

Research Life at HACTO

T. Katsura

Purpose of Our Research

- To obtain better understanding about the **structure, dynamics and evolution** of the **Earth's interior** through determining physical and chemical **properties** of geomaterials at **high P-T** through high P-T **experiments**

Attitude to Research 1.

- Consider by yourself!
 - **The reason** why you are doing so must be always **clear**.
 - You have all responsibility about your research.
 - Do not blindly trust what your colleague says.
 - Discuss with your colleague until you understand his point.
 - Do not blindly trust what is written on papers, books and internet.
 - What is written is not always right.
 - Read reference of the paper if necessary
 - Even if you do not find a clear reason, you should have **your own opinion based on your scientific sense**.

Attitude to Research 2.

- Never fail to follow the professors' regulation.
 - Even if he is not your direct supervisor
 - The professors are responsible to the laboratory
 - If you try to conduct anything new, **confirm its appropriateness** by discussing with the professors.
 - whether it would be useful for your research
 - whether it would not be interfere your colleagues' research
 - whether it would not damage the laboratory
 - whether it would not be too much time-consuming
 - whether it would not be too expensive

Attitude to Research 3.

- Do your best!
 - Do not do “**Tenuki**”
 - “Tenuki” in Japanese means “corner-cutting” in English
 - unconscientiousness
 - Do not take an easy way
 - Always do it so that you can obtain the best results
 - 「しない理由ではなく、する理由を見つけよ」
 - *Do not try to find a reason not to do it, but find a reason to do.*

Learning

- Read textbooks of physics, mathematics, material science and geophysics.
 - Without background of physics, you cannot understand what occurs.
 - Follow all the equations by you hand.
 - Repeat to read it until you understand it.
 - Do not leave what you can not understand.
 - We should have a realistic physical image about what is written.
 - Sometimes try to translate the textbook to your mother tongue.

Collaboration

- All the members in HACTO are under collaboration.
 - Give **suggestions** to anyone who may have a problem.
 - **Help physically hard works** even if you are not asked.
 - If you consider someone is wrong, you should tell him your idea even if he is in the higher position than you.
- Try to communicate with each other.
 - Come to our coffee room to talk with your colleagues if you have time.
 - Unfortunately, not so many people stay there.

Seminars

- **Never fail to attend** all the seminar that the staff members suggests you.
 - The seminars are designed for educational point of view.
- **Be punctual!**
 - Those who will give a presentation should finish the setting of preparation before the starting time.

Seminar

- **Do your best for your presentation** so that the audience can understand what you say.
 - Prepare your presentation from the view point of a stranger.
 - Prepare additional slides for possible questions
- All participant should give at least **one question** every seminar.
 - Any question is OK even if it is stupid.
 - Never say that I do not know what to ask
- **Properly answer to any question**
 - No silence is allowed to any question.
 - Positively consider about any criticism given to you.

House Keeping

- We always have to consider to **keep the laboratory under the best conditions.**
 - It is **never allowed to damage** the laboratory even if it is advantageous for your experiments.
- **Save the research budget**
 - High pressure experiments are extremely expensive

House Keeping 1.

- **Minimize the damage to the apparatuses**
 - You have to always consider whether your action may damage the apparatus or not.
 - Prevent **ceramic powder** to the **lathes** and boring machine
 - Prevent **dust** to the **optical microscope**
 - Avoid rusting by **salt** (NaCl, CsCl...)
 - No too much force to tools
 - **Saw of the isomet, tweezers, horn** of the ultrasonic coring machine...

House Keeping 2.

- The planes to which flatness is required should be carefully treated.
 - Do not put the spacers of the 5000 ton press on others.
 - Do not put the tools to fix a pressure medium in the cabinet on others as well.



House Keeping 3

- Make **the machine under the best conditions** by your alignment
 - If you do not know how to align, you should learn about it from someone else.
 - Centering of drill of the lathe
 - Stopper of the lathe
 - Smoothness of the **bed** of the plane grinder
 - The lathe must be clean.
 - **If you find the lathe is not cleaned in the morning, immediately find Oka-san to ask to clean it.**
 - If you cannot, you should clean it by yourself.

House Keeping 4.

- **Return tools** to their original place!
 - Especially, drills for the lathe *even if you are not the person who left the tool*
 - If you do not know their original place, ask the staff where they should be kept.
 - The saw of the isomet should be taken out and kept in the draw after your use.



House Keeping 5.

- Save the materials!
 - Return **ceramic blocks** that still can be used to the draw.
 - If a ceramic block for the lathe is too short, fix the block on a metal column by glue.
 - The length of **thermocouple** must be shortest.



House Keeping 6.

- **Cleaning time** (16:00-16:30 every Friday)
 - Work as hard and effective as you can
 - Should be hard in this order
 - **Students > Researchers > Staffs > Guests**
 - Start before 16:00 and finish after 16:30
 - Find the important places and machines to clean so that our research becomes more effective.
 - Clean the places that is too dirty for you to want to touch.

Safety

- **“Safety” is the most important issue.**
 - Do not put your hand near any working machine.
 - Start any machine after confirming no interference with anything.
 - Wear **goggles** if you do not wear glasses when you machine.



Safety

- “Safety” is the most important issue.
 - Do not wear sandals in the lab.
 - Do not directly touch acetone.
 - Cut the main switch of a machine when you take care of it.



Chemical substances

- All the chemical substances must be carefully treated!
 - **Poisonous and deleterious substances** must be locked in the storage.
 - When you take a new bottle, write it on the record.
 - The open bottles should be kept in the draft chamber.
 - The chemicals should not be taken out from the chemistry room.

Official communication

- If you plan to be absent, you have to **inform your absence to Uehashi-san** at your earliest convenience.
- If you cannot come to the institute in that day, you also have to inform about it to Uehashi-san immediately.
 - you or your family catch a cold
 - you have to go to somewhere
- If you are assigned for the next speaker of a seminar, you must not fail to **inform your cancellation of presentation to the convener**.

As a member of the community

- **Keep the laws of Japan**
 - Even if you do not appreciate
- Keep the rules of your village or town.
- Try to understand Japanese common senses
 - It is not a issue whether the “common sense” makes sense or not.
 - You do not have to keep the Japanese common senses if you do not like
- Avoid damage to your apartment.