

Writing ALMA Proposals

Chin-Fei Lee
(ASIAA)

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Materials from Prof You-Hua Chu 2016 with some
modifications

Know the instrument!

Read Guide, Primer, Technical book

- **ALMA capabilities (comparing to SMA, NOEMA)**
 - Millimeter to submillimeter wavelengths, new windows in band 4, 5, 8, 9, 10 at high resolutions.
 - High Sensitivities, Fast Imaging
 - High Resolutions with high image fidelity
 - High Spectral Resolutions, Wide Bandwidths, Spectral scans
 - Full polarization modes, stokes I, Q, U ,V
 -

Three Types of Motivation

- **Observe an interesting or your favorite object(s):**
e.g., HH 212 (Space Hamburger and Bullets)
is it unique or the first of its kind?
- **Solve a problem (e.g., Jet Origin)**
 - Start from a single object: e.g., HH 212
 - Pilot study: e.g., 3 objects, HH 212, HH 211, HH 111
 - Survey: More than 5 objects
 - Line Survey, spectral scan for astrochemistry
- **Want to use ALMA** because it's the biggest ground-based telescope, and many users are using it

Before Writing Proposals

- **Idea! Idea! Idea! Identify what to propose!**
 - Think, Read, and Discuss, Preparatory work, Collaborations. **Is your idea new, interesting, and important for the community?**
 - If needed, read through the titles and abstracts in the previous accepted proposals in your related field to have a sense of the current problems to be solved.
- **Doable with ALMA? Only ALMA can do? Read the Primer!**
- **Any stronger competitors?**

Proposal Recipe

- Interesting and attractive Project Title
- Concise abstract, laying out the problems and how to solve.
- Introduce the scientific background
- Scientific question to be answered
- Why previous work was inadequate?
- How can ALMA help answer it?
- Proposed program
- Immediate objectives
- Scientific impact
- Feasibility (Technical Justification)

0. Attractive Title

Reviewers may get bored with the similar titles after reading a bunch of proposals. So stand-out title!

First Confirmation of Protostellar Jet Rotation with ALMA.

1. Introduction/Background

Reviewers may not be familiar with what you propose to do. Give a brief and concise introduction.

Write only **relevant** material. Do not waste space writing things that reviewers do not need to know:

Jet is often seen coming out from the inner part of the accretion disk, representing one of most intriguing signposts in star formation.

2. Scientific Question

Raise the reviewers' curiosity, make them want to see the proposed observations and results.

This had better be a **worthy** question.

This is essentially why you do the proposal.

Jet is expected to carry away the angular momentum from the inner disk, but no jet rotation has been convincingly detected

3. Previous Work Was Inadequate

You need to know **what has been done.**

You need to state why **previous work is inadequate** (resolution? Wavelength?).

- **Ex: Jet is very narrow (e.g., < 10 au in radius) and expected to have a small rotation velocity (e.g., 5 km/s at 5 au) in current jet models. Previous observations did not have enough spatial and velocity resolutions to resolve the velocity gradient across the jet axis for reliable measurement of jet rotation.**

4. How Can ALMA Answer It?

- High spatial resolution and velocity resolution.
- Wavelength coverage.
- Sensitivity.
- Southern sky.

Ex: ALMA provides both high spatial (5 au) and high velocity (1 km/s) resolutions to resolve the velocity gradient at more than 5 sigma detection.

5. Proposed Program

Make sure “Proposed Program” is a section heading or begin the the paragraph with “We propose...”.

Reviewers need this to find the proposed program fast during the review...

- Ex: We propose to observe the HH 212 jet at 5 au (corresponding to 0.013" here) resolution and 1 km/s velocity resolutions for 3 hrs in SiO J=8-7 to resolve the velocity gradient across the jet axis at more than 5 sigma detections to have the first reliable measurement of jet rotation..

6. Expected Results

What are the physical parameters that can be immediately derived from the observations.

These physical parameters allow us to discriminate between competing models or understand a phenomenon...

- Ex: The measured jet rotation will allow us to discriminate between the two competing models, namely, x-wind model and disk-wind model.

7. Scientific Impact

Describe the impact from small scales to broader scales.

- **Ex:** The results will allow us not only to determine the role and the origin of the jets, but also to probe the feeding process in the innermost edge of the disks to the central protostars. These results can be applied to jets and accretion disks around compact objects, AGNs ...

8. Feasibility

This is technical justification.

The proposed observations need to have the resolution and sensitivity to allow you to do the proposed science.

- Also, make the good use of the wideband receiver and include as many lines as possible. You will be surprised how powerful ALMA is to detect very faint lines.

be $??$ Jy/beam. Thus, we request a total time of 5 hrs in order to achieve a noise level of $??$ Jy/beam for more than 5 sigma detection to have the first reliable measurement of jet rotation.

Proposal Recipe

- Interesting and attractive Project Title
- Interesting and Eye-catching Title
- Clear and self-explanatory images.
- Easy sentences.
- Clear and informative section titles.
- Prepare as early as possible.
- Simulated images, model images
- Feasibility

Think about this:

1 reviewer needs to read, evaluate, and write comments about 100 proposals in a week or one proposal in 20 mins. If you were the reviewer, what would you do?

Note that, ALMA may start using distributive review in a couple of years.

Don't

- has been studied previously (Joe et al. 2013)
- reported by Me et al. (2016, submitted)
- It is obvious...
- inconsistency in time request (abstract & text)
- Spelling errors, typos, etc.
- Use small fonts to squeeze in more text
- Alter proposal template
- Exceed page limit

Do

- *The most important part of a proposal is the abstract.*
- *Some reviewers read ONLY the abstracts...*

Good luck on your proposals!!

Writing in English

- **Vocabulary**
- **Grammar**
- **Style of writing**

Writing Is Hard ?!

Grammatically correct is not adequate!

Construct each sentence with proper focus and emphasis.

Make proper transitions between sentences to make the text flow.

Constructing a Sentence

Subject + Verb + Stress Position

The subject is what is being discussed/described.

The verb articulates the action.

The stress position provides clue to the emphasis of the sentence.

For beginners, sentences are good to be as short and as simple as possible. Check with google translate!

Linking Sentences Together

Topic Position + Verb + Stress Position

The topic position establishes a perspective for viewing the sentence as a unit. It should provide the linkage (looking backward) and context (looking forward).

Linking Sentences Together

Topic Position + Verb + Stress Position

Put in the topic position the old Information that links backward; put in the stress position the new information you want the reader to emphasize.

Good luck on your proposals!!