

Looking back My research life

Takuya Kawasaki

Self introduction

- Takuya Kawasaki
 - <https://granite.phys.s.u-tokyo.ac.jp/kawasaki/html/>
 - I have been engaged in quantum experiments.

Takuya Kawasaki at the University of Tokyo

Home CV Research Publications Miscellanies





I have been elucidating basic problems on quantum mechanics using measurement techniques of gravitation detectors.

[Explore](#)

Welcome to Takuya Kawasaki's website.

I am a Ph.D student at the University of Tokyo. I am especially interested in using quantum manipulation for precise measurement (more about my work). I am a member of the KAGRA Collaboration.

Recent

 Maintenance 21-06-29	 Presentation 2021-06-23	 Publication 2021-05-21	 Publication 2020-7-03
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Today's talk

- My laboratory life at Ando group
- What I will do

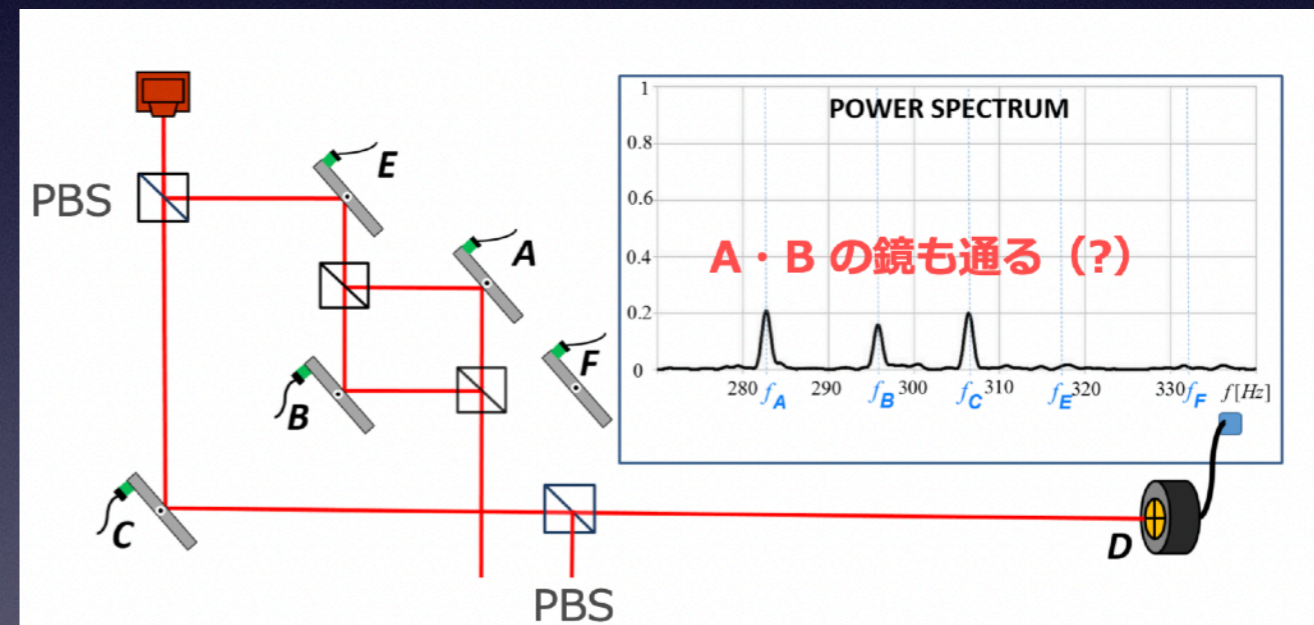
Research history

- Undergraduate
- Master course
- Ph.D. course



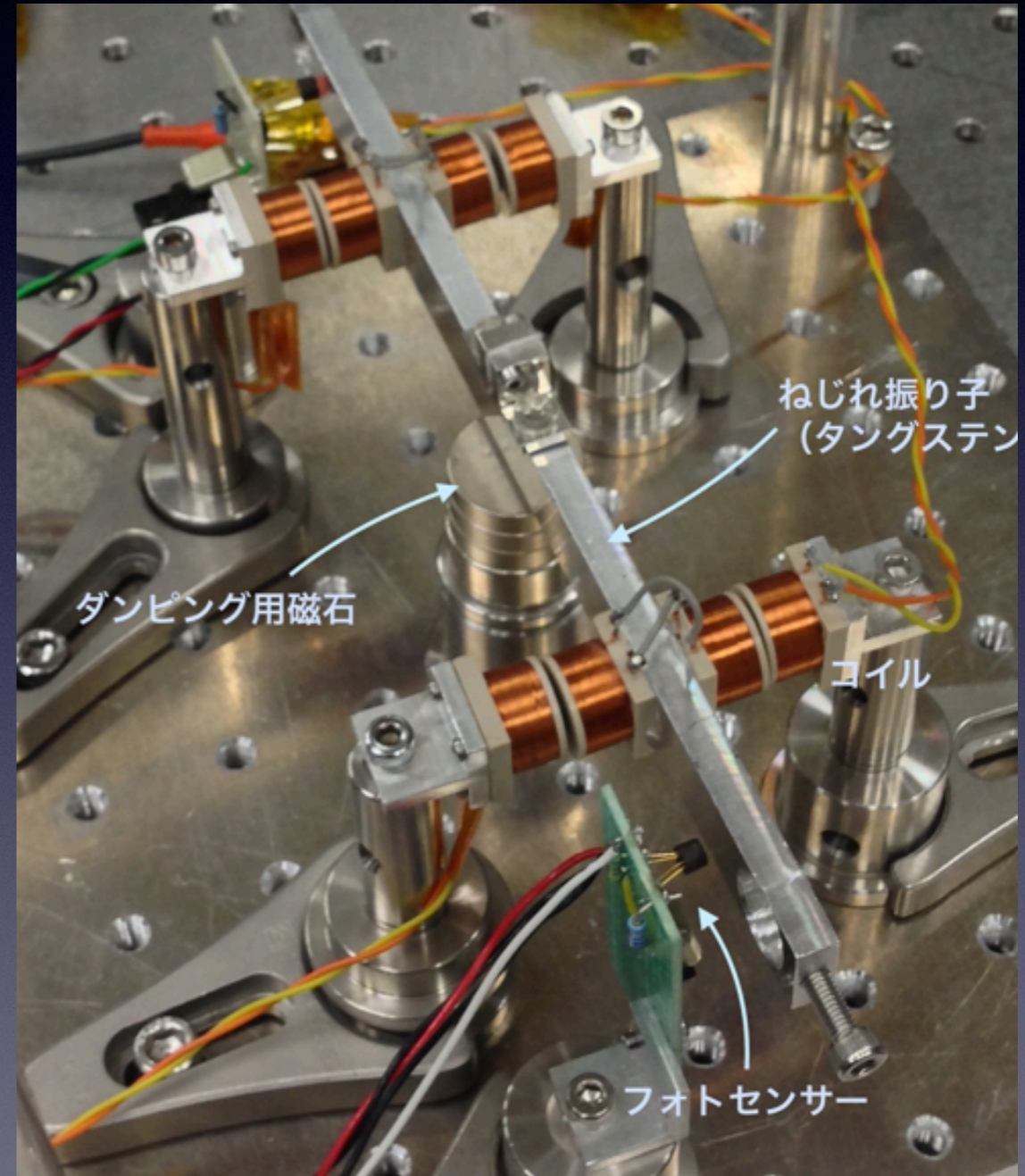
B4

- Gogatsu-sai
- Quantum information group
- Ando group supported us.
- with Kawabata-kun, Lee-kun.
- Tried to observe a curious phenomenon of quantum measurements.



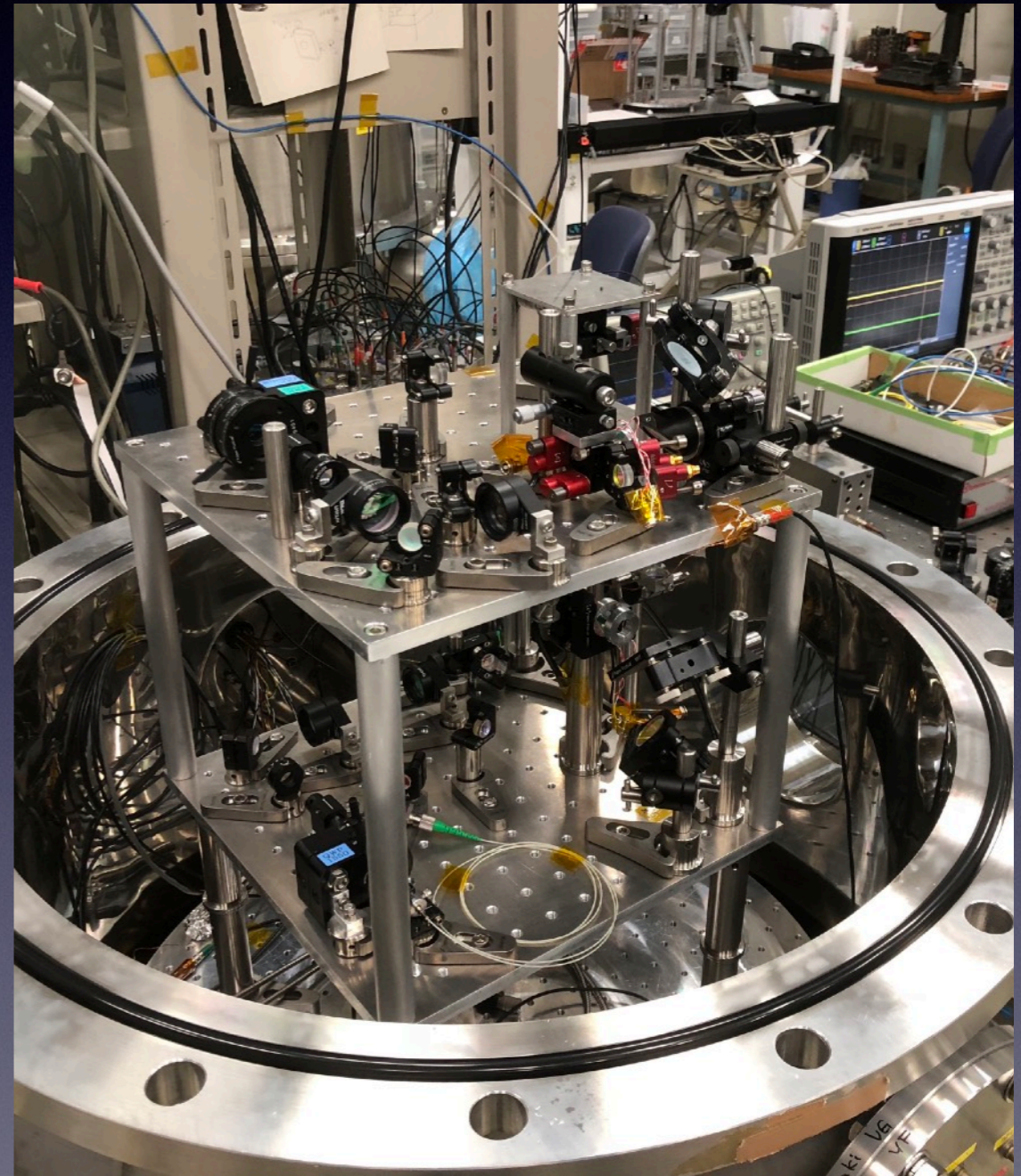
B4

- Coil-coil actuator
 - with Arai-kun
 - We made a coil-coil actuator attached on a torsional pendulum.



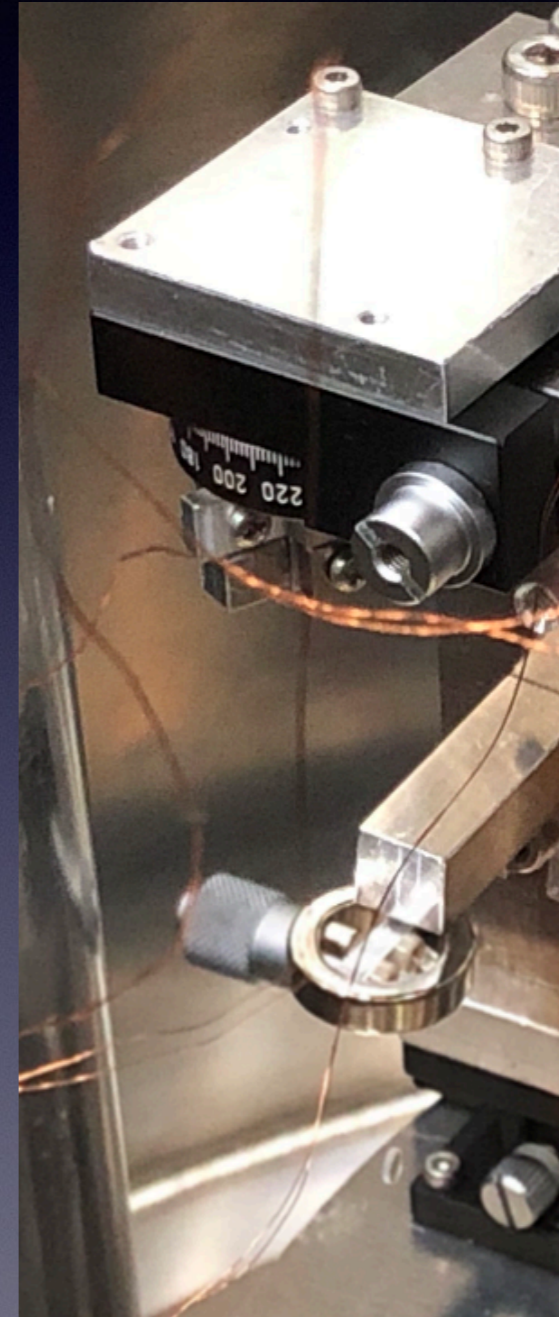
Master course

- Optical levitation
 - with Wada-san,
Nagano-san,
kita-kun
- The confirmation of the stability of the sandwich configuration.



Ph.D. course

- Quantum radiation pressure fluctuation
- Utilizing a linear cavity that is stable in the angular motion.



International workshops



ANU visit



CREST meeting



GWADW

- Many opportunities
- I hope covid-19 will calm down soon.

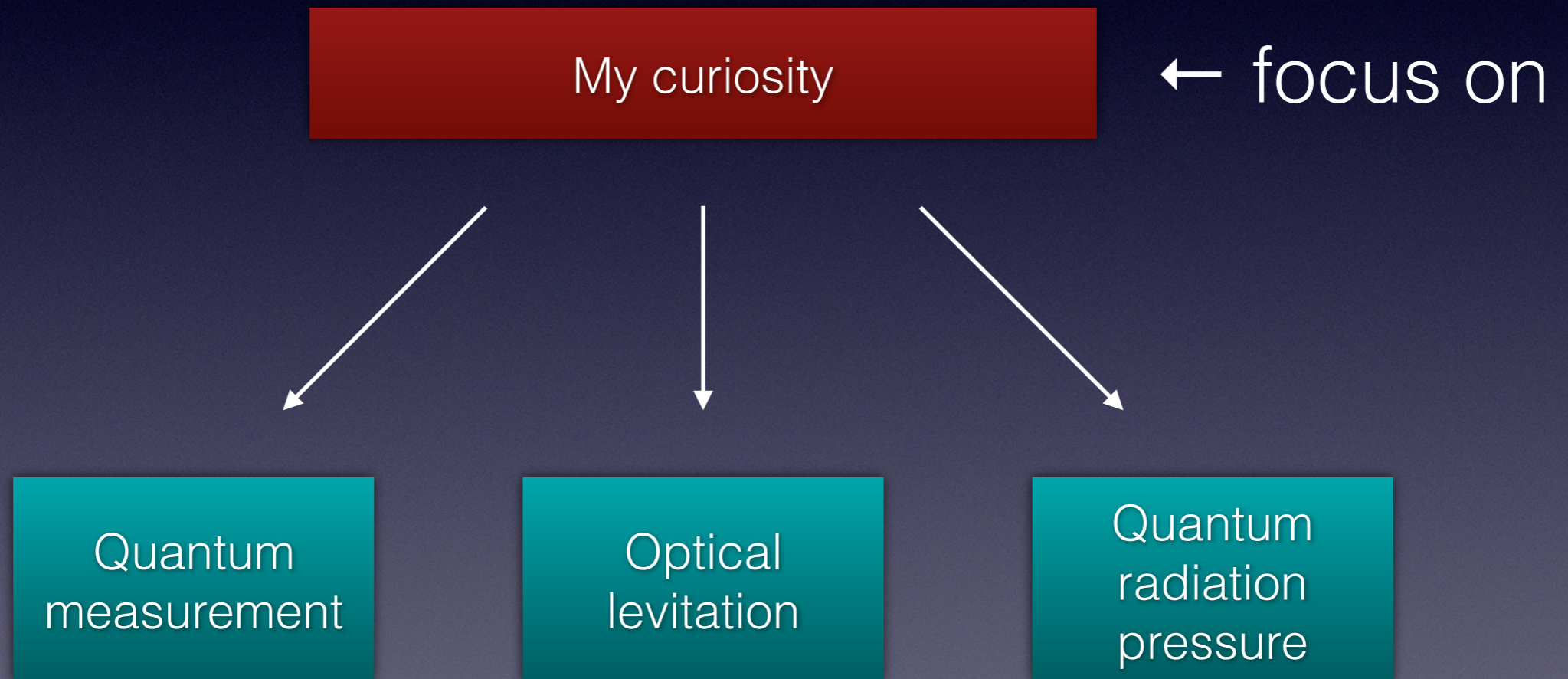
Next talk

Quantum
measurement

Optical
levitation

Quantum
radiation
pressure

Next talk



When I was a B4 student

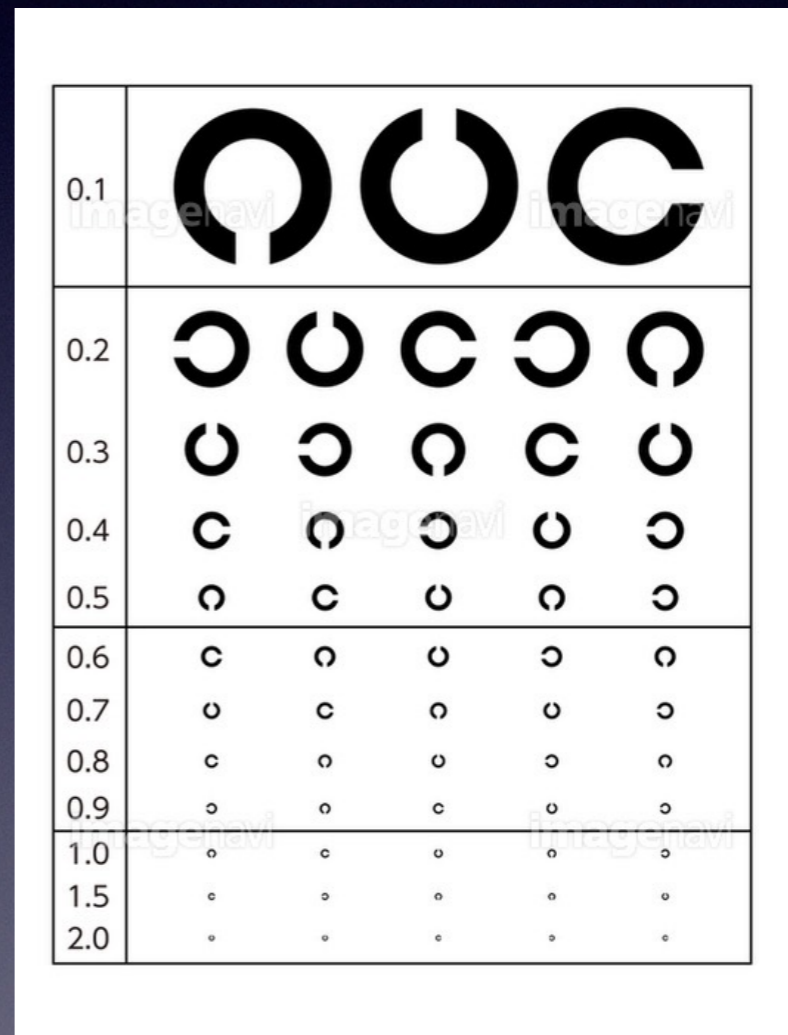
- I learned the basics of quantum mechanics.
 - “state” and “measurement” are somehow keys.
- My naive questions
 - What is the “measurement”?
 - Is it okay with watching by naked eyes?

Quantum Zeno effect

- Time evolution will stop when the system is continuously measured.
- It is curious because I cannot stop a people or an object by watching them.

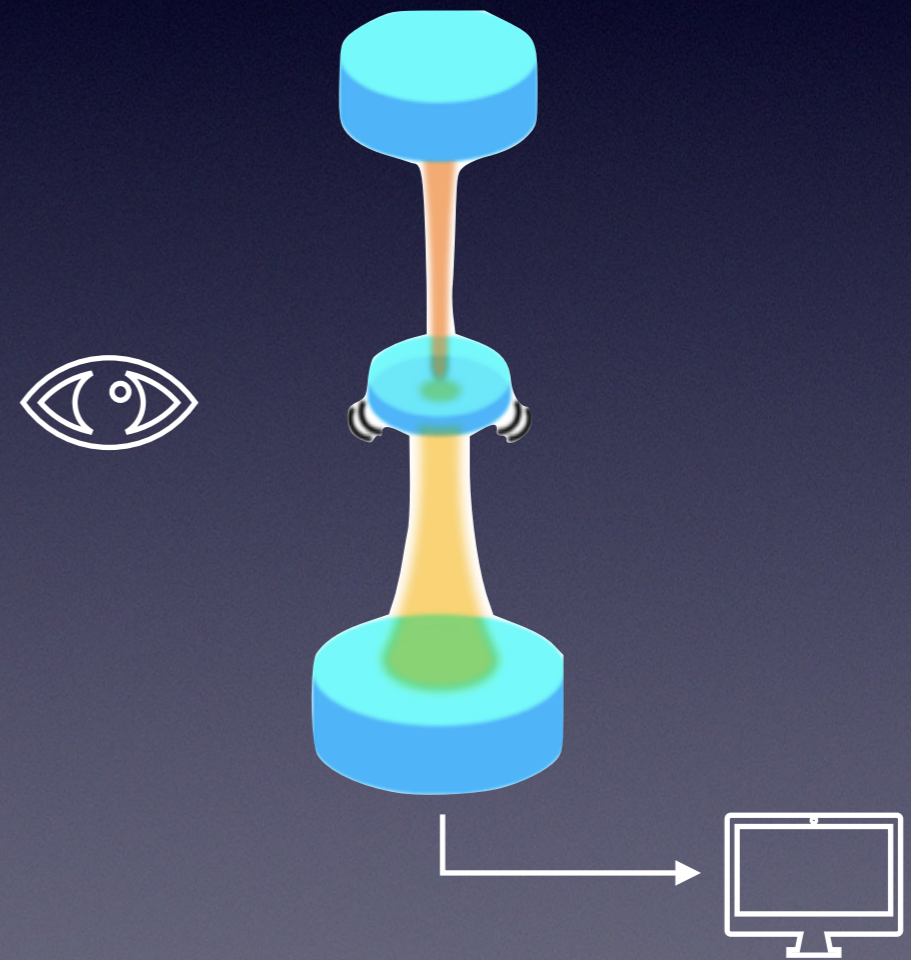
Naive thinking

- Weak eyesight?
 - Visual activity 0.03
 - 1.0
 - 10^{10}
- uncertainty principle??



Naive thinking

- When we watch the levitated mirror from the view port, the output signal changes?



Real measurement

- Even when a device measure a physical quantity, at last we measure the value of it by our eyes.
- Watching with eyes
 - Chemical reaction at crystalline lens or change in the ion concentration in our brain?
 - (projective) measurement is an instant operation.
 - Watching have time duration.

Some things I know now

- Quantum Zeno effect will not happen if the measurement is indirect measurement.
 - But what is categorized as “indirect measurement”?
- Anyway, these many naive questions are the origin of my motivation.

What I will do

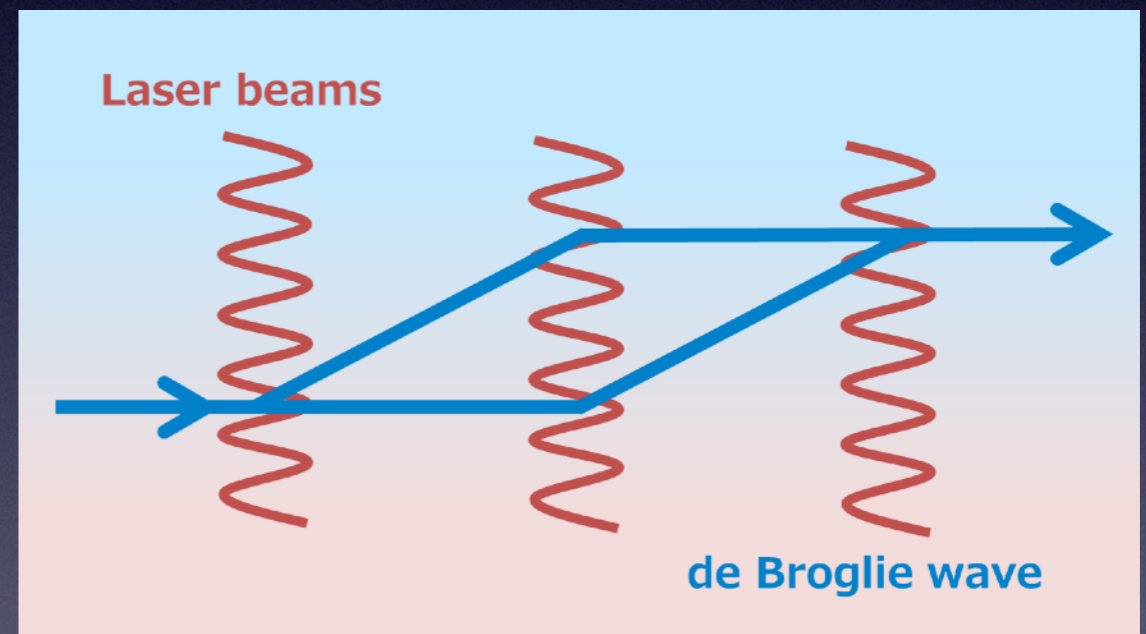
Job hunting

- Somiya lab (JSPS PD)
 - Application by the document.
- Kozuma lab
 - Somiya-san introduced me.
 - Interviews.



What I will do

- Quantum navigation
 - Quantum sensor as a gyroscope
 - Use atom interferometry
- I am very looking forward to do this research, and I am happy I can continue quantum experiments.



Good luck,
and wish me luck.