



**Držite
nosnici
zaprti.
Začnite
žvečiti.**



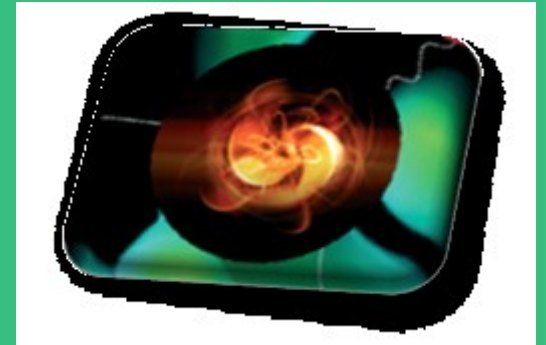




Konferenca učiteljev naravoslovnih predmetov

Od opazovanja in raziskovanja do znanja

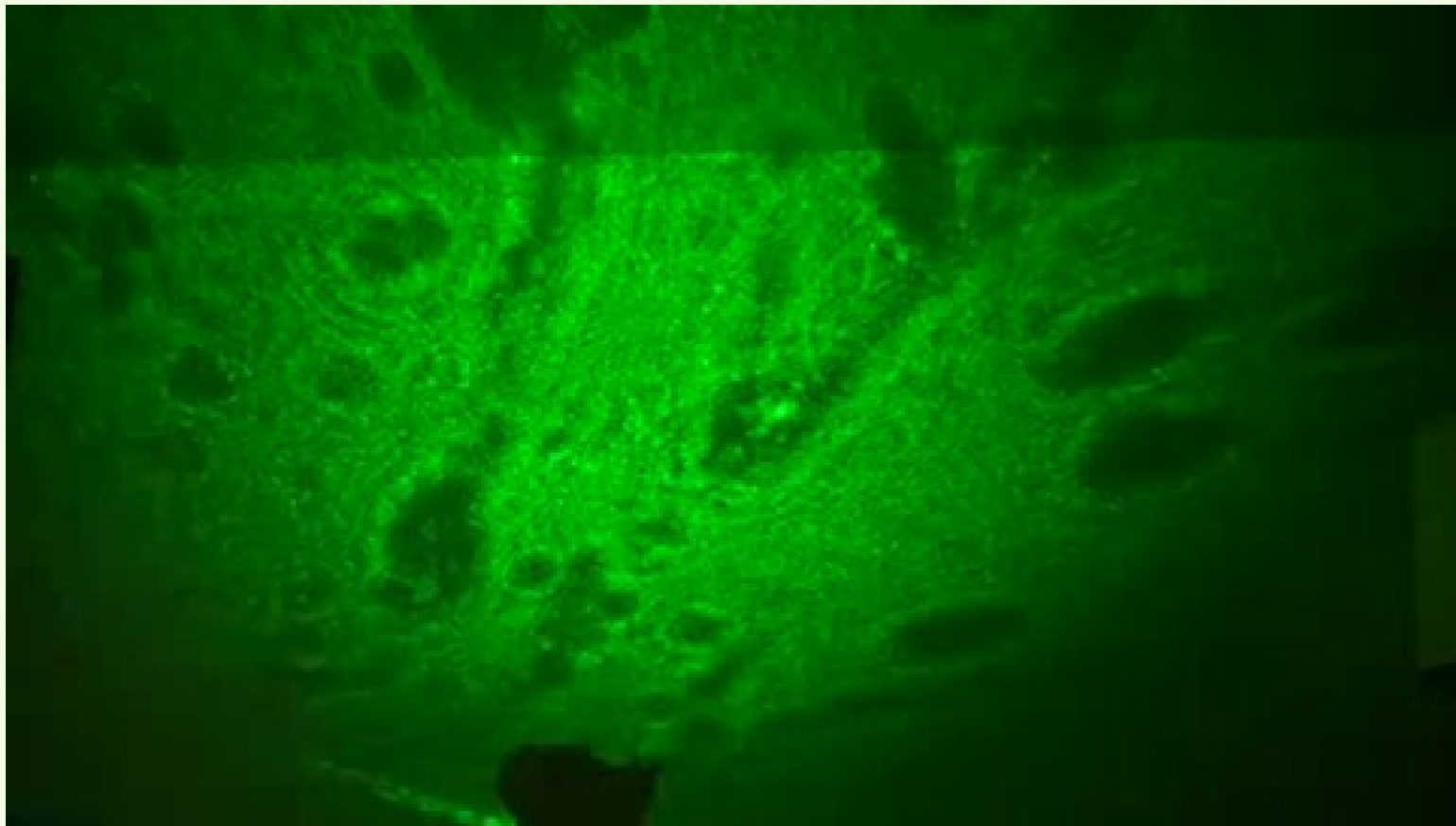
Laško, 19. november 2013



PISATI S SVETLOBO

Ambrož Demšar, OŠ Simona Kosa Podbrdo

Projekcija skozi kapljico vode



Water-Drop Projector

Gorazd Planinsic, Department of Physics, University of Ljubljana, Jadranska 19, 100 Slovenia; gorazd.planinsic@upr.si

Due to a growing interest in biology among science students, using demonstration experiments in physics classes that involve observations of biological material or that relate to plant, animal, or human physiology can often raise student motivation. The experiment described below involves observation of microorganisms in a drop of pond water. An explanation of the image formation in the paraxial region is then given using geometrical optics.

Beginning with the invention of the first microscope, humans have been fascinated by the observation of microscopic life. In his spare time, Dutch draper Antoni van Leeuwenhoek (1632-1723) made his own single-lens microscope using a small glass sphere. Keeping de-

tailed records of his observations, he made his first drawing of a bacterium in 1683. Descriptions of the construction of a simple van Leeuwenhoek's microscope (glass tubular microscope) have appeared previously in *TP*. However, it is easier still to build a simple microscope by using a drop of clear water instead of a glass lens. The small water drop works as a spherical lens with a large magnifying power.

Experiment

To collect your sample, fill a syringe with water from a pond or large puddle with decaying plants. If you live at the coast, try to catch some very small animals (1 mm to 0.5 mm) that move around in the water. Many of them are found close to the bottom of the pond.

Fix the syringe on a holder (Lego block or a piece of wood works well) using adhesive tape, as shown in Fig. 1.

For a light source, fix a laser pointer to a vertical positioner. An empty stick-deodorant container will do, as shown in Fig. 1. Turn on your lens, carefully push the syringe plunger to form a water drop (about 2 mm in diameter) at the end of the nozzle.

Observation

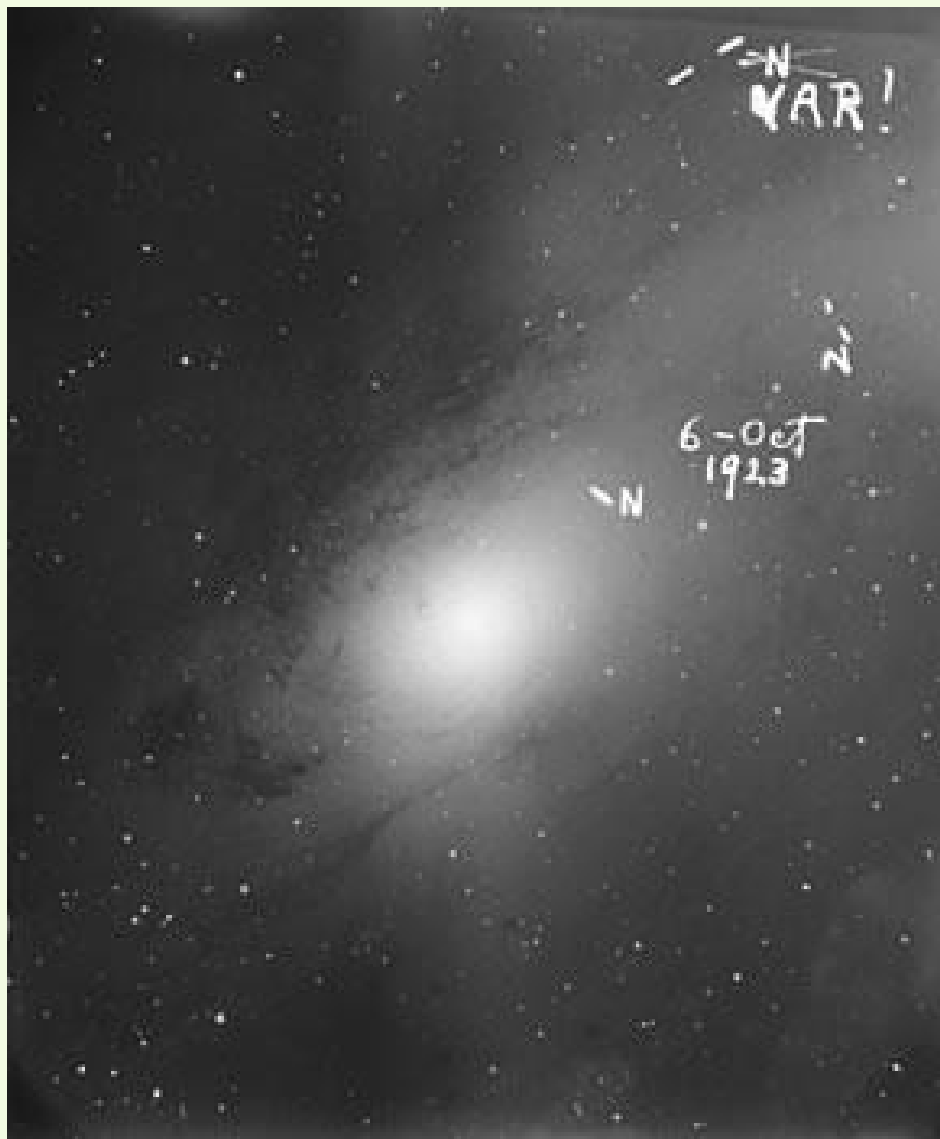
Place the syringe holder on a table and



Fotografija



Fotografija



Fotografija

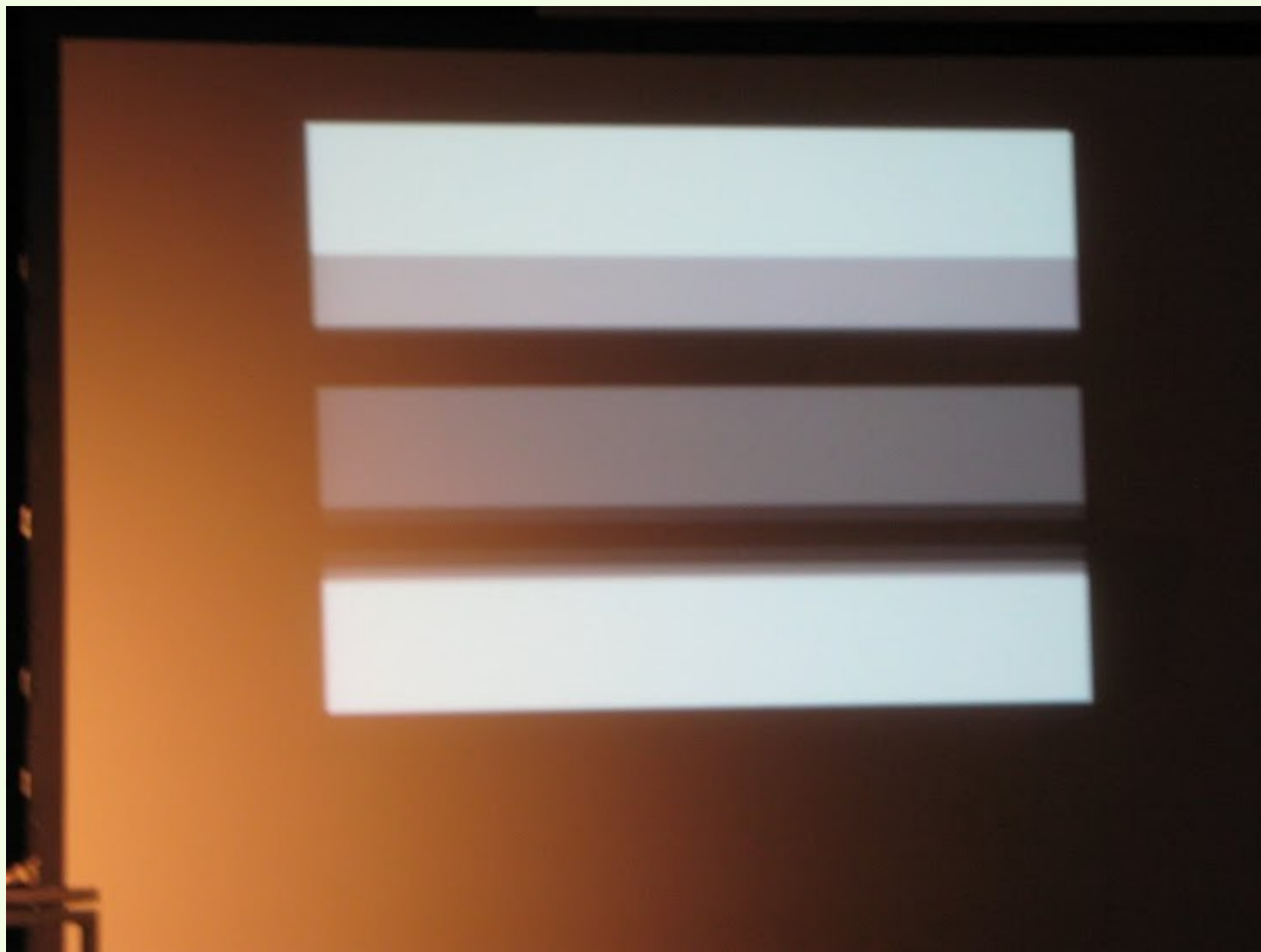


Medicinska fizika – rentgen

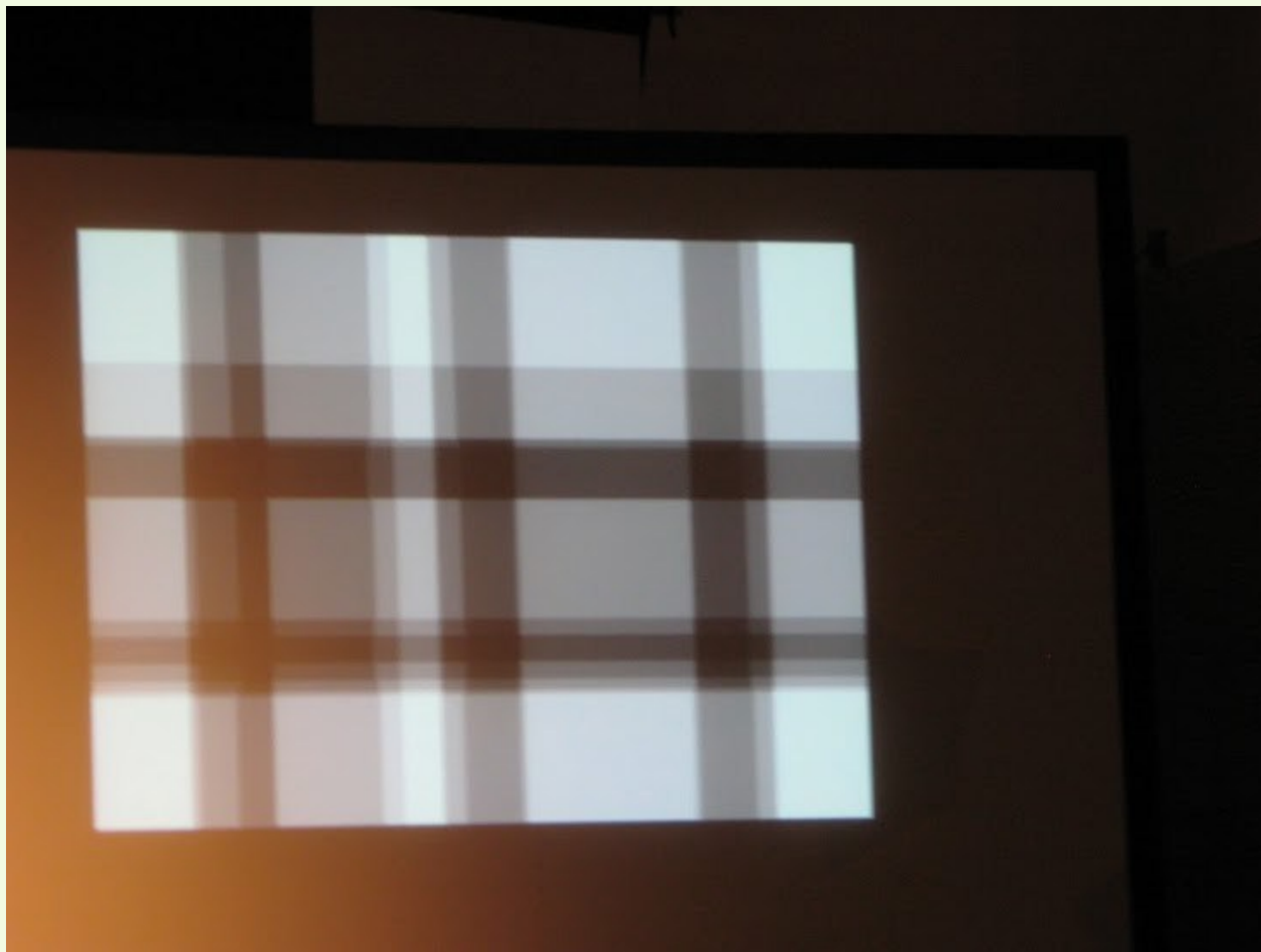
(z dovoljenjem Olaf Gutschker, TU Cottbus)



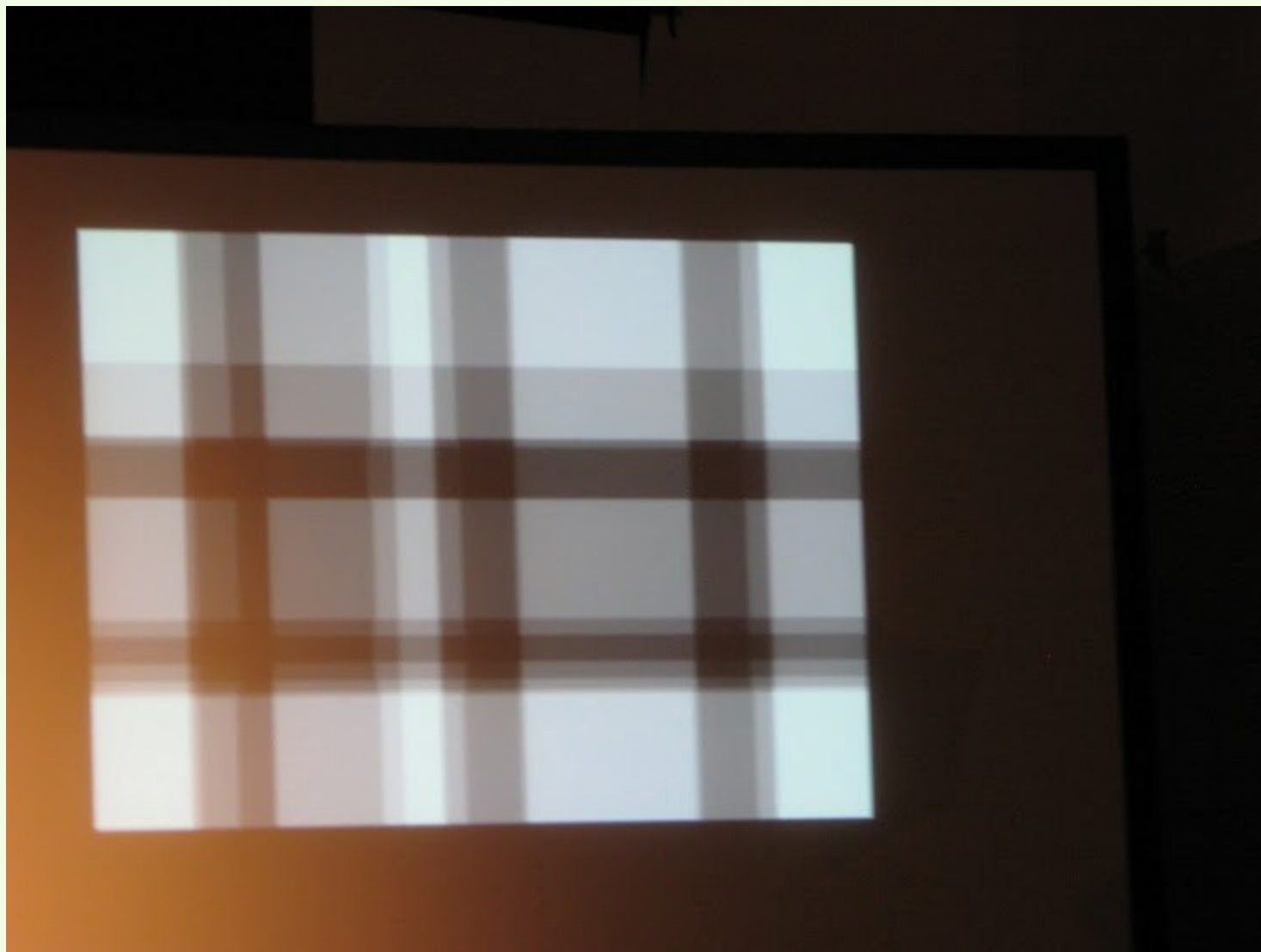
Medicinska fizika - rentgen



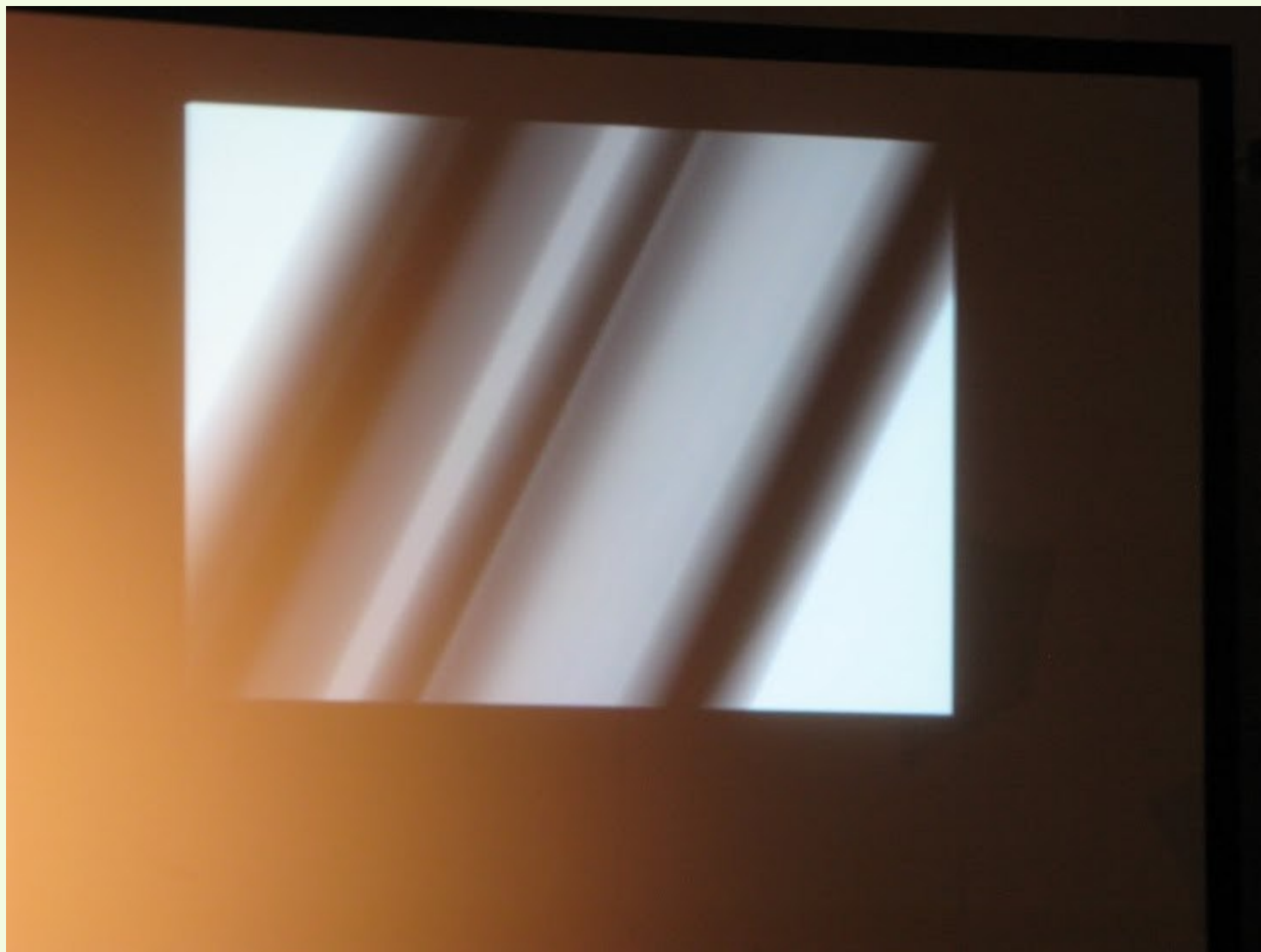
Medicinska fizika - rentgen



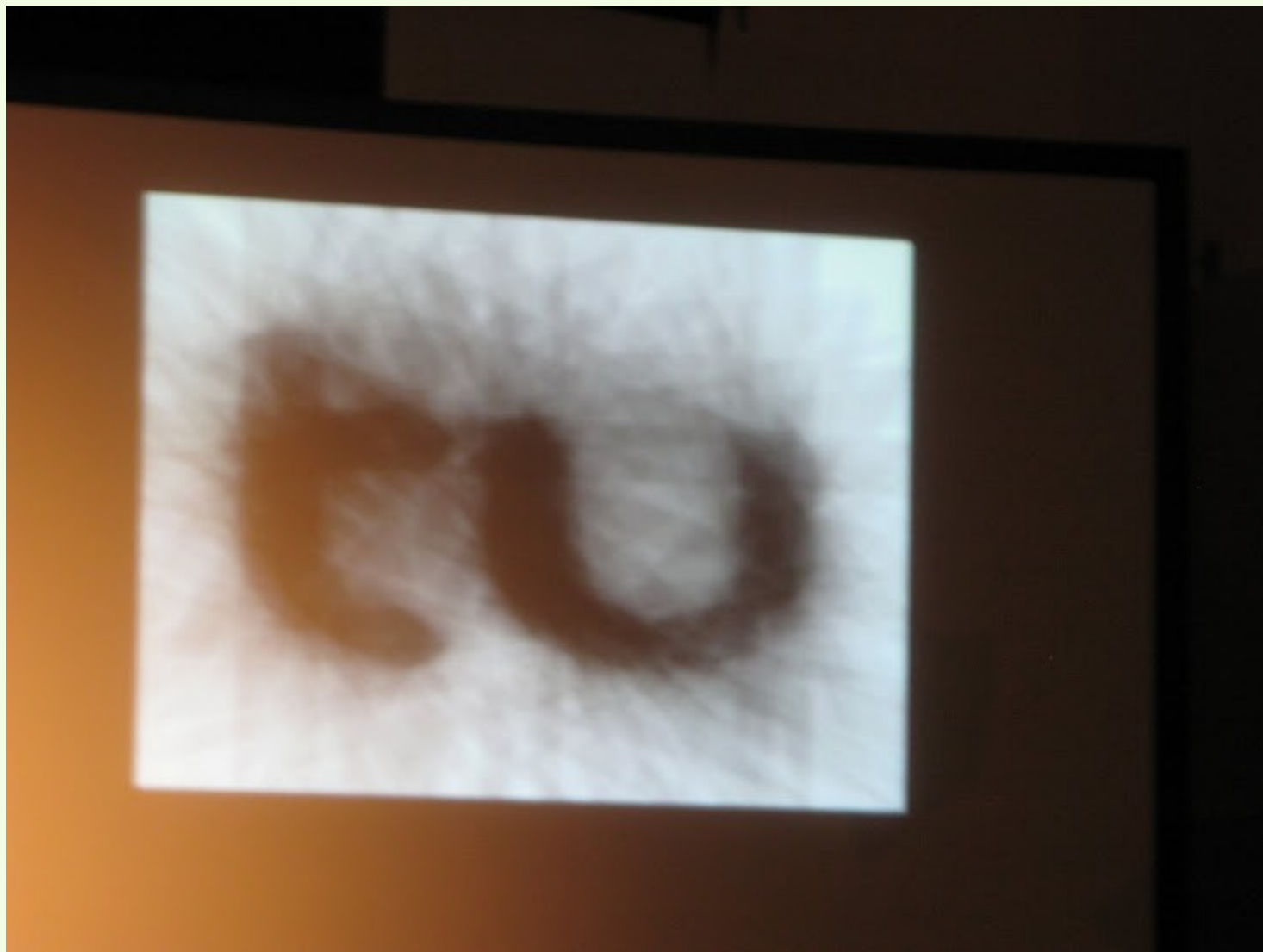
Medicinska fizika - rentgen



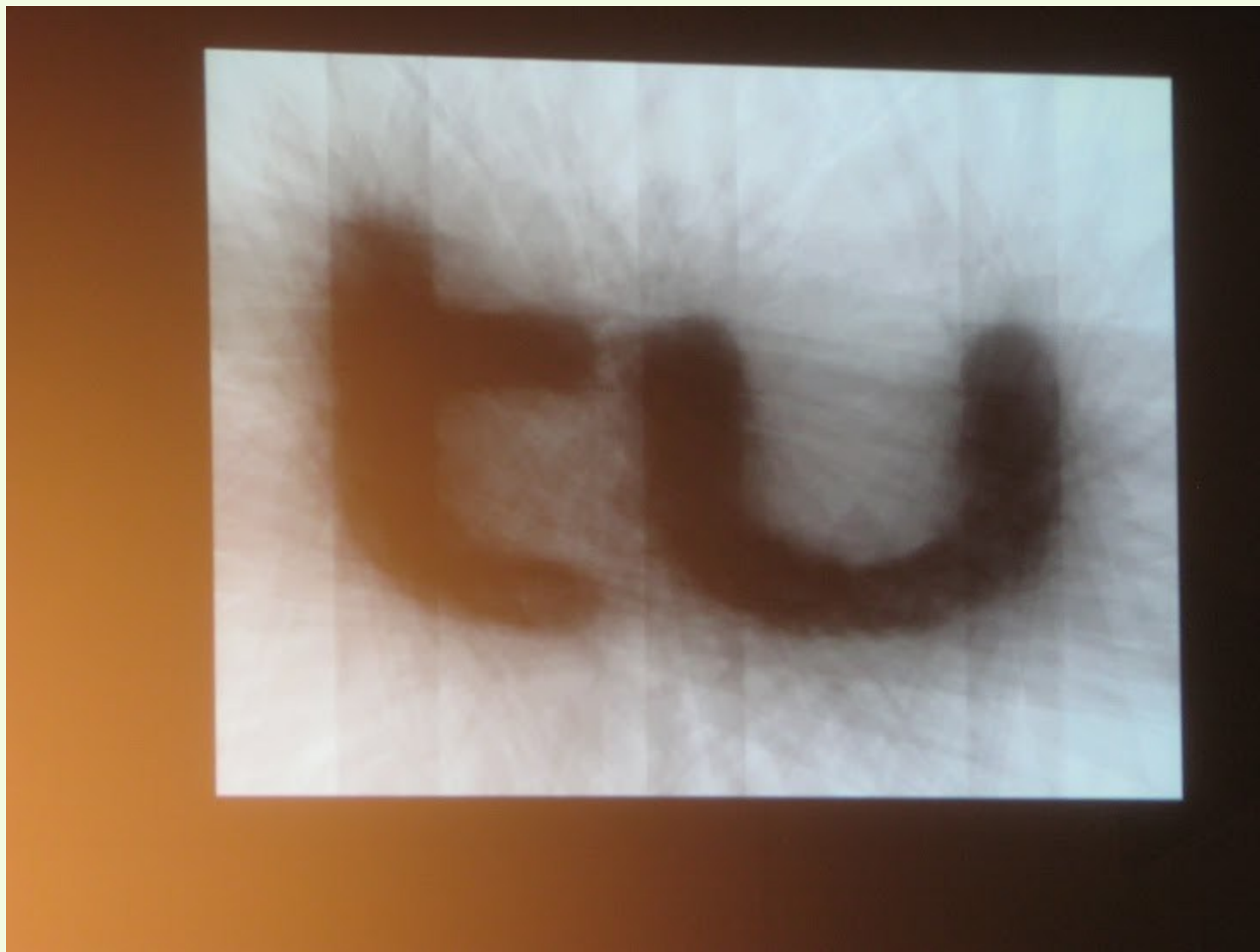
Medicinska fizika - rentgen



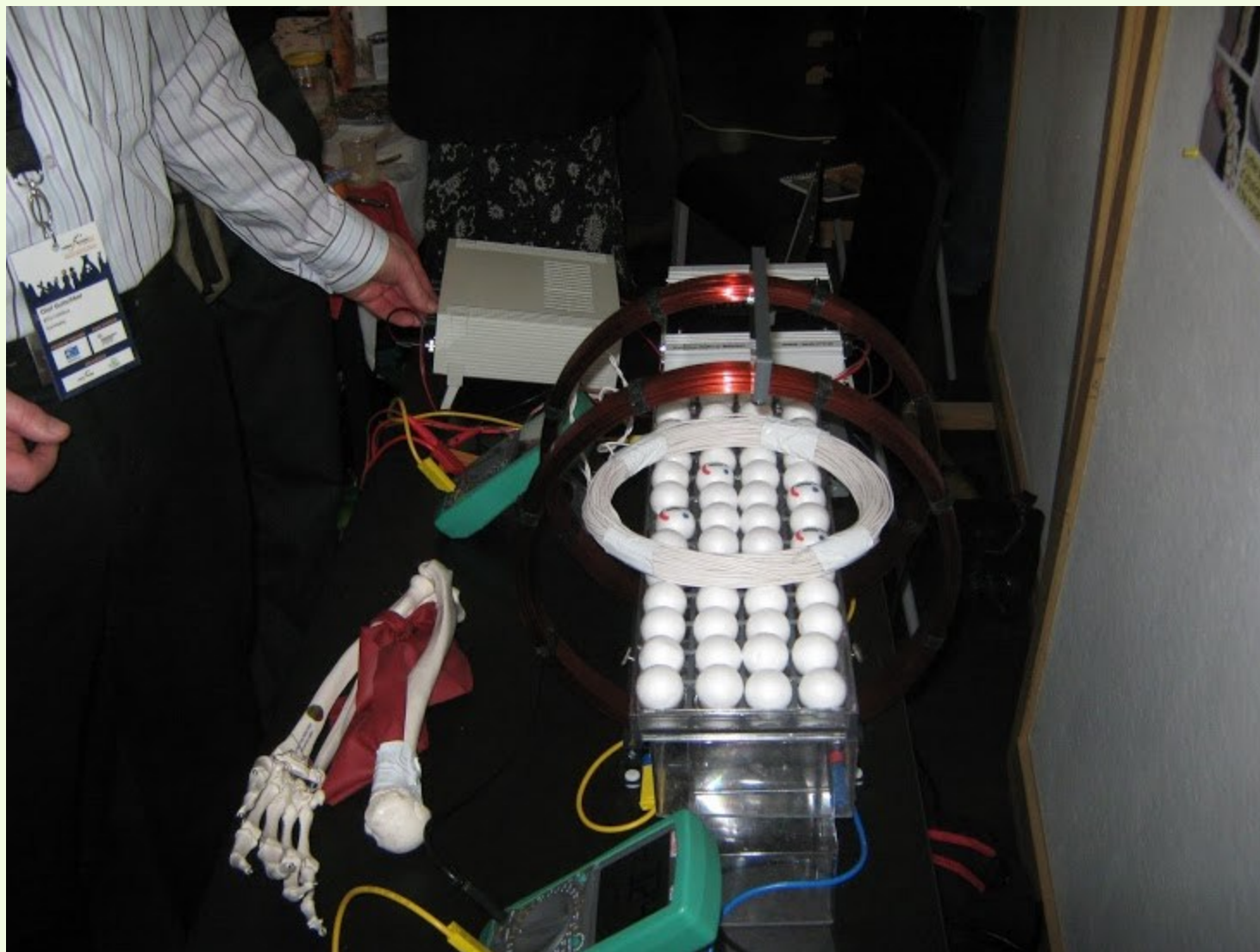
Medicinska fizika - rentgen



Medicinska fizika - rentgen



Medicinska fizika – magnetna resonanca



Medicinska fizika – magnetna resonanca



Holografija -



<http://www.youtube.com/watch?v=TGbrFmPBV0Y>



Zakaj fizikalne fotografije? Ego



Zakaj fizikalne fotografije? Poskus ne uspe

<http://www.levitron.com/>



Zakaj fizikalne fotografije? **Poskusa ne zelim ponoviti**



Zakaj fizikalne fotografije? **Kompliciranost**



○ Science on Stage Greece

Fotografije so malo vredne! V živo!!!



Leto 2007





Like

Physics pictures
photos
1 Oct 2007 15:22

5 girls talking...

Ambrož Demšar
photos
Oct 2007 11:11

What is the angle of the mirrors on this picture?
Kakšen je kot med ogledali na sliki?



Science on stage

Danska

17 Apr 2011

🌐 photos: 5

kosarka

6 Jan 2009

🌐 photos: 11

Some of them

17 Aug 2008

🌐 photos: 16

**Hotair baloon -
Toplozračni balon**

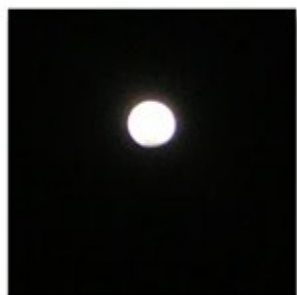
12 May 2008

🌐 photos: 6

**National golden cable
eTwinning prize**

14 Apr 2008

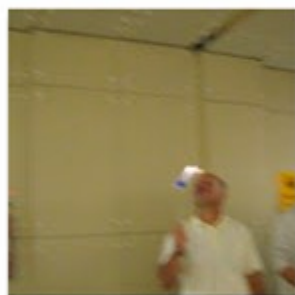
🌐 photos: 11



**Eclipse da Lua - Lunar
Eclipse - Lunin mrk**

3 Mar 2008

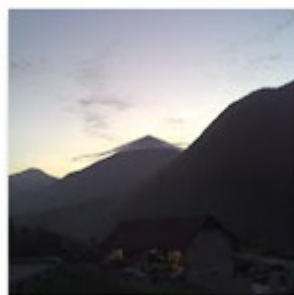
🌐 photos: 9



**Festival znanosti -
Festival of science**

16 Sep 2006

🌐 photos: 64



**Tempo - Weather -
Vreme**

24 May 2006

🌐 photos: 15



**Pressão - Pressure -
Tlak**

29 Apr 2006

🌐 photos: 39



**Fluidos - Fluids -
Tekočine**

29 Apr 2006

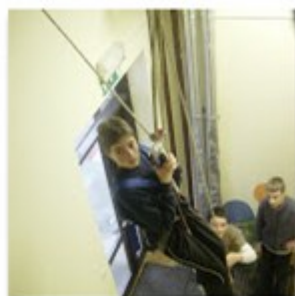
🌐 photos: 36



**Temperaturno
raztezanje - Thermal
expansion - Expansão
térmica**

20 Apr 2006

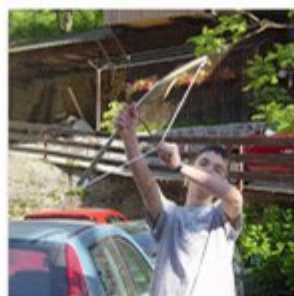
🌐 photos: 4



**Delo - Mechanical
work - Trabalho**

19 Apr 2006

🌐 photos: 31



**Energija - Energy -
Energia**

19 Apr 2006

🌐 photos: 13



**Merjenje -
Measurement -
Medições**

19 Apr 2006

🌐 photos: 19



Luz - Svetloba - Light

19 Apr 2006

🌐 photos: 36



Dopolnjevanje



Dopolnjevanje



Dopolnjevanje



Šolske fotografije



Fizika v vsakdanjem življenju



Sejem eksperimentov



Estetika



[illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible][illegible]

eTwinning trojezični delovni zvezek

3 Matéria - Matter - Snov

Our web site:

[http://sites.google.com/
site/physica/](http://sites.google.com/site/physica/)

More pictures:

[http://picasaweb.google.
com/physica](http://picasaweb.google.com/physica)



- 3.a.5 Pod navadnim mikroskopom papir zgleda drugače. Pod elektronskim še bolj. Iz česa so snovi?
Em circunstâncias normais, sob microscópio, o papel parece diferente. Isto é ainda mais evidente sob o microscópio eletrônico. Quais são as substâncias presentes?
Under an ordinary microscope paper looks different. It looks even more under the electron microscope. What substances are there?



- 3.b.5 Obkroži! Na sliki se je sneg, ki je trdnina-kapljevina-plin, toda obnašal se je kot trdnina-kapljevina-plin.
Sublinha a resposta! A neve é um (sólido-líquido-gás), mas aqui comporta-se como um (sólido-líquido-gás).
Underline the answer! The snow is (solid-liquid-gas), but here behaves as a (solid-liquid-gas).

GIF



○ [Wikipedia Commons](#)



Kratki filmi



Kratki filmi



○ [Wikipedia Commons](#)



Model strele s pomočjo risalnih žebelčkov

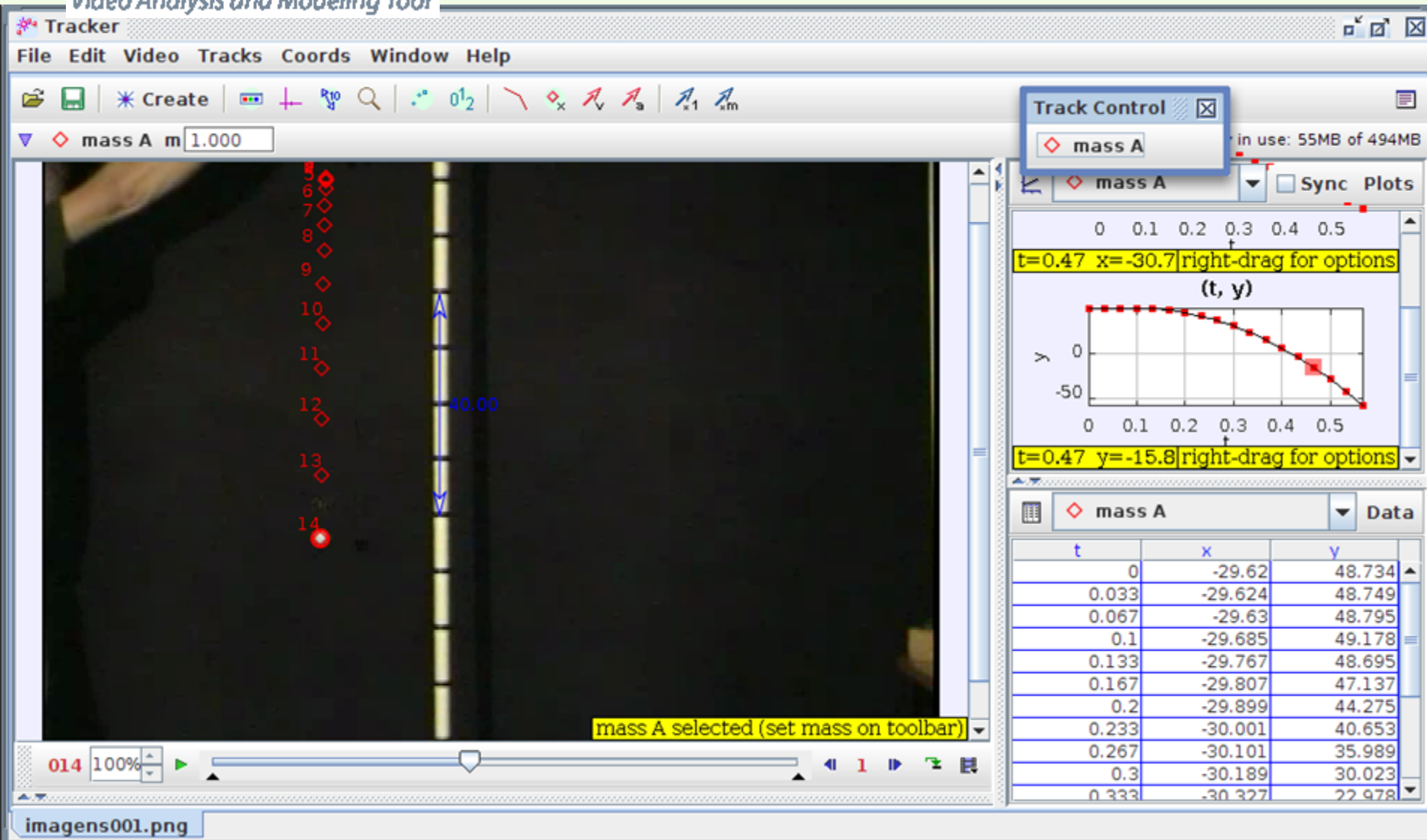


○ Science on Stage Polska

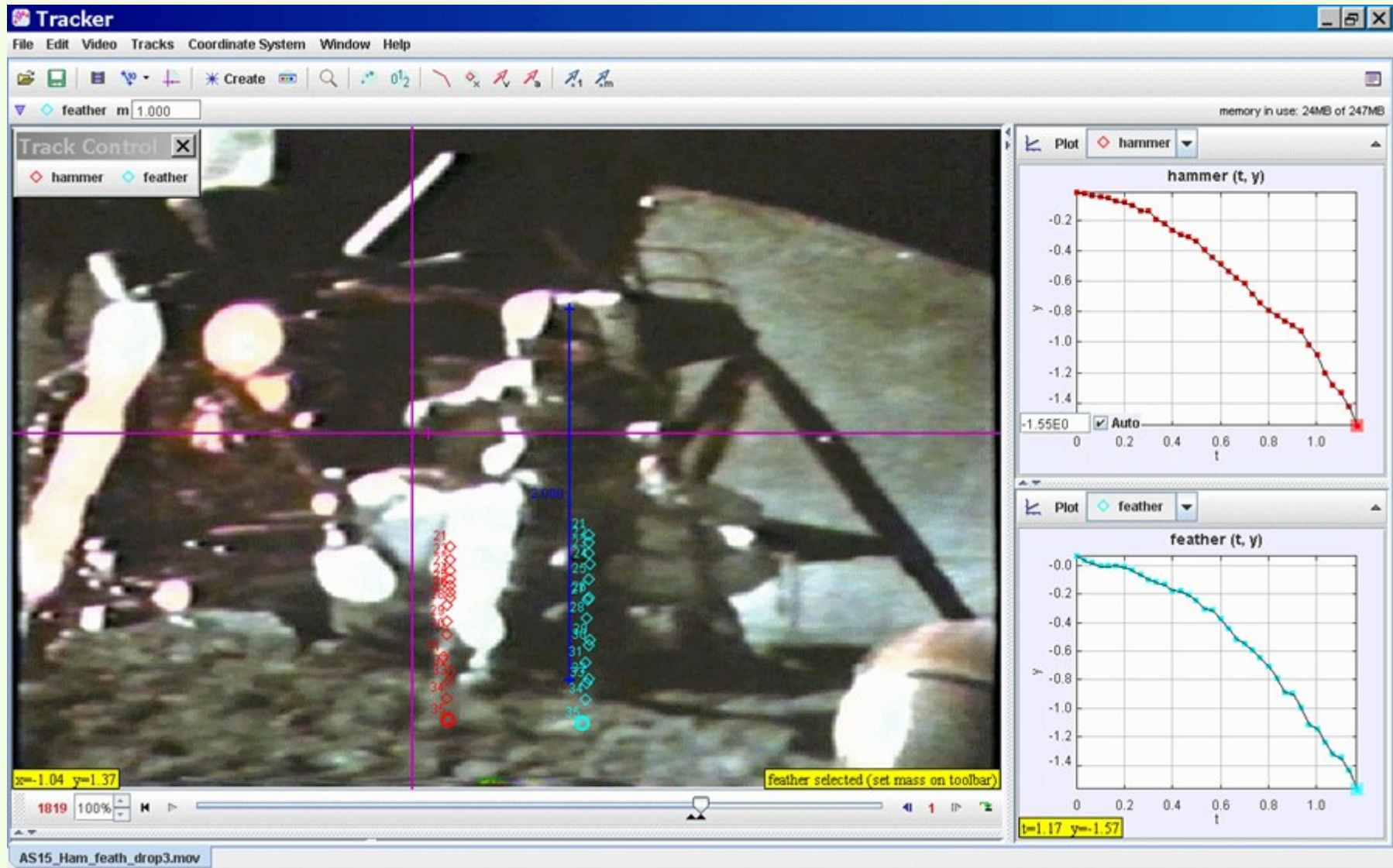


Pametni telefoni





Tracker

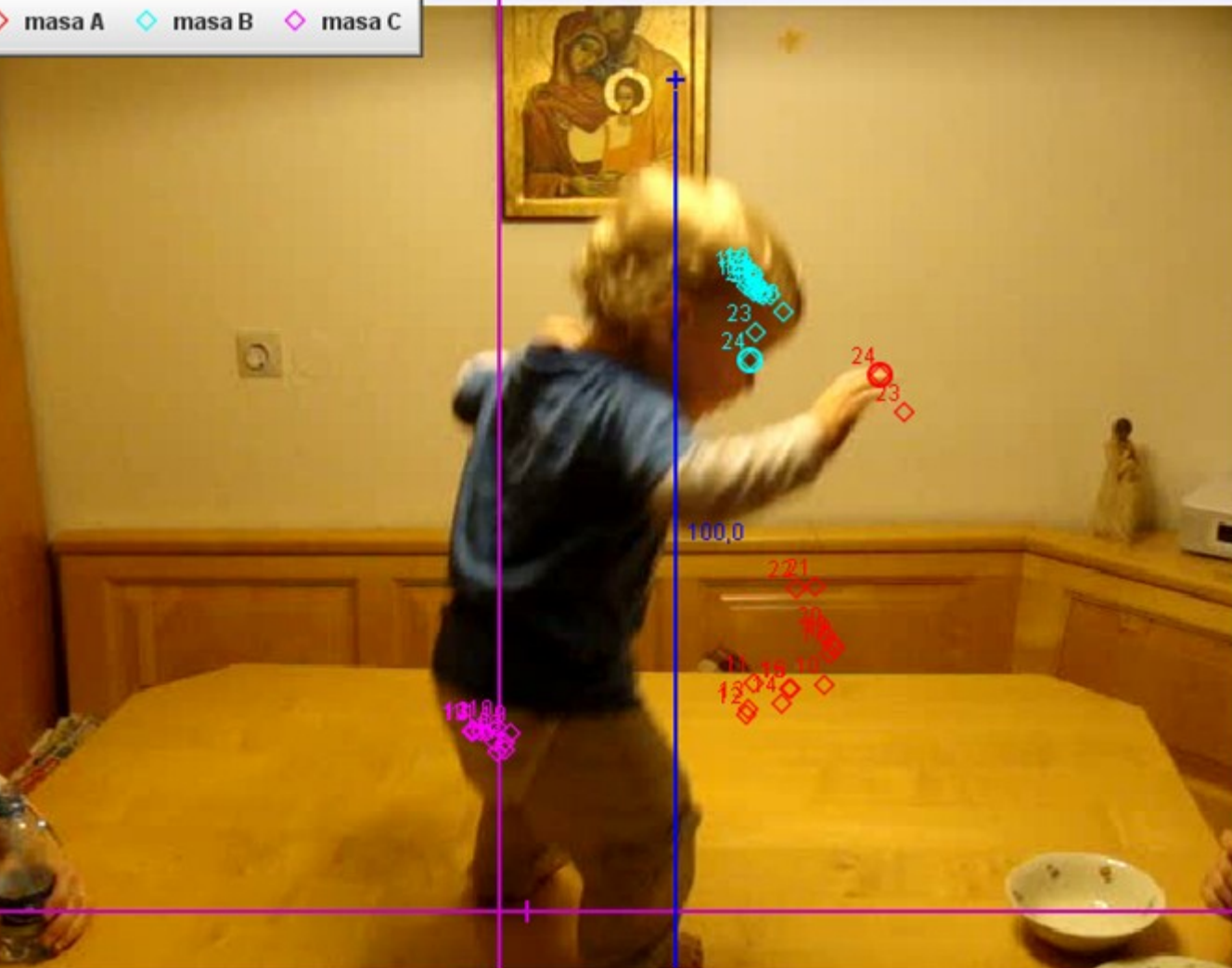


masa C m 1,000

Uporaba pomnilnika: 26MB od 24

kontrola sledi

masa A masa B masa C



Grafi masa C

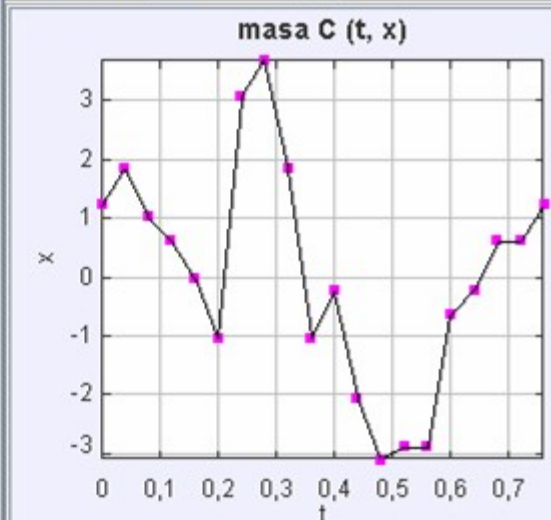
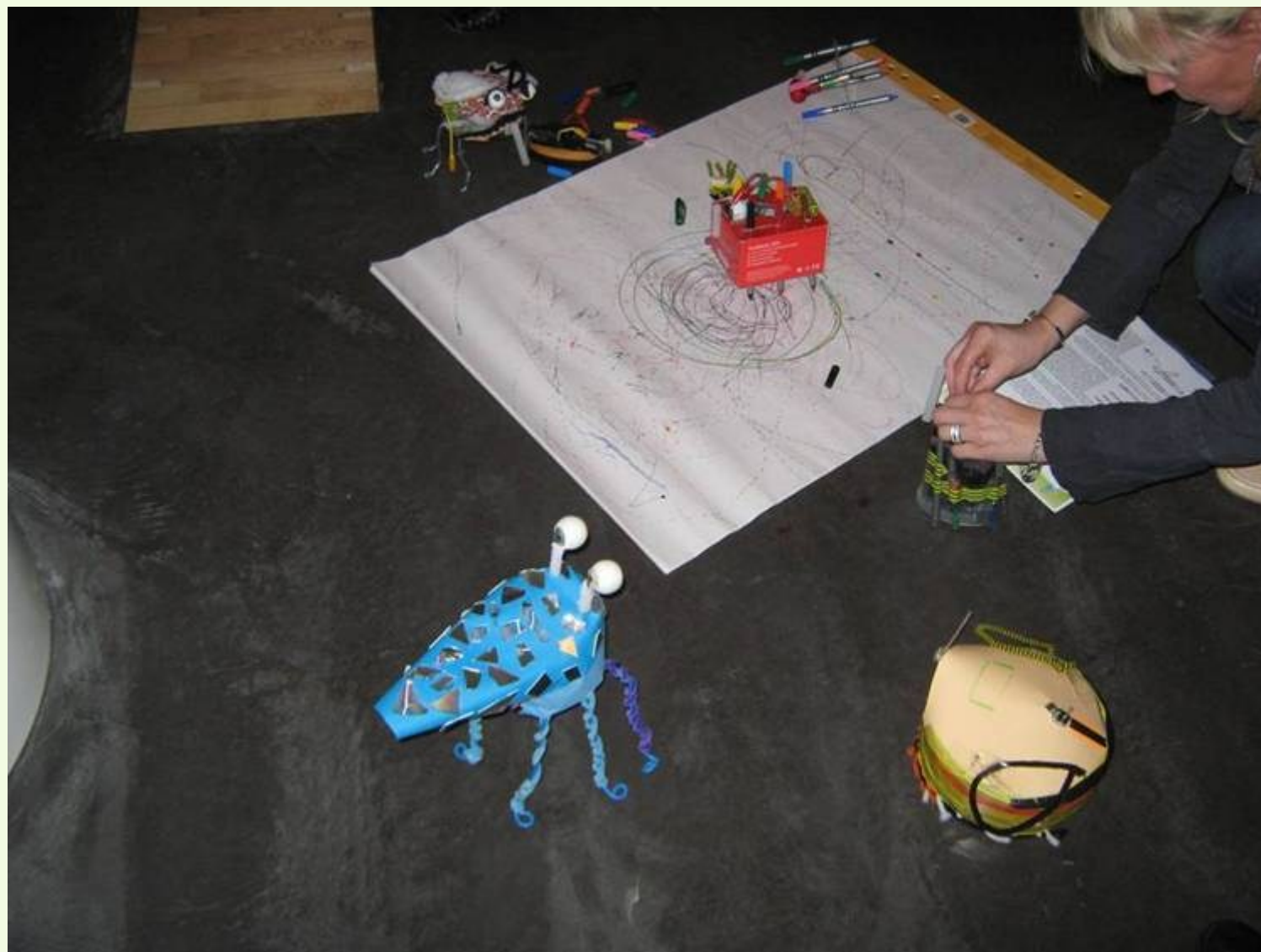


Table masa C

t	x	y
0	1,237	25,567
0,04	1,856	25,567
0,08	1,031	21,856
0,12	0,619	23,093
0,16	0	22,474
0,2	-1,031	23,093
0,24	3,093	18,763
0,28	3,711	18,763
0,32	1,856	18,557
0,36	-1,031	20
0,4	-0,206	20,412
0,44	-2,062	20
0,48	-3,093	20
0,52	-2,887	20,206
0,56	-2,887	20
0,6	-0,619	18,969

masa C izbrano (maso nastaviš v orodni vrstici, položaje označiš s shift-klik)

You Tube



Sejem eksperimentov na Festivalu znanosti



Science on
Stage Slovenija
deluje v okviru
Slovenske
znanstvene
fundacije.







Prva stran

Eksperimenti z opisi

Galerija slik in kratkih filmov

Obvestila in objave
18. slovenski festival znanosti

Povezave

Razpis za Science on Stage Festival 2013 je zaključen.

135

dni do dogodka
Science on Stage Festival

+1 1

Eksperimenti z opisi

Knjižice z opisi najboljših eksperimentov, izbrane s strani irske delegacije

- [Science on Stage 1 Teaching Ideas](#) (.pdf, 4.7 Mb)
- [Physics on Stage 2 Teaching Ideas](#) (.pdf, 2.0 Mb)
- [Physics on Stage 3 Teaching Ideas](#) (.pdf, 1.0 Mb)

Najboljše ideje s festivala v Kobenhavnu 2011

- http://www.science-on-stage.de/media/materialien/sos_11/Dokumentation Science on Stage Festival 2011.pdf

Opisi vseh eksperimentov s festivala v Kobenhavnu 2011

- <http://www.science-on-stage.de/?p=296>

Handbooks Teaching Science in Europe 1, 2, 3, 4

Teaching Science in Europe 1 (v .pdf, EN, DE)

Topics:

- Science in Primary School
- The interdisciplinary approach of teaching science in Eu

Festival znanosti vsaki dve leti:

- Noordwijk, Ženeva, Grenoble, Berlin
- Kobenhavn 2011
- Frankfurt Słubice 2013  
- London 2015 

4 dnevi

350 učiteljev iz EU in Kanade

5 slovenskih učiteljev **brezplačno**