

Programme

Summer School Food from Mars to Moon



Course leaders

Dr.ir. Wieger Wamelink & Dr Zhen Liu

Date: 10 July – 21 July 2023

Location: Wageningen Campus, Phenomea building (building 125), The Netherlands

Organisation: Wageningen Academy

Introduction to the course

Welcome to the course 'Summer School Food For Mars and Moon'.

Learning objectives

After this course you will:

- Overview of the lunar and Martian environments
- Agricultural techniques and technologies for space environments
- Plant biology and genetics in space
- Food processing and preservation in space
- Nutritional requirements for space travelers
- Sustainability and resource management in space agriculture

Course Structure:

- Every day half day onsite/online live lectures
- Experiment at different locations in the 2 weeks program

Group assignment

You will be divided into teams and will work together with participants in the next 2 weeks, the group members information and group assignment information will be released later when the course is kicked off.

WUR guest account

You will receive an email from register.wageningenacademy@wur.nl about the your personal WUR guest account and further information to access to the online education platform Brightspace. Your guest account will be valid till August 15, 2023.

All the lectures will be given in live, so you are encouraged to join it lively to participant in discussions. However, if you miss one or two modules due to other obligations, you still have the chance to watch it later as all the lectures will be available in the whole study period till August 15, 2023.

Brightspace

This will be the main channel for the course, everyday there will be live lectures in the virtual classroom. Recommend to follow it via computer, using Chrome or Firefox to access the virtual classroom.

Certification

After attending this course and pass the evaluation, a personalized certificate will be issued by Wageningen University & Research. It will be in your name and signed by the course leader. To be awarded this certificate you need to fulfil all course requirements and fill in the course evaluation survey.

The outstanding standing students will have the chance to get a recommended letter or/and WUR souvenir.

List of speakers

Dr. ir. Wieger Wamelink	Senior scientist Wageningen University & Research
Mr. Govert Schilling	Science writer, author of several acclaimed books about astronomy and cosmology
Dr. Cecilia Stanghellini	Senior Scientist Greenhouse technology, Wageningen University & Research
Esther Meinen	Researcher Crop Physiology and Cultivation Systems, Wageningen University & Research
Caterina Carpineti MSc	Researcher Vertical Farming, Wageningen University & Research
Dr.ir. Twan van Hooff	Associate professor Building Ventilation, Unit Building Physics and Services, Eindhoven University of Technology
Raf Verdaasdonk	MSc Student Biology and Plant sciences at Wageningen University & Research
Rebeca Gonçalves MSc	Commercialization and Innovation for Human and Robotic Space Exploration European Space Agency – ESA
Charlotte Pouwels MSc	CTO and Co-founder ICEE. Space and CHILL-ICE analogue astronaut mission coordinator
Tiago Pereirinha Ramalho MSc	Doctoral researcher, Sustainable bioproduction on Mars, Research Group Environmental Process Engineering and Laboratory of Applied Space Microbiology, University of Bremen
Dr. Iulian Zultan Boboescu	Assistant Professor microbial and microalgal multiproduct biorefinery, Wageningen University & Research
Antonia Fichtbauer MSc	PhD researcher, Bio Process Engineering, Wageningen University & Research
Prof dr. Eiko Kuramae	Professor Microbial Community Ecology & Environmental Genomic, Utrecht University
Ir. Natasja Gianotten	Research Engineer Entomology at Ynsect Netherlands Biotech R&D
Ir. Lotte Bohlander	Space farmer @ Food For Mars & Moon (research intern), Wageningen University & Research
Dr. Zhen Liu	Program manager, Wageningen Academy, Wageningen University & Research

Location for lectures

Location: Wageningen Campus, Phenomea-building | Room Plaza
Address: Bornsesteeg 9, Building 125, Wageningen



Location for experiment in Wageningen



Location: Wageningen Campus, Nergena
Address: Bornsesteeg 10, building 112, 6721 NG Bennekom

Monday 10 July 2023 Program introduction

- 09:00-09:15 Welcome and introduce of the summer school
Dr.ir. Wieger Wamelink & Dr Zhen Liu
- 09:15-10:15 Introduction experiment and challenge
Dr.ir. Wieger Wamelink
- 10:30-12:00 Strange new worlds – the Moon and Mars
Mr. Govert Schilling

Tuesday 11 July 2023 Exobiology

- 09:00-12:00 Life outside Earth, possibilities, impossibilities and threats
Dr.ir. Wieger Wamelink

Wednesday 12 July 2023 Plant growth in space: the challenges

- 09:00-12:00 Feeding the crew for space missions (Terrestrial analogue & Indoor cultivation of a vegan diet)
Dr. Cecilia Stanghellini, Esther Meinen and Caterina Carpineti

Thursday 13 July 2023 Crop growth in space under zero gravity

- 09:00-11:00 Computational fluid dynamics (CFD) for vertical farms: airflows, heat transfer and buoyancy
Dr.ir. Twan van Hooff
- 11:00-12:00 Sharing the experiment result of Food for Mars and Moon project in WUR
Raf Verdaasdonk

Friday 14 July 2023 Plant growth and challenges with the regoliths

- 09:00-10:00 Intercropping on Mars soil simulant and Earth soil- an application on Both Worlds
Ms. Rebecca Gonçalves MSc
- 10:00-12:00 Earth analogue missions like Hi-SEAS & Project of NASA and ESA and their challenges
Ms. Charlotte Pouwels MSc

Saturday 15 July 2023 Excursion

Whole day trip to some castle(s) and Space Expo in the Netherlands

Monday 17 July 2023 Plant growth and challenges with the regoliths

- 09:00-10:30 Sustainable bioproduction on Mars: from primary producers to crop production
Mr. Tiago Pereirinha Ramalho MSc
- 10:30-12:00 Q&A sections

Tuesday 18 July 2023 Algae for proteins, medicine and as manure

- 09:00-10:00 Phytoplankton in space: Could microalgae unlock circular food and life support systems
Dr. Iulian Zultan Boboescu & Antonia Fichtbauer
- 10:00-12:00 Beneficial microbes inhabiting simulated Martian soil
Prof.dr. Eiko Kuramae

Wednesday 19 July 2023 Excursion day

NPEC & Unifarm & AlgeaParc in Wageningen

Thursday 20 July 2023 Insects for proteins

- 09:00-11:00 Insect rearing: an alternative source of protein in our meals.
Ir. Natasja Gianotten
- 11:00-12:00 The lesser mealworm for food security on Mars
Ir. Lotte Bolander

Friday 21 July 2023

- 09:00-11:00 Group presentations
- 11:00-12:00 Wrap up and closing
Dr.ir. Wieger Wamelink & Dr Zhen Liu

Participants list

No.	Name	Country	Organization	Online/ On-site
1	Serena Bordignon	Italy	Ghent University	On-site
2	Stavroula Chaloulakou	Greece	Agricultural University of Athens	On-site
3	Nuofan Gao	Italy	Sant'Anna School of Advanced studies	On-site
4	Sunghyuk Jang	South Korea	Chungnam National University	On-site
5	Can Jiang	China	Chongqing University of Education	On-site
6	Hangi Kim	South Korea	Chungnam National University	On-site
7	Daan Molhuijsen	The Netherland	HAN University of Applied Science	On-site
8	Chengyi QU	China	Zhejiang University	Online
9	Alvaro Roperro	Spain	Utrecht University	On-site
10	Agustin Iberlucea Saglietto	Argentina	Universidad Nacional del Sur	Online
11	Junwei Sun	China	Yunnan Agricultural University	Online
12	Costanza Torchia	Italy	Utrecht University	Online
13	Malachai Uys	Zimbabwe	Stellenbosch University	Online
14	Yiling YANG	China	Zhejiang University	Online
15	Lu Yingji	China	China Agricultural University	Online
16	Jieyu Zhang	China	Chengdu University	On-site
17	Qi ZHAO	China	Zhejiang University	Online
18	Polaris Zhou	China	Nanjing Agricultural University	Online
19	Guillaume Gégo	Belgium	University of Mons	Online
20	Jin YANG	China	Nanjing Agricultural University	Online
21	Zheng LIN	China	Zhejiang University	Online
22	Yike TAO	China	Zhejiang University	Online
23	Maria Grazia Ieva	Italy	Università di Bologna	tbc
24	Lotte Bohlander	The Netherlands	Wageningen University	On-site
25	Raf Verdaasdonk	The Netherlands	Wageningen University	On-site