PHABLABS 4.0

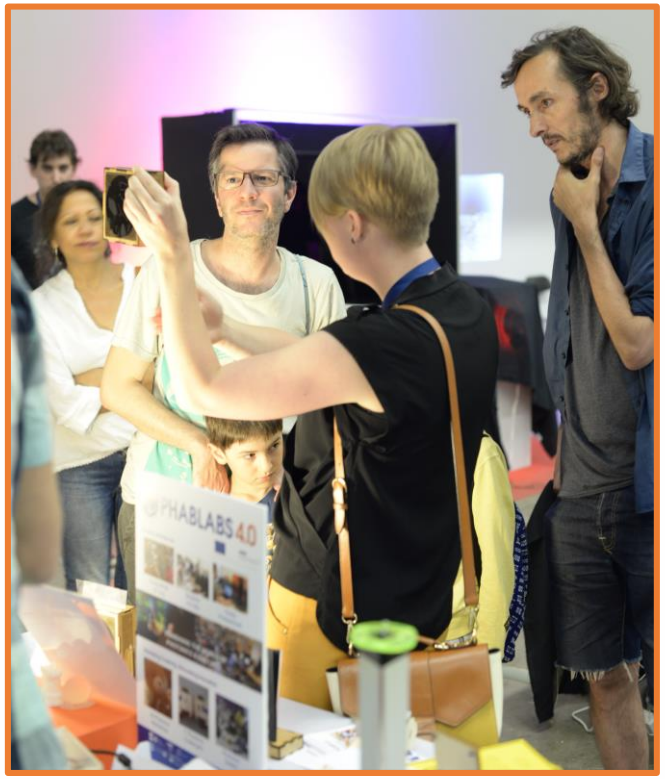
Photonics enhanced **fAB LABS** supporting the next revolution in **digitization**

VUB B-PHOT BRUSSELS PHOTONICS

PHOTONICS PUBLIC PRIVATE PARTNERSHIP

PHOTONICS21

HELLO, I AM …

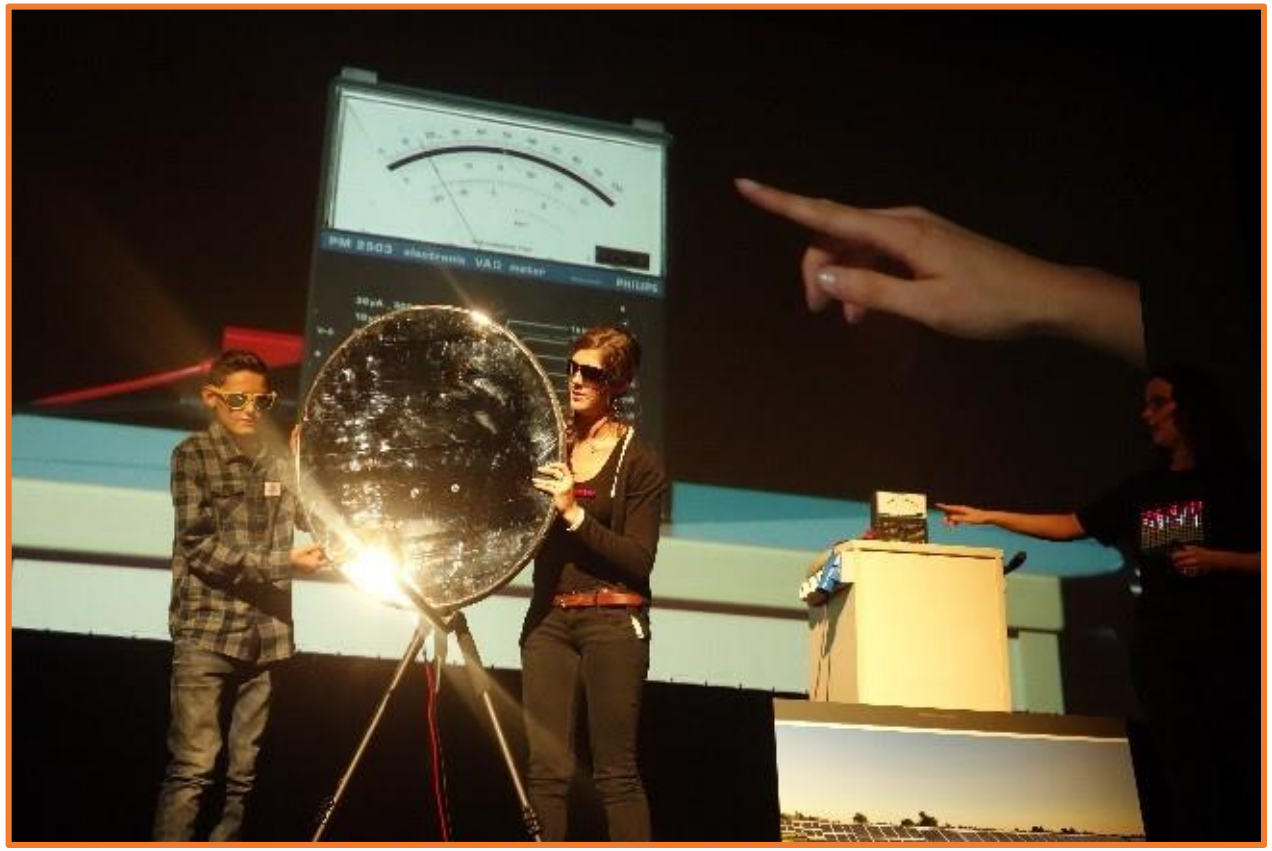


OUTREACH IN PHOTONICS

B-PHOT BRUSSELS PHOTONICS

PHOTONICS PUBLIC PRIVATE PARTNERSHIP

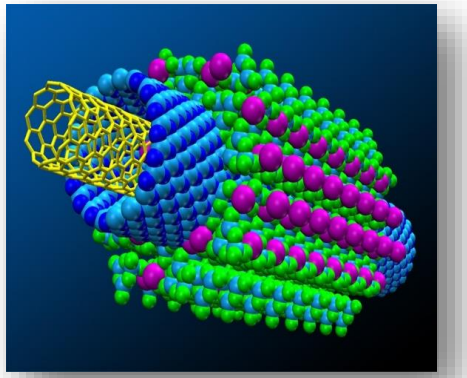
OUTREACH IN PHOTONICS



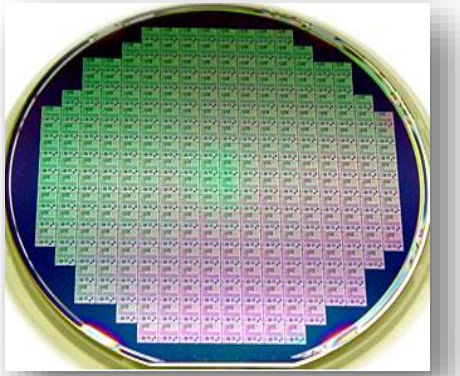
PHOTONICS?

PHOTONICS = KEY ENABLING TECHNOLOGY

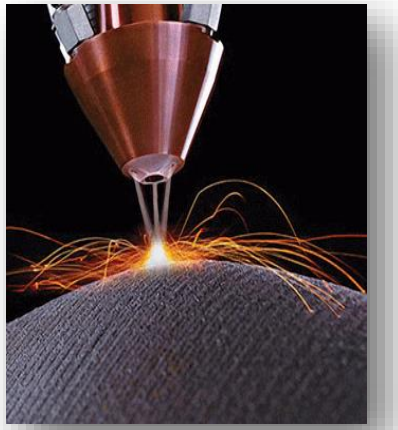
Biotechnology



Nanotechnology

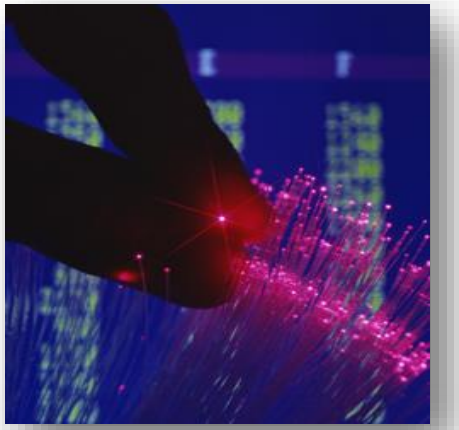


Nanoelectronics



Advanced Manufacturing

Advanced Materials



Photonics

B-PHOT BRUSSELS PHOTONICS

PHOTONICS 21

PHOTONICS PUBLIC PRIVATE PARTNERSHIP

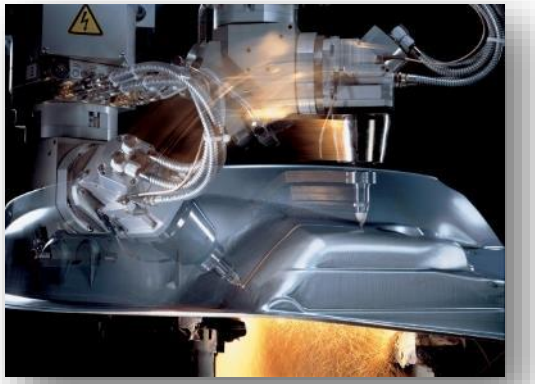
PHOTONICS = KEY ENABLING TECHNOLOGY

Optical Datacom

Photovoltaics

LED Lighting

Displays



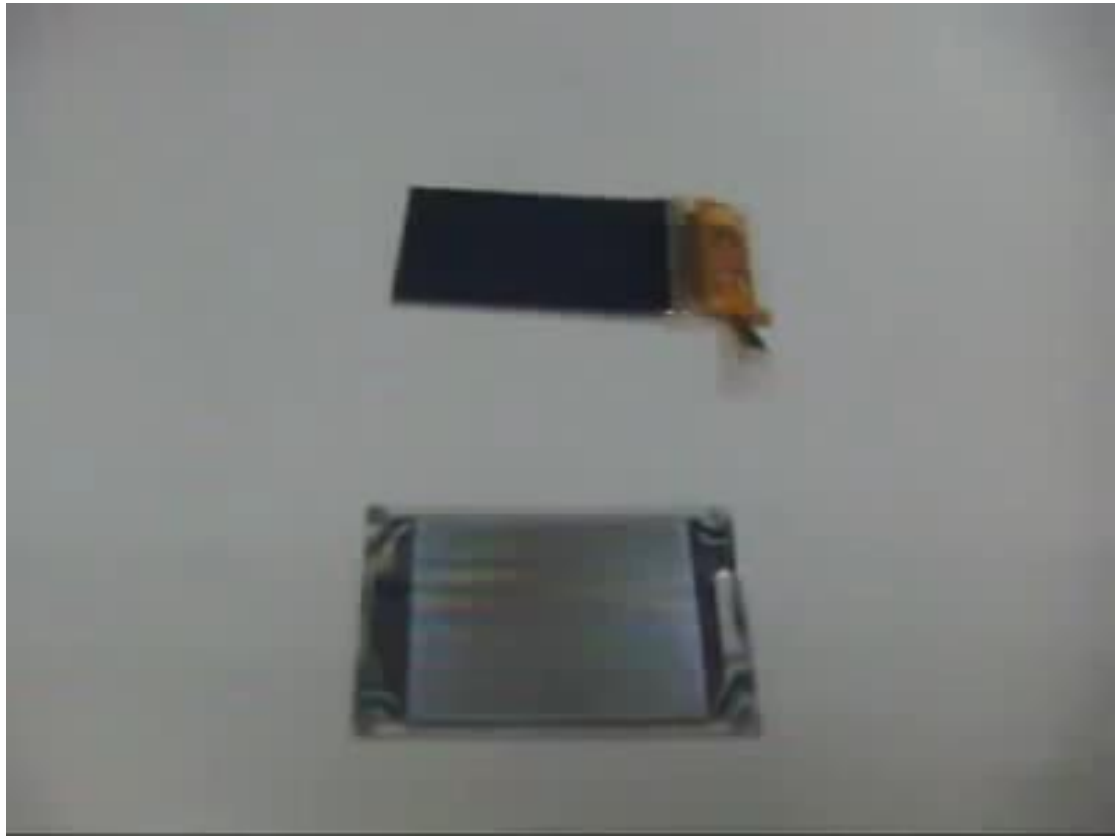
Lasers in Manufacturing

Machine Vision

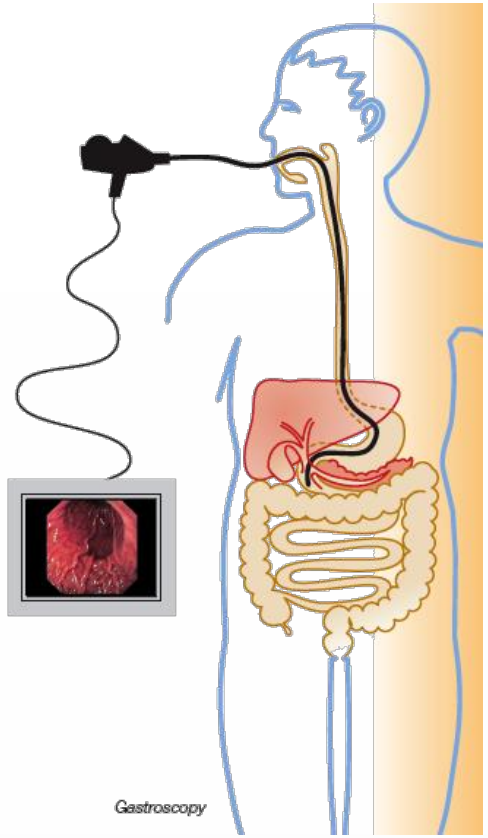
Medical Optics

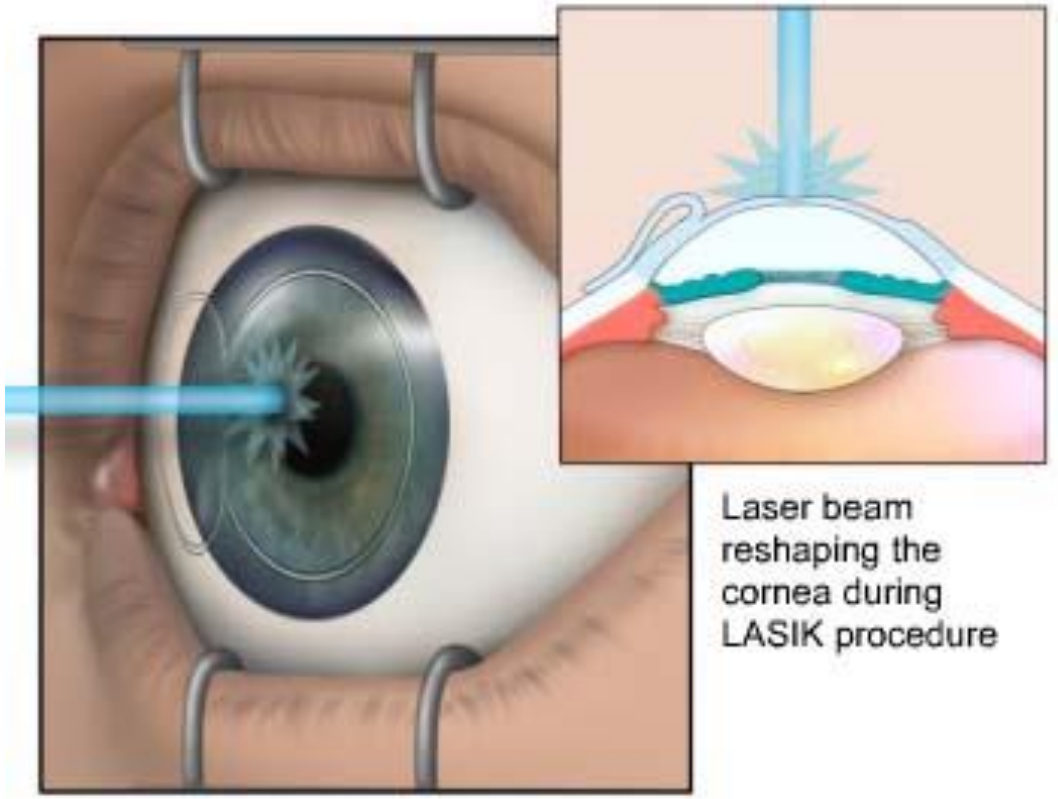
Optical Components

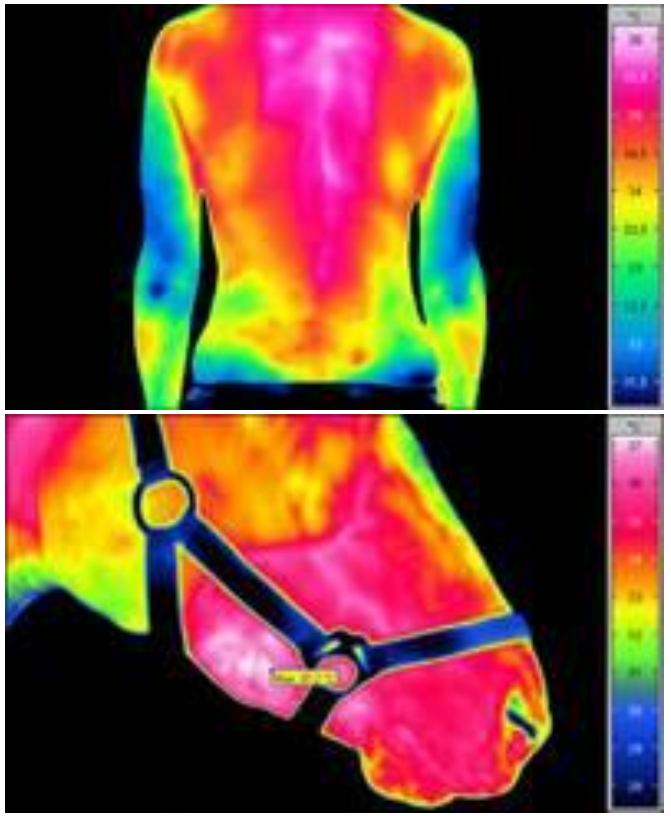
PHOTONICS IN SMARTPHONES



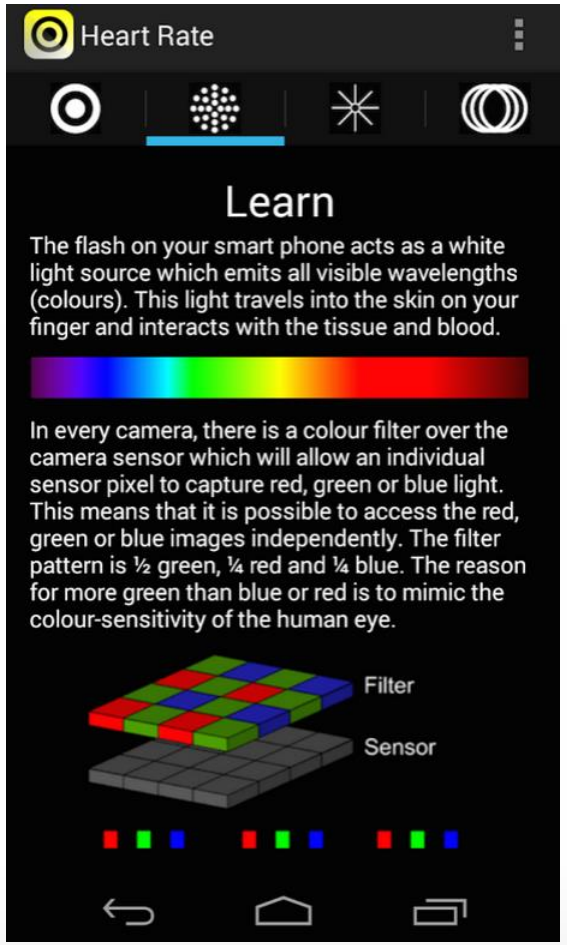
PHOTONICS IN HOSPITALS

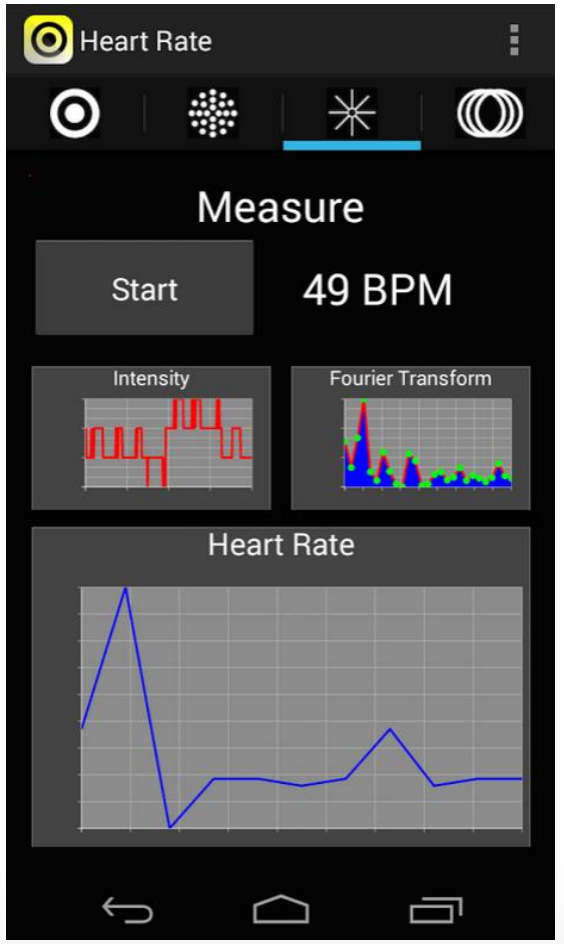




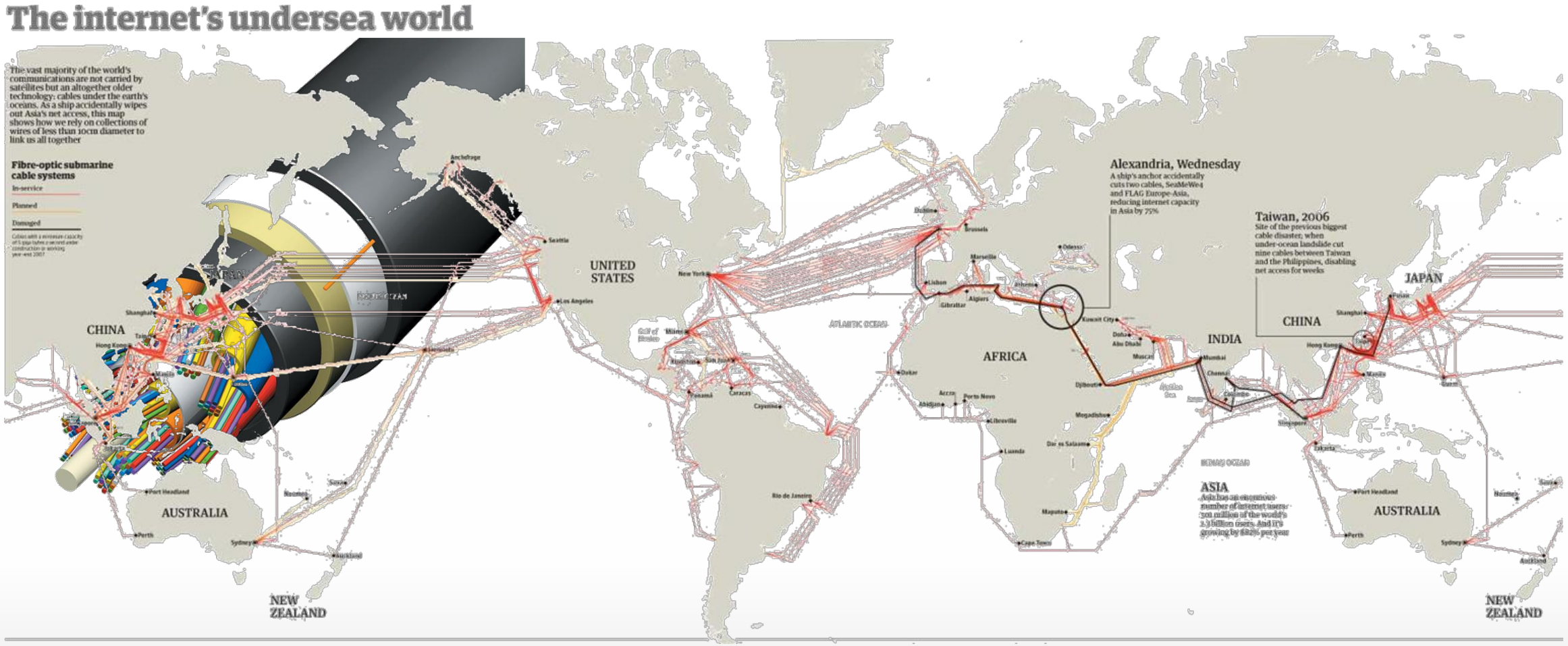


PHOTONICS IN HOSPITALS





PHOTONICS IN TELECOMMUNICATION



PHOTONICS IN TELECOMMUNICATION

1 Blu-ray Disc
≈ 50 GB = 400 Gb

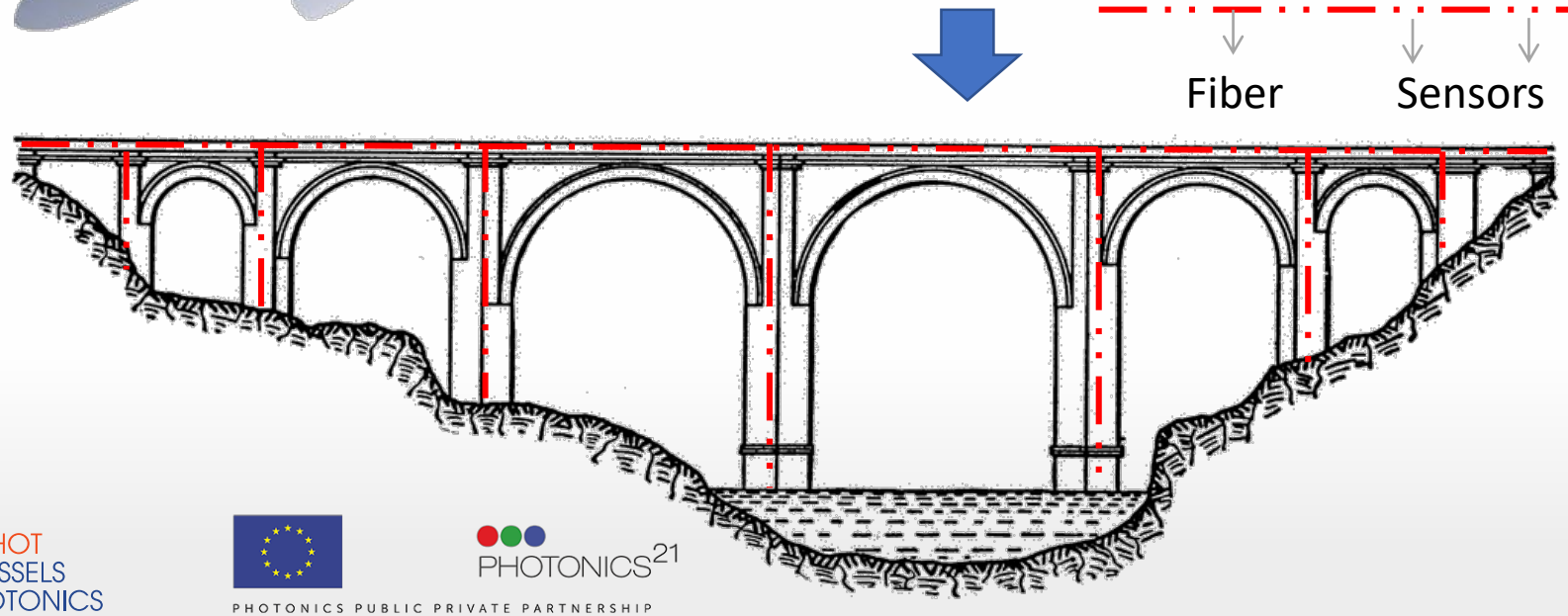
Fast Ethernet
≈ 0.1 Gb/s

→ 66 min

Optical Fiber
≈ 1000 Gb/s

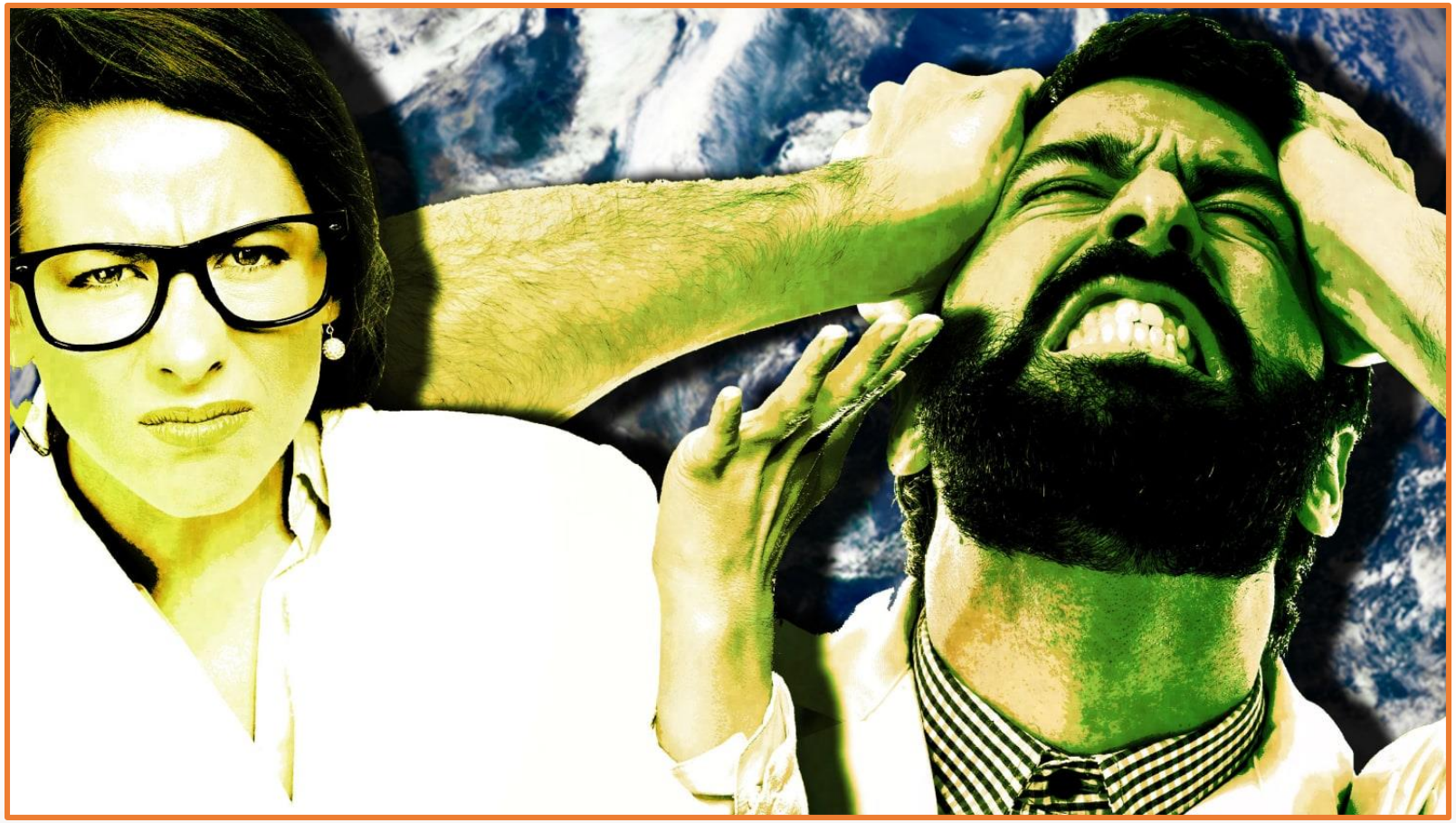
→ 0.4 s

PHOTONICS AS SENSORS



PHOTONICS IN FOOD

STEM, SAY WHAT…?



COMBINING PHOTONICS & FAB LABS

PHABLABS 4.0

Photonics

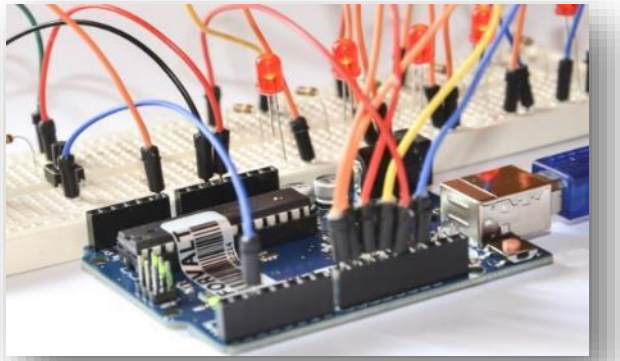
Fab Labs

PHABLABS 4.0

FAB LABS & Maker Spaces

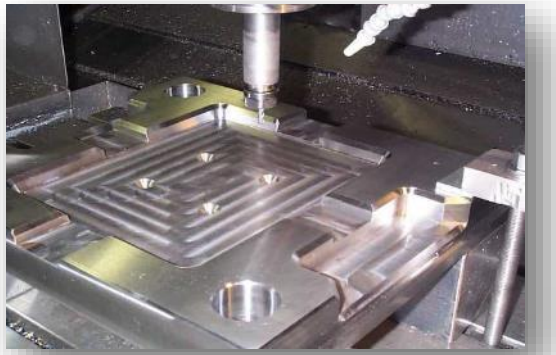
PHABLABS 4.0

Laser Cutting

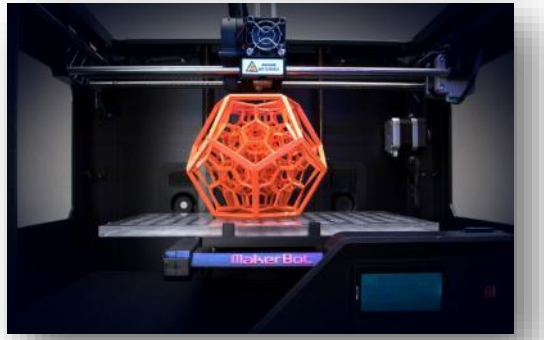


Electronics

3D scanning



CNC milling machines



3D printing

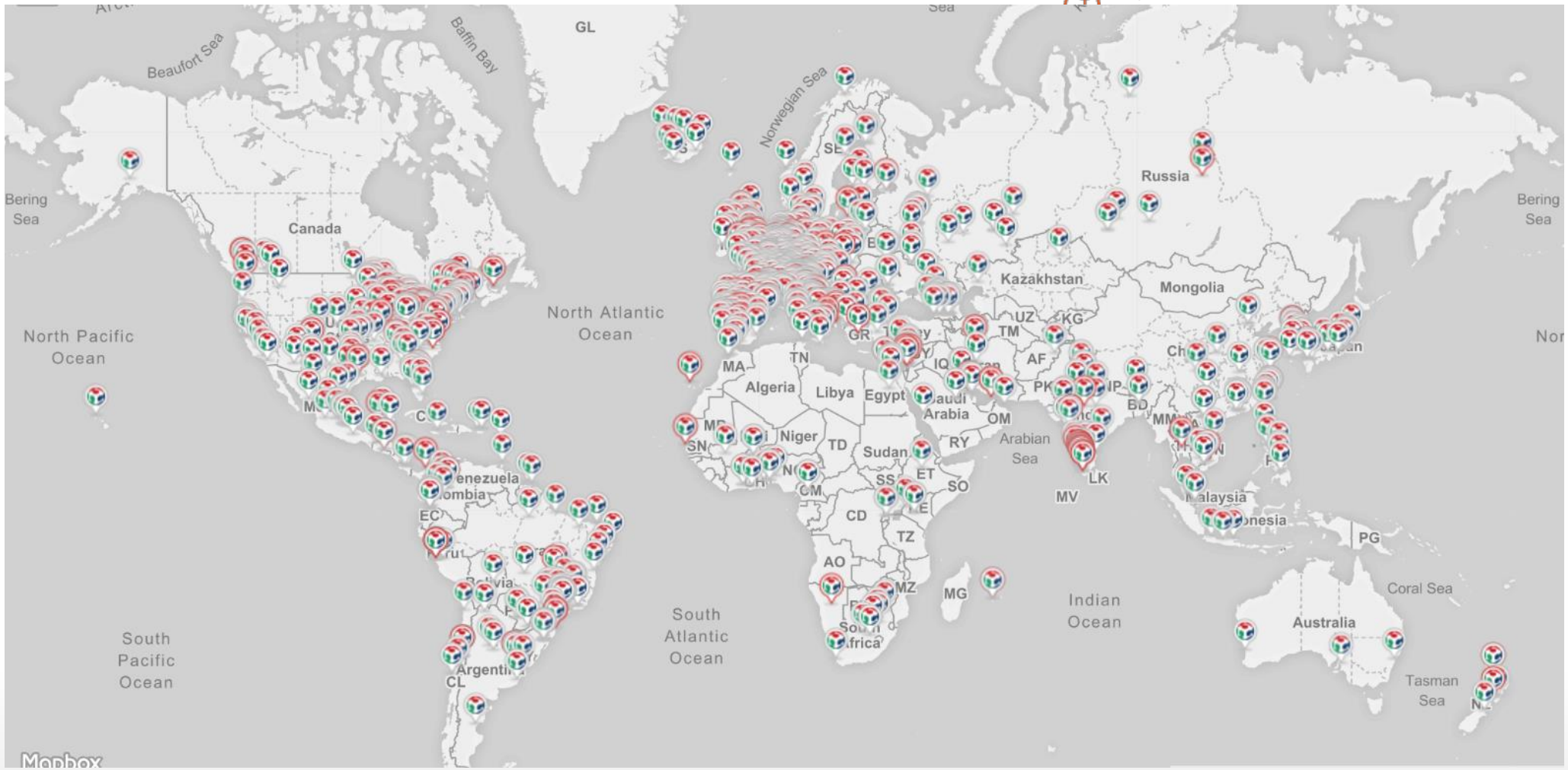
Robotics

STEM projects

Computer modelling design

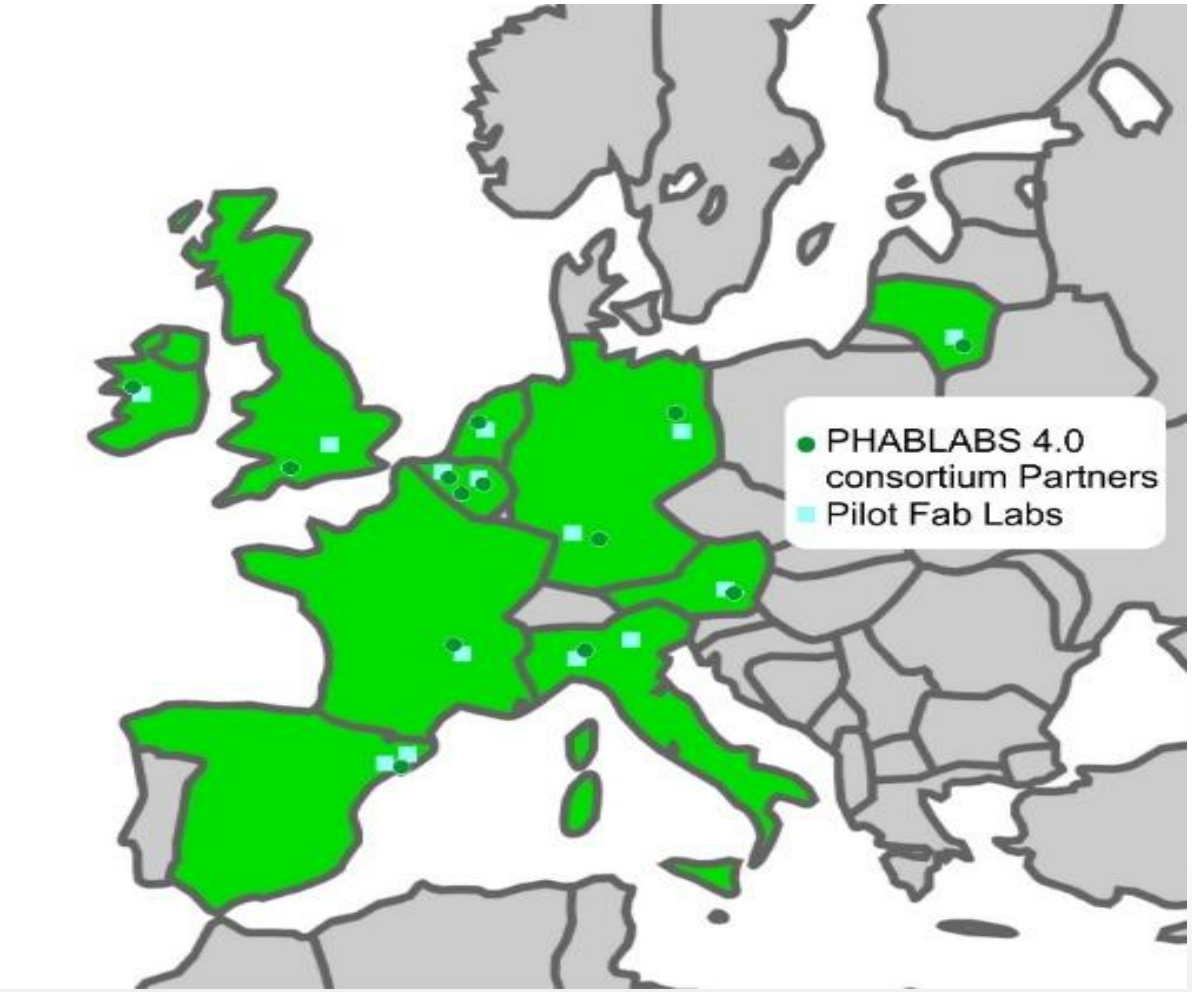
FAB LABS & Maker Spaces

PHABLABS 4.0



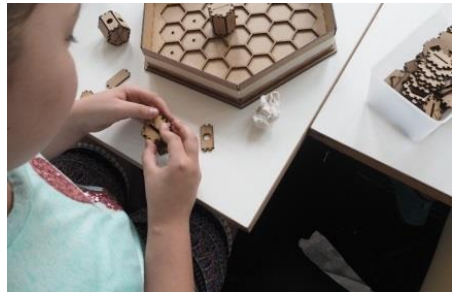
11 Photonics Partners & 14 Fab Labs

PHABLABS 4.0



Photonics Partners	Pilot Fablabs
Brussels , VUB	FabLab Brussels FabLab Erpe Mere
Barcelona, ICFO	FabLab Barcelona Tinkerers Fab Lab
Berlin, FBH	ViNN:Lab
Milan, IFN-CNR	Muse FabLab, Trento FabLabMilano
Galway, NUIG	Makerspace of NUI Galway
Paris, UJM	OpenFactory42
Southampton, UoS	Fab Lab London
Graz, JR	FabLab Graz
Stuttgart,SEZ	Fablab Karlsruhe
Delft, TUD	Science Centre TuDelft
Vilnius,FTMC	M-LAB

TARGET GROUPS



Young minds (10-14y)

Raise awareness about the different unique characteristics of light

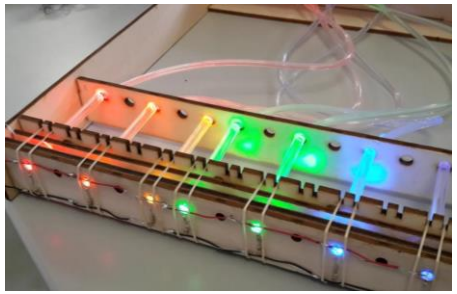
Students (15-18y)

Enhance Photonics **skills**, 21st century skills and general makerskills.

Young professionals (+18y)

Stimulate innovation with photonics.

INDUSTRY 4.0



PHOTONICS WORKSHOPS

Master the enabling character of photonics and its many applications

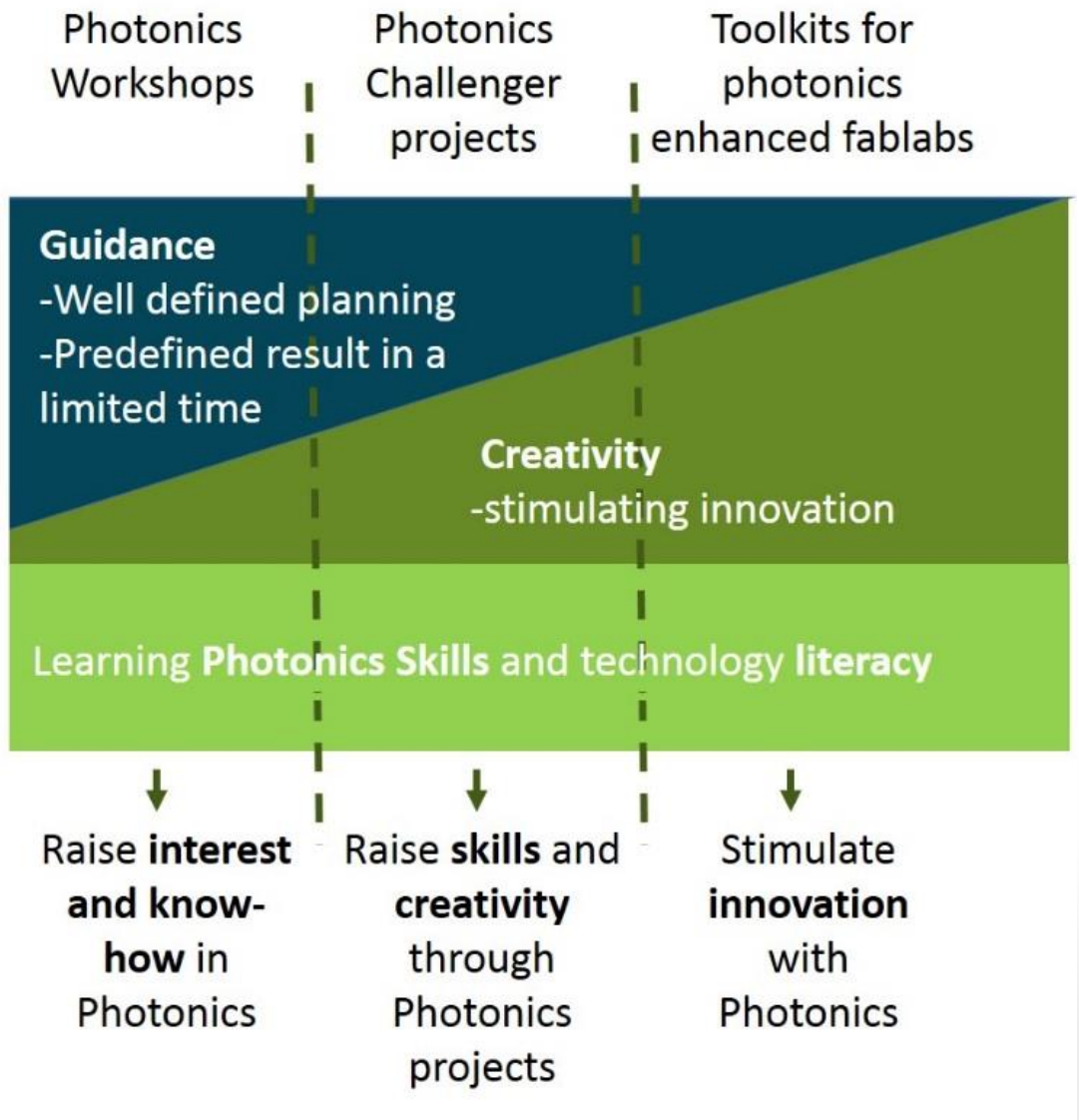
PHOTONICS CHALLENGER PROJECTS

As eye-opener to discovering the wide range of potential applications with photonics technology and **trigger creativity**

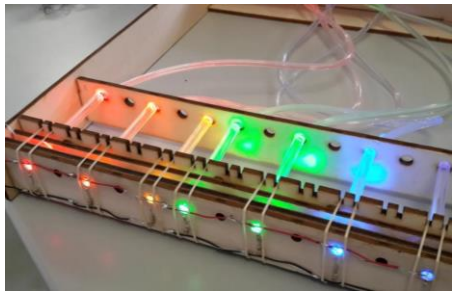
PHOTONICS TOOLKITS FOR FAB LABS

Make available durable low-cost photonics components and inspire innovation with photonics technology

INDUSTRY 4.0


Photonics Workshops
Photonics Challenger projects
Toolkits for photonics enhanced fablabs
Guidance
-Well defined planning
-Predefined result in a limited time
Creativity
-stimulating innovation
Learning Photonics Skills and technology literacy
Raise interest and know-how in Photonics
Raise skills and creativity through Photonics projects
Stimulate innovation with Photonics

INDUSTRY 4.0



PHOTONICS WORKSHOPS

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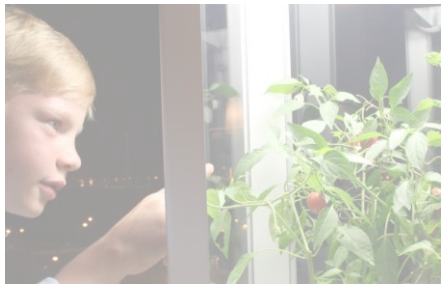

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PHOTONICS TOOLKITS FOR FAB LABS

Make available durable low-cost photonics components and inspire innovation with photonics technology

PHOTONICS WORKSHOPS

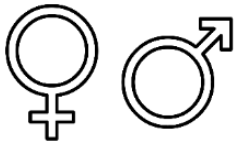
PHABLABS 4.0

Workshop instructor has a strong guiding role

Duration:
½ day up to 1 day

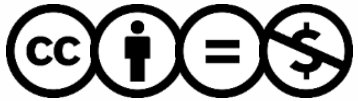
instructables

Pre-defined end-result/system

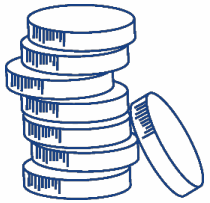


A female-friendly approach

Target groups:
*Young minds (10-14y)
*Students (15-18y)
*Young professionals (18+)



Creative commons "Attribution-Non-Commercial-No-Derivate Works"



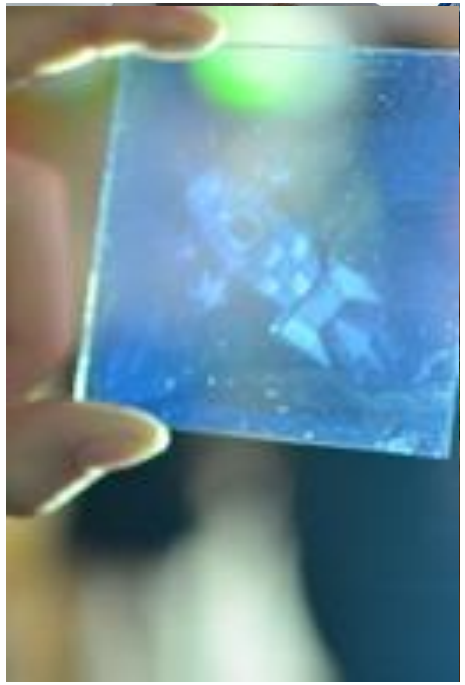
€10 - €32 per participant

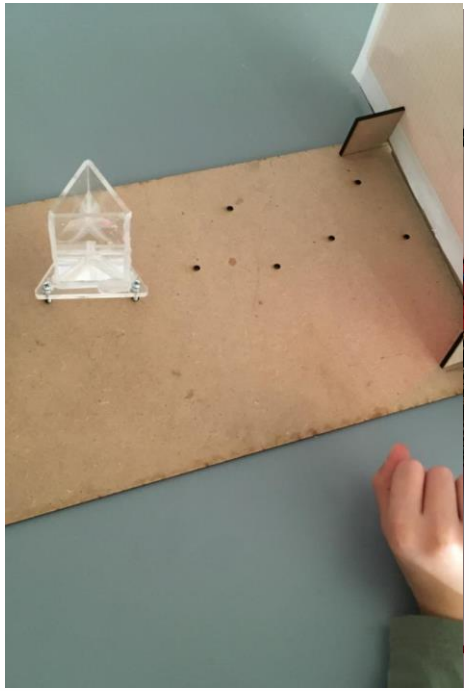
Possibility to combine several workshops in a Photonics Camp

PHOTONICS WORKSHOPS

Young Minds (10-14y)

PHABLABS 4.0

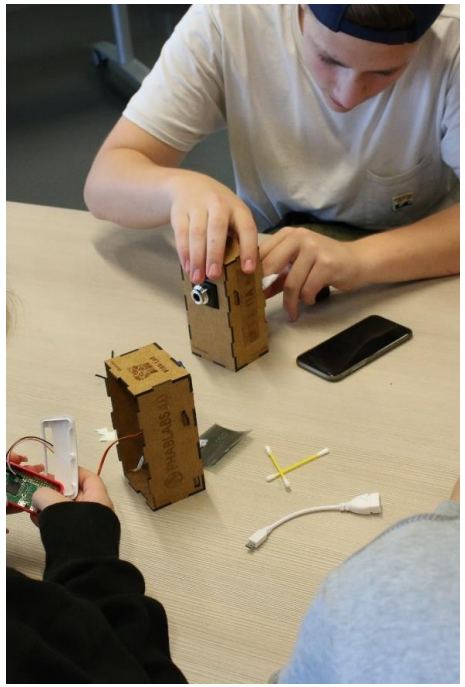


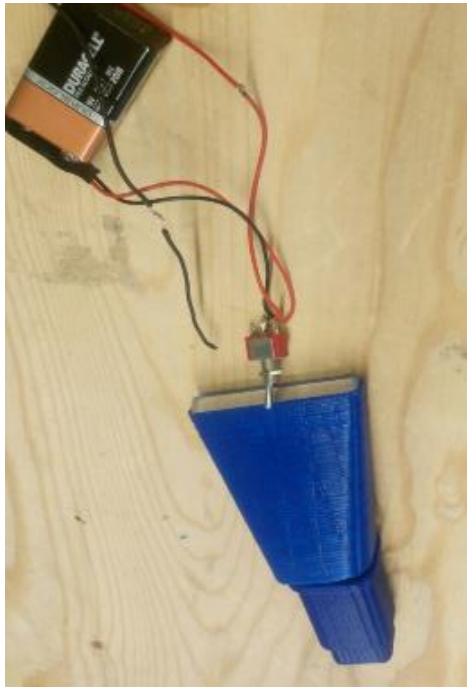


PHOTONICS WORKSHOPS

Students (14-18y)

PHABLABS 4.0

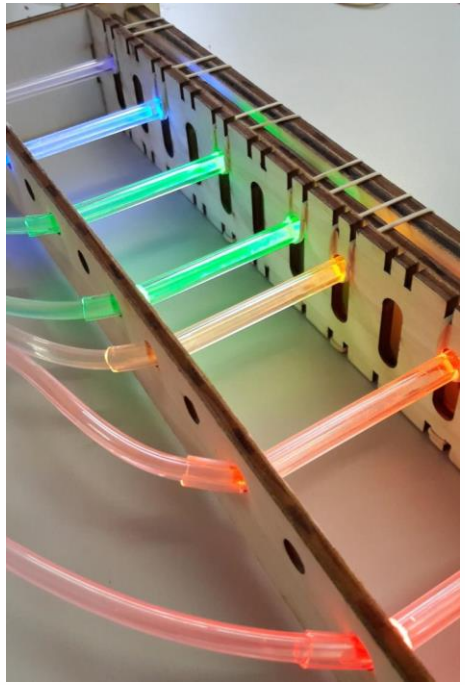
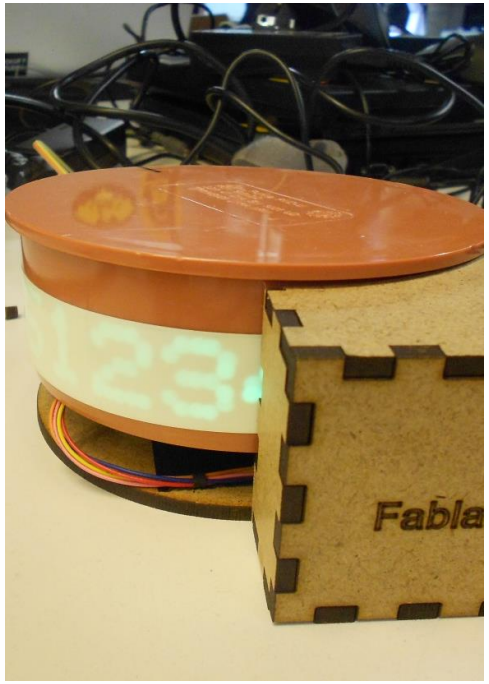



PHOTONICS WORKSHOPS

Young Professionals (+18y)

PHABLABS 4.0

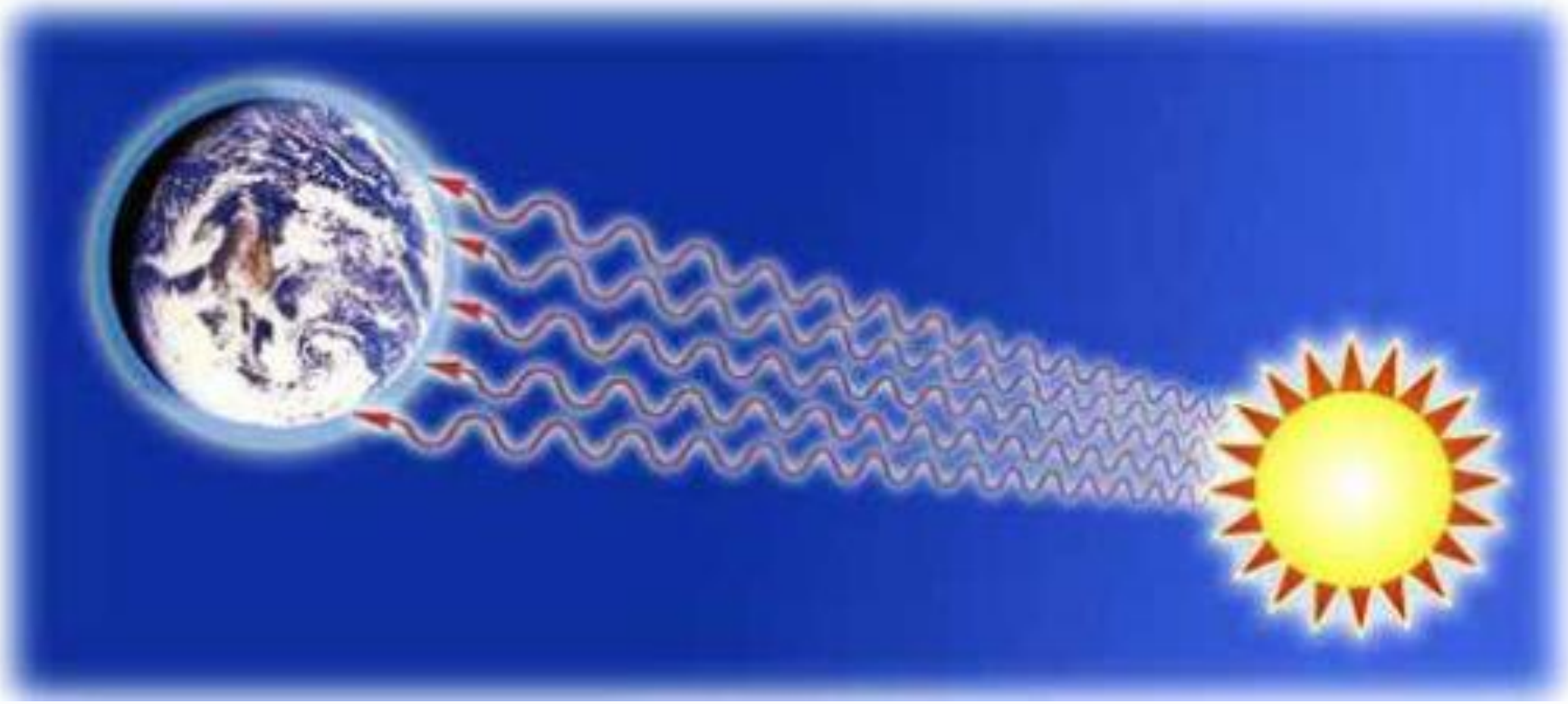




ART WITH LIGHT: POLARISATION

Young Minds (10-14y)

ART WITH LIGHT: POLARISATION

What is polarisation?



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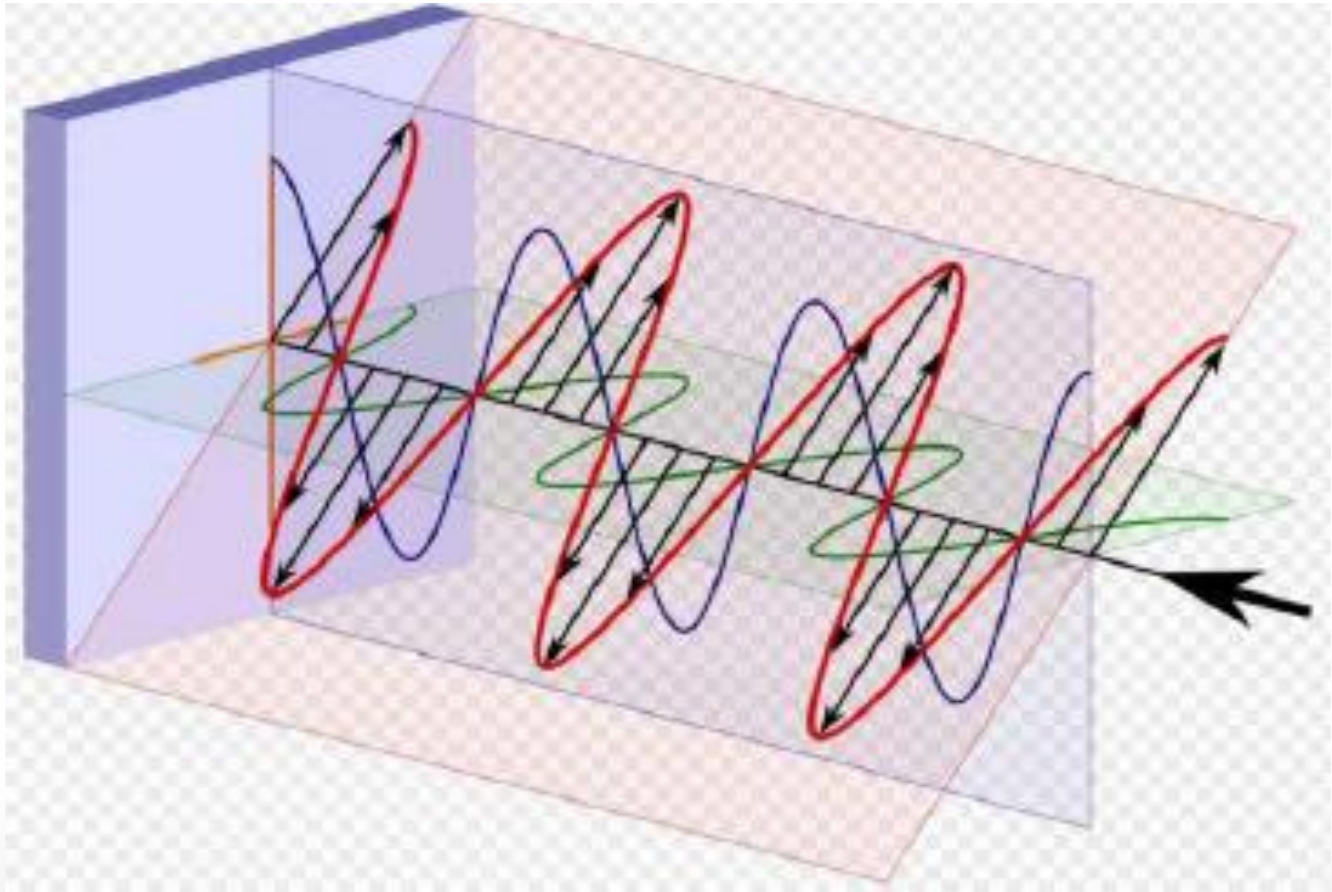

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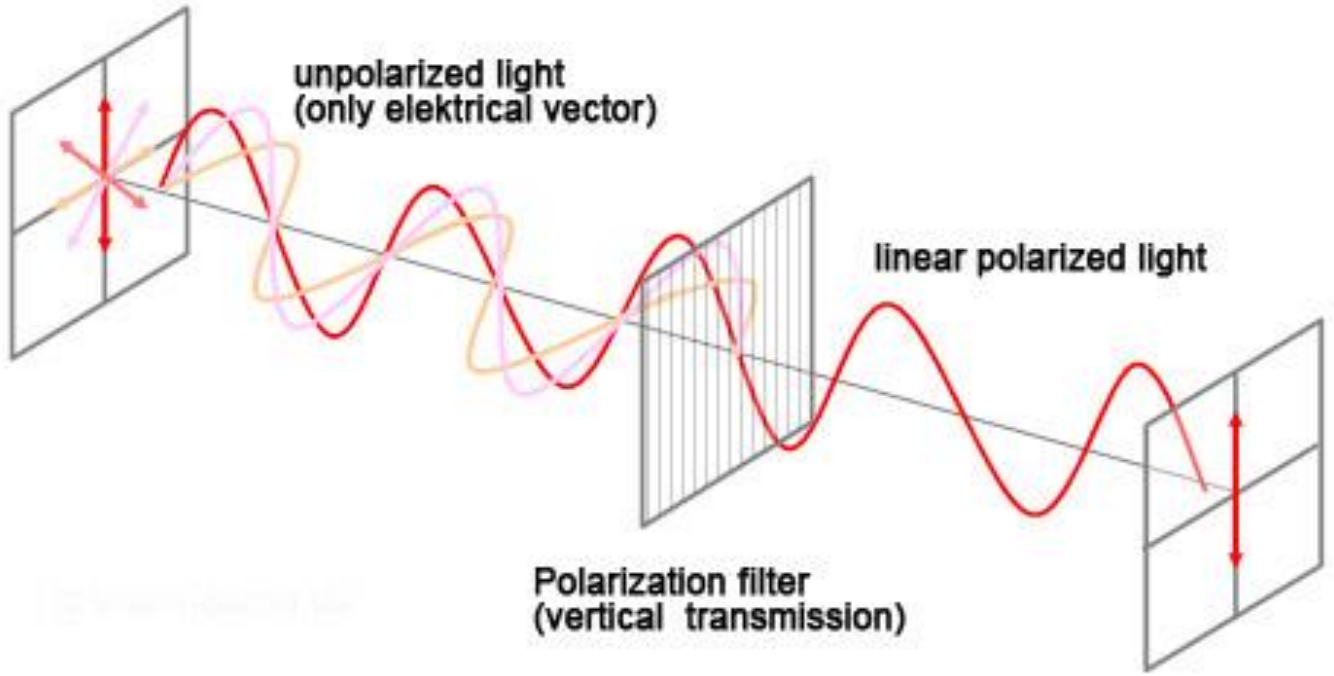

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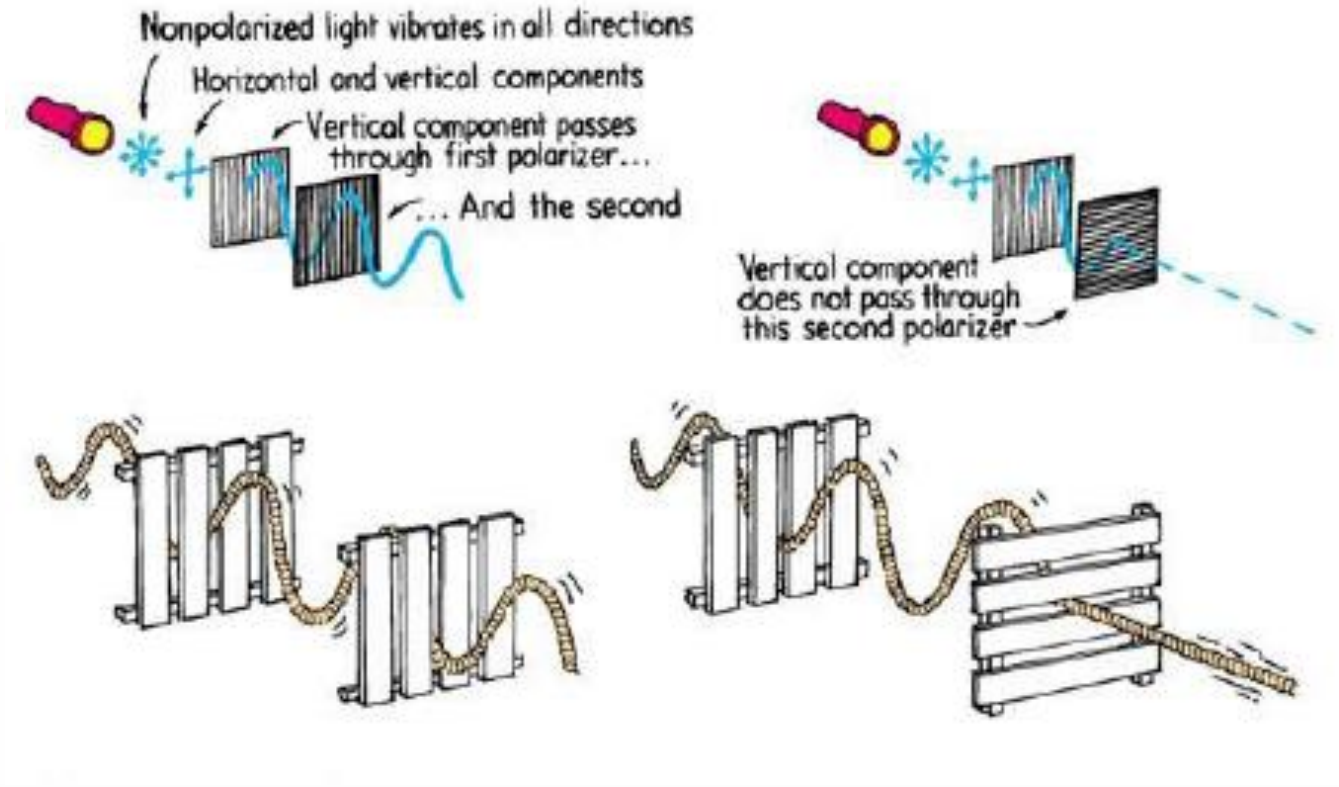
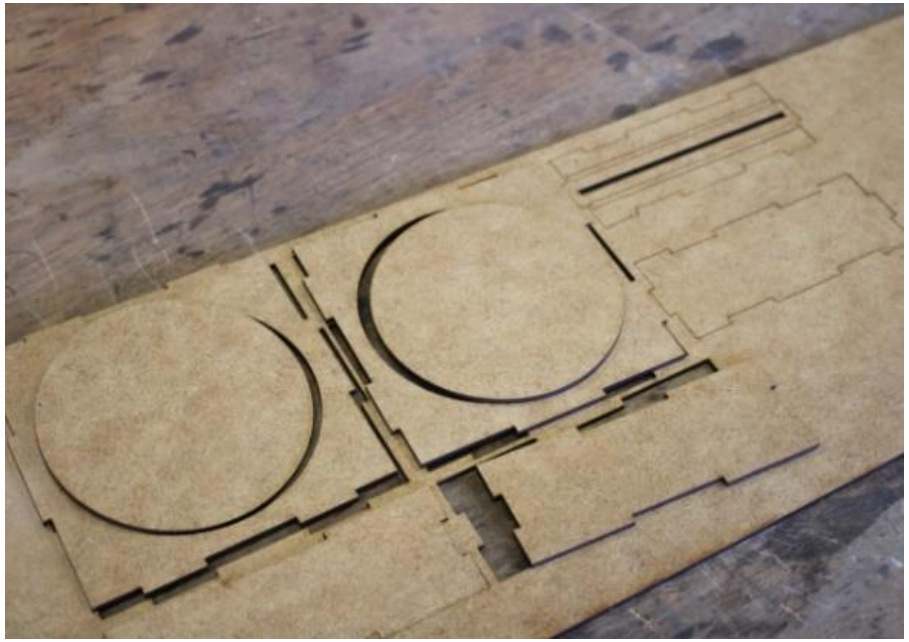


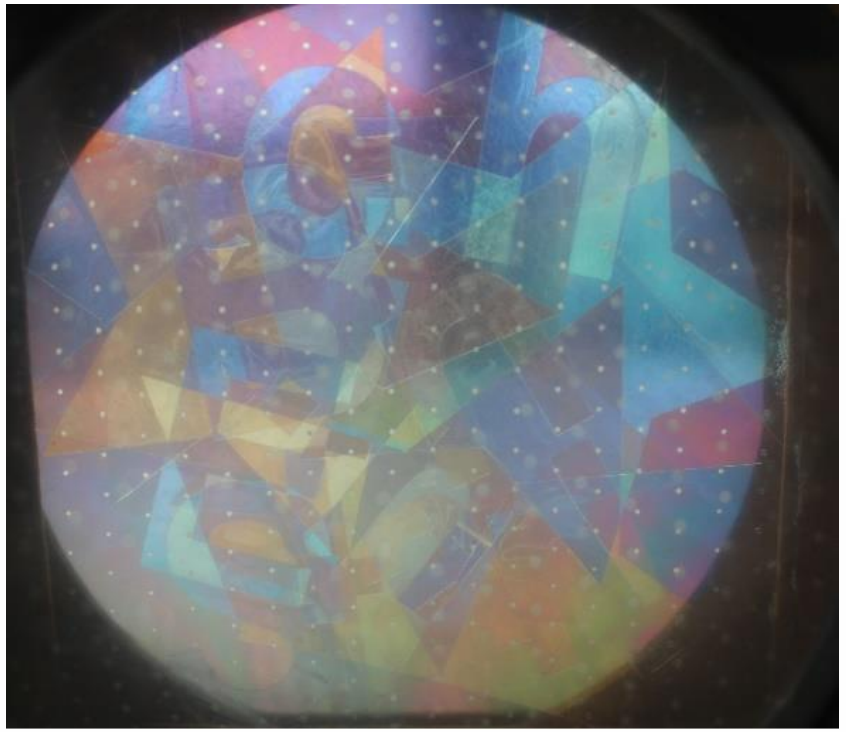
ART WITH LIGHT: POLARISATION

Art with polarisation



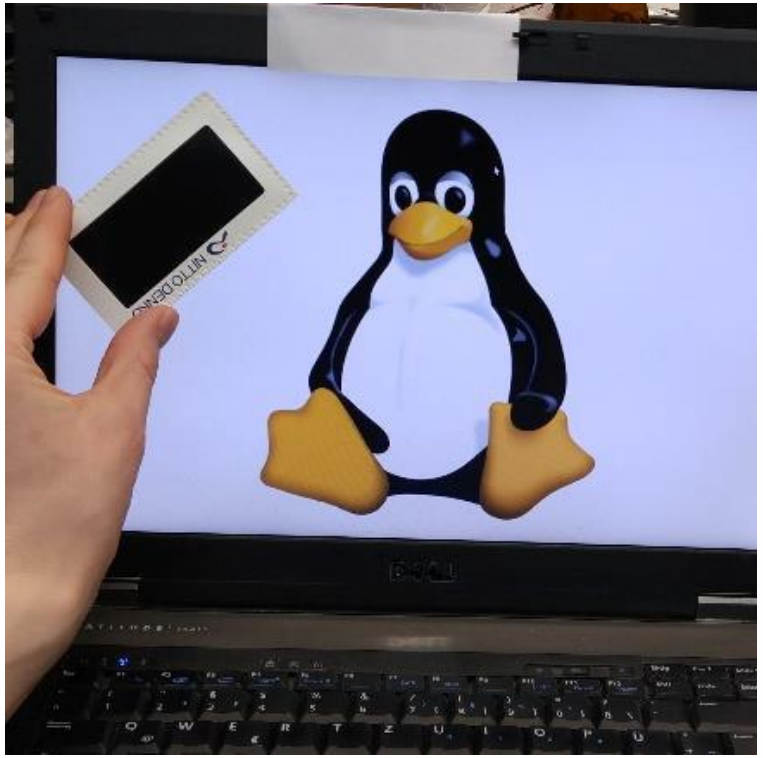
ART WITH LIGHT: POLARISATION

Art with polarisation



ART WITH LIGHT: POLARISATION

Application: LCD display



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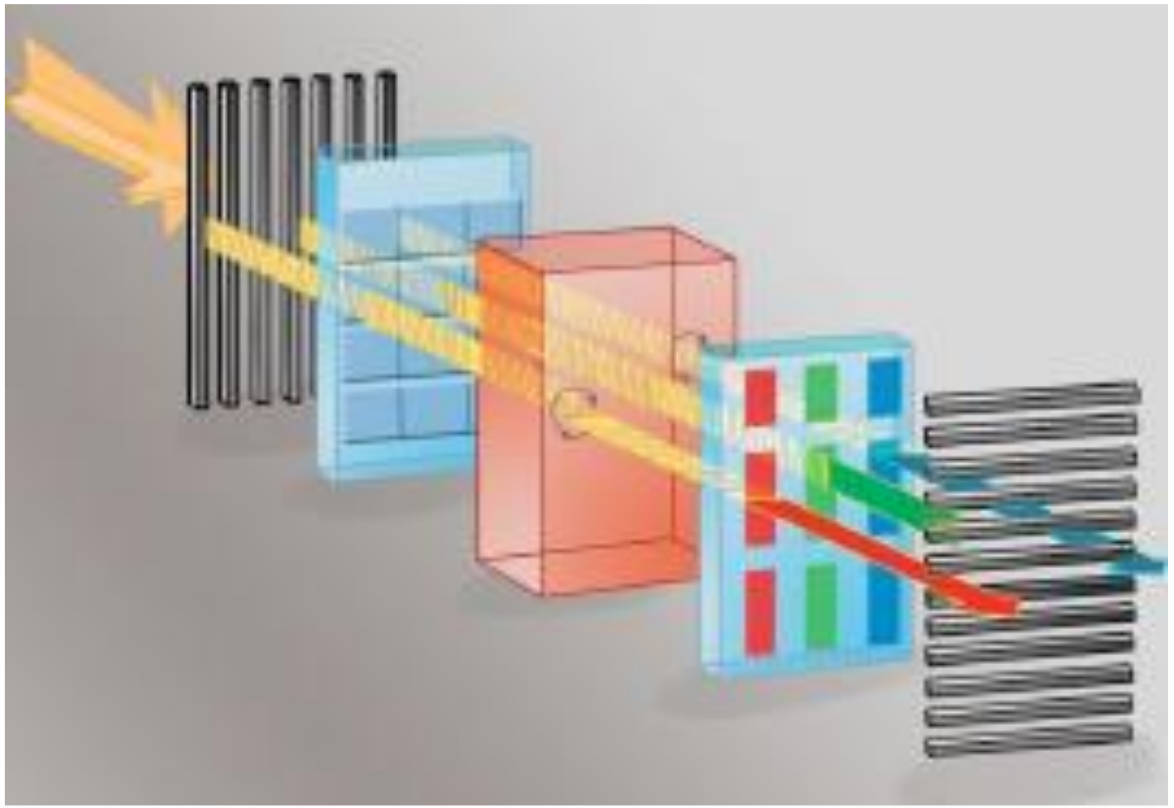
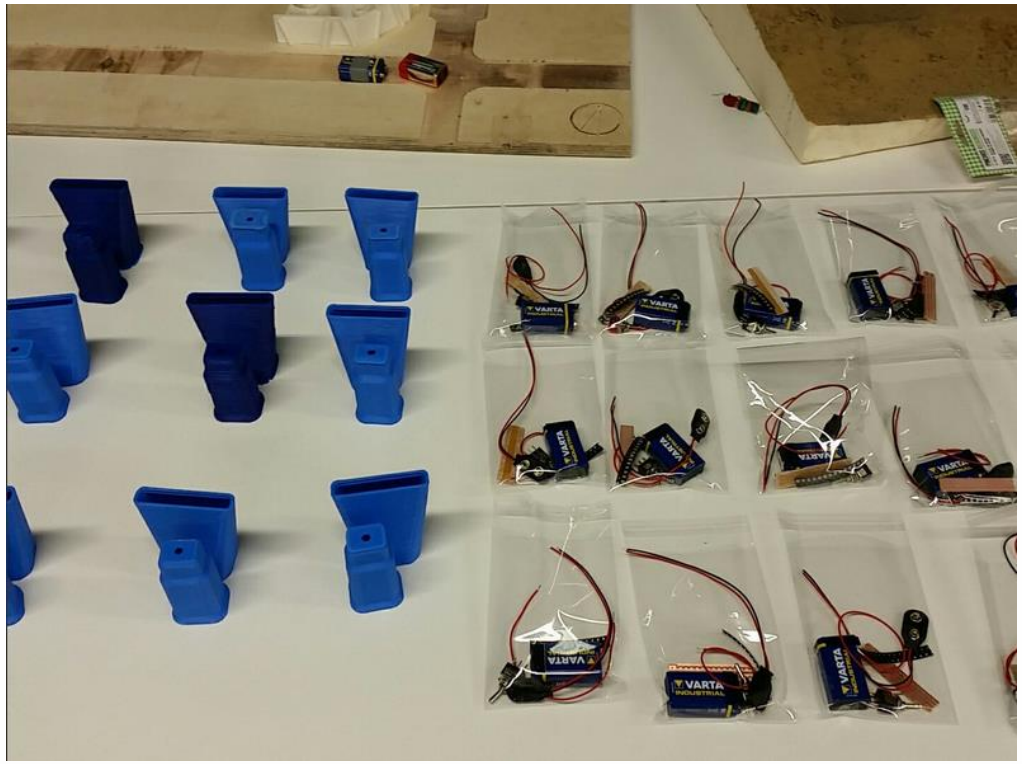


LIGHTPAINTING

Students (14 -18y)



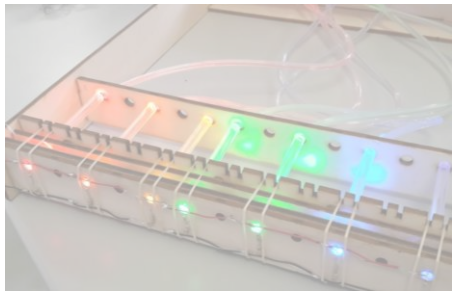
LIGHTPAINTING

Students (14 -18y)

LIGHTPAINTING

Students (14 -18y)

INDUSTRY 4.0



PHOTONICS WORKSHOPS

Master the enabling character of photonics and its many applications

PHOTONICS CHALLENGER PROJECTS

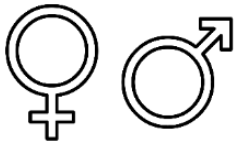
As eye-opener to discovering the wide range of potential applications with photonics technology and **trigger creativity**

PHOTONICS TOOLKITS FOR FAB LABS

Make available durable low-cost photonics components and inspire innovation with photonics technology

PHOTONICS CHALLENGERS

PHABLABS 4.0

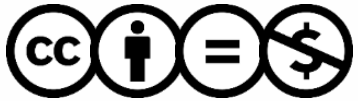


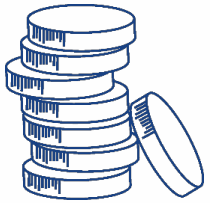
Mentor the projects more than guide them.

Duration:
Several months

Encourage team-work.

A female-friendly approach





Target groups:

*Students (15-18y)
*Young professionals (18+)

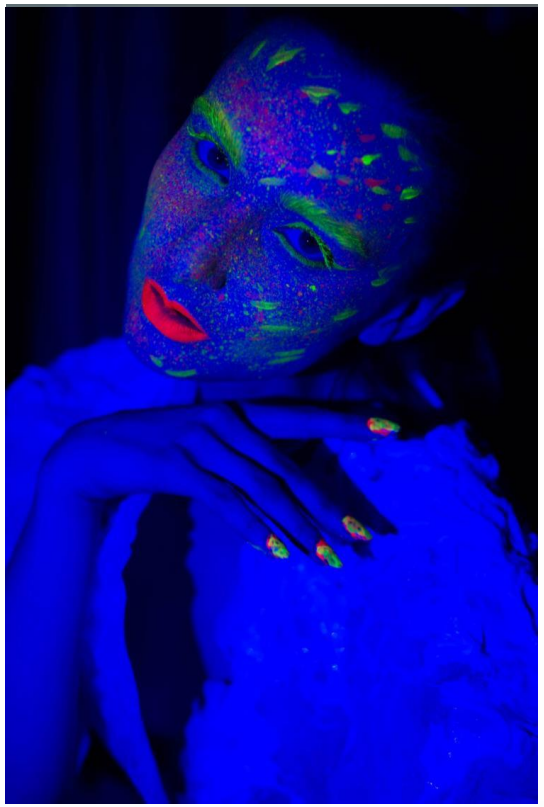
Creative commons "Attribution-Non-Commercial-No-Derivate Works"

€160 per team

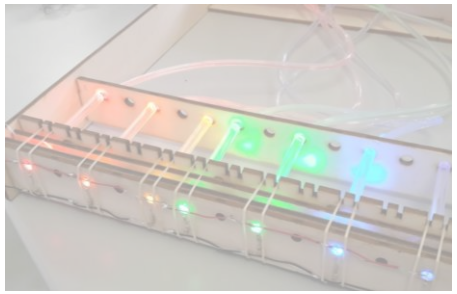
Promote creativity: only the assignment is determined

PHOTONICS CHALLENGERS

PHABLABS 4.0

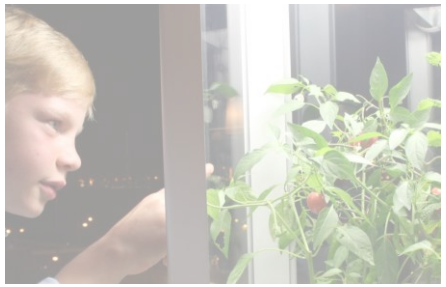


INDUSTRY 4.0



PHOTONICS WORKSHOPS

Master the enabling character of photonics and its many applications



PHOTONICS CHALLENGER PROJECTS

As eye-opener to discovering the wide range of potential applications with photonics technology and **trigger creativity**

PHOTONICS TOOLKITS FOR FAB LABS

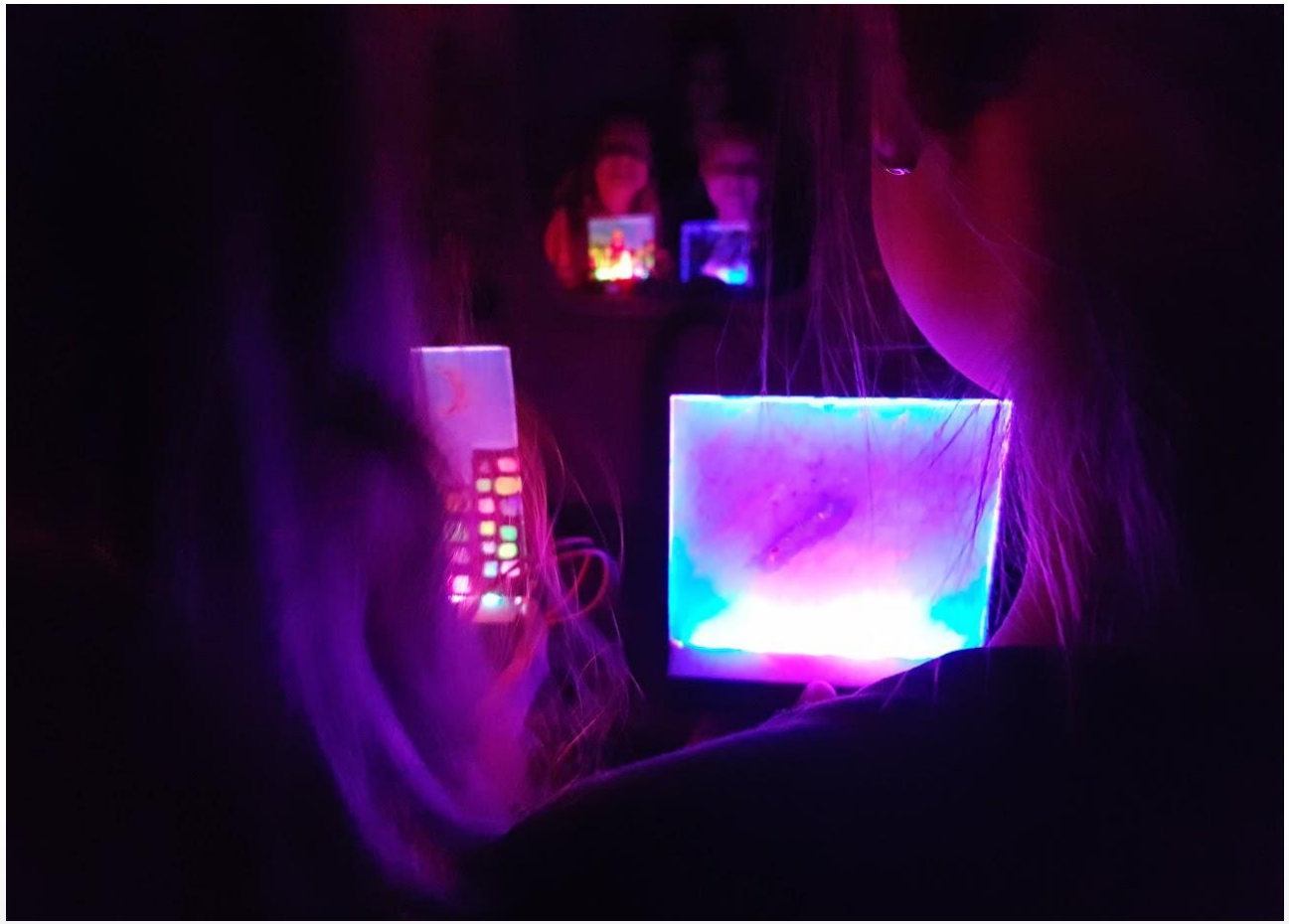
Make available durable low-cost photonics components and inspire innovation with photonics technology

PHABLABS 4.0

PHOTONICS 21
PHOTONICS PUBLIC PRIVATE PARTNERSHIP

PHOTONICS TOOLKITS

GENERAL PHOTONICS TOOLKIT

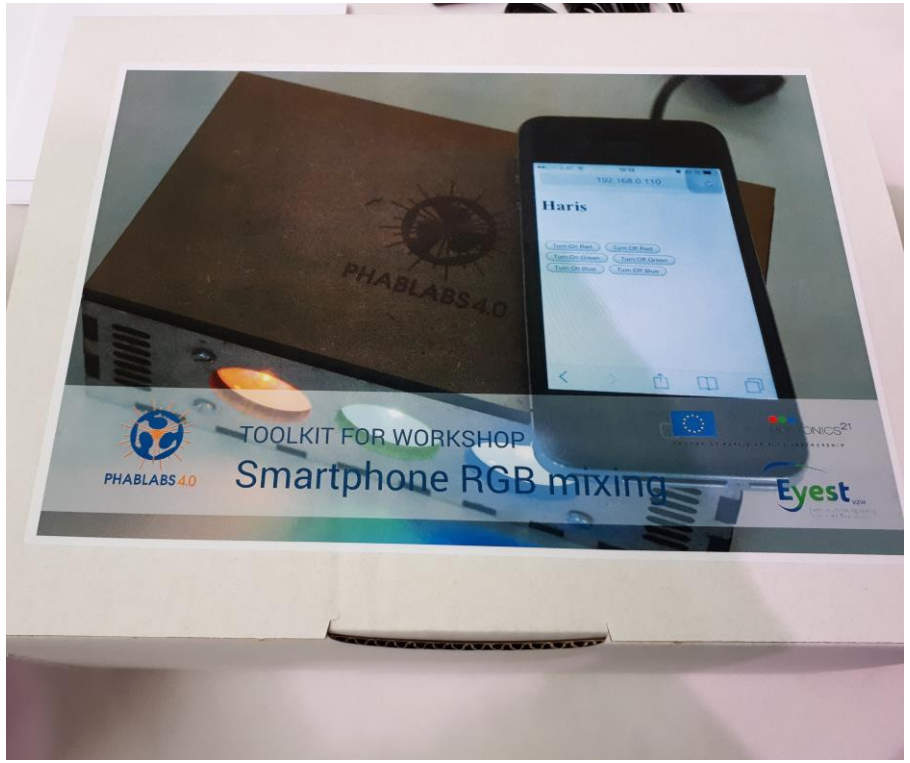


PHOTONICS TOOLKITS

WORKSHOP SPECIFIC TOOLKIT

PHOTONICS TOOLKITS

SMARTPHONE RGB colour mixing

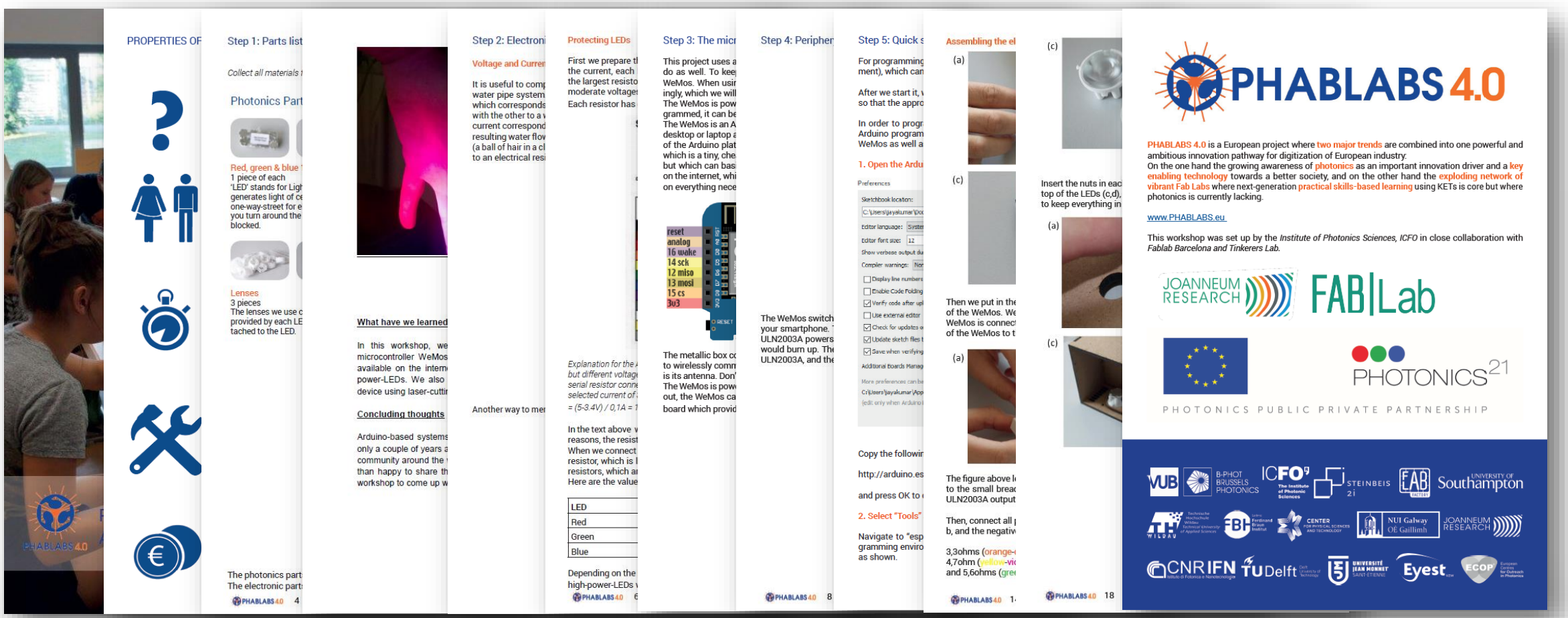


Included in the Photonics Toolkit:

-Instructions to perform this workshop
-All Photonics & Electronics material for 10 participants

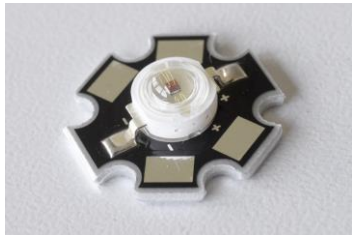
PHOTONICS TOOLKITS

SMARTPHONE RGB colour mixing: instructions & educational value



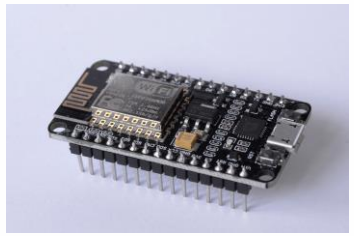
PHOTONICS TOOLKITS

SMARTPHONE RGB colour mixing: Materials per participant



3 High Power LEDS: Red, Green & Blue

3 lenses for High Power LEDS



WeMos microcontroller

Resistor 3.3 Ohm

Resistor 4.7 Ohm

Resistor 5.6 Ohm

ULN2003A

Breadboard small

Breadboard extra small

USB A to Micro B

PHOTONICS TOOLKITS

SMARTPHONE RGB colour mixing: Tests in secondary schools

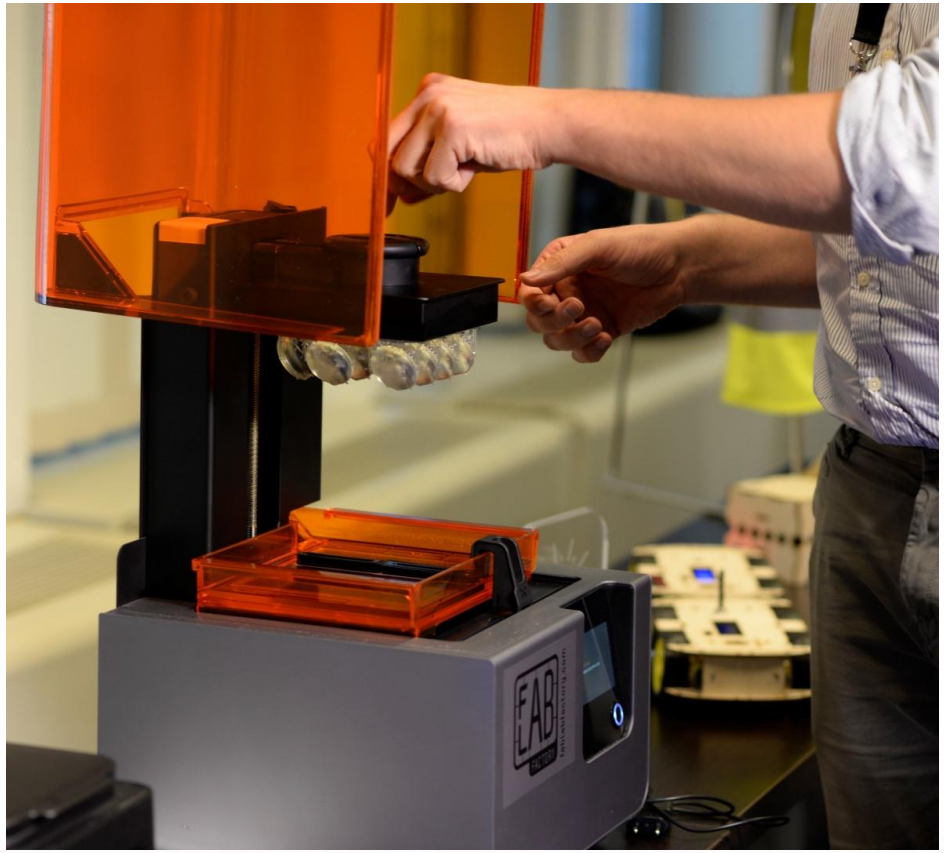
PHABLABS 4.0

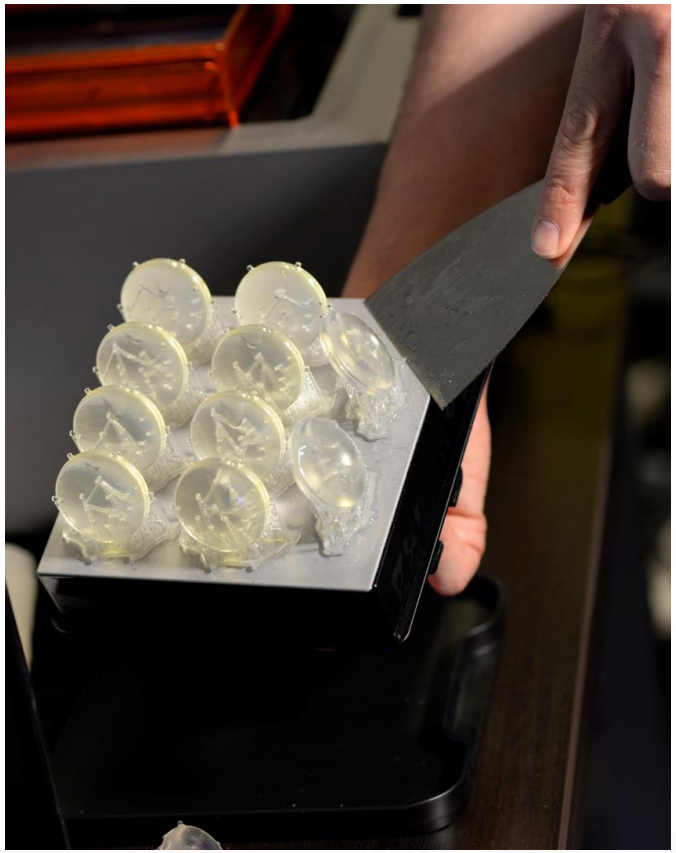
PHOTONICS TOOLKITS

3D printer for transparent material

PHOTONICS TOOLKITS

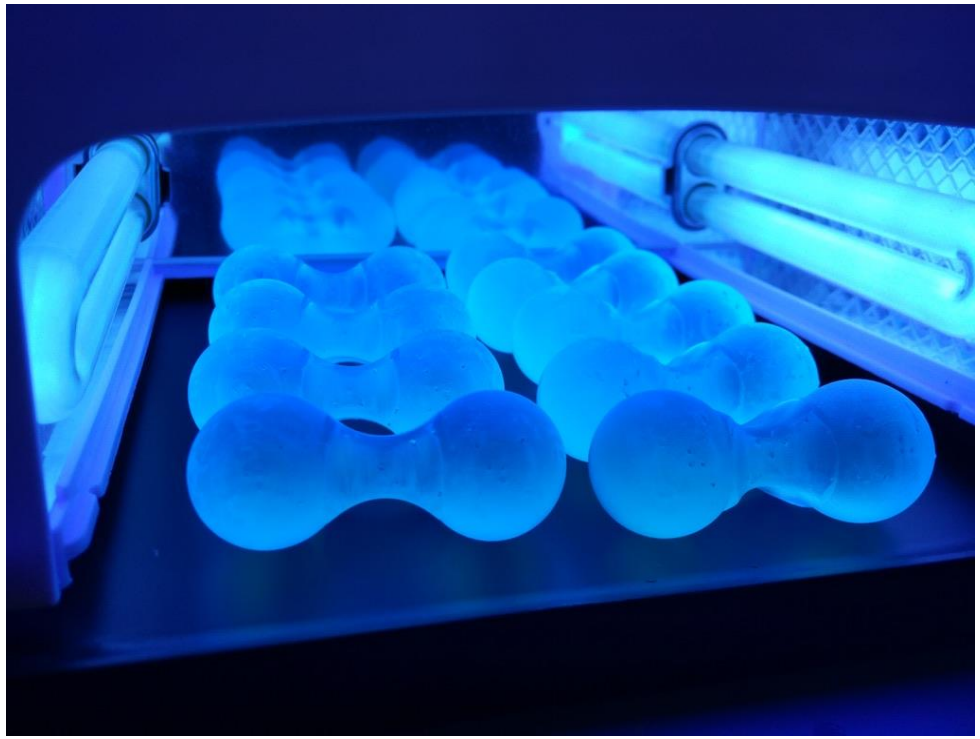
3D printer for transparent material

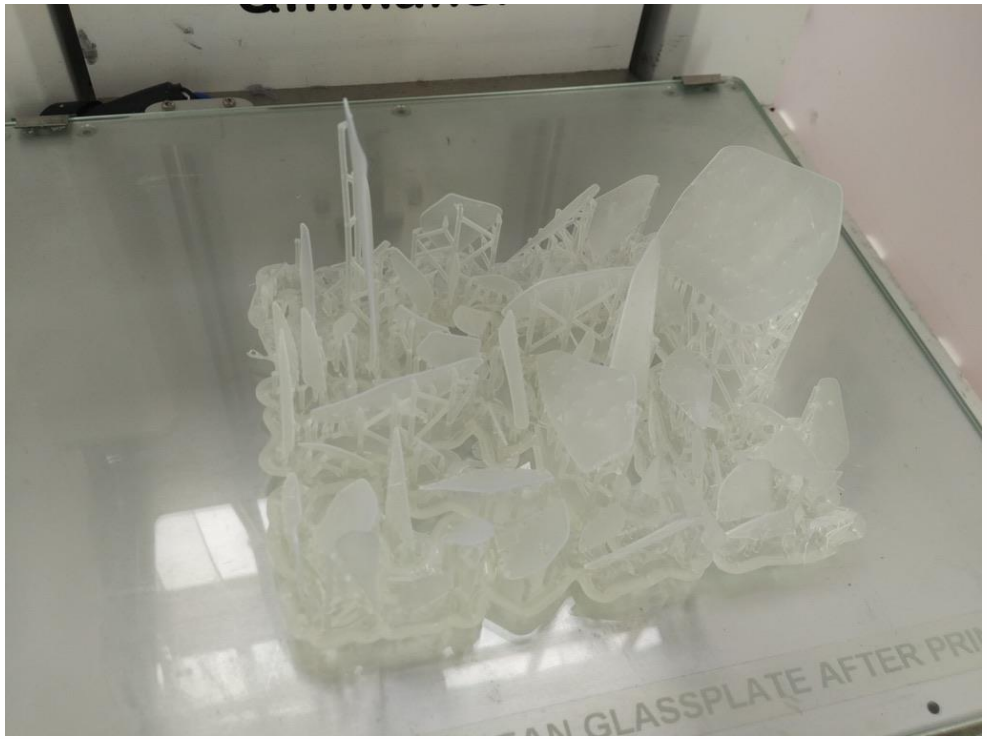




PHOTONICS TOOLKITS

3D printer for transparent material





GIRL FRIENDLY APPROACH

IET
@TheIET

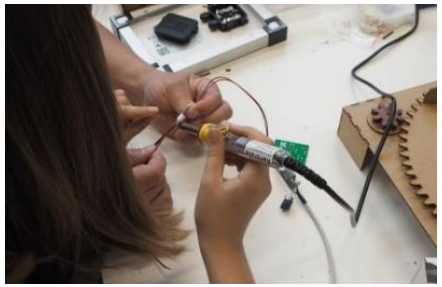
Follow

More than one in 10 girls think that STEM careers are more suited for boys. In modern society, it's important to disregard stereotypes.
#SmashStereotypesToBits #INWED18

12:00 am - 21 Jun 2018

500 Retweets **666** Likes

GIRL FRIENDLY APPROACH




Aim
To increase **the number of females** who consider studying Physics/Photonics.

Philosophy
Start from where the girls are (**their self-identity**). Do **NOT** expect them to change or to act like/become proto males.

Motto
Equality of experience is not the same as equality of opportunity

GIRL FRIENDLY APPROACH

What activities don't work?

- Competitions

  - The PHABLABS 4.0 consortium changed the Photonics Challenger contest into an award system.

- After-school STEM clubs

  - We tried to integrate the PHABLABS 4.0 activities into other hobbies/activities of the girls. E.g.: youth movement, schools…

- Activities that don't involve mum

  - We organised PHABLABS 4.0 workshops that include Mothers – either on the day or via a flyer to take home to show Mum.

GIRL FRIENDLY APPROACH

Pragmatic approach during workshops in Fab Labs

Objectives:

- Explore how to **engage** girls
- Be aware of how instructors' behaviour can **encourage** or put off students
- Increase awareness of strategies to manage your engagement with young people to encourage them to see photonics as "**something for them"**

Ensure you spend as much time with girls as boys. Choose your vocabulary and messages during the workshops and challengers carefully.

PHOTONICS WORKSHOPS

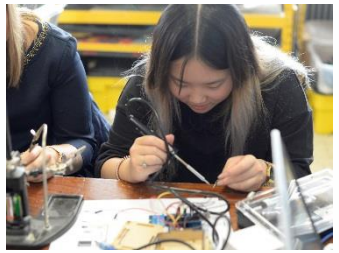
Tested during 12 months

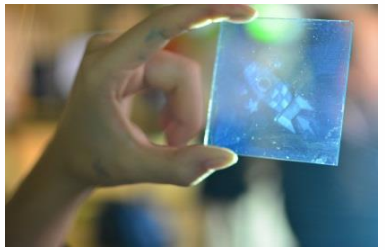
PHABLABS 4.0

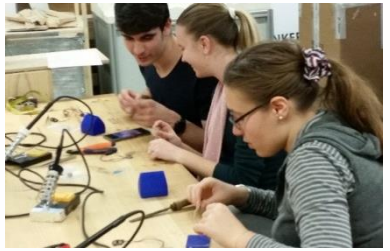










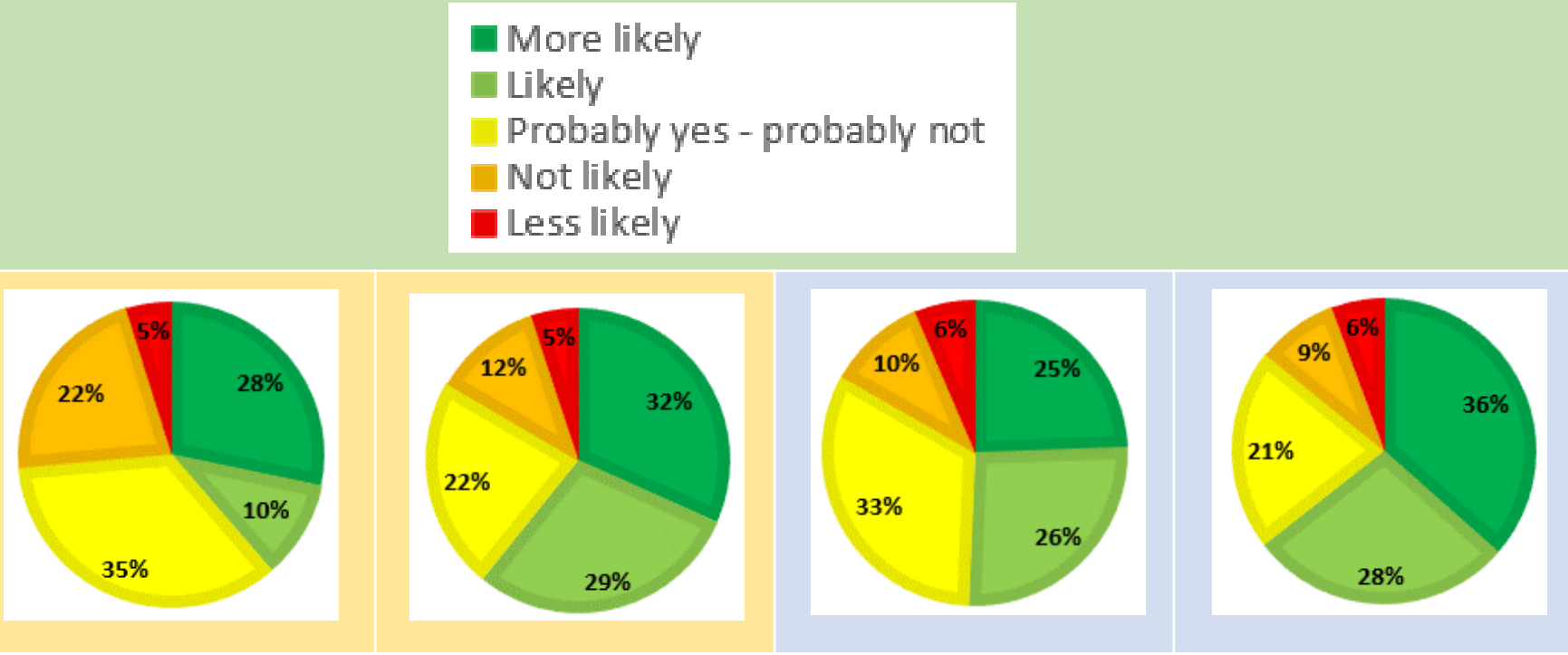




GIRL FRIENDLY APPROACH

GIRLS	108	BOYS	217
Before	**After**	**Before**	**After**

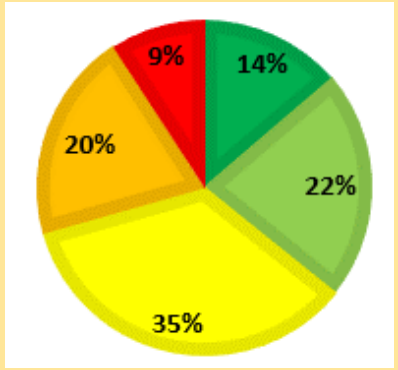
2. Can you imagine yourself working in a science or technology business?

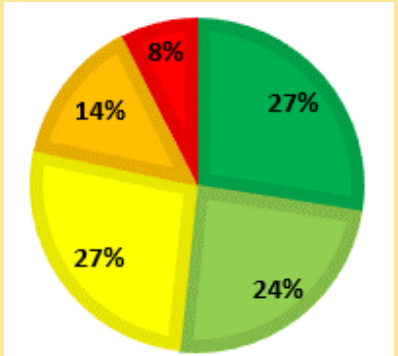


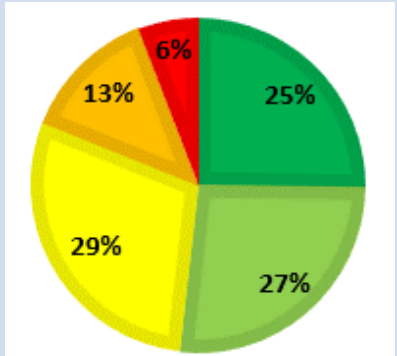
GIRL FRIENDLY APPROACH

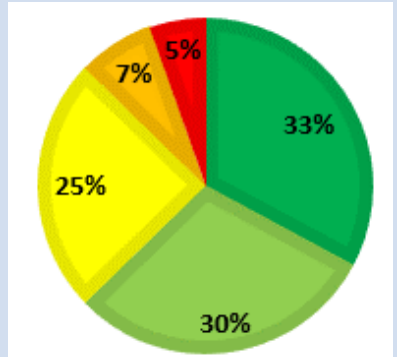
GIRLS	108	BOYS	217
Before	**After**	**Before**	**After**

4. I believe I can be successful in a career in engineering?









NEXT STEPS?

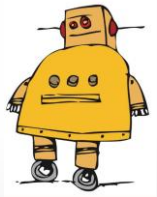
PHABLABS 4.0

www.phablabs.eu

https://www.facebook.com/PHABLABS

@Phablabs40

PHABLABS 4.0 Youtube Channel



Instructables PHABLABS 4.0