

Paralelni svjetovi koje dopušta fizika

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Preludij

"Nadnaravna bića priznaju sve religije,
a ne niječe ih ni znanost.

Dr. sc. Hrvoje Zorc, fizičar Instituta Ruđer Bošković,
kaže da fizika ne negira postojanje paralelnih svjetova".

Tehnopolis 18, listopad 2012.

U čemu je problem?

- (1) paralelni svjetovi na koje je mislio dr. Zorc **nisu** oni paralelni svijetovi na koje je aludirala novinarka Tehnopolisa
- (2) pogrešan zaključak da znanost ne niječe nadnaravna bića izveden je iz miješanja **svjetonazora**

Dva međusobno isključiva svjetonazora (I)

TWO WAYS OF EXPLAINING THE WORLD

1. Supernaturalism:

Beyond the obvious physical world is another invisible world containing **active agents** that behave unpredictably

*All known human cultures throughout recorded history embrace this view that is based on **faith**, defined as accepting the authority of revelation, dogma and ancient texts.*

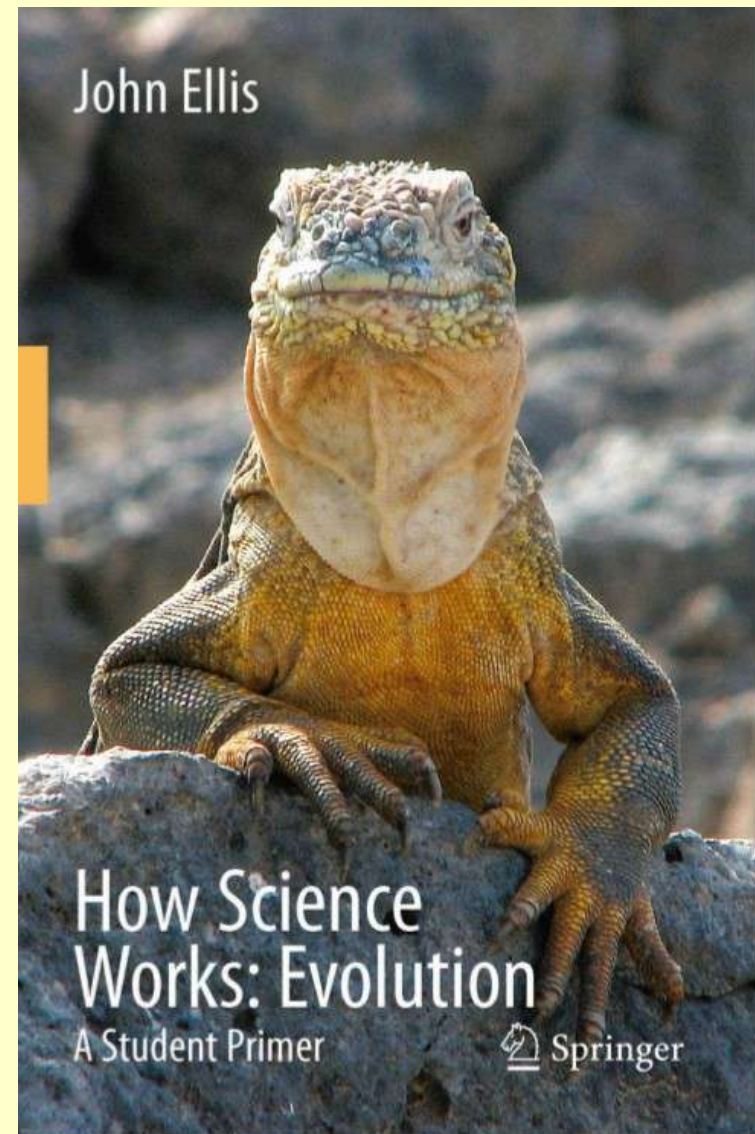
2. Naturalism:

Everything there is belongs to the physical world that we all experience and that behaves according to **unvarying regularities** ("laws of nature")

*This view is very recent, is the dominant view amongst leading scientists today, and is based on **reason** applied to observations and experiments accessible to all.*

Dva međusobno isključiva svjetonazora (II)

"Now it is important to understand that *both naturalism and supernaturalism are assumptions, and both are logically possible, but both cannot be correct* – by definition, one excludes the other."



John Ellis, **How Science Works: Evolution: A Student Primer**, Springer (2010)

"fizika ne negira postojanje paralelnih svjetova"

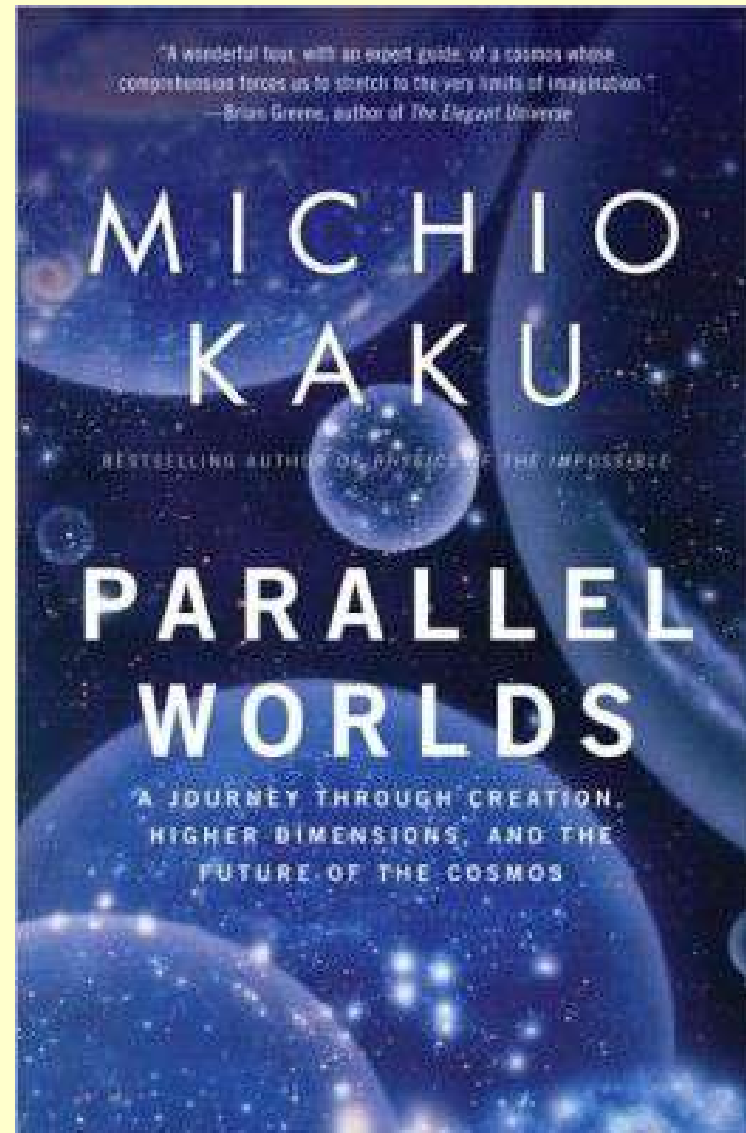
točno, ali... fizika ih zasad ni ne potvrđuje, samo dopušta njihovo postojanje

međutim... fizika svašta dopušta u okviru poznatih prirodnih zakona, no sve što je dopušteno nije nužno i ostvareno

u svakom slučaju... paralelni svjetovi koje fizika dopušta nisu svjetovi nastanjeni nadnaravnim bićima koja se povremeno upliću u naš svijet mimo prirodnih zakona

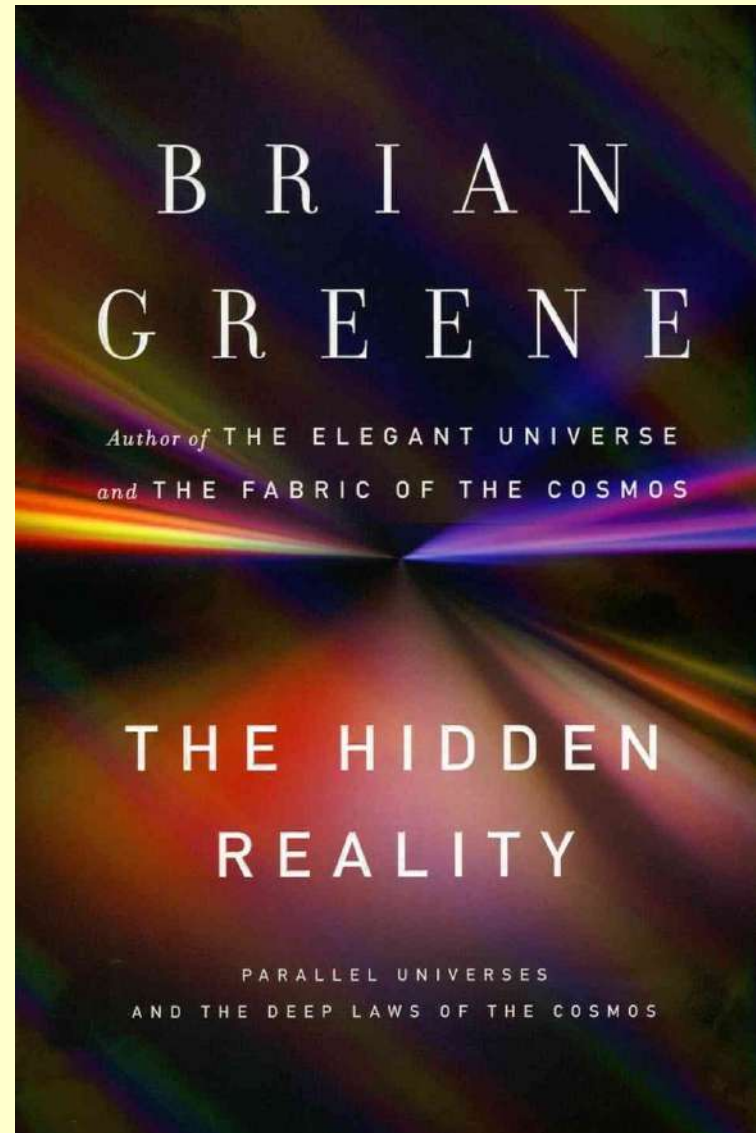
Što fizičari kažu o paralelnim svjetovima (I)

Michio Kaku, **Parallel Worlds:**
A Journey Through Creation,
Higher Dimensions, and the
Future of the Cosmos
(Doubleday, 2004)

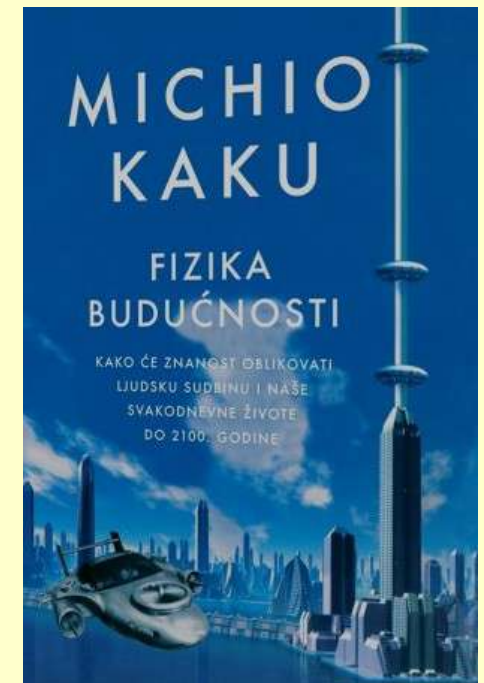
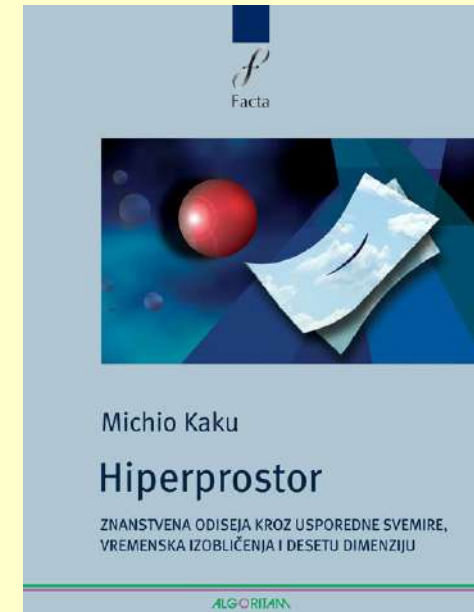
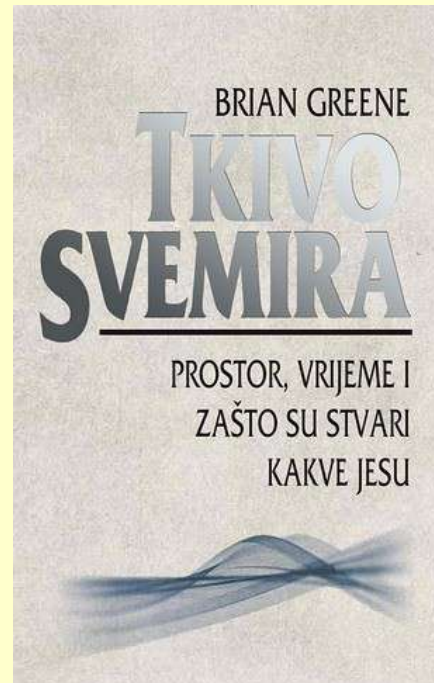


Što fizičari kažu o paralelnim svjetovima (II)

Brian Greene, **The Hidden Reality**: Parallel Universes and the Deep Laws of the Cosmos
(Knopf, 2011)



Greene i Kaku na hrvatskom



MULTIVERZUM - paralelni svjetovi fizike

The multiverse (or meta-universe) is the hypothetical set of infinite or finite possible universes (including our universe) that together comprise everything that exists and can exist: the entirety of space, time, matter, and energy as well as the physical laws and constants that describe them. The various universes within the multiverse are sometimes called **parallel universes**.

<http://en.wikipedia.org/wiki/Multiverse>

9 tipova MULTIVERZUMA Briana Greenea

Višeslojni

The quilted multiverse works only in an infinite universe. With an infinite amount of space, every possible event will occur an infinite number of times. However, the speed of light prevents us from being aware of these other identical areas.

Inflatorni

The inflationary multiverse is composed of various pockets where inflation fields collapse and form new universes.

Branski

The brane multiverse follows from M-theory and states that each universe is a 3-dimensional brane that exists with many others. Particles are bound to their respective branes except for gravity.

Ciklički

The cyclic multiverse has multiple branes (each a universe) that collided, causing Big Bangs. The universes bounce back and pass through time, until they are pulled back together and again collide, destroying the old contents and creating a new.

Krajobrazni

The landscape multiverse relies on string theory's Calabi–Yau shapes. Quantum fluctuations drop the shapes to a lower energy level, creating a pocket with a different set of laws from the surrounding space.

Kvantni

The quantum multiverse creates a new universe when a diversion in events occurs, as in the many-worlds interpretation of quantum mechanics.

Holografski

The holographic multiverse is derived from the theory that the surface area of a space can simulate the volume of the region.

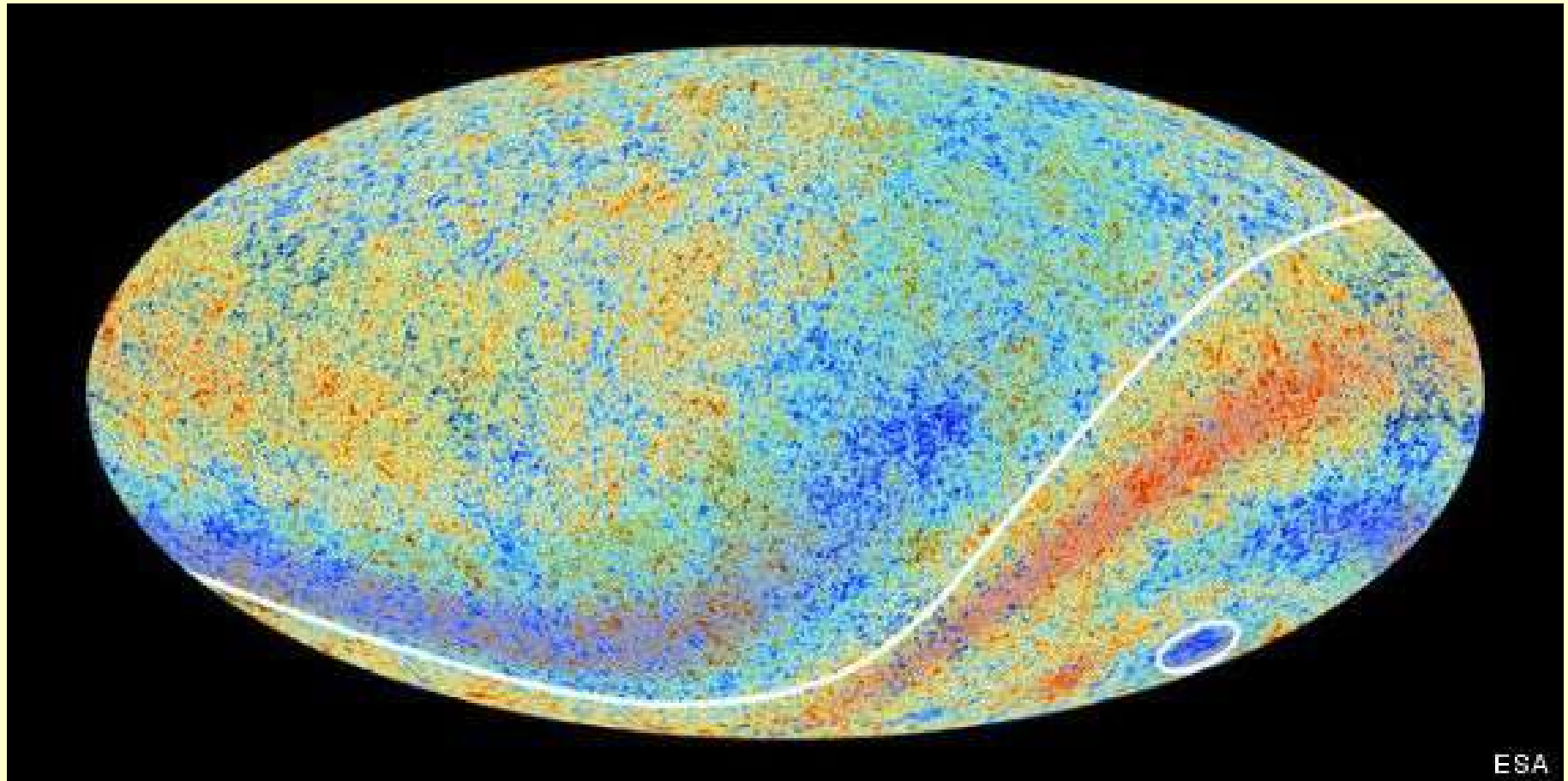
Simulirani

The simulated multiverse exists on complex computer systems that simulate entire universes.

Konačni

The ultimate multiverse contains every mathematically possible universe under different laws of physics.

Prva potvrda sudara s drugim svemirom!?



prvi rezultati satelita Planck (ožujak, 2013.)
dosad najpreciznije mjerenje anizotropije kozmičkog mikrovalnog zračenja
"the axis of evil"