

Seminar III: Strange Galaxy

General instructions

This document provides instructions for the third of the four seminars forming part of the examination for the course *Physics of Galaxies* in 2019. This is an exercise with game-like mechanics that aims to provide insight into some of the observational techniques commonly used in extragalactic astronomy.

In the *Strange galaxy* game, you will be assigned to different teams and presented with a sequence of observational problems to solve. Each such scenario involves a set of observational data on an unusual, poorly understood galaxy or other astronomical object. The objective is to understand the nature of the object by gathering additional information through carefully chosen follow-up measurements. There are many observational methods that can be applied in each situation (optical monitoring, ultraviolet spectroscopy, high-resolution near-infrared imaging etc.) and they all provide slightly different clues to the puzzle. Resources are, however, limited. At the start of each scenario, every team will be granted a limited research budget (in a fake, in-game currency), and every new measurement that you choose to make will set you back by a certain amount. The objective of the game is to crack the puzzle before running out of funding.

The point of this exercise is to:

- Learn more about observational methods in extragalactic astronomy, get a feeling for the pros and cons of the different techniques and what methods it makes sense to apply in a given situation
- Practice critical thinking
- Practice collaborating within a team

Preparing for the seminar

In preparing for the seminar, you should:

- Read sections 1.3-1.4 (pages 19-42) in the textbook to get an orientation about some of the telescopes and observational methods relevant for extragalactic astronomy

Please note, that unlike seminar IV in the *Physics of Galaxies* course, seminar III one will only be graded pass/fail. If you are actively taking part in the game, then you will pass. Don't worry if your team keeps going bankrupt or fails to solve the puzzles – this is all part of the learning experience.

Erik Zackrisson, March 2019