

Seminar II: An amazing discovery / Crackpot?

General instructions

This document provides instructions for the second of the three seminars forming part of the examination for the course *Physics of Galaxies* in 2020. This is a role-playing exercise that will cast you into situations that scientists (and especially astronomers) frequently encounter, yet in general tend to be rather poorly prepared for.

The point of this exercise is to:

- Practice reading research papers, press releases and other scientific texts in the field of extragalactic astronomy
- Practice critical thinking
- Practice interacting with the public and with journalists in a professional manner, and also to get some feeling for what it may feel like to be on the other side of this conversation.

This seminar features two separate role-playing scenarios – *An amazing discovery* and *Crackpot?* – with each scenario revolving around the meeting of two different characters. Each scenario will take about one hour to enact, including some time to get into character at the start of each scenario and some time for feedback and discussions afterwards.

At the start of each scenario, all students will be randomly assigned into pairs and given one of the two roles available. Since you won't know beforehand which role you'll get to play, you should mentally try to prepare for both. Please note that once you have been assigned a role, you will also get a sheet with some additional character information, i.e. information that the student playing the other character will not have access to.

A bit of background

A career as a scientist occasionally involves giving public talks, communicating with the media, informing politicians about science and taking part in other kinds of outreach activities¹. Getting media coverage is not equally easy for all branches of science, but media loves astronomy (it's true!), and many – if not most – professional astronomers therefore regularly get requests from journalists to either discuss their own results or to comment on the results of others. There are specialized courses for scientists on how to deal with the media, but the vast majority of astronomers have learned how to get by through trial and error. Another common experience for the professional astronomer is to get approached by members of the public who are curious about some sky phenomenon, or otherwise want to

¹ At Swedish universities, the task of interacting with society is often referred to as *tredje uppgiften* – “the third task” – with the first two being research and education.

discuss the inner workings of the Universe. Dealing with tasks of this type are usually both fun and rewarding, but there are definitely cases where things can get a bit tricky. An important goal of this role-playing exercise is to get first-hand experience of some of the difficulties that may arise in situations like these.

Preparing for the seminar

In preparing for the seminar, you should:

- Read the scenario descriptions below
- Study and scrutinize the online material that these descriptions link to.
When doing so, you'll notice that the research paper used in scenario 1 is pretty lengthy and technical. However, it is not necessary to wrap your head around every single detail in that paper – just focus on the big picture. In a real-life media situation, you'll likely have no more than an hour or two to prepare before an interview, so please don't spend more time than that studying this particular paper.
- Develop your own opinions on the credibility of this material. This may well require doing some online detective work, reading other relevant literature or doing some calculations to verify or overthrow the claims made.
- Mentally prepare to play *both* characters in each scenario. This may, for instance, involve preparing questions that character A may want to ask character B, and vice versa.

If you want to look for scientific papers on topics related to these scenarios, the recommended article databases are:

- http://adsabs.harvard.edu/abstract_service.html
(to get the published versions of papers)
- <http://arxiv.org>
(for preprints – but please note that some of these are will never get published in a refereed journal)

You are perfectly welcome to collaborate with your classmates when preparing for the seminar, but once there – everyone is on their own. This means that you are not supposed to rely on the notes, knowledge etc. of others. Please note, that unlike seminar III in the *Physics of Galaxies* course, seminar II one will only be graded pass/fail. If you have understood the assigned reading material and made a decent effort of playing the parts you are assigned during the seminar session, then you will pass. Serious acting skills are not required.

Scenario 1: An amazing discovery

Characters: PhD student in astronomy and science journalist

Online material: SeminarI_press_release.pdf, SeminarI_paper.pdf (available from the Student portal)

An extravagant press release issued by NASA catches the eye of a freelance science journalist. The press material describes what appears to be an exciting result in extragalactic astronomy, and the journalist decides to cover this in a short article. However, the research paper that forms the basis of this press release is a bit too technical for a non-astronomy major and the journalist therefore calls the local university to get some advice from a professional astronomer on what the paper is actually saying. At last, the journalist manages to get hold of a PhD student who is willing to take a look at the paper and comment on its content. This PhD student is not a specialist on the topic in question, but is at least doing research in an adjacent field. Later that day, the two meet up at the astronomy department for an interview session.

Scenario 2: Crackpot?

Characters: PhD student in astronomy and self-taught cosmologist

Online material: SeminarI_draft.pdf (available from the Student portal)

A person calls the astronomy division, presents him/herself as a self-taught cosmologist and claims to have discovered something truly amazing in a publicly available astronomical dataset. This independent researcher has drafted a paper about the results, but would really like to get the opinion of a professional astronomer before submitting the manuscript for publication. After having been given the runaround for a while, he/she finds a PhD student willing to take a look at the manuscript. The self-taught cosmologist promises to send the manuscript by email immediately, but also asks whether it would be OK to drop by at the department the following day to discuss the contents? After a bit of hesitation, the PhD student agrees to this meeting. Then the paper arrives. It clearly has many flaws, but is it possible that there is a real discovery buried in the mess? Is this the work of a crackpot or an outsider genius?

Erik Zackrisson, March 2020