Hyper-Kamiokande

Computing contributions to Hyper-Kamiokande

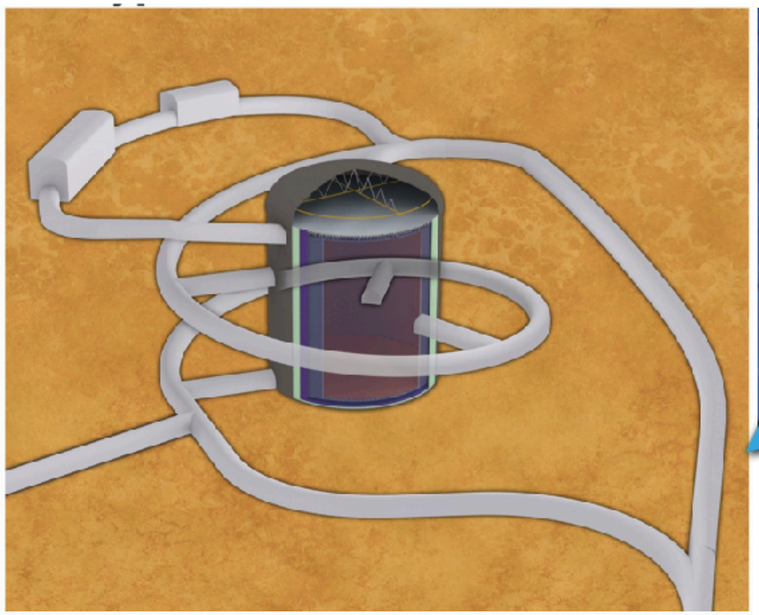
LLR/LPNHE Neutrino groups

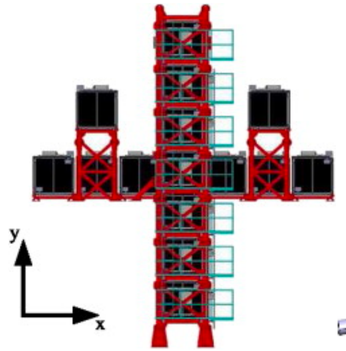
SCIENCES SORBONNE UNIVERSITÉ

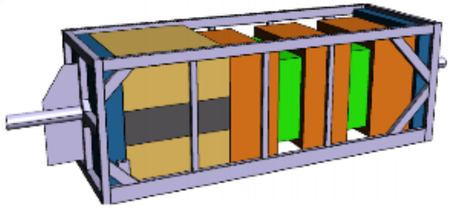
LPNHE PARIS

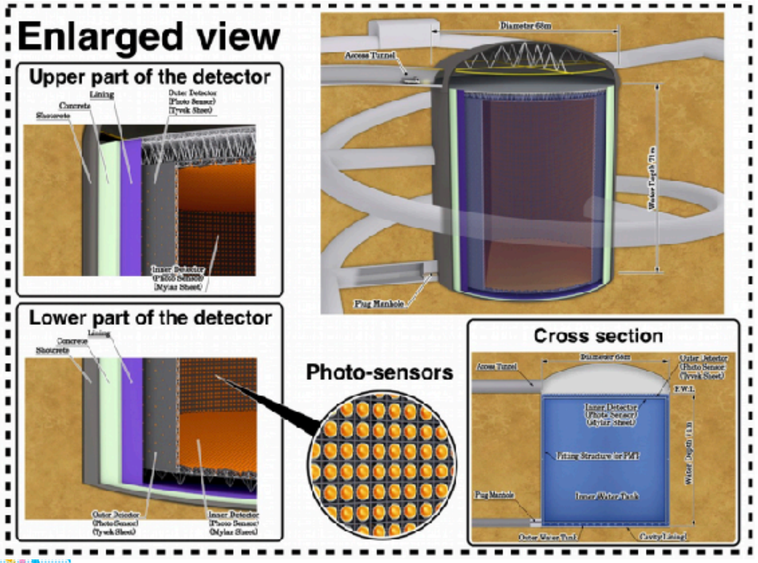
cnrs IN2P3 Les deux infinis

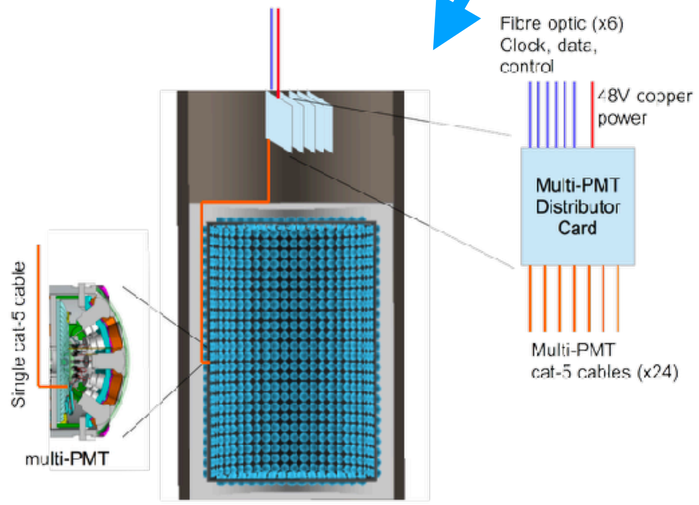
What is Hyper-Kamiokande?









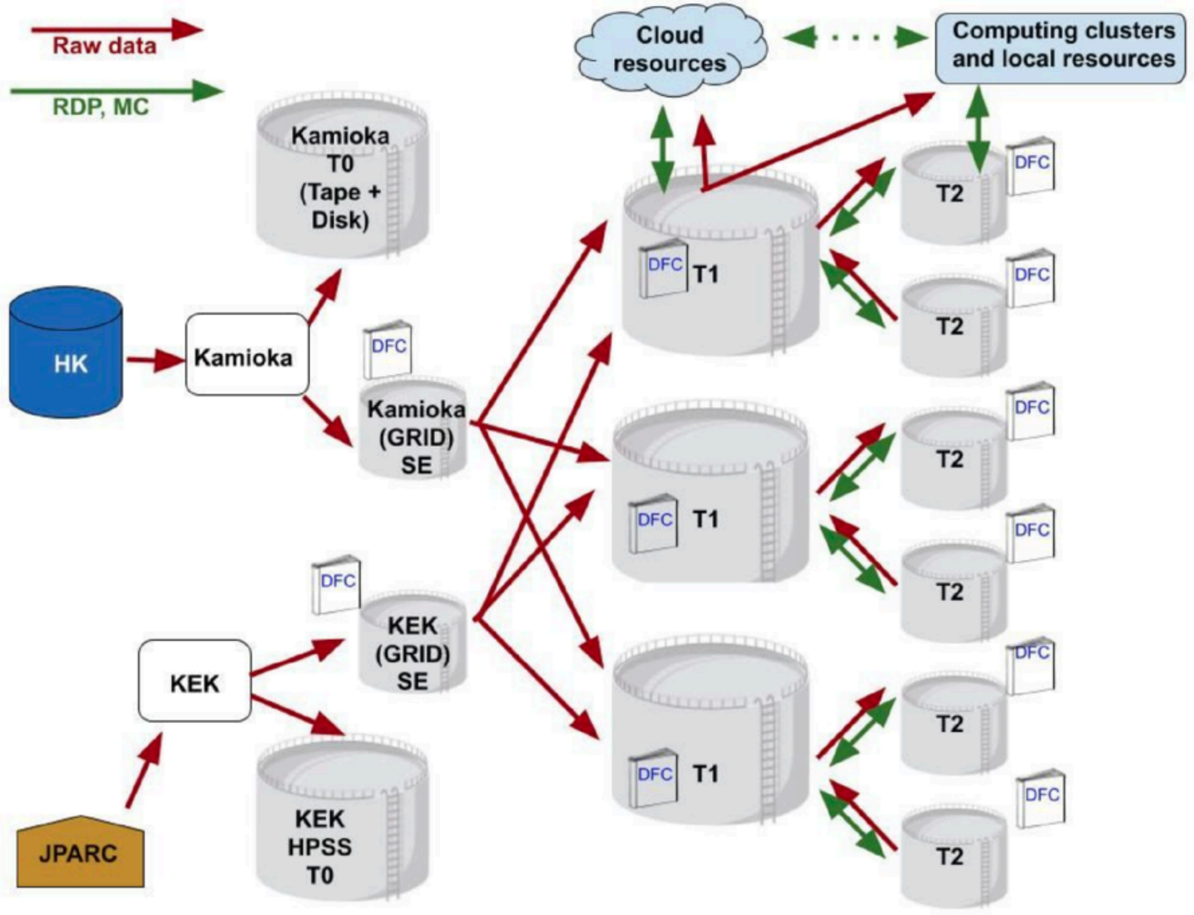


Hyper Kamiokande computing model

Tiered system inspired by LHC

Resources shared via DIRAC
Software shared via CVMFS
iRODS for data transfer between clusters

Model very similar to Belle-II's
→Jennifer-II European consortium
→Develop similar strategies



Hyper-Kamiokande computing needs

First 10 years of operations:

→25 PB (data + MC — mostly FD)

→880 MCPU.hours

(minimal with one copy of each file)

Currently one declared T1 site (RAL)
Each T1 site can't hold all data

→replica on several T1 and T2 sites

Dirac for data management system

Construction period (7 years)

Detector	MC (CPU.hours)	MC Storage (TB)
INGRID	0.13M	7
ND280	19.2M	2,250
IWCD	97M	52
Far detector	20M	500
Total	136.33M	2,824

Operations period (10 years)

Detector	Data Storage (TB)	MC (CPU.hours)	MC Storage (TB)
INGRID	226	0.51M	26
ND280	669	42.2M	4,950
IWCD	620	684M	367
Far detector	18,440	25M	500
Total	19,955	751.71M	5858

Detector	Construction (MC)	Data taking (raw data)	Data taking (MC/proc)
INGRID	$T1_{IN}+nT2_{IN}$	$T0_{IN}+2T1_{IN}$	$T1_{IN}+nT2_{IN}$
ND280	$T1_{ND}+nT2_{ND}$	$T0_{ND}+2T1_{ND}$	$T1_{ND}+nT2_{ND}$
IWCD	$T1_{WC}+nT2_{WC}$	$T0_{WC}+2T1_{WC}$	$T1_{WC}+nT2_{WC}$
Far detector	$T1_{FD}+nT2_{FD}$	$T0_{FD}+2T1_{FD}$	$T1_{FD}+nT2_{FD}$

Possible contributions to HK computing

CC-IN2P3 is already Tier1 for LHC (WLCG)

→infrastructure available, need resources

Could we become Tier 1 for HK?

→Strong support from HK collaboration

→Hosting near detectors (ND280 and INGRID) data + MC

Setup and maintain tools for software, job and data management

→DIRAC file catalog, GitLab, web interface, production job submission…

→A lot of expertise within IN2P3 (DIRAC core developers etc)

→Useful for other IN2P3 experiments e.g. Belle-II