

DRIVING QUESTION



Starting: Should we look for, and try to contact, intelligent extraterrestrial life?

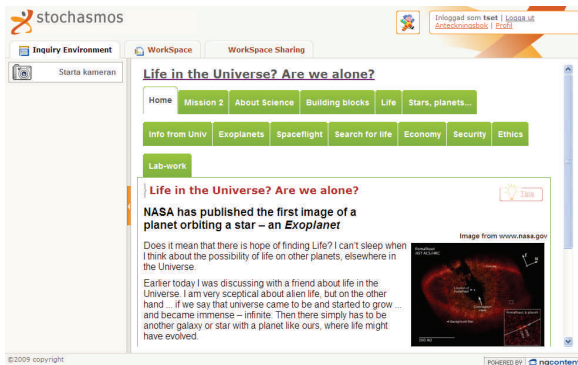
Halfway: Should we try to transform Mars into a planet where humans are able to live in the future?



LOCAL WORKING GROUP MEMBERS

Lena Hansson, Andreas Redfors & Maria Rosberg, Kristianstad University
Ingid Lundh, Bromölla, Sweden

SCENARIO



NASA has published the first image of a planet orbiting a star – an Exoplanet

Does it mean that there is hope of finding Life? I can't sleep when I think about the possibility of life on other planets, elsewhere in the Universe. Earlier today I was discussing with a friend about life in the Universe. I am very sceptical about alien life, but on the other hand ... if we say that universe came to be and started to grow ... and became immense – infinite. Then there simply has to be an-

other galaxy or star with a planet like ours, where life might have evolved. But, can it be proved? I get confused by this issue, because even if I do not believe in God directly. I find it hard to believe that humans just evolved and came to be in several places.

But, if you can find planets around our stars it might be a breakthrough. It raises a lot of questions with me. Are we alone? Where can life be found? Would it be possible for us humans to move to another planet? Are there ways to find out about this? Who should do it? Should we do it? Do we want to know? What would it cost? I now want Your help in answering the basic question:

- Should we look for, and try to contact, intelligent extraterrestrial life?

Before you decide you need to review scientific data on stars, planets and possible life in the universe. You need to study data on scientific, social, economical and ethical aspects of this question, and base your evidence-based answer on this.

LEARNING GOALS

- By the end of the intervention students are expected to:
- demonstrate an understanding of an evolving universe, exoplanets, atomic spectra, req for life, observations, time and distances, technical development, ethics of science and technology
 - demonstrate an understanding of the nature of science and theoretical models through evidence-based argumentation
 - describe the connection between performed hands-on lab-work and methods within astrobiology research
 - provide evidence-based answers to the questions, using four aspects: scientific, social, economical and ethical.

INQUIRY ACTIVITY OVERVIEW

- Worldview activity on presuppositions.
- Lab-work on triangulation and atomic spectra.
- Analyses and discussions of habitable zones for exoplanets.
- Analyses and discussions of the probability of other intelligent species in the milky based on the Drake equation.
- Inquiry in STOCHASMOS and synthesis into an evidence-based report with a feedback-based revision process with peers in STOCHASMOS.
- Final discussion in the group before submitting a final report.

PILOT ENACTMENT

- Begin date:** Feb.27th 2009
- End date:** Apr. 3rd 2009
- Number of sessions:** 13
- Duration of each session:** 70-minute sessions
- Grade level:** 9th grade (15-16 years old)
- Subject:** General Science
- Number of participating students:** 30
- Enactment teachers:** 1

WORKSPACE

The WorkSpace environment for the pilot consisted of a total of eight templates of three different types.

The first type of templates supported students in activities.

The second type supported creation and synthesis of evidence-based arguments.

The third type of templates supported students in writing their final decision.