

An Introduction to Radio Interferometry

6-1 Proposal preparation



You can find relevant material
on my personal webpage

NSYSU EMI Online Lecture Series Haiyu Baobab Liu (吕浩宇),
Department of Physics

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SMA



JVLA



ALMA



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My attitude

- Routinely, I have to collect data for my students, myself, etc.
- I really hate writing proposals.
Therefore, I do it efficiently.

The following material is based on experience.

There is no guarantee that my suggestion will help to any extent.

Not everyone gets observing time

It is a competition. Only winners get observing time.

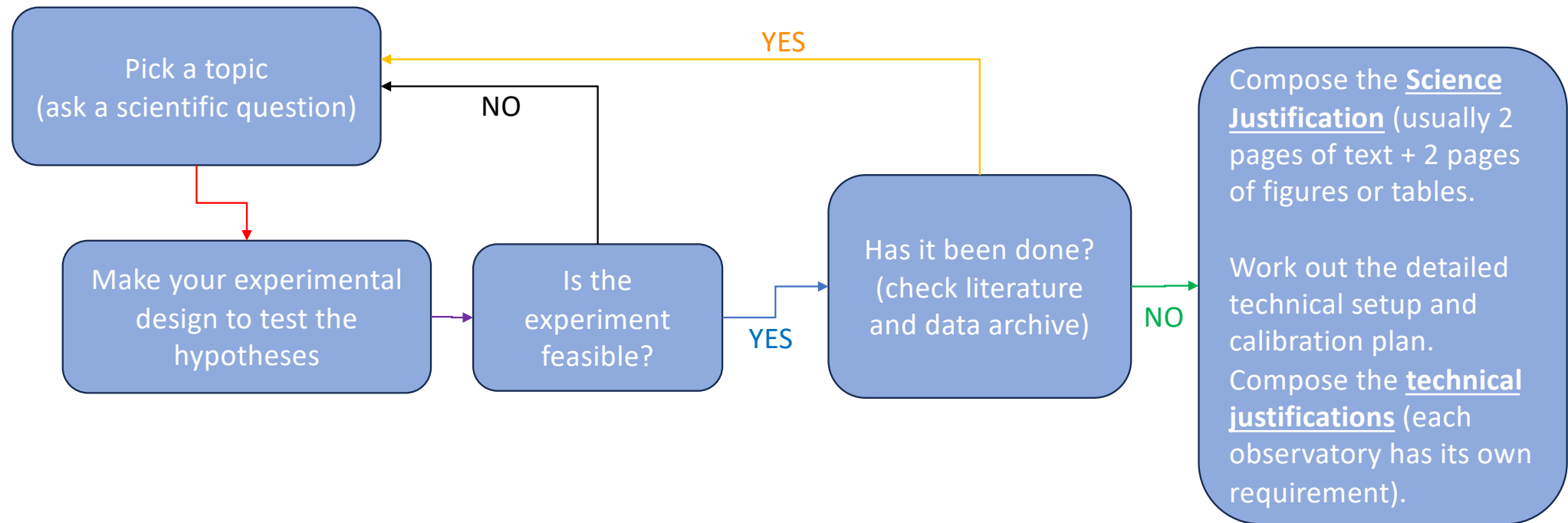
The quality of a proposal has a relative sense. **There are always better proposals. You can always make your proposal better.**

If you do not get observing time, you cannot write papers based on new data over the next 0.5~1 years.

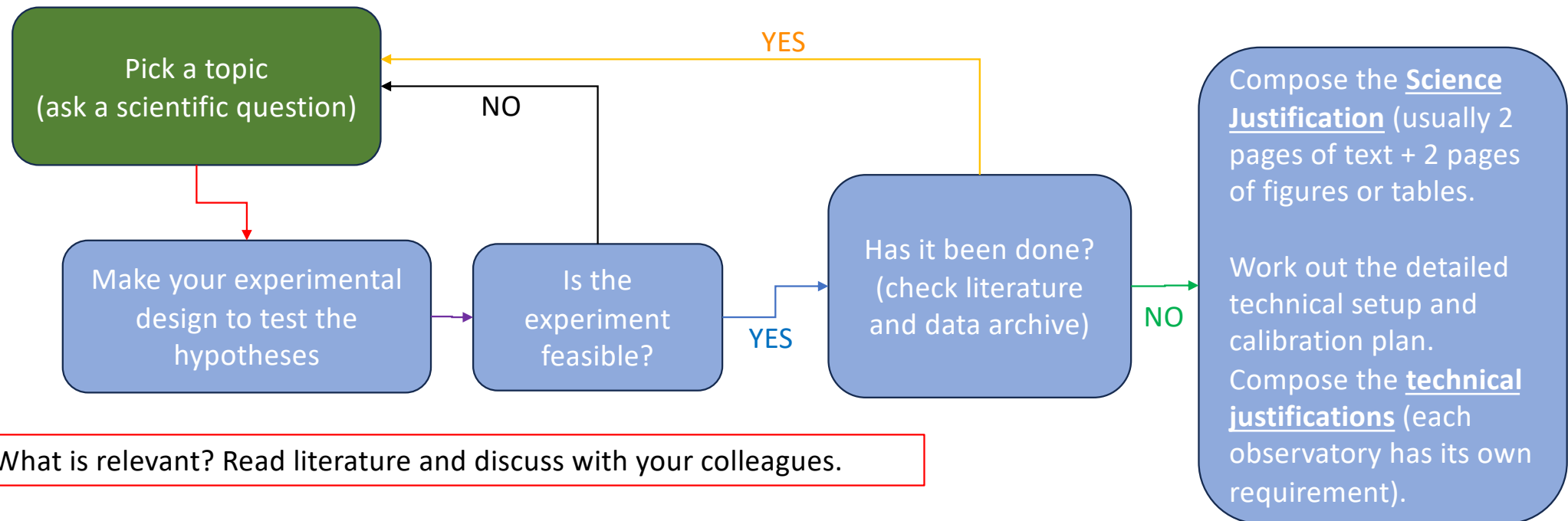
Keep in mind the proposal deadlines

- The observatories used to call for proposals once or twice every year. Only those that are submitted to the observatory ahead of the deadline will be considered. For example, the proposal deadlines for the SMA are usually in March and September; for the JVL A, usually in February and August; for the ALMA is usually in late April.
- If you are a student or a postdoc, it would usually **take you 2~4 weeks to prepare a good proposal**. You need to reserve time **dedicated** to proposal writing.

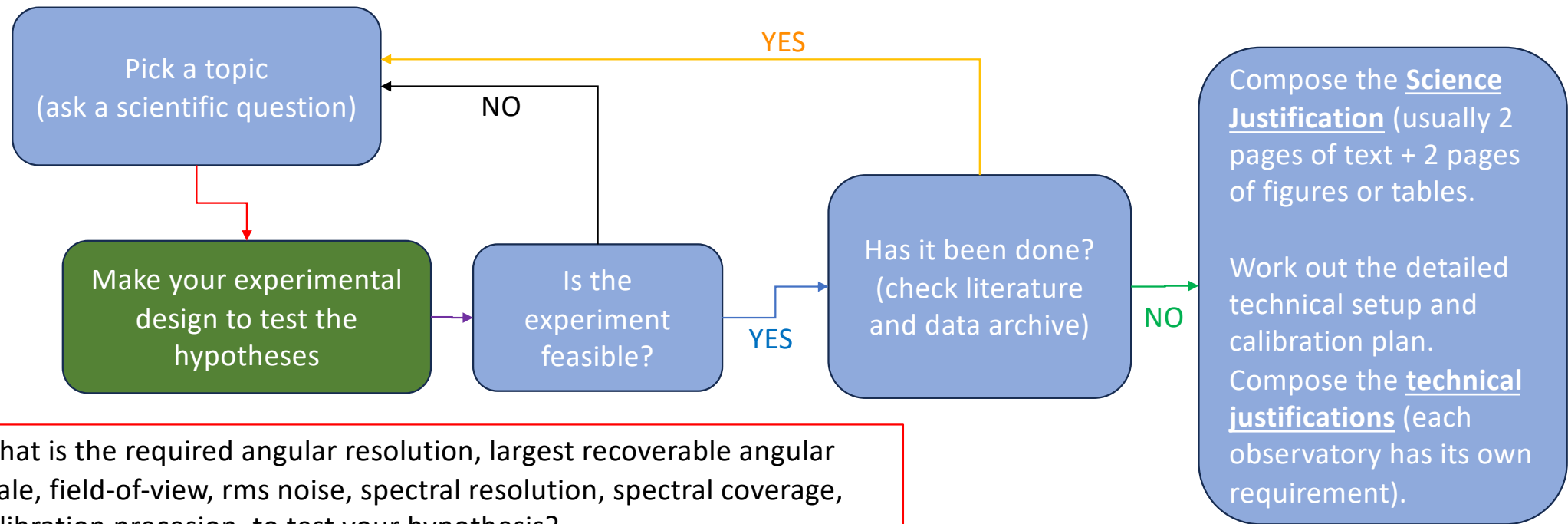
Once you know the proposal deadline



Once you know the proposal deadline

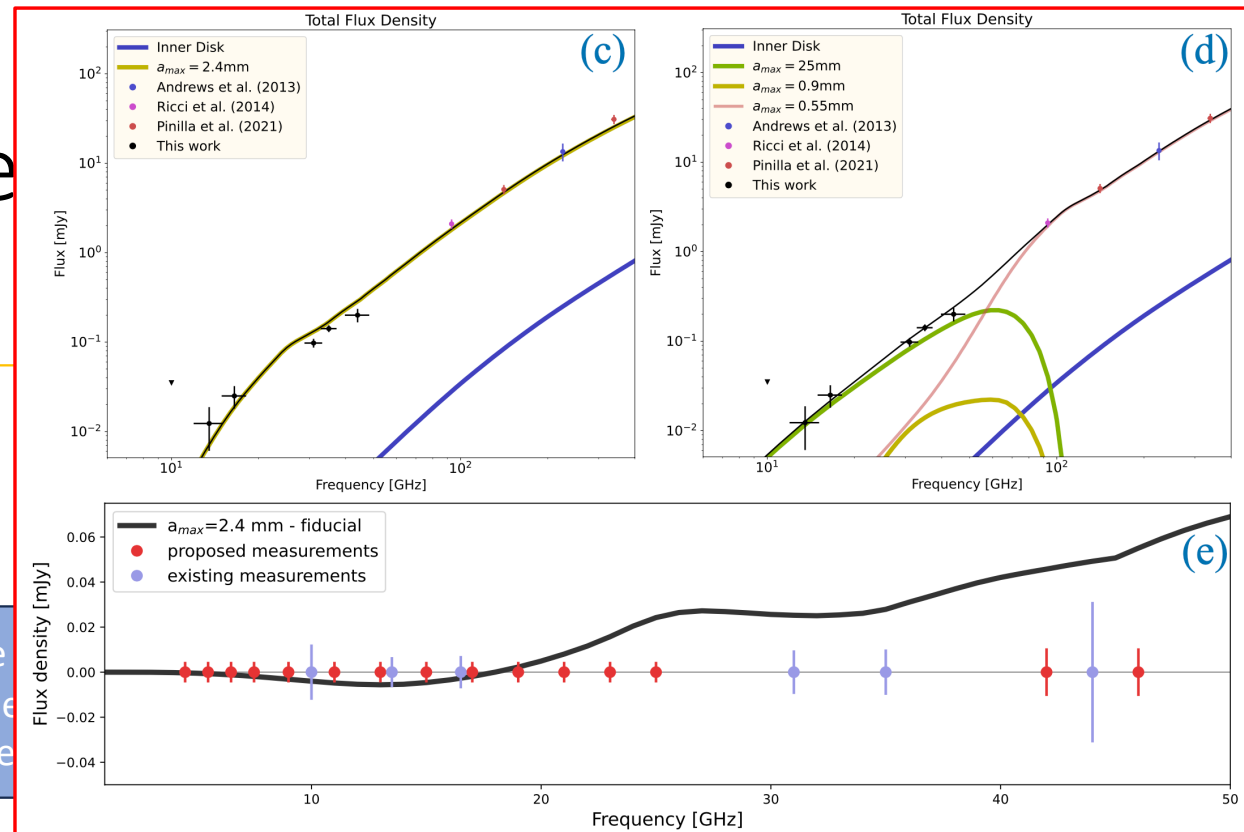
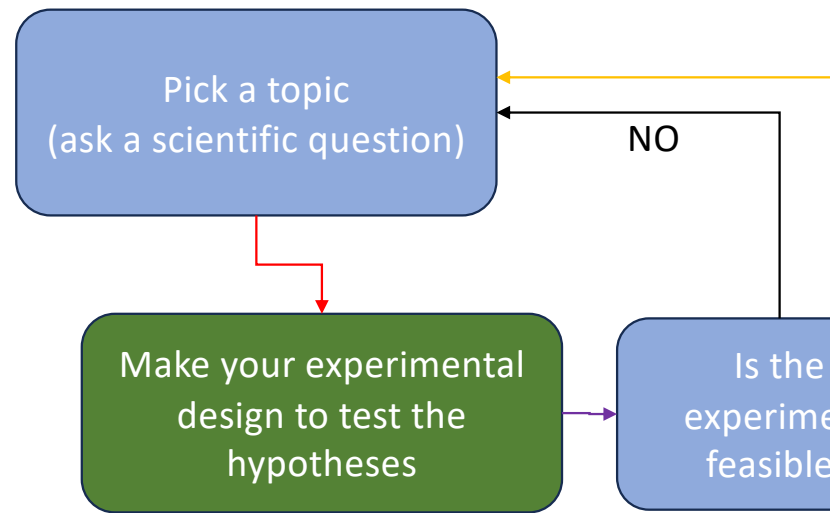


Once you know the proposal deadline



What is the required angular resolution, largest recoverable angular scale, field-of-view, rms noise, spectral resolution, spectral coverage, calibration precesion, to test your hypothesis?

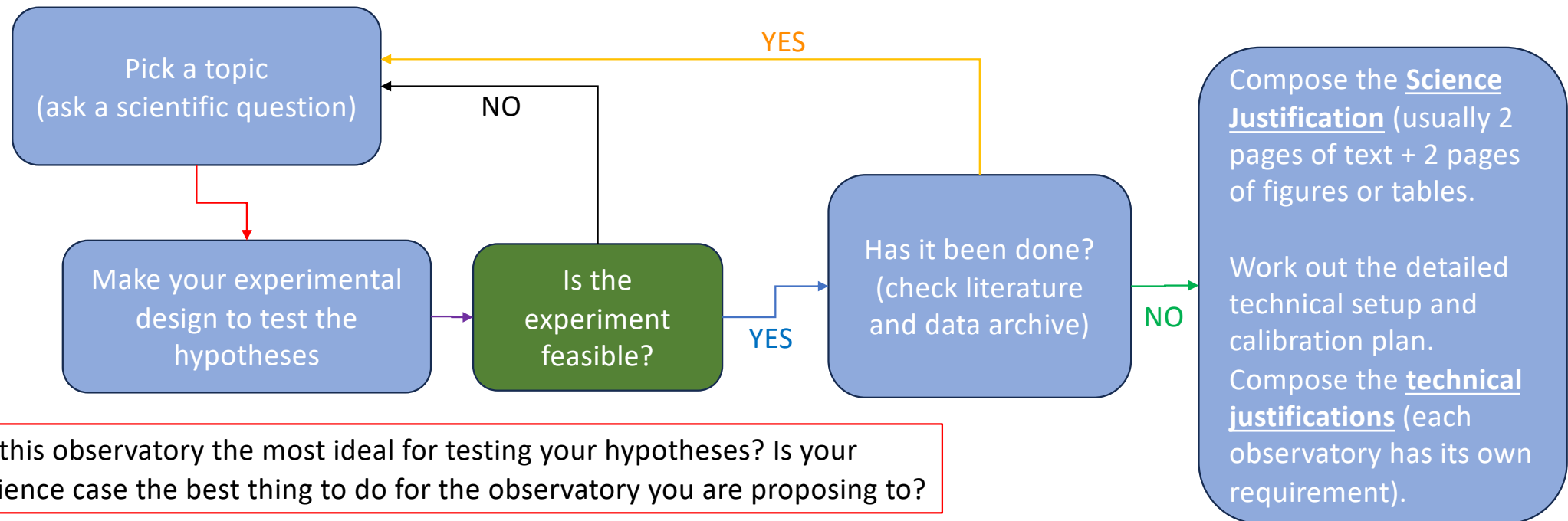
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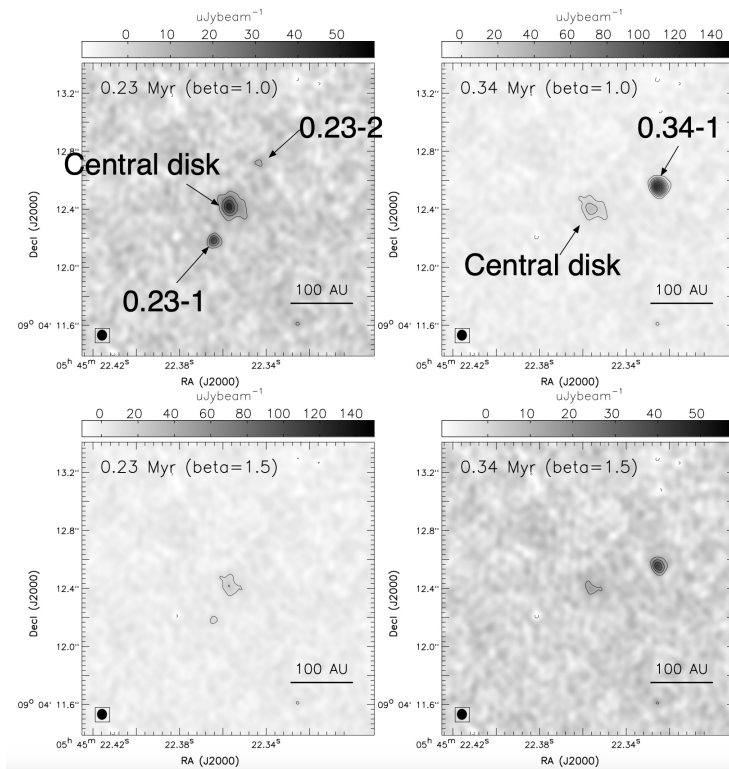
What is the required angular resolution, largest recoverable angular scale, field-of-view, rms noise, spectral resolution, spectral coverage, calibration precision, to test your hypothesis?

Need very serious models sometimes. It takes time to work on it.

Once you know the proposal deadline



Simulate JVLA observations at 33 GHz

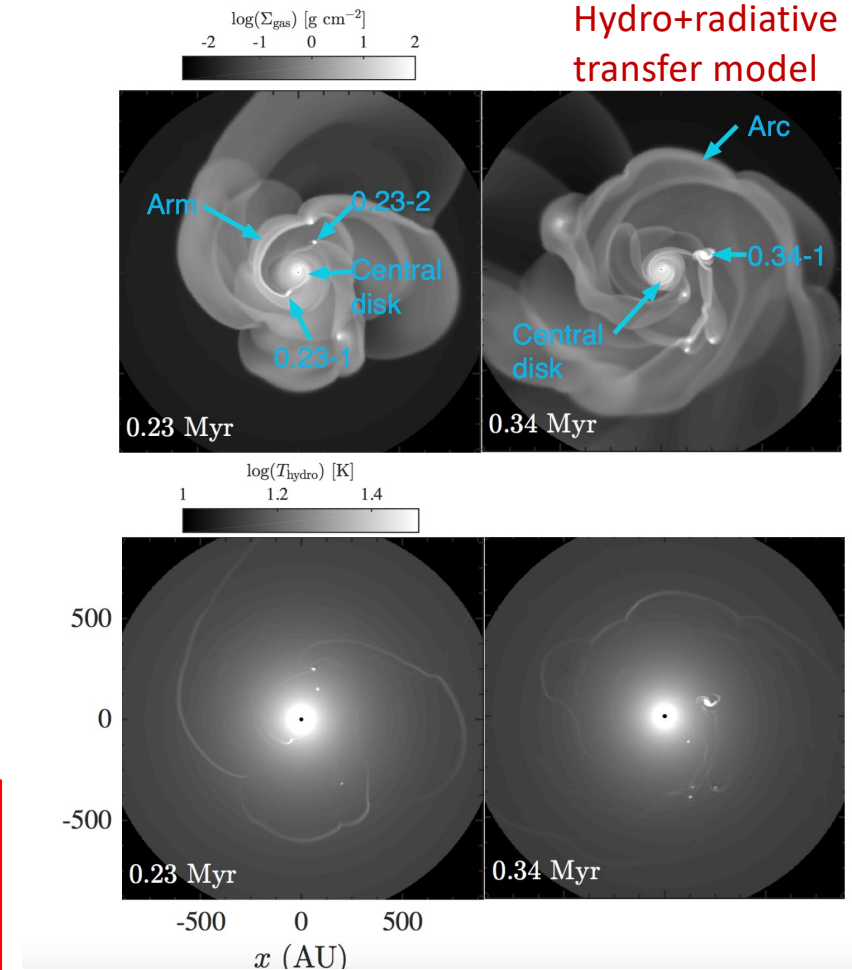


What is the required angular resolution, largest recoverable angular scale, field-of-view, rms noise, spectral resolution, spectral coverage, calibration precession, to test your hypothesis?

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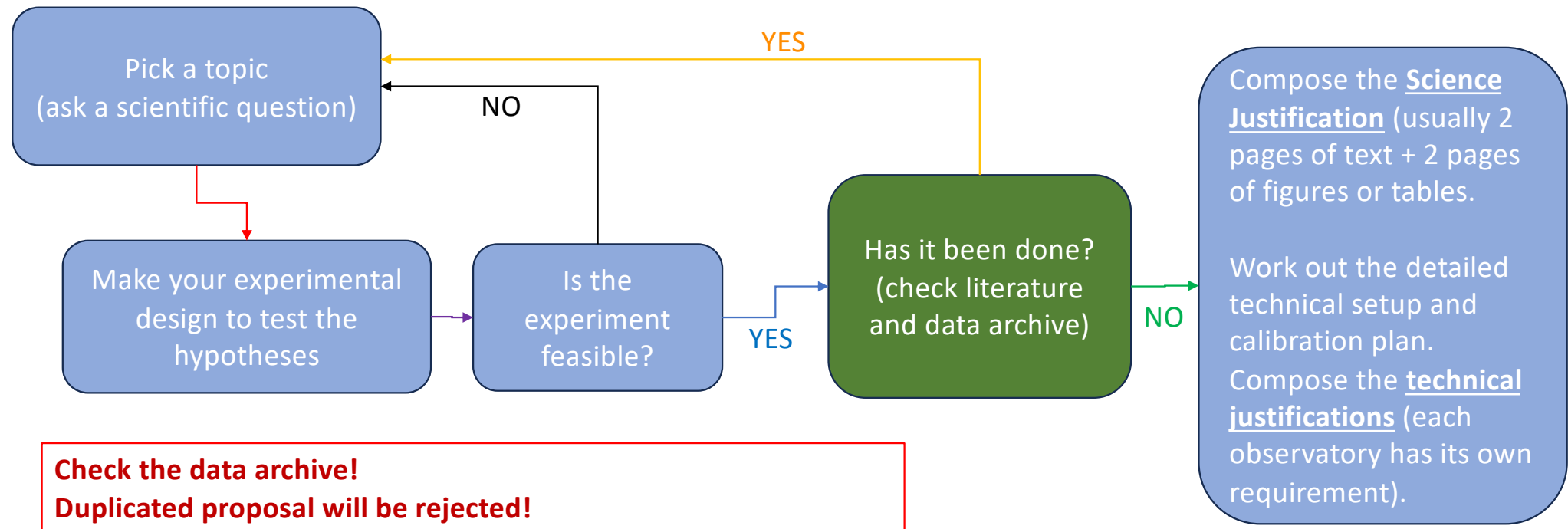
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Hydro+radiative transfer model

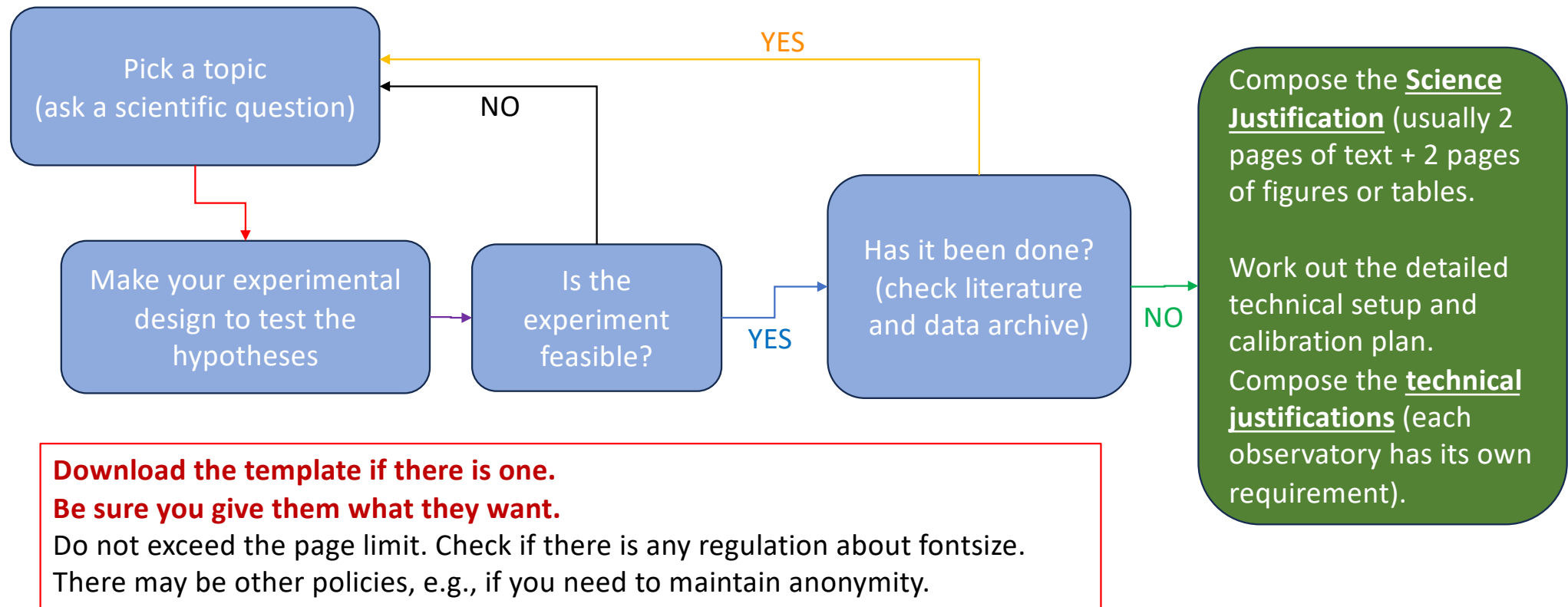


Courtesy of Eduard Vorobyov (Wien University) and Ruobing Dong (UVic)

Once you know the proposal deadline



Once you know the proposal deadline



What is essential?

- **Novelty** (Observing time is expensive!)

- Why your project matters?
- Would the requested observations be worth a good journal publication?
- Is it leading a breakthrough or just being incremental?
- Is the project just getting your supervisor one more citation, or is it testing the problem or challenging the previous understanding from a new aspect?

Give yourself specific and concrete answers to these questions before proceeding to the next step. If you cannot do it, then discuss it with your colleagues or supervisor more frequently and constructively.

What is essential?

- Novelty
- Solidness

This sometimes conflicts with the previous point, e.g., there can be high-risk, high-reward projects that can be exploratory.

Otherwise, it could be a designed experiment to constrain certain fundamental physical parameters, such as fine-structure constants, or to verify/falsify certain relevant astrophysical models.

The bottom line is the terms have to be well-defined.

What is essential?

- Novelty
- Solidness
- Self-consistency

There should be no loophole in the logic.

What is essential?

- Novelty
- Solidness
- Self-consistency

Preparing a proposal to a competitive observatory will **cost you and your colleagues very significant time**. If you just want to try some observations but do not know how it matters, think again or go to small observatories.

Only bring up something that matters when everybody is busy (e.g., close to the ALMA proposal deadline).

1. Find a topic.
2. Read the call for proposals and the technical information.
3. Make experimental design and check feasibility.
4. Check duplication.
5. Compose your proposal and submit ahead of the proposal deadline.