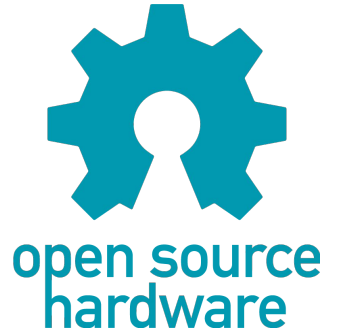


CONGRATS CERN OSPO!

I'm ecstatic! - Alicia Gibb / Seidle

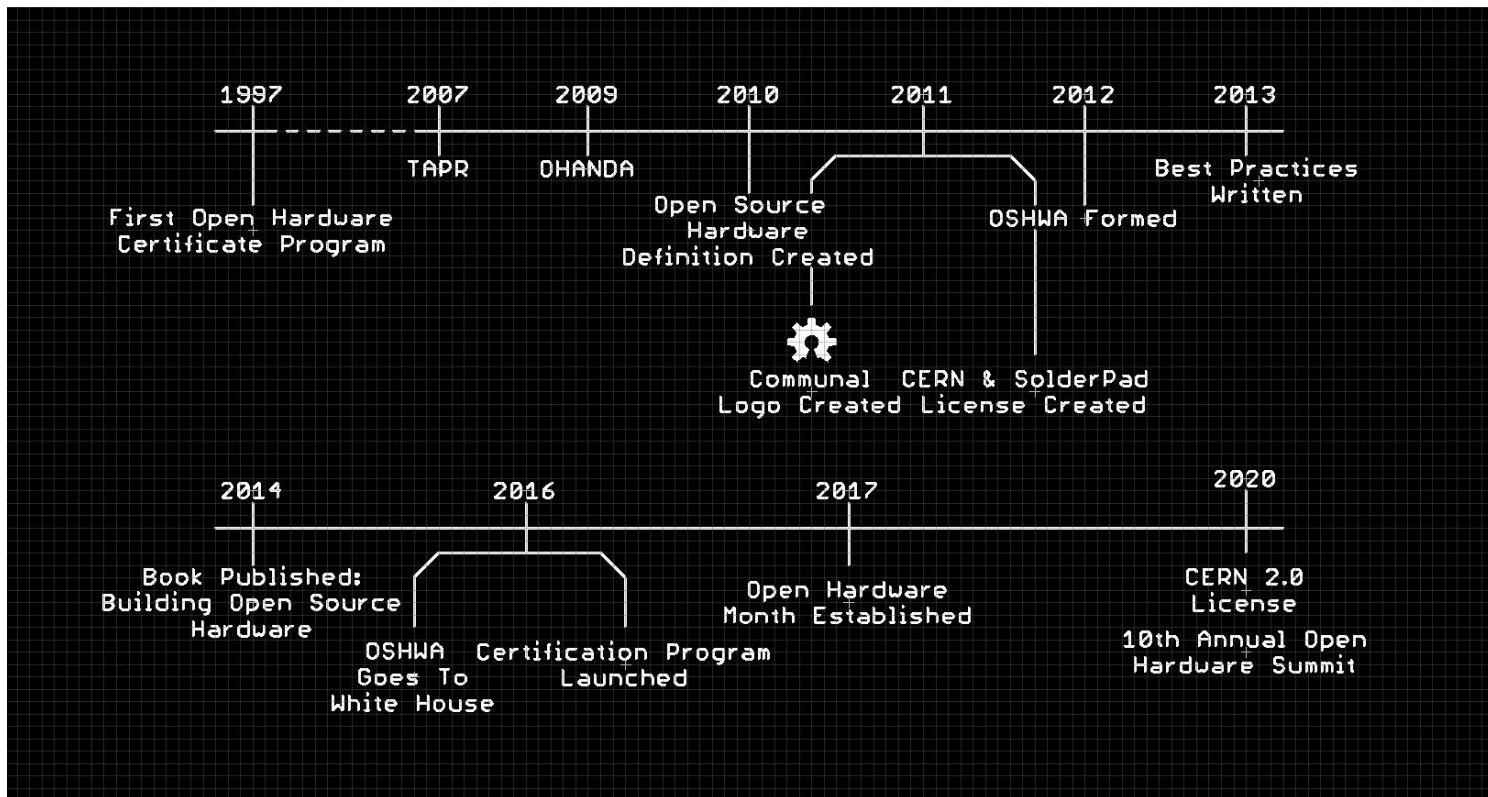
What is Open Source Hardware



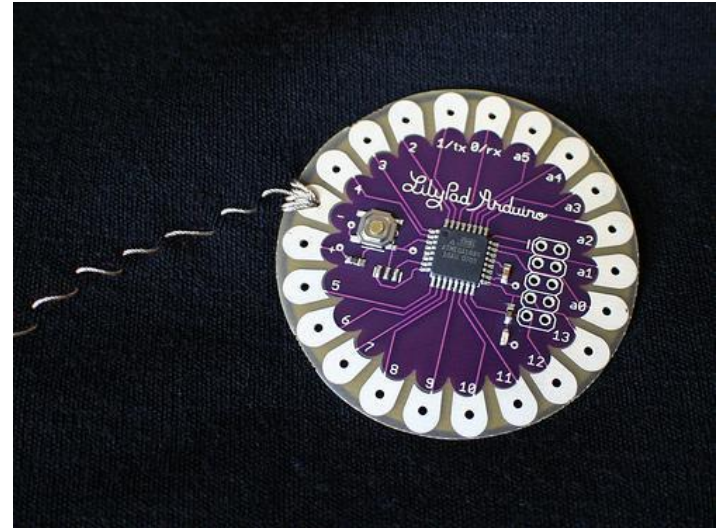
- Remix
- Remake
- Replicate
- Remanufacture
- Redistribute
- Resell
- Study and Learn from



Brief History of Open Hardware



Examples of Open Hardware



Examples of Open Hardware

— — —
Open Source Hardware Pick
and Place



Image CC-BY-ND: Opulo

Examples of Open Hardware



Image CC-BY-SA: System 76

Examples of Open Hardware

— — —

Open Source Hardware Hammock



Image CC-By-SA: Hummingbird Hammocks

Examples of Open Hardware

— — —
Open Source Hardware Perfume

Top Note

[Marine + Ozone Accord](#) x 2 drops of 10% dilution - \$3/4ml

Middle Notes

[Hexenol-3-cis](#) x 2 drops of 10% dilution - \$6.75/4 ml

[Neroli + Orange Blossom](#) x 3 drops of 10% dilution - \$6.00/4ml
(alternative to Norlimbanol, choose only one)

Base Notes

[Cedarwood, Texas](#) x 3 drops of 10% dilution - \$2.50/4 ml

[Norlimbanol \(Firmenich\)](#) x 3 drops of 10% dilution - \$5.25/4ml
(alternative to Neroli, choose only one)

Examples of Open Hardware in Science

Open Source Lab Equipment



Screenshot: [https://en.wikipedia.org/wiki/Open-Source_Lab_\(book\)](https://en.wikipedia.org/wiki/Open-Source_Lab_(book))

Examples of Open Hardware in Science

— — —
3D printed Wind Tunnel

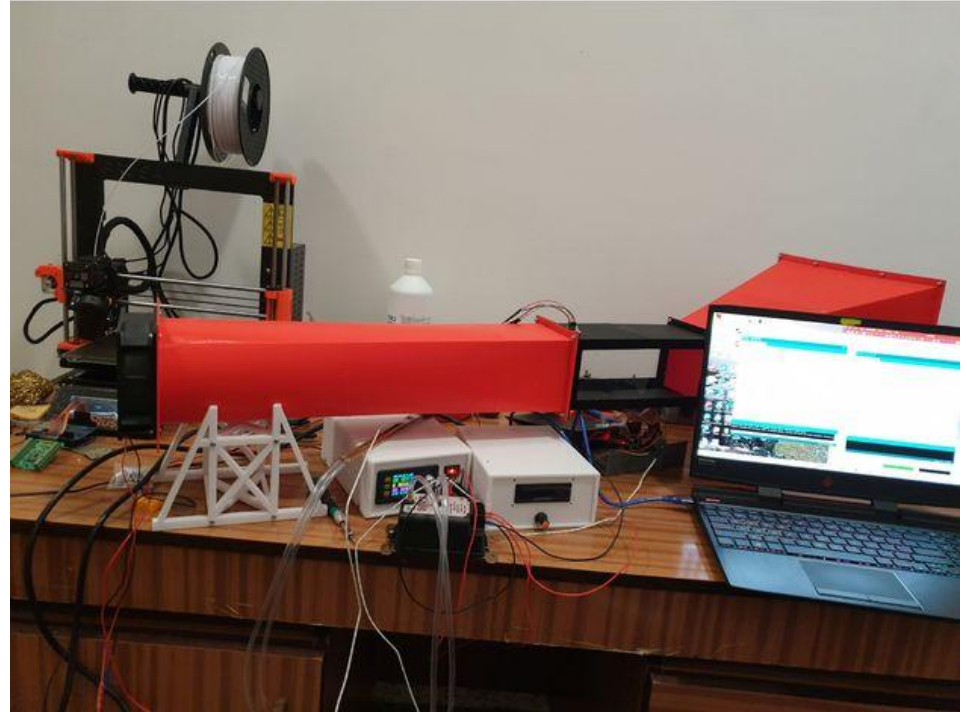


Image CC-BY-SA: <https://github.com/majaczec/wind-tunnel>

Examples of Open Hardware in Science

— — —
A Parametric open source
hardware Geological
Simulator

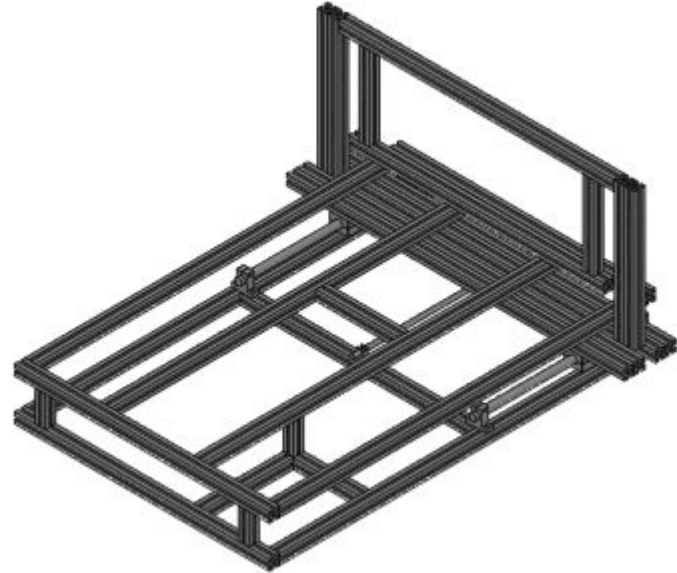


Image CC-BY:
<https://github.com/URJCMakerGroup/TFG-Cristina-Fernandez/wiki>

Examples of Open Hardware in Science

Atrial Fibrillation
Detection Blood Pressure
Monitor

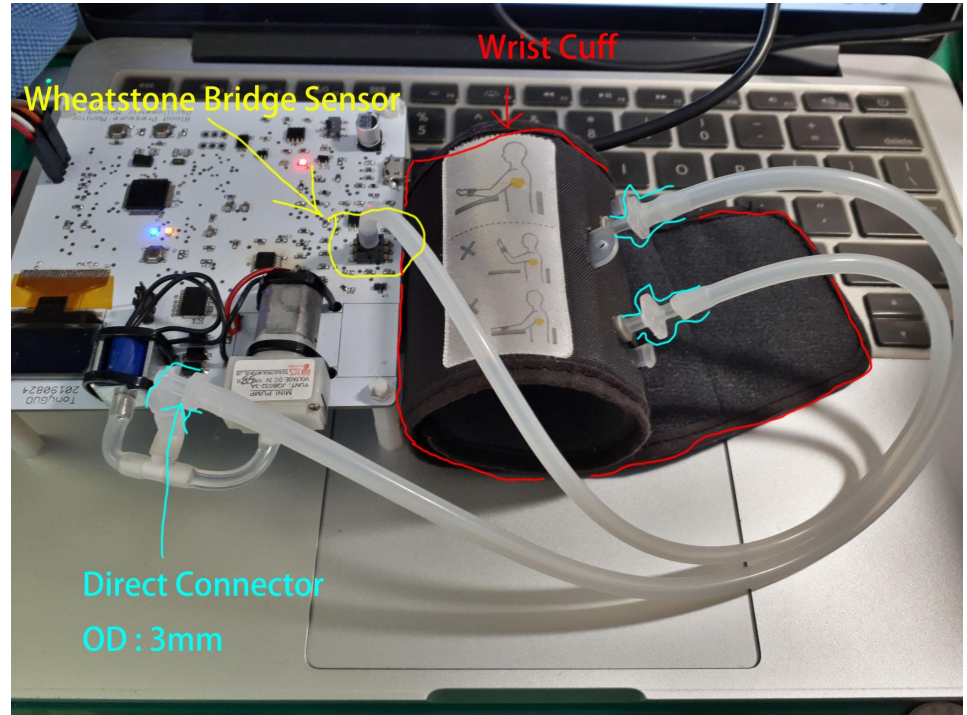


Image MIT license:
<https://github.com/GCY/Atrial-Fibrillation-Detection-Blood-Pressure-Monitor-Oscillometric-Method->

Examples of Open Hardware in Science

— — —
ANAVI Gas Detector

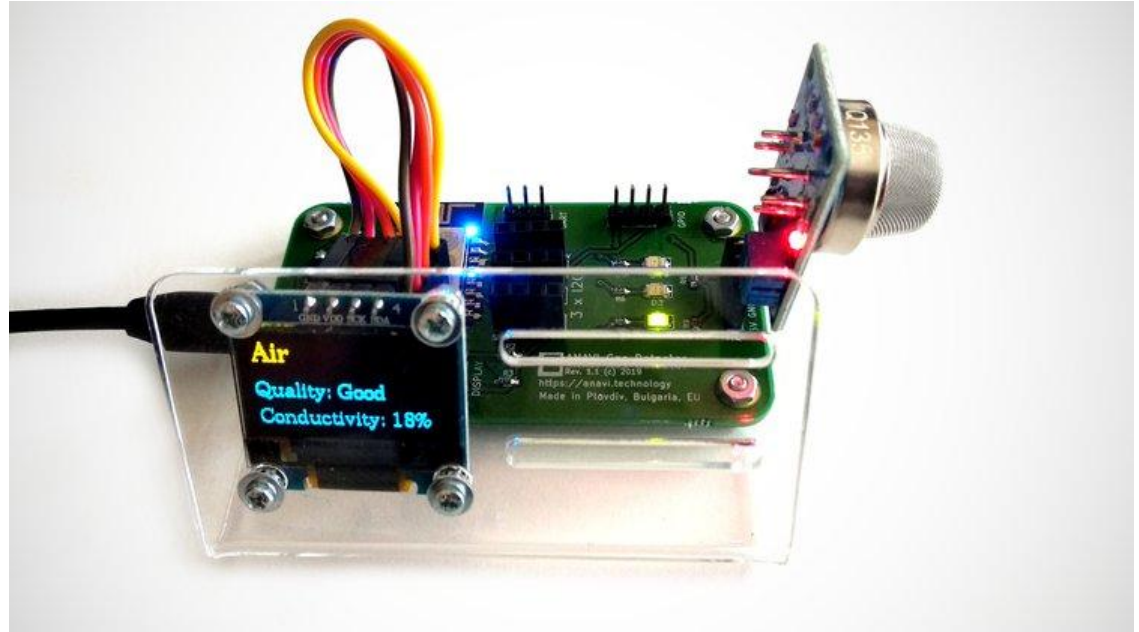


Image CC-BY-SA 4.0:

<https://github.com/AnaviTechnology/anavi-docs/blob/main/anavi-gas-detector/anavi-gas-detector.md>

Examples of Open Hardware in Science

— — —
Imaging Rig for Microfluidic
Blood Analysis

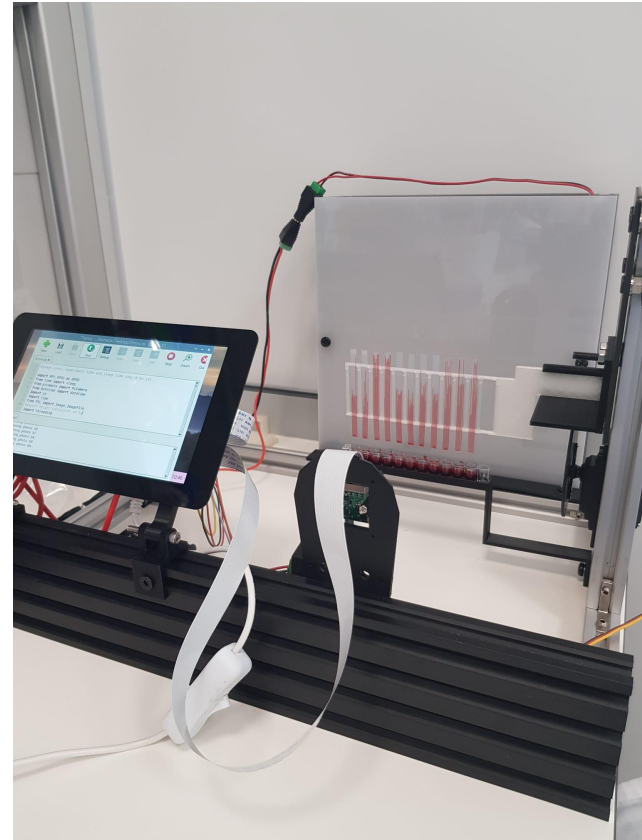


Image CC-BY-SA: Rüya Meltem Sariyer
https://gitlab.com/ruyameltem/imaging_rig

Examples of Open Hardware in Science

— — —
Open Hardware Ventilator
Examples

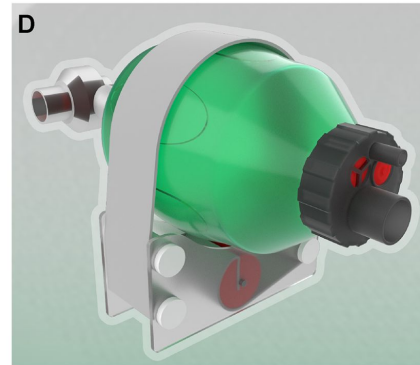
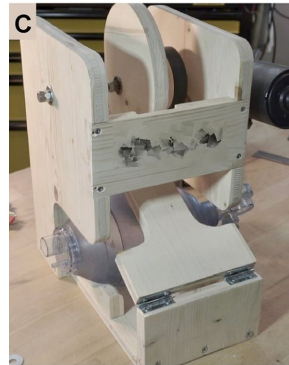
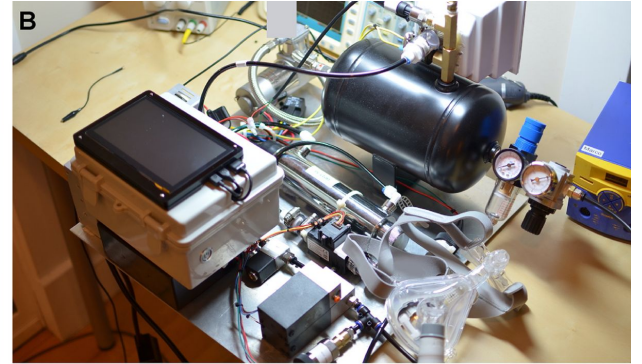
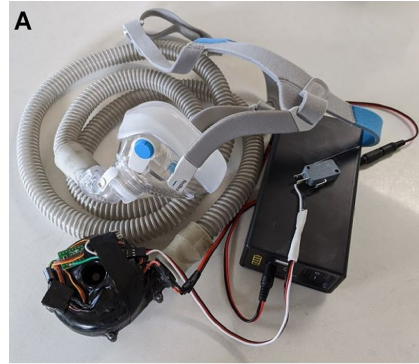


Image Open Access: Leveraging open hardware to alleviate the burden of COVID-19 on global health systems

<https://doi.org/10.1371/journal.pbio.3000730>

What is OSHWA

The Open Source Hardware Association



- Stewards of the open hardware definition
- Umbrella / Standards organization
- Certification holder
- Collect data
- Organize community events



History of CERN and OSHWA



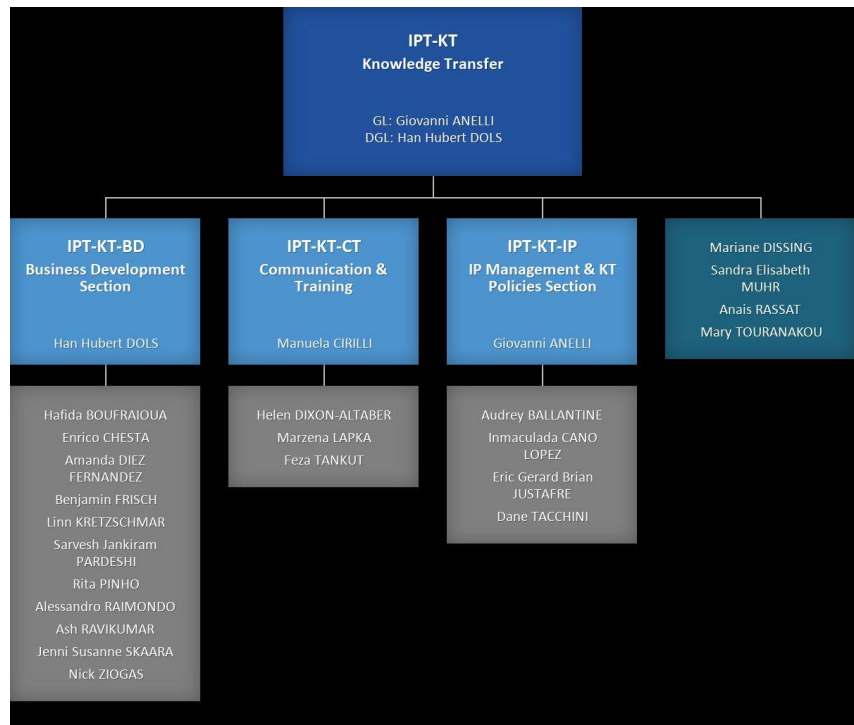
Open Hardware at CERN
The first ten years

Javier Serrano
Open Hardware Summit
New York, 13th March 2020



Thank You KT @ CERN

Your gift the the whole open hardware
community: Validity of open hardware



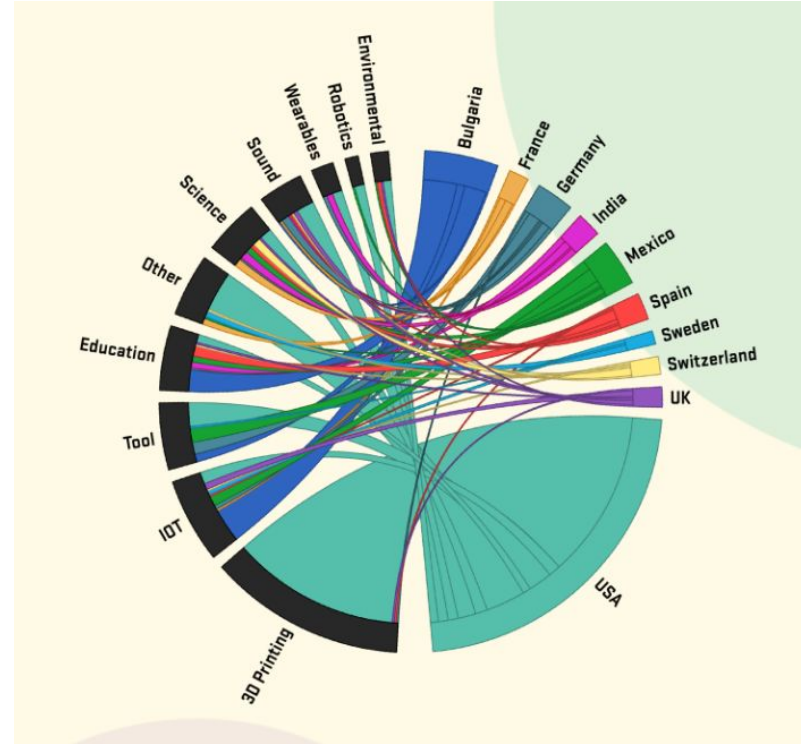
State of Open Source Hardware

MORE THAN JUST MICROCONTROLLERS



State of Open Source Hardware

— — —
21 certified Swiss Open Hardware projects



State of Open Hardware: Communities

— — —



THE GROWTH OF THE OPEN SOURCE HARDWARE UNIVERSE

The open source hardware community has grown rapidly over time, creating new organizations as well as welcoming existing ones. While no list will ever be complete, these are some of the governmental and nonprofit organizations that help make up that community. They join countless open source hardware companies, some of which are represented in the top certifiers chart.

OPEN SOURCE HARDWARE ASSOCIATION (OSHWA)

ACADEMIC JOURNALS IN OSHW

- HardwareX
- Journal of Open Hardware
- Journal of Open Engineering

BIO, MEDICAL, AND EMERGENCY RESPONSE

- Field Ready
- Get Us PPE
- Global Community Bio Summit
- Open Source Medical Supplies
- Safecast

COMMUNITY ORGANIZATIONS

- BeagleBoard.org
- e-NABLE
- Open Hardware Makers
- Open Research Institute
- OpenAir Collective
- Open Ecology
- Open Compute Project
- RepRap.org
- Wildlabs.net

DOCUMENTATION REPOSITORIES

- Materiom
- Kitspace.org
- NIH 3D Print Exchange
- Open Know-How

ECOLOGY AND CONSERVATION

- Arribada Initiative
- AudioMoth
- Conservify
- FieldKit
- FreakLabs
- OpenCollar

FUNDING ORGANIZATIONS

- Alfred P. Sloan Foundation
- Chan Zuckerberg Initiative
- Gordon and Betty Moore Foundation
- Shuttleworth Foundation

OPEN CHIP DESIGN

- CHIPS Alliance
- Free and Open Source Silicon Foundation
- Free Silicon Foundation
- lowRISC
- OpenHW Group

OPEN HARDWARE IN SCIENCE

- AfricaOSH
- CERN
- GOSH
- reGOSH
- Open Ephys
- Public Lab

STANDARDS ORGANIZATIONS

- DIN
- IEEE SA
- OpenForum Europe

THINK TANKS AND RESEARCH CENTERS

- Engelberg Center on Innovation Law & Policy,
- NYU Law
- Public Knowledge
- Wilson Center

State of Open Hardware: Communities

OSHWA [Download PDF](#)

THE GROWTH OF THE OPEN SOURCE HARDWARE UNIVERSE

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OPEN SOURCE HARDWARE ASSOCIATIONS

ACADEMIC

Hardw
Journ
Journ

BIO, MEDICAL

Field R
Get Us
Global
Open S
Safeca

COMMUNITIES

Beagle
e-NAB
Open H
Open R
OpenAir Collective
Open Ecology
Open Compute Project
RepRap.org
Wildlabs.net

DOCUMENTATION REPOSITORIES

OPEN HARDWARE IN SCIENCE

AfricaOSH
CERN
GOSH
reGOSH
Open Ephys
Public Lab

STANDARDS ORGANIZATIONS

DIN
IEEE SA
OpenForum Europe

THINK TANKS AND RESEARCH CENTERS

Engelberg Center on Innovation Law & Policy,
NYU Law
Public Knowledge
Wilson Center

OPEN CHIP DESIGN

CHIPS Alliance
Free and Open Source Silicon Foundation
Free Silicon Foundation
lowRISC
OpenHW Group

State of Open Hardware: Institutional Actors

3 February 2023



The EU Open Source
Policy Summit 2023



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OPEN SCIENCE

**2023 is the
Year of Open
Science**

Celebrating the Benefits and
Successes of Open Science



YEAR OF
OPEN SCIENCE

◆ NASA ◆ NSF ◆ NOAA ◆
◆ DOE ◆ GSA ◆ NEH ◆ NIH ◆
◆ NIST ◆ USDA ◆ USGS ◆

State of Open Hardware: Funders



OSHW Projects now

certification.oshwa.org



OSHWA Certification provides an easy and straightforward way for producers to indicate that their products meet a uniform and well-defined standard for open-source compliance.

[SHOULD I CERTIFY MY PROJECT?](#)



OSHWA Projects now

CERTIFIED OPEN SOURCE HARDWARE PROJECTS

DISPLAYING 2533 PROJECTS

PROJECT NAME ▾	UID ▾	PROJECT TYPE ▾	CERTIFICATION DATE ▾
0.95" OLED PMOD	SE000004	OTHER	MAY 04, 2020
0X33.BOARD	IT000010	ELECTRONICS	AUGUST 05, 2022
0XCB	DE000104	ELECTRONICS	MARCH 24, 2021
0XCB	DE000108	ELECTRONICS	APRIL 16, 2021
0XCB 1337	DE000112	ELECTRONICS	MAY 27, 2021

OSHWA Projects now

Open Source Licenses "Facts" generator

This generator ([source](#)) builds on an idea by [Alicia Gibb](#) to present the three licenses that cover an Open Source Hardware project, in the form of the classic US "Nutrition Facts" food labeling design. It was created by [Jeffrey Yoo Warren](#), who at time of writing is a member of the OSHWA board.

Enter your licenses:

Hardware:

CERN Open Hardware Licence Version 2 - Permissive x ▾

Software:

GNU General Public License v3.0 or later x ▾

Documentation:

Creative Commons Attribution 4.0 International x ▾

Go

Pre-generated SVGs can be found [in the project repository](#)

Open Source Licenses

Hardware	CERN-OHL-P-2.0
Software	GPL-3.0-or-later
Documentation	CC-BY-4.0

Download

SVG PNG JPG

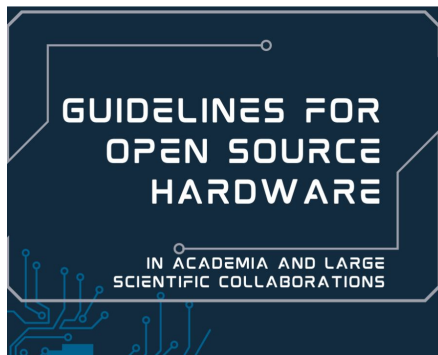
OSHWA Projects now

ohca.oshwa.org



**Open Hardware
Creators in
Academia**

OSHWA Projects now



Faculty Profile

Open Hardware Creators in Academia Fellow

Dr. Zsuzsa Márka

Scientist
Columbia Astrophysics Laboratory

[Zsuzsa Márka](#) (she/her) is a scientist at the Columbia Astrophysics Laboratory. She works on the [LIGO](#) (Laser Interferometer Gravitational-wave Observatory) project, the experiment that in 2016 announced the first direct detection of gravitational-waves.

OSHWA Projects now

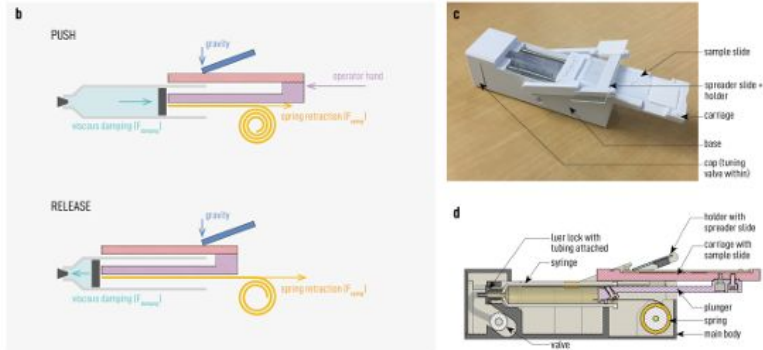


Open Hardware Creators in Academia Fellow

Dr. Manu Prakash

Professor
Stanford University

Manu Prakash (he/him) is a professor at Stanford University. He is a physical biologist applying his expertise in soft-matter physics to illuminate often easy to observe but hard to explain phenomena in biological and physical contexts and to invent solutions to difficult problems in global health, science education, and ecological surveillance. His [many lines of research](#) are driven by curiosity about the diversity of life forms on our planet and how they work, empathy for problems in resource-poor settings, and a deep interest in democratizing the experience and joy of science globally.



OSPPOs and TTOs

Open Source Program
Offices
&
Tech Transfer Offices

“OUR MANDATE IS TO MAXIMISE
THE IMPACT OF CERN
TECHNOLOGIES
ON SOCIETY, WE HAVE A
TOOLBOX TO ACHIEVE
IMPACT AND OPEN
SOURCE IS ONE OF THE TOOLS”
--CERN KNOWLEDGE TRANSFER
GROUP



Plans and visions at OSHWA



Congrats on the OSPO

From the whole open
hardware community

