



Federal  
Citizen Science  
Inspiration &  
Networking Day



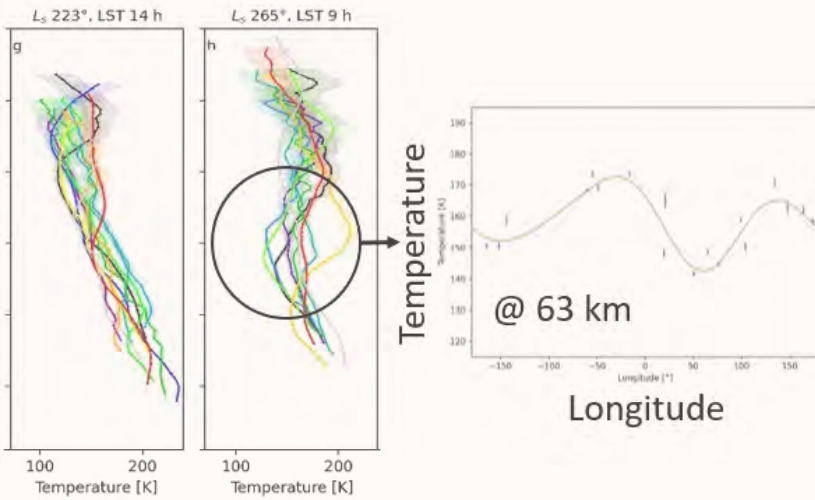
Art: the gateway to science for everyone  
Karolien Lefever





# Planetary atmospheres are complex systems

## Longitudinal variations in MY 35

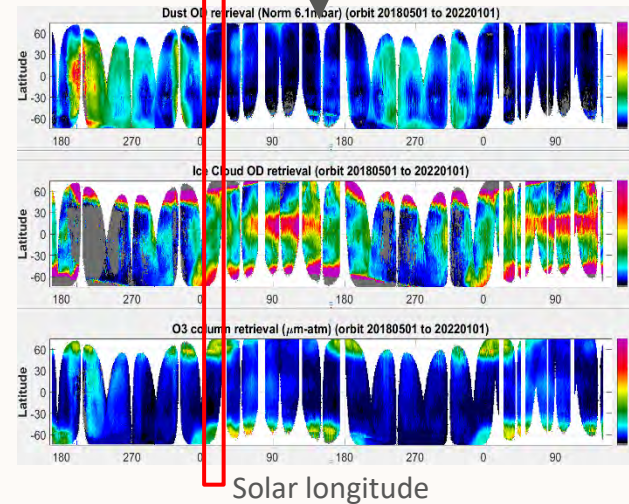


## Nadir climatologies

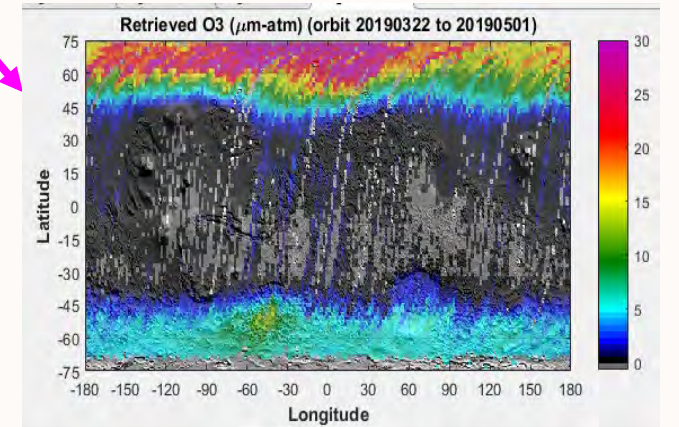
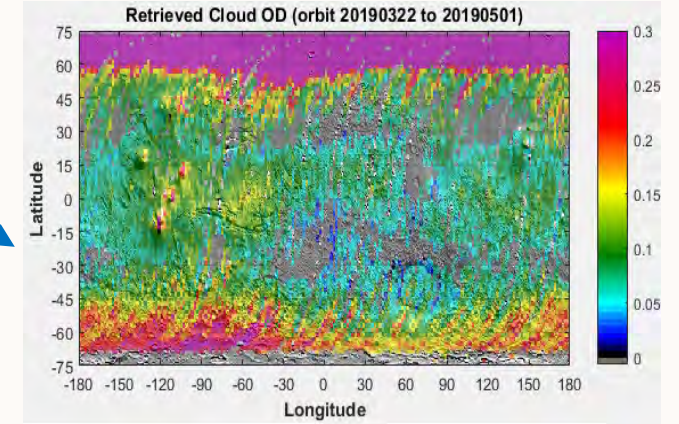
Spatial map of ice clouds

Spatial map of ozone

Seasonal maps of ice clouds, dust and ozone



$L_s = 0 - 20^\circ$



$L_s = 0 - 20^\circ$

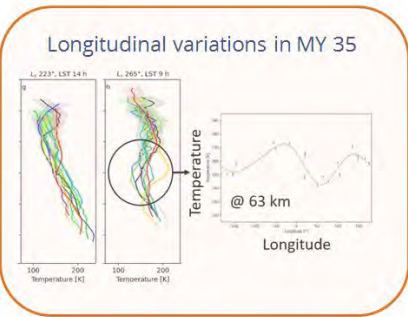
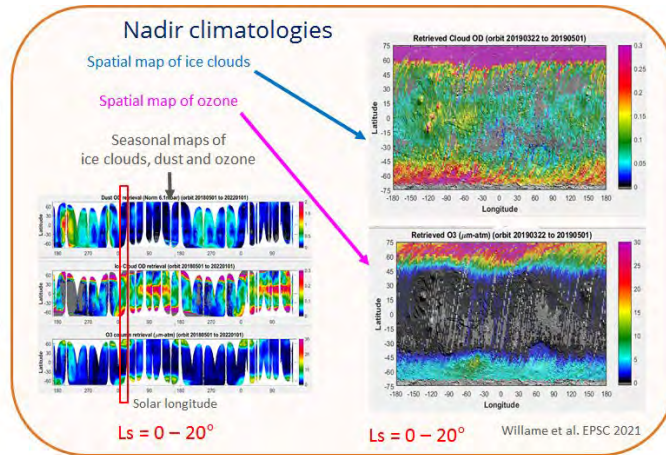
Willame et al. EPSC 2021



# Planetary atmospheres are complex systems

The conventional way of representing atmospheric data has many limitations:

- **Scientists** may miss the opportunities to see trends/patterns in the data that could appear by analyzing the data from a different perspective.
- The **general public** may find it difficult to understand what the data is telling us.
- **People with visual disabilities** are completely left out.



We need to think outside of the known boundaries and explore new territories between science and arts.

It is important to include art in the representation process in order to create new strategies, tools and resources that may provide people with special educational needs a participative learning place.





Making planetary research inclusive and accessible to all

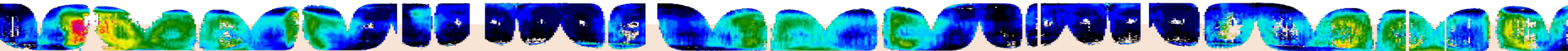
# RoadMap

H2020 RoadMap:  
ROle and impAct of Dust  
and clouds in the Martian  
AtmosPHERE: from lab to space



3rd bachelor  
“Media and  
Information  
Design”

=> “Students learn to deal creatively with new media technologies and present information in a visually clear and attractive way.”



PROJECT WEEK: Students learn to interpret and present highly complex data through artistic data representations. They create unique visual expressions that offer an unconventional way of experiencing the data.



# “Dust on Mars” - Digital projection

**KEY MESSAGE** - Dust is omnipresent on Mars. Its abundance varies by altitude and season.



*Scientists from BIRA-IASB are being immersed in an environmental representation of aerosols in the Martian atmosphere.*

The amount of aerosols is intuitively shown as particles, while their altitude is shown by their height, creating a unique and engaging experience that evokes standing on Mars surrounded by dust.

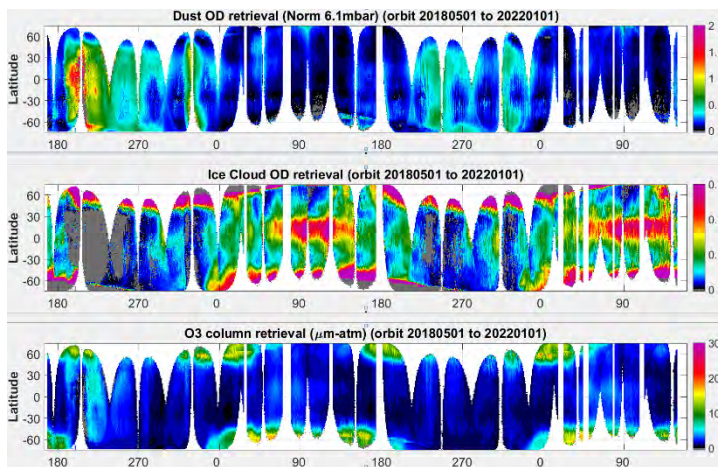
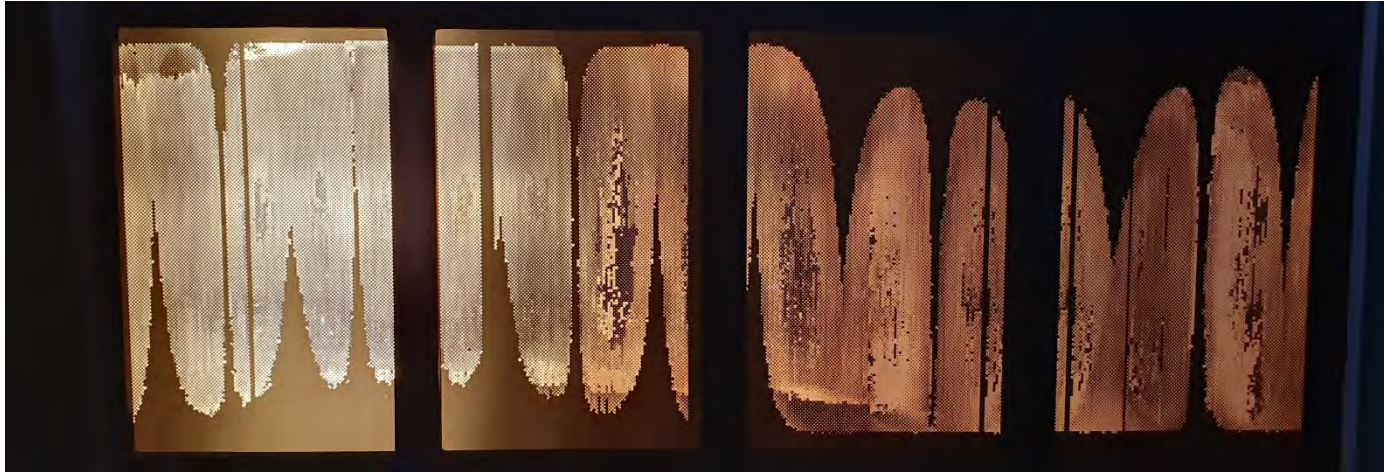
**Artists:**

Hannelore Knaepen, Asad Masood, Tristan Van Garsse





# “Shine through Mars” – Physical box



**KEY MESSAGE** - Depending on the amount of dust and ice clouds in the Martian atmosphere, there may be less light reaching the planets surface.

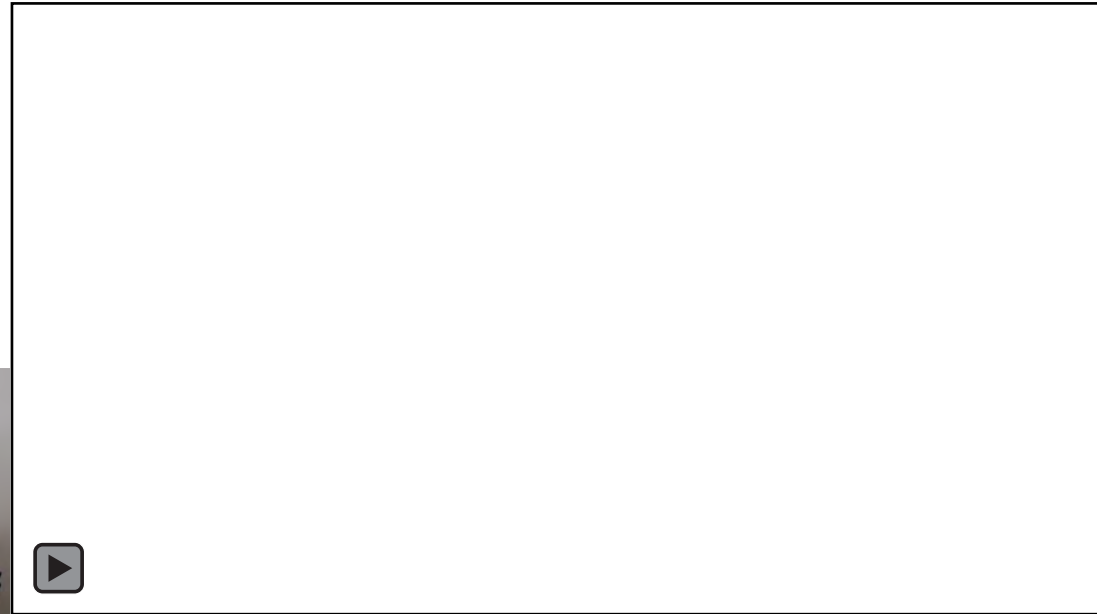
The installation shows the amount of light that reaches Mars throughout the four seasons of one year.

Artists:

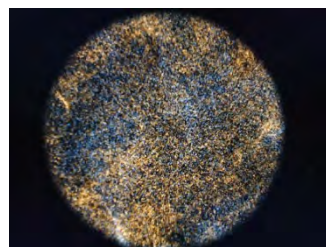
Hannelore Knaepen, Asad Masood, Tristan Van Garsse



# “Ice Clouds and Dust on The Red Planet” – An Acoustic Journey



**KEY MESSAGE - Changing weather patterns on Mars (evolution of ice clouds and dust).**



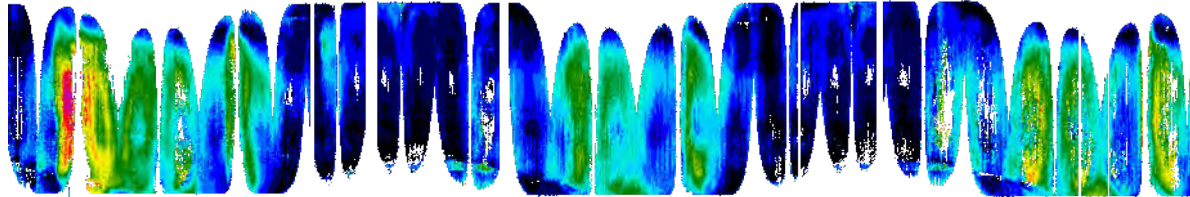
*Each particle (ice and dust) has a unique sound and comes from either left or right, while the frequency of the sound represents the amount of that particle. As time progresses, the seasons change, resulting in a unique acoustic representation of the changing weather patterns on Mars.*

**Artists: Karina Gevorgyan, Nattakit Pheanklang, Dieter Roozeleer**





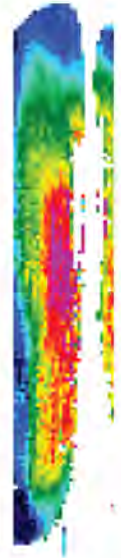
# Explanatory exhibition panels



*"I was inspired by the rainbow coloured data visualisations that are so prevalent in your field, as I find that they can be rather beautiful in some cases. I used Yannick's seasonal dust data and recreated his visualisation. Then I took enlarged fragments from it and used those on the poster and cards. It is somewhat ironic since this workshop is about creating new, more artistic visualisations, but your visualisations have their own appeal."*

The Martian atmosphere is a fascinating and enigmatic subject of study. It is a complex system of gases, dust, ice, and other particles that are constantly interacting and affecting the planet's weather patterns. However, this highly technical and scientific data is often unapproachable to a wider audience, which raises the question, how can abstract, scientific data about the atmosphere of Mars be represented in an artistic and appealing form?

Inspired and informed by BISA researchers studying the atmosphere of Mars, students from the Media and Information Design (MIND) programme of Luca School of Arts in Brussels sought to answer this question in the course of a week long workshop on artistic data visualisation. Highly complex data about dust and ice in the atmosphere were transformed into unique and engaging representations that offer a new way of looking at scientific research.



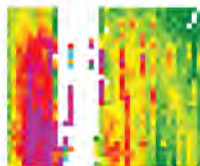
This exhibition is the result of a workshop that took place in March 2023 at LUCA School of Arts Brussels and was guided by Gillespiers and Jekub Strpanovic.

**Participating students:**  
Houda Ben Azzouz, Romain Couet, Fien Denblinden, Federica Garcia Carrera, Karina Gevorgyan, Hannelore Knoepen, Asad Masood, Nattakit Pheankiang, Dieter Roozleer and Tristan Van Garsee

**LUCA**  
SCHOOL OF ARTS

## Shine through Mars

As humans, we experience light in our own particular way. It allows us to enjoy and understand the world around us. As light travels from the sun to earth the amount of light we are able to perceive depends on what is flying in the atmosphere. On Mars, things work quite similarly. Depending on the amount of dust and ice clouds present in the martian atmosphere, there may be less light reaching the planets surface. Shine through Mars is an installation where we are able to see the amount of light that reaches Mars, based on the data collected by the Royal Belgian Institute for Space Aeronomy throughout the four seasons of one year.



Houda Ben Azzouz, Romain Couet, Fien Denblinden and Federica Garcia Carrera

## Dust on Mars

Scientific data visualisations can be difficult for lay audiences to interpret, relying on complex spatial and color representations. However, this digital projection offers a different approach, immersing the audience in an environmental representation of aerosols in the Martian atmosphere. The amount of aerosols is intuitively represented as particles, while their altitude is shown by their height, creating a unique and engaging experience that evokes standing on Mars surrounded by dust.



Hannelore Knoepen, Asad Masood and Tristan Van Garsee

## Ice Clouds and Dust on The Red Planet - An Acoustic Journey

Ice Clouds and Dust on The Red Planet: An Acoustic Journey is a sonic experience that explores the changing amounts of dust and ice clouds in the Martian atmosphere. Each particle type has a unique sound and comes from either left or right, while the frequency of the sound represents the amount of that particle. As time progresses the seasons change, resulting in a unique acoustic representation of the changing weather patterns on Mars.



Karina Gevorgyan, Nattakit Pheankiang and Dieter Roozleer





# Questions to ask ourselves...

How to strengthen the link between science and communities?

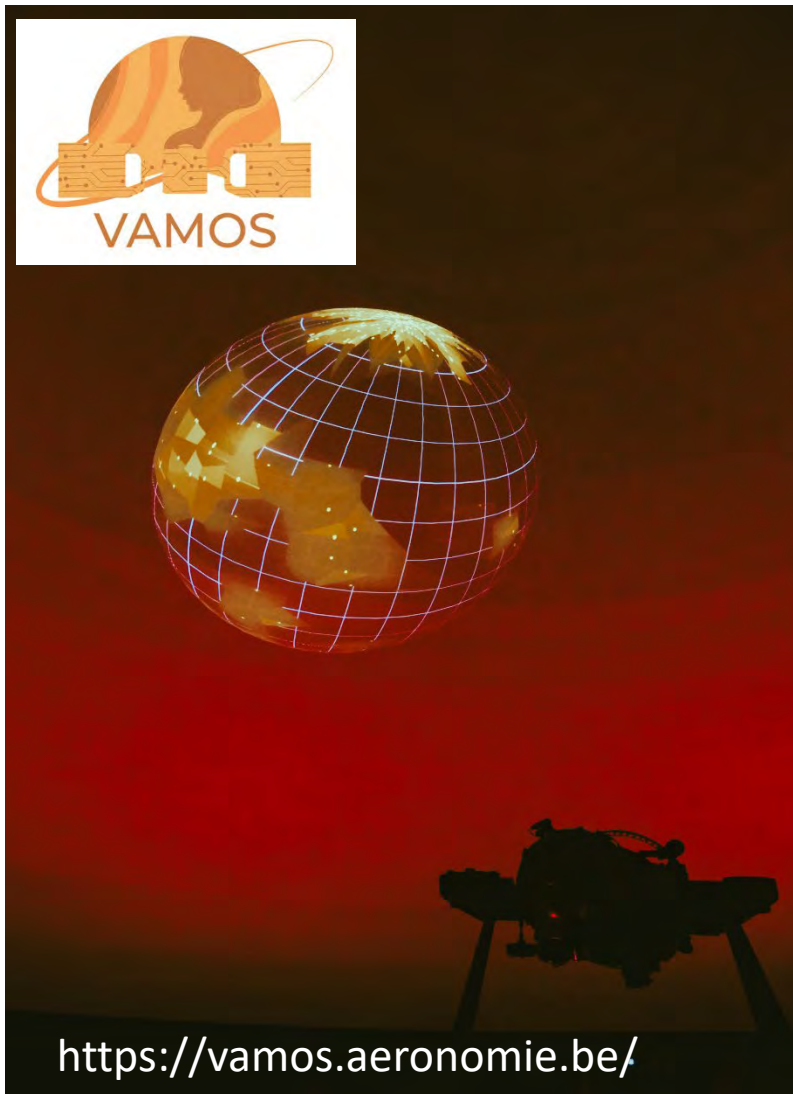
How to make our science accessible to everyone?

How to engage youngsters for science?

=> Art: the gateway to science for everyone



# Other cross-disciplinary collaborations between scientists and artists



<https://www.a-touch-of-space-weather.be/>





THANK YOU!  
MORE INFO?

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OUR SPECIAL  
THANKS TO

**LUCA**  
SCHOOL  
OF  
ARTS

Gijs Ipers  
Sandy Claes



Ann Carine Vandaele  
Yannick Willame  
Lori Neary  
Arianna Piccialli  
Karolien Lefever

Karolien Lefever  
Gijs Ipers  
Lucie Lamort  
Jakub Stepanovic  
Lenka Zychova

IMAGE CREDITS