HELSINGIN YLIOPISTO
HELSINGFORS UNIVERSITET
UNIVERSITY OF HELSINKI

PAP301 Seminars in Particle Physics and Astrophysical Sciences

5 ECTS course 2025-2026

https://www.mv.helsinki.fi/home/osterber/Paras_seminars/

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Goals & outcomes of the course

- Develop your **oral & writing skills** in scientific contexts of your own specialisation (”presentation skills”) in English
- Develop your **peer-reviewing skills** (”feedback”) in English
- Develop your ability to **promote your expertise and market yourself** (”career development”) in English

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- **Plan your MSc thesis** & start working on it (if not already on-going, autumn 2025)
- **Make a MSc thesis disposition** (autumn 2025)
- **Prepare & give oral presentation** related to MSc thesis subject (spring 2026, first oral presentations already in Dec 2025)
- **Prepare abstract of oral presentation** (spring 2026, Dec 2025)
- **Give feedback** to your fellow students on career related task(s), oral presentation itself & its material (autumn 2025 & spring 2026)
- **Career related lectures/webinars & task(s)** (spring 2026)

Course plan

Gatherings:

- ✓ Period I-II: Wednesday 14-16 in lecture room Exactum CK107
  Get-to-gethers only occassionally, email sent in advance.

  Additional preliminary dates for autumn: Wed 3.12.
- ✓ Period III-IV: Wednesday 14-16 in lecture room Exactum CK107
  Regular presentations mostly every week, email sent in advance.
- ✓ Career related lectures/webinars/workshop (spring, date & time to be fixed)

Course homepage:
https://www.mv.helsinki.fi/home/osterber/Paras_seminars/

Autumn 2025: focus on starting and planning of MSc thesis

Spring 2026: focus on the preparation & giving of oral presentation (+ giving of feedback) as well as career related lectures & tasks

Course requirements

Course requirements:

- ✓ Make MSc thesis supervision agreement (if not yet done, autumn)
- ✓ Complete thesis disposition exercise (autumn)
- ✓ Make career development related tasks (spring)
- ✓ One page abstract of seminar topic (spring, Dec)
- ✓ Giving of a 25 minutes seminar (spring, Dec)
- ✓ Act as opponent & mentor to seminar presentation at least twice (spring, Dec)
- ✓ Min. 80 % attendance of seminars & career lectures/webinars/workshop (spring, Dec)

New for 2025-26

Course assessment

Changed for 2025-26

Course assessment

(based on oral presentation, grading 0-5, same as PHYS4006):

- ✓ 20 % timing (providing abstract 1 week in advance & slides 2 days before presentation and keeping the 25 min presentation time)
- ✓ 20 % abstract (descriptive & compact title, clarity & readability, language and correspondence to presentation)
- ✓ 25 % presentation material (adaptation to target group, structure of presentation, clarity of slides, suitability & readability of pictures, figures, formulas & tables, variables & unites clearly visible)
- ✓ 25 % presentation itself (contact & interaction with audience, audible voice and suitable pace, answering of raised questions)
- ✓ 10 % acting as opponent (constructive feedback, general assessment, detailed feedback, abstract vs presentation)

Use of generative AI

Use of generative AI:

✓ On the course we follow the general rules of University of Helsinki: https://studies.helsinki.fi/instructions/article/using-ai-support-learning

✓ Usage of Large Language Models (LLMs) is encouraged (when suitable for the task(s) to be completed)

✓ Usage of LLM's should be clearly stated including how LLM's were used

✓ Recommended to use the LLM provided by the university to students: Copilot (or CurreChat if you have access).
Instructions:
https://helpdesk.it.helsinki.fi/en/instructions/information-security-and-cloud-services/cloud-services/generative-ai-university

Discussion 1: MSc thesis research question

12 minutes discussion: Present your answers to the following questions to the other group members one at a time. The other group members are asked to give feedback.

Present your research question & open it up (Toulmin's model)

- What is your (possible) **conclusion/claim to your research question?**
- Which is **your argumentation** for your (preliminary) **conclusion/claim** and how are you going **show** (proceed to) **it ?**
- Which **counterarguments** do you have against your methods/conclusion/claim?
- Did you find this **opening up of the research question** helpful ? Or did you find it difficult **?**

Short reports (max 2 minute) by each group to the whole room

Discussion 2: MSc thesis work process

12 minutes discussion: Present your answers to the following questions to the other group members one at a time. The other group members are asked to give feedback.

- What kind of **research methods** are you going to use?
- From where can you find **backing/support** to use this methods?
- How is the **MSc thesis work process going** for you ?
- Have you **encountered difficulties/obstacles** during the MSc thesis work ? If so, have you **found help/ways to overcome** them ?
- Do you have any **suggestion/feedback** to supervisors/Master's programmes ?

Short reports (max 2 minute) by each group to the whole room

Seminar presentations

- ✓ **Seminar abstract** (in English & pdf format) **at least one week in advance** (uploaded in student area in Moodle) ⇒ put on course home page by Prof.
- ✓ **Seminar transparencies** (in English & pdf format) **at least 2 days in advance** (uploaded in student area in Moodle) (latest 23:55 on Monday during the same week as presentation on Wednesday)
- ✓ **Give a 25 minute seminar** (in English) preferably about Master thesis or at least about Master thesis subject
- ✓ Science discussion (questions & answers)
- ✓ Feedback on presentation by the two opponents

Abstract of seminar

- ✓ Maximum one page
- ✓ Content:

  i) the research area and topic, its purpose and background

  ii) the methods and data used plus results

  iii) possible conclusions based on the results

- ✓ Try if by any means possible to write the abstract as a (long) scientific abstract
- ✓ To be uploaded by the student in the students' work area on course Moodle page as a new topic "Jane/Joe Smith abstract and slides" (replace "Jane/Joe Smith" by your own name), **no later than one week before the seminar.** Prof. makes the abstract available on the course home page.

Seminar presentation slides

- ✓ To be uploaded by the student in the students' work area on course Moodle page under the same topic as his/her abstract **latest Monday 23:55** the same week as the presentation on Wednesday.

The tasks of the mentors

- ✓ Make feedback and suggestions for improvements on the abstract and presentation slides under the abstract and slides topic in the students' work area in course Moodle page.
- ✓ Abstract and presentation slides feedback by Tuesday evening (when the presentation is on Wednesday)
- ✓ Gives the presenter the possibility to upload new versions of abstract and presentation slides by Wednesday 14.15.

NB! The mentors should give constructive and encouraging feedback.

The tasks of the opponents

- ✓ Gets acquinted with the abstract and the research field
- ✓ Asks (at least) 1-2 relevant questions about the seminar (preferably thought through before the seminar)
- ✓ Gives feedback to the seminar holder on following topics:
  - abstract: descriptive & compact title, clarity & readability, language and correspondence to presentation.
  - transparencies: adaptation to target group, structure of presentation, clarity of slides, suitability & readability of pictures, figures, formulas & tables, variables & unites clearly visible
  - performance: contact & interaction with audience, audible voice, suitable pace and answering of raised questions.

NB! The opponents should behave correctly, be encouraging and give constructive feedback.

Seminar schedule December

Wednesdays in Exactum CK107 (maximum 2 seminars per session)

- 3.12. 14:15 Rasmus (opponent #1: Taavi, opponent #2: Esra, mentor #1: Esra, mentor #2 Antonio)
- 3.12. 15:15 Esra (opponent #1: Rasmus, opponent #2: Anne, mentor #1: Antonio, mentor #2 Rasmus)
- 14.1. 14:15 Jeff (opponent #1 Esra, opponent #2 Rasmus, mentor #1: Rasmus, mentor #2 Esra)

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Getting your message through

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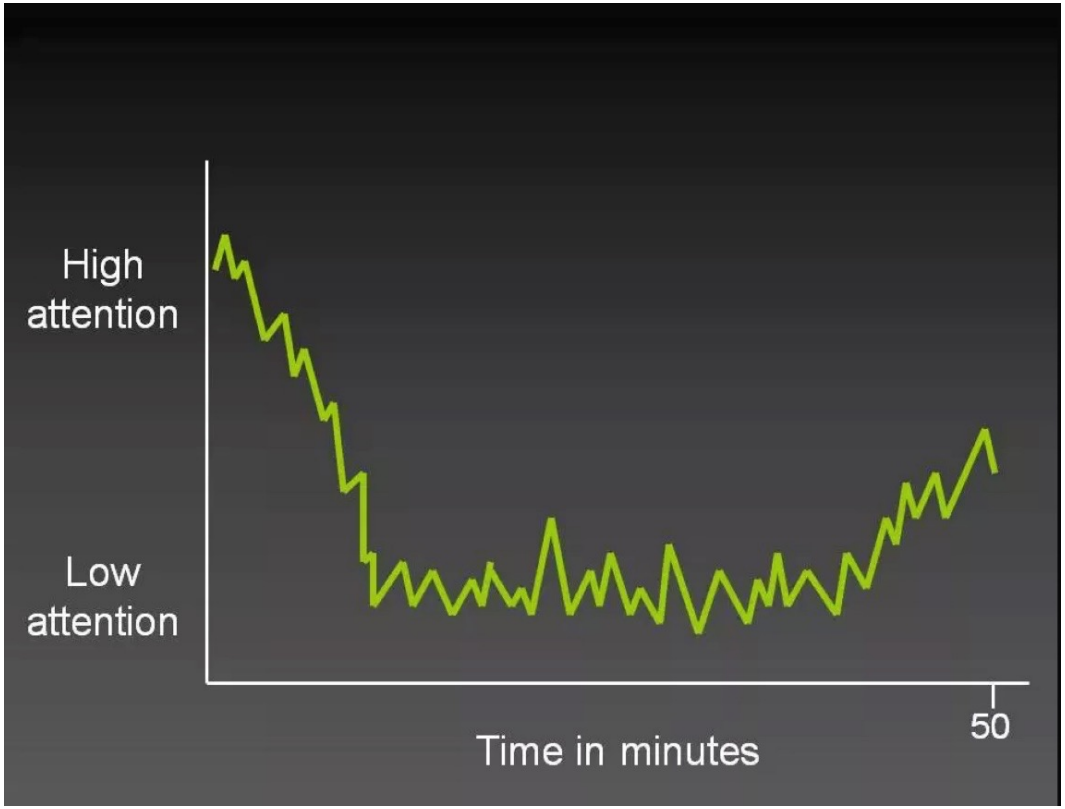
Seminar

You should:

- win the attention of the audience
- show you credibility as a speaker
- keep the interest of the audience
- give the listeners new ideas, thoughts or knowledge

Hartley and Davis 1978: The attention of university students during a 50 minute lecture – where the lecturer lost his audience



Think about your audience

- Always start by thinking about your audience
  - What do they know about the subject?
  - What could they be interested to hear about it?
  - How can you get the attention or make interested as many as possible of what you are talking about?
- To talk to a high school class is completely different than to talk to specialists of your own field → influences the emphasis of your presentation and how much time you spend on introduction, current state of the art, specific research question and methods, results.

How to get your message through ?

Follwing things can prevent your scientific message to reach the listeners:

- Usage of difficult terminology
- Unnecessary and unexplained usage of abbreviations and acronyms
- Too many details without the global picture
- Long derviation of formulas, which is impossible to follow during the limited time of the presentation

The three critical points

- Outline: tell the essential about your presentation and repeat it
- Slide titles: never waste them - give a message!
- Conclusions: Interpret your results

Outline

How much information does this outline give about the scientific content of your presentation?

- Background
- Methods
- Results
- Conclusions
- Future steps

Outline

That's right zero! Outline is first possibility to give relevant scientific information – use it

- Describe the *scientific content* of your presentation to the audience.
- Show where you are going to start, where you will go next, and how you are going to finish.

Good practice to repeat the outline after each part

Scientific topics as outline are a step in right direction …

- Methane in the atmosphere
- Measuring methane fluxes
- Methane fluxes in a Finnish pine forest

Scientific topics as outline (with question formulation)

- Methane in the atmosphere...has a role in what? Aerosol formation? Global warming? Oxidation?
- Measuring methane fluxes...with what? was how? Trivial?/Easy?/Complicated?/Needs development?
- Methane fluxes in a Finnish pine forest...were what? Unexpected? Surprising? Similar to global average?

Give the audience a message !

Summarise the main message of each section in your outline; it includes the topic but is more informative:

- Methane is an important greenhouse gas
- Measuring methane fluxes with chambers can be tricky
- Surprisingly variable methane flux in a Finnish pine forest

The three critical points

- Outline: tell the essential about your presentation and repeat it
- Slide titles: never waste them - give a message!
- Conclusions: Interpret your results

Never EVER waste title space!

- Title is the first thing the audience will see and read
- It is the biggest, the most visible space you have on your slide
- Use it to full advantage: give the *message* of your slide!
- Then it will be of less relevance into what details you go that allows the listeners to get a picture of what you want to get across.

Small ion concentration measurements

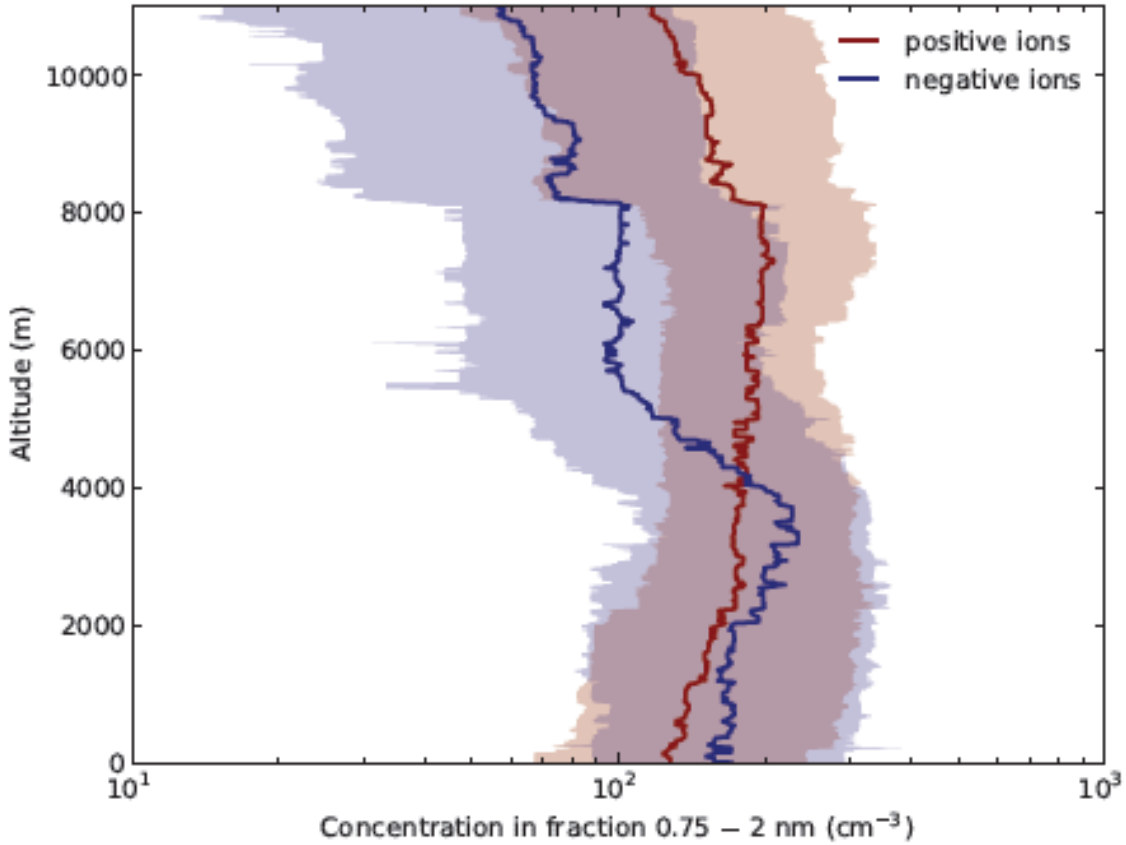
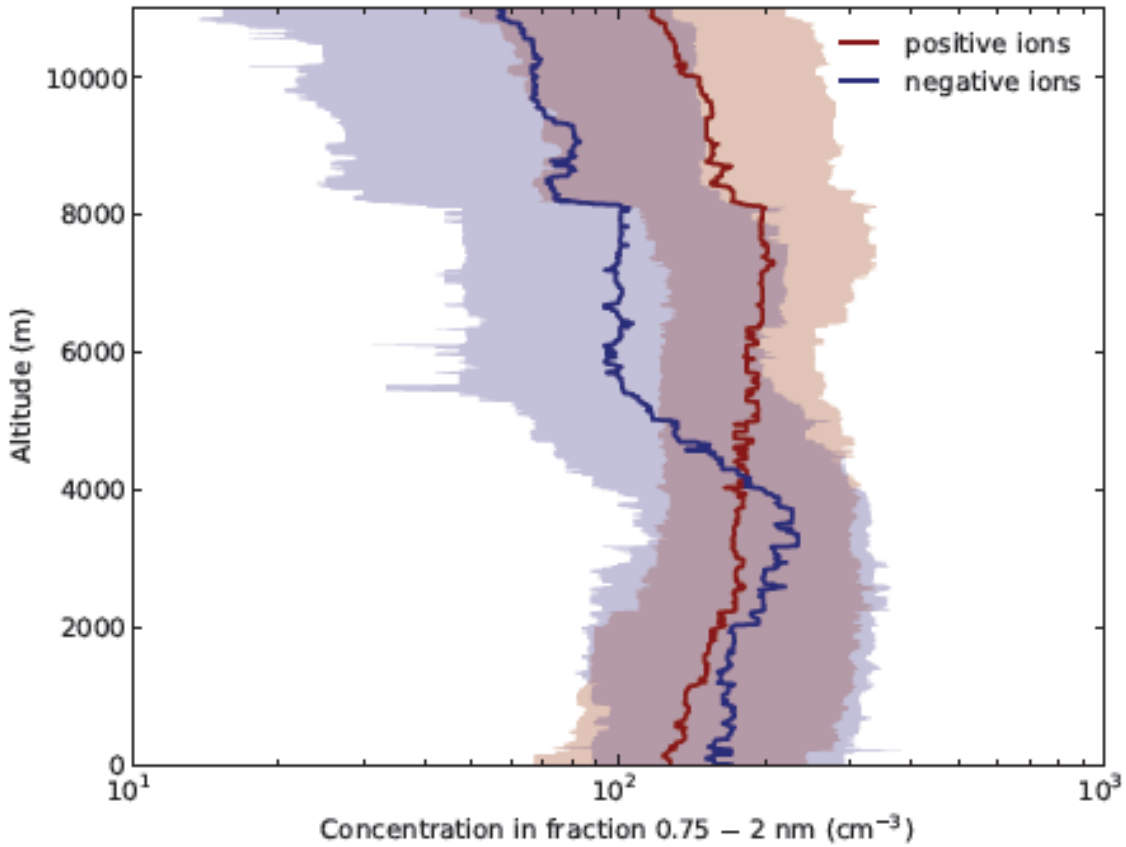


Fig. 9. Small ion concentration as a function of altitude – medians and 25 and 75% quantiles are presented.

Perhaps the most typical type of title, this one gives the complete topic of this slide. But do you understand why the speaker shows this slide? Do you see the scientific significance?

The concentration of small ions showed the expected height profile



This title gives the main point !

If title becomes too long you can divide it into a title and subtitle.

Fig. 9. Small ion concentration as a function of altitude – medians and 25 and 75% quantiles are presented.

The three critical points

- Outline: tell the essential about your presentation and repeat it
- Slide titles: never waste them - give a message!
- Conclusions: Interpret your results

The conclusions tells the relevance of your results/research

- The frame of reference of the results and their immediate relevance demand your expertice and reveals that you are an expert.
- Anybody can write a list of results… but only YOU can tell the audiance the relevance of the results for the global picture.
- With your own expertice, tell what has succeeded and what not as well as what you recommend should be done differently or as next steps.
- Always end with the main message.

Best practices

- Interact with the audience both visually and verbally !
- Time your presentation well and put regularly highlights or attention drawers (to keep the interest of the audience)
- Don’t use too many effects and colours for the slides, removes the attention from the key points: your message
- Don’t put too much material per slide (3-4 main bullets) so that the audience have time to read the slide & listen to you

Best practices

- Add illustrations, graphs, pictures (”a picture says more than 1000 words”) but they should be clear, easily readable and relevant for the message !
- Highlight relevant parts of formulas and tables to ease their reading
- Add references & put page numbers (for further reading & questions after the presentation)
- Make the presentation personal, to reflect your personality !