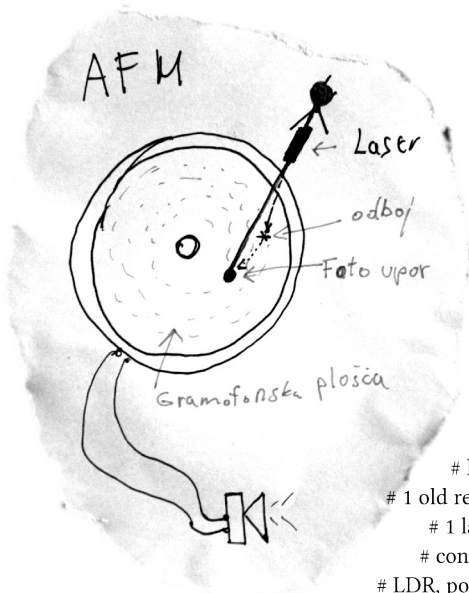


# Stefan Doepner Marc Dusseiller Boštjan Leskovšek

## Nanošmano, NanoPunk and the Hacking of Future

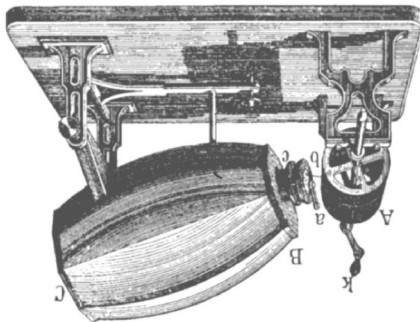
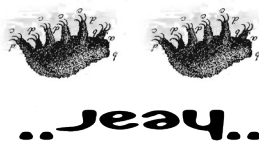
20.9 - 1.10.2010

# Kapelica Gallery, Ljubljana



- Material:**
- # lousy music
  - # 1 old record player
  - # 1 laser pointer
  - # concave mirror
  - # LDR, poti & battery
  - # duct tape
  - # amp & speaker

Nanošmano Turntable



Nanošmano Turntable

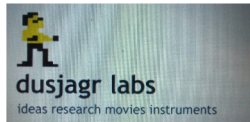
# NŠT 1.0

*Lao Zi - Dao De Jing - Chapter 14*

Du schaust – und nimmst es doch nicht wahr,  
sein Name lautet „Unstichtbar“; (微 - yi)  
du horchst – nichts, was zu hören war,  
sein Name lautet „Unhörbar“; (希 - xi)  
du greifst – nichts ist zu fassen da,  
sein Name lautet „Umfassbar“; (希 - wei)  
Drei Wege, man kann sie nicht erkunden,  
so sind sie, als Einheit gebildet, verbunden.

S not seen as, it is called micro;  
hear the deaf, it is called Greek;  
Fought not, it is called barbarians.  
These three can not be induced interrogate,  
so confused one.

視之不見，名曰微；  
聽之不聞，名曰希；  
搏之不得，名曰夷。  
此三者，不可致詰，  
故混而為一。



Special Thanks to: Borut Savski, Špela Petrič, Maya Smrekar, Dr. Erik Zupanič, Feargal Parkes, Dorotyya Környei, Venzha Christ, Prof. Dr. Igor Muševič, Dr. Dominik Ziegler, Janez Janša, Jure Sajovic, Natasha Muševič, Marko Batista, Petra Milič, Kiberpipa and the Worms...

[www.dusseiller.ch/labs/](http://www.dusseiller.ch/labs/)  
[www.f18institut.org/](http://www.f18institut.org/)  
[www.hackteria.org/](http://www.hackteria.org/)

# Tales from NanoŠmano

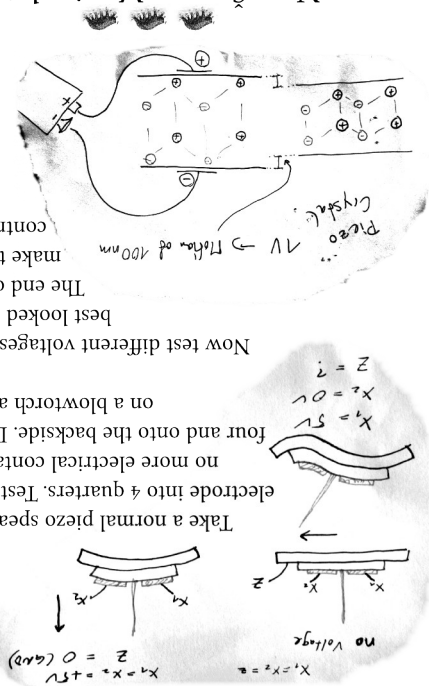
For two weeks, we have been working in Kapelica Gallery to find ways to approach the topic of micro and nanoscale realities in the field of art. As a mixed team of a sculptor, a scientist and a sound artist, together with friends and visitors, we explored the possibilities of hacking into abundant consumer technology from the trash and use them for NanoŠmano experimentation. We transformed old DVD-burners into tools to manipulate and sense matter on the nanoscale, we hacked webcams into powerful microscopes for observation and constructed systems to play with and have audio/visual experiences.

By the end, we had constructed several artefacts, such as the NanoŠmano Glista Dance (NŠ GL 1.0), the NanoKunstFabrik (NKF 0.1 & 0.2), the NanoŠmano Television (NŠ TV 1.0), the pd\_NanoŠmano Explorer (NŠ ex 0.2) and the NanoŠmano Magnetic Moses (NŠ MM 1.0).

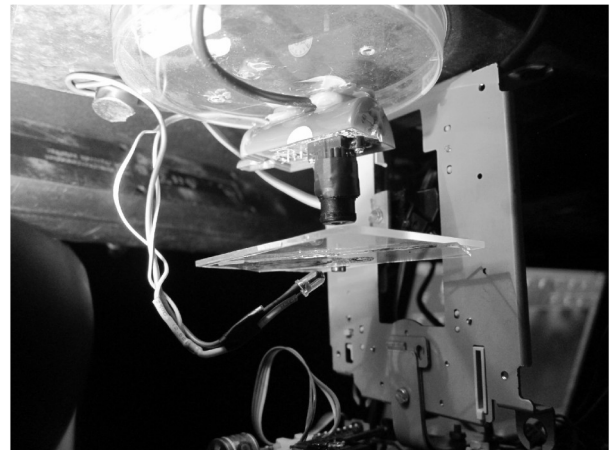
In addition we have developed highly simple experiments to start NanoŠmano explorations, which are described through the following pages and should enable everyone to start their own NanoŠmano.

## NanoŠmano Manipulator

Instructions:  
 Take a normal piezo speaker and cut the silver electrode into 4 quarters. Test to make sure there is no more electrical contact. Solder wire on all four and onto the backside. Draw thin glass probe on a blowtorch and glue to the center.  
 Now test different voltages on all the electrodes, best looked at with a microscope. The end of the glass tip should make tiny little movements, controlled by either sound or a microcontroller.



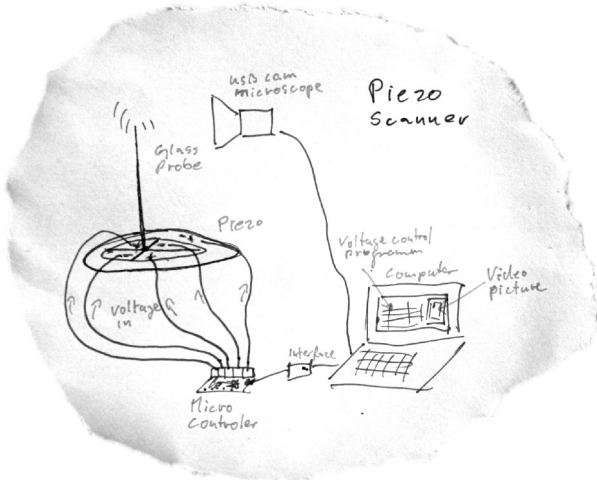
## NanoŠmano Digital Microscope



Material:

- # piezo-buzzer
- # glass pipette
- # electric wire & solder
- # microcontroller or amplified sound signal

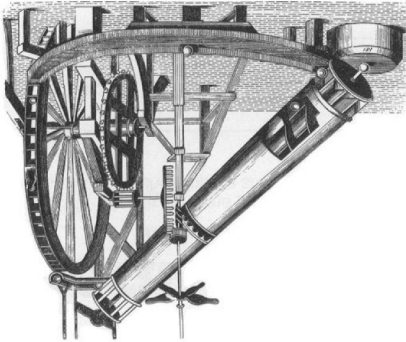
$1\text{nm} = 1\text{m} \cdot 10^{-9}$   
 $1\text{nF} = 0,001\text{MF}$   
 Kristal



Nanošmano Manipulator



..touch..

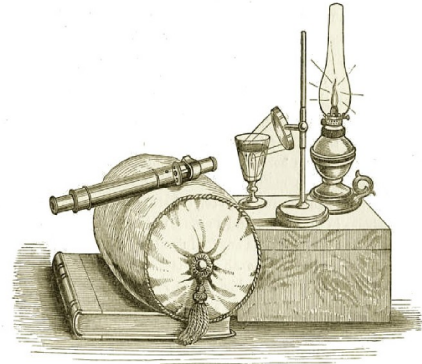


Nanošmano Manipulator

NŠ M 1.0

# NŠ DM 1.0

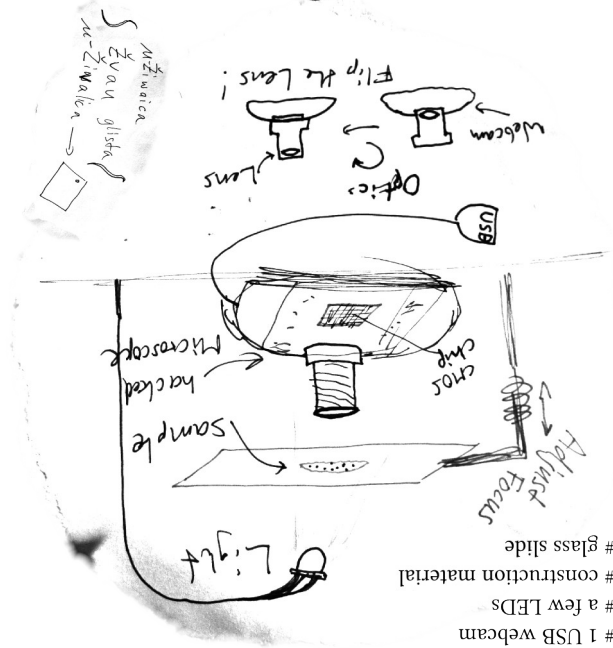
Nanošmano Digital Microscope



..see..



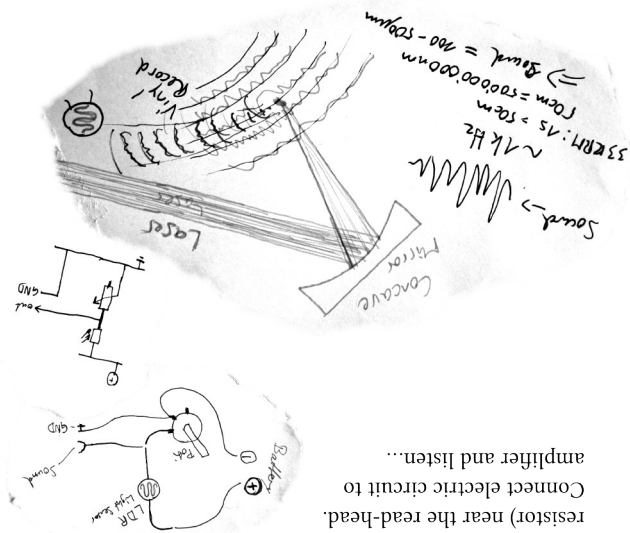
Nanošmano Digital Microscope



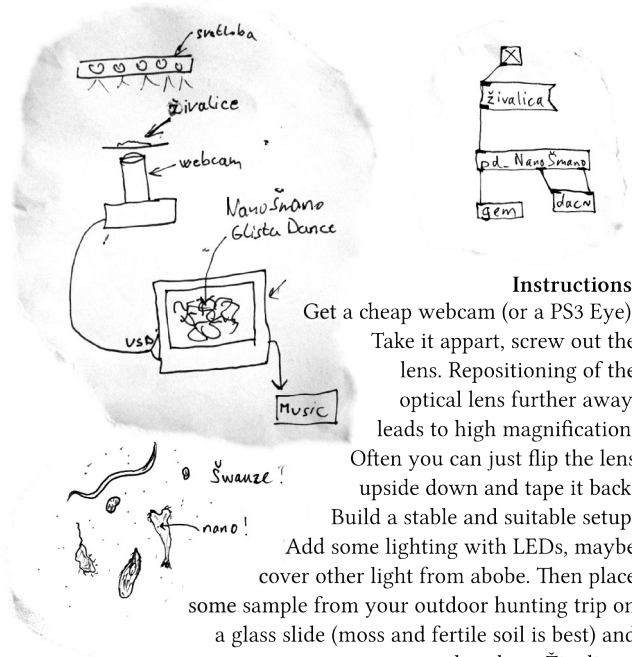
- Material:
- # 1 USB webcam
  - # a few LEDs
  - # construction material
  - # glass slide



Nanošmano Manipulator  
Nanošmano Turntable



**Instructions:**  
Stick laser on the arm of record-player. Somehow mount the concave mirror at the head, focusing the laser down to the record. Place the LDR (light dependant resistor) near the read-head. Connect electric circuit to amplifier and listen...



**Instructions:**  
Get a cheap webcam (or a PS3 Eye). Take it appart, screw out the lens. Repositioning of the optical lens further away, leads to high magnification. Often you can just flip the lens upside down and tape it back. Build a stable and suitable setup. Add some lighting with LEDs, maybe cover other light from abobe. Then place some sample from your outdoor hunting trip on a glass slide (moss and fertile soil is best) and marvel at the  $\mu$ -Živalice...

Nanošmano Digital Microscope  
Nanošmano Turntable

