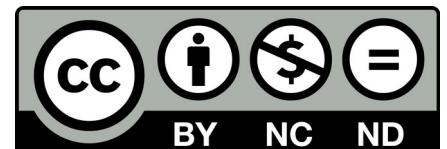


# Construção de impressora 3D

**Laureana Stelmastchuk Benassi Fontolan**

lfontolan@cti.gov.br

laure.stelmastchuk@gmail.com



# FABRICAÇÃO DIGITAL

# MANUFATURA ADITIVA

**Modelo 3D (CAD) → Fatiamento (CAM) → Impressão**

**Modelo 3D (CAD)** → **Fatiamento (CAM)** → **Impressão**

Blender

OpenSCAD

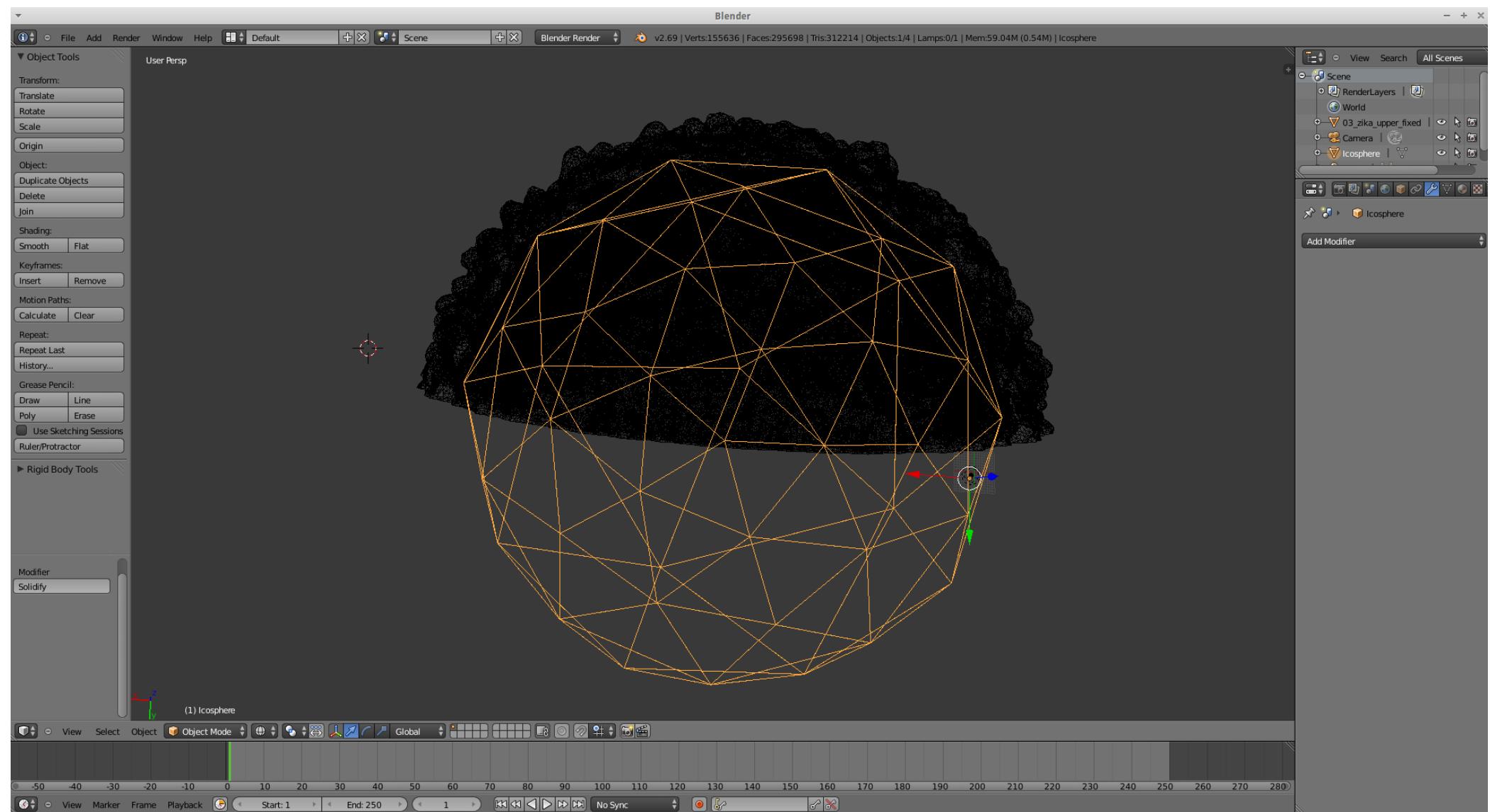
.stl

.dae

.obj

...

# BLENDER



23/06/2023

# OPENSOLIDWORKS

File Edit Design View Help

OpenSCAD - placas\_hexgrid\_vazada.scad

```
module hexgrid_fenestrated() {
    module hexagon(radius)
    {
        circle(h=1, r=radius,$fn=6);
    }

    module shell(radius)
    {
        difference()
        {
            hexagon(radius*1); // base
        }
    }

    module piece(radius)
    {
        translate([0, 0, -radius/12])
        {
            scale([1, 1, 1])
            {
                hexagon(radius);
            }
        }
    }

    module shell_with_piece(radius)
    {
        shell(radius);
        piece(radius);
    }

    function column_to_offset(column, offset) = (column % 2) * offset;

    module translate_to_hex(x_coord, y_coord, hex_width)
    {
        translate([x_coord*hex_width*1.75, y_coord*hex_width*2+column_to_offset(x_coord, hex_width), 0])
        {
            child(0);
        }
    }

    module lattice(rows, columns, hex_width)
    {
        for(x = [6:columns-1])
        {
            for(y = [6:rows-2.2])
            {
                translate_to_hex(x, y, hex_width)
                {
                    shell(hex_width);
                }
            }
        }
    }
}
```

The image shows a 3D rendering of a hexagonal grid structure. The grid is composed of white hexagons. There are several green circles of varying sizes placed at different points within the grid. A yellow shell surrounds the entire structure. The rendering is done in a perspective view with a coordinate system (x, y, z) visible.

CGAL Cache insert: group(){multmatrix([[1,0,0,52.4563], [0,1 (3328 bytes)

CGAL Cache insert: group(){multmatrix([[1,0,0,52.4563], [0,1 (3328 bytes)

CGAL Cache insert: group(){multmatrix([[1,0,0,52.4563], [0,1 (3328 bytes)

CGAL Cache insert: group(){group(){multmatrix([[1,0,0,4.768 (13168 bytes)

CGAL Cache insert: group(){group(){multmatrix([[1,0,0,14.30 (13168 bytes)

CGAL Cache insert: group(){group(){multmatrix([[1,0,0,23.84 (13168 bytes)

CGAL Cache insert: group(){group(){multmatrix([[1,0,0,33.38 (13168 bytes)

CGAL Cache insert: group(){group(){multmatrix([[1,0,0,42.91 (13168 bytes)

CGAL Cache insert: group(){group(){multmatrix([[1,0,0,52.45 (13168 bytes)

CGAL Cache insert: group(){group(){group(){multmatrix([[1,0 (72208 bytes)

CGAL Cache insert: group(){group(){group(){group(){multmatr (72208 bytes)

PolySets in cache: 6

PolySet cache size in bytes: 85520

CGAL Polyhedrons in cache: 84

CGAL cache size in bytes: 476352

Compiling design (CSG Products normalization)...

Normalized CSG tree has 14 elements

CSG generation finished.

Total rendering time: 0 hours, 0 minutes, 0 seconds

Viewport: translate = [34.91 24.59 38.31], rotate = [41.70 0.00 31.30], distance = 1045.38

Modelo 3D (CAD) → **Fatiamento (CAM)** → Impressão

Slic3r

Cura

Pronterface

.gcode

# CURA

Cura - 15.04.2

File Tools Machine Expert Help

Basic Advanced Plugins Start/End-GCode

**Machine**

Nozzle size (mm) 0.4

**Retraction**

Speed (mm/s) 40.0

Distance (mm) 3

**Quality**

Initial layer thickness (mm) 0.18

Initial layer line width (%) 120

Cut off object bottom (mm) 0

Dual extrusion overlap (mm) 0.15

**Speed**

Travel speed (mm/s) 150

Bottom layer speed (mm/s) 40

Infill speed (mm/s) 0.0

Top/bottom speed (mm/s) 0.0

Outer shell speed (mm/s) 0.0

Inner shell speed (mm/s) 0.0

**Cool**

Minimal layer time (sec) 5

Enable cooling fan  ...

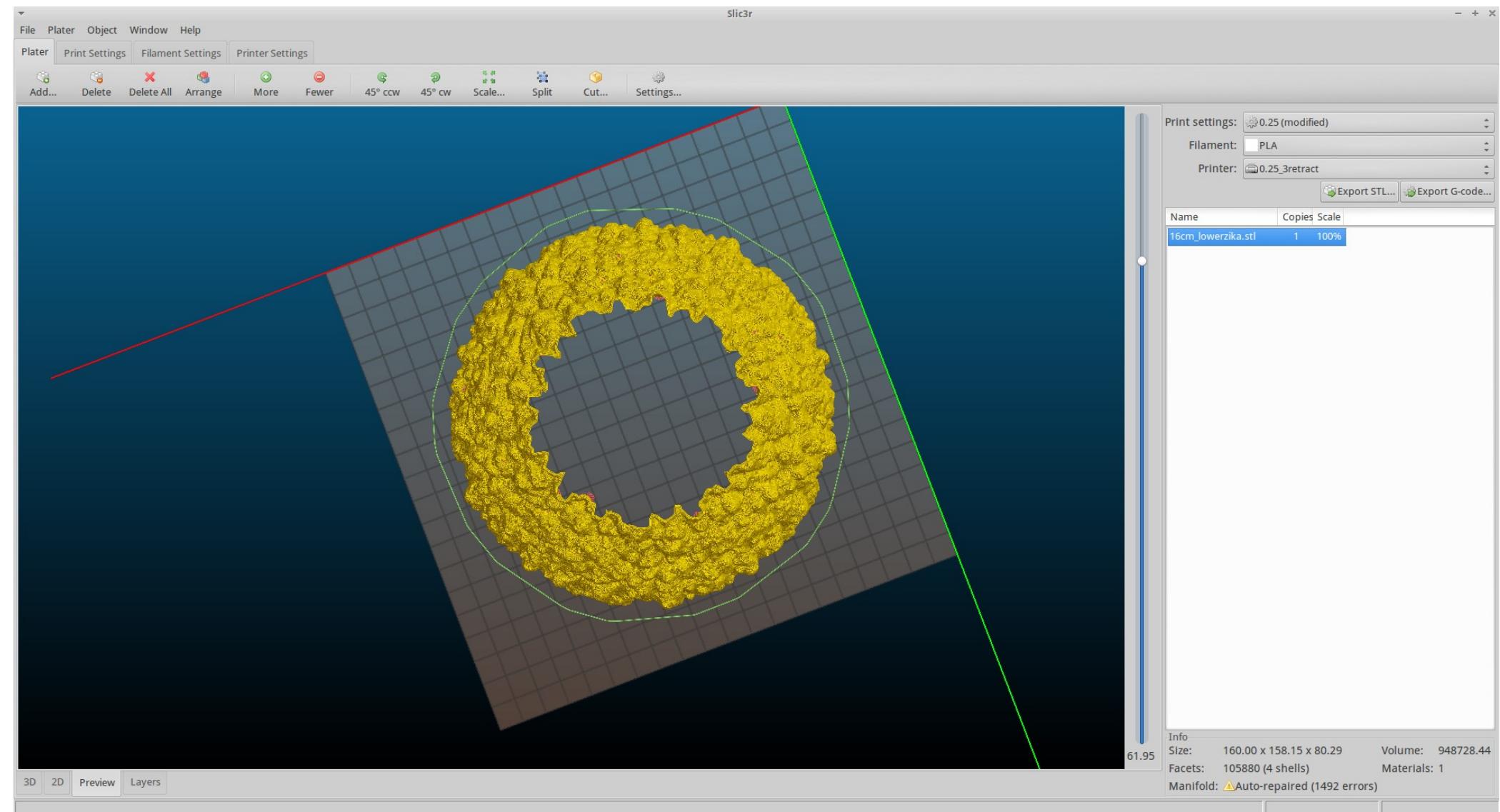
111 hours 8 minutes  
170.27 meter 479 gram

YM

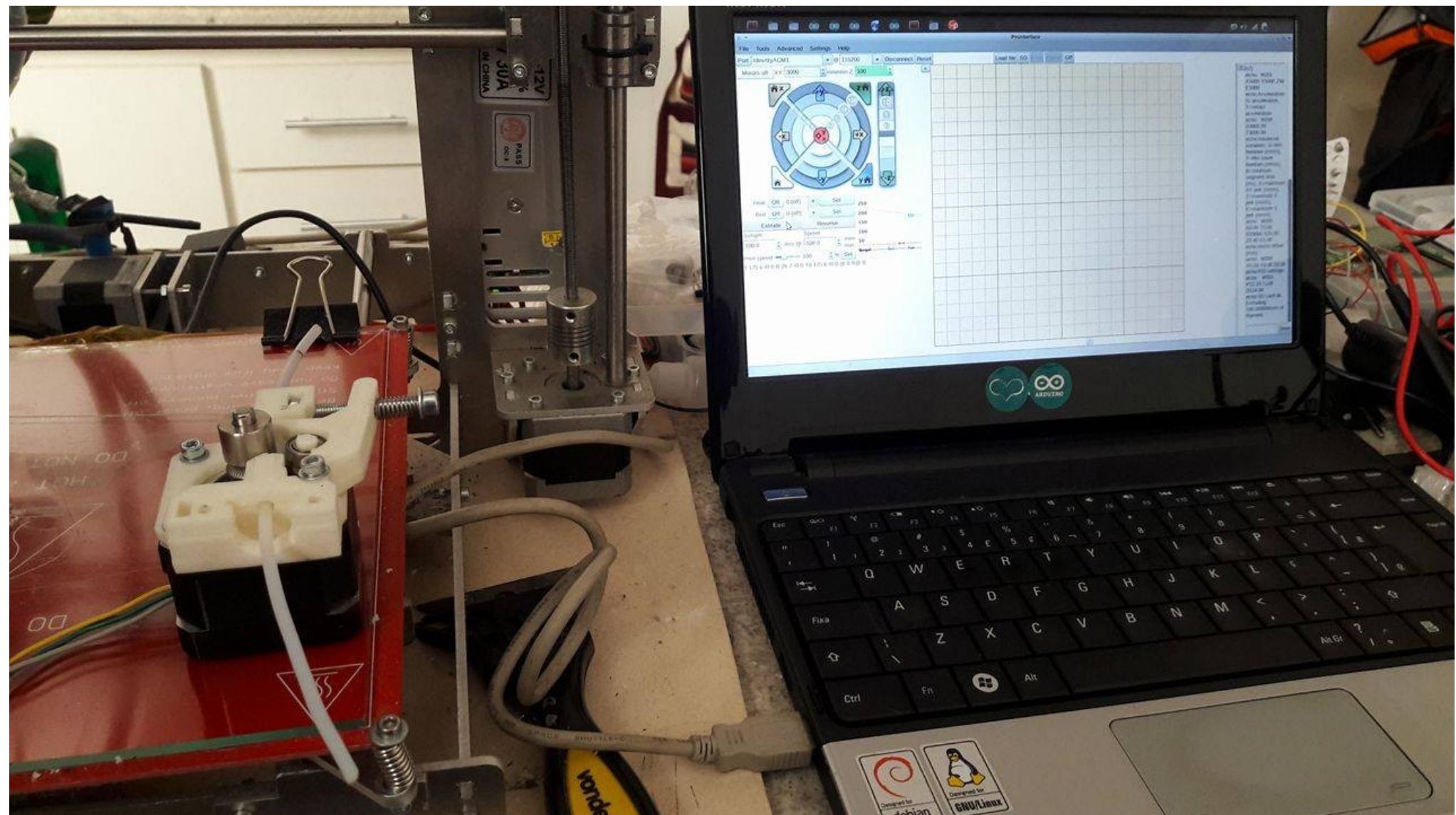
W, D, H: 142.8, 140.1, 142.2 mm

Scale X 0.3  
Scale Y 0.3  
Scale Z 0.3  
Size X (mm) 142.809  
Size Y (mm) 140.13  
Size Z (mm) 142.244  
Uniform scale

# SLIC3R



# PRONTERFACE



23/06/2023

**Modelo 3D (CAD) → Fatiamento (CAM) → Impressão**

SD    USB    Rede

Alimentação

Resolução – Ø ponteira

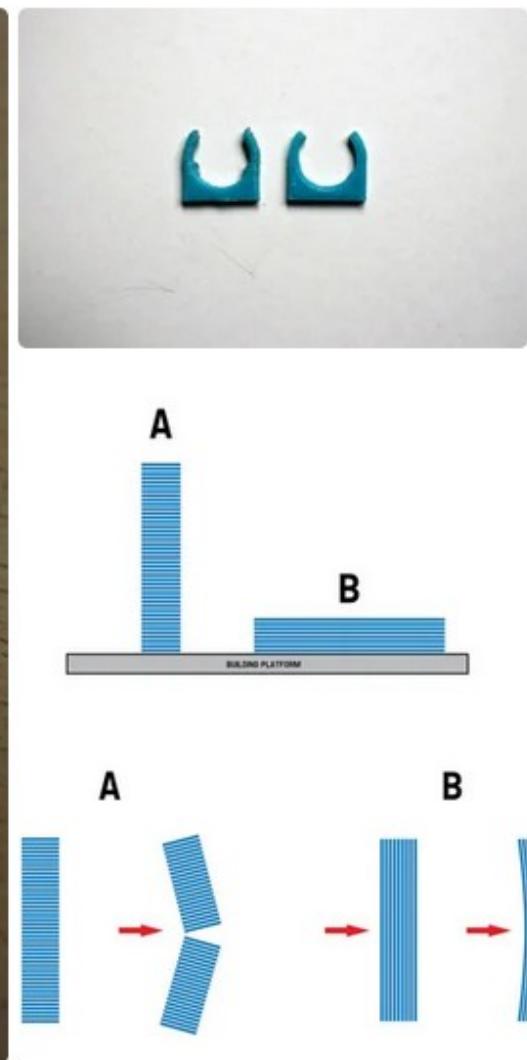
**SUPORTES**

**NEM TUDO É “IMPRIMÍVEL”**

**TÉCNICAS DE IMPRESSÃO**

**QUALIDADE DO MATERIAL**

# Nesting e orientação de peças



<https://www.instructables.com/id/Fixing-the-stuff-around-you-with-a-3D-printer/>

23/06/2023

# OBTENÇÃO DE MODELOS 3D

**BASES DE DADOS**

**MODELAGEM 3D**

**VARREDURA**



## Quilling "Swan"

by TanyaAkinora, published Feb 19, 2016



Thing Details



Thing Files



Apps

29

Comments

3

Made

191

Collections

1

Remixes

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265

Collect

191

Comment

29

I Made One

3

Watch

0

Remix It

1

Share



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CUSTOMIZE

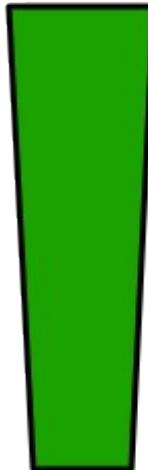


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```
#!/bin/bash
#
# pdb2stl
#
# Given a protein PDB, generate a STL file of the corresponding molecular
# surface (Connolly).
#
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```

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#!/bin/bash
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# Given a protein PDB, generate a STL file of the corresponding molecular
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#
#
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```



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## RESEARCH ARTICLE

# Customizable 3D Printed ‘Plug and Play’ Millifluidic Devices for Programmable Fluidics

Soichiro Tsuda<sup>1,2</sup>, Hussain Jaffery<sup>1</sup>, David Doran<sup>1</sup>, Mohammad Hezwani<sup>1</sup>, Phillip J. Robbins<sup>1</sup>, Mari Yoshida<sup>1</sup>, Leroy Cronin<sup>1\*</sup>

**1** WestCHEM, School of Chemistry, University of Glasgow, Glasgow, United Kingdom, **2** Institute of Molecular Cell and Systems Biology, University of Glasgow, Glasgow, United Kingdom

\* [Lee.Cronin@glasgow.ac.uk](mailto:Lee.Cronin@glasgow.ac.uk)



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## OPEN ACCESS

**Citation:** Tsuda S, Jaffery H, Doran D, Hezwani M, Robbins PJ, Yoshida M, et al. (2015) Customizable 3D Printed ‘Plug and Play’ Millifluidic Devices for

## Abstract

Three dimensional (3D) printing is active technology to construct complex objects at scale. Previously we utilized Fused deposition modeling (FDM) to construct complex 3D chemical fluidic sys-

**Published:** November 11, 2015

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3D milli-fluidic structures for programmable liquid handling and control of biological samples. Basic fluidic operation devices, such as water-in-oil (W/O) droplet generators for producing compartmentalized mono-disperse droplets, sensor-integrated chamber for online monitoring of cellular growth, are presented. In addition, chemical surface treatment techniques are used to construct valve-based flow selector for liquid flow control and inter-con-



# CERN OPEN HARDWARE LICENCE

OVERVIEW WIKI ACTIVITY MAILING LIST NEWS DOCUMENTS

## CERN Open Hardware Licence - Introduction

Myriam Ayass, legal adviser of the Knowledge and Technology Transfer Group at CERN

*In the spirit of knowledge sharing and dissemination, the CERN Open Hardware Licence is intended to facilitate the sharing of hardware designs. The CERN Open Hardware Licence is a derivative of the General Public Licence (GPL) and is designed to cover hardware designs. It aims to encourage the sharing of hardware designs and to promote the development of open hardware projects.*

*The CERN-OHL is to hardware what the General Public Licence (GPL) is to software. Just as 'open source' or 'open software' is not yet as well known or widespread as the free software movement, 'open hardware' is not yet as well known or widespread as the free design documentation in case of hardware), study it, modify it and share it.*

*In addition, if modifications are made and distributed, it must be under the same licence. This ensures that everyone can benefit from improvements, in the sense that everyone will in turn be able to make modifications to the hardware design and share them with others.*

The CERN Open Hardware Licence was originally written for CERN designs hosted in the [OSHWA definition criteria](#). If you would like to contribute to make it better, please submit your suggestions to the [OSHWA definition criteria](#).

## Open Hardware for CERN's accelerator control systems

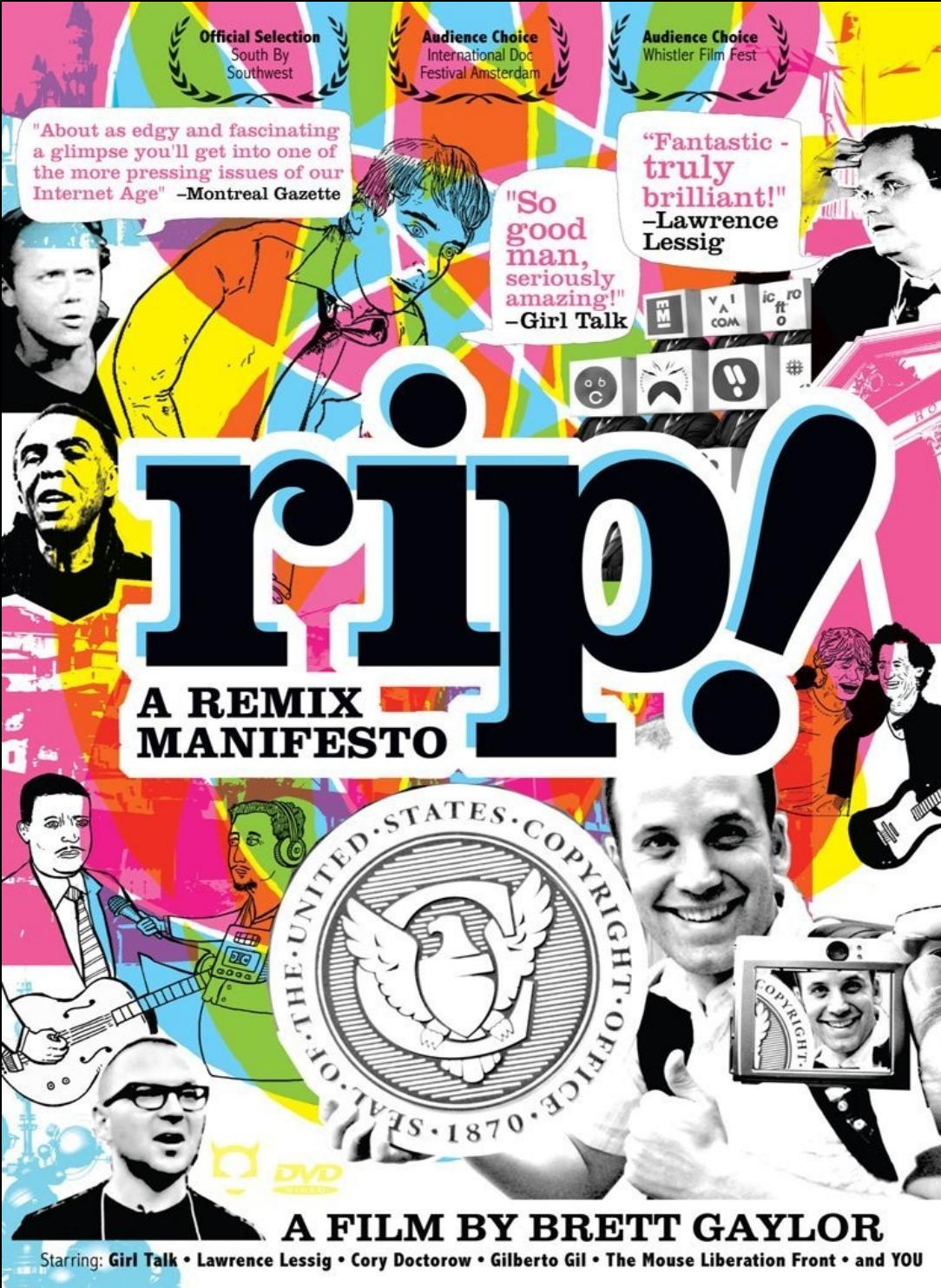
**E. van der Bij<sup>1</sup>, J. Serrano, T. Wlostowski, M. Cattin, E. Gousiou, P. Alvarez Sanchez, A. Boccardi, N. Voumard and G. Penacoba**

*CERN,  
Genève, Switzerland*

*E-mail: [Erik.van.der.Bij@cern.ch](mailto:Erik.van.der.Bij@cern.ch)*

**ABSTRACT:** The accelerator control systems at CERN will be upgraded and many electronics modules such as analog and digital I/O, level converters and repeaters, serial links and timing modules are being redesigned. The new developments are based on the FPGA Mezzanine Card, PCI Express and VME64x standards while the Wishbone specification is used as a system on a chip bus. To attract partners, the projects are developed in an 'Open' fashion. Within this Open Hardware project new ways of working with industry are being evaluated and it has been proven that industry can be involved at all stages, from design to production and support.

**KEYWORDS:** Data acquisition circuits; Manufacturing; Hardware and accelerator control systems; Detector control systems (detector and experiment monitoring and slow-control systems, architecture, hardware, algorithms, databases)



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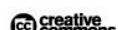
6 listopada 2007, godzina 18.00, Klubokawiarnia Chłodna 25

[kultura20.blog.polityka.pl](http://kultura20.blog.polityka.pl) [pwa.gov.pl](http://pwa.gov.pl)

organizator  
imprezy:

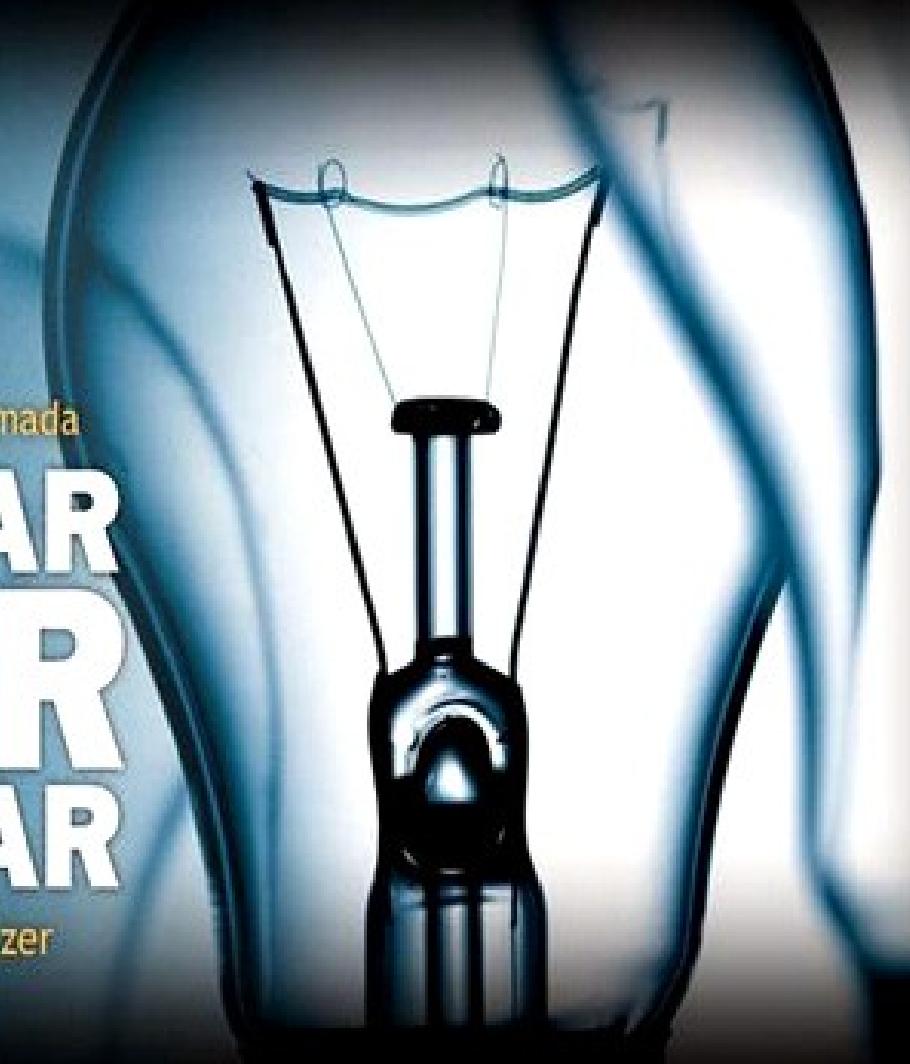


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Un film de Cosima Dannoritzer

2010

Cosima Dannoritzer

<https://www.youtube.com/watch?v=GCKsmGqXDj4>



## Quilling "Swan"

by TanyaAkinora, published Feb 19, 2016



Thing Details



Thing Files



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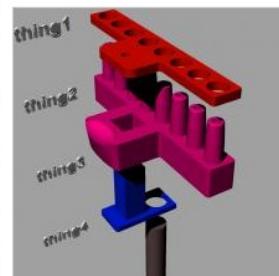
3DRX-003288 Laboratory Sample Rotator and Shaker with onb...

karancd



3DRX-003287 Laboratory Sample Rotator

karancd



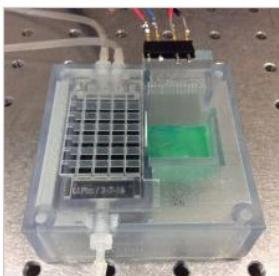
3DRX-003200 6 channel aspirator adaptor

marcociro1970



3DRX-003182 Laboratory Sample Rotator

karancd



3DRX-003134 Electrophysiology Testing Chamb...

chom



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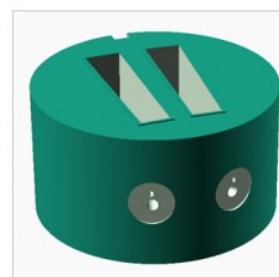
chom



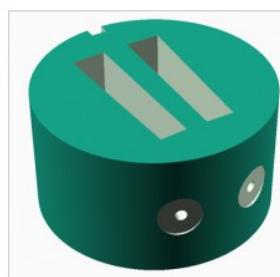
3DRX-003089 Spectrophotometer\_1



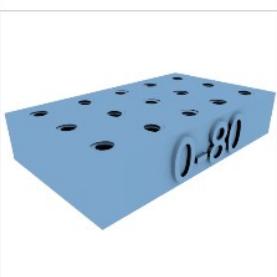
3DRX-002876 Centerpiece for fluorescence AUC



3DRX-002874 Analytical ultracentrifugation double sector...



3DRX-002650 Graduated ruler for US gel



3DRX-002522 Gel/well Titration Blocks for Swiss Cap 2.0 and...

# **DESVANTAGENS EM BASES DE DADOS**

# coiso trequinho birinaite

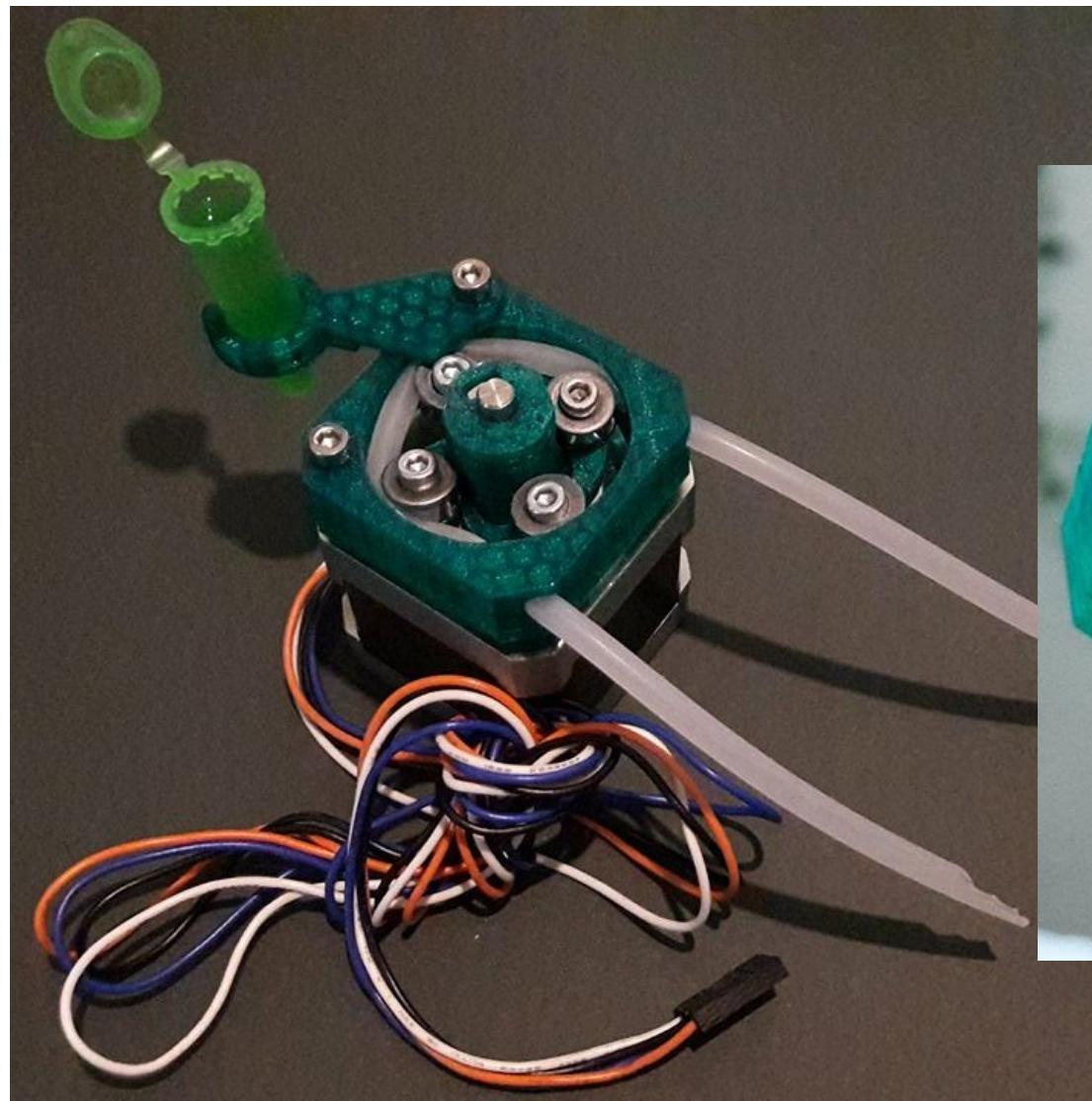


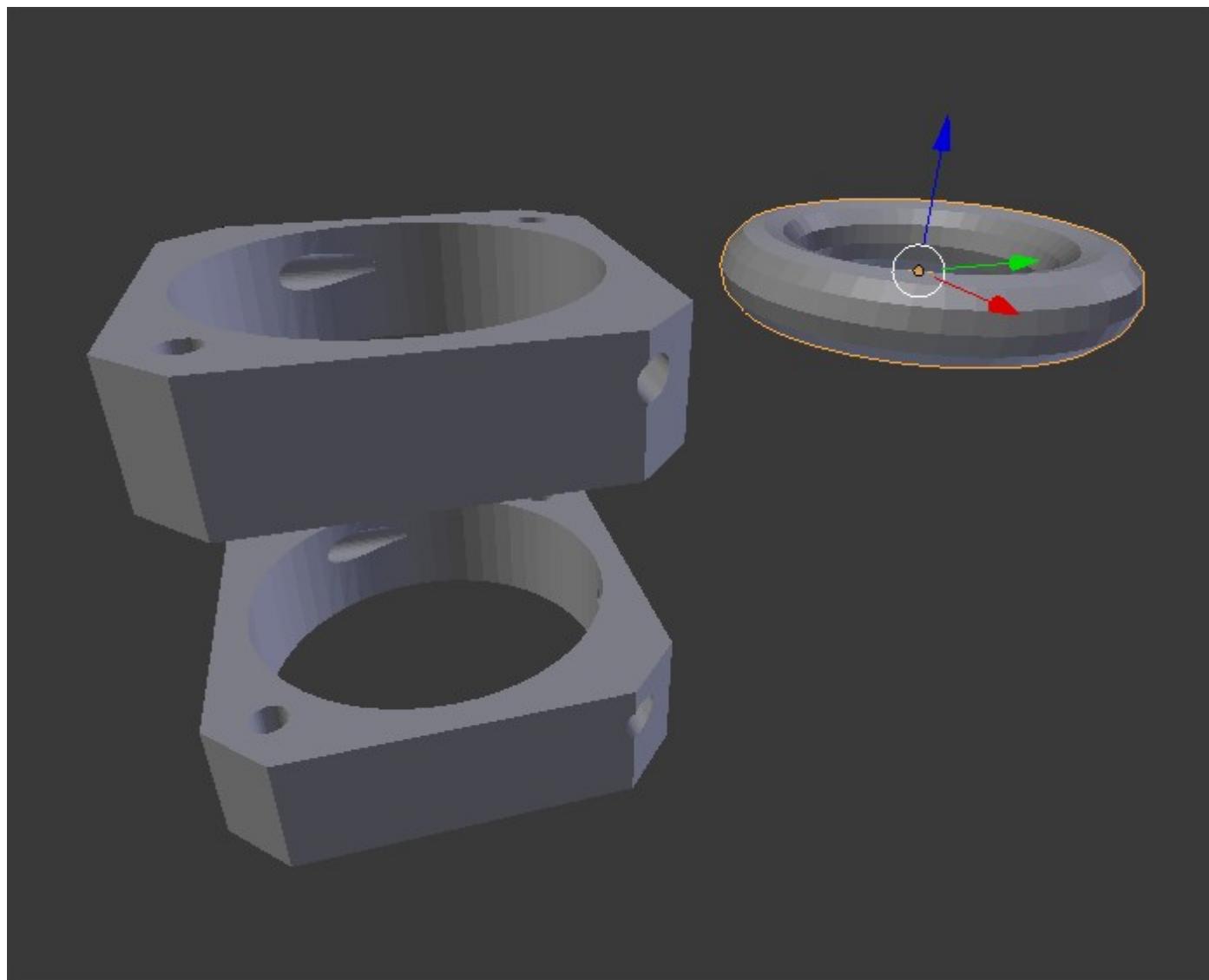
<https://www.instructables.com/id/Fixing-the-stuff-around-you-with-a-3D-printer/>

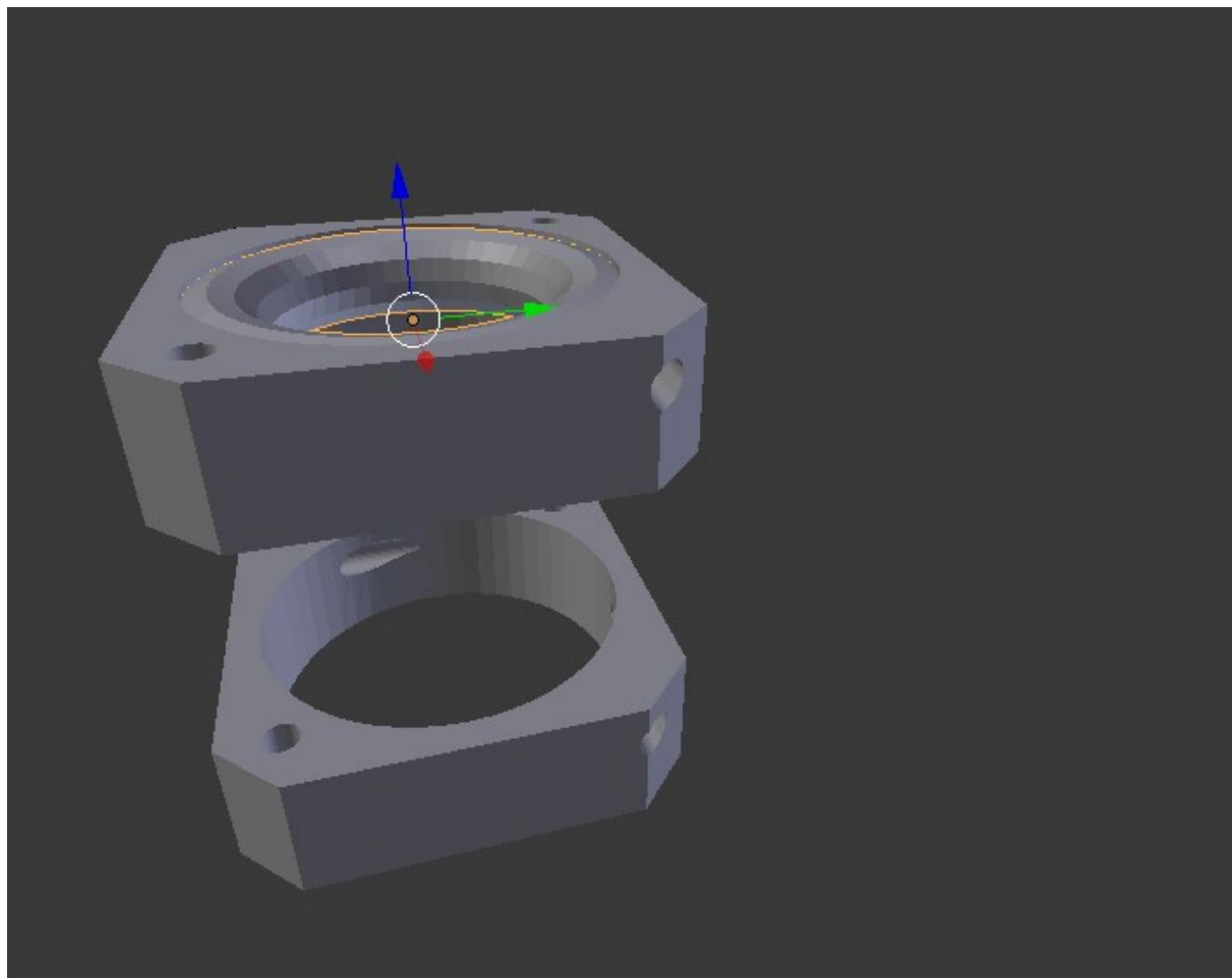
23/06/2023

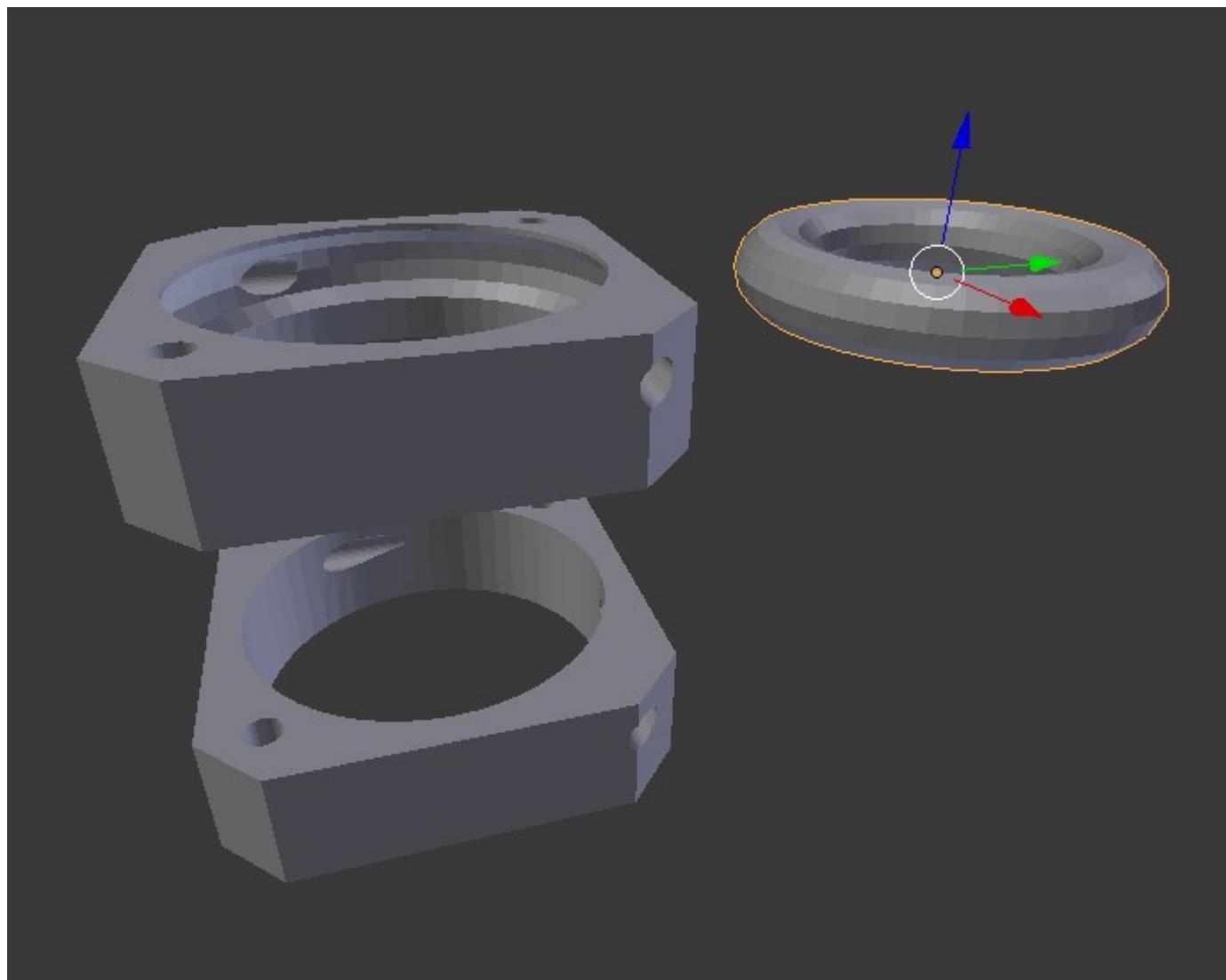


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# **CREATBOT PEEK 3000**

## **Primeiras Impressões**

**ABS**

**PLA**

**PEEK**

## **VANTAGENS**

**Bobina armazenada**

**Fatiador baseado no Prusa Slicer**

**Extrusora dupla**

## **DESVANTAGENS**

**Impressora normal que esquenta muito**

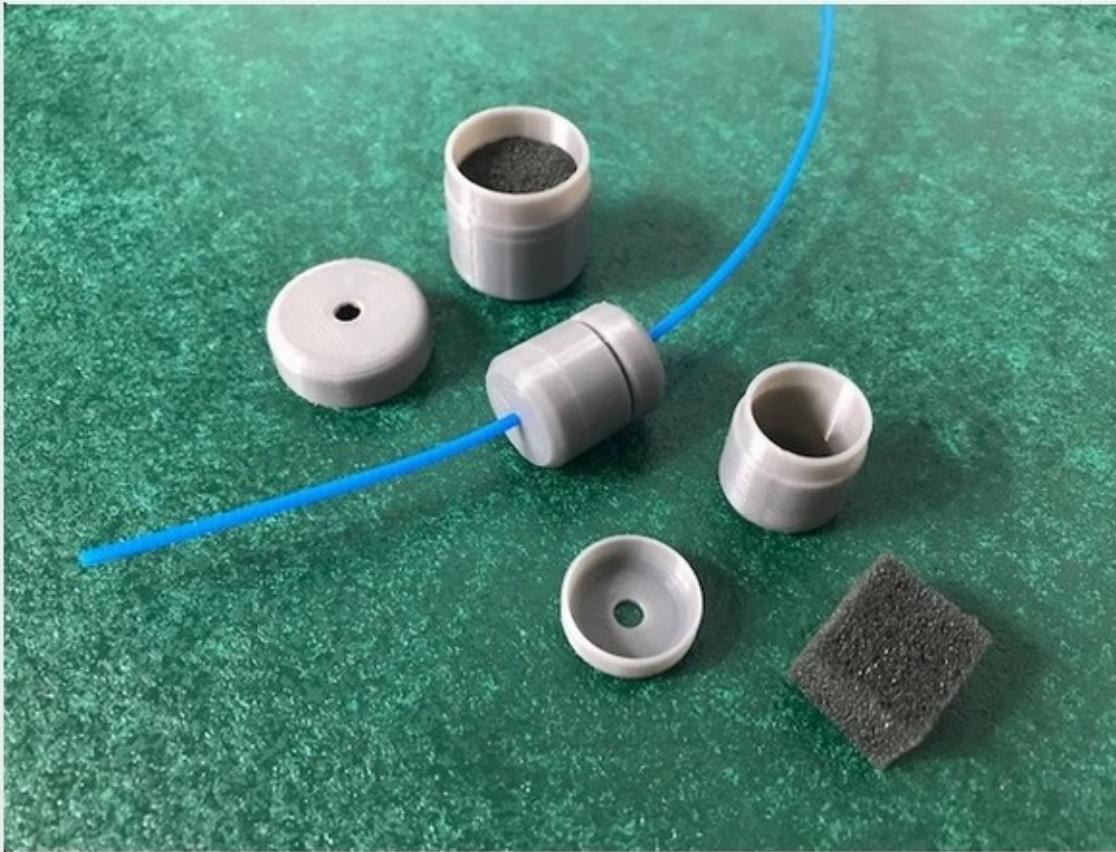
**Esquenta muito mesmo, até a porta**

**Extrusora dupla**



### Universal Filament filter or dust filter (for 1.75mm)

by [nice\\_3d](#) August 04, 2018





## Filament Storage Solution (IKEA SAMLA)

by [wstein](#) March 27, 2015





## Airtight Filament Storage/ Dispenser II

by [Simonwlchan](#) September 29, 2015







## Parametric universal spool holder

by [rowokii](#) April 11, 2015



**OBRIGADA!**

