

MYTH vs. REALITY

Science Challenges the
Blogosphere

The Blogosphere:

- “ Microwave(s) Ovens Hazardous to Your Health”
- “Microwave ovens... and cancer risk”
- “Recent Russian studies have shown that normal microwave cooking converts food protein molecules into carcinogenic substances.”



Bob Schiffmann: IMPI Short
Course November 2010

“Belly Armor” To Protect Your Baby From The Dangers of Everyday Life



Belly Tee

\$59.00

Expecting mothers can don this t-shirt as a basic top or an undershirt for all-day protection as you go about your daily activities. Lightweight and breathable, this cotton/spandex blend has a mid-section lined with RadiaShield® fabric to give you mobile protection from everyday radiation. The Belly Tee is so comfortable and convenient it would become your favorite t-shirt even if it weren't helping protect your child within.

Prices in US Dollars. For Asia/Australia/NZ orders, please visit [here](#).

Efficacy: Shields 99.9% of incoming radiation (~50dB). View independent FCC-certified laboratory [testing report](#). Try the [Cell Phone Test](#).

Material: 95% cotton, 5% spandex, and RadiaShield® lining. [Sizing Chart](#)

Care: Machine wash cold with similar colors. Air dry. Do not bleach.

color

size

quantity

Select an option ▾

Select an option ▾

1 ▾

Add to Cart



Belly Band

\$59.00

Protect your baby from everyday radiation during your pregnancy, while complementing any outfit. A maternity essential, the flattering Belly Band feels like second skin. Go about your day freely and stylishly with the peace of mind of RadiaShield® protection.

Instructions: Wear under or over clothes throughout your pregnancy, with larger side fully covering your belly.

Prices in US Dollars.

Efficacy: Shields 99.9% of incoming radiation (~50dB). View independent FCC-certified laboratory [testing report](#). Try the [Cell Phone Test](#).

Material: 95% rayon, 5% spandex, and RadiaShield® lining. [Sizing Chart](#)

Care: Machine wash cold with similar colors. Air dry. Do not bleach.

color

size

quantity

Select an option ▾

Select an option ▾

1 ▾

Add to Cart



Belly Blanket - Chic

\$69.00

The highest quality baby-soft cotton together with the reliable protection of RadiaShield® fabric make this blanket a convenient and unobtrusive way to protect your child within against the risks of everyday radiation. Easily portable in your handbag, this blanket is ideal for both the home and the office. You'll forget this breathable protector is even there while having the peace of mind of RadiaShield® protection.

Instructions: During pregnancy, drape over your midsection while sitting or lying down.

Prices in US Dollars. For Asia/Australia/NZ orders, please visit [here](#).

Efficacy: Shields 99.9% of incoming radiation (~50dB). View independent FCC-certified laboratory [testing report](#). Try the [Cell Phone Test](#).

Dimensions: 30 x 35 inches (75 x 90 cm)

Material: 100% pre-shrunk cotton and RadiaShield® lining

Care: Machine wash cold with similar colors. Air dry. Do not bleach.

color

quantity

Select an option ▾

1 ▾

Add to Cart

COSMO

How do Belly Armor products work?

- “Without getting too deep into the details, RadiaShield® fabric shields against everyday radiation by neutralizing incoming electromagnetic waves – similar to how noise canceling headphones work with sound waves or how a grounding wire neutralizes an electric current.”

“Microwaves can lead to cancer... You will need an immune system booster... And rid your body of the free radicals which can now be in your food”

Fucoidan to
offset
carcinogens



which
microwave
ovens emit
in your
food!!

Rid your
body of
electrosmog
which your
microwave
emits!!



Build up your Immune System Booster daily!!!

What's going on?

Reason's for Myths

- A 2007 survey showed that only 28% of American are scientifically literate
- Laymen are confused over the concepts of radiation, ionizing vs. non-ionizing radiation

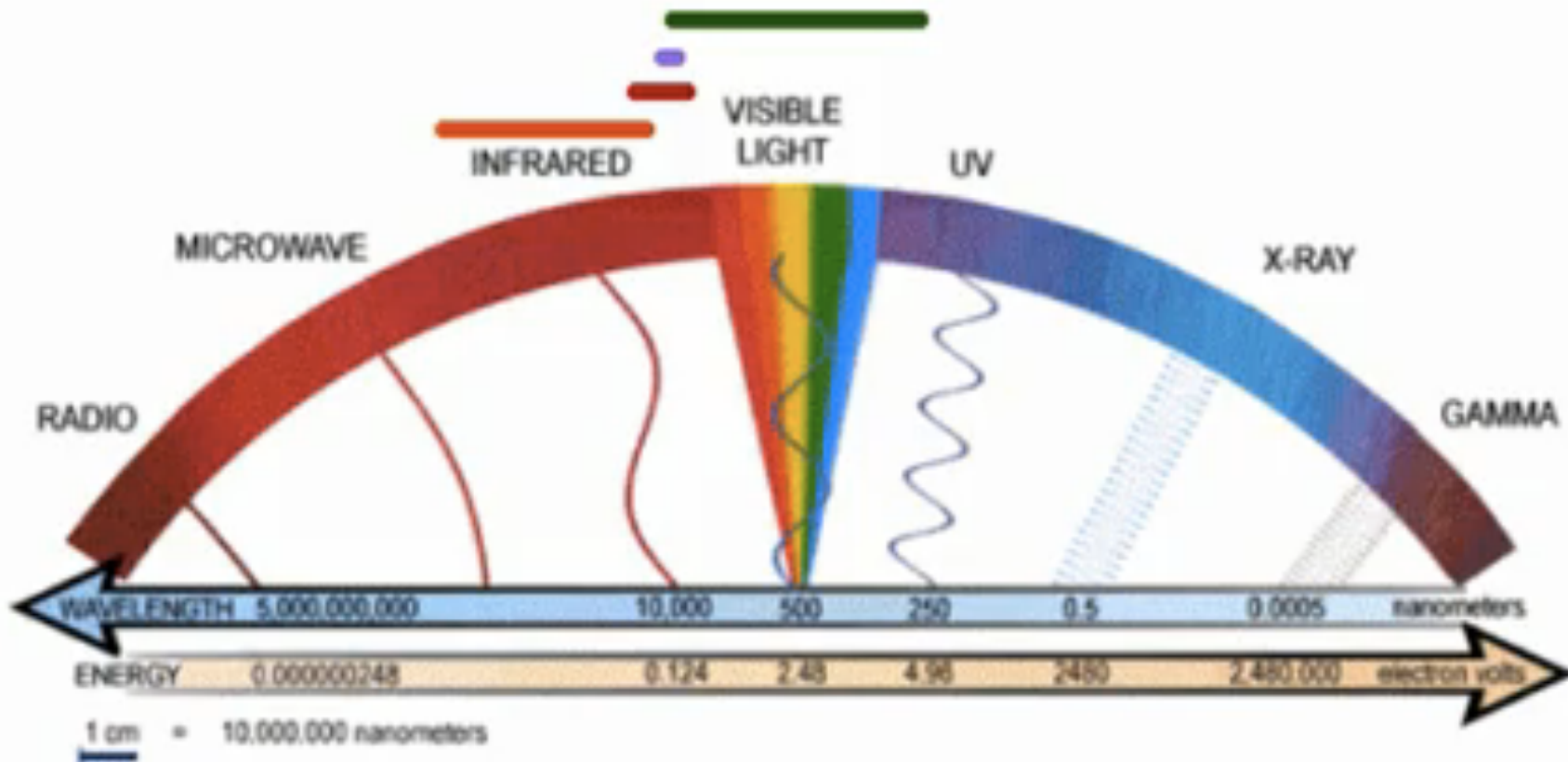
More Reasons

- Information in the Blogosphere can easily become viral
- Bloggers rarely check their sources, rather they simply copy & paste (a kind of plagiarism)

*So, misinformation spreads
like wildfire!*

Let's do some science

EM Spectrum



What is Radiation?

- Any emanation of energy, including sound and light.
- All energy produces radiation:
 - Light bulbs: emits light & infrared (heat)
 - Humans: emit heat & sound
 - Sun: emits light & heat (infrared) & ultraviolet radiation

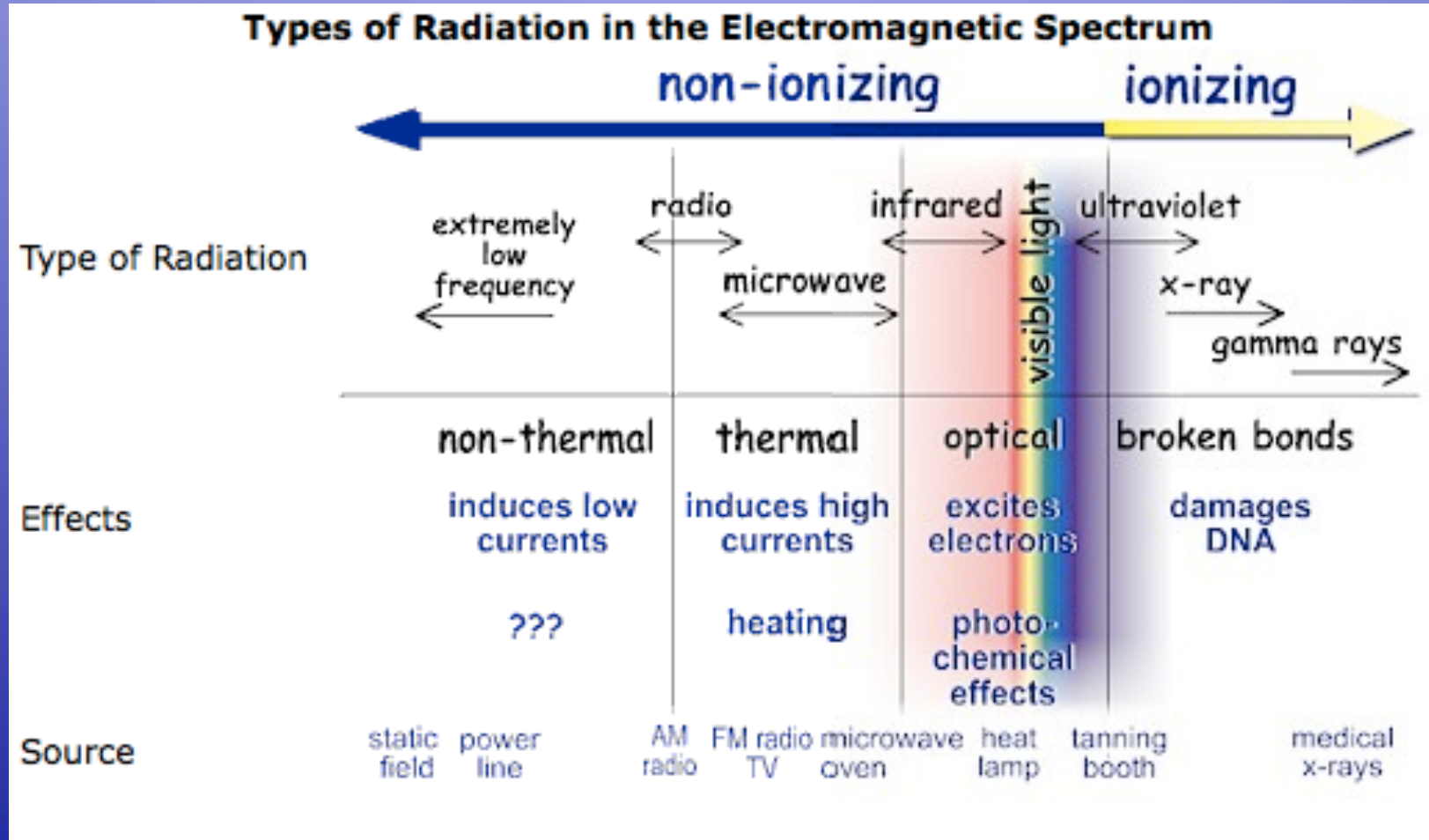
What is Radiation?

- Many lay people confuse Microwave Radiation with Nuclear Radiation:
- “Radiation... is “the electromagnetic waves emitted by the molecules of a radioactive substance as a result of nuclear decay....microwave ovens change the molecular structure of food with radiation”. (from a blog)

That's "Bad Science" and
WRONG!

Ionizing vs. Non-Ionizing Radiation

Ionizing vs. Non-Ionizing



Ionizing Radiation

- Includes nuclear radiation, medical x-rays, gamma rays, and even tanning booth ultraviolet rays.
- It is extremely high-energy:
 - Can strip electrons off atom (ionize)
 - At highest energies can break apart the nucleus
- Can damage DNA and cause cancer

Non-Ionizing Radiation

- Includes microwaves, sound waves and visible light rays
- Has enough energy to agitate atoms in a molecule and cause them to vibrate
- But not enough energy to remove electrons
- The motion caused by non-ionizing radiation creates heat (or sound)

Energy in EM Waves is Directly Related to their Frequency

$$\text{Energy} = h\nu$$

Where,

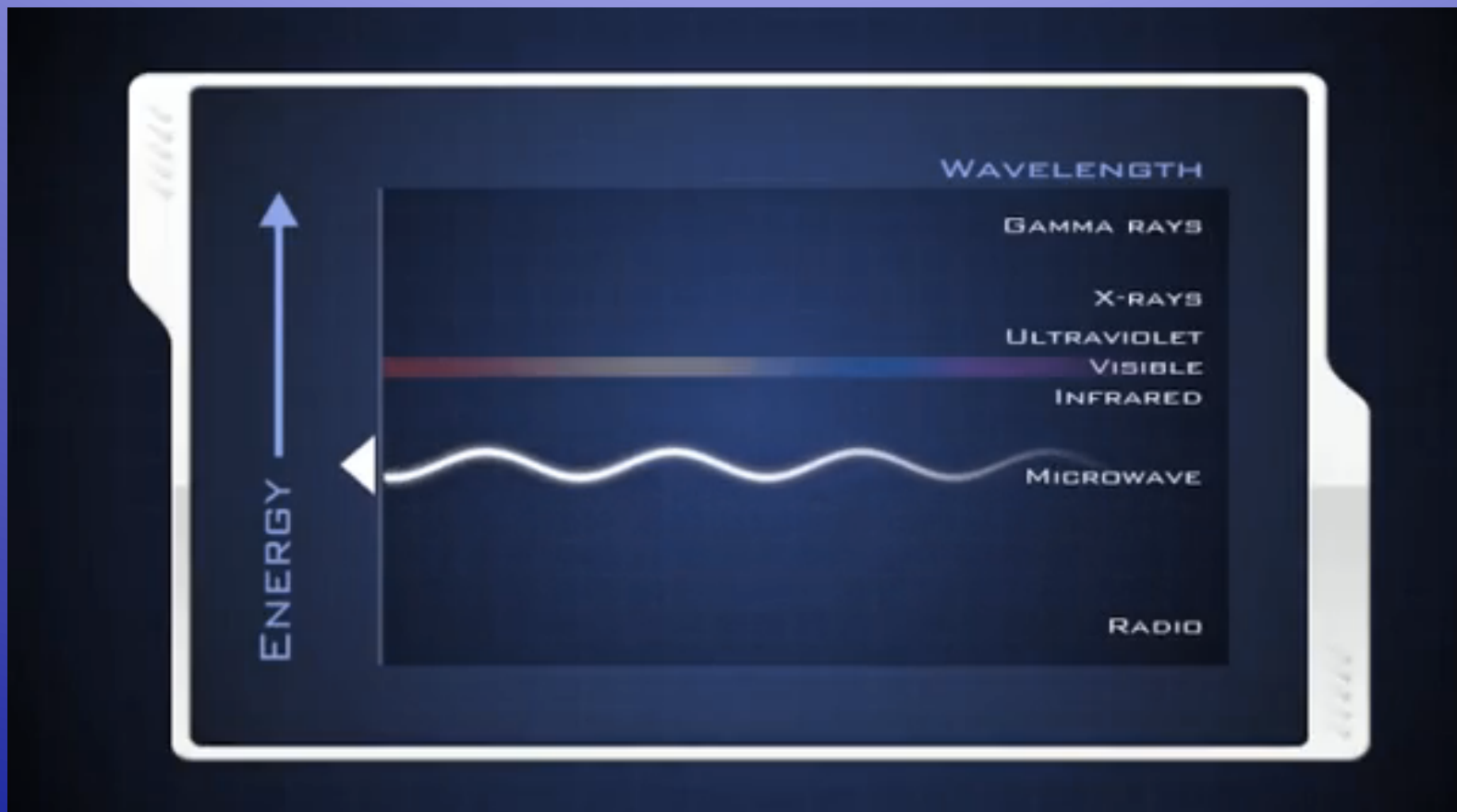
E = Energy

h = Planck's Constant *

ν = frequency

* 6.626×10^{-34}

Microwaves vs. Energy



Gamma Rays vs. Energy



Energy Content EM Waves

Region	Energy (ev)	Size of Wave
Microwave Oven	0.00001	Mouse
Visible	0.3 – 0.5	Bacteria
Ultraviolet	0.5 – 20	Virus
X-Rays	20 – 3×10^4	Atom
Gamma Rays	$>3 \times 10^4$	Nucleus

So...

- There is about 30,000 to 50,000 times more energy in visible light than there is in microwave oven radiation!
- There is about 20 to 30 Billion times more energy in X-Rays than in microwave oven radiation.

All Microwaves Can Do Is
Heat Things!

How Much Energy is Required to Ionize?

- Ionize atomic Hydrogen: 13.6 eV
- Microwave oven energy: 0.00001 eV

–So, Microwaves about one million times too weak

How Much Energy is Required to Break Molecular Bonds?

- It generally takes about one to three eV to break a bond
- Microwave oven energy: 0.00001 eV
 - ***So, Microwaves about 100,000 times too weak!***

Now, Let's Look at Some of
the Blogger Claims:

Microwaves and DNA

- **MYTH:**
 - Microwaves damage DNA (break the covalent bonds in DNA)

Microwaves and DNA

- REALITY:
 - 10 eV required to break a co-valent bond
 - Microwaves: 10^{-5} eV
- Therefore, microwaves are incapable of damaging DNA

Microwaves and Nutrition

- **MYTH:**
 - Microwave cooking destroys the nutrients if food
- **REALITY:**
 - Any method of cooking will result in the deterioration of nutrients if the cooking food is allowed contact with water and/or heat.

Microwaves and Nutrition

- REALITY (cont.)
 - Numerous studies have shown that microwave cooked foods retain nutritional values better than conventionally cooked food because of lower cooking temperatures and less water.
- So, there is no scientific validity to the nutrition-damaging claims

Microwaves and Cancer

- **MYTH:**
 - Microwaves foods contain more cancer-causing chemicals than conventionally cooked foods.

Microwaves and Cancer

- REALITY:
 - high heat cooking methods such as: grilling, barbecuing, pan-frying and broiling cause the production of a number of carcinogenic agents such as heterocyclic amines & nitrosamines. Because the microwave cooks at lower temperatures, with a cool ambient, the food does not brown or caramelize, so there are little of any of these carcinogens produced.

Microwaves and Cancer

- Microwave cooking does not create carcinogenic chemicals
- Microwaved food does not cause cancer

Plastic Containers in a Microwave Oven

- **Myth:**
 - You should not heat foods in plastic containers or wrap in your microwave oven because chemicals such as BPA and Phthalates may leach into your food.

Plastic Containers in a Microwave Oven

- Reality:
 - Good Housekeeping, November 2008, did extensive testing of 31 different plastic containers & wrap. Four contained low levels of BPA or phthalates. No chemicals leaching into food was observed.
- *“MW-safe” Plastic containers and wrap are safe to use in the microwave oven*

Non-Food Claims

- **MYTH:**

- Science Fair project: Two plants were tested, one with regular water, the other with microwaved water. The claim is that the microwave water plant withered and died while the other survived in good health

- **REALITY:**

- this is an Internet urban myths. A well-controlled test was run by Snopes and both plants did very well.

Non-Food Claims

- REALITY (concluded)
 - www.snopes.com/science/microwave/plants/asp
- ***Microwave energy does not alter water molecules!***

Some Other Myths

- Microwave athermal effects
- Microwaves cause headaches, nausea, dizziness, weakness
- Microwave cooking destroys micronutrients (for example: B12)
- Dr Hertel and eating microwaved food caused decreased hemoglobin, leukocytes and cholesterol

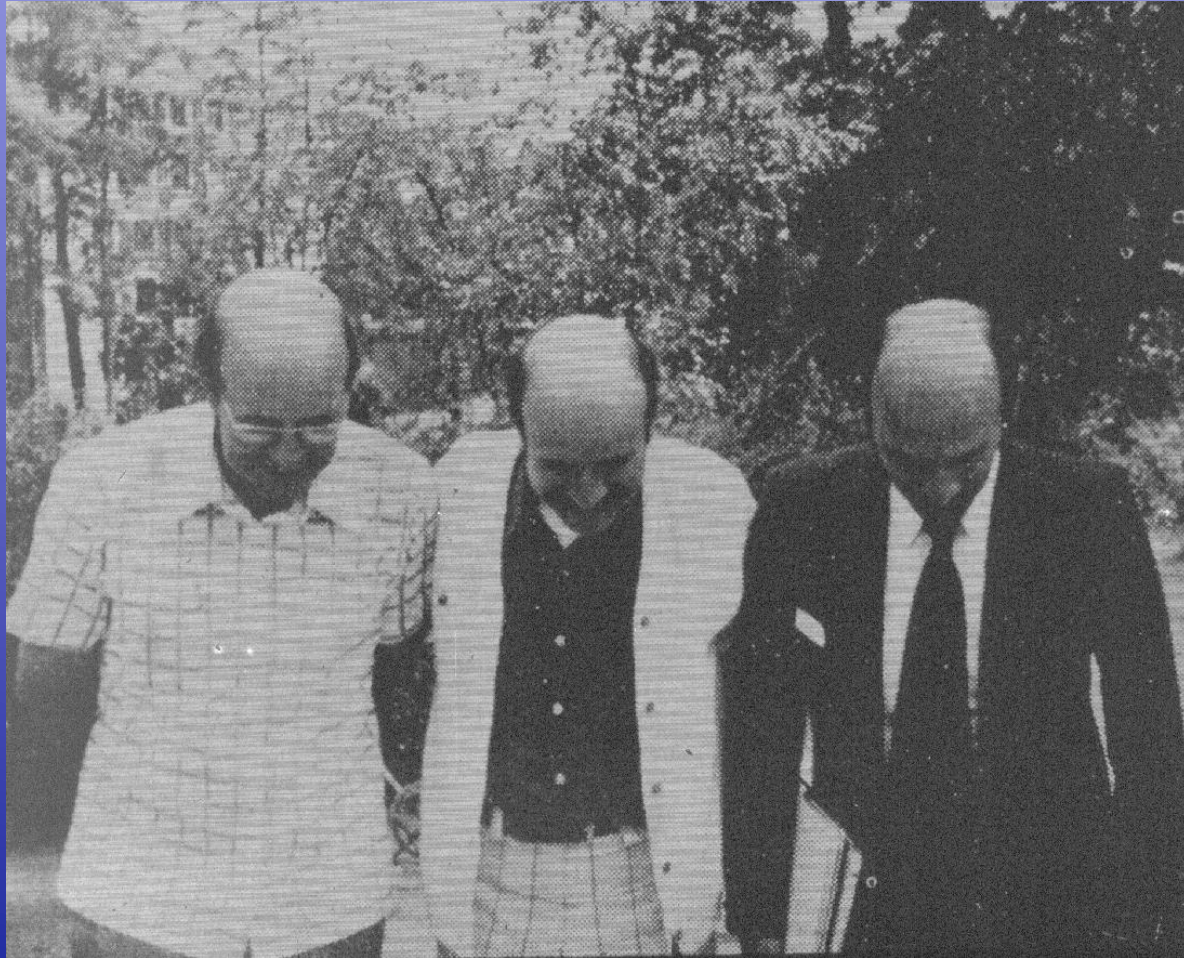
The Bottom Line

- All microwave ovens can do is heat things
 - Any harmful effects of microwaves is due to overheating
- They cannot damage cells or DNA; or break bonds; or ionize molecules
- The nutritional effects of microwave cooking are at least as good as any other cooking method, and often superior

Microwave Hazards

- Overheating
- Hidden high temperatures (baby food)
- Eruption
- Steam
- Fires
- ***But all are thermal effects!***

But, Could This Be a Microwave Effect?



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Once some people have
made up their minds about
something, it is hard to
confuse them with facts!

Questions?