

KAGRA tour

<http://gwcenter.icrr.u-tokyo.ac.jp/en/>



Entrance of Kamioka mine, with a large sign of “Congrats Kajita”

“KAGRA” is the name of this large cryogenic gravitational wave telescope, and not an awkward acronym. But KAGRA implies “KAmioka” and “GRAvity”, also KAGURA (神楽) means shito-style dance and music and sounds familiar for Japanese.

It is consisted of two orthogonal 3km arms in the mountain to suppress seismic noise.

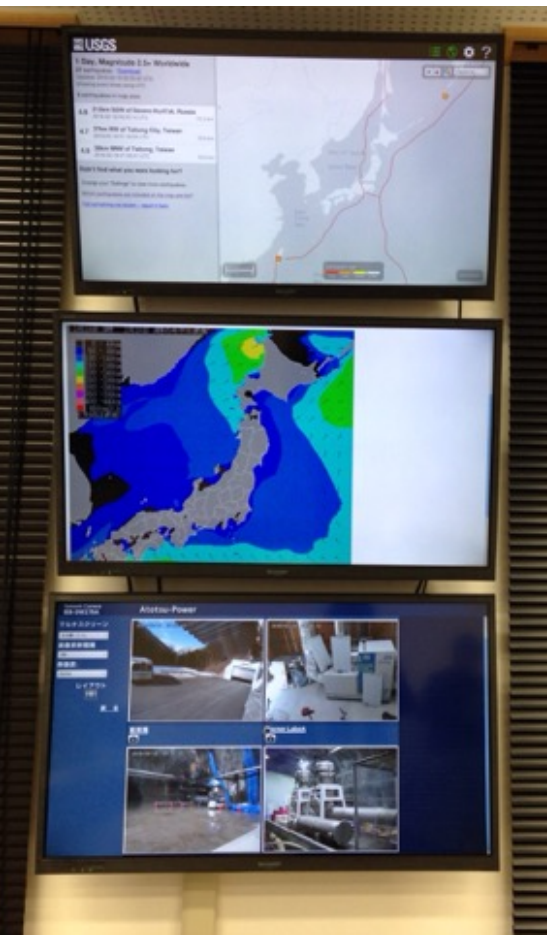
- Laser – 180W Nd:YAG (1064nm)
- Vacuum – 1.5E-9 Torr
- Mirror – sapphire crystal (20K)

大型低温重力波望遠鏡



KAGRA control room. They have an own building different from Super-K and KamLAND. The main things to monitor are stabilities of mirrors and the laser.

They also monitor all seismic activities in Japan (Japan is located on the meeting point of 4 major tectonic plates)



Awai-san (Super-K and KAGRA electronics engineer) kindly gave this tour!

Tepei Katori

16/02/20

It has the own entrance. Because it doesn't share area with Kamioka mining company unlike other experiments (Super-K, KamLAND, Xmass), miners laws are not applied.

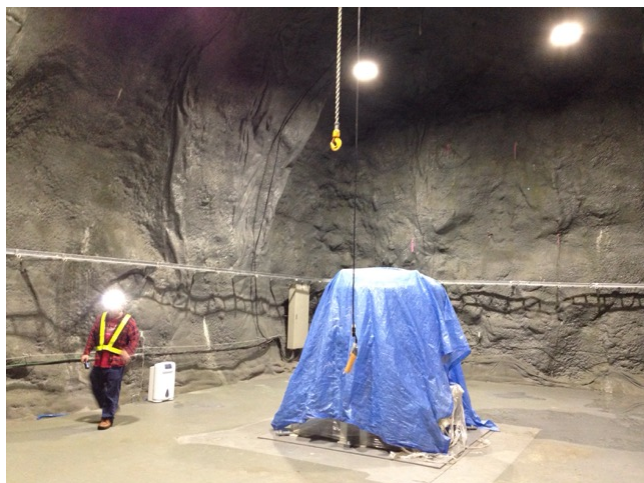
For example, cars here are not required to have special catalytic converter, also you can drive in without miners drivers license.



....but all cars are electric cars. Why not, because they are cleaner and this is Japan.

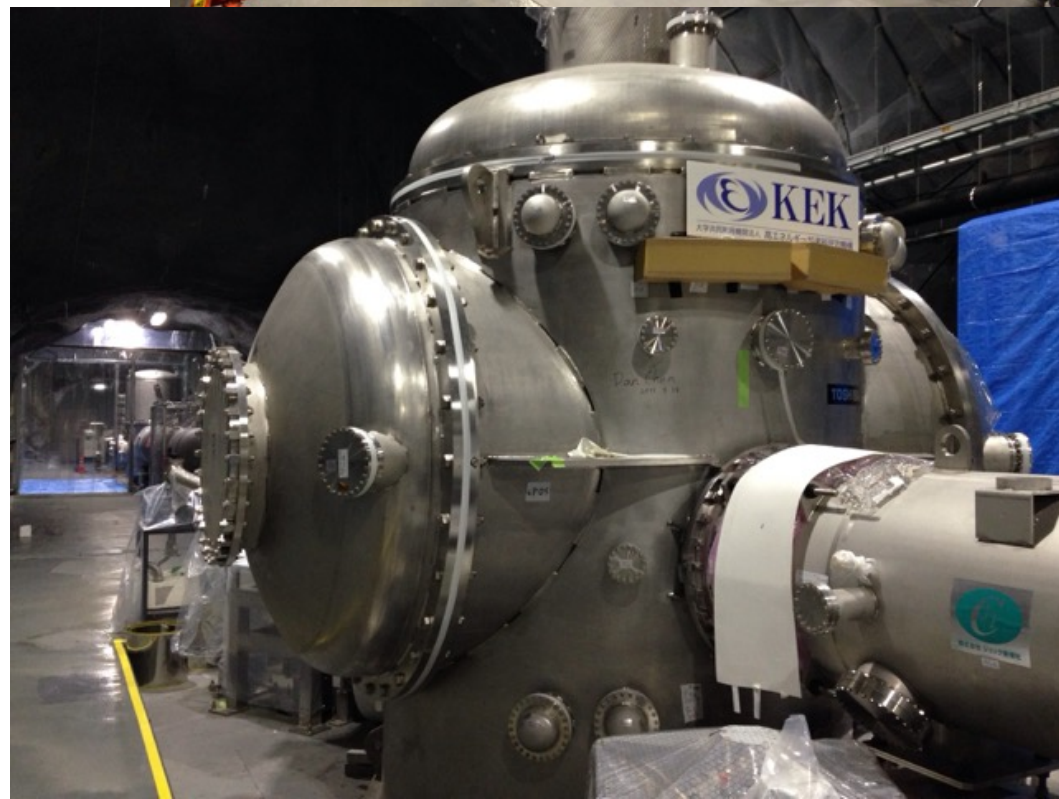
KAGRA is under construction. Full KAGRA (with cryogenic mirrors) will take another 1-2 years. But they will run anyway without cryogenic system from March 2016.

View to the one arm. The large device is the cryostat to keep the sapphire crystal mirror cold (20K). The mirror will be suspended from 14m above where you can see the port for that..



Suspension room. The cryogenic sapphire mirror is hung from this room.

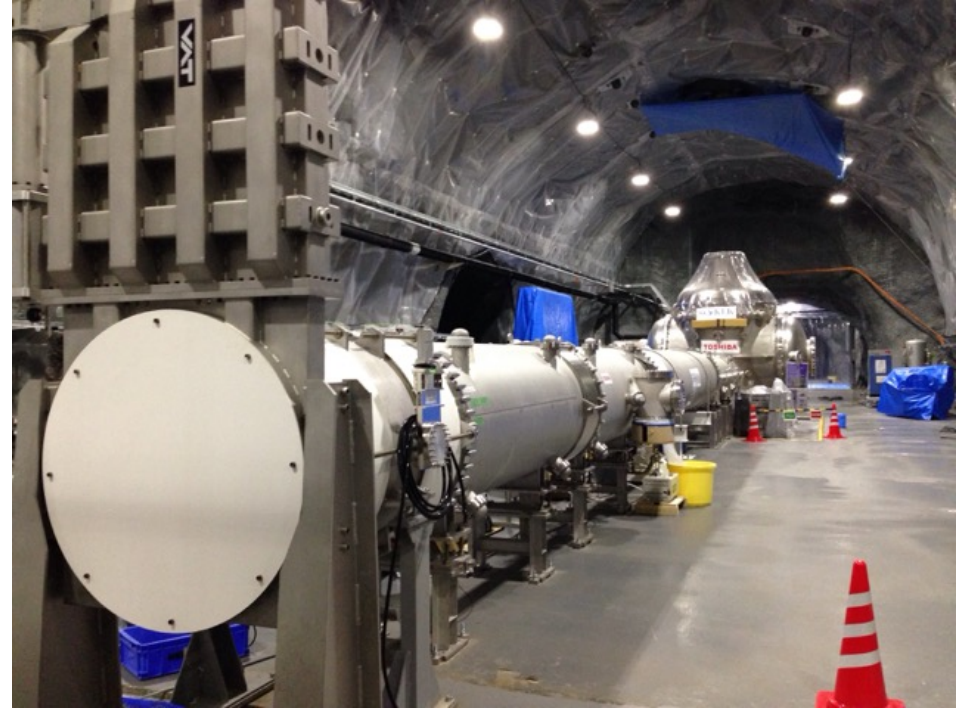
The cryostat for cryogenic sapphire mirrors (x4, 2 at the end of arms, and 2 near the splitter). Provided by KEK. KAGRA is the joint project of KEK, ICRR (institute of cosmic ray research, who owns Super-K) and NAOJ (national astronomic observatory of Japan).



One of the 3km arms. People move by bike or electric cart (I didn't drive!).

Pipe is 80cm diameter, smaller than LIGO (120cm) due to better laser system.

The tunnel has a slope to remove mine water (10m elevation in 3km).



Beam splitter area. 2 arms (one is not connected yet) will meet at here. To protect from mine water, everything is covered.

