

A Guide to Scientific Presentations

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IAA-CSIC

Scientific Presentation in Astronomy
IAA-CSIC, Severo Ochoa Programme
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Outline

- 1 Introduction
- 2 Content of a Talk
- 3 Presenting a Talk
- 4 Summary

Introduction

Introduction

What makes a good scientific talk?

The basic ingredients

- Well-defined topic and structure
- Clear take-away message(s)
- Easy to follow **by eye and ear**
- The Speaker **engages the audience.**

A fundamental truth. . .

No matter how great the content, no one will get it if they stop paying attention.

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Aims of this talk

Identify the keys to a good presentation.

Provide guidelines for preparation and presentation.

The two pillars of a presentation

- ### Content
- Purpose of talk
 - Scientific context
 - Motivation
 - Main message(s)

- ### Presentation
- Visual material
 - Speech
 - Clarity and conciseness
 - Enthusiasm

Advertising your talk

The abstract

- The abstract captures potential audience.
- **Keep it short.** (max 150 words)
- Only one paragraph.
- No details.
- Do not use the abstract from a paper.

Long is bad.

The nuclear cluster of the Milky Way: our primary testbed for the interaction of a dense star cluster with a massive black hole

This talk intends to provide a concise overview, from an observational point-of-view, of the current state of our knowledge of the most relevant properties of the Milky Way's nuclear star cluster (MWNSC). The MWNSC appears to be a typical specimen of nuclear star clusters, which are found at the centers of the majority of all types of galaxies. Nuclear clusters represent the densest and most massive stellar systems in the present-day Universe and frequently coexist with central massive black holes. They are therefore of prime interest for studying stellar dynamics, and the MWNSC is the only one that allows us to obtain data on milli-parsec scales.

After discussing the main observational constraints, we start with a description of the overall structure and kinematics of the MWNSC, then focus on a comparison to extragalactic systems, summarise the properties of the young, massive stars in the immediate environment of the Milky Way's central black hole, Sagittarius A*, and finally focus on the dynamics of stars orbiting the black hole at distances of a few to a few tens of milli parsecs.

Short is good!

The Milky Way's nuclear star cluster

Nuclear clusters represent the densest and most massive stellar systems in the local Universe and frequently coexist with massive black holes. They are almost omnipresent in galaxies. The Milky Way's nuclear star cluster is the only one that we can resolve into individual stars to study their kinematics and interaction with the central black hole. In this talk we will review the observational knowledge of our Galaxy's nuclear star cluster and the benchmark role it plays for understanding galactic nuclei, star formation, and stellar dynamics.

Part1: Content of a Talk

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Focus on the audience

Presentation must be centred on audience.

- 1 Who is your audience and what is the occasion?
- 2 Why may they be interested in listening to you?
- 3 What *is in it* for the audience?
- 4 Gauge your audience correctly.
- 5 Interests of audience vs. what *you* want to say

Remember your own experiences as member of an audience.

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Work out your main message

There should be a clear takeaway from your talk.

- 1 What is your main message?
- 2 Max three takeaways
- 3 Make sure message is interesting for audience

● What do you remember from talks that you attended?
● What would you do if you only had chalk and blackboard?
● Less is more.

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Describe the necessary background and motivation.

- Introduction: Provide necessary scientific context.
- Motivation: Why is this relevant and interesting (for you/the audience?)
- End intro with a statement of the problem.

What is the BIG PICTURE and where does your work fit in?

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Methods

Explain your methodology and techniques.

- Sufficiently detailed, but: Keep it simple! (KIS)
- Do not get lost in technical details.
- Identify key methodologies
- What is new in your theory, data, or methodology?
- Focus on what is necessary, not on all you know.

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Takeaway messages

Work out your main messages.

- Show highlights instead of all your results.
- Do not get lost in details.
- Conclude sections by summing up key points.
- Provide an outlook.

What do YOU remember from past talks?

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General aspects

Take care of these general points:

- Keep it simple.
- Leave room for questions.
- A talk CANNOT be complete; it serves as appetiser.
- Acknowledge collaborators, provide your contact details.

Complicated talks are not helpful.

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Content: Summary

Key points

- 1 **Adapt your talk to the audience.**
- 2 Work out your main messages.
- 3 Provide necessary background/big picture.
- 4 Do not talk about more than three highlights.
- 5 Be concise.

Presentation

Part 2: Presenting a Talk

Engage your audience emotionally.

Capture and keep the audiences attention.

- 1 **Transmit enthusiasm.**
- 2 Tell *your* story.
- 3 How could your work change the **big picture**?
- 4 What's in it for the audience?
- 5 Face your audience, smile, search eye contact.

How to present

- 1 Face your audience
- 2 Look at friendly faces, smile.
- 3 Speak clearly, slowly, and modulate your voice.
- 4 Speak with enthusiasm.
- 5 Do not make excuses.
- 6 Guide the audience through your talk (transitions).

Be a storyteller.

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Proper timing and organisation are fundamental,

- 1 **Shorter is (almost always) better.**
- 2 Follow the red thread, do not get lost on tangents.
- 3 Clearly mark the beginning and end of your talk.
- 4 Summarise key points at end of sections.
- 5 Pay special attention to **introduction** and **summary**.

Do not exceed your allocated time. CAPITAL SIN!

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Guidelines for slides

- 1 One clear statement per slide.
- 2 Be minimalist with your slides.
- 3 Never include anything that you will not explain.
- 4 It's a talk, not a reading session.
- 5 Text: Less is more (no complete phrases, few bullets)
- 6 Be careful with fancy PP/Keynote effects.
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The audience will see each slide typically for only ~ 1 min.

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- 5 Do not overuse pointer, slides should be self-explanatory.
- 6 Use sans-serif font (Helvetica, Arial, Gill Sans . . .).
- 7 Large font size, 24 pt minimum (20 pt for almost irrelevant information)
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Guidelines for the text content

- It is not very comfortable for the audience to have to read long text sections and bullet points that extend for more than one line.
- If you have something relevant to say then it should be readable.
- Often you may be tempted to include lots of fill words like "the", "a/aa", "as we can see", "we show that"... You can always make this easier with telegram style: *Our data show that the earth is round. → Earth is spherical.*
- And now you have seen a slide with too much text on it.

Be careful with contrast/colors.

Visual material

Guidelines for graphics

- 1 Use **dedicated graphics**, not graphics from articles.
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- 4 **Always** explain the details of **each** figure.
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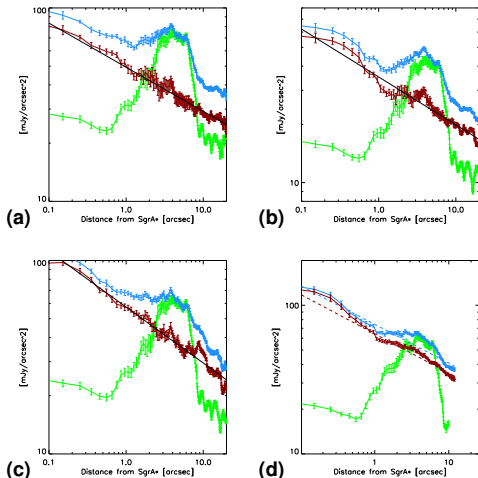
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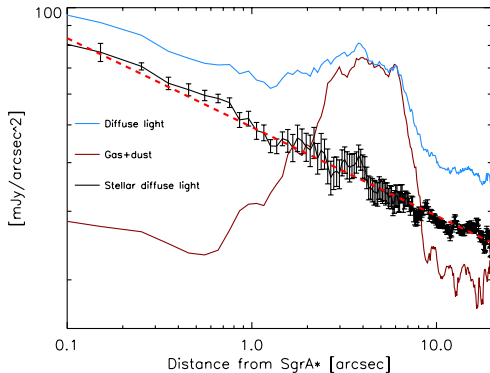
Graphics: Example - 1



How NOT to do it.

- Too many graphics
- Similar content
- Unreadable text
- Graphics taken from paper

Graphics: Example - 2

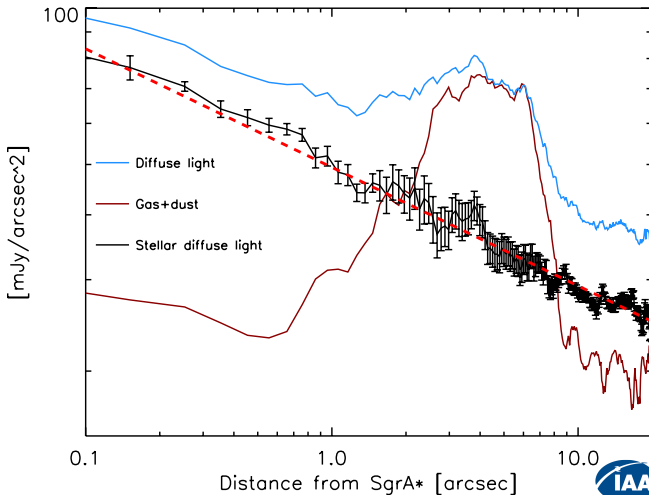


How to do it.

- Single graphics
- Readable
- Explain all details
- Unnecessary to show closely related graphics

Graphics: Example - 3

Stellar surface brightness increases toward Sgr A* (power-law).



Visual material

Pay attention to details.

- Check **spelling** carefully.
- Use correct capitalisation of titles.
- Take care with **pronunciation** (and clarify your doubts).
- **Accessibility**
 - Think of persons who cannot see or hear well.
 - Talk should be understandable from audio only.
 - Avoid small letters and small graphics.
 - Talk slowly and clearly.
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- Take care with **pronunciation** (and clarify your doubts).
- **Accessibility**
 - Think of persons who cannot see or hear well.
 - Talk should be understandable from audio only.
 - Avoid small letters and small graphics.
 - Talk slowly and clearly.
 - Avoid red/green graphics.

Visual material

Pay attention to details.

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Presentation

Adequate preparation is the mother of success.

- **Always do dry runs** for first-time talks.
- Explore the venue and test your slides.
- Dress for the occasion (neither over-, nor underdressed).
- Seek the help of **mother tongue speakers**.

Presentation

Common sins

- 1 Thinking a collection of slides is enough
- 2 Failing to put yourself in the audience's shoes
- 3 Not understanding how hard it is to gauge your audience
- 4 Using journal article graphics (or similarly unsuited ones)
- 5 Not understanding what can (and cannot) be achieved
- 6 Not doing dry runs on first-time talks
- 7 Not leaving time for questions
- 8 Rushing through your talk
- 9 Never ending your talk, overstuffing your talk

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Presentation

Think of the time, patience, and the amount of work (Full Time Equivalents) the audience dedicates to you.

Respect your audience.

How to prepare your Presentation

- 1 Think: message, audience
- 2 Create outline: slides, titles
- 3 Create and include graphics
- 4 Include some (but not too much) text
- 5 Repass your slides
- 6 Practice without audience, adjust and correct
- 7 Practice with audience, adjust and correct
- 8 If necessary, iterate

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Summary

A good scientific presentation . . .

- 1 is adapted to the audience.
- 2 focuses on a few highlights.
- 3 has unambiguous take-home messages.
- 4 is not too long.
- 5 is easy to listen and has easily readable graphics and text.
- 6 **engages the audience.**

Remember your own experiences.

Practice your talks.

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Practice your talks.

The end

Thank you.

Material

- 1 How to give a dynamic scientific presentation, Marilynn Larkin; <https://www.elsevier.com/connect/how-to-give-a-dynamic-scientific-presentation>
- 2 Common mistakes, David Robinson; <http://blogs.nature.com/naturejobs/2016/02/10/a-david-letterman-like-countdown-to-the-10-biggest-pitfalls-in-scientific-presentations/>
- 3 Section 5 of the LaTeX beamerclass manual; <http://tug.ctan.org/macros/latex/contrib/beamer/doc/beameruserguide.pdf>
- 4 Scientific presentations: A cheat sheet, A. Gaudet and L. Fonken; <http://blogs.nature.com/naturejobs/2017/01/11/scientific-presentations-a-cheat-sheet/>
- 5 Improve your scientific presentation slide design with 5 simple tricks, L. Smith; <https://www.theonlinescientist.com/5-simple-tricks-improve-slides/>

Material

An excellent talk

Nuclear Star Clusters - N. Neumayer, MPIA

<https://www.iaa.csic.es/seminars/so-webloquio-nuclear-star-clusters>