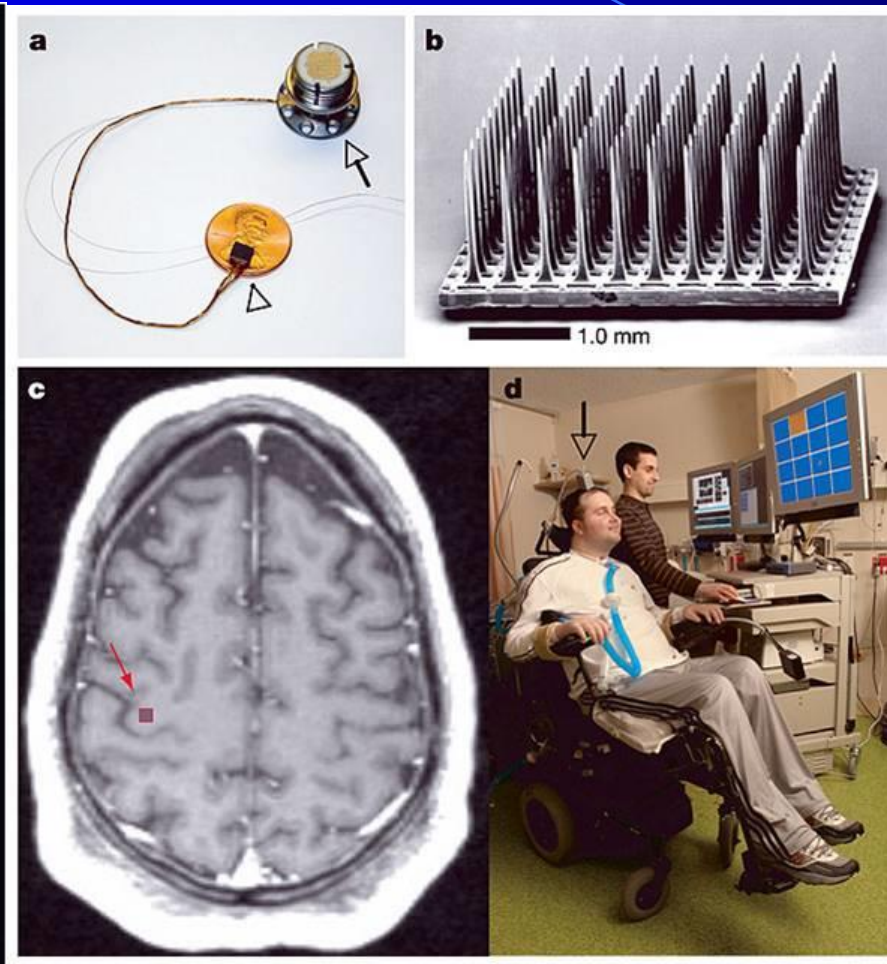


# The Digitalization of the Mind



Telepathy, telekinesis, uploading and recording memories, photographing thoughts and dreams – all are now possible.

# Connecting mind and machine



Paralyzed people who suffered from massive strokes can now surf the web, write emails, and play video games.



# Creating Exoskeletons



The brain can be connected to an exoskeleton, guided by the brain alone.

# Brain-net in Daily Life



At parties, these cat ears rise (or fall) when you are interested.

One day, we might have a brain-net, where emotions, sensations, memories are sent over the internet.

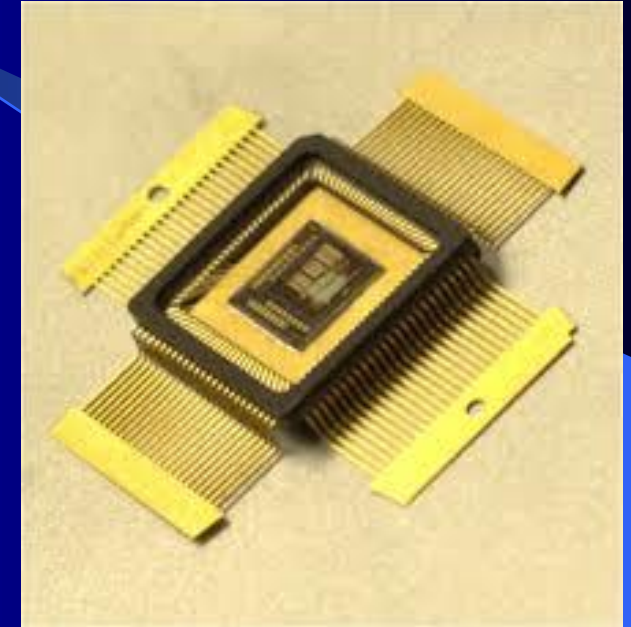
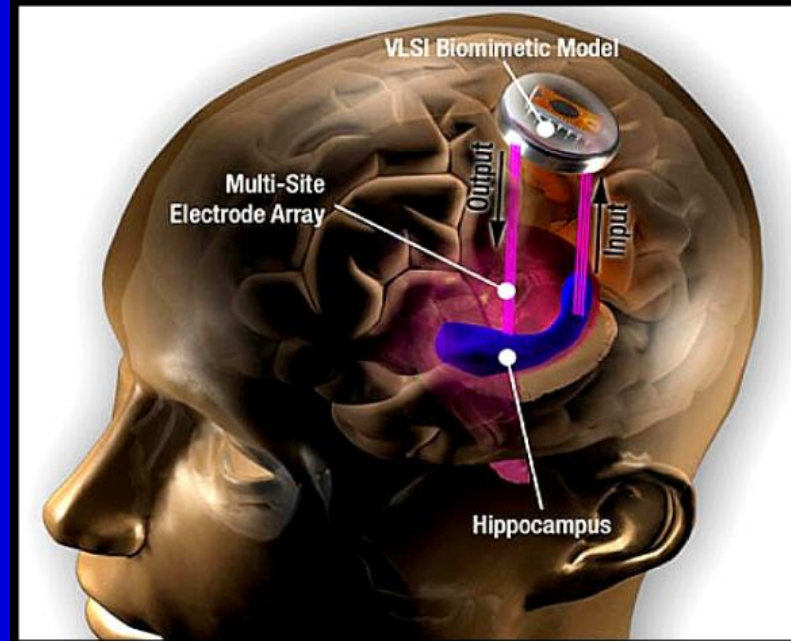


# Photographing a thought



An MRI scan calculates brain blood flow in 30,000 places, and then a computer analysis this to create a picture of what you are thinking about. You can even photograph a dream.

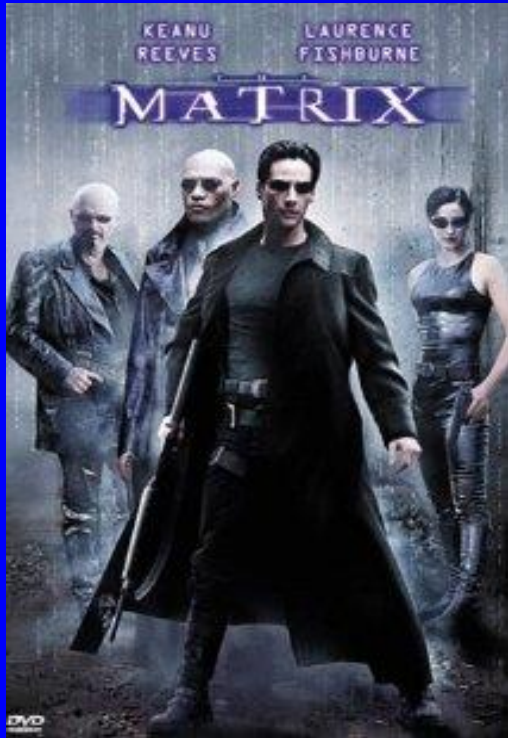
# Brain Pace-makers



Memories pass through the hippocampus for the brain. By recording the signals in the hippocampus, and then uploading it again, one can record memories and upload them. Eventually, we might have a brain pace-makers for Alzheimer's patients.



# Living in the Matrix



In the Matrix, you can upload skills and memories and live in a totally imaginary world, as if it were real. This might be possible.

# Immortality and a Library of Souls



Our memories and personality can be assembled and digitalized, so we can re-create a “copy” of your consciousness. So you will be able to “talk” to great figures of history and your own ancestors in a library of souls.



# Send the Connectome to the Stars



Your connectome can be placed on a laser beam, and then shot into outer space. Within a minute, you are on the moon, without any messy booster rockets or radiation problems. This could create an intra-galactic “highway” system connecting the stars/

# Conclusion

- The computer will eventually disappear, and will be everywhere and nowhere.
- Music was the first industry to be digitalized. Now, its media. Tomorrow, its education, medicine, transportation, etc.
- TV will be 3D, without glasses.
- Cars will be driverless. Jets will be supersonic.
- We will communicate mentally with computers. Telepathy, telekinesis, uploading memories, are now possible.
- Rise of perfect capitalism/intellectual capitalism.





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**Randall  Reilly<sup>®</sup>**

*Keynote Speaker*

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