

svet

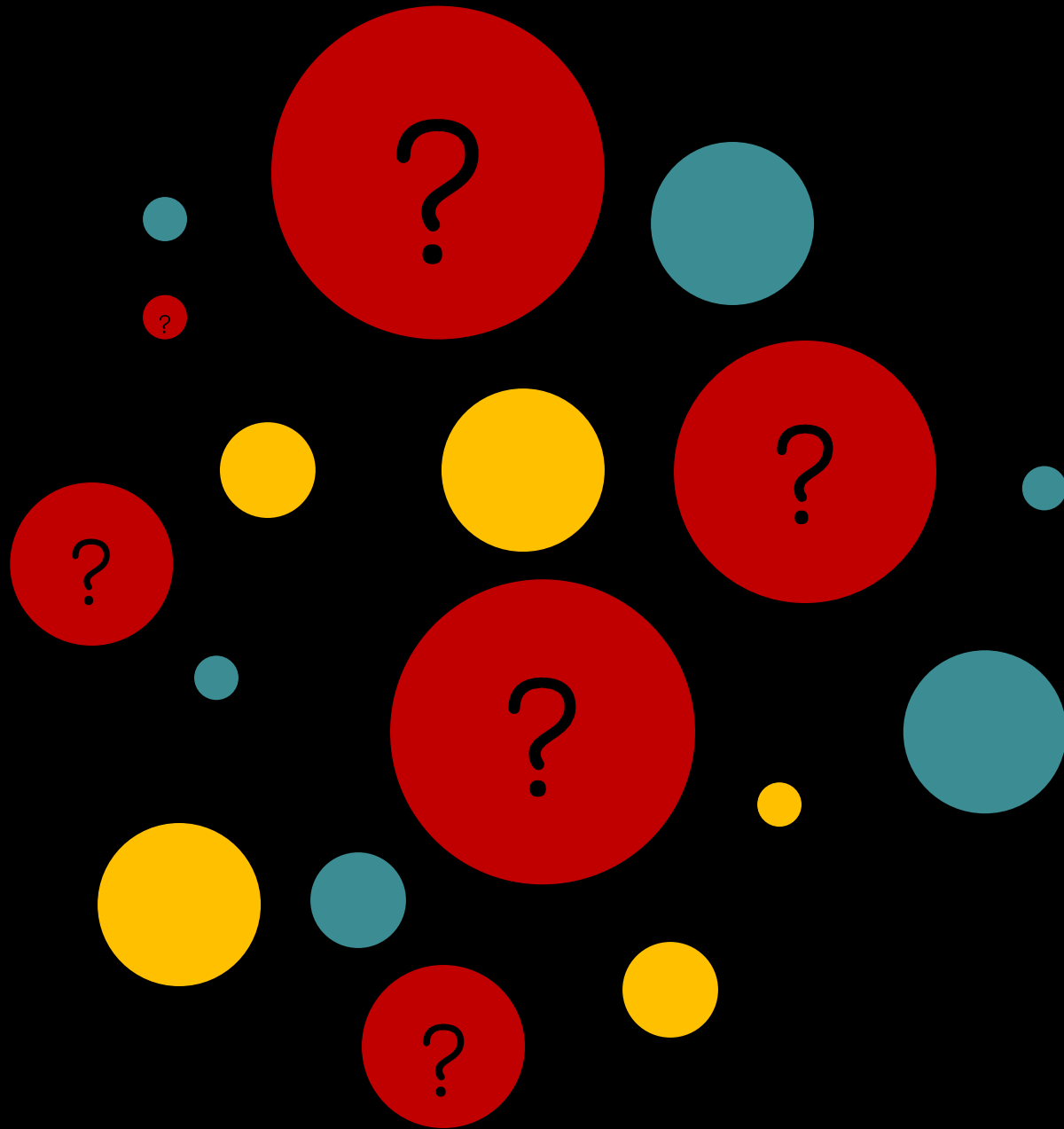


Daniel Nagaj (Uni Wien)

VEDA

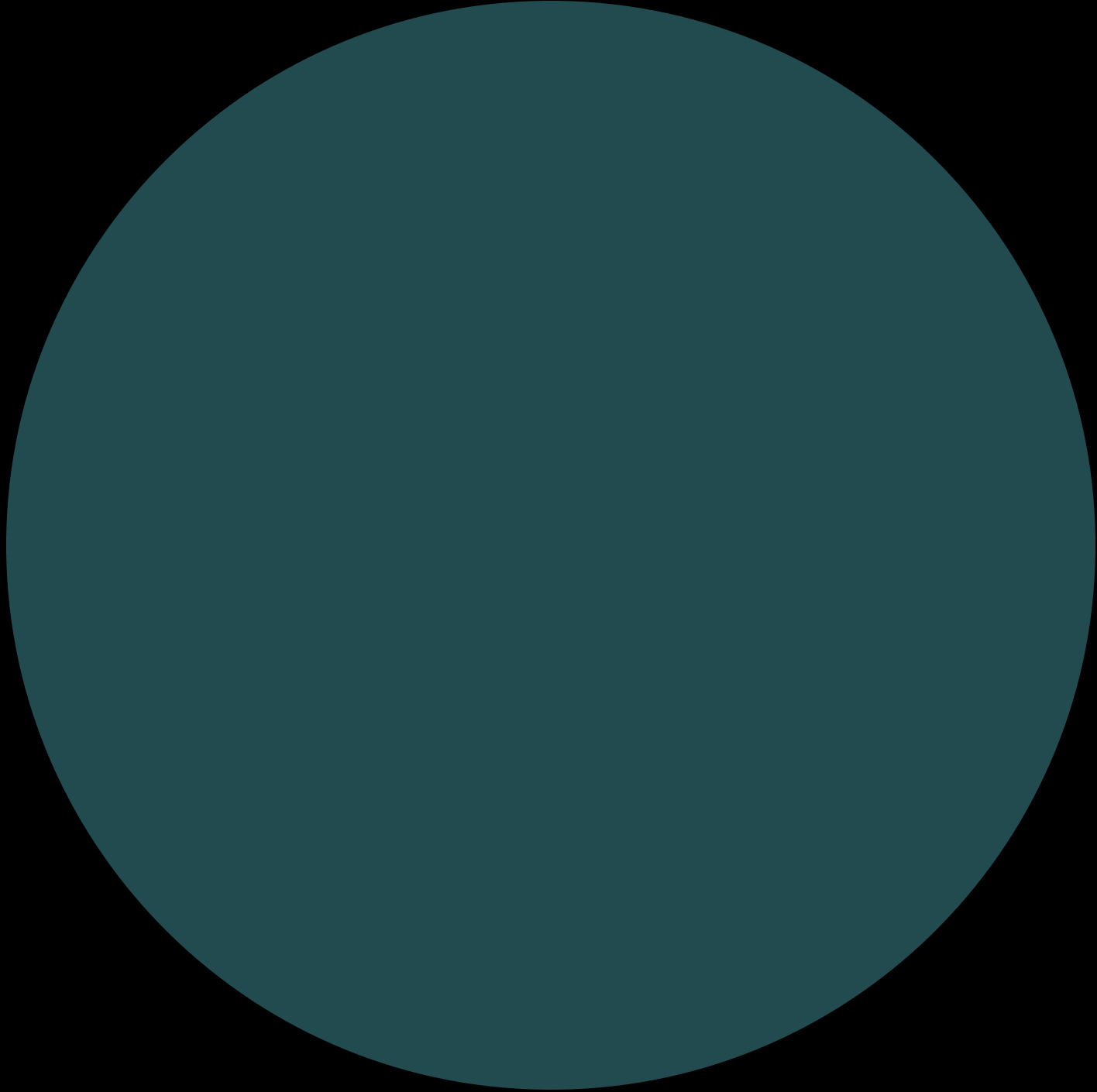
VEDEC

ZVEDAVEC



Z čoho
je zložený
svet?

Ako
funguje?





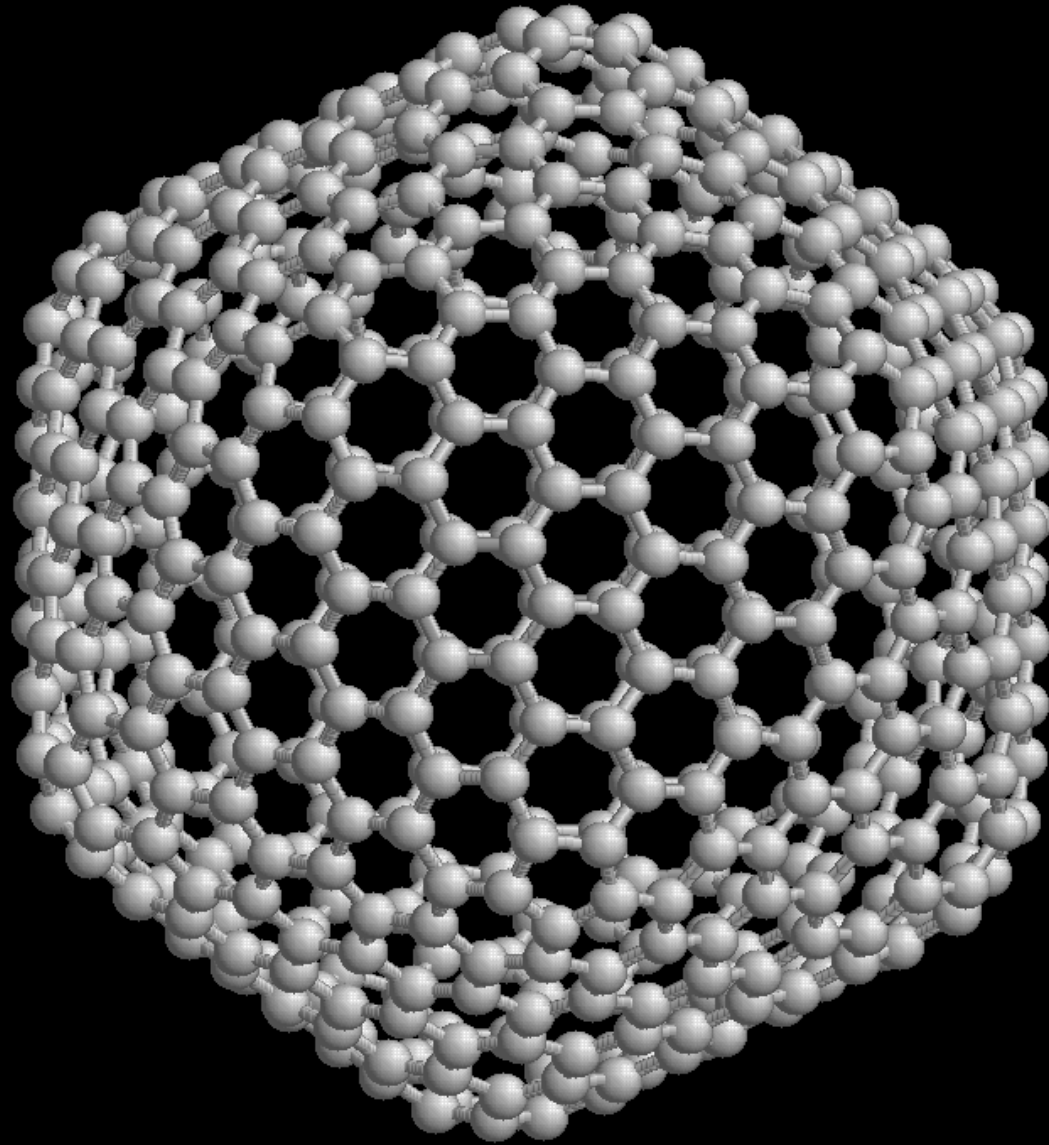


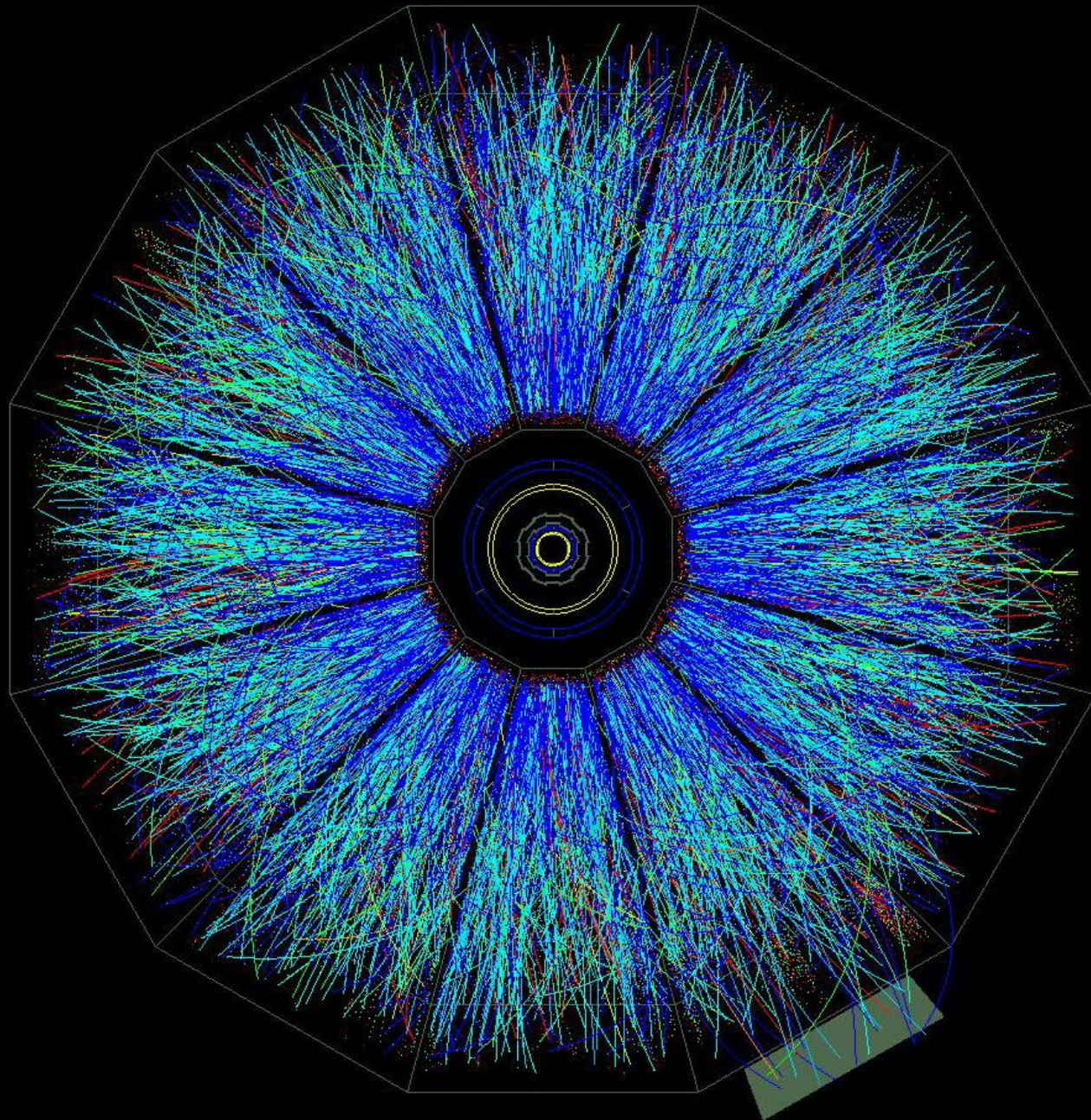
[Ray Stann]



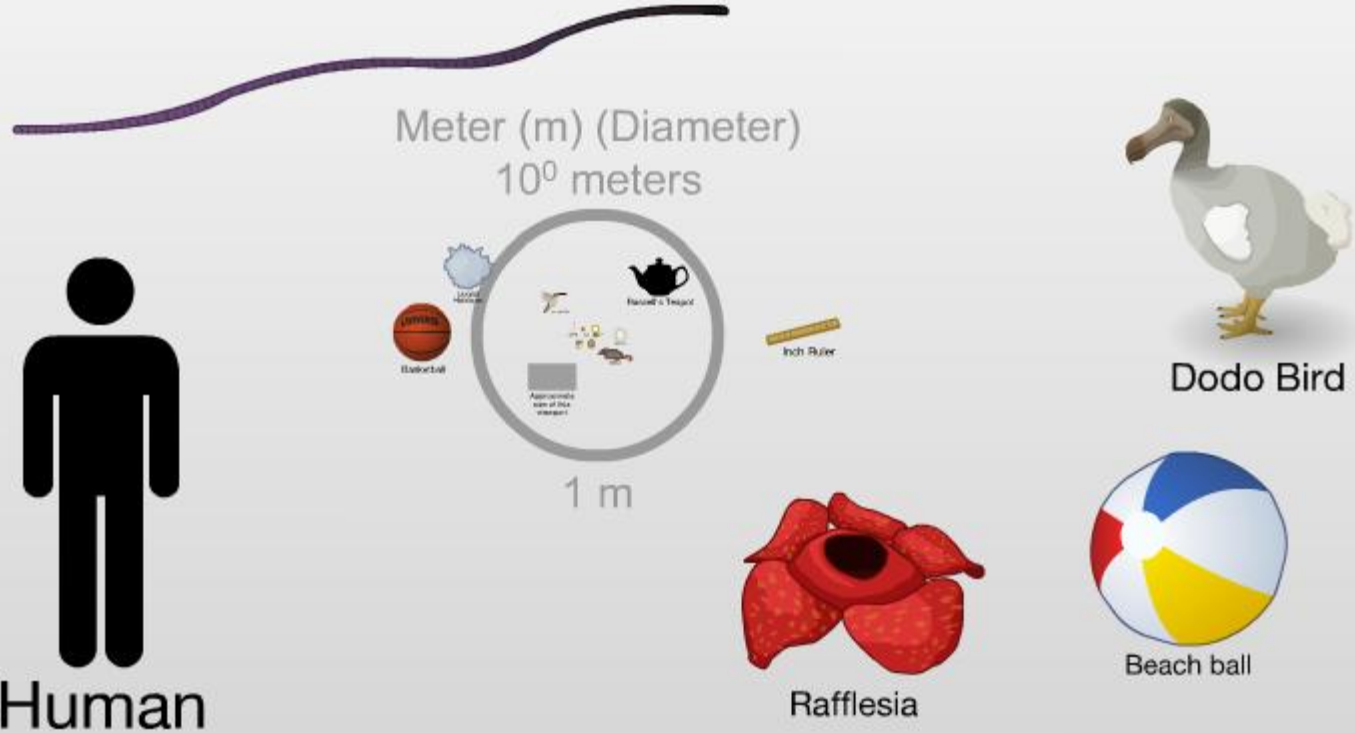
[Gregory H. Revera]







Giant Earthworm



www.htwins.net/scale2/



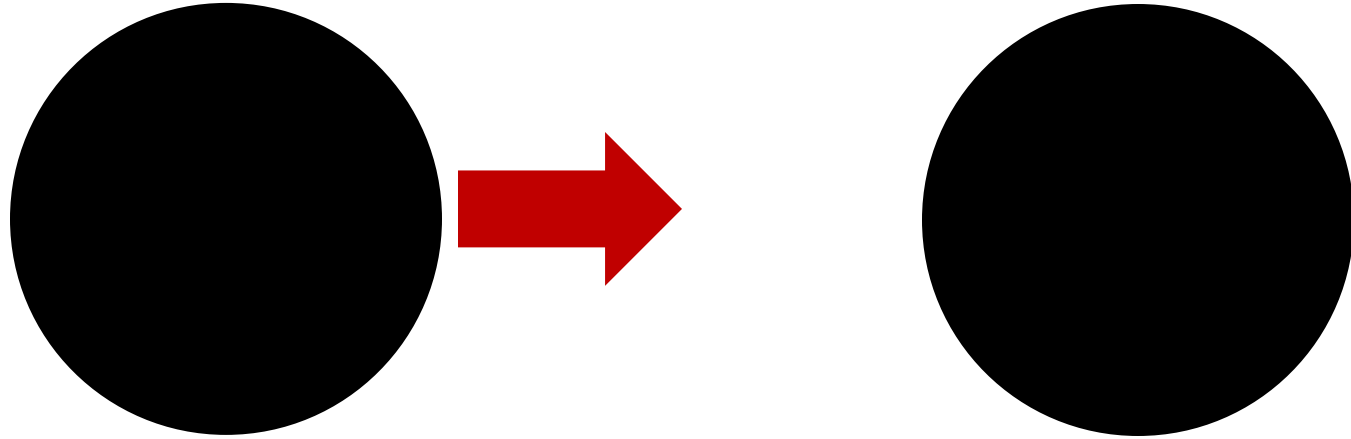
hmotnost'

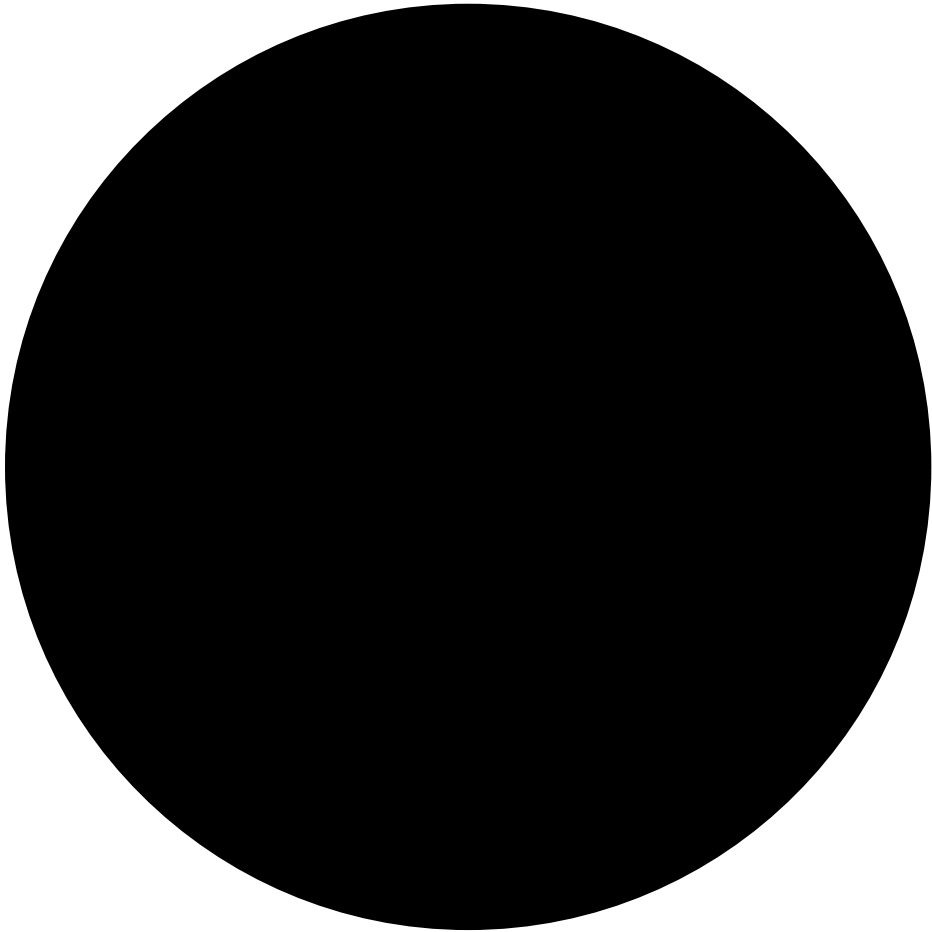


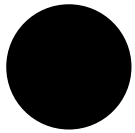
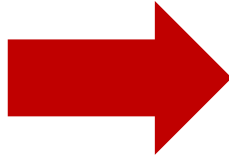
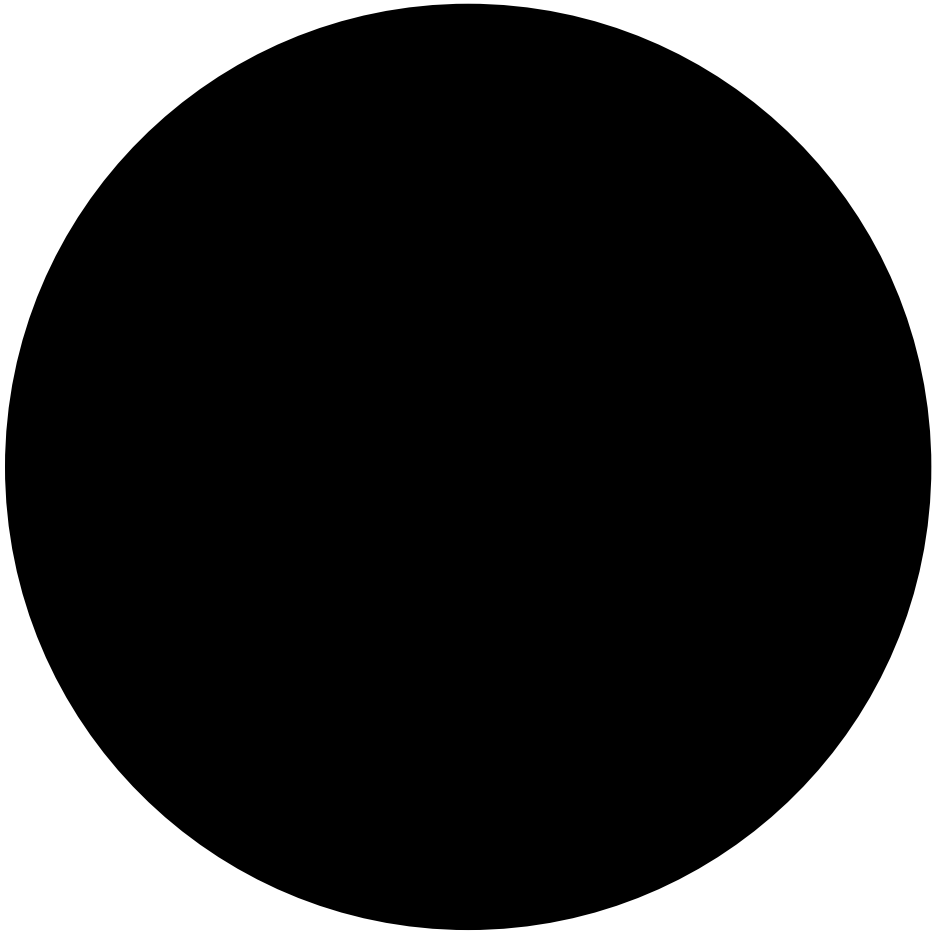
rozbehnúť

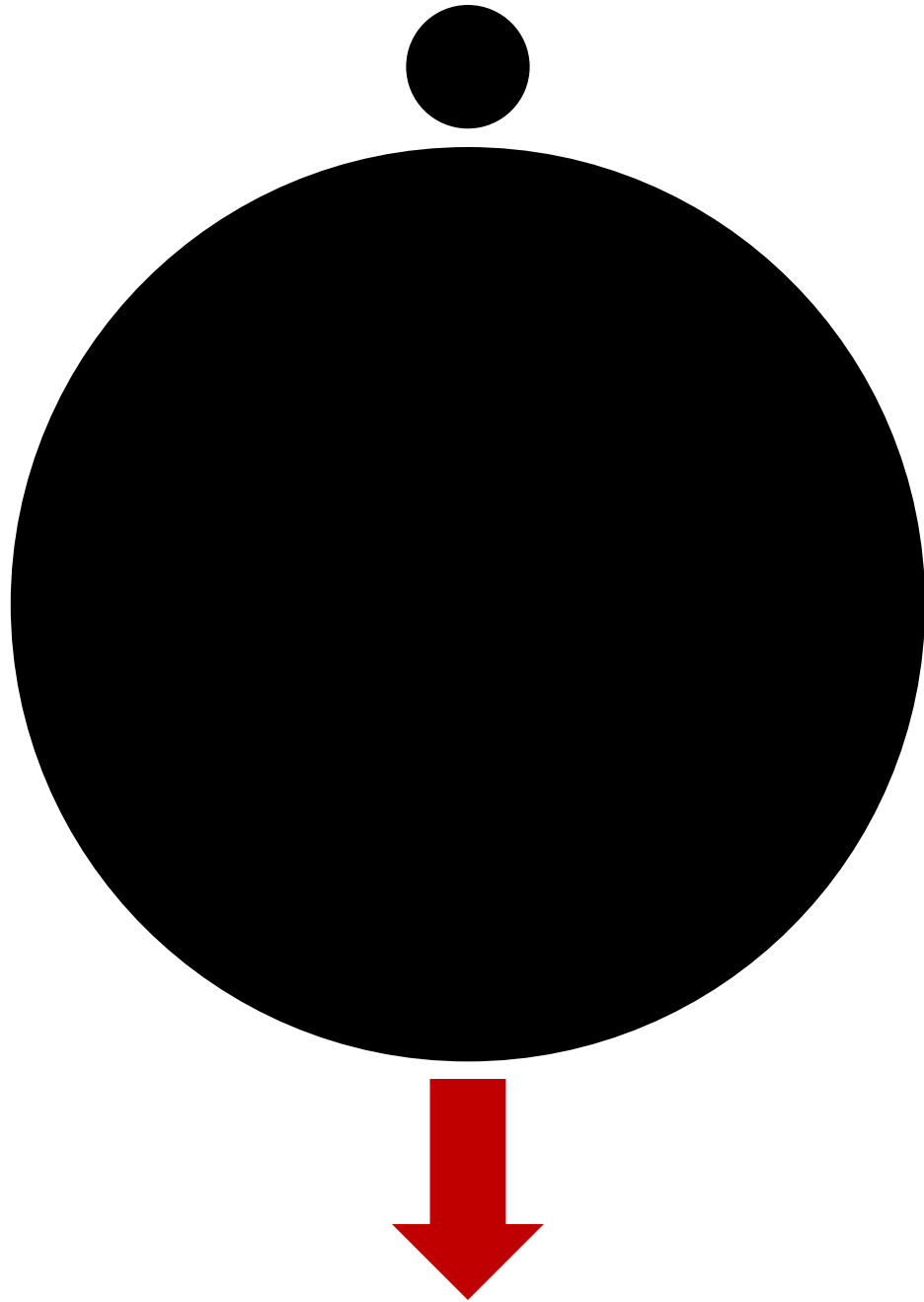
zastaviť



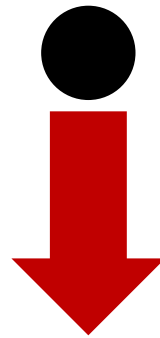
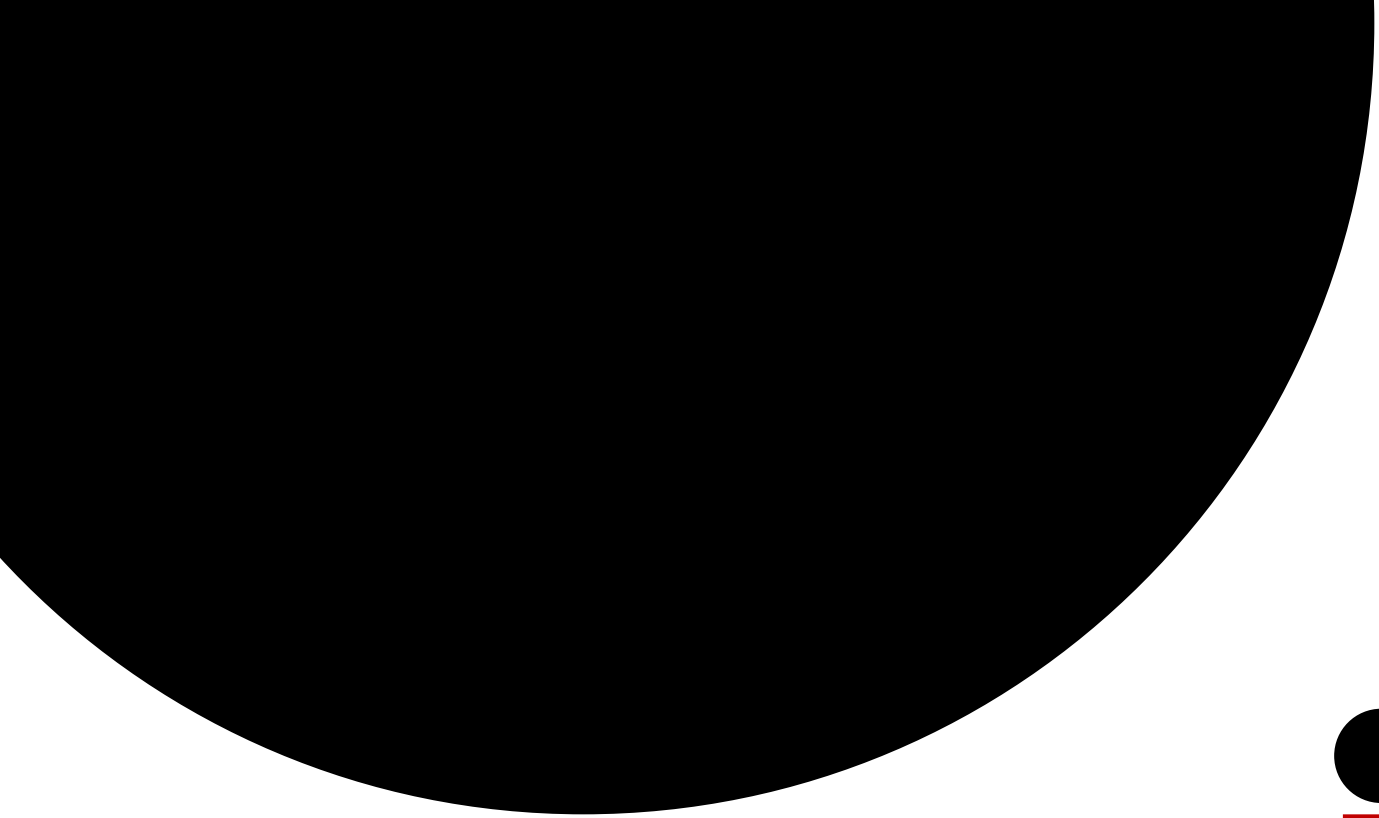


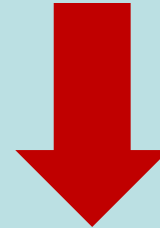
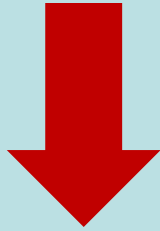














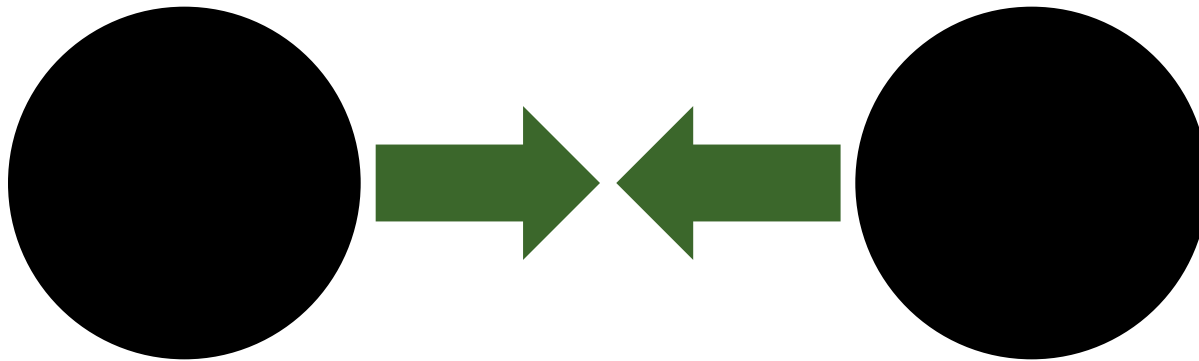
vo vákuu



vo vákuu



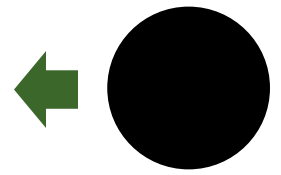
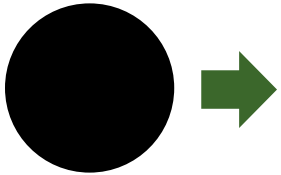
gravitácia



gravitácia



gravitácia



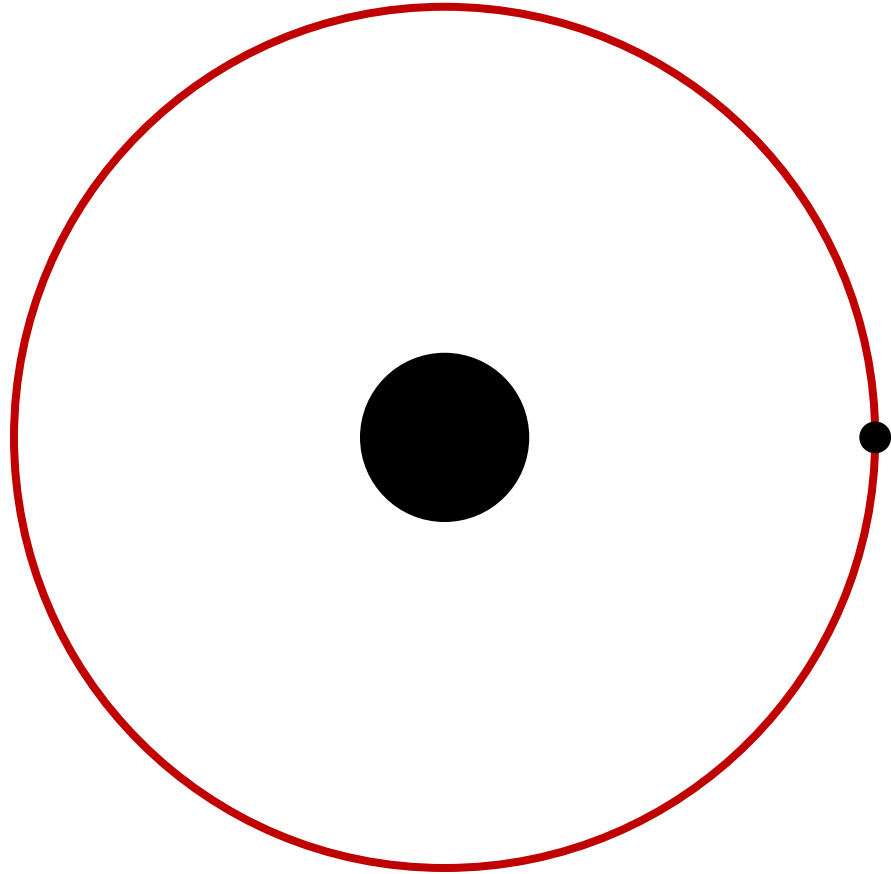
slnečná
sústava

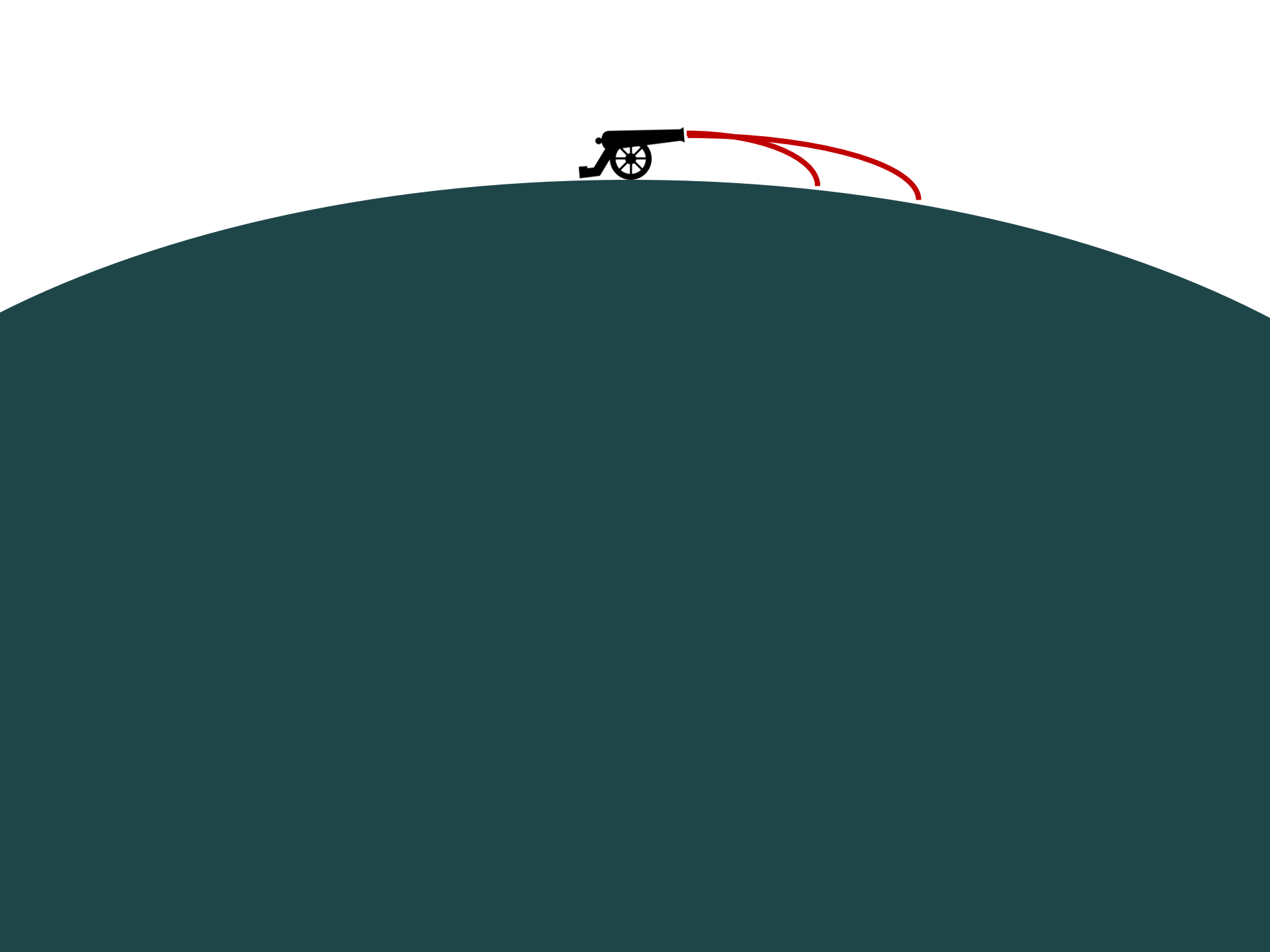


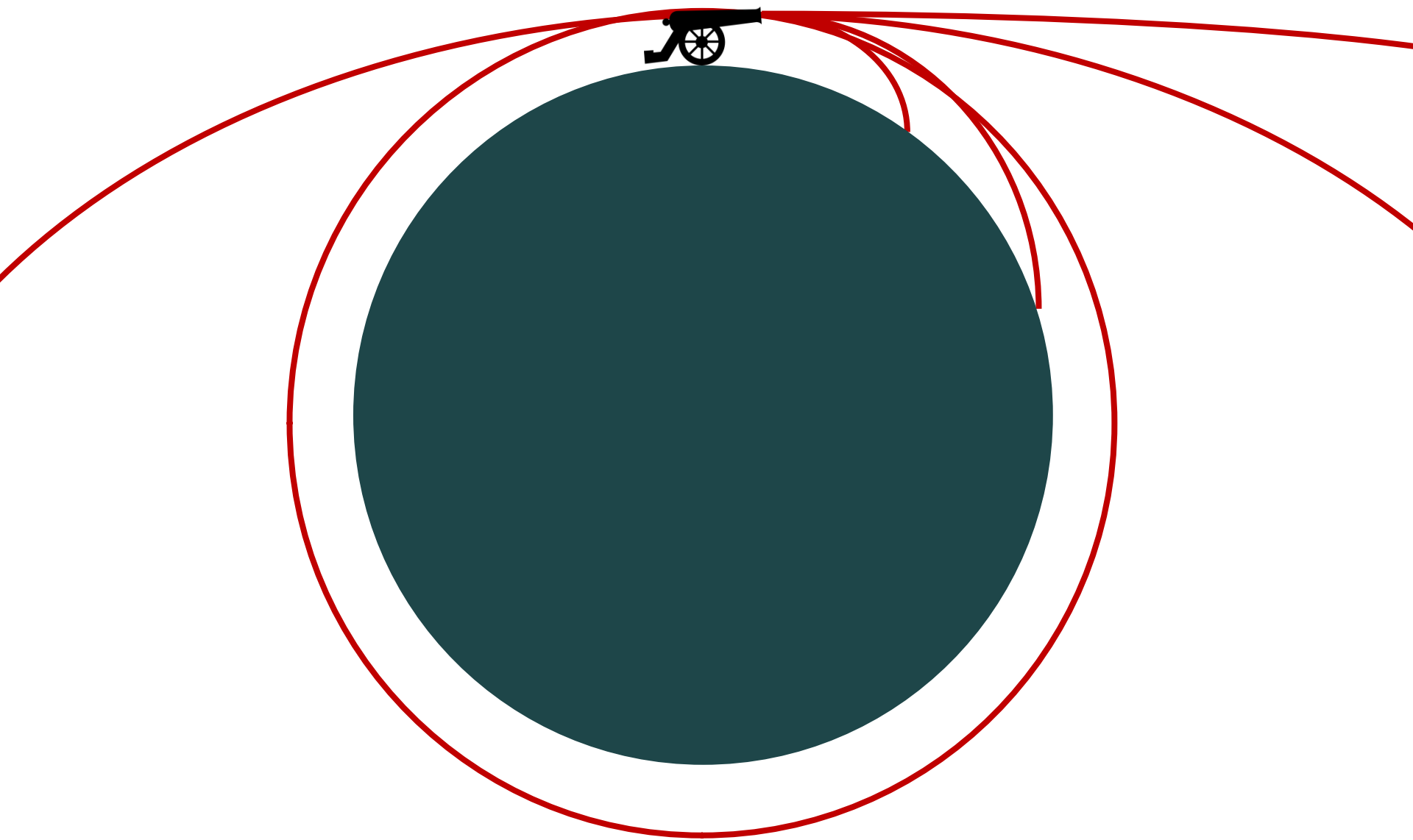
[Comet ISON, Damian Peach]











hmotnosť





formy
hmoty

priesvitné

čierne

na vode
plávající

pórovité

tvrdé

vodivé

hrajúce
všetkými
farbami

rozpuštěné

krehké

drsné

ohybné

výbušné

šmykl'ové

lepkové

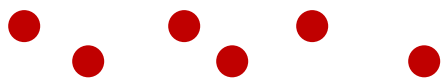
hrdzavejúce



tuhé látky

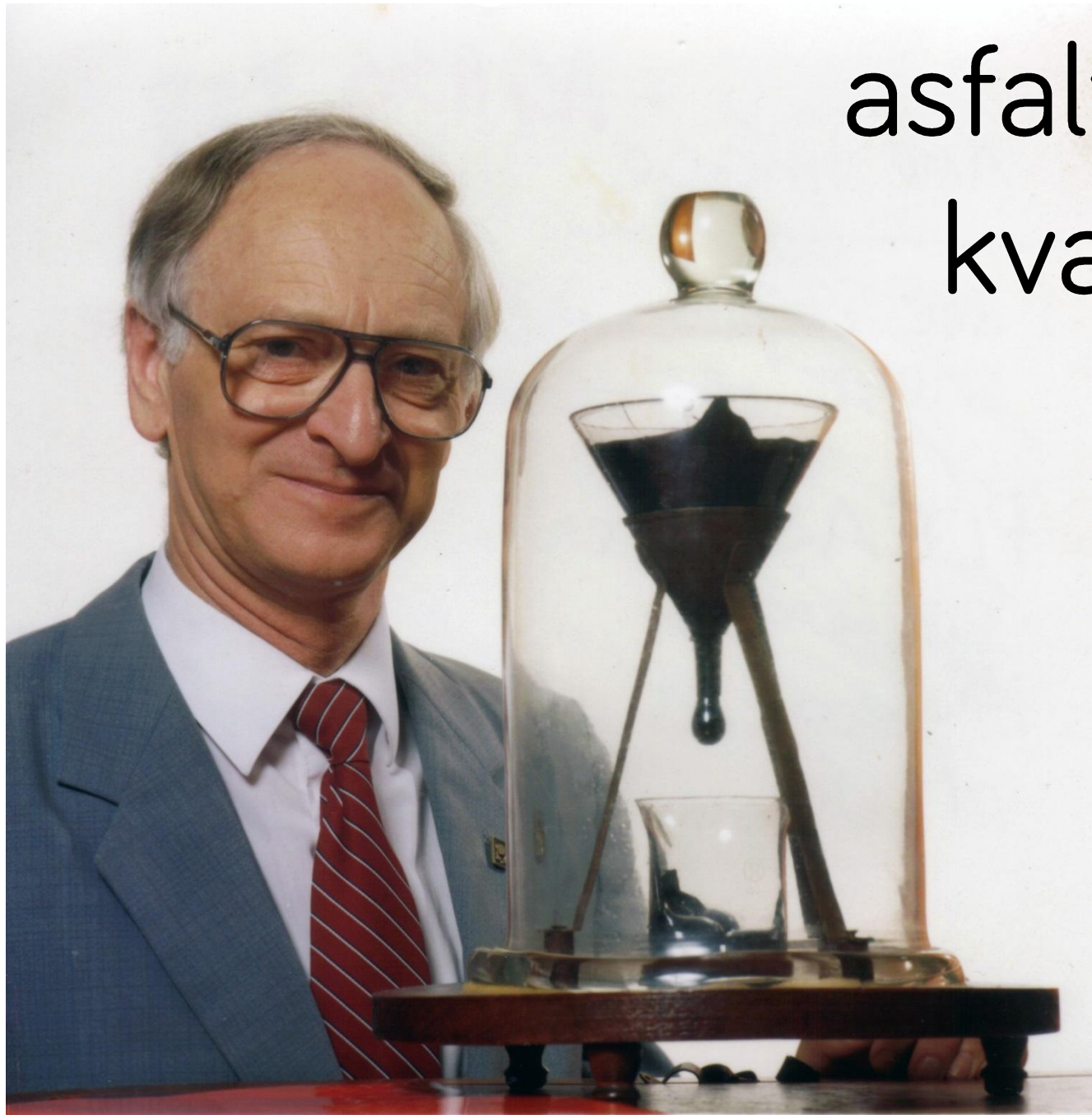


kvapaliny



plyny

asfaltová kvapka



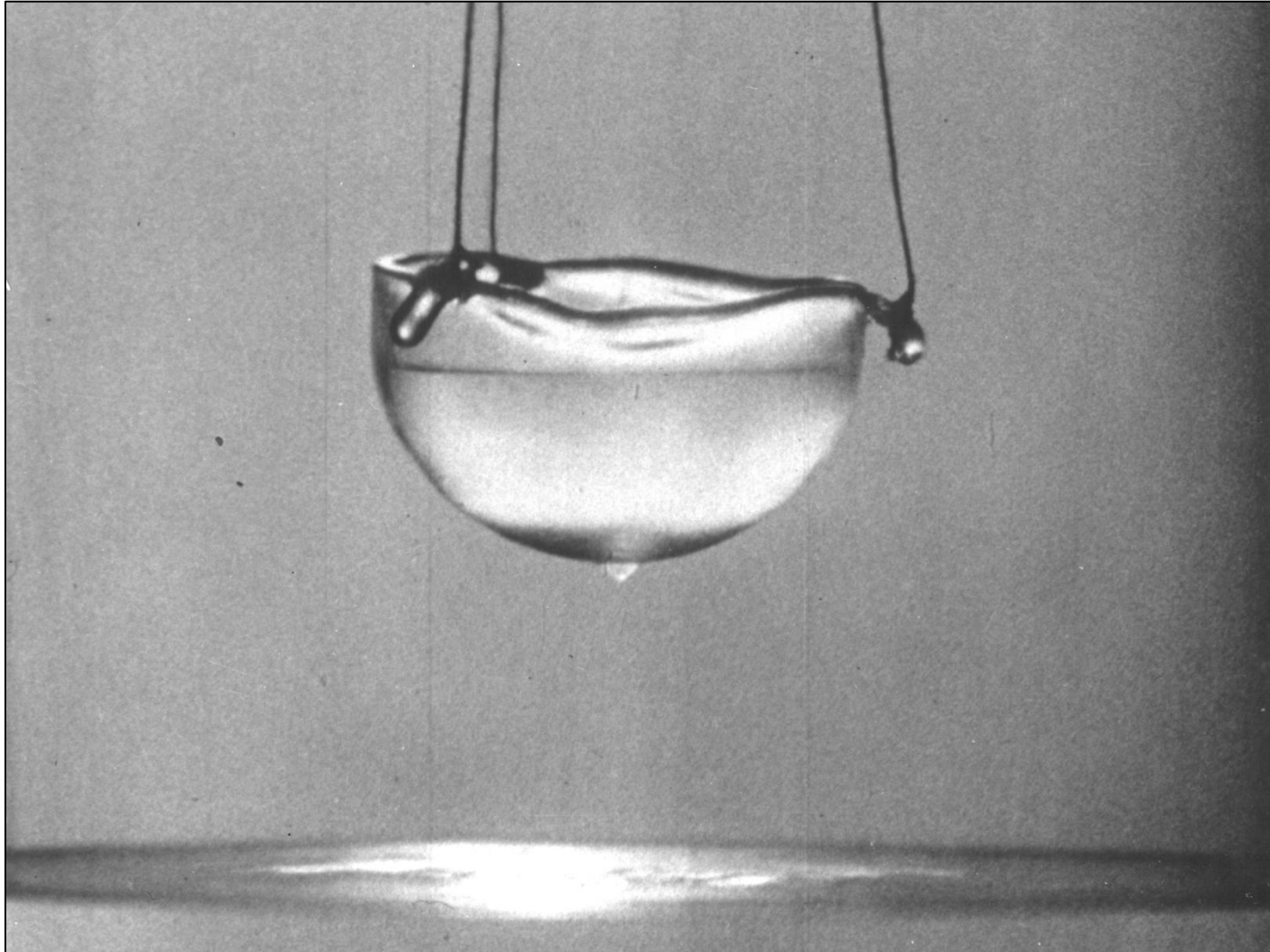
oobleck (voda + maizena)



vzlínanie po
mokrej šnúrke
od čajového
vrecka

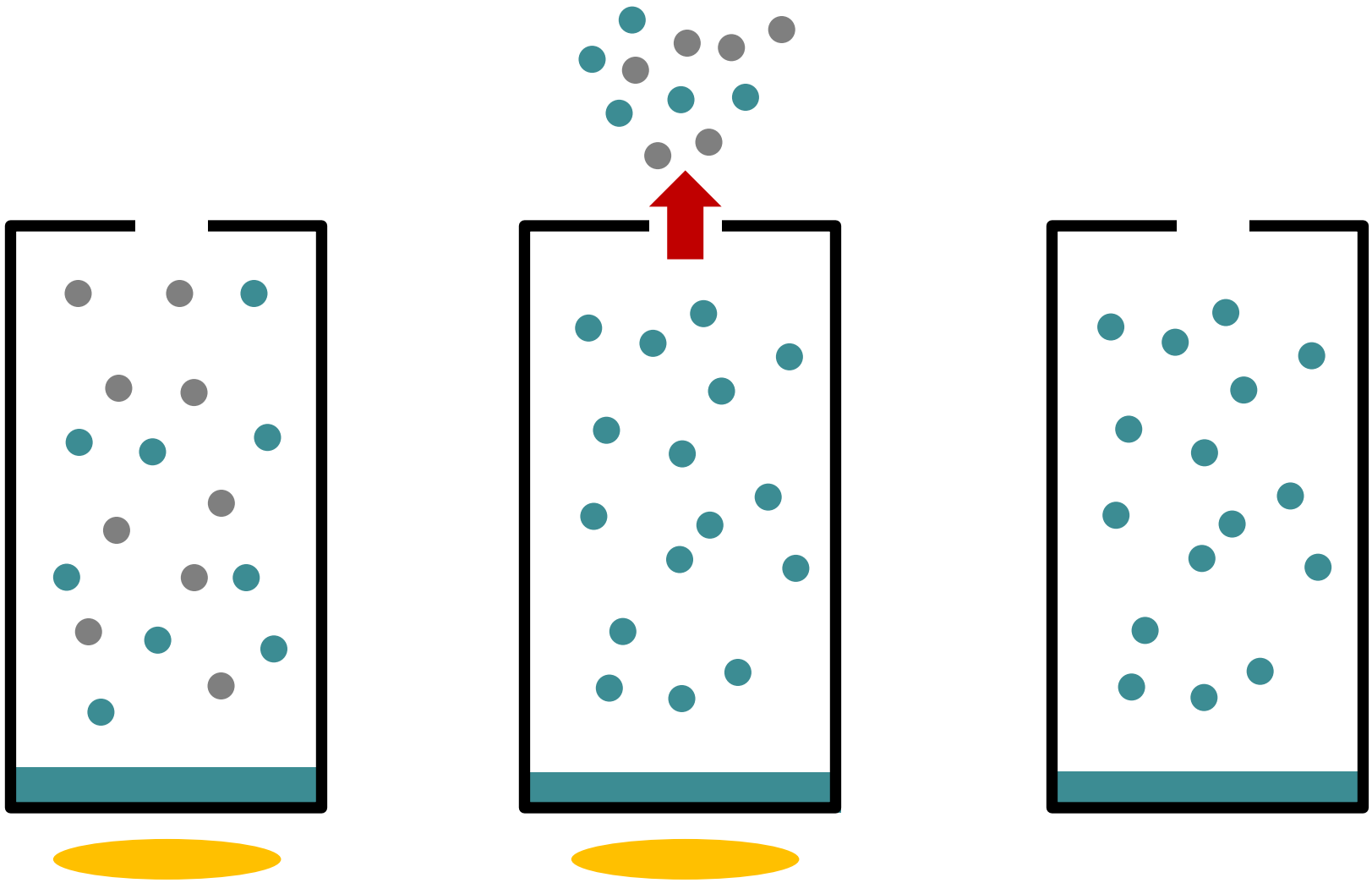


supratekuté Hélium 3

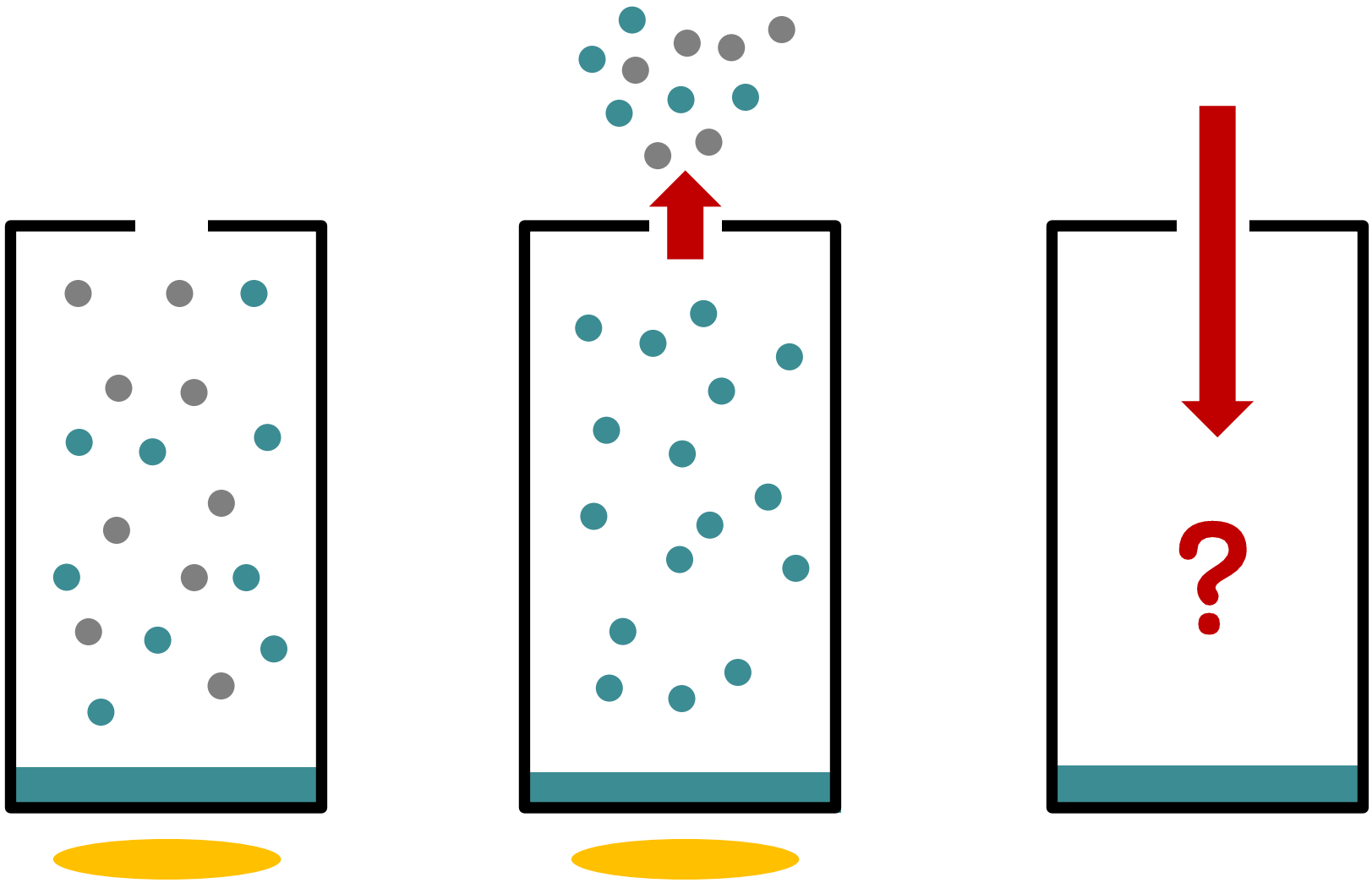




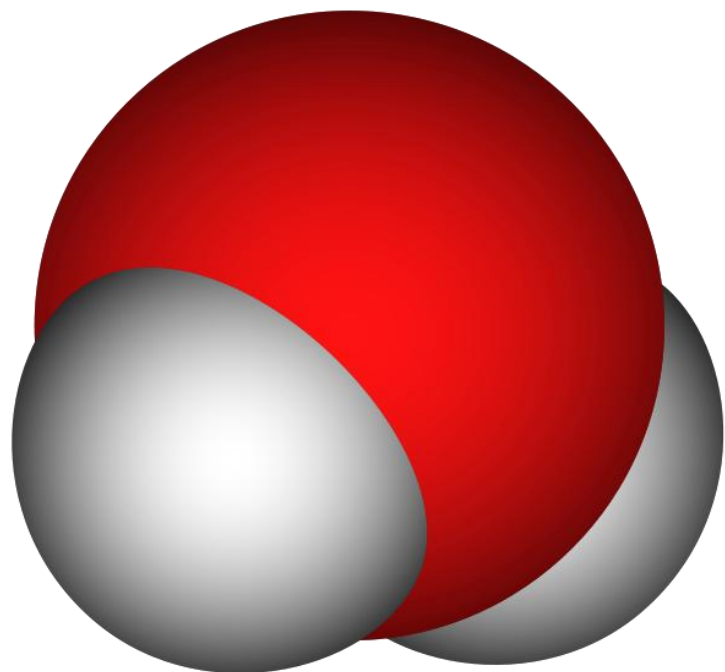
para sa rozpína



para sa **rozpína**, para **kondenzuje**



para sa **rozpína**, para **kondenzuje**



**molekuly
a atómy
zblízka**

1000 × 1000
× 1000 × 1000
× 1000 × 1000
× 1000 × 1000



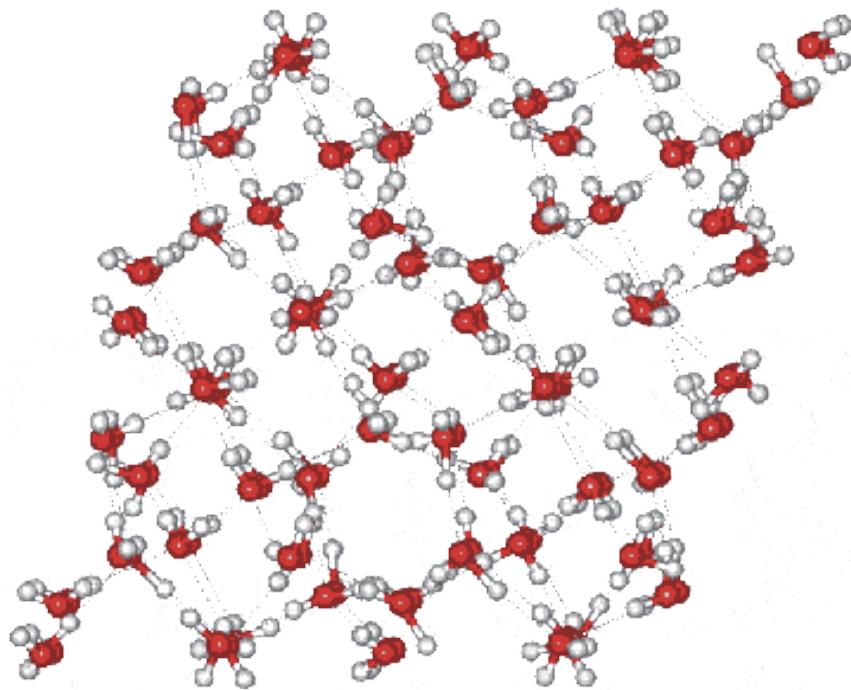
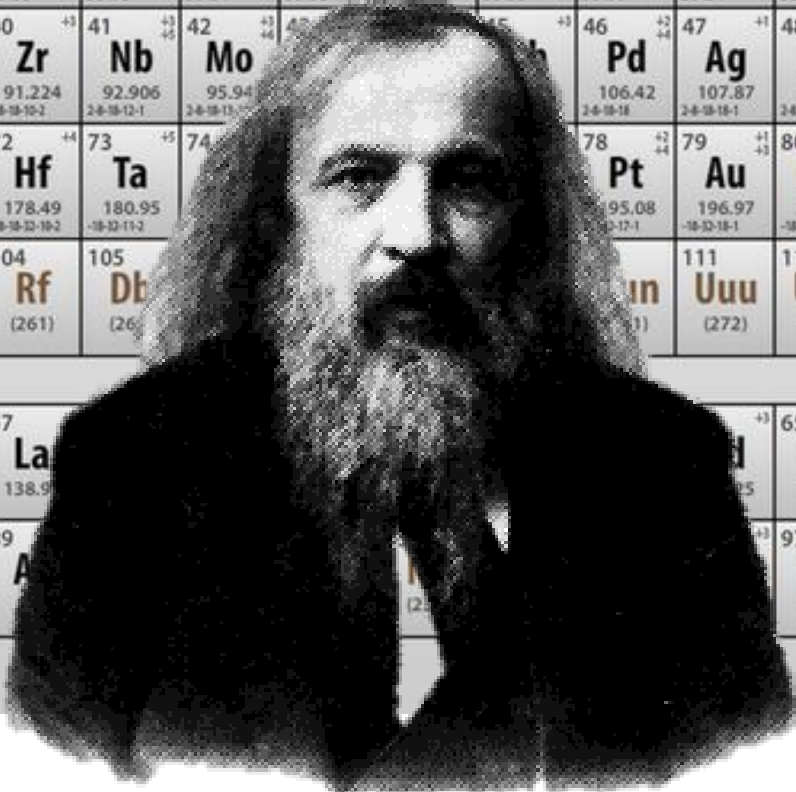


		Table of Common Polyatomic Ions										Element categories					State of matter at 25 °C					
		acetate	C ₂ H ₃ O ₂ ⁻	silicate	SiO ₃ ²⁻	Alkali metals					Gas	Liquid	Solid	Artificially prepared	Unknown							
		chlorate	ClO ₃ ⁻	sulfate	SO ₄ ²⁻	Alkaline-earth metals																
		hydroxide	OH ⁻	thiosulfate	S ₂ O ₃ ²⁻	Transition metals																
		nitrate	NO ₃ ⁻	arsenate	AsO ₄ ³⁻	Other metals																
		permanganate	MnO ₄ ⁻	phosphate	PO ₄ ³⁻																	
		carbonate	CO ₃ ²⁻	ammonium	NH ₄ ⁺																	
		chromate	CrO ₄ ²⁻	hydronium	H ₃ O ⁺																	
		dichromate	Cr ₂ O ₇ ²⁻																			
1	1											13	14	15	16	17	18					
	IA											IIIA	IVA	VA	VIA	VIIA	VIIIA					
1	1											5	6	7	8	9	10					
												B	C	N	O	F	He					
												10.811	12.011	14.007	15.999	18.998	20.179					
2	2											11	12	13	14	15	16					
												Li	Be				Ne					
												6.941	9.0122				20.179					
3	3											19	20	21	22	23	24					
												Na	Mg				Ar					
												22.990	24.305				39.948					
4	4											39	40	41	42	43	44					
												K	Ca				Kr					
												39.098	40.078				83.80					
5	5											55	56	57	58	59	60					
												Rb	Sr				Xe					
												85.468	87.62				131.29					
6	6											72	73	74	75	76	77					
												Hf	Ta				Rn					
												178.49	180.95				(222)					
7	7											104	105	106	107	108	109					
												Rf	Db				Uuo					
												(261)	(262)				(294)					
												57	58	59	60	61	62					
												La	Ce				Lu					
												138.9	140.1				174.97					
												89	90	91	92	93	94					
												Ac	Th				Lr					
												(261)	(262)				(262)					



Selected Oxidation States

Atomic Number

Symbol

Electron Configuration

Atomic Mass

21	+
Sc	
44.956	
3d-4s-2	





síra

med'



1 kg zlata?

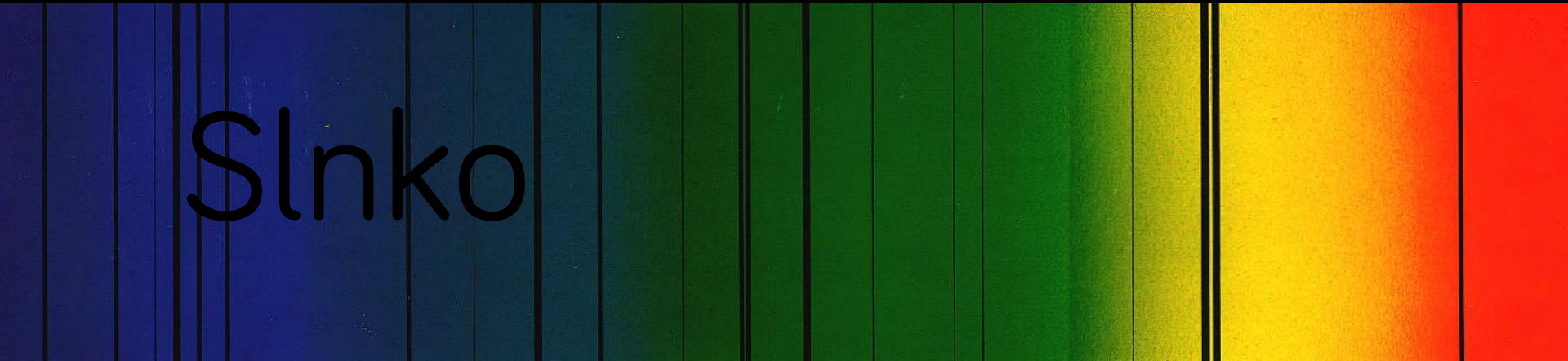


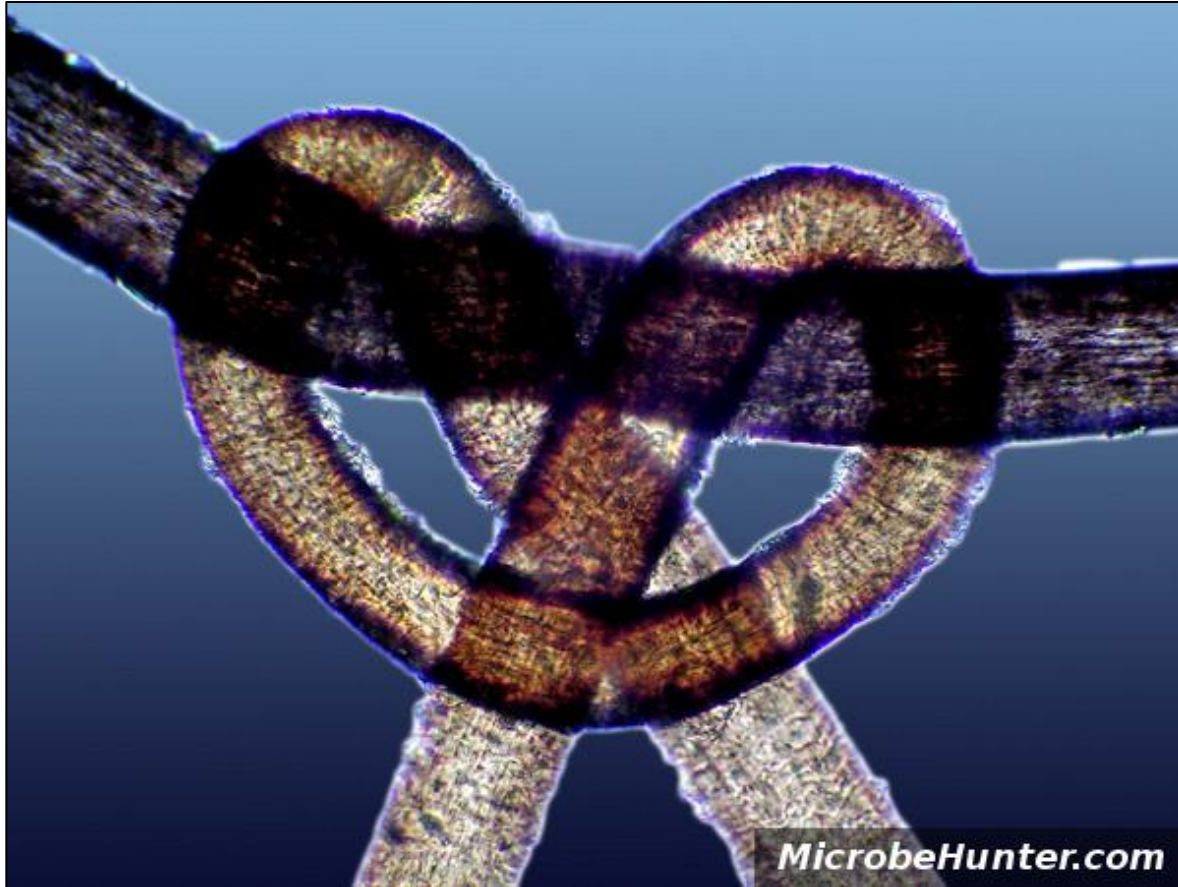
spektroskopia

sodíková výbojka



Slnko





mikroskop



Röntgen

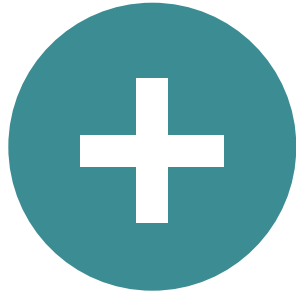
[Tetbury Hospital]

elektrónový mikroskop

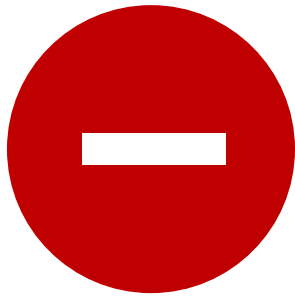


elektrónový mikroskop



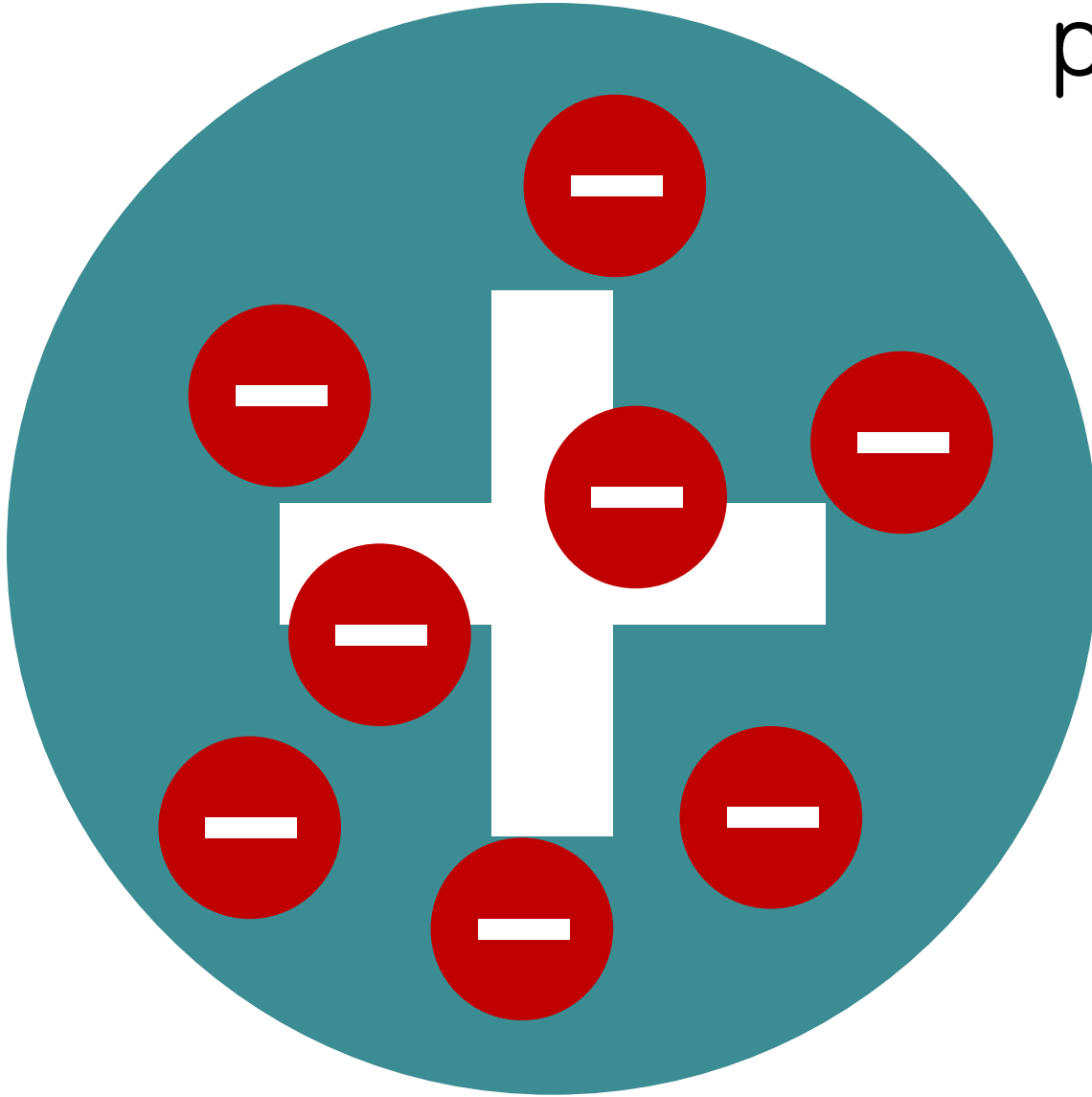


elektrický
náboj

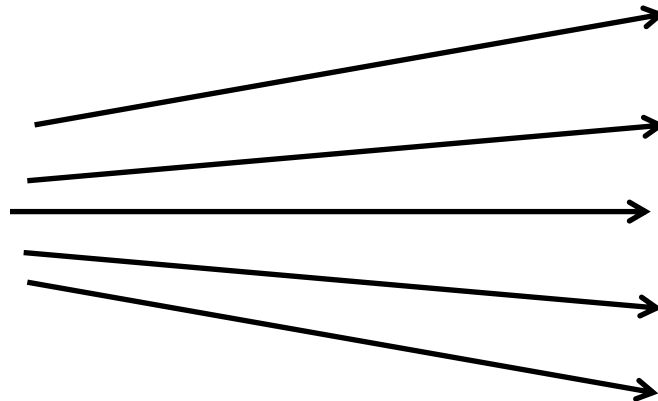
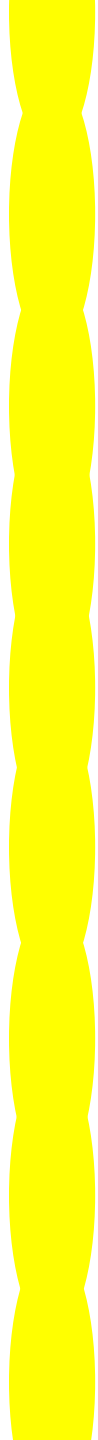


elektrón

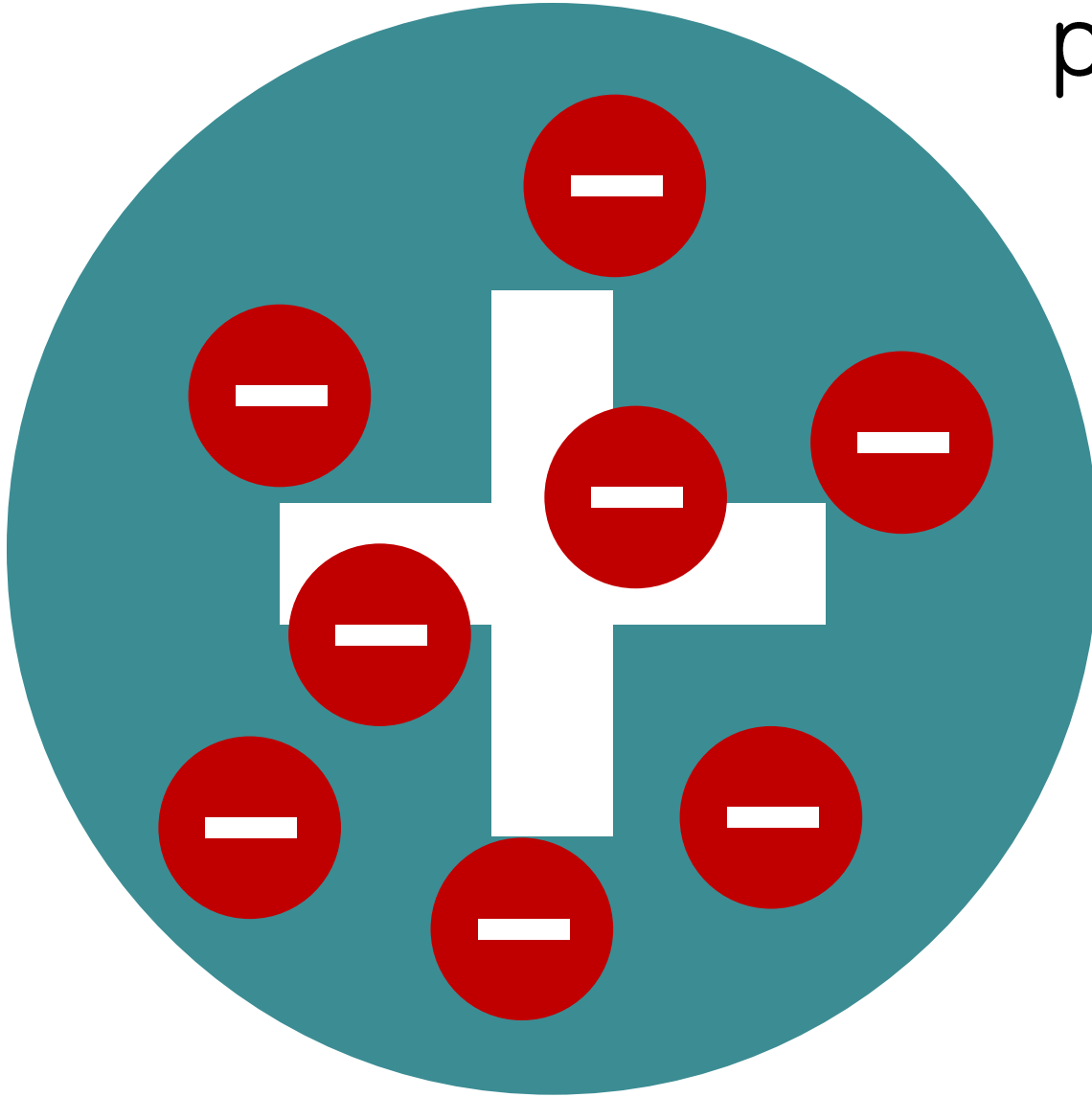
puding



Geiger
Marsden
Rutherford
1909



puding

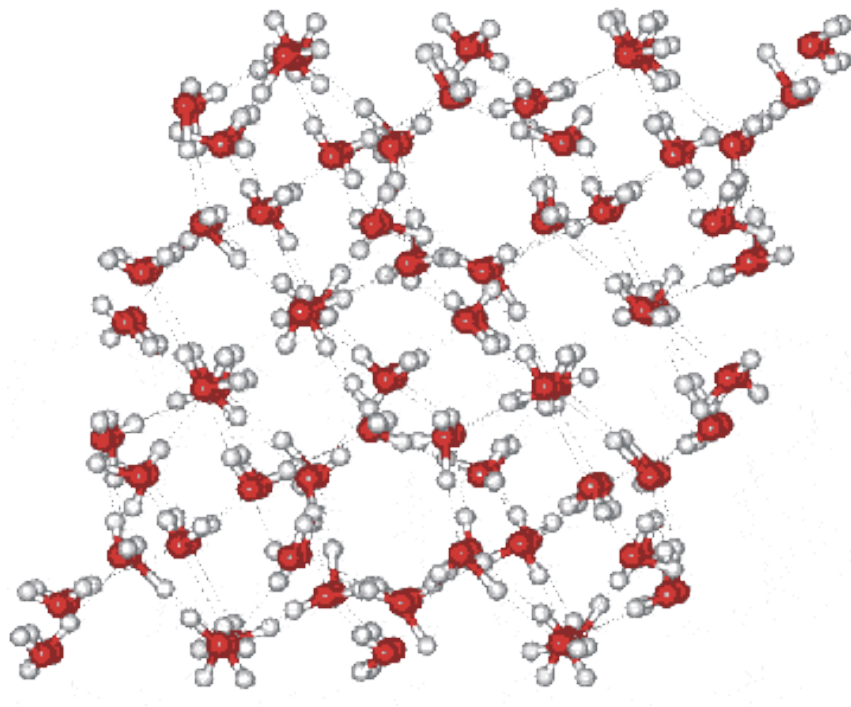


obal

- + jadro

2000x ťažšie

50000x menšie





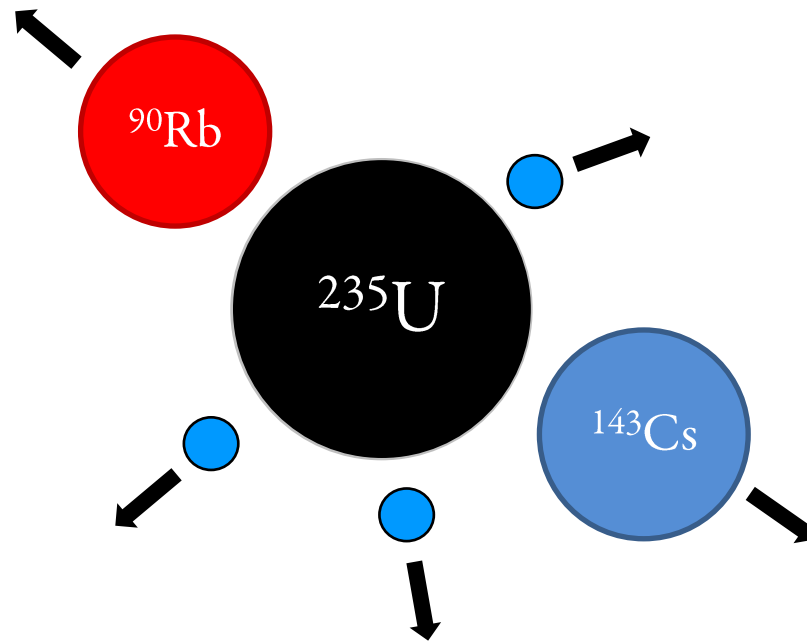
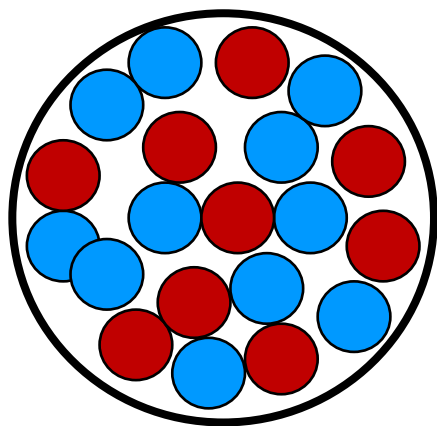
jadrové elektrárne
jadrové výbuchy
jadrová fúzia



rádioaktivita





-  Protón
-  Neutrón

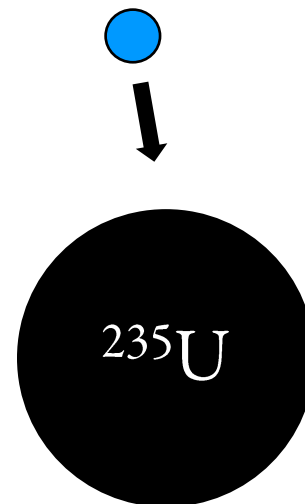
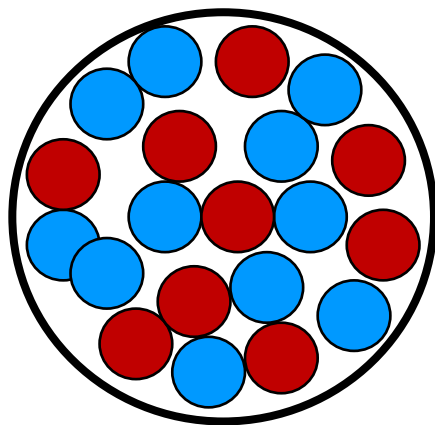


samovolný rozpad

rádioaktivita





-  Protón
-  Neutrón

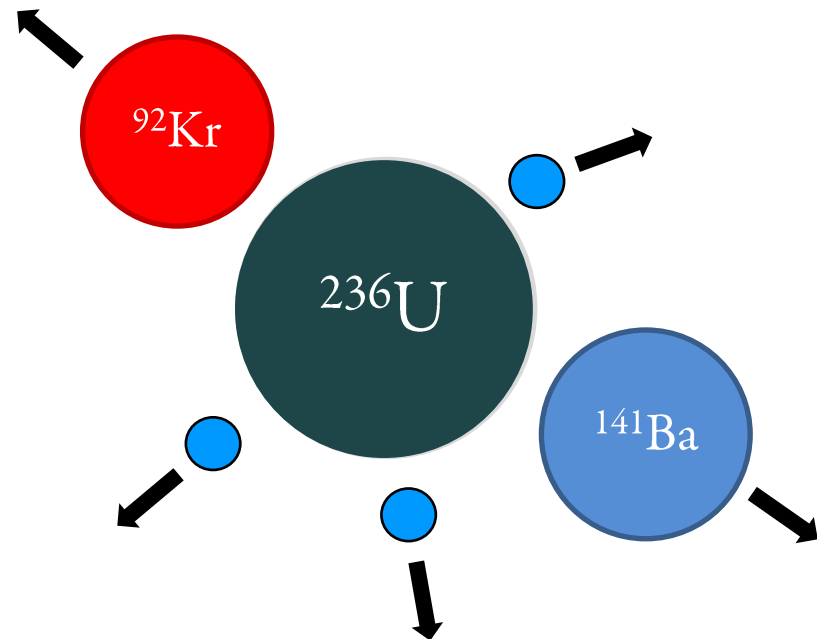
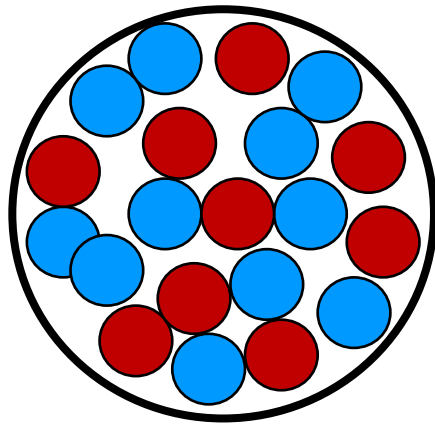


indukovaný rozpad

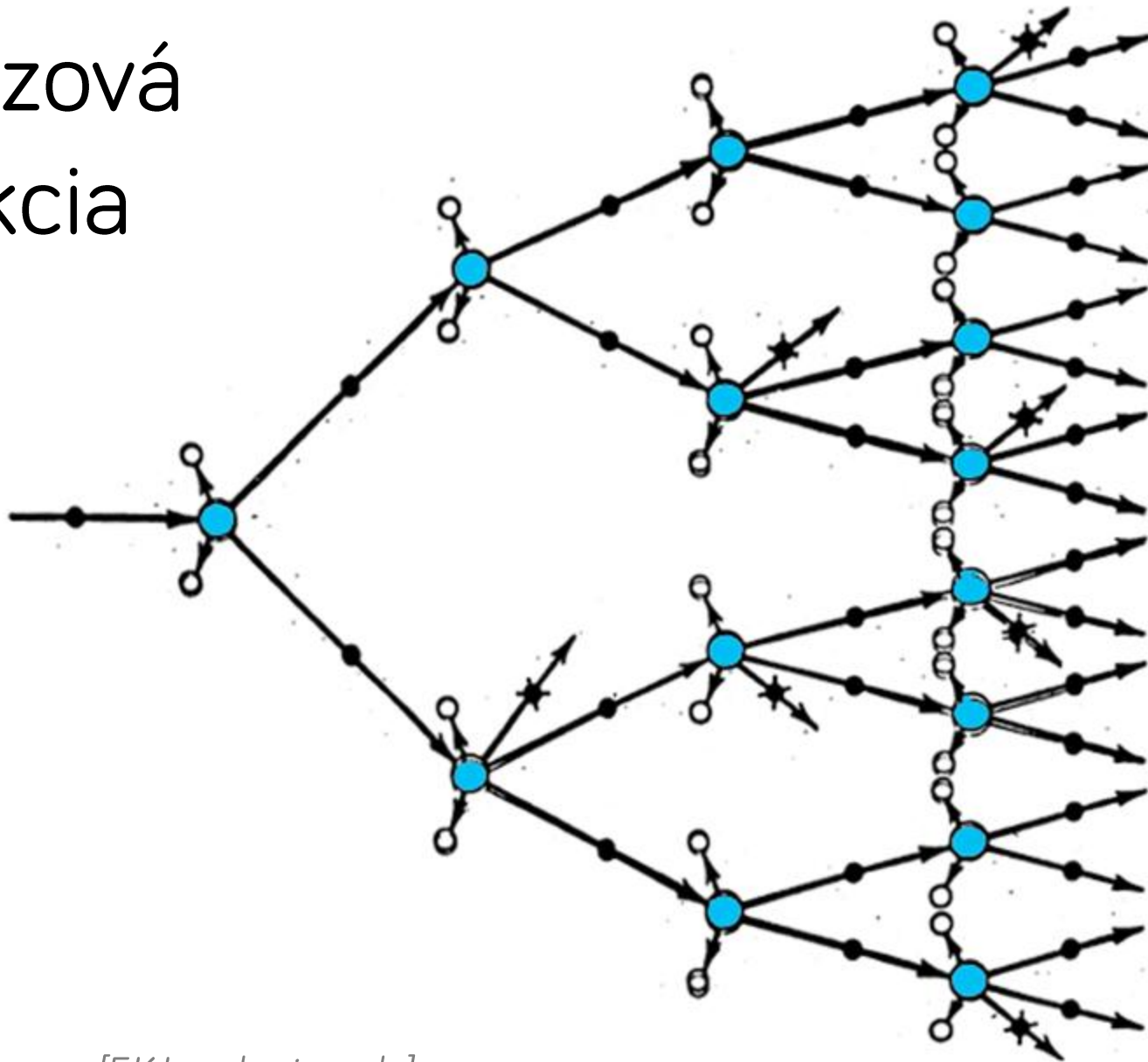
rádioaktivita



-  Protón
-  Neutrón



reťazová reakcia

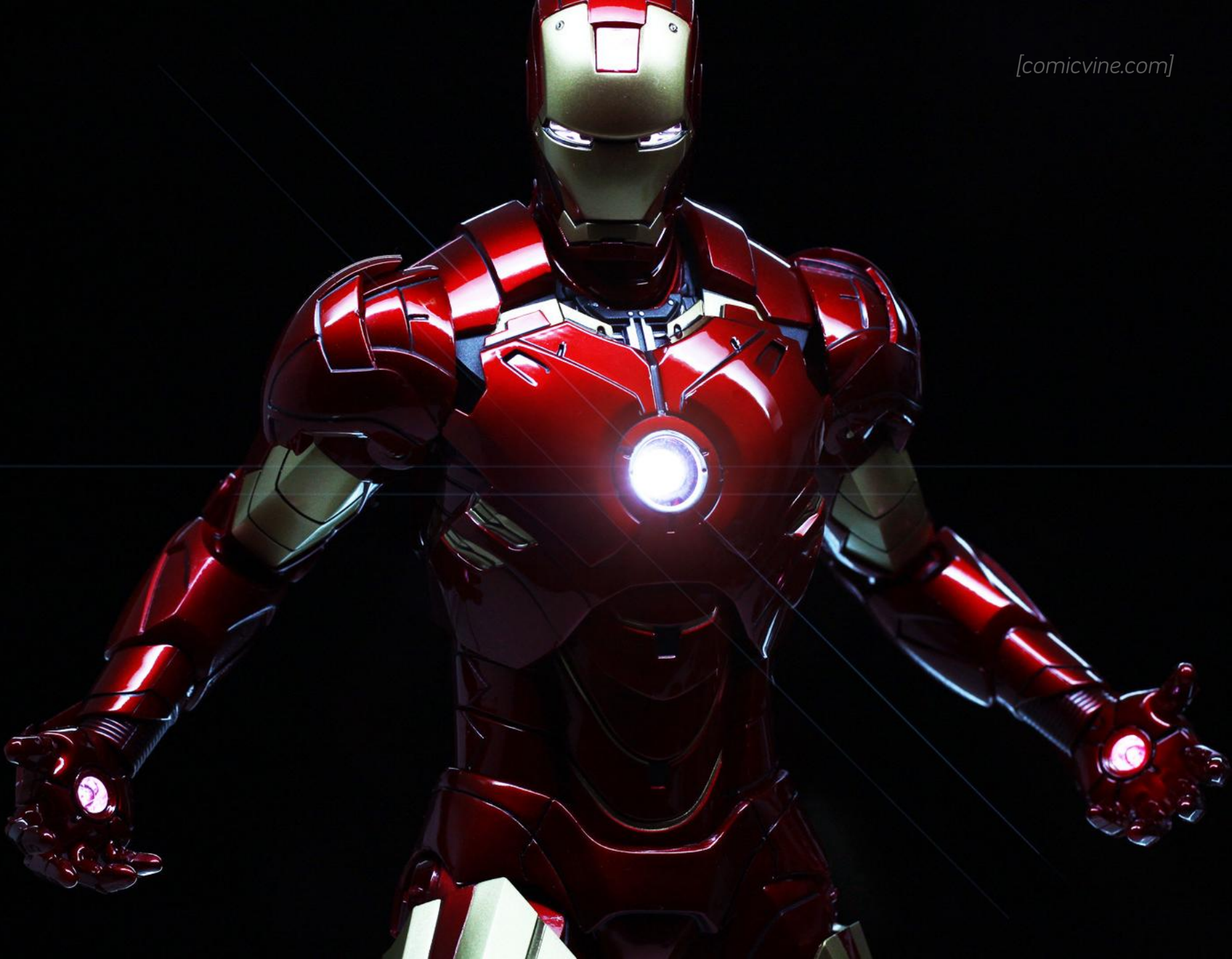


[F.K.Lamb, uiuc.edu]

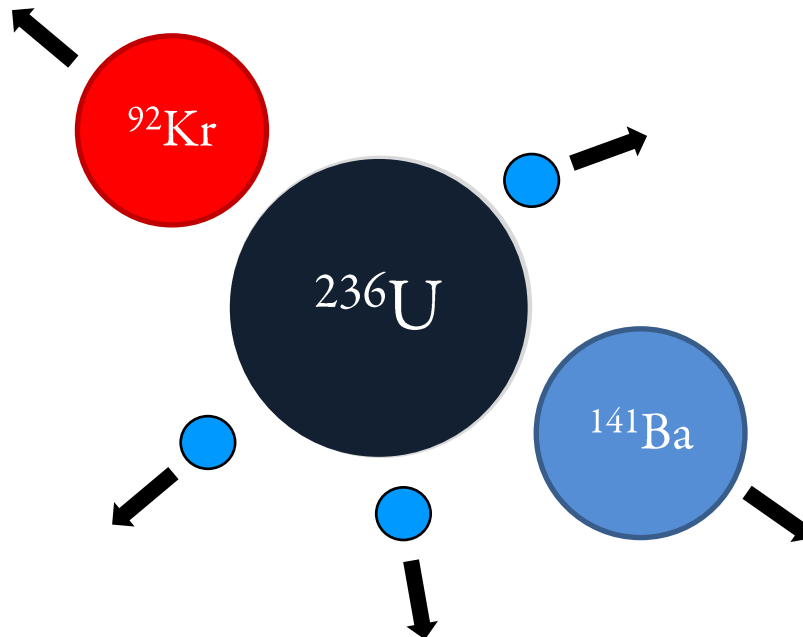
jadrové elektrárne



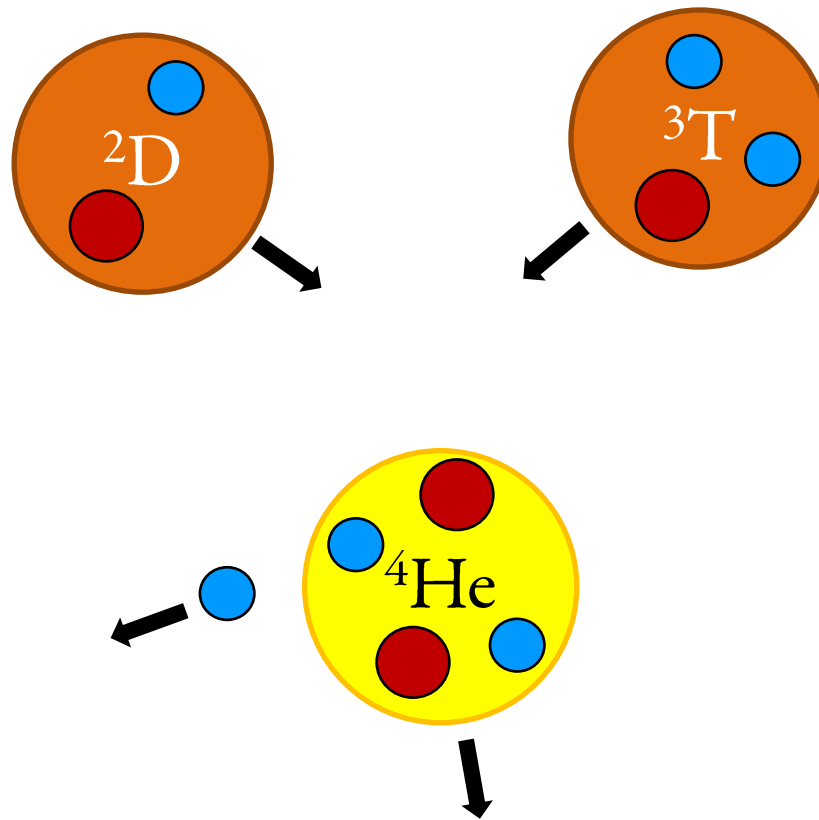
(tam to máme pod kontrolou)

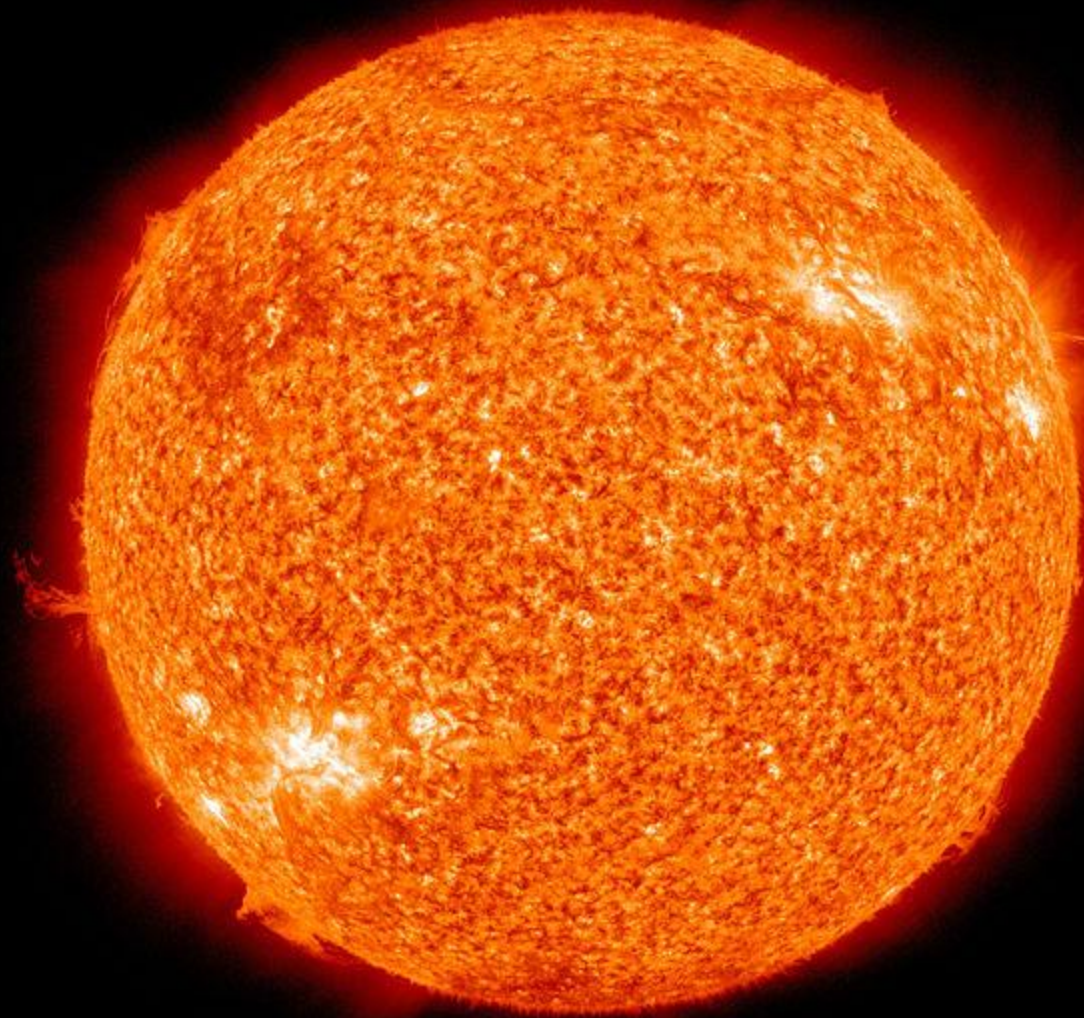


rozpad



fúzia (spájanie)





[Ivy Mike, USA, 1952]



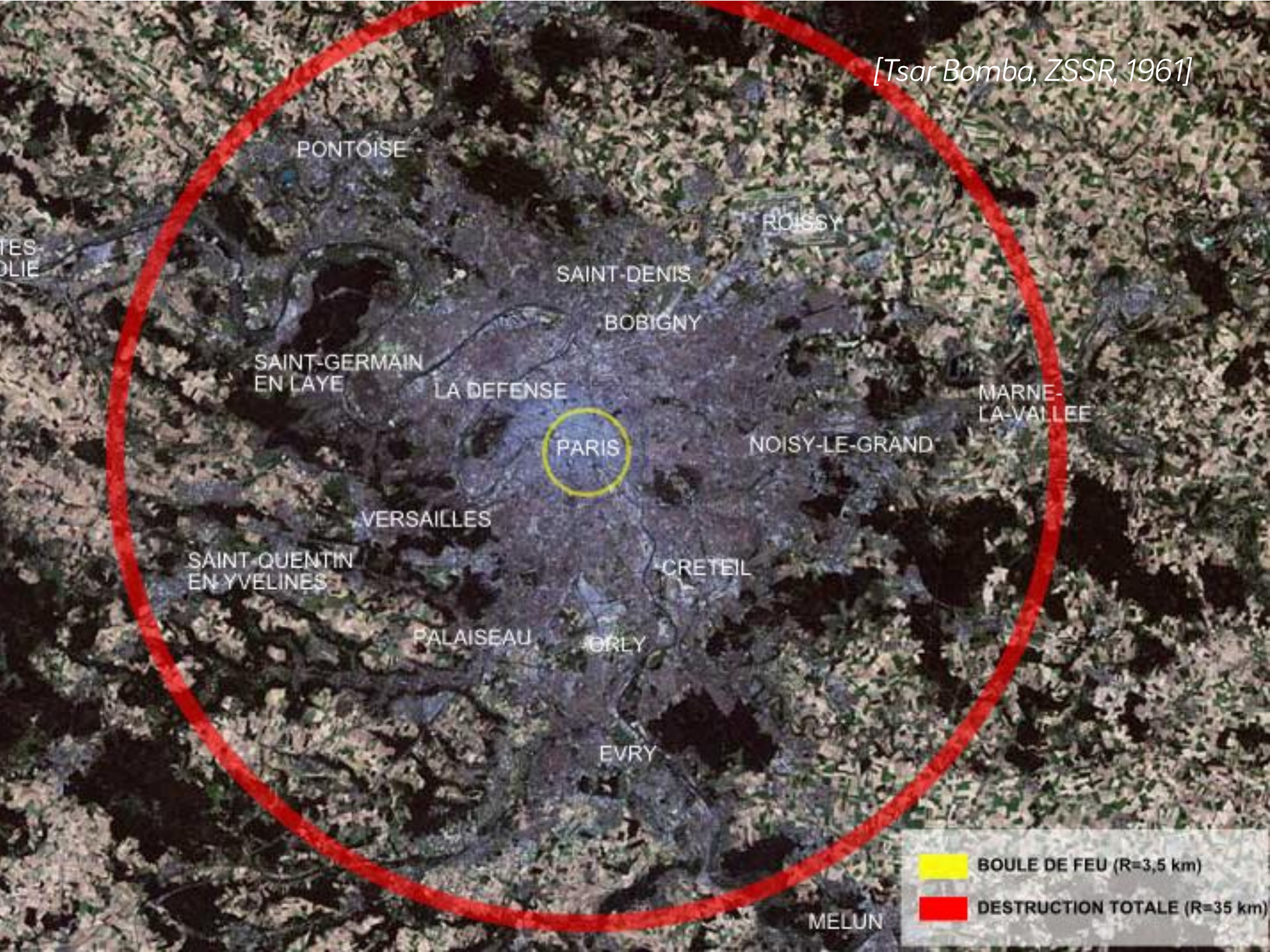
[Tsar Bomba, ZSSR, 1961]



[Tsar Bomba, ZSSR, 1961]



[Tsar Bomba, ZSSR, 1961]



PONTOISE

ROISSY

SAINT-DENIS

BOBIGNY

SAINT-GERMAIN
EN LAYE

LA DEFENSE

PARIS

NOISY-LE-GRAND

MARNE-
LA-VALLEE

VERSAILLES

SAINT-QUENTIN
EN YVELINES



CRETEIL

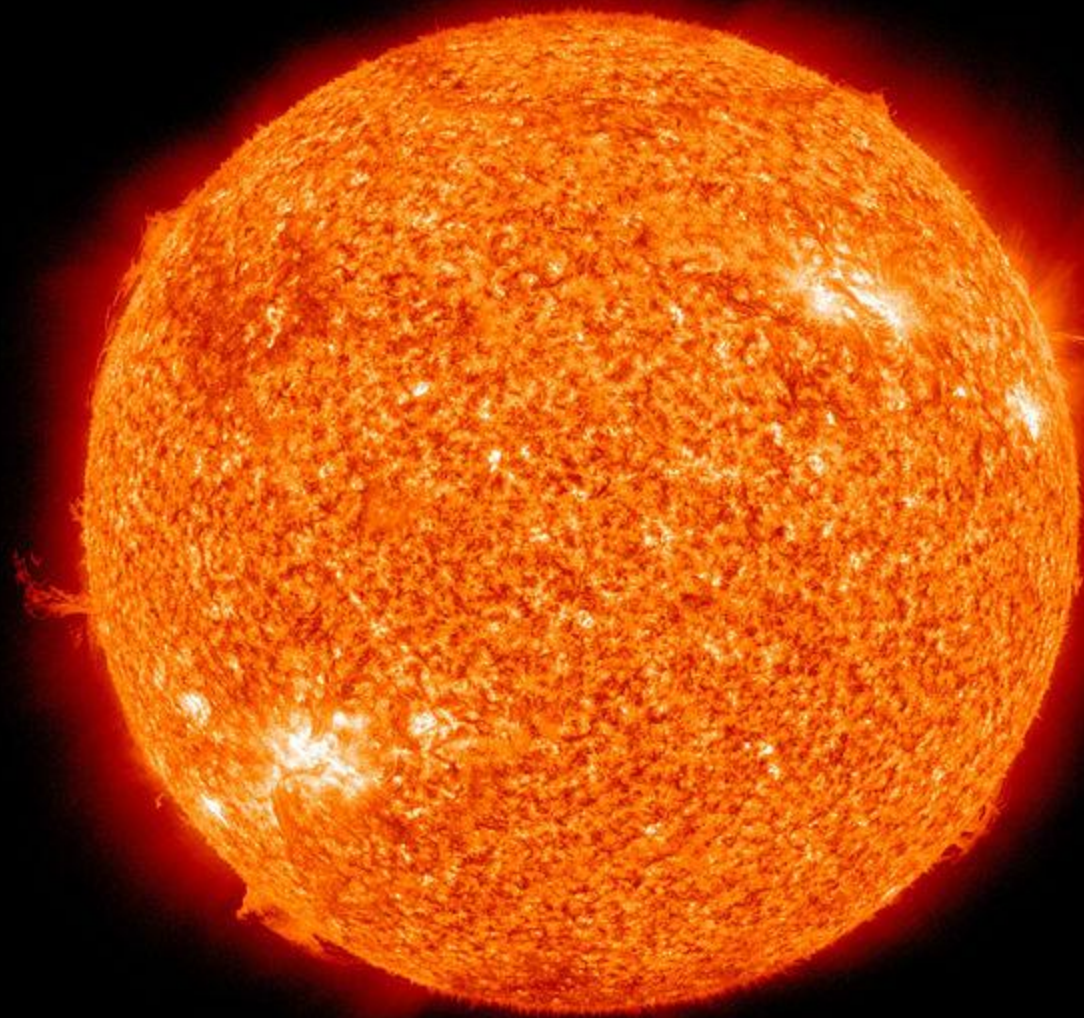
PALaiseAU

ORLY

EVRY

MELUN

 BOULE DE FEU (R=3,5 km)
 DESTRUCTION TOTALE (R=35 km)



**zákon
zachovania
hmotnosti**

zákon

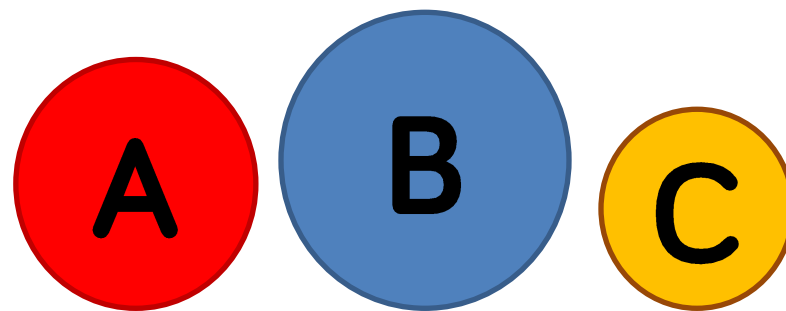
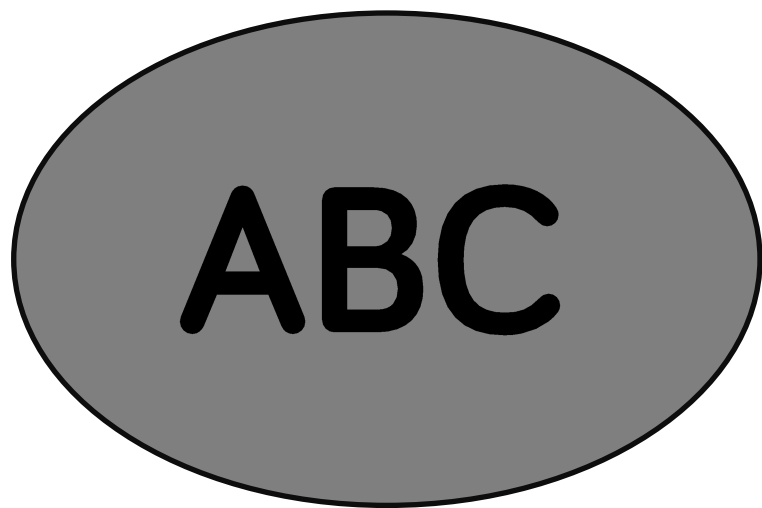
zachovania

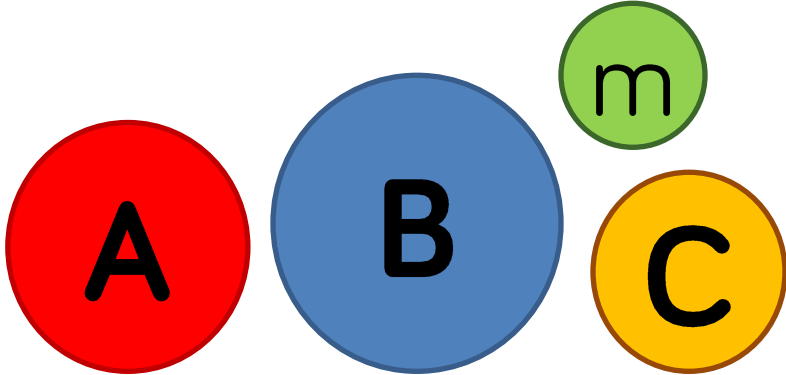
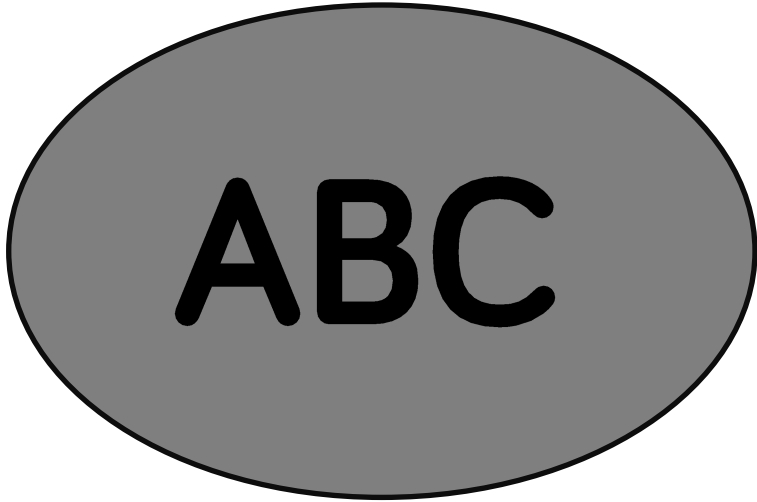
hmotnosti

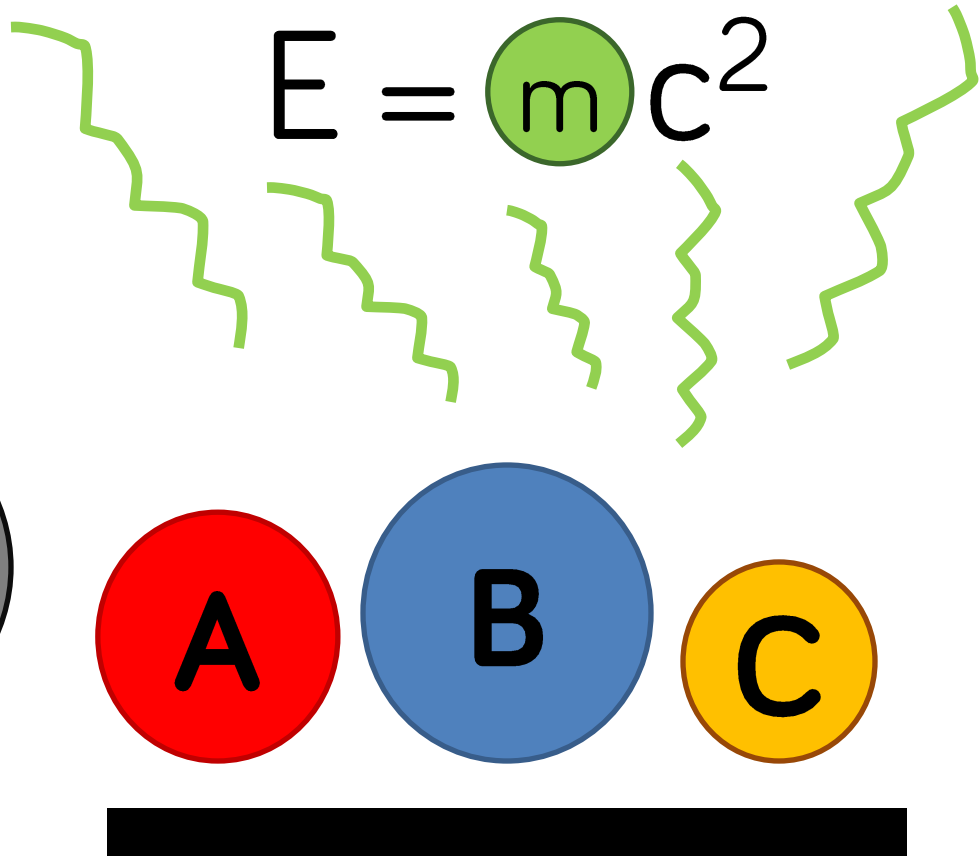
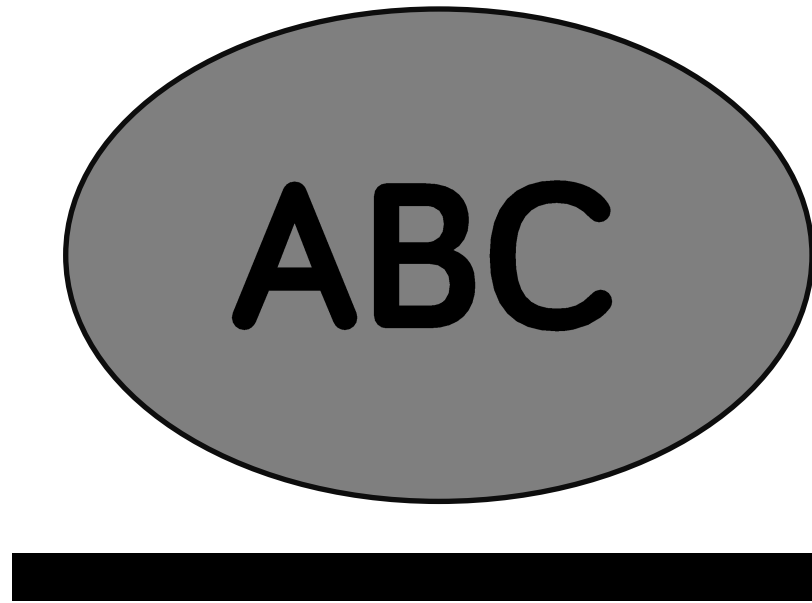
z ák on

za ch ova nia

h m ot n os ti

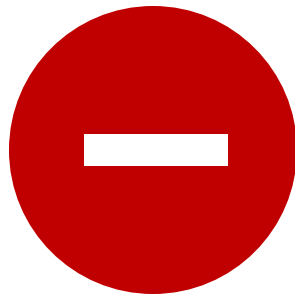




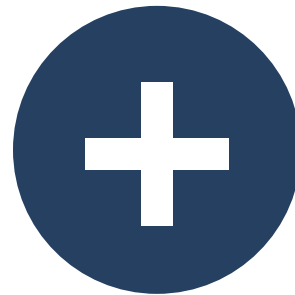


a h a t o n m i t

antihmota?



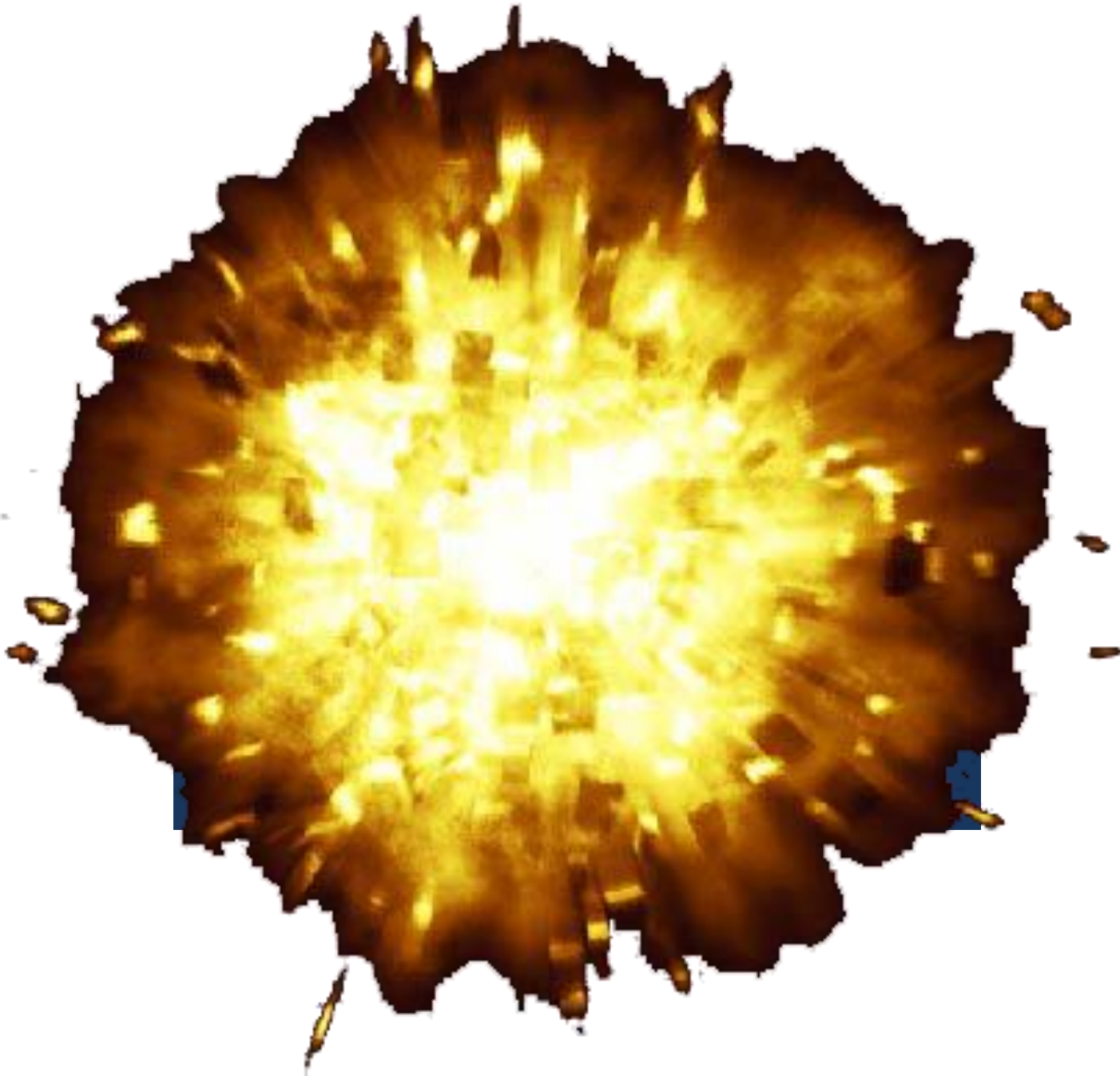
elektrón



pozitrón

hmota

antihmota

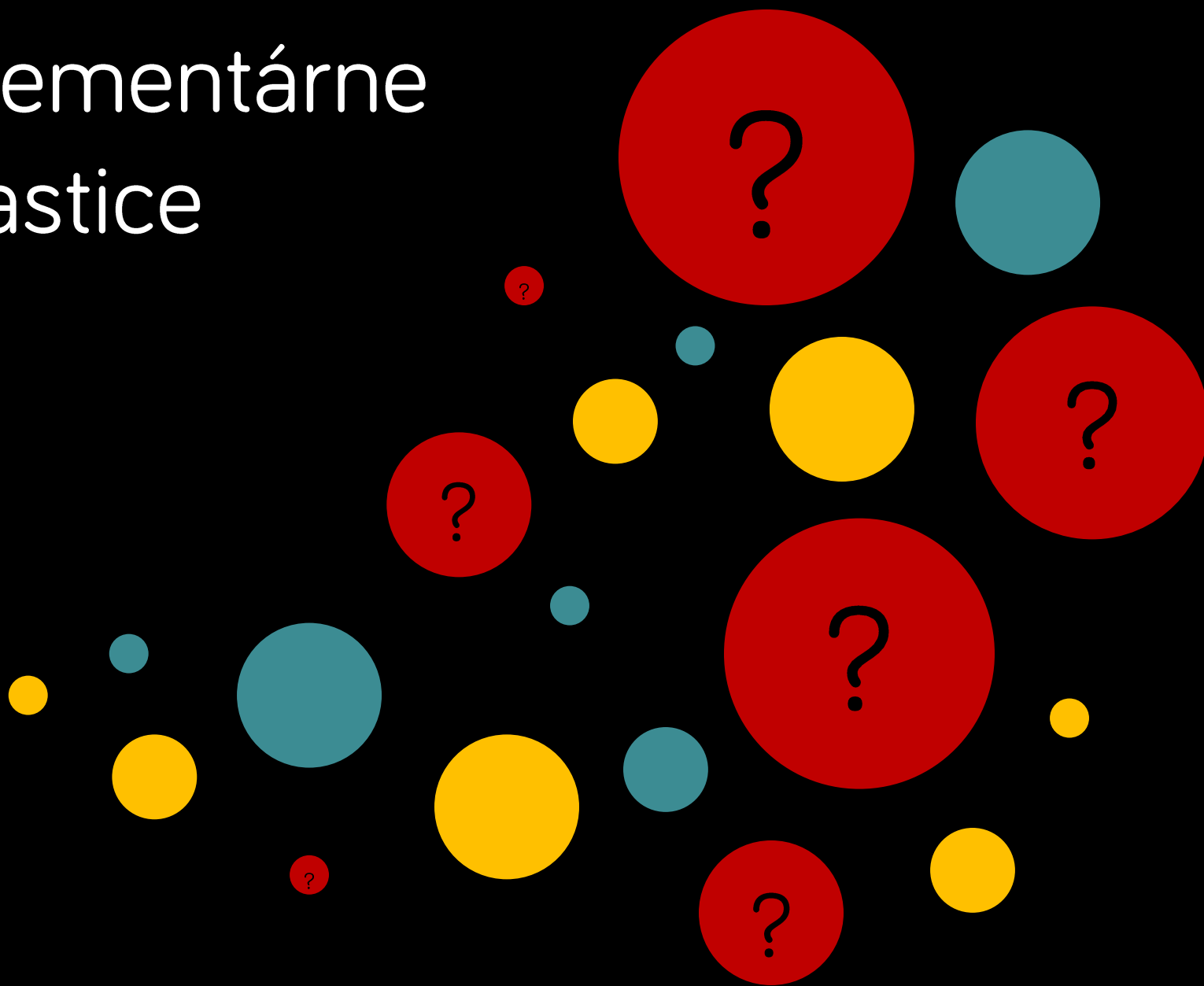


Je ešte niečo hlbšie?

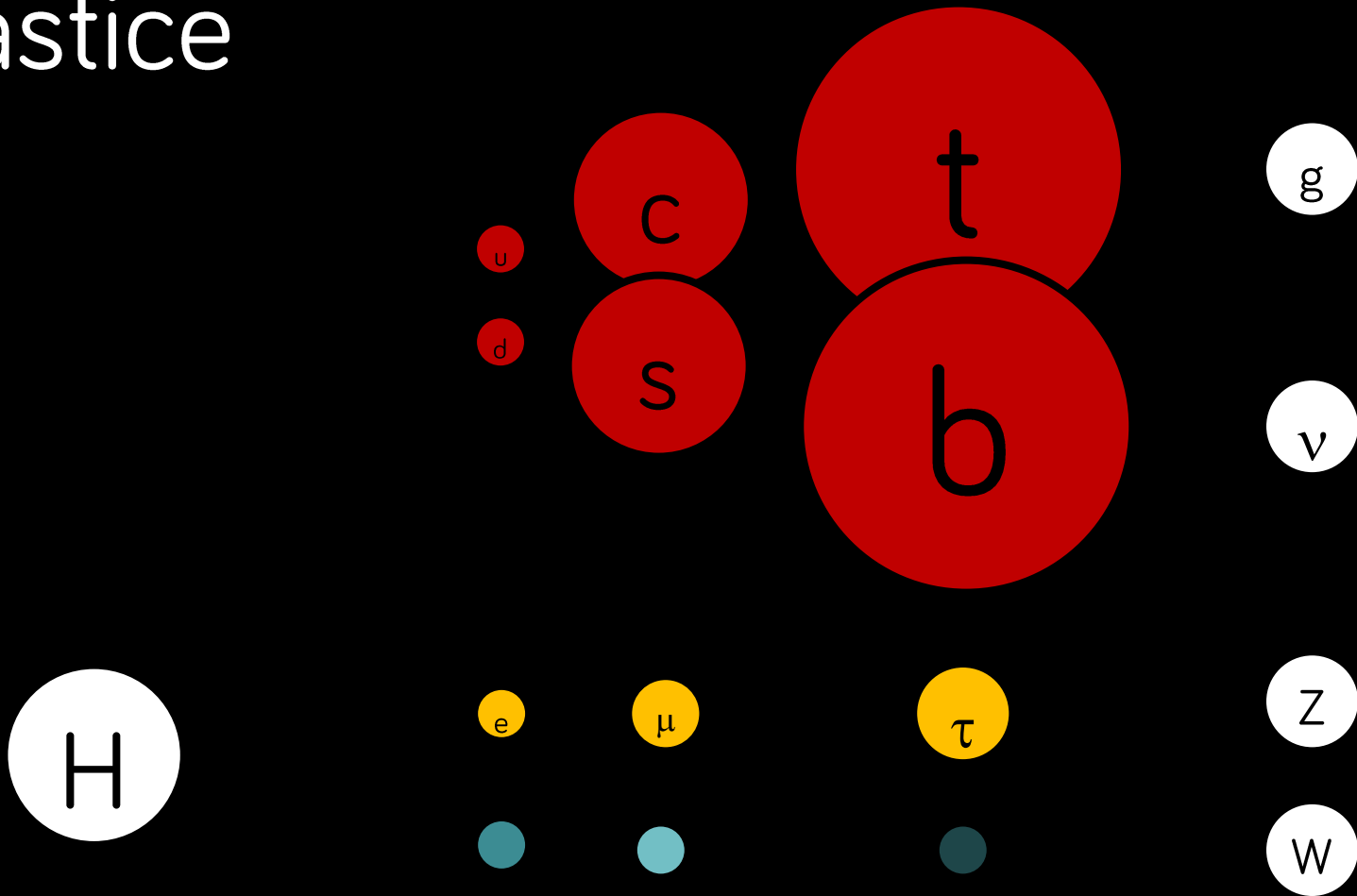


*[Crab nebula: remains of the
supernova of AD 1054, NASA]*

elementárne častice



elementárne častice





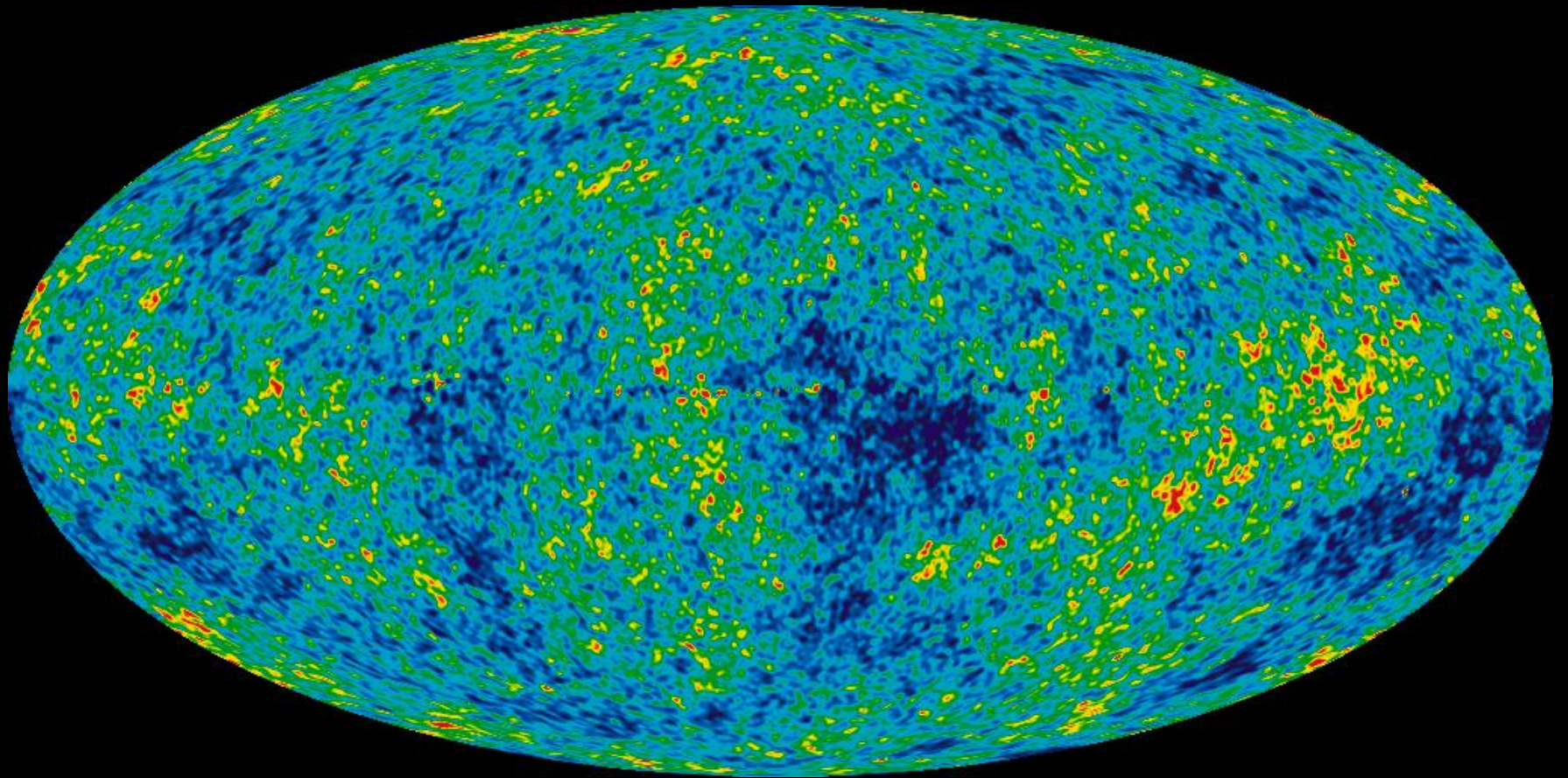
[Large Magellanic Cloud, NASA]



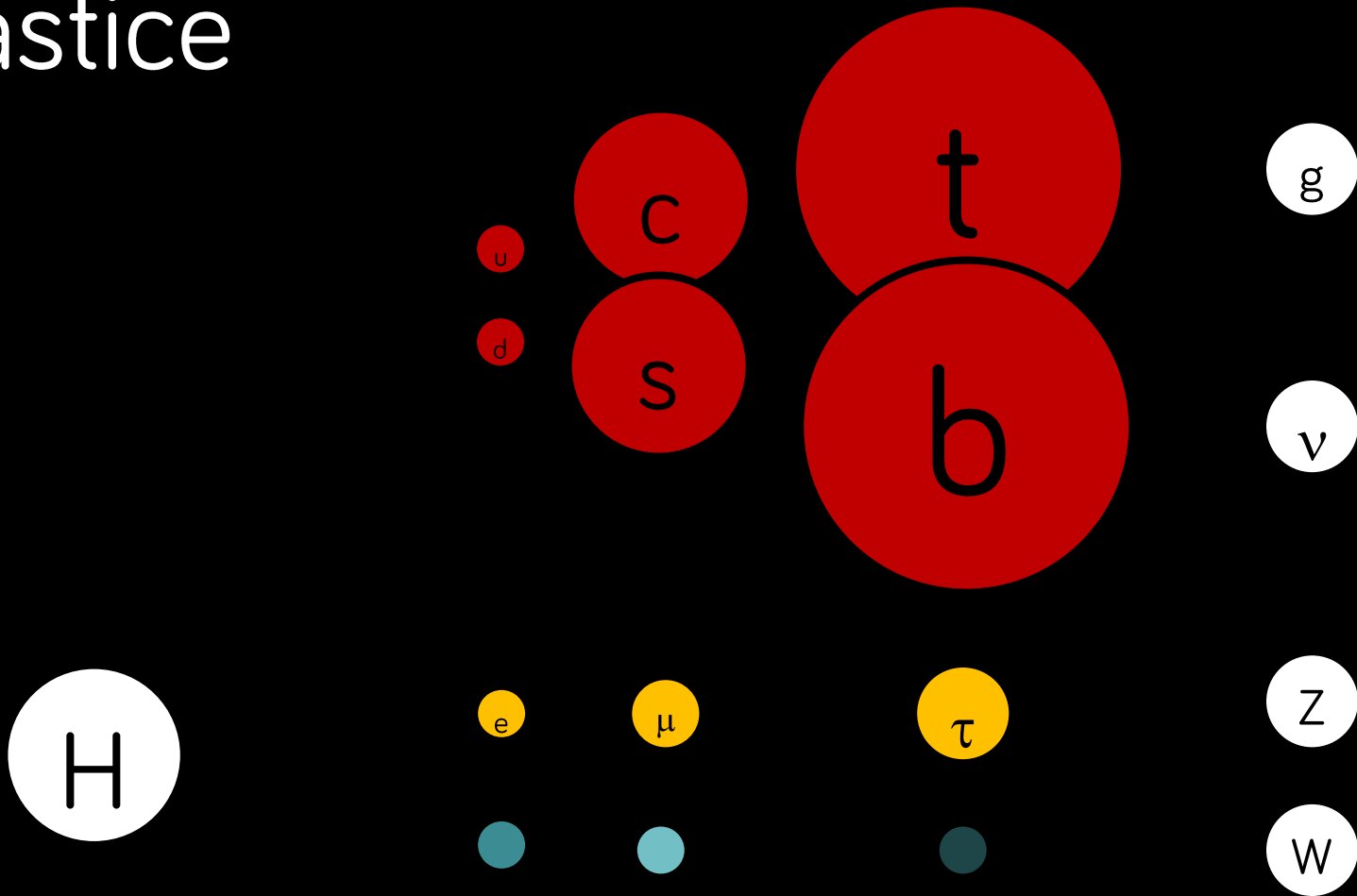


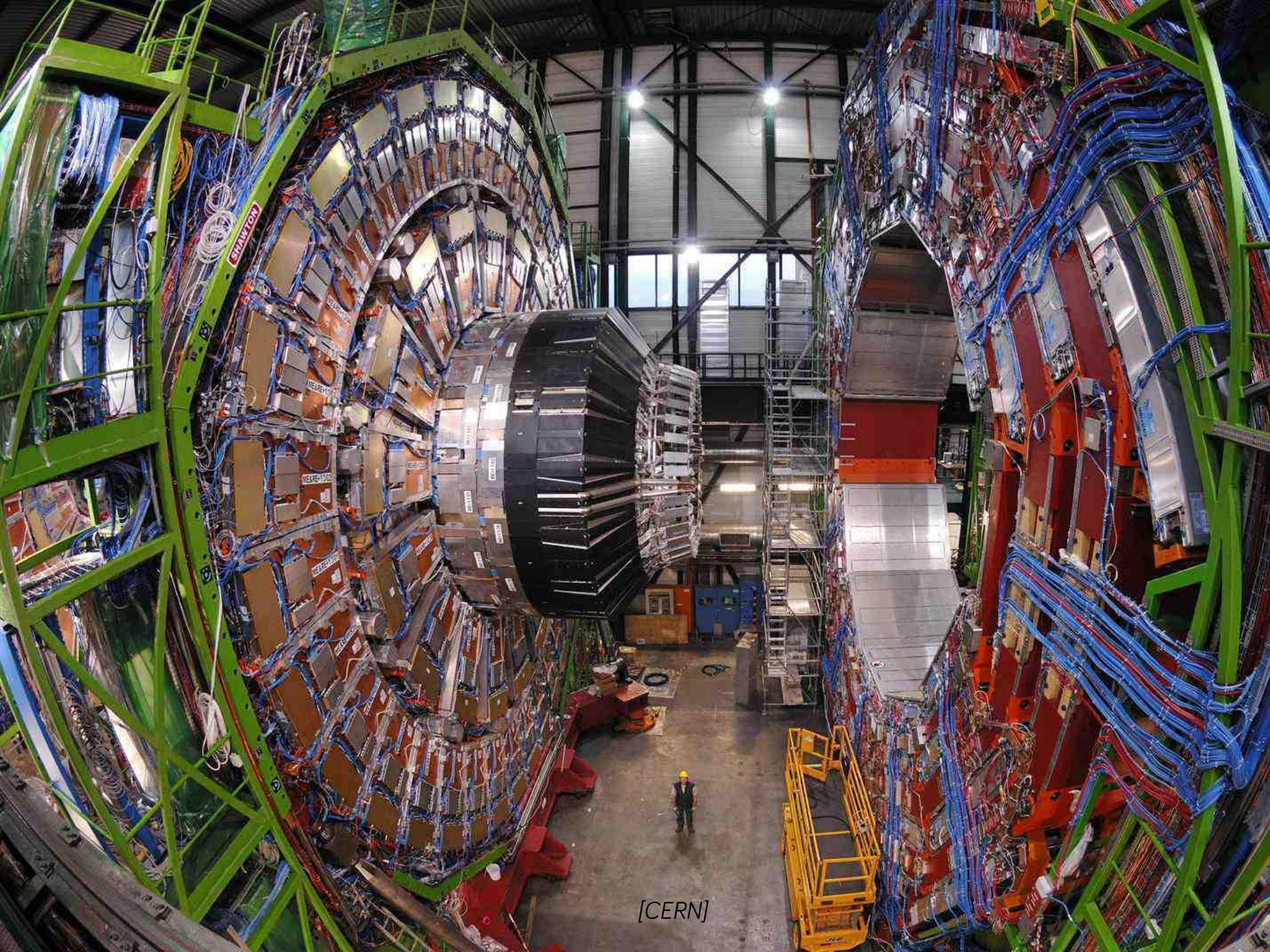
[wikipedia]

jasná správa o začiatku sveta

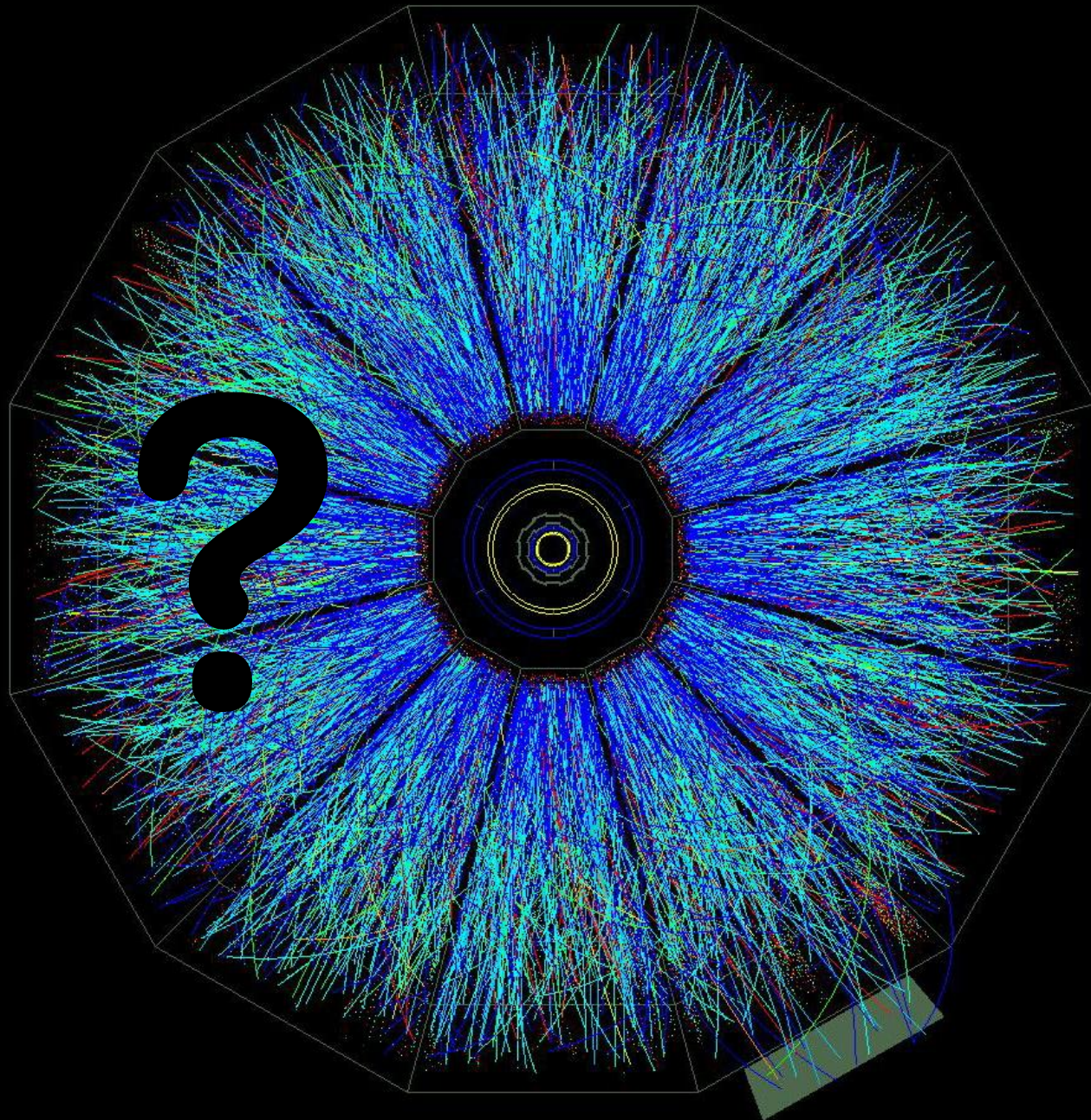


elementárne častice





[CERN]

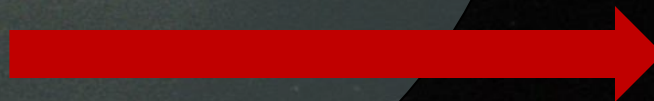




[Ray Stann]

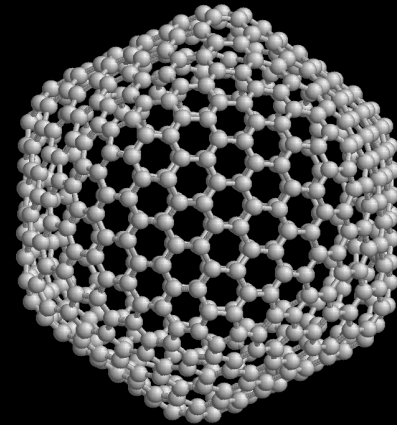
*tmavá
hmota*

?



?





svet

