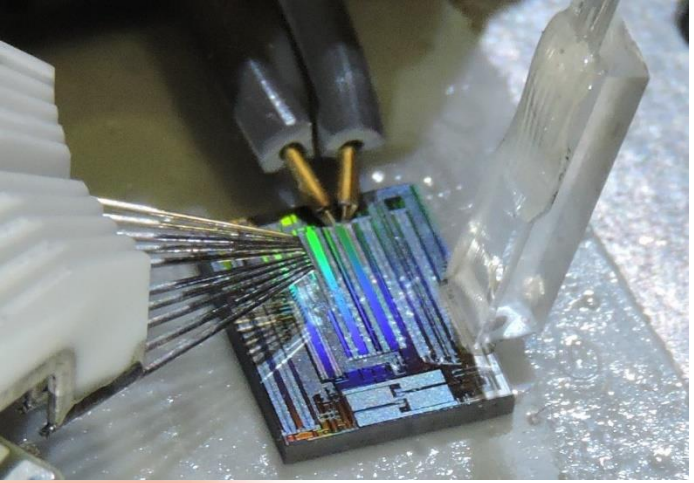

Greatest level of understanding will be reached,
only when one masters every single detail…

Along the road, you will gain insight into lab work,
and confidence in your intuition.

Technical documentation organization

in LCO group

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Nathalie Bacon
2021-01-10

Sharing knowledge and good practices !

Plan

Technical Equipment Documentation
1. Equipment a. The ultimate reference : Y:\LaboComOpt\EQUIPMENTS\DOCUMENTATION b. The COPL inventory. c. Paper documentation d. The *Equipment per function.xlsx* file *(in Y:\LaboComOpt\Inventories)*
2. Miscellaneous Components - Y:\LaboComOpt\Inventories a. PROBES RF & DC b. Fiber Arrays c. SOC - Small Optical fiber Components d. OPT - Free Space Optics Inventory e. CHIPS
3. Fibers - Y:\LaboComOpt\Fibre optique GEL a. Speciality fibers b. Standard fibers c. COPL - Glass Characterization Capacities
4. **Trainings - Y:\LaboComOpt\Trainings** a. ESD b. Optical connector care c. RF connector care d. Other specific equipment (Luna, Cailab, etc)
5. LCO Web site & Internal web site

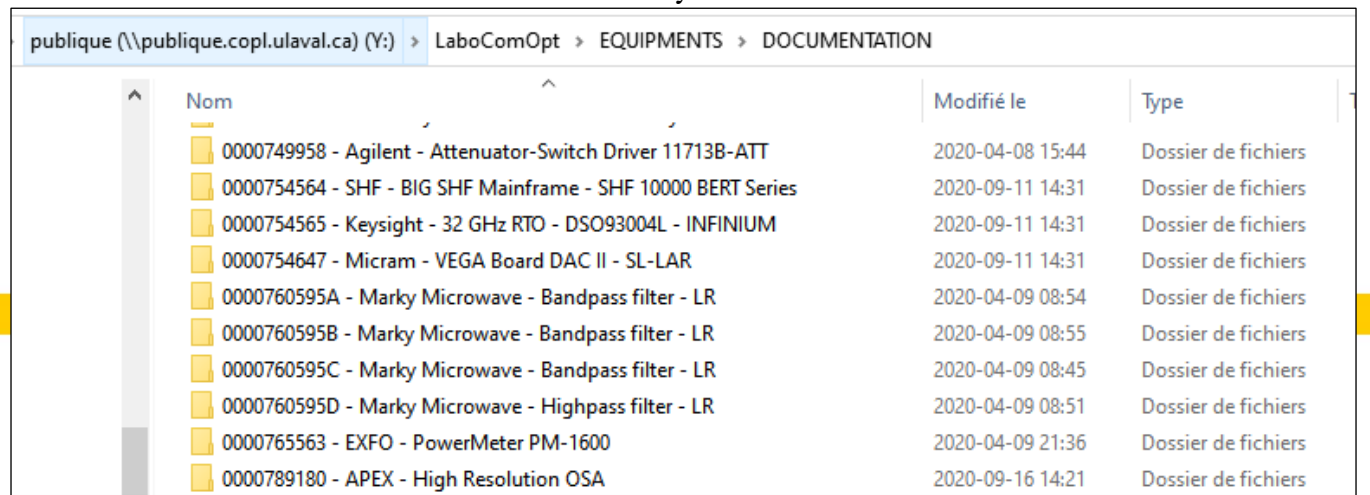
1. Documentation on Equipment

a. The ultimate reference : Y:\LaboComOpt\EQUIPMENTS\DOCUMENTATION

a. Every folder contains the digital documentation related to one type of equipment.
b. Example #1: *0001178840 - Anritsu - Signal Generator 20 GHz – LAR*
   - « 0001178840 » : COPL number or Purchase Order (PO) number. Unique number in the university.
   - « Anritsu » : name of the company
   - « Signal Generator 20 GHz » - Common name of the equipment
   - « LAR » : initials of the professor who purchased it.
c. Example #2: 0000000000 - GGB - RF Probes
   - « 0000000000 » : defines a global folder for all RF& DC probes purchased at GGB. Inside the folder, one will find many different folders for each of the probes purchased and data sheets, if available.

Limitation

a. Eventually this reference folder, will become the most complete database. At the moment, a merge is still necessary from an older folder and the COPL inventory.



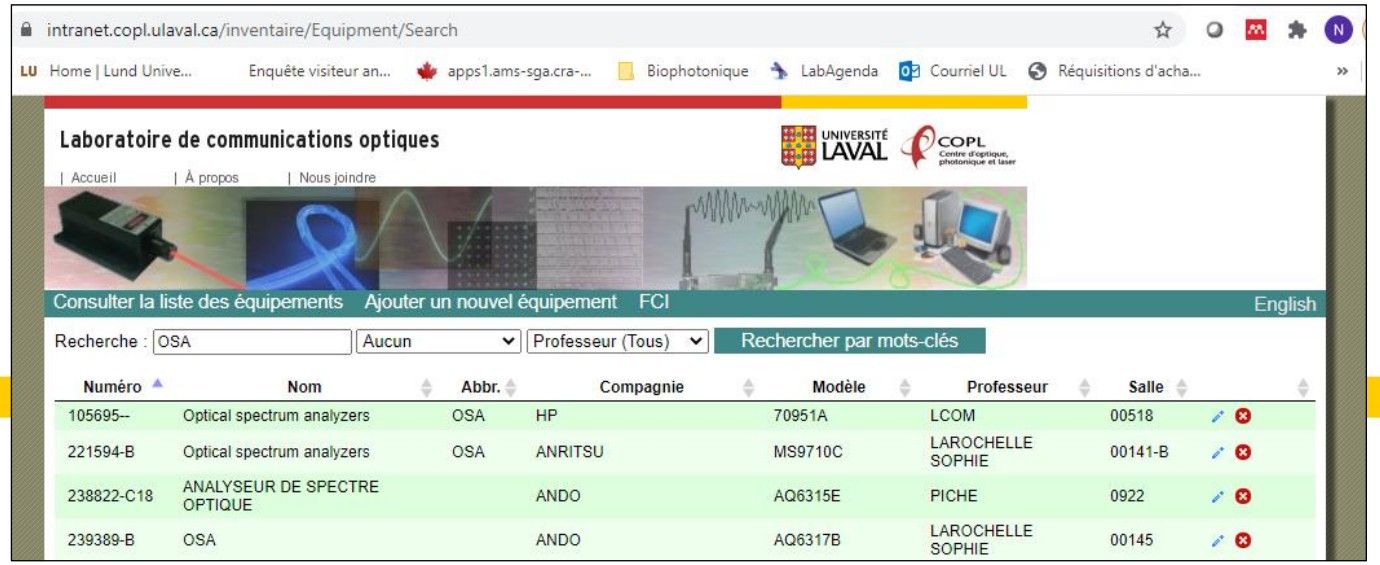
1. Documentation on Equipment

b. The COPL's inventory.

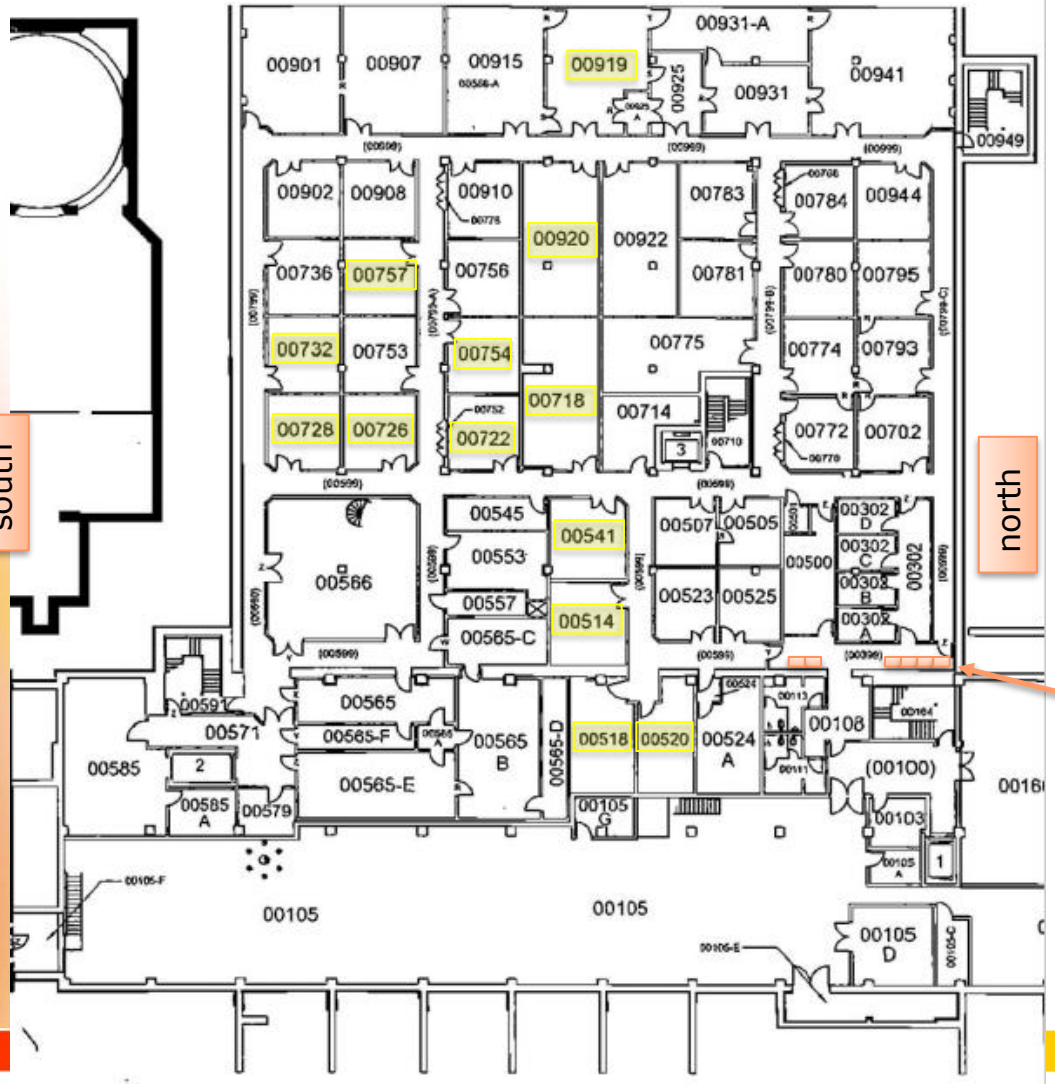
a. Access: https://www.intranet.copl.ulaval.ca/inventaire/
   - Database of equipment in the COPL, including equipment owned by the LCO or LCOM group.

b. Search could be made by:
   - COPL # or Purchase Order (PO) number – As labeled on the equipment
   - Name of the equipment
   - Abbreviation
   - Company's name
   - Model number
   - Professor

c. Some documents are available directly from that inventory, otherwise search the reference folder shown previously.



1. Documentation on Equipment



c. Paper documentation

a. Paper document/manuals are stored in the tall cabinets on level 00 in front of the technicians' room entrance (00302).

b. A few manuals can be found in the upper cabinets of some labs.

1. Documentation on Equipment

d. The *Equipment per function.xlsx* file *(in Y:\LaboComOpt\Inventories)*

a. This document is not an official inventory, and is not updated in real time; but rather a personal tool for identifying the right equipment for the right purpose (specs) and optimize the sharing among the students. It is available as an additional resource. The most updated file is in my personal folder.

b. How this file has been built? (Whenever there is a specific need to look for something…)

   a. Starting from the COPL's inventory, a list of equipment with a specific function is withdrawn.

   b. Then each equipment is found in the lab, and the labeling is checked, and location noted.

   c. Then with the help of manuals, and other documents, I look for the key specs which are sometimes not too obvious, but necessary to determine if an equipment if good for some application or not, or for sharing optimization purpose, or to know how many equipments could do the job. I look for those once, and save them in that file for further quick reference.

      a. Ex. Wavelenght range, optimize wavelenght, maximum bandwidth,

(Examples are given in the following pages)

1. Documentation on Equipment

d. The *Equipment per function.xlsx* file *(in Y:\LaboComOpt\Inventories)*

c. Example 1 : Sheet labeled « OSAs » in our group: status; key specs, locations, etc.

	Optical spectrum Analyzer - LCOM									
	Status	COPL #	# Serial	Abbr.	Name	Model	Key Specifications - Wavelengh range - Resolution	Company	Professor	Location
1	Working Connectors to repolish - **Feasible ?**	789180-A	12-2043-B-000567	OSA	APEX AP2043B	AP2043B	High résolution: #1: 0,8 pm and #2: **0,04pm** [5MHz] 1520nm to 1630nm(tunable laser) -67dBm at 1550nm at 20 MHz Résolution Max input power : 10 dBm = 10 mW. Option 01: source accordable 1520-1630nm Option 08: 1 input PC SM, 2 inputs PC PM.	Apex Technologi	SL-LAR	00514 Guan
2	2020-10-15 Retour pour calibration et mis à jour.	270264-A	10201889	OSA	ANDO -> Yokogawa OSA - Optical spectrum analyzers Discontinued on october 2004	AQ6317B	600 to 1750 nm Resolution setting: 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0nm Best resolution: **10 pm**	ANDO	RUSCH LESLIE	
3	Calibré 2020-09-25	269256	973423	OSA	ANDO -> Yokogawa OSA - Optical spectrum analyzers Discontinued on october 2004	AQ6317B	600 to 1750 nm Resolution setting: 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0nm Best resolution: **10 pm**	ANDO		00728 Hanlin & Lixian
4	not in inventory or other prof ?	239389-B	10201905	OSA	ANDO -> Yokogawa OSA - Optical spectrum analyzers Discontinued on october 2004	AQ6317B	600 to 1750 nm Resolution setting: 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0nm Best resolution: **10 pm**	ANDO	SL	00718 - Zibo
5	Octobre 2020 - mis à jour et recalibré chez Asset Relay	1262741		OSA	ANDO -> Yokogawa OSA - Optical spectrum analyzers Discontinued on october 2004	AQ6317B	600 to 1750 nm Resolution setting: 0.01, 0.02, 0.05, 0.1, 0.2, 0.5, 1.0, 2.0nm Best resolution: **10 pm**	ANDO		Satyendra
6	not in inventory or other prof ?	821060	91M827936		OSA - Optical spectrum analyzers	AQ6370C -10-D/FC/RFC	600-1700 nm Resolution: **0.02 nm (20pm)**, 0.05, 0.1, 0.2, 0.5, 1 and 2 nm PC (free space input)	YOKOGAWA (previously ANDO)	SL-LAR	00726 Charles
7	RETOURNÉ pour réparation	817689-B	6261046650	OSA	Anritsu	MS9740A	0,6um - 1,75 um Resolution Accuracy: **30pm** ±2.2% (1520 to 1620 nm, resolution: 0.5 nm)	Anritsu		Pour Hanlin et Saber
8	Réparé et Calibré 2020-09-25	817689-A	6261046650	OSA	Anritsu	MS9740A	0,6um - 1,75 um Resolution Accuracy: **30pm** ±2.2% (1520 to 1620 nm, resolution: 0.5 nm)	Anritsu		00754 Philippe & Mohammad
9		1132688-A	00648	OSA	FTOSA Portable with same COPL number	OSA205C	1000 - 5600 nm for OSA205 Résolution (1550nm) : **60 pm** **Mode wavelength meter en continu (0.2pm) - PowerMeter**	THORLABS	WEI SHI	00754 Mohammad
		105695--		OSA	OSA - Optical spectrum analyzers	709510		HP	LCOM	00518

1. Documentation on Equipment

d. The *Equipment per function.xlsx* file *(in Y:\LaboComOpt\Inventories)*

d. Example 2 : Sheet « Positionners » for RF & DC probes. There are 10 available. Cascade's ones have 100 TPI and Signatone have a 40 TPI (thread per inch).

	Computer Status	COPL #	# Serial	Name	Model	Key Specifications	Company	Professor
1		1173389-B		micropositioner	RPP210-M-R-Al		Cascade Microtech	WEI SHI
2		1197377-A	IM45160	micropositioner	RPP210-M-L-Al	100 TPI Mag Base Left Arm	Cascade Microtech FormFactor	WEI SHI
3		173389-A		micropositioner	RPP210-M-L-Al		Cascade Microtech	WEI SHI
4		857791-A		micropositioner	s-m40		Signatone	SL-LAR
5		857791-B		micropositioner	s-m40		Signatone	SL-LAR
6		857791-C		micropositioner	s-m40		Signatone	SL-LAR
7		890713-A		micropositioner	RPP210-M-L-Al		Cascade Microtech	WEI SHI
8		890713-B		micropositioner	RPP210-M-R-Al		Cascade Microtech	WEI SHI
9		906776-A		micropositioner	RPP210-M-L-Al		Cascade Microtech	SL-LAR
10		906776-B		micropositioner	RPP210-M-L-Al		Cascade Microtech	SL-LAR

2. Miscellaneous components inventories - Y:\LaboComOpt\Inventories

a. **PROBES RF & DC**
   a. List of RF and DC probes available in the lab. They are kept in a locked cabinet in 00520. One should ask any of Simon, Nelson or Nathalie to get one.
   b. The most reliable way to uniquely identify a probe is with its Serial Number (SN). Boxes are sometimes mixed. ☹
   c. When you borrow a probe, your name is registered in the file, and you are responsible for it until you return it. When you return it, your probe is inspected to detect any damage. A huge database of pictures is available on the computer in 00520 for comparison.
   d. Additional informations:
      a. Y:\LaboComOpt\EQUIPMENTS\DOCUMENTATION\0000000000 - GGB - RF Probes
      b. Y:\LaboComOpt\EQUIPMENTS\DOCUMENTATION\0000000000 - Cascade - RF Probes

b. **Fiber Arrays**
   a. List of fiber arrays available in the lab. They are kept in a locked cabinet in lab 00520. One should ask any of Simon, Nelson or Nathalie to get one. Some are sometimes already packaged on some chip and availability must be checked first.
   b. There is no recording of their status or who is using what.

2. Miscellaneous Components - Y:\LaboComOpt\Inventories

c. SOC - Small Optical fiber Components

a. It is an inventory of all small optical components (mostly fibered) in the lab, and in Sophie's tall cabinet outside the cleanroom. (Nortel)
b. Each component found has been identified with a round sticker with its reference number.
    a. Ex. SOC-445
    b. Whenever there is an available data sheet, this one is saved in the *SOC-DATA folder*
        a. If the data sheet is not available, we look for it only if there is a need for that particular component.
c. The inventory has more than 550 components so far, but some are still missing:
    a. components already in use on existing setups haven't been registered yet,
    b. A few components in the storage
    c. Components for MID-IR in 00754.

SoC	Small Optical Components								Packaged	2019-03-21	d/m/y		
Nbr	Status	COPL #	# Serial	Current names	Name / Model	Key Specifications	Company	Professor	Transparent box	Location	Year of purchase	Data Sheet	
445		1211829	FL041210		Fiber Bragg Grating Filter FBG-50-1553,33-TC-1 FFC-FBG-050	50 GHz filter Central wavelenght: 1553,33 nm	Lightwavestore	SL	No	00728	2019 (2012)	Soc-445	
446		1211829	JE104516		Fiber Bragg Grating Filter FBG-LDT1-585-00, 1530.751nm FFC-FBG-090C105	50 GHz filter Central wavelenght: 1530,72 nm	Lightwavestore JDS Uniphase	SL	No	00728	2019 (2001)	Soc-446	

2. Miscellaneous Components - Y:\LaboComOpt\Inventories

d. OPT - Free Space Optics Inventory

a. It is an inventory of free space optical components in the lab.
b. Each component found has been identified with a round sticker with its reference number.
    a. Ex. OPT-109
    b. Whenever there is an available data sheet, this one is saved in the *OPTICS-DATA folder*
        a. If the data sheet is not available, we look for it only when there is a need for that component.
c. The inventory doesn't include:
    a. UV optical components in the Bragg Grating Lab (00722). There is an existing list, to be updated. (See Nelson)

CAT	Status	Category	CODE	Total	OPT-#	PO	Manufacturer and model	P
Bsplit-C-Pol		Beamsplitter - Cube - Pol	PBS204	4	5,6,7,8	870161	20 mm Polarizing beamsplitter cube	
Bsplit-C-Pol		Beamsplitter - Cube - Pol	PBS254	4	1, 2,3,4	1170449	1" Polarizing Beamsplitter Cube, 1200 - 1600 nm	
Bsplit-C-Pol		Beamsplitter - Cube - Pol	PBS054	1	144		PBS054 - 5 mm Polarizing Beamsplitter Cube, 1200 - 1600 nm	
Bsplit-plate		Beamsplitter - Others			18		Beamsplitter plate mounted in a cage	
Collim-adj		Collimator - Adjustable FC/PC	CFC-11X-C	1	90	892573	Adjustable FC/PC Collimator, f = 11.0 mm, ARC: 1050-	L
Collim-Fiber		Collimator - Fiber Collimation	F220APC-1550+D17	2	105, 106 [00541]		1550 nm, f = 11.32 mm, NA = 0.24 FC/APC Fiber	
Collim-Fiber		Collimator - Fiber Collimation Package	F220FC-1550 In use on OAM	2	85 (2X), 97, 98, 99, 100, 101, 102, 103 ->[00541- OAM]		Thorlabs F220FC-1550 - 1550 nm, f = 11.29 mm, NA = 0.24 FC/PC Fiber Collimation Pkg. THEORETICAL 1/e² OUTPUT BEAM DIAMETER : **2.1mm**	
Collim-Fiber		Collimator - Fiber Collimation Package	F240APC-1550	1	86	870161-L	f = 8.18 mm, NA = 0.49 FC/APC, 1550 nm 1/e² OUTPUT BEAM DIAMETER : **1,6 mm** THEORETICAL FULL ANGLE BEAM DIVERGENCE: 0.073	L
Collim-Fiber		Collimator - Fiber Collimation Package	F260APC-1550	3	83, 84, 104	919432-A	1550 nm, f = 15.58 mm, NA = 0.16 FC/APC Fiber Coll 1/e² OUTPUT BEAM DIAMETER : **3.0 mm** THEORETICAL FULL ANGLE BEAM DIVERGENCE: 0.038	S
Collim-Fiber		Collimator - Fiber Collimation	F280APC-1550		107 [00541]		1550 nm, f = 18.75 mm, NA = 0.15 FC/APC Fiber Coll	

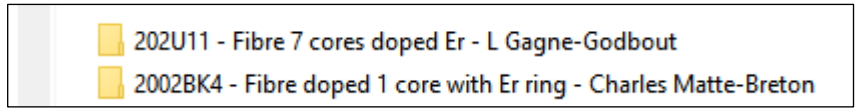
2. Miscellaneous Components - Y:\LaboComOpt\Inventories

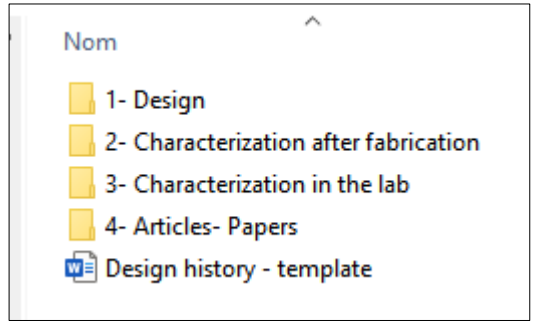
e. CHIPS

a. It is an inventory of a good part of the chips in the lab, received after September 2018.
b. Each box received, is identified with:
    a. Date of receipt
    b. Student's name
    c. Run & Name of design area : Ex. 2001PH-IPHLVOAM
    d. Whenever there is an available wafer map, this one is saved in the *CHIPS-DATA* folder
c. The Excel file has 3 tabs: Applied Nanotool, CMC, and Boxes found in the labs. (initial inventory prior to 2018)
d. Limitations:
    a. Prior to September 2018, the inventory is only partial, due to the lack of information on the boxes and difficulty to link them to particular designs or runs.
    b. Not all the final design files are stored on the LCO server, but it seems that they are on a GEL server.

3. Fibers – Y:\LaboComOpt\Fibre optique GEL

a. **Speciality fibers:** *SPE - Speciality Optical Fibers SPOOL Inventory.xls*
   a. This inventory file contain the list of all speciality fibers; those designed and drawn at the COPL and those available commercially. Ex. SPE-157.3
   b. COPL designs are named according to their: Code - Description – Designer





   c. Limitations:
      a. Some designs are not available to all the group, but saved in particular folders

b. **Standard fibers:** *STD - Standard Optical Fibers SPOOL Inventory.xls*
   a. Tag on the spools :ex. STD-100
   b. Limitations: Based on information available on the spools.
   c. Location: 00518

c. **COPL - Glass Characterization Capacities**
   a. This inventory lists all the characterization tool in the COPL for preform and fiber, as well as tools to process fibers.

4. Trainings - Y:\LaboComOpt\Trainings

Browse through the following folders to find the training documents. The main document is always appearing first; a PowerPoint document converted in PDF.

a. ESD
b. Optical connector care
c. RF connector care
d. Other specific equipment trainings(Luna, Cailab, etc)

5. LCO Web site & Internal web site

External web site:
https://lco.fsg.ulaval.ca/

LCO Internal Web Site:
http://lco-int.copl.ulaval.ca/index.html