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*Gedefiniërde Wél Ongeëwenaard Reliëfs Wêreldstelsels Té Dáárom Sinaïwoestyn  
Lêer Geïnteresseerd Één Geïllustreerde Asiëoorlog Rûe Trôe Wîe Breëblaarwoude  
Paleosoïkum Bó Sôre Sjiiete Vóór Vêrste Teëgestaan Dáárom Gesê Appèl Hê Adélie-  
pikkewyn Pêrel Dít Óm Geïgnoreer Móre Álle Brûe Sinaïwoestyn Adéliepikkewyn  
Ýs Têre Karotenoïede Reënboognasie Kwêvoël Geëmigreer Ónder Hoëdrukgebiede  
Kontinuïteit Vóór Mét*

**GEDEFINIËRDE WÉL ONGEËWENAARD RELIËFS WÊRELDSTELSELS TÉ  
DÁÁROM SINAIWOESTYN LÊER GEÏNTERESSEERD ÉÉN GEÏLLUSTREERDE  
ASIËOORLOG RÛE TRÔE WÎE BREËBLAARWOUDE PALEOSOÏKUM BÓ SÔRE  
SJIÏETE VÓÓR VÊRSTE TEËGESTAAN DÁÁROM GESÊ APPÈL HÊ ADÉLIEPIKKE-  
WYN PÊREL DÍT ÓM GEÏGNOREER MÔRE ÁLLE BRÛE SINAIWOESTYN ADÉLIE-  
PIKKEWYN ÝS TÊRE KAROTENOÏEDE REËNBOOGNASIE KWÊVOËL GEËMIG-  
REER ÓNDER HOËDRUKGEBIEDE KONTINUÏTEIT VÓÓR MÉT**

*Priključenje Brežuljkašti Općeprihvaćena Korčulanskom Najsačuvaniji  
Tisućgodišnjeg Požrtvovnog Obilježjima Poistovjećuje Olakšavanje Stećci  
Prvovjenčanog Solženjicina Tisućljeća Bespomoćnost Tkalčičeva Snalažljivi-  
vošti Osvrćući Lednim Tjelovježbom Gradonačelnik Najuočljivija Uljepšava-  
ju Starogruojčice Unutrašnjosti Promidžbenom Najznačajniji Višestoljetnog  
Podčinjena Šižgoričevo Dušobrižništvo Raščlanjenosti Nešto Spužvaršt-  
vo Ranokršćanske Starožidovskog Proglašavanje Dušobrižništvo Potčinjeni  
Južnočakavskom Najznačajniji Špijuniranje Između Iznenađujućom Prešućivanje  
Najšumovitiji Općeprihvaćena Tuđmanom Predškolskog*

**PRIKLJUČENJE BREŽULJKASTI OPĆEPRIHVAĆENA KORČULANSKOM  
NAJSAČUVANIJ I TISUĆGODIŠNJEG POŽRTVOVNOG OBILJEŽJIMA  
POISTOVJEĆUJE OLAKŠAVANJE STEĆCI PRVOVJENČANOG SOLŽENJICINA  
TISUĆLJEĆJA BESPOMOĆNOST TKALČIĆEVA SNALAŽLJIVOSTI OSVRĆUĆI  
LEDNIM TJELOVJEŽBOM GRADONAČELNIK NAJUOČLJIV IJA ULJEPŠAVAJU  
STAROGRUOJČICE UNUTRAŠNJOSTI PROMIDŽBENOM NAJZNAČAJNIJI VIŠES-  
TOLJETNOG PODČINJENA ŠIŽGORIČEVO DUŠOBRIŽNIŠTVO RAŠČLANJENOSTI  
NEŠTO SPUŽVARSTVO RANOKRŠĆANSKE STAROŽIDOVSKOG PROGLAŠAVAN-  
JE DUŠOBRIŽNIŠTVO POTČINJENI JUŽNOČAKAVSKOM NAJZNAČAJNIJI ŠPI-  
JUNIRANJE IZMEĐU IZNENAĐUJUĆOM PREŠUĆIVANJE NAJŠUMOVITIJI  
OPĆEPRIHVAĆENA TUĐMANOM PREDŠKOLSKOG**

*Sõbralikumad Vähestabiilsed Küpsetuspulber Lepingusätteid Polüetüleenil Kredii-  
tühisuse Föderatsiooni Päikeseööpäeva Päikeseööpäeva Fetišism Kuulmishäireid  
Hõimurahvaste Tööarmeed Ülevenemaaline Žürii Basaltbretšaks Bolševistlikul Risti-  
sõdijatel Linaäärne Piirikõveriku*

**SÕBRALIKUMAD VÄHESTABIILSED KÜPSETUSPULBER LEPINGUSÄTTEID PO-  
LÜETÜLEENIL KREDIITÜHISUSE FÖDERATSIOONI PÄIKESEÖÖPÄEVA PÄIKE-  
SEÖÖPÄEVA FETIŠISM KUULMISHÄIREID HÕIMURAHVASTE TÖÖARMEED  
ÜLEVENEMAALINE ŽÜRII BASALTBRETŠAKS BOLŠEVISTLIKUL RISTISÕDIJA-  
TEL LINAÄÄRNE PIIRIKÕVERIKU**

*Dänemark Energieströme Wüstengebiete Ausgeübt Großbritannien Flussmündung  
Veröffentlichung Schöngeistig Dritthäufigste Prüfungsfragen Großwild Cöllnisch  
Möglichkeit Frischkäse Programmäquivalenz Düker Dreißigjährige Gräser Religiös  
Füße Magnesiumstäbe Unregelmäßig Färöisch Fließrichtung Einschließlich Drei-  
zehenmöwe Cünzer Makroökonomie Prävention Ursprünglich Nadelwälder Garten-  
schläuche Südlich Großtechnisch Ruderfußkrebs Färöer Baumstämme Fließfähig-  
keit Jüdisch Unpässlichkeit Trägheit Aufspüren Ursprünglich Lageänderung*  
**DÄNEMARK ENERGIESTRÖME WÜSTENGEBIETE AUSGEÜBT  
GROßBRITANNIEN FLUSSMÜNDUNG VERÖFFENTLICHUNG SCHÖNGEIS-  
TIG DRITTHÄUFIGSTE PRÜFUNGSFRAGEN GROßWILD CÖLLNISCH MÖG-  
LICHKEIT FRISCHKÄSE PROGRAMMÄQUIVALENZ DÜKER DREIßIGJÄHRIGE  
GRÄSER RELIGIÖS FÜSSE MAGNESIUMSTÄBE UNREGELMÄSSIG FÄRÖISCH  
FLIEßRICHTUNG EINSCHLIEßLICH DREIZEHENMÖWE CÜNZER MAKRO-  
ÖKONOMIE PRÄVENTION URSPRÜNGLICH NADELWÄLDER GARTENSCHLÄU-  
CHE SÜDLICH GROßTECHNISCH RUDERFUßKREBS FÄRÖER BAUMSTÄMME  
FLIEßFÄHIGKEIT JÜDISCH UNPÄSSLICHKEIT TRÄGHEIT AUFSPÜREN UR-  
SPRÜNGLICH LAGEÄNDERUNG**

*Kafbátur Pýpagóras Pílu kast Viðskiptafræði Indíáni Landamæri Nýgrísku Boðorð  
Pétur Kjördæmaskipan Apolloníos Hernaðaráttökum Pýpagóras Vesturevrópskt  
Íþróttir Góður Hléi Mínóísk Bergþór Nauðungarsölur Sköpun Íslandsbyggðar Gúllas  
Nýlendutímanum Menningarsvæði Skipaútgerð Óásættanlegt Matthíasdóttir Gýgur  
Flúoríða Stjörnuvísindi Arabíuskagi Guðmundur Abkhazía Tækniþróun Fátækrar-  
mörkum Pýrenea Eðlisfræði Joðið Landamæralauð Óútkljáð*  
**KAFBÁTUR PÝPAGÓRAS PÍLUKAST VIÐSKIPTAFRÆÐI INDÍÁNI LANDAMÆRI  
NÝGRÍSKU BOÐORÐ PÉTUR KJÖRDÆMASKIPAN APOLLONÍOS HERNADARÁ-  
TÖKUM PÝPAGÓRAS VESTUREVRÓPSKT ÍÞRÓTTIR GÓÐUR HLÉI MÍNÓÍSK  
BERGÞÓR NAUÐUNGARSÖLUR SKÖPUN ÍSLANDSBYGGÐAR GÚLLAS NÝLEN-  
DUTÍMANUM MENNINGARSVÆÐI SKIPAÚTGERÐ ÓÁSÆTTANLEGT MATTHÍ-  
ASDÓTTIR GÝGUR FLÚORÍÐA STJÖRNUVÍSINDI ARABÍUSKAGI GUÐMUNDUR  
ABKHAZÍA TÆKNIÞRÓUN FÁTÆKRARMÖRKUM PÝRENEA EÐLISFRÆÐI JOÐIÐ  
LANDAMÆRALAUST ÓÚTKLJÁÐ**

*Ćwierćfinale Rozluźnienie Właściwościami Skarłowaciale Przeobrażający  
Młodzieńczych Przyjeżdżają Choćby Dwójłomnym Rybołówstwo Współpracę  
Więźniowie Społeczeństwem Głębińskiego Prośbą Nieodłącznym Właściwościami  
Przeciwieństwo Zróżnicowanych Męczenników Sędziówponad Niedostępności  
Mścisław Wyodrębnionych Zaprzysiężenia Podchorążówka Najśłynniejsze  
Długotrwałego Gąsienicowe Bakteriobójcze Rozciągających Śródgóorskimi*  
**ĆWIERĆFINALE ROZLUŻNIENIE WŁAŚCIWOŚCIAMI SKARŁOWACIAŁE  
PRZEOBRAŻAJĄCY MŁODZIEŃCZYCH PRZYJEŹDŻAJĄ CHOĆBY DWÓJŁOMNYM  
RYBOŁÓWSTWO WSPÓŁPRACĘ WIĘŹNIOWIE SPOŁECZEŃSTWEM  
GŁĘBIŃSKIEGO PROŚBĄ NIEODŁĄCZNYM WŁAŚCIWOŚCIAMI  
PRZECIWIEŃSTWO ZRÓŻNICOWANYCH MĘCZENNIKÓW SEDZIÓWPONAD  
NIEDOSTĘPNOŚCI MŚCISŁAW WYODRĘBNIONYCH ZAPRZYSIĘŻENIA  
PODCHORĄŻÓWKA NAJSŁYNNIEJSZE DŁUGOTRWAŁEGO GĄSIENICOWE BAK-**



*The Drake equation in other words summarizes the factors which are thought to affect the likelihood that humans will be able to detect radio-communication from intelligent extraterrestrial life (Burchell). The argument was first\* proposed in by American astronomer Frank Drake, for the purpose of stimulating scientific dialogue at the meeting of the Search for Extra-Terrestrial Intelligence (SETI) community:*

*„As I planned the Meeting, I realized a few day[s] ahead of time we needed an Agenda. And so I wrote down all the Things you needed (to Know to predict) how hard it's going to be to ¶ detect Extraterrestrial [life]. And looking at them it Became pretty evident that if you multiplied all these together\*, you got a number, N, which is the Number of detectable civilizations in our {galaxy}. This was aimed at the radio search, and not to Search for primordial or Primitive life forms.“*  
— Frank Drake

*• The meeting of the SETI community was arranged following a surge of interest among various well-known physicists and astronomers' in searching for extra terrestrial communications! Evidence of this interest includes Giuseppe Cocconi and Philip Morrison's «Nature article» Searching for ‡ Interstellar Communications § which first proposed the idea of using radio telescopes to & try to detect transmissions broadcast by extraterrestrial civilizations? „It also includes a newspaper article entitled Life on other Planets?“ in the Sydney Morning Herald in which Harlow Shapley (father of Nobel laureate mathematician Lloyd Shapley) and William Howells' work for the Darwin Centennial celebration is highlighted!*

*Fraction of habituated planets that develop intelligent life: Estimations of the fraction of habituated planets that go on to develop not only life, but intelligent life {fi}, expectedly, varies widely. Among those who argue for low values, it is pointed out that among the billions of species on earth, only & one [that we know of] has become intelligent, and so divided by billions appears to argue for a small fraction. Among those who argue for high values, it is commonly pointed out that as the complexity of life increases over time, intelligence appears almost inevitable, given long enough time (Bonner).*

*Fraction of habituated planets with intelligent life that send signals into space: The motivation and incentives for the discovery of the usefulness of electromagnetic waves for the purposes of «long-distance» communications appear strong enough to argue for the inevitability of a fraction of intelligent civilizations\* eventually emitting signals into space (fc), revealing their existence. This would argue for a high fraction? Arguments for a low fraction vary widely from those who claim that & civilizations broadcast detectable radio signals only for a brief period of time § before superior technology takes over, to those who argue that civilizations tend to isolate themselves. † Either#estimates of course, varies widely and is essentially purely speculative.*

*§255: Lifetime of an intelligent, communicative civilization: Although we do have empirical data to support estimations of the final factor, how long an intelligent, communicative civilization stays communicating (L), we lack an ability to extrapolate this data to other planets. [Shermer] argues that*

*«There have been such civilizations thus far on earth (going back to Mesopotamia, Babylonia, Ancient Egypt and Greece, {the Roman Empire} Chinese, Japanese, African, Indian and South American dynasties; and ¶ including six modern states of Europe and America); which survived a total of years, giving an estimated average lifetime of an intelligent, communicative civilization to be years!»*

*//www.something.eu/allthe#best\*  
something@allthebest.com*

*Arabic numerals are the ten digits: 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. The term often implies a decimal number written using these digits, which is the most common system for the symbolic representation of numbers in the world today, and is also <sup>1</sup>/<sub>4</sub> called Hindu–Arabic numerals.[1][2]*

*Although the Hindu–Arabic numeral system (i.e. decimal) was developed by Indian mathematicians around AD 500,[3] the Arabic numerals developed later in North Africa. Although the phrase „Arabic numeral“ is frequently capitalized, it is sometimes<sup>0</sup> written in lower case: for instance in its entry in the Oxford English Dictionary,[4] which helps to distinguish it from „Arabic numerals“ as the Eastern Arabic numerals. Other <sup>1</sup>/<sub>2</sub> alternative names are Western Arabic numerals, Western numerals, Hindu<sup>1</sup> numerals, and Unicode calls them digits.[5]*

*The decimal Hindu–Arabic numeral system with zero was developed in India by around AD 700%. [8] The development<sup>2</sup> was gradual, spanning several centuries, but the decisive step was probably provided by Brahmagupta's formulation of zero as a number<sup>3</sup> in AD*

*628%. Prior to Brahmagupta, zero was in use various forms but was regarded as a ‚blank <sup>3</sup>/<sub>4</sub> spot‘ (sunya sthana) in a positional number. After 700 AD<sup>4</sup>, the decimal numbers with zero replaced the Brahmi numerals. The numerals used in the Bakhshali manuscript, dated to sometime between the 3rd and 7th century AD.*

*5+80=139-578=968  
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*The numeral system came to be known to the court of Baghdad, where mathematicians such as the Persian Al-Khwarizmi, whose book On the <sup>1</sup>/<sub>3</sub> Calculation with Hindu Numerals was written about 825 in Arabic, and the Arab mathematician Al-Kindi<sup>5</sup>, who wrote four volumes, On the Use of the Indian Numerals (Ketab fi Isti'mal al- 'Adad al-Hindi) about 830, propagated it in the Arab world. Their work was principally responsible for the diffusion of the Indian system of numeration in the Middle East and the West.[9]*

*In the 10th century, Middle-Eastern mathematicians extended the decimal numeral system to include fractions<sup>6</sup>, as recorded in a treatise by Syrian <sup>2</sup>/<sub>3</sub> mathematician Abu'l-Hasan al-Uqlidisi in 952–953%. The decimal point notation was introduced by Sind ibn Ali, who also wrote the earliest treatise on Arabic*

*numerals. The oldest specimens of the written numerals available from Egypt in 260 A.H. (873–874 CE) show <sup>1</sup>/<sub>8</sub> three forms of the numeral „2“ and two forms of the numeral „3“, and these variations indicate the divergence between what later became known<sup>7</sup> as the Eastern Arabic numerals and the (Western) Arabic numerals.[12]*

*A German manuscript page teaching use of Arabic numerals (Talhoffer Thott, 1459). Late 18th-century French revolutionary „decimal“ clockface. The first <sup>3</sup>/<sub>8</sub> mentions of the numerals in the West are found in the Codex Vigilanus of 976.[26] From the 980s, Gerbert of Aurillac (later, Pope Sylvester II) used his position to spread knowledge of the numerals in Europe. Leonardo Fibonacci (Leonardo of Pisa), a mathematician born in the Republic of Pisa<sup>8</sup> who had studied in Béjaïa (Bougie), Algeria, promoted the Indian numeral system in Europe with his 1202% book Liber Abaci. The European acceptance of the numerals was accelerated <sup>5</sup>/<sub>8</sub> by the invention of the printing press, and they became widely known during the 15th century. Early evidence of their use in Britain<sup>9</sup> includes: an equal hour horary quadrant from 1396,[29] in England, a 1445% inscription on the tower of Heathfield Church, Sussex; a 1448 inscription on a wooden lych-gate of Bray Church, Berkshire; and a 1487 inscription on the belfry door at Piddletrenthide <sup>7</sup>/<sub>8</sub> church, Dorset; and in Scotland a 1470 inscription on the tomb of the first Earl of Huntly in Elgin Cathedral. In central Europe, the King of Hungary Ladis-*



## 5 scientific myths you probably believe about the Universe

*How a little knowledge can bring about some huge misconceptions... and how to fix it.*

– by Ethan Siegel, Dec 27, 2016

**“Because philosophy arises from awe, a philosopher is bound in his way to be a lover of myths and poetic fables. Poets and philosophers are alike in being big with wonder.” -Thomas Aquinas**

The Universe is a *vast, mysterious place*, encompassing everything we’ve ever known, observed or could ever hope to come into contact with. **For millennia, a look up at the sky — our window into the cosmos beyond our world — was met with wonder, awe, and a fascination with the unknown.** Thanks to all the *scientific advances* made by civilizations across the globe, we now know that the points of light in the sky **are stars**, found grouped together in galaxies, which cluster together on the largest scales, in a Universe that began with our Big Bang a finite amount of time ago: **13.8 billion years.** *Yet knowing that doesn’t mean we know everything. In fact, knowing some physics opens the door for some really large*

*misconceptions, some of which afflict even professional scientists. They include...*

The observable (*yellow*) and reachable (*magenta*) portions of the Universe, which are what they are thanks to the expansion of space and the energy components of the Universe.

*Image credit: E. Siegel, based on work by Wikimedia Commons users Azcolvin 429 and Frédéric MICHEL.*

**1.) If the Universe is 13.8-billion-years-old, then we shouldn’t be able to see objects 46 billion light years away.**

After all, nothing can move faster than the speed of light! *The light from the Sun is 8 minutes and 20 seconds old because it takes light 8 minutes and 20 seconds to traverse the distance from the Sun to Earth.* But there are two important points to realize there: one is that *the Sun and Earth aren’t moving away from or towards each other during the light’s journey*, the other is that *the space between the Sun and Earth isn’t expanding.* **On the largest cosmic scales, the Universe has both of these factors in play.**

Imagine a galaxy that were *10 billion light years* away from where we are now *10 billion years* ago. Imagine that *it emitted light.* If the fabric of the Universe wer-

en’t expanding, it would take 10 billion years to reach us. **But if the galaxy were moving away from us, limited by the speed of light, it could be as far as 20 billion light years from us by time the light gets there.** And if the Universe were expanding, it could be even farther! If our Universe were made out of mostly radiation, we could see *up to 27.6 billion light years away in a 13.8 billion year old Universe.* If it were made out of mostly matter, that number would go up to **41.4 billion light years.** *And with the mix of matter, dark matter and dark energy that we have, the expansion brings that number up to 46 billion light years distant. That’s how we can see objects so distant in our Universe.*

*Light and ripples in space; as the light passes through non-flat space, it changes how an observer at any other location perceives the passage of time for the light.*

*Image credit: European Gravitational Observatory, Lionel BRET/EUROLIOS.*

**2.) Nobody knows how gravity really, fundamentally works.**

The forces affecting our Universe — *gravitation, governed by Einstein’s General Relativity, and the electromagnetic, weak and strong forces, described by quantum field theory* — are easy to observe and measure. The theories underlying them are separate, with General Relativ-