OPEN SCIENCE HARDWARE AND GLOBAL COMMUNITY

Congrès Général des 150 ans de la Société Française de Physique

Urs Gaudenz
MSc Microtechnology (EPFL)
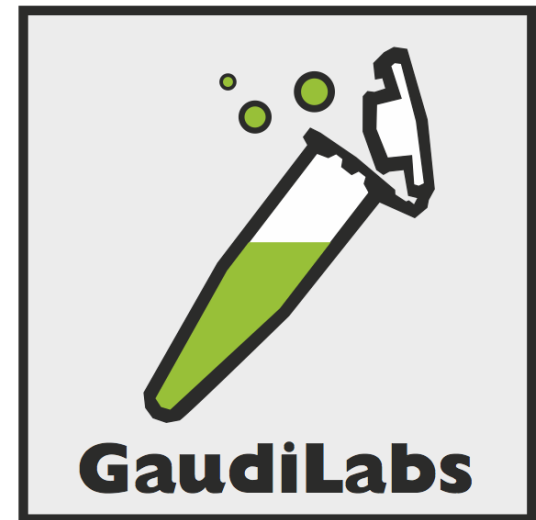Founder of GaudiLabs Switzerland
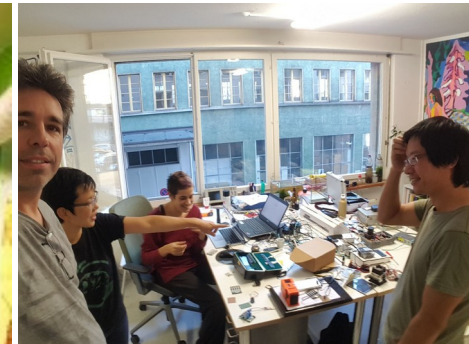
Technikumstrasse 21, CH-6048 Horw
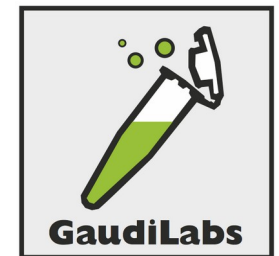T +41 41 349 33 11, F +41 41 349 39 60
T direkt +41 41 349 35 97
mailto:urs.gaudenz@hslu.ch

GaudiLabs

GaudiLabs - A Third Place for Third Culture

Company Registration
CH-100.1.805.041-1

Ecogen BSL1
Meldung A192563

Open Source Lab Equipment

GaudiLabs

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
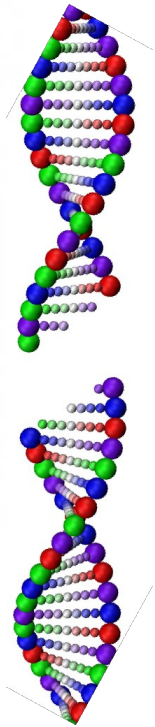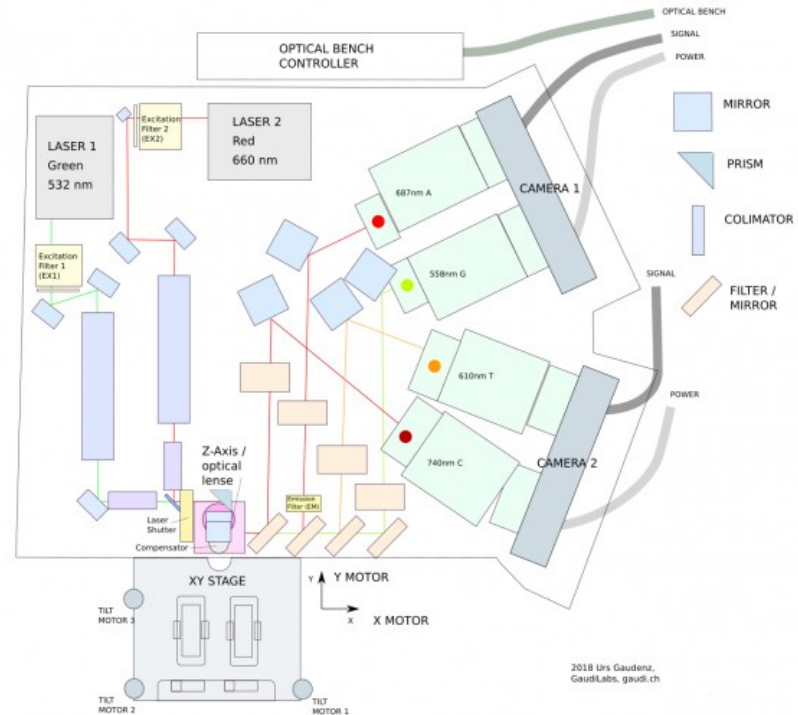- Founder of GaudiLabs, creative spaces for working, thinking and living where culture and technology meet.

Old Radio – Comes with the full Schematic

Source: http://wearcam.org/veillanceIoT.htm

Reverse engineering a DNA Sequencing Machine

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

Open Source Lab Equipment

https://www.hackteria.org/wiki/HiSeq2000_-_Next_Level_Hacking

GaudiLabs

Hackteria – Open Source Bio Art, DIY Biology and Lab Equipement

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

International Conference MutaMorphosis, Pargue 2012

Hackteria Lab Bangalore (NCBS)
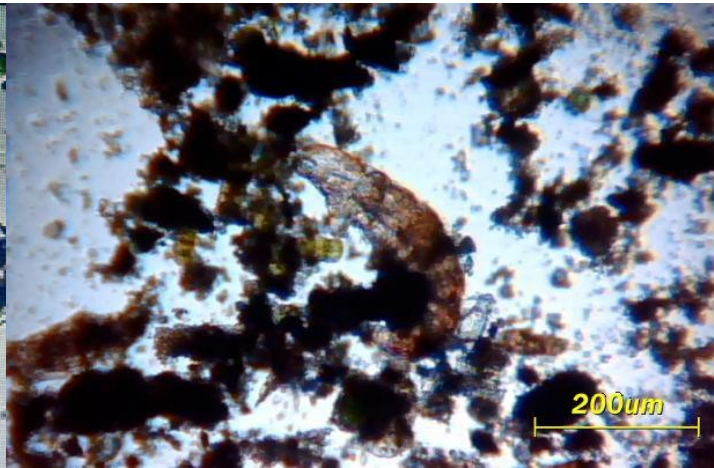
Open Source Lab Equipment

Improvised, mobile Laboratory

GaudiLabs

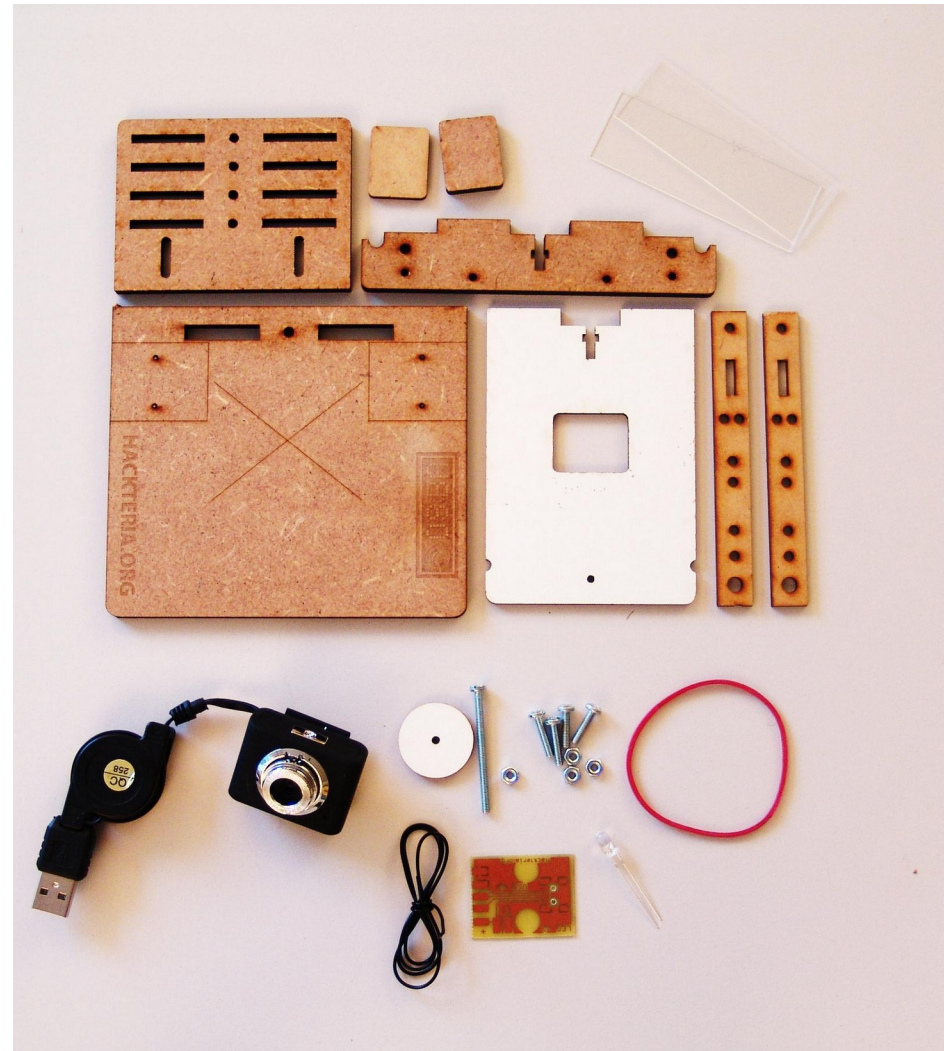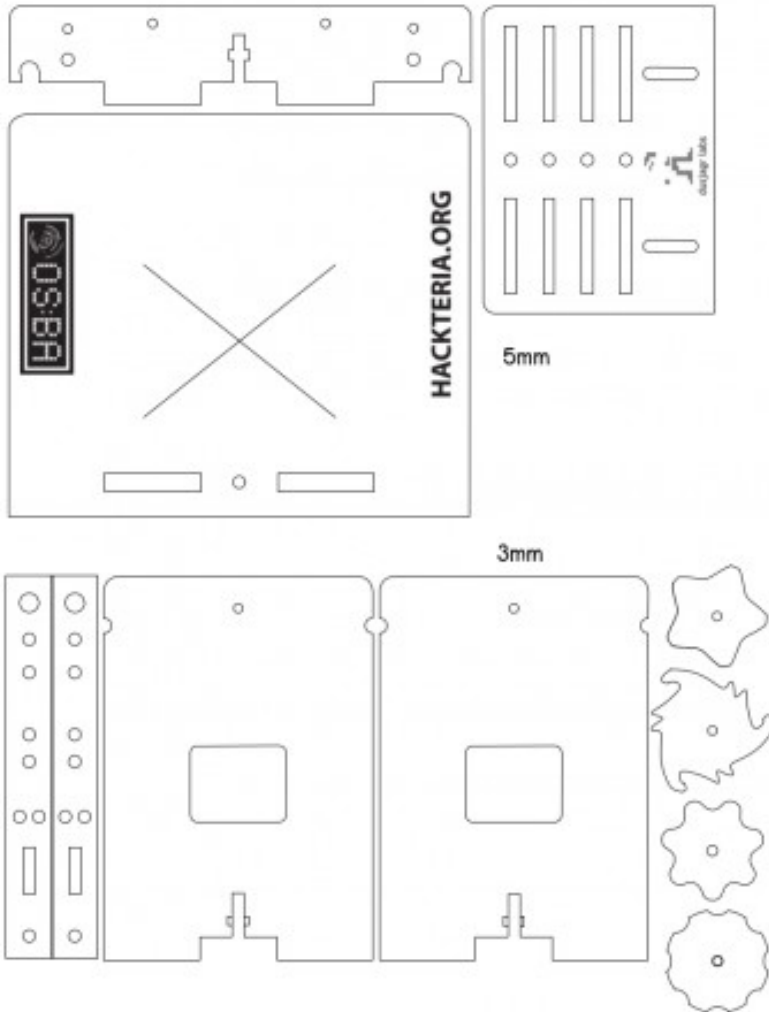# Building Low Cost Microscopes from Webcams

Seeing the microscopic world, 400x

200um

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Open Source Design for Laser Cutting in a FabLab

Hackteria WebCam Microscopy Stage Kit - 2013

Hackteria Inverted WebCam Microscope

GaudiLabs
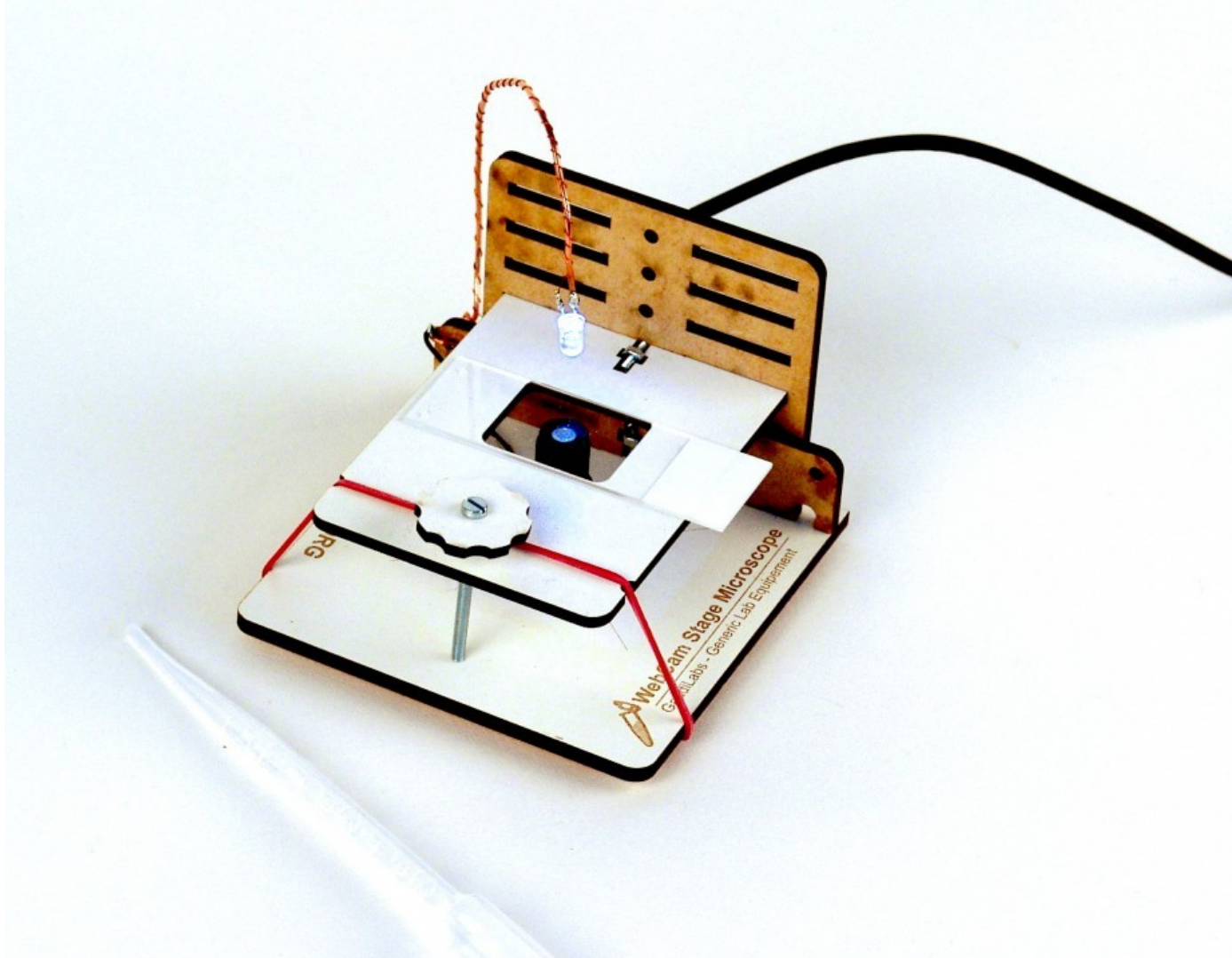
Customizable Design on Thingiverse.com
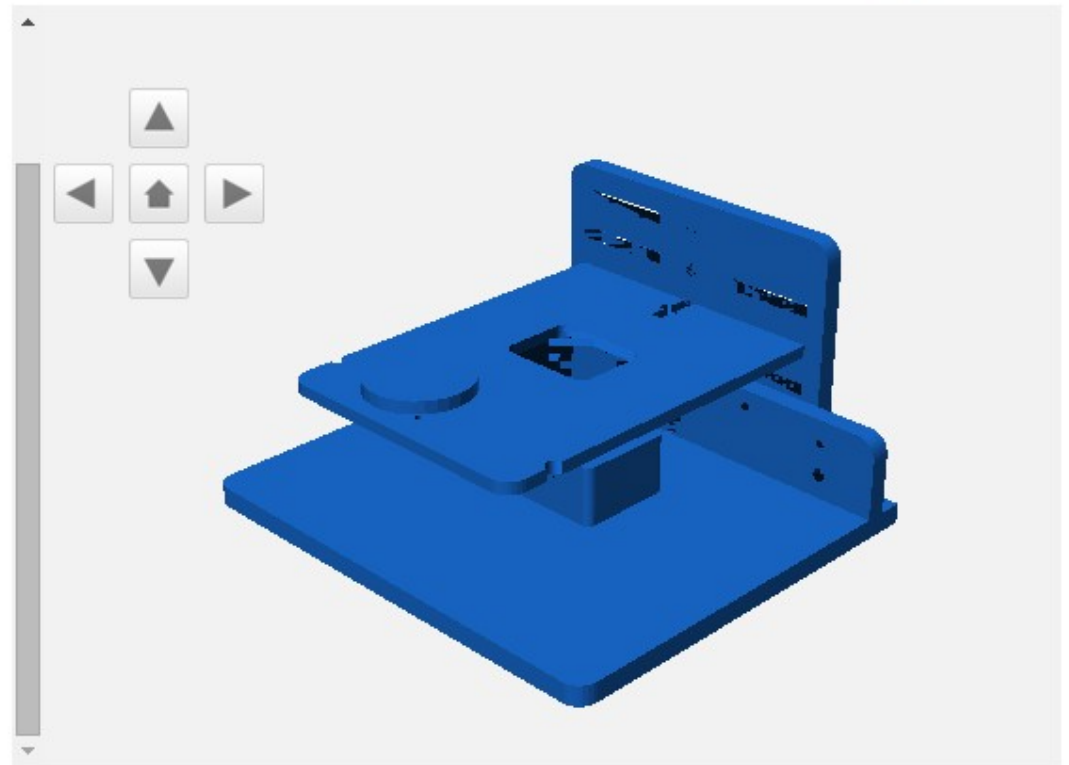
An the play goes on... Made in Taiwan

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Generic Lab Equipment - Computer WebCam Mikroskop

http://www.youtube.com/watch?v=-BgTDjYrIV8

GaudiLabs

Hard Disk Centrifuge

Open Source Lab Equipment

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Light Bulb Incubator
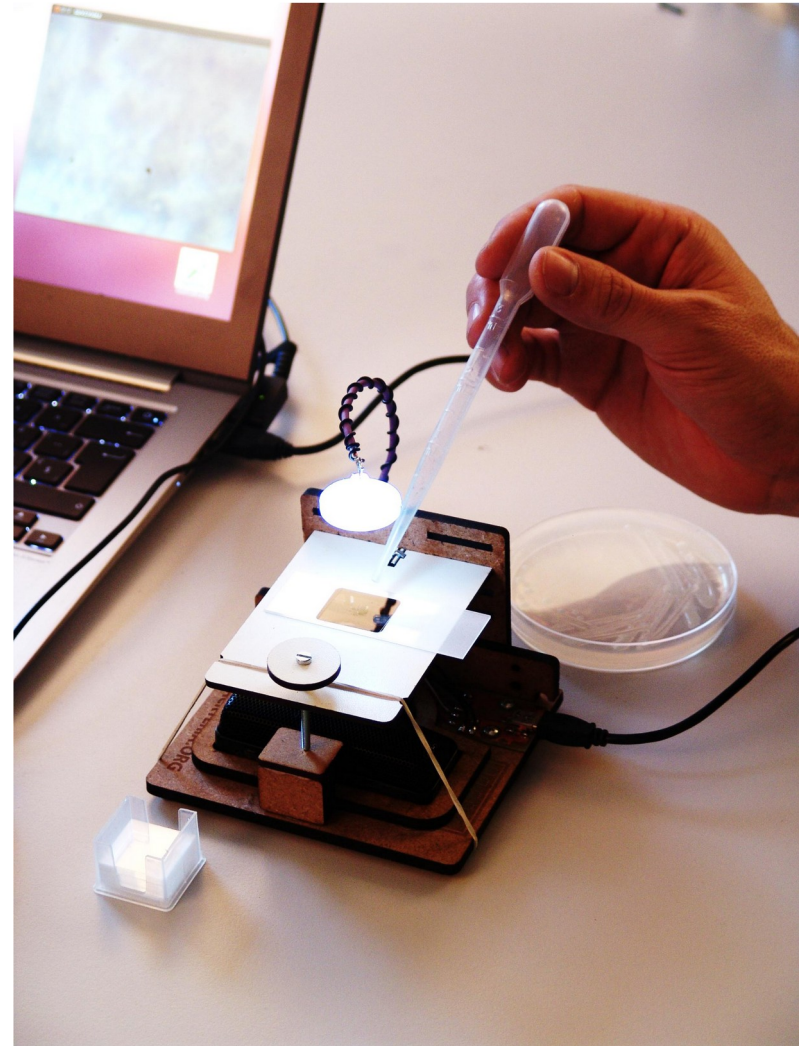
GaudiLabs
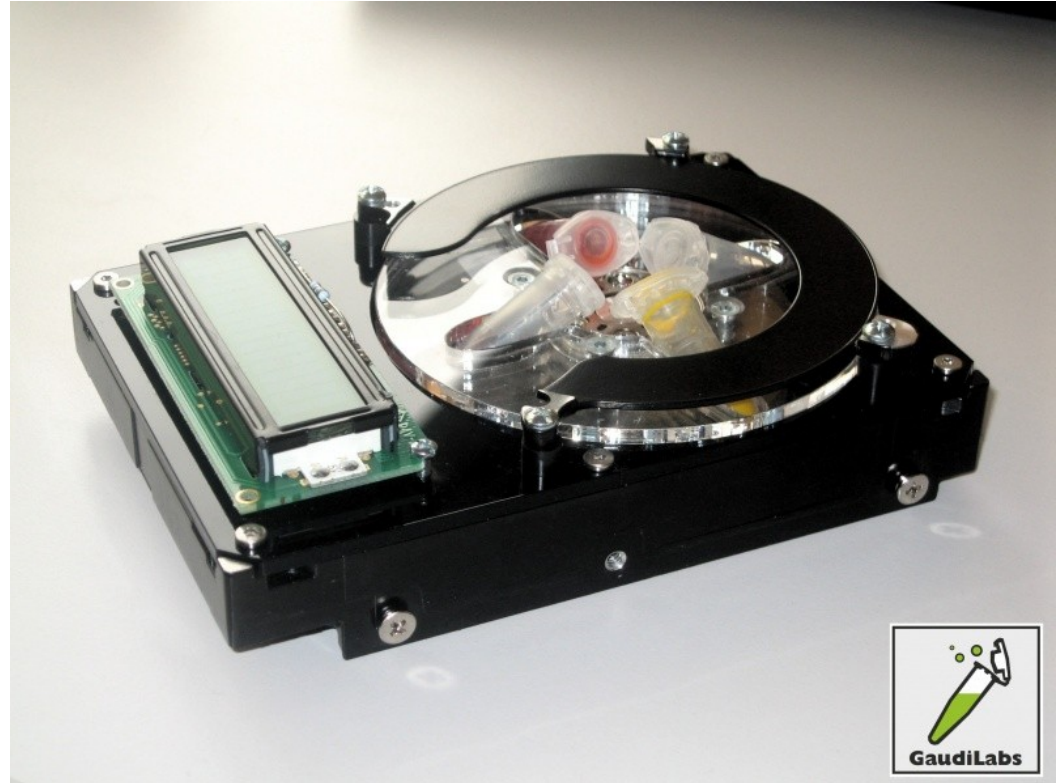
CD-ROM Spectrometer

Open Source Lab Equipment
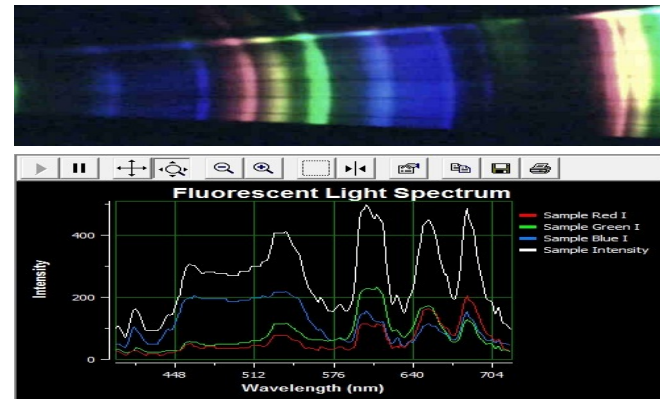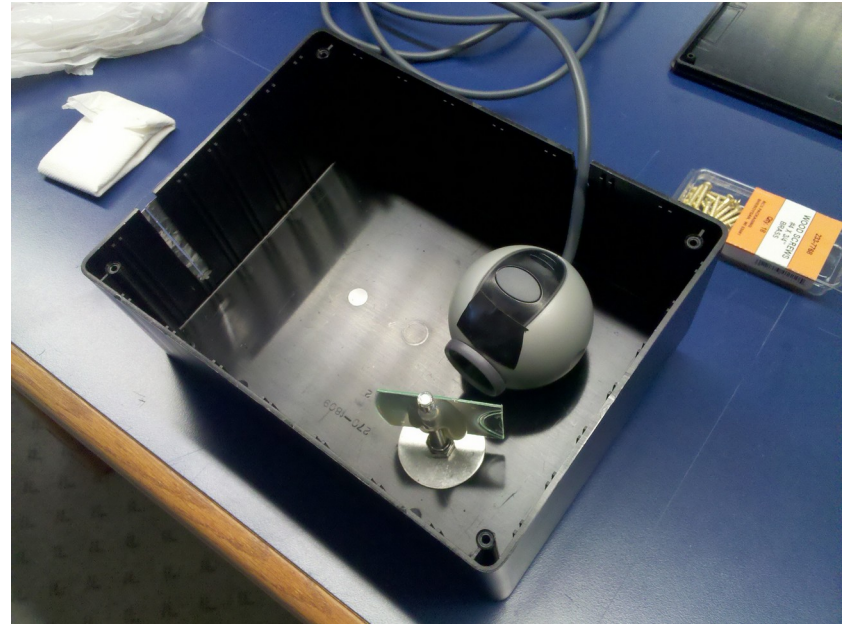
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Bicycle pump Gene Gun

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

Open Source Lab Equipment
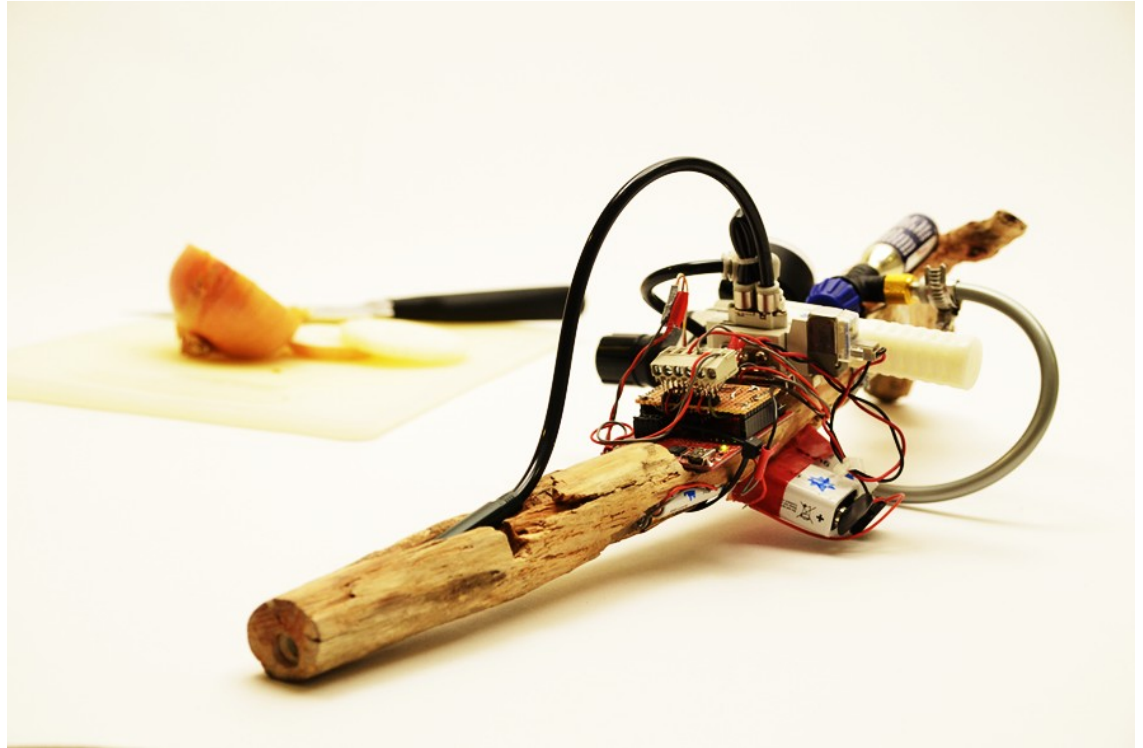
GaudiLabs

DIY Open Source Generic Lab Equipment
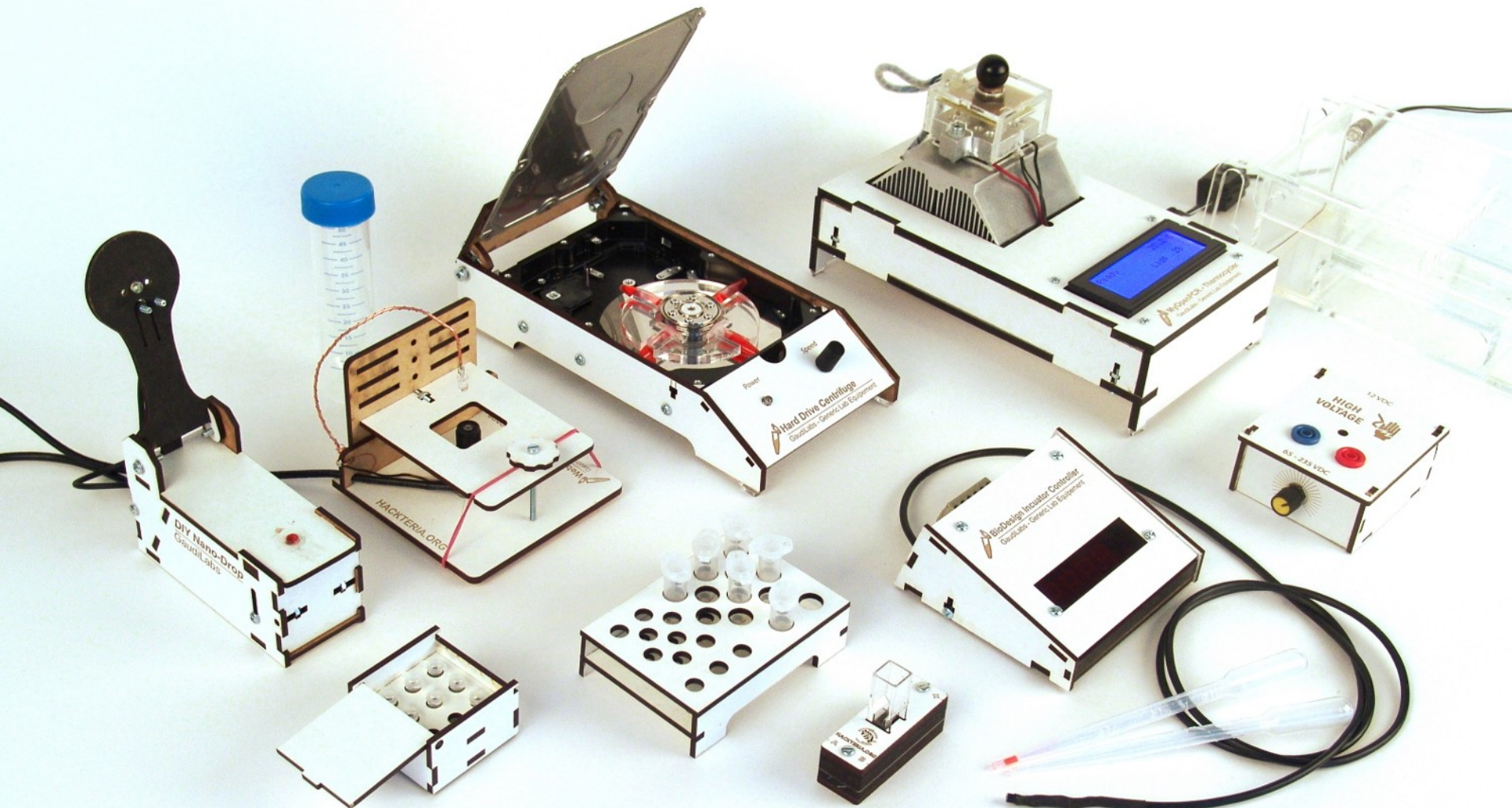
Gathering for Open Science Hardware
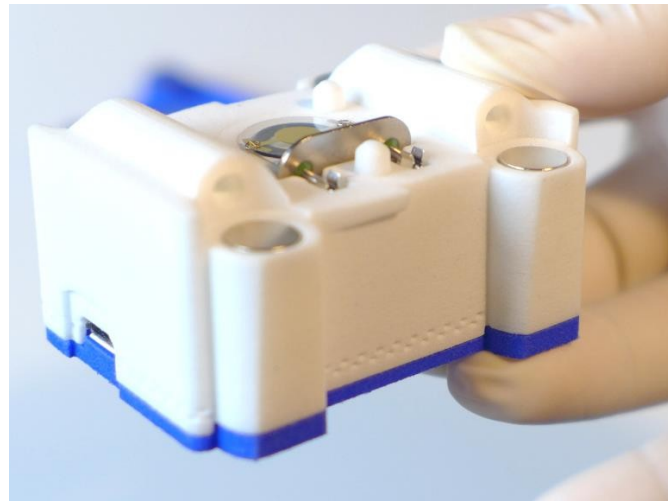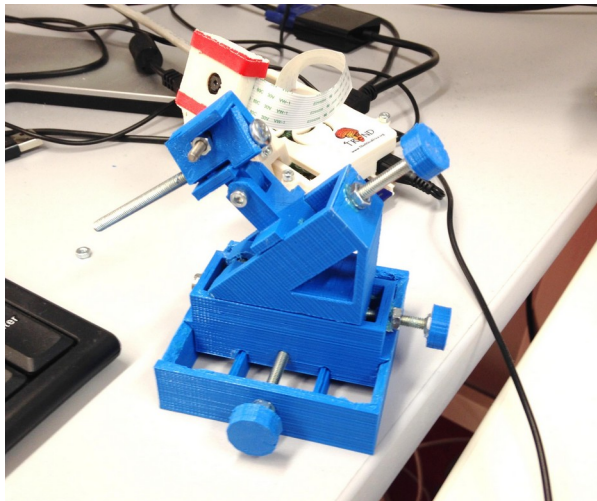
Geneva, Switzerland | Santiago, Chile | Shenzhen, China | Panama

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

Open Source = Make Source of your work Openly available

PocketPCR - Open Source Thermo Cycler for PCR
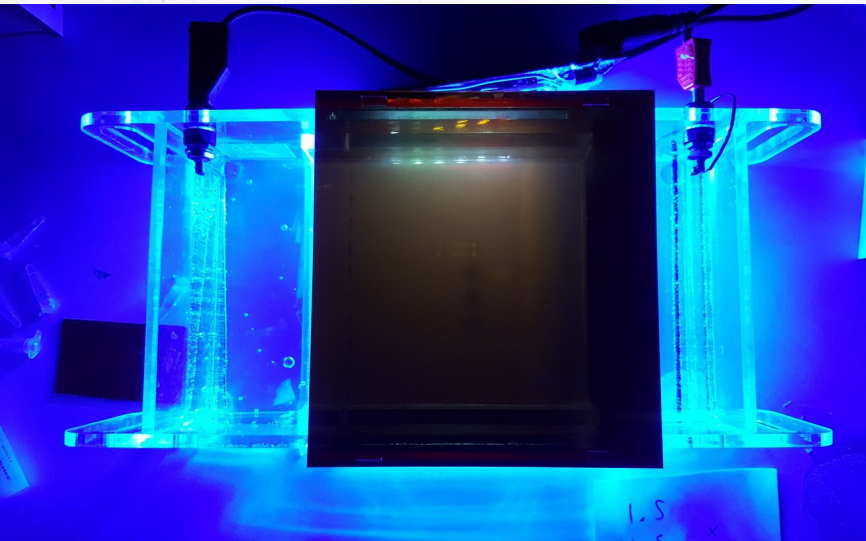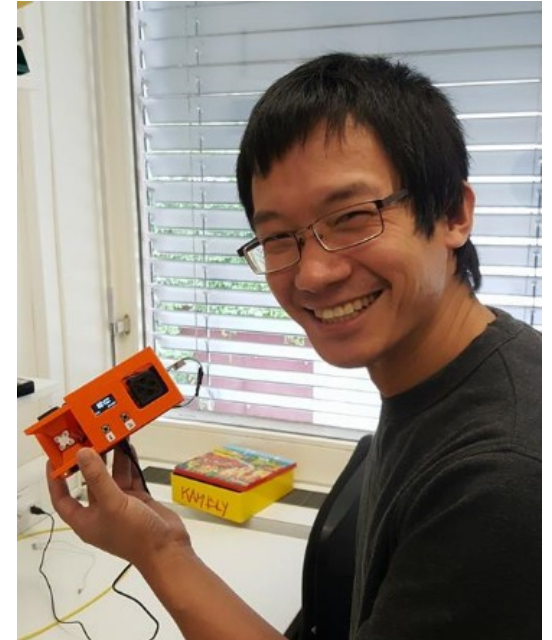
Open Source 3D Printable Spectrometer

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

USB Camera with cable and USB-A connector.

3D Fiber Spectrometer

Diffraction Grating
1000 lines / inch

Optical Slit
0.1 mm x 5 mm

gaudishop.ch

Diffraction Grating and Optical Slit

Light Emitting Diodes (LEDs)

Cuvettes for Liquids
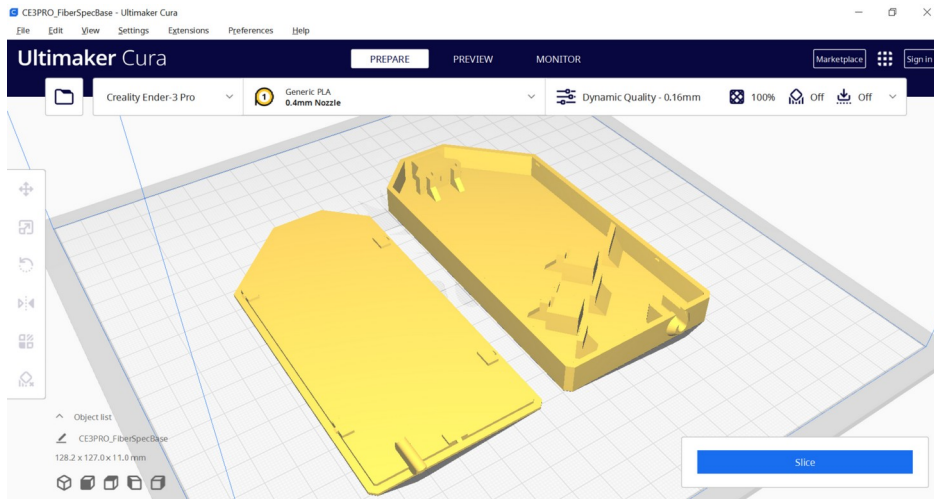
Open Source Lab Equipment

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DIY Mobile Gen Lab

Bethan Wolfenden / Philipp Boeing - bento.bio

GaudiLabs

bento Lab

Open Source Lab Equipment

OpenDrop – Digital Microfluidics Platfrom

Interest form the Industry

AUTODESK. RESEARCH

Dot Silverman, Bio/Nano Research group at Autodesk Research

diagenode — Innovating Epigenetic Solutions

Jean-Luc Deladriere, diagenode, Innovating Epigenetic Solutions

EUROIMMUN

Markus Cavalar, Head of molecular infection diagnostics, Euroimmun, Deutschland
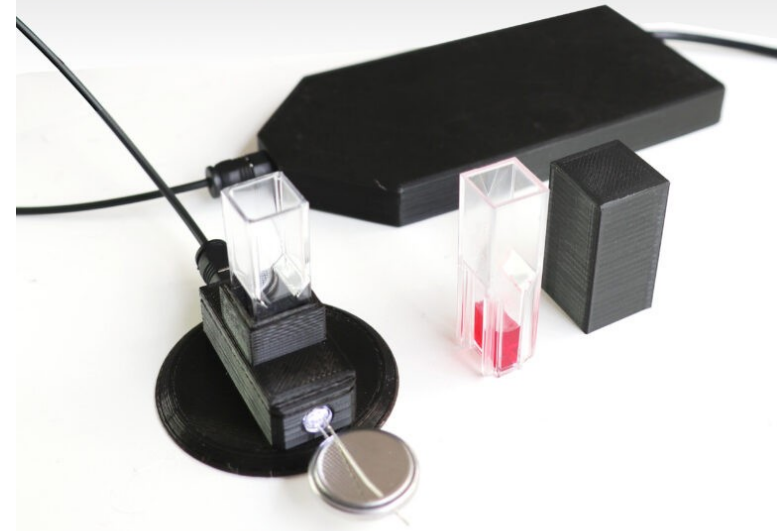
HAIKANGLIFE

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

Roche 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)

hp invent

Hewlett Packard, Palo Alto

intel

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

Ranjeet Alexis, Intel Capital

LyoGen LLC

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

zepto

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

Open Source Lab Equipment

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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

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

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

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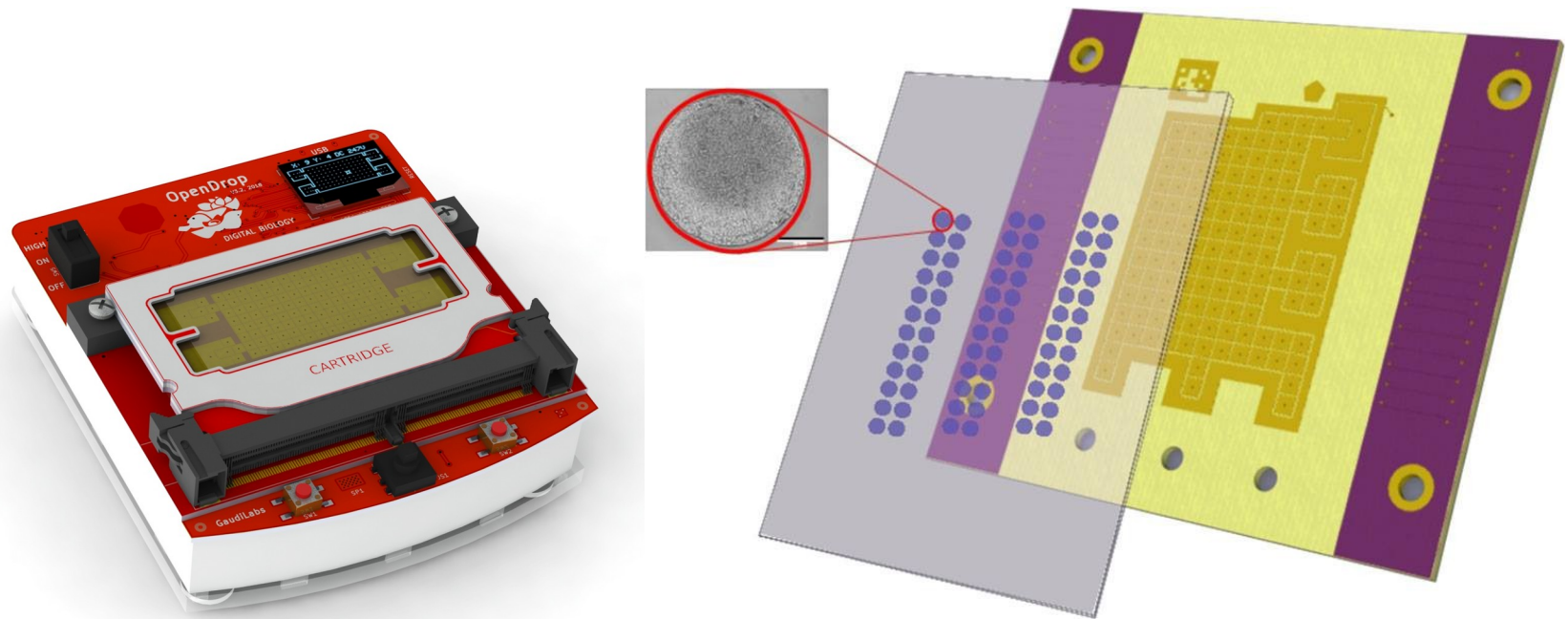Washington, Department of
Bioengineering, BioRobotics
Laboratory

Open Source Lab Equipment

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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 all from University of Washington
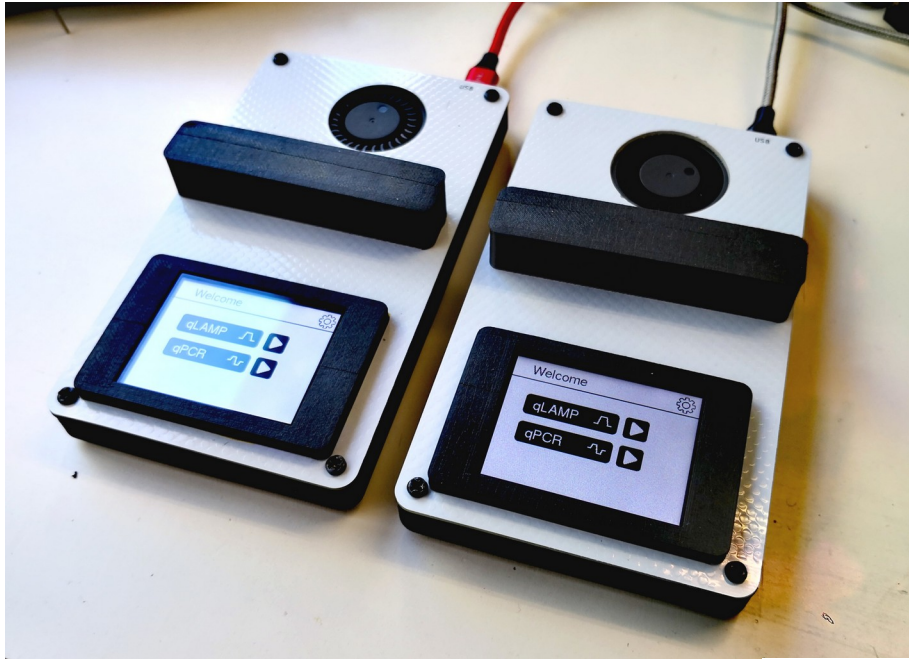just published a Nature Communications

https://www.nature.com/articles/s41467-019-09517-y?fbclid=IwAR288zDLTS RMEF_FkkKN2Bd1A_F2_SG_qpZu74qO-tZrrYDMuRSqSJtuuN4

Open Source Lab Equipment

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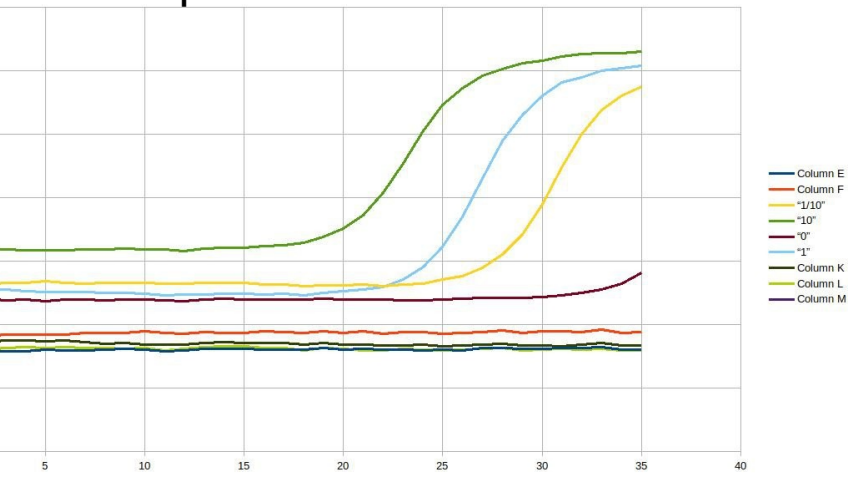# GlobalLAMP – Global Collaboration for Low Cost PCR Diagnostics

- Quantitative real-time DNA amplification is at the heart of diagnosing infectious disease

- This project will change accessibility and affordability of this device

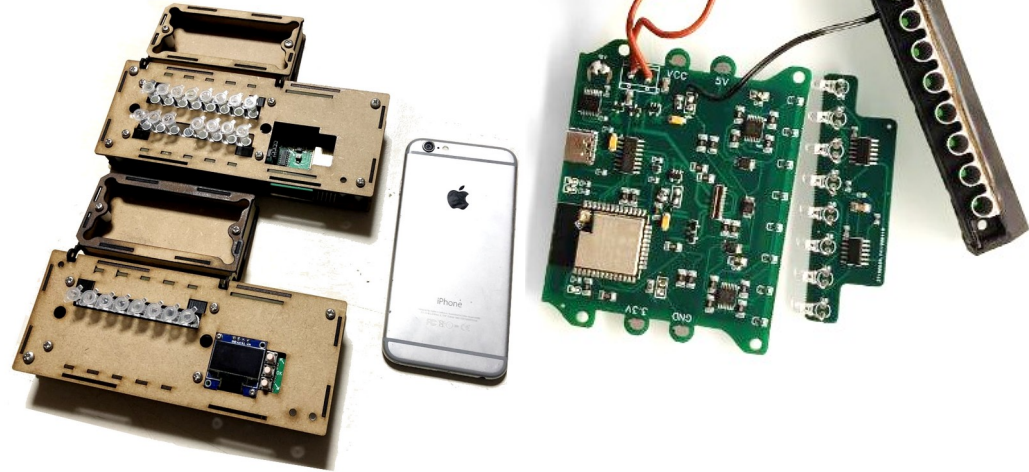- The core of the project are researchers from diverse geographical backgrounds, expertise and socioeconomic origins

LEARNING PLANET INSTITUTE

Open Source Lab Equipment

https://www.hackteria.org/wiki/GlobalLAMP-Paris
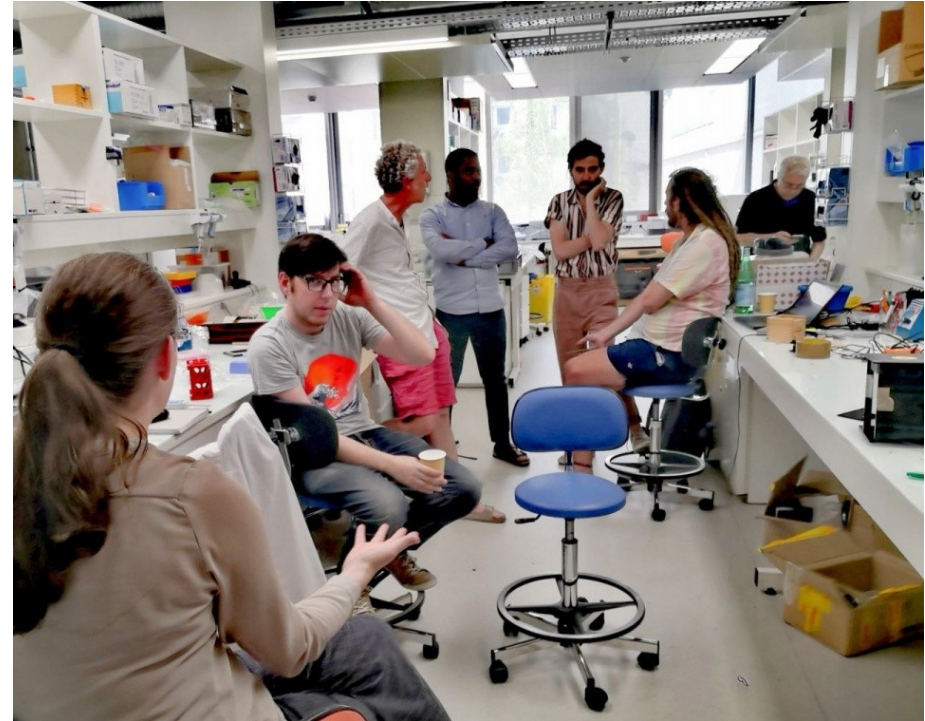
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Three Devices for qLAMP and qPCR < 1000 euro

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

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

Open Source Lab Equipment

https://openbioeconomy.org/projects/open-enzyme-collections/ GaudiLabs