

# L'impression 3D au FacLab

David Ott

8 juin 2022



UNIVERSITÉ  
DE GENÈVE

**facelab**

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In 1987 Chuck Hull commercialises the first ever 3D printer, the SLA-1.

Source: <https://www.3dsourced.com/guides/history-of-3d-printing/>

# Partie 1 : L'impression 3D



# Courte histoire de l'impression 3D

## **1952 : First commercial numerically controlled lathe (MIT)**

1974 : In a New Scientist column, David Jones (aka Daedalus) describes the SLA process

1981 : Dr Hideo Kodama (NMIRI) published details concerning a layer-by-layer 'rapid prototyping' technique

1986 : Charles 'Chuck' Hull files patent for SLA technology

## **1987 : Chuck Hull (3D Systems) commercialises first 3D printer (SLA)**

1988 : Carl Deckard (U of Texas) files patent for SLS technology

1989 : Scott Crump (Stratasys) files patent for FDM technology

## **2005 : Adrian Bowyer initiates the RepRap project**

2012 : Josef Prusa founds Prusa Research

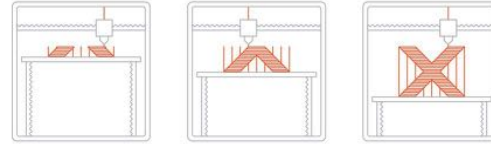
2014 : I buy my first 3D printer kit (approx. chf 1500.-)

2019 : FacLab of UNIGE is inaugurated on the 1st of April and procures a Peopoly Moai 130 SLA 3D printer

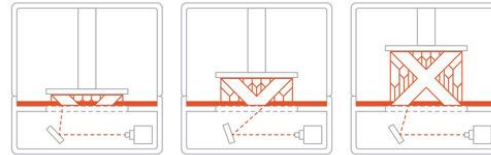
## **2020 : FacLab procures 3x Prusa Mini**

# Différentes méthodes d'impression 3D

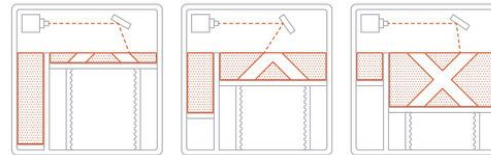
Material extrusion (FDM|FFF)



Vat polymerization (SLA|DLP)



Powder bed fusion (SLS)



# Différentes matières

- Thermoplastics (PLA, PETG, nylon, etc.)
- Metaux (Acier inox, titanium, etc.)
- Céramiques, “ciments”, verre, etc.
- Bio(printing)



### 3D Printed Ears First Used in Human Patient

By Kerry Stevenson on June 6th, 2022 in [news](#), [Usage](#)  
 Tags: [bioprinting](#), [cartilage](#), [ear](#), [medical](#), [organs](#), [tissue](#)



3D bioprinted human ear cartilage [Source: 3DBio]

In a milestone development, 3DBio Therapeutics have completed reconstruction of a human ear with 3D printing.

Working with the Microtia-Congenital Ear Deformity Institute, 3DBio has used their AuriNovo technology to create a personalized ear implant using 3D bioprinted living tissue.

### L'Oréal Leads Beauty Industry Makeover with 3D Printing

By Charles Goulding on May 20th, 2022 in [news](#), [Usage](#)  
 Tags: [beauty](#), [factory](#), [l'oreal](#), [manufacturing](#), [packaging](#), [printer](#)



3D Printing at L'Oréal [Source: L'Oréal]

Charles Goulding and Andressa Bonafé examine the incredible and growing use of 3D printing at beauty giant L'Oréal.

With 36 brands and 88 thousand employees in 150 countries, L'Oréal is the largest cosmetics group worldwide. Founded in 1909, it has built a history of innovation and leadership in the beauty sector, pushing the boundaries of science and technology.

### Triumph Group Uses 3D Printing for Aircraft Parts

By Charles Goulding on June 7th, 2022 in [news](#), [Usage](#)  
 Tags: [aerospace](#), [lightweight](#), [metal](#), [triumph](#)



Boeing NextGeneration 737 [Source: Boeing]

Charles R. Goulding and Julia Wallace look at Triumph Group's investment into 3D printing technology for aerospace.

Triumph Group is in the late stages of its "Path to Value" reconstruction plan, which began in 2016 to reduce risk and increase financial stability by divesting some of its locations, and plans to soon transition toward a period of growth.

The company has also committed itself to lowering its carbon footprint, publishing its

### 3D Printed Digital Inventory Gets Real in Oil & Gas

By Kerry Stevenson on May 13th, 2022 in [news](#), [Usage](#)  
 Tags: [oil](#), [digital inventory](#), [manufacturing](#), [spare](#), [spare parts](#), [3d](#)



A 3D printed part from a new digital inventory [Source: Spare Parts 3D]

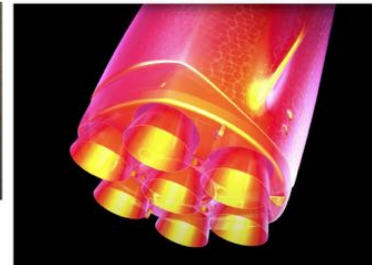
News from Spare Parts 3D reveals interesting results from a digital inventory move.

Digital inventory is a relatively new concept that involves printing required spare parts on demand, rather than keeping a warehouse full of spare parts that could be potentially used.

The problem is that with mass manufacturing techniques spare parts are created only once by running the production line a bit longer before it is shut down. The spare parts can sit in a warehouse for decades, in case they are ever needed, but are only one available for

### Relativity Space Reveals Fully 3D Printed Reusable Rocket

By Kerry Stevenson on June 14th, 2022 in [news](#), [Usage](#)  
 Tags: [aerospace](#), [manufacturing](#), [model](#), [relativity space](#), [rocket](#), [space](#)



Engines firing on the proposed Terran R 3D printed reusable rocket first stage [Source: Relativity Space / YouTube]

Relativity Space revealed Terran R, their fully 3D printed reusable rocket.

The company has been building the technology to inexpensively launch medium-sized payloads around the concept of full reusability. Traditionally, rockets were entirely expendable: they would be abandoned after a single flight, making flights extraordinarily expensive. That's why only governments typically operate above the Earth.

However, reusability seems to be the key to opening up space, as has been exploited for the last few years by SpaceX, which developed a partially reusable medium-sized



Modernizing Manufacturing  
**PepsiCo Saves 96% by 3D Printing Bottle Molds**  
 3D Printed  
 12 October 2021  
 12 October 2021



The Sky is the Limit  
**3D Printed Telescope: The Best Projects to See the Stars**  
 3D Printed  
 12 October 2021  
 12 October 2021



Think Outside the Flat Pack  
**Ikea 3D Print: The Best 3D Printed Ikea Hacks of 2022**  
 3D Printed  
 12 October 2021  
 12 October 2021



## 3D Printing Service

Create and customize. Streamline and save. Break down design barriers and scale your business with Shapeways 3D printing services.

Get a Quote

Contact Sales

## Why 3D Printing?



### Reduce Assembly Time

Don't waste time putting products together! Rely on 3D printing to make complex geometries that can be printed as one piece—or consolidated in one build.



### Fast Turnaround

Working on a project for a customer that has to be just right? Get models back fast, and 3D print new iterations, if needed, for final feedback and production.

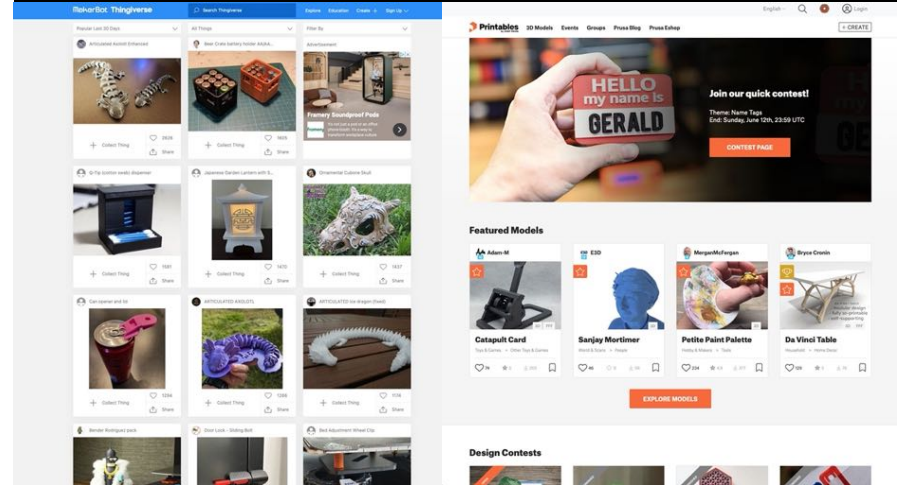
Learn more



### Reliable Quality

Proprietary processes, expert 3D printing operators, and inspections are our secrets to delivering exceptional, quality products every time.

## thingiverse.com & printables.com







## Partie 2 : L'impression 3D au FacLab

# Le FacLab de l'Université de Genève



Fablab académique

Un outil du Pôle Innovation Numérique (PIN)

Espace de fabrication ouverte (du tangible et de l'intangible)

Résidences éphémères

Battelle bâtiment A

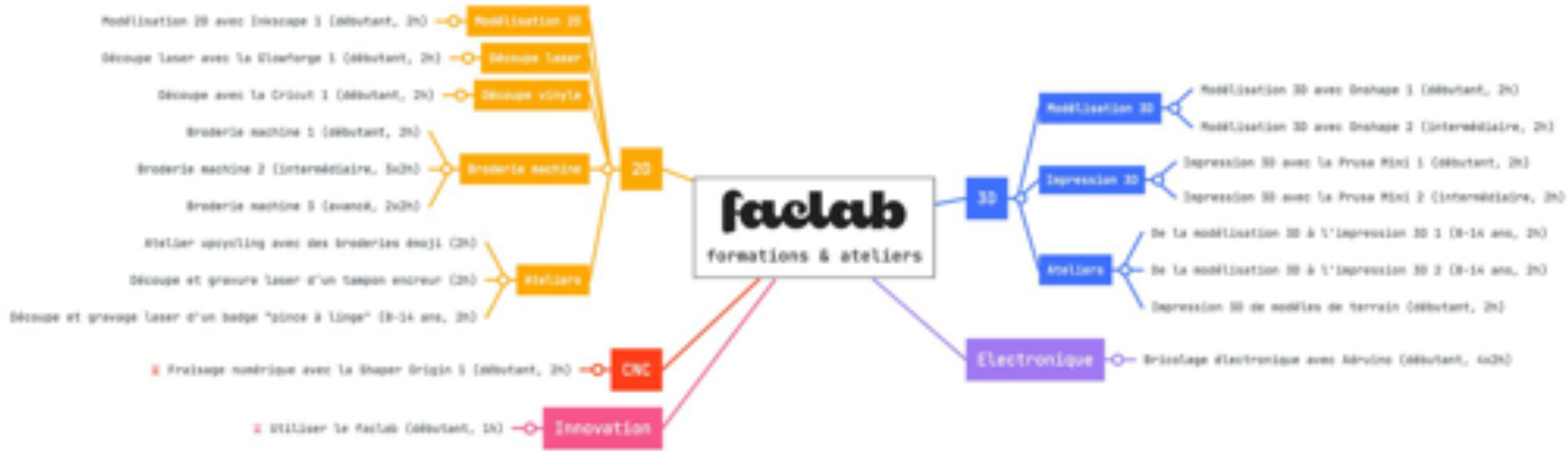
# La ferme d'imprimante 3D du FacLab

- 3x Prusa Mini
- 1x Prusa MK3S+
- 1x Peopoly Moai 180

Et bientôt:

- 1x Prusa XL

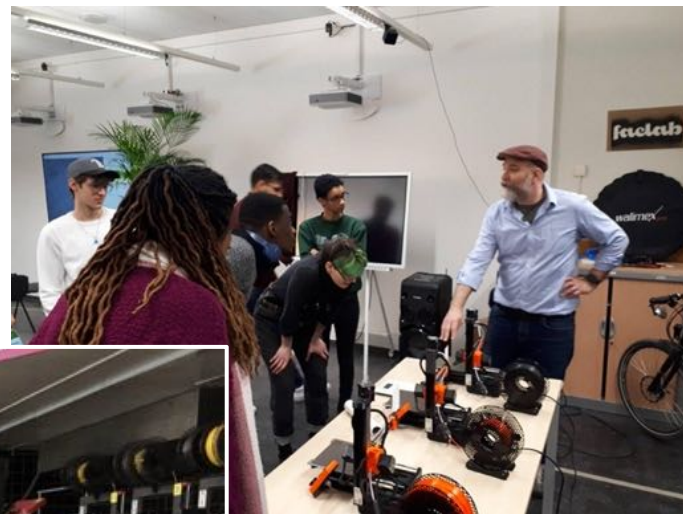




## Participants

Académiques, grand public, adultes, enfants, etc.



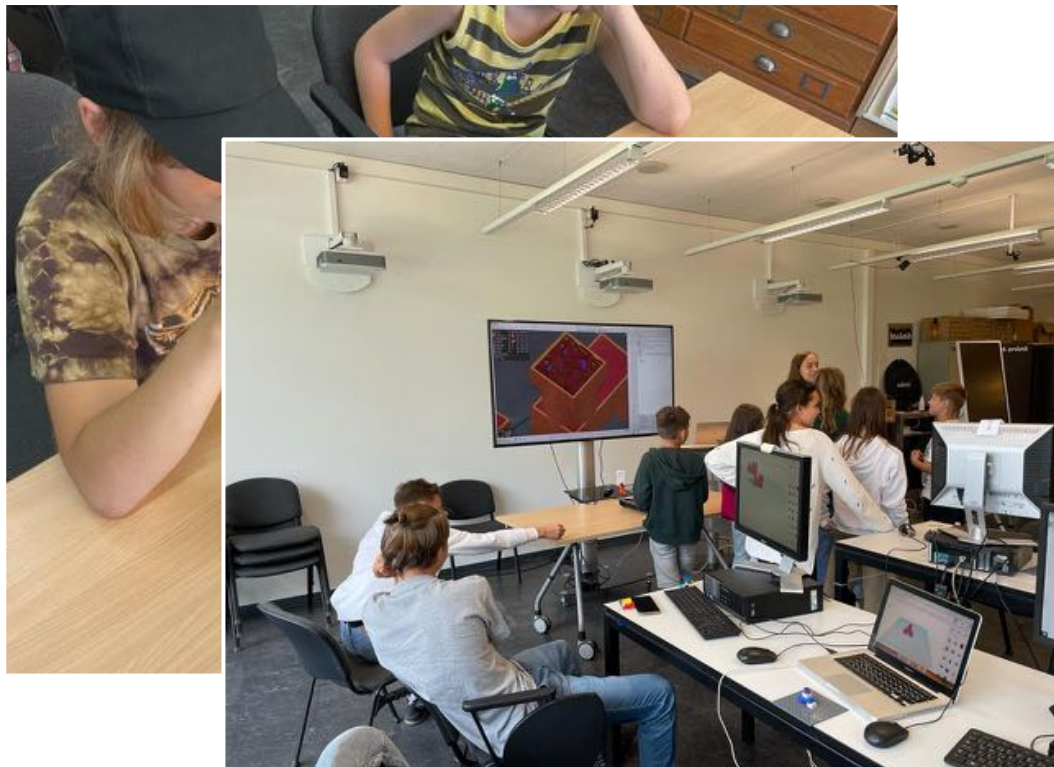


Services et Technologie  
Multimédia, printemps 2022

De la modélisation 3D  
à l'impression 3D,  
printemps 2022

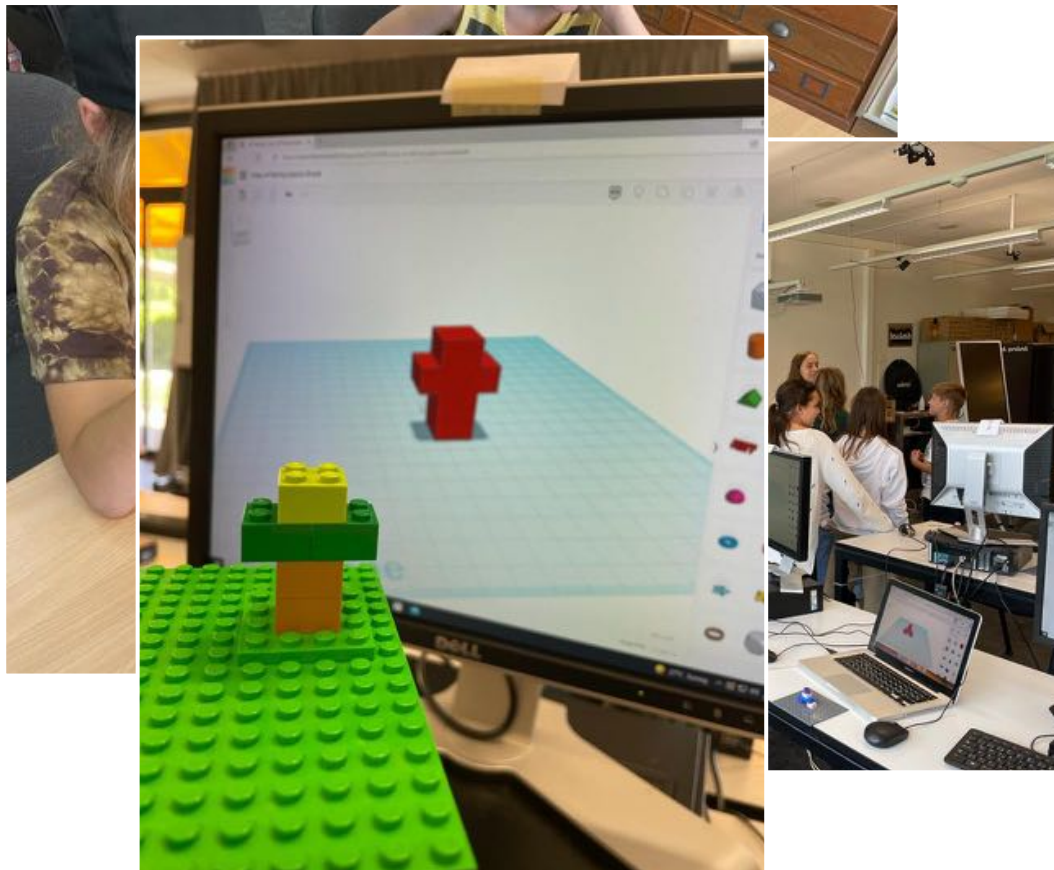


De la modélisation 3D  
à l'impression 3D,  
printemps 2022

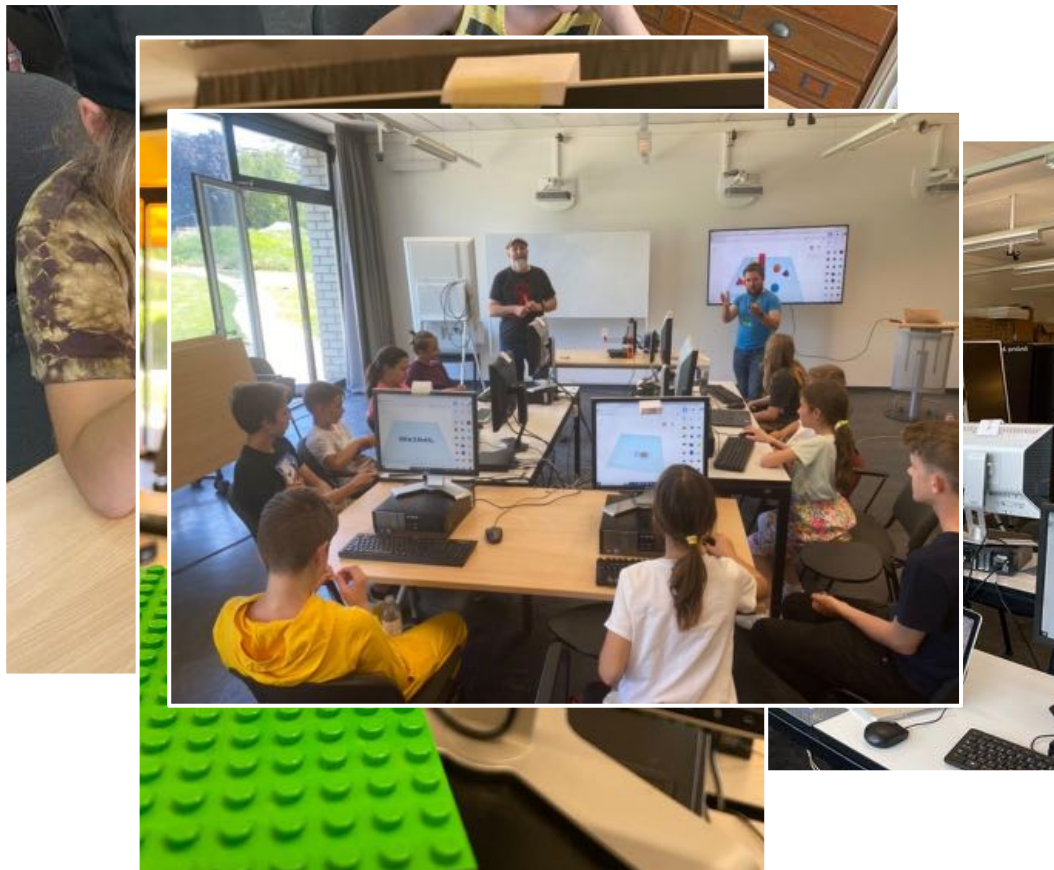




De la modélisation 3D  
à l'impression 3D,  
printemps 2022



De la modélisation 3D  
à l'impression 3D,  
printemps 2022



De la modélisation 3D  
à l'impression 3D,  
printemps 2022



De la modélisation 3D  
à l'impression 3D,  
printemps 2022





**Collaboration: virus 3D**

**Transformer le désordre en ordre dans le vivant**

**Nuit de la Science 2022**

**Biochemistry department, Kruse lab**

**Université de Genève**



# Collaboration: Maechler lab Department of Cell Physiology and Metabolism University of Geneva (Angela M. Ramos Lobo, PhD)

BioTechniques

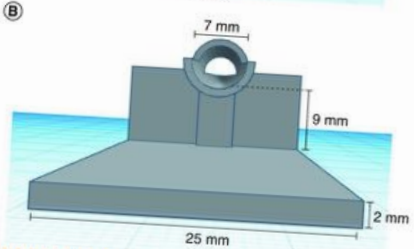
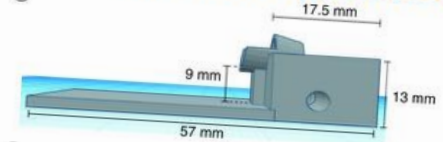
**Benchmark**  
A device for stereotaxic, intracerebrally injecting the brains of neonatal mice

**Pedro B. Oliveira**<sup>1,2</sup>, **Clay G. Lasefeld**<sup>1</sup> & **Christoph Kellerbank**<sup>1,2,3,4</sup>  
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First draft submitted: 19 April 2020; accepted for publication: 6 July 2020; published online: 11 August 2020

**ABSTRACT**  
The present authors have designed and constructed a device for stereotaxic, intracerebrally injecting the brains of neonatal mice. The device consists of a stainless steel base and a custom-machined aluminum top. The top is designed to hold a syringe and a glass needle in a fixed position, allowing for reliable and accurate methods for delivering



# Collaboration: Support tableau patient

## Equipe "Plus de temps pour les patients"

### Hôpitaux Universitaires de Genève





**Collaboration: Simulateur de transducteur**  
**Groupe de recherche "Image Guided Interventions"**  
**HUG - Radiologie**  
**(Orane Lorton)**



# Collaboration: Sonde Radiologie Hôpitaux Universitaires de Genève



**Collaboration: Genève imprimable**  
**Département du Territoire**  
**Canton de Genève**



# Partie 3 : Vos questions...