

OPEN SCIENCE HARDWARE AND GLOBAL COMMUNITY

Congrès Général des 150 ans de la
Société Française de Physique

Urs Gaudenz

MSc Microtechnology (EPFL)

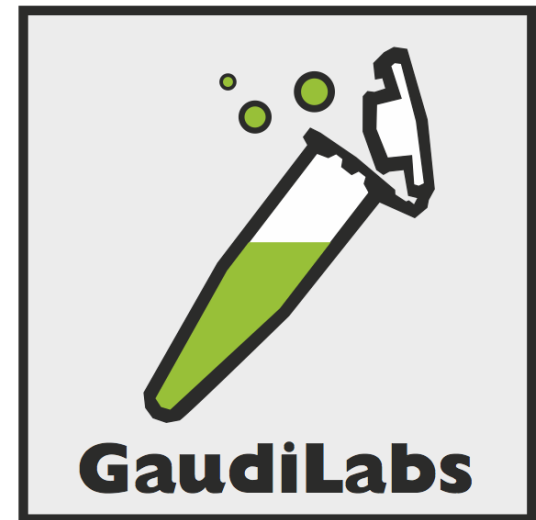
Founder of GaudiLabs Switzerland

Technikumstrasse 21, CH-6048 Horw

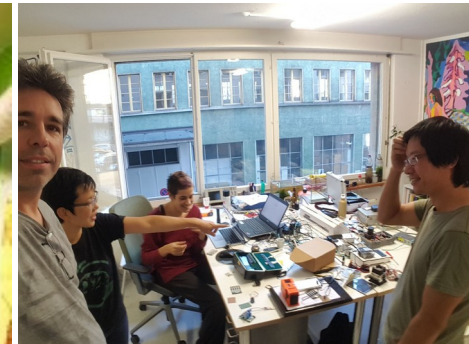
T +41 41 349 33 11, F +41 41 349 39 60

T direkt +41 41 349 35 97

<mailto:urs.gaudenz@hslu.ch>



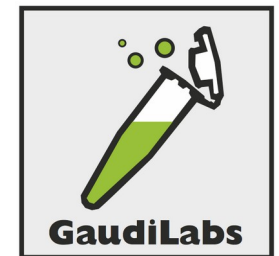
GaudiLabs - A Third Place for Third Culture



Company Registration
CH-100.1.805.041-1

Ecogen BSL1
Meldung A192563

Open Source Lab Equipment



Urs Gaudenz

- Urs Gaudenz is microengineer and worked for Swiss high tech companies in the field of micro sensor technology.
- Several years of experience as a consultant in innovation management
- Lecturer for product innovation at the Lucerne University
- **Founder of GaudiLabs, creative spaces for working, thinking and living where culture and technology meet.**



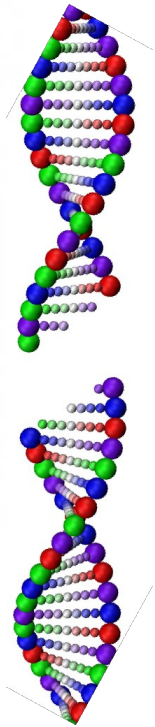
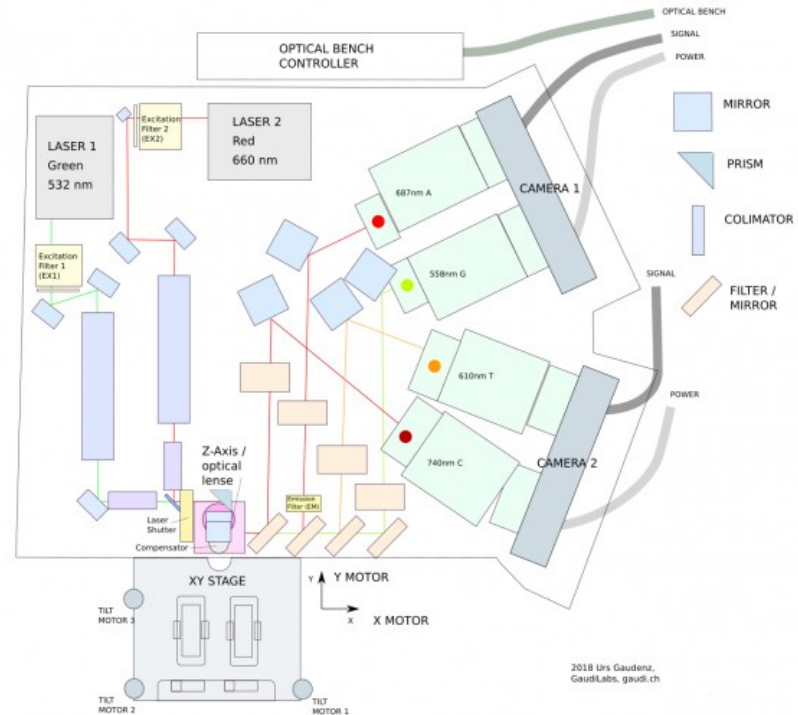
Old Radio - Comes with the full Schematic



Source: <http://wearcam.org/veillanceloT.htm>

Reverse engineering a DNA Sequencing Machine

- Illumina HiSeq2000
- Reverse engineering Hardware
- Crowdfunding for Open Software



HiSeq2000 - Next Level Hacking

LEDMODETMPST On	LEDMODETMPST	0 = single mode / 1= Full size blue nightrider sweep.	Special LED nightrider mode
Emission Filters			
EM2VL_DN pin	EM2VL_DN	p=[9..91 / 10,20,40] (percent)	Emission Filter 2, Down Velocity (Percent) (Down=out of path, really is up)
EM2VL_UP pin	EM2VL_UP	p=[9..91 / 10,20,40] (percent)	Emission Filter 2, Up Velocity (Percent) (Up=in of path, really is down)
EM2RDV_DNn	EM2RDV_DN v	v = [9..91] 10	Emission Filter 2, Read Down Velocity
EM2RDV_UPn	EM2RDV_UP v	v = [9..91] 10	Emission Filter 2, Read Up velocity
EM2On			Move filter Out of Path
EM2In			Move filter In of Path
EM2RDn	EM2RD 0 1 0 0	a b c d =[0,1] / a= , b=InPathSensor, c=OutOfPathSensor, d = / position = IntoPath / OutOfPath / Unknown	Read Filter Position (Sensor)
Excitation Filters			
EX4HM2n	EX4HM2	s=[1,2] filter path	Home excitation filter 1 or 2 to laser-safe blocked position.
EX4MV pin		s=[1,2] p=[71,71] (OD0.4) / 270.0000 degrees / 71 Moved 'Reflective' to index 2 (OD2.5) 90 degrees	Move Excitation Filter Wheel by p (71 = 90 degrees 35.5=1 step?)
EX4V pin		s=[1,2] p=[131072]	Set Excitation Filter Wheel speed?
EX4CUR pin		s=[1,2] p=[35]	Set Excitation Filter Wheel Current?
Tilt Motor Control			
		n = [1,2,3] (motor), p=[0..ca.34300] (6560 steps / mm) 0 =	Tilt motor (n) (ca.34300 steps / mm) (0 =

Hackteria - Open Source Bio Art, DIY Biology and Lab Equipment

- Open Knowledge Sharing
- International Collaboration
- Interdisciplinary Science Projects
- Community Science
- Open Labs



International Conference MutaMorphosis, Pargue 2012



Hackteria Lab Bangalore (NCBS)

Open Source Lab Equipment



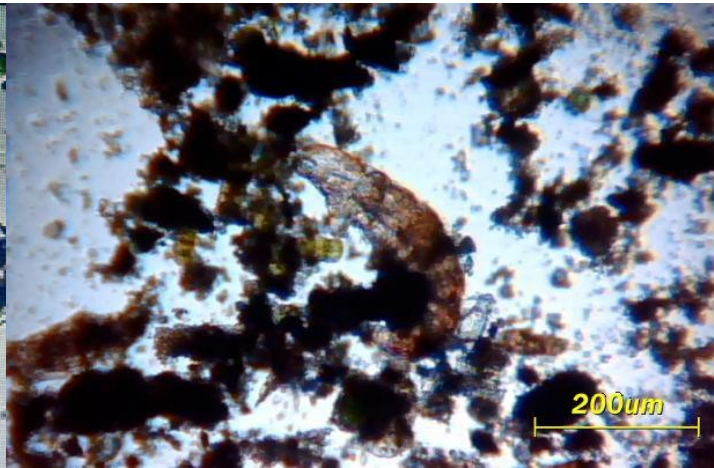
Improvised, mobile Laboratory

GaudiLabs

Building Low Cost Microscopes from Webcams

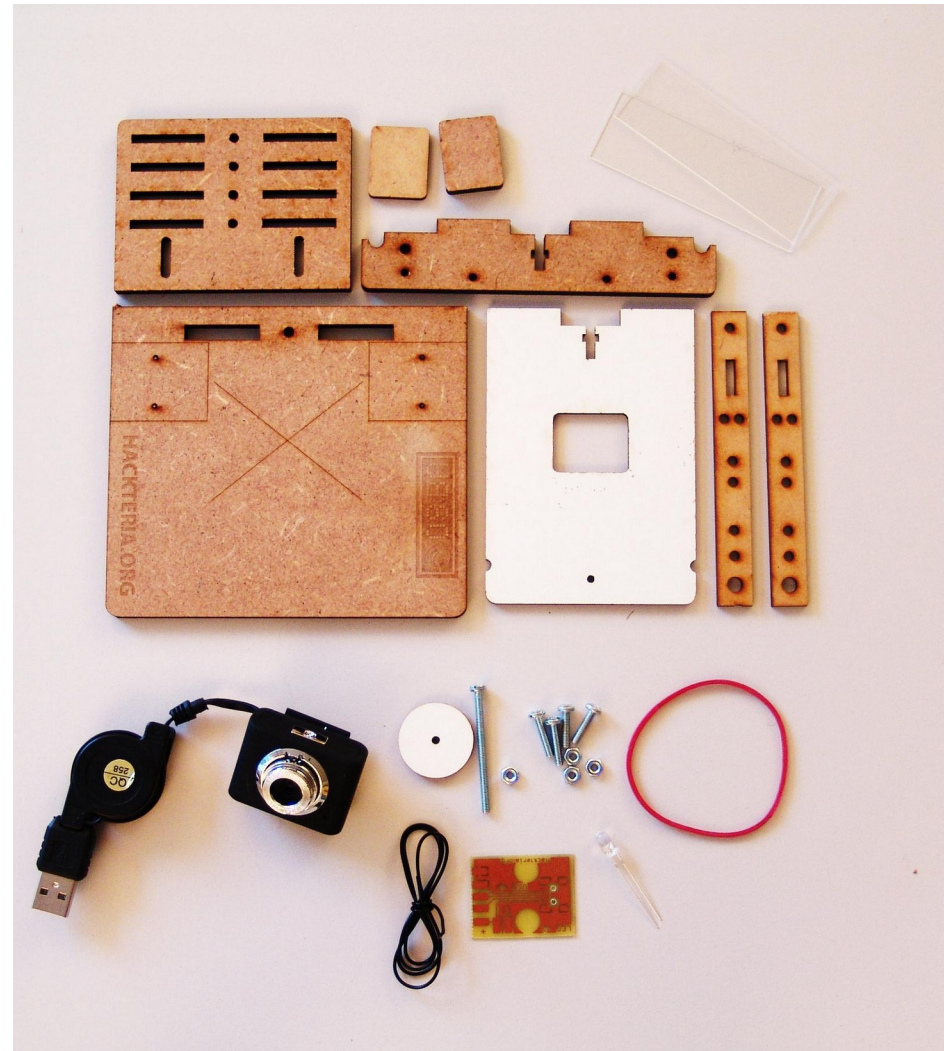
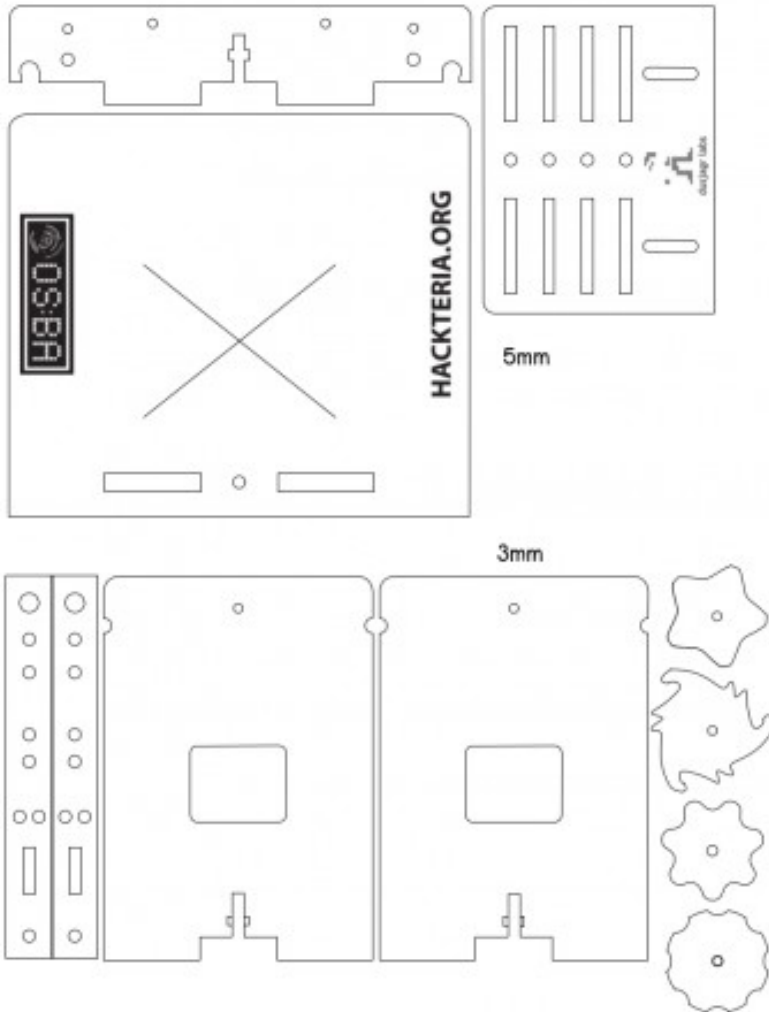


Seeing the microscopic world, 400x

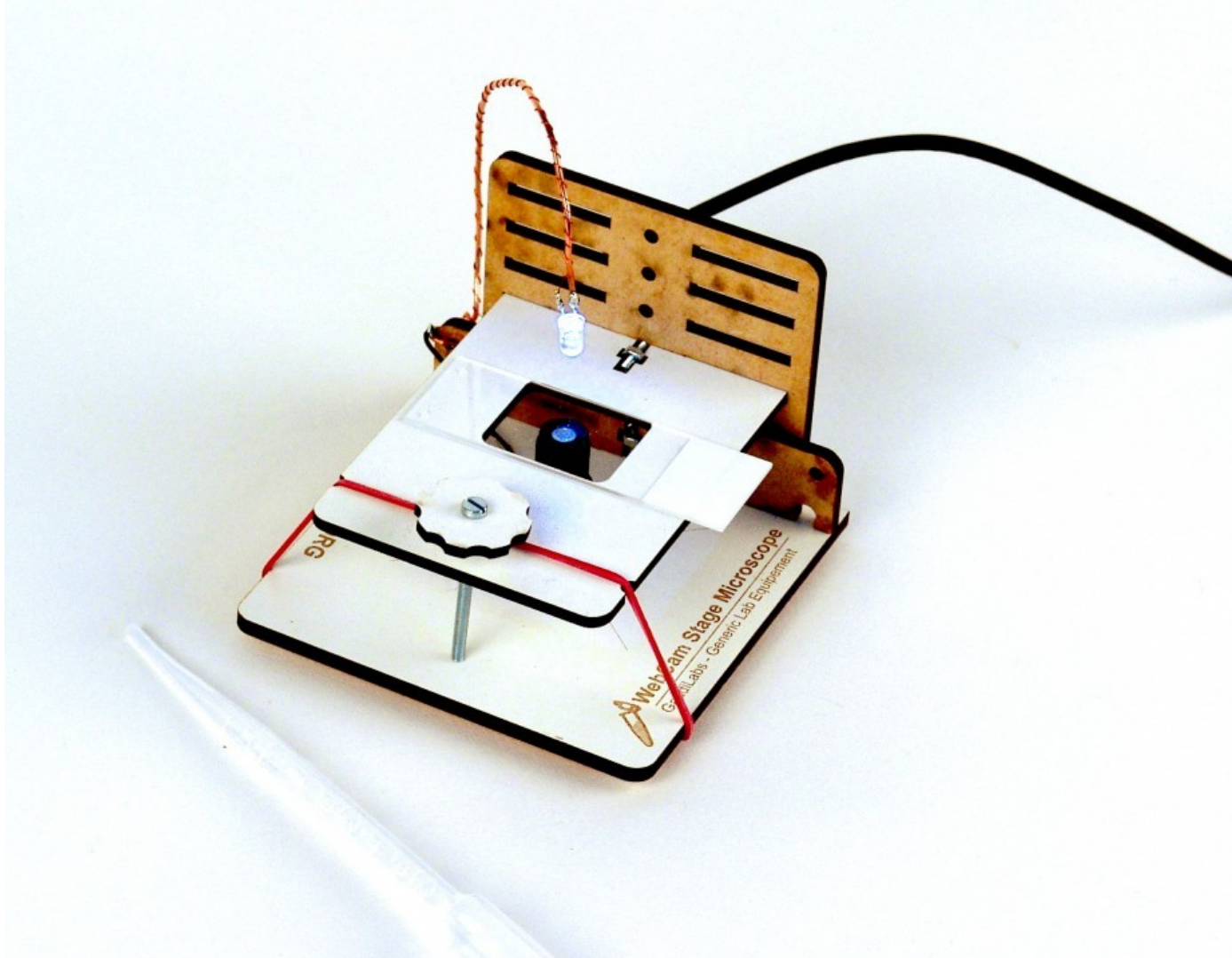


Open Source Design for Laser Cutting in a FabLab

Hackteria WebCam Microscopy Stage Kit - 2013



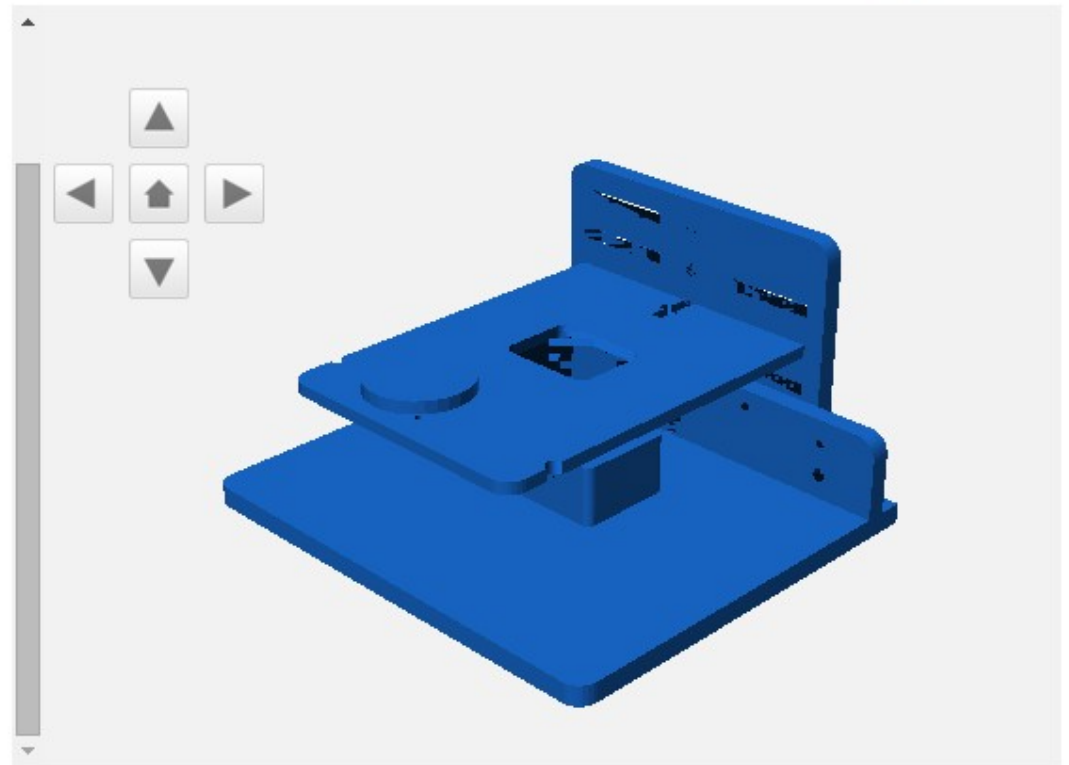
Hackteria Inverted WebCam Microscope



Customizable Design on Thingiverse.com

Webcam Microscope Stage

- Microscope Width 120
- Microscope Depth 105
- Microscope Height 60
- Object Plate Depth 94
- Object Plate Width 70
- Object Hole Width 25
- Object Hole Depth 20
- Wheel Diameter 25
- ▼ material
- Base Material 5
- Plate Material 3



<http://www.thingiverse.com/app/>

Copy

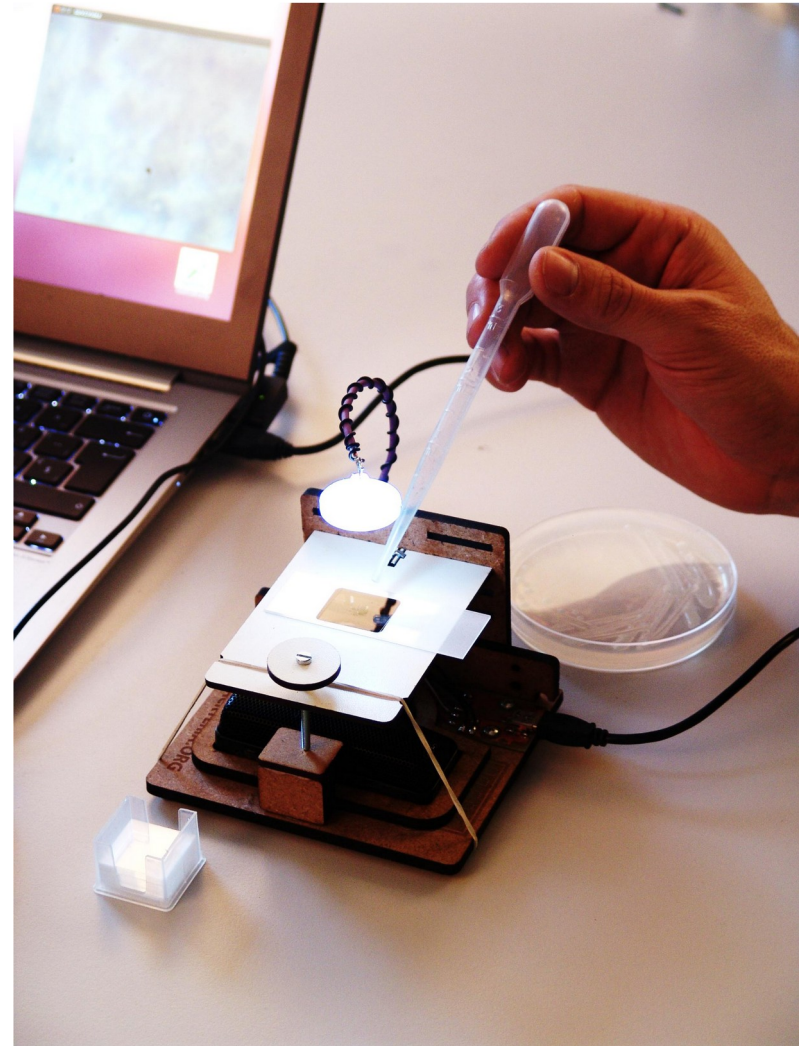
View Source

Create Thing

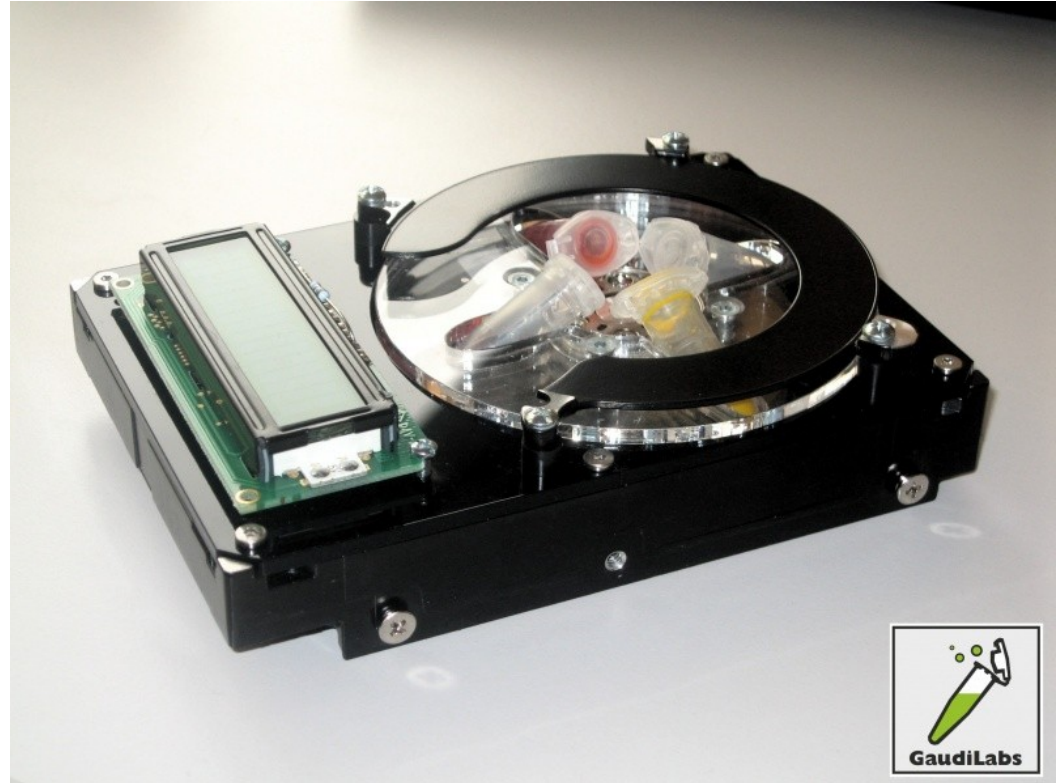
An the play goes on... Made in Taiwan



Generic Lab Equipment - Computer WebCam Mikroskop



Hard Disk Centrifuge

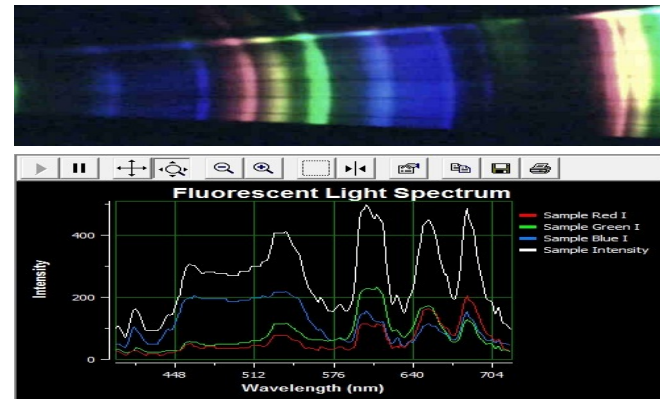
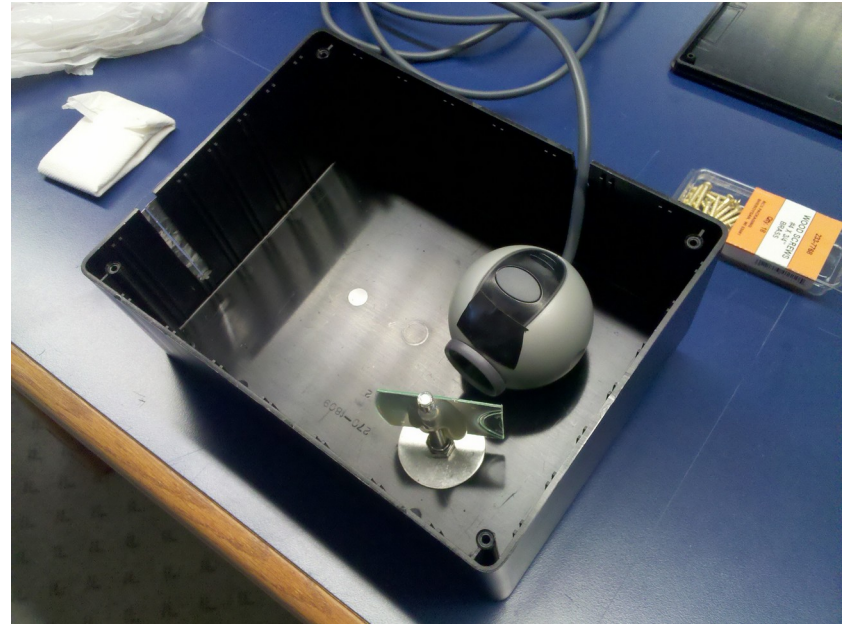


<http://www.youtube.com/watch?v=uqa1JNLLB78>

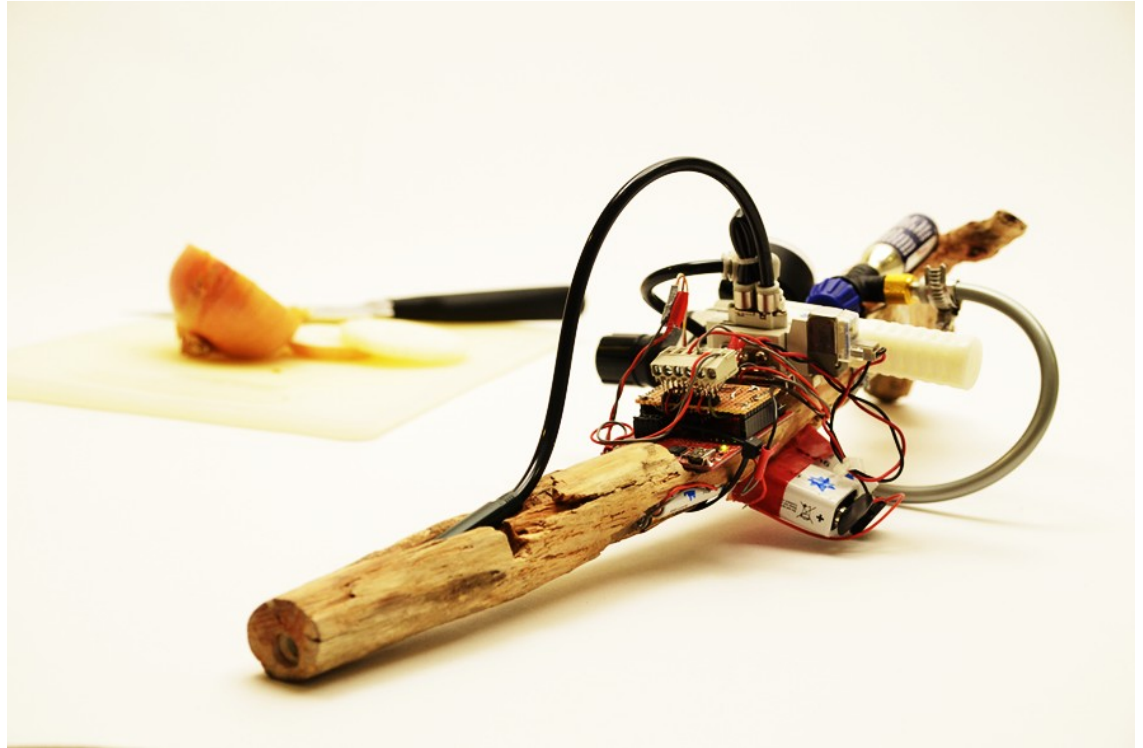
Light Bulb Incubator



CD-ROM Spectrometer

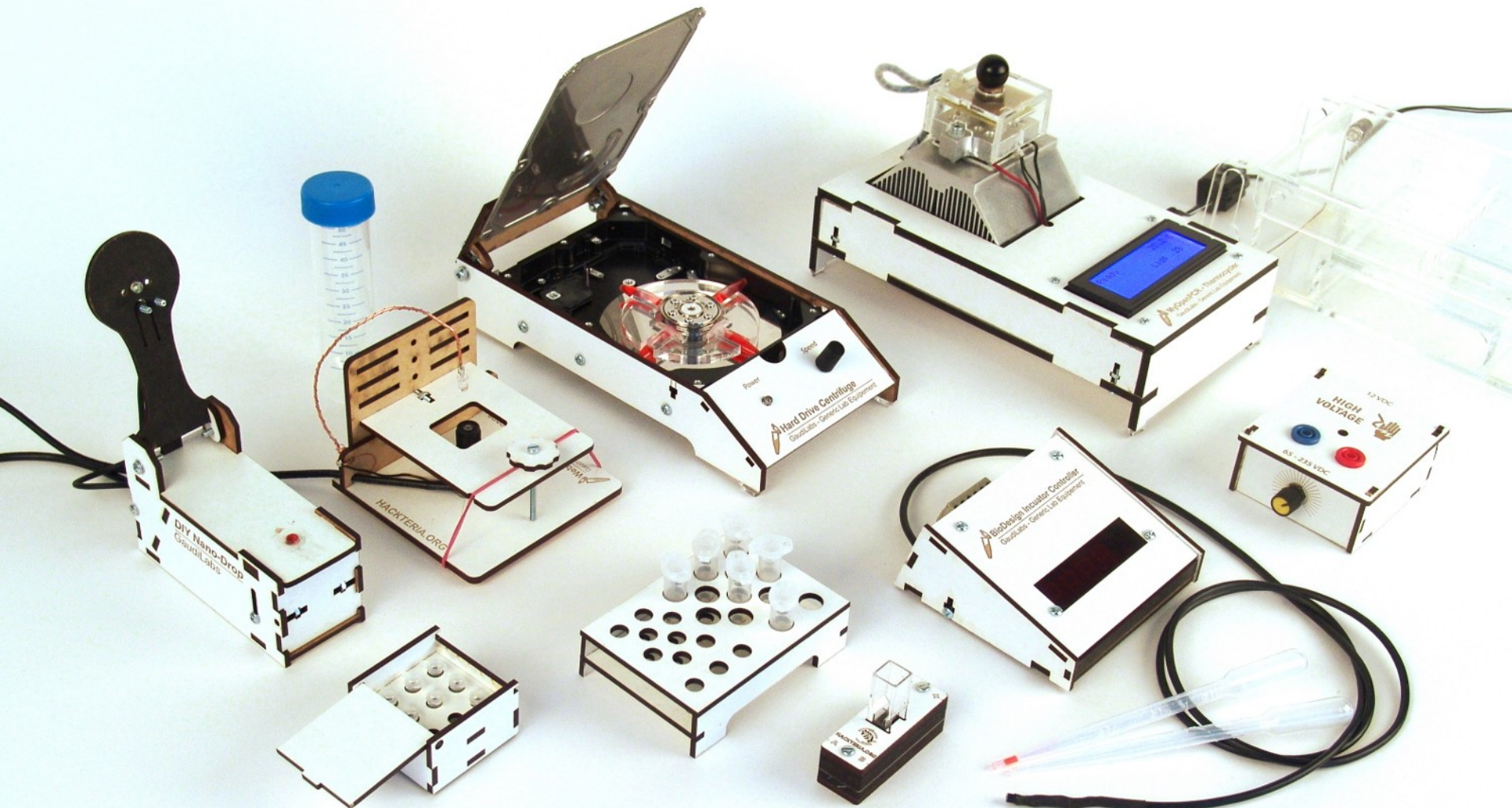


Bicycle pump Gene Gun



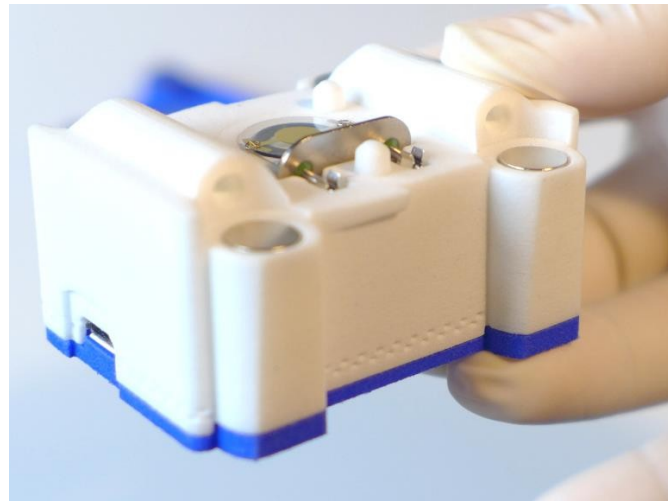
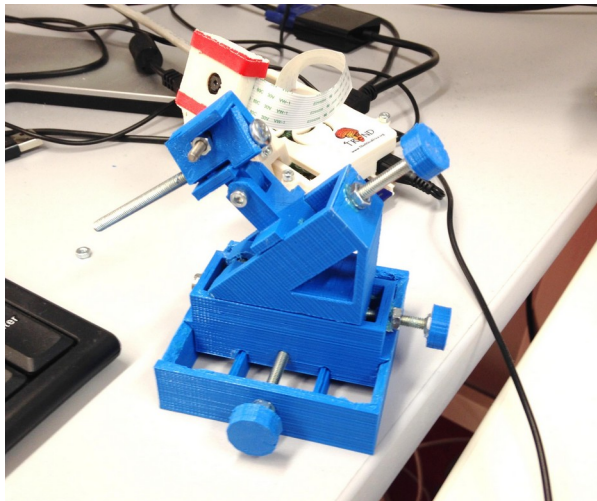
<http://hackteria.org/?p=1979>

DIY Open Source Generic Lab Equipment



http://www.gaudi.ch/GaudiLabs/?page_id=328

Gathering for Open Science Hardware



Geneva, Switzerland | Santiago, Chile | Shenzhen, China | Panama

GOSH Manifesto - 571 supporter worldwide

GOSH is accessible

GOSH is ethical

GOSH changes the culture of science

GOSH democratizes science

GOSH has no high priests

GOSH has no black boxes

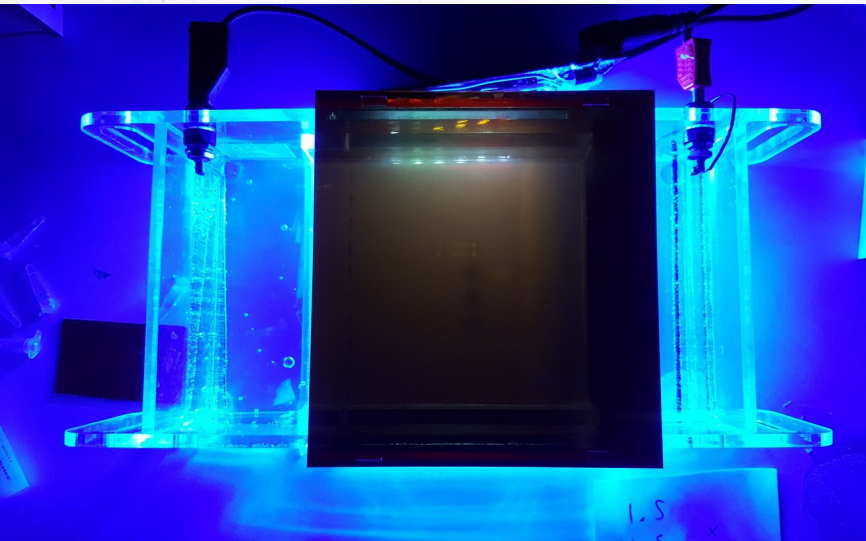
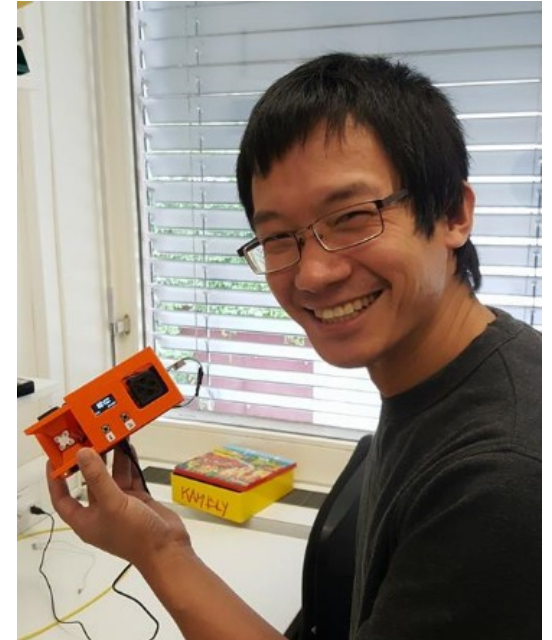
GOSH allows multiple futures for science



GOSH
Gathering for Open
Science Hardware

Open Source = Make Source of your work Openly available

PocketPCR - Open Source Thermo Cycler for PCR



Open Source 3D Printable Spectrometer



Optical Fiber used as a light guide with a connector on each side.

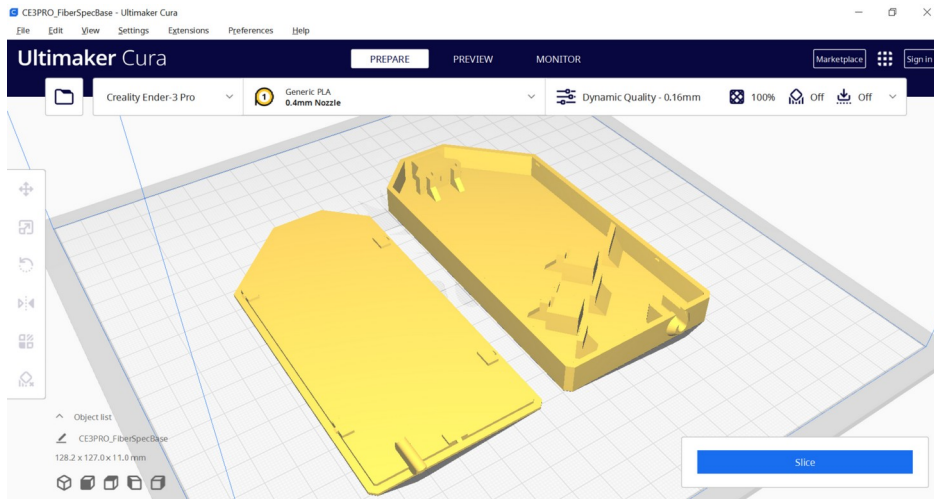
USB Camera with cable and USB-A connector.



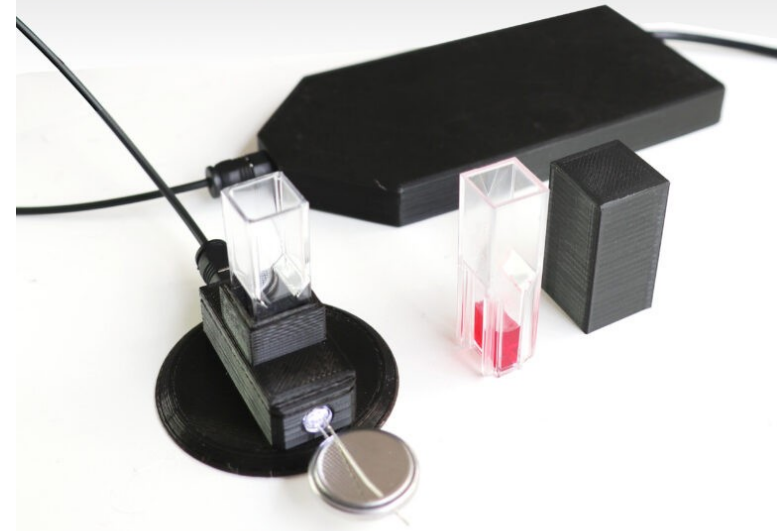
Diffraction Grating and Optical Slit

Light Emitting Diodes (LEDs)

Cuvettes for Liquids



Open Source Lab Equipment



GaudiLabs

DIY Mobile Gen Lab



Open Source Lab Equipment



Bethan Wolfenden / Philipp Boeing - bento.bio
GaudiLabs

OpenDrop - Digital Microfluidics Platform



Interest form the Industry



Dot Silverman, Bio/Nano
Research group at
Autodesk Research



Innovating Epigenetic Solutions

Jean-Luc Deladriere, diagenode,
Innovating Epigenetic Solutions

EUROIMMUN



Markus Cavalari, Head of molecular
infection diagnostics, Euroimmun,
Deutschland



Perry Lam, Purchasing Officer, HAI
KANG LIFE CORPORATION
LIMITED (HKLife), Hong Kong,
P.R.China



Diagnostics

Bruno Frey, Head Technology
Assessment Chief Technology
Office at Roche Diagnostics

Karan Kampani, RnD for
Roche Molecular Solutions
based in California

SiLA

 Rapid Integration®

Devon Johnston, Chief Operating
Officer & VP Association
Consortium Standardization in Lab
Automation (SiLA)



i n v e n t

Hewlett Packard, Palo Alto



Mark Nowakowski , LyoGen
LLC, San Diego, CA, USA



Tulasi Sivanesan , Systems
Engineering Requirement
Manger, Intel Corporation, USA

Ranjeet Alexis, Intel Capital



Gerson Aguirre, Director of
Microfluidics, Zepto Life
Technology, McGill University

Great Response form academics in US Universes



Henry Lee, Ph.D., PostDoc
Department of Genetics
Harvard Medical School,
Cambridge



Nathaniel Omans, Columbia
University Department of
Biochemistry, Zuckerman Mind
Brain Behavior Institute



Luis Soenksen, PhD, Research
Fellow MIT, innovation &
Entrepreneurship activities



MARQUETTE
UNIVERSITY

Mike Bachmann, Biomedical
Engineering – Bioelectronics,
Marquette University



Philip Brisk , Dan Grissom,
Associate Professor of Computer
Science with the University of
California, Riverside.



Jeanette Nguyen, Kevin Lhoste,
Game Lab, Center for Research
and Interdisciplinarity (CRI), Paris,
France

CAL POLY
SAN LUIS OBISPO

Ben Hawkins, faculty
member at CalPoly, a
university in central
California

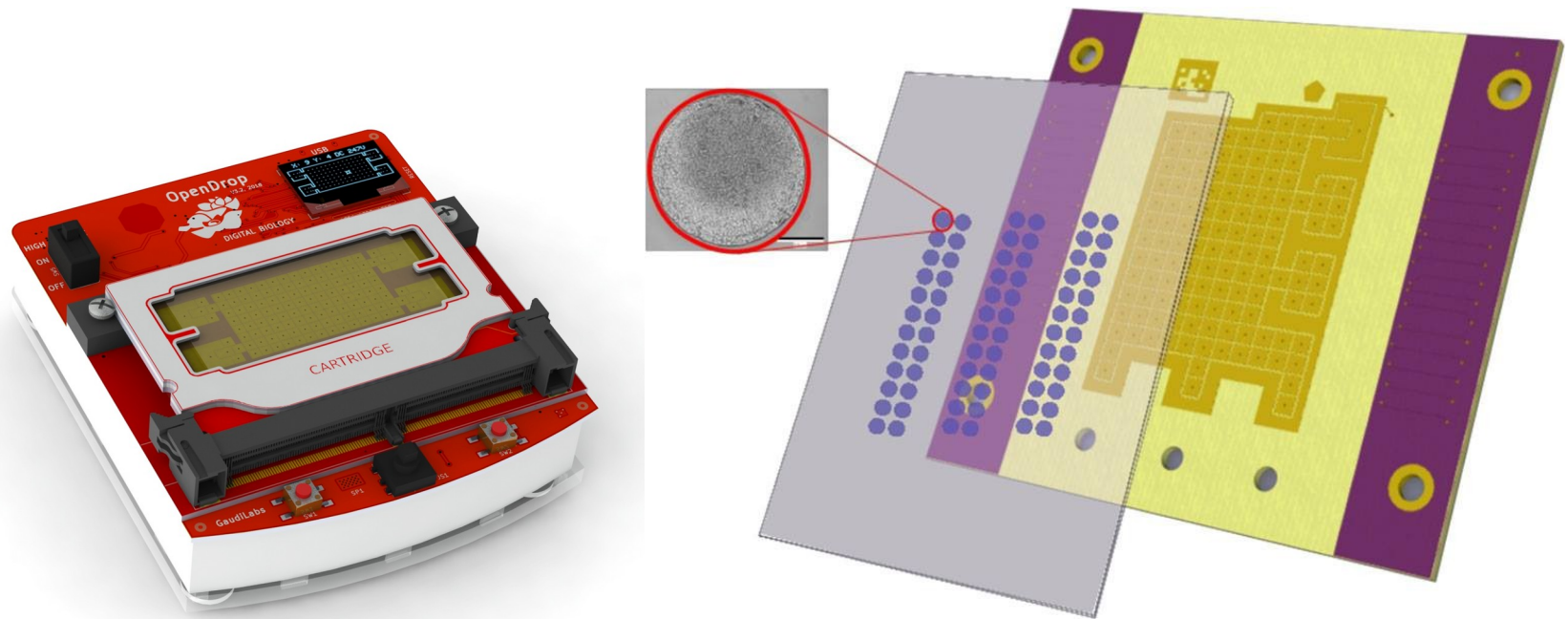
W
UNIVERSITY of
WASHINGTON

Sharon Newman, University of
Washington, Department of
Bioengineering, BioRobotics
Laboratory



DNA data storage on the OpenDrop platform

- "We demonstrate that 1 TB of data could be stored in a single spot of DNA and successfully retrieved using this method"

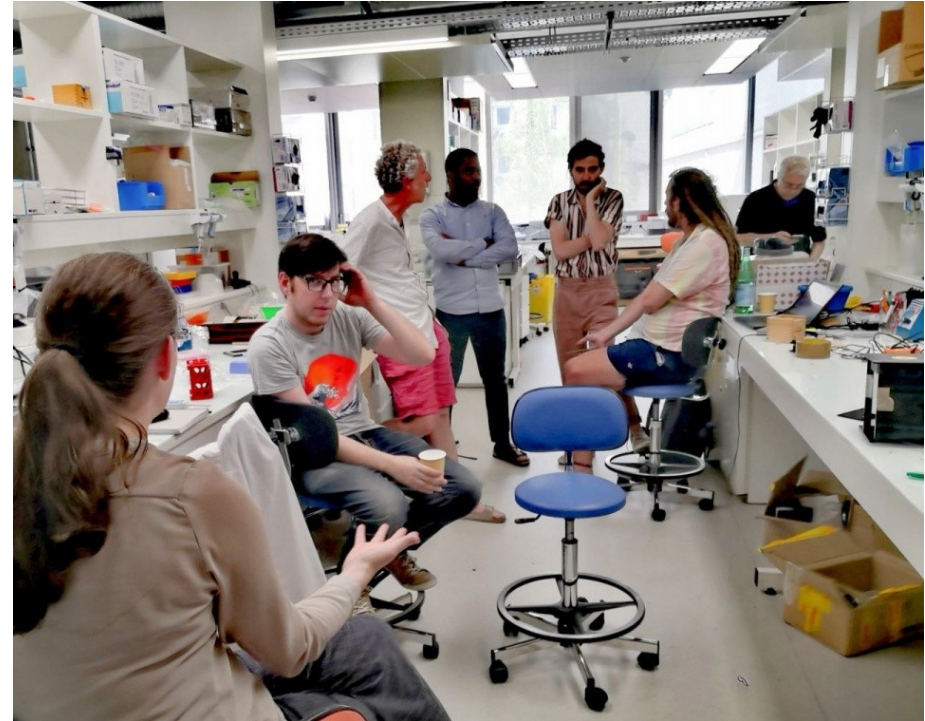


Sharon Newman et al from University of Washington
just published a Nature Communications

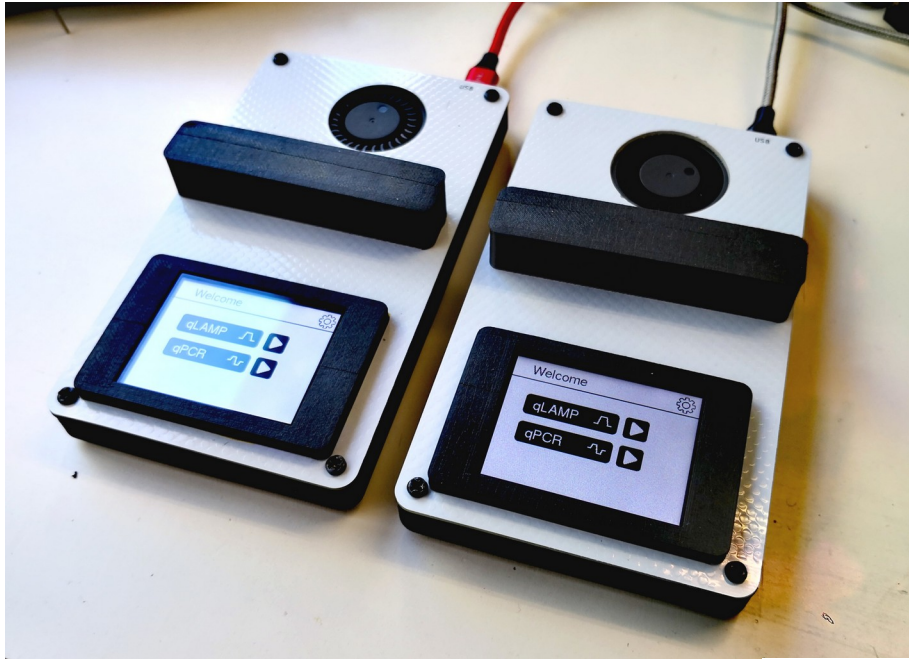
https://www.nature.com/articles/s41467-019-09517-y?fbclid=IwAR288zDLTSRMEF_FkkKN2Bd1A_F2_SG_qpZu74qO-tZrrYDMuRSqSJtuuN4

GlobalLAMP - Global Collaboration for Low Cost PCR Diagnostics

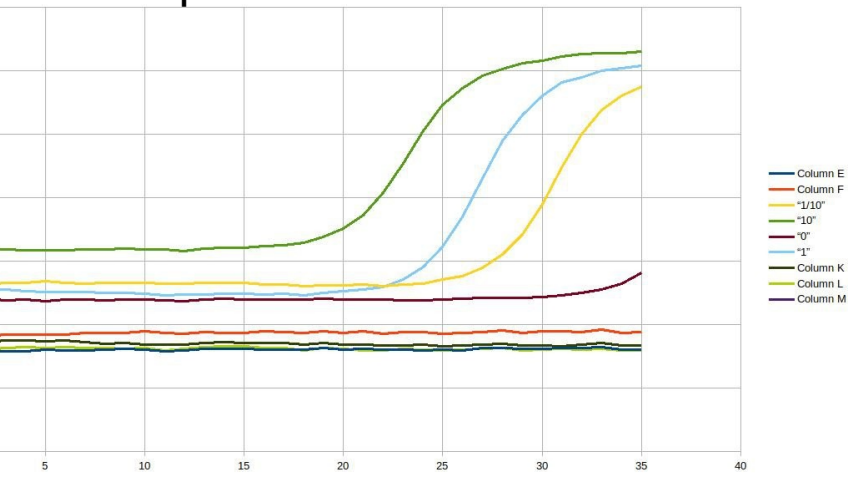
- Quantitative real-time DNA amplification is at the heart of diagnosing infectious disease
- This project will change accessibility and affordability of this device
- The core of the project are researchers from diverse geographical backgrounds, expertise and socioeconomic origins



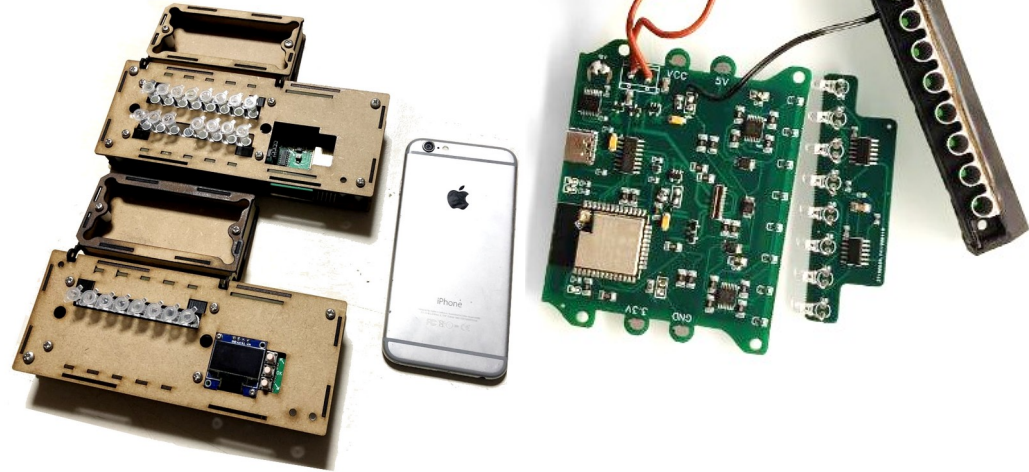
Three Devices for qLAMP and qPCR < 1000 euro



qPocketPCR



qByte



Ninja qPCR

GaudiLabs

Collaboration with MboaLab / Beneficial Bio Cameroon



Presentation at the Center D'Expertise De Diagnostic Biologique Du Cameroon CEDBCAM

Open Source Lab Equipment

GaudiLabs

Successfully run a qLAMP reaction from a Powerbank during blackout



Open Source DNA Code to produce enzymes



Open Biotechnology

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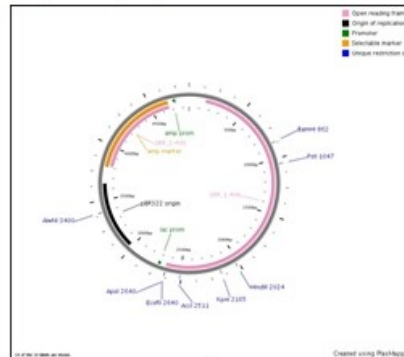
- Why Open Biotechnology?
- Core Principles
- Innovation Scholarships
- Free Deposit Service

Biotechnology Tools

- Cell Lines
- Cytokines
- Cloning**
- Standards and Ladders
- PCR
- Protein Production



Home > Cloning > pOpenTaq Expression Vector



Price: **\$40.00**

Qty:

This item qualifies for free shipping!
Product Code: POPENTAQ

Description

pOpenTaq is a plasmid vector for Taq polymerase expression. It was created by Open Biotechnology, Inc using synthetic biology and released for unrestricted use. This is what we use to produce Taq polymerase ourselves used in our own Open Master Mix.

[pOpenTaq Expression Vector datasheet](#)

[pOpenTaq Expression Vector Expression Protocol](#)



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http://www.openbiotech.com/product_p/popentaq.htm