

Space beyond STEM

Building a truly inclusive space industry

Remco Timmermans, 30 Sep 2023

International Space University
Space Communications Alliance
IAF Space Education and Outreach Committee
Spaceside OU



ARE YOU LIVING YOUR DREAM?

At any time
No loading
Mon-Sat
8 am - 9:15 am
4:30 pm - 6:00 pm



A blue sign with the ARSVA logo at the top. Below the logo is a table with several rows of text, likely providing information about services or regulations. The sign is mounted on a utility pole.

Social Media Specialist for Space



What my friends think I do
Hanging around rocket launches every week



What my parents think I do
Jet setting around the world



What society thinks I do
Are you an astronaut?



What my customers think I do
Geeking out with space characters



What I think I do
Telling cool stories online about new space technology



What I really do
Working behind my computer in my office all day

The stories of space

Feature Index
 Where Progress...
 Clear the Path!
 10 PER WEEK

The Huntsville Times

MONDAY, APRIL 20, 1968

Man Enters Space

'So Close, Yet So Far,' Sighs Cape U. S. Had Hoped For Own Launch

Hobbs Admits 1944 Slaying

Praise Is Heaped On Major Gagarin

'Worker' Stands By Story

Reds Deny Spacemen Have Died

No Astronaut Signal Received At Ft. Monmouth

Reds Win Running Lead In Race To Control Space

Today's Chronicle

FORECAST
 Columbus Evening Dispatch HOME
 OHIO'S GREATEST HOME NEWSPAPER
 VOL. 61, NO. 281 Phone-Capitol 1-2881 COLUMBUS 16, OHIO, TUESDAY, FEBRUARY 20, 1962 56 Pages 1 Cent

Glenn Launched Into Orbit; 'Beautiful Sight,' He Says

'I Feel Fine,' Glenn Radios From Rocket

'Short Day,' He Remarks Soaring into Night Zone

Ohio Astronaut Slated to Circle World 3 Times

Minor Trouble with Controls

Height of 100 Miles

Soviet Movie of Space Flight May Be Doctored

INSIDE THE DISPATCH
 TODAY'S NEWS
 TODAY'S SPORTS
 TODAY'S LOCALS
 TODAY'S BUSINESS
 TODAY'S ENTERTAINMENT
 TODAY'S OPINION
 TODAY'S LETTERS
 TODAY'S CLASSIFIED

"All the News That's Fit to Print"

The New York Times

LATE CITY EDITION
 NEW YORK, MONDAY, JULY 21, 1969 10 CENTS

MEN WALK ON MOON

ASTRONAUTS LAND ON PLAIN; COLLECT ROCKS, PLANT FLAG

Voice From Moon: 'Eagle Has Landed'

A Powdery Surface Is Closely Explored

By JOHN NAGLE WILFORD
 HOUSTON, Monday, July 21—Men have landed and walked on the moon.
 Two Americans, astronauts of Apollo 11, steered their fragile four-legged lunar module safely and smoothly to the lunar landing yesterday at 6:37:40 P.M. Eastern Daylight time.
 Neil A. Armstrong, the 38-year-old civilian commander, landed to start and the mission ended down here.
 "Houston, Tranquility Base here. The Eagle has landed."
 The first man to reach the moon—Dr. Armstrong and his moon-robot, Ed, Edson II, of the Alvin

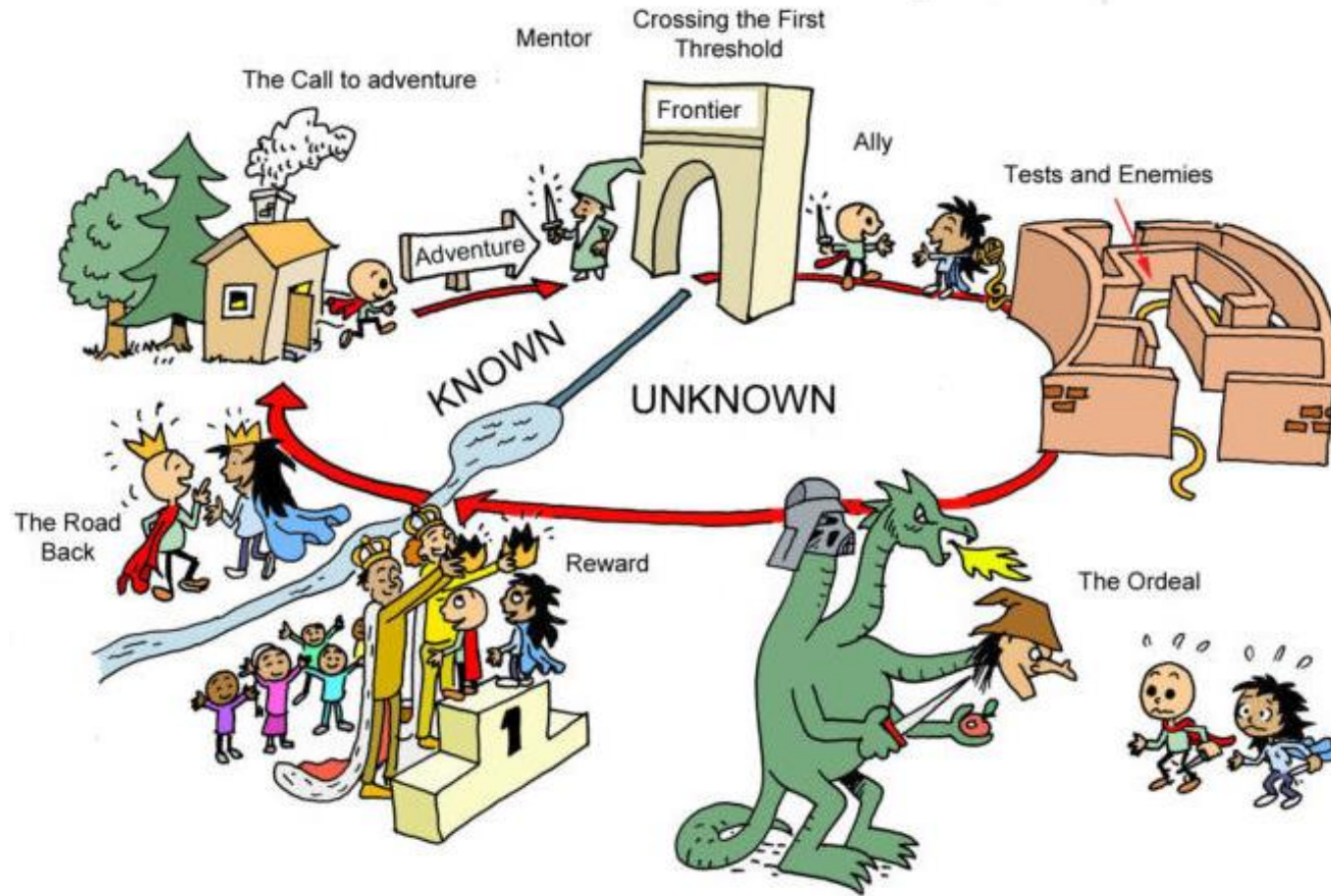




THE RIGHT STUFF

How the future began.

Storytelling 101: “The hero’s journey”



Why did the story of the space race work?

- Identifiable heroes: Our scientists, engineers and astronauts: “us”
- Identifiable antagonists: The Soviets or the Americans: “them”
- Identifiable mentors: Wernher von Braun, Sergey Korolev: “Q”
- Identifiable problem: “Space Race” with one winner
- Identifiable crises: Rockets that exploded: “oh no”
- Identifiable solutions: Bigger and better rockets
- Identifiable resolution: “Our” hero was first in space/on the Moon
- Identifiable celebration: “Our” heroes parading the world

Hero: someone we can identify with, a role model



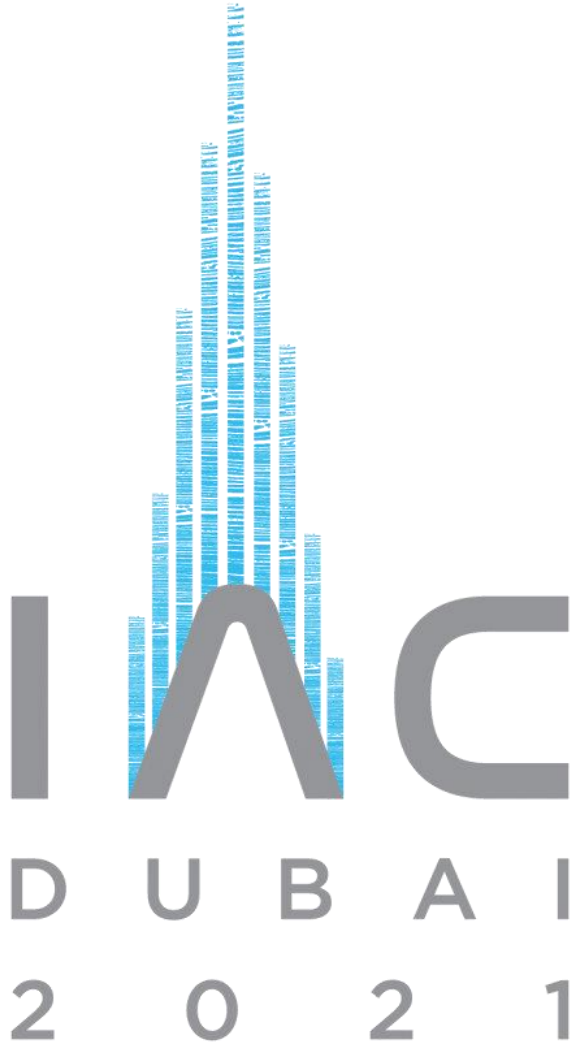
Literature Review (2021)

- Geographical imbalance in space job opportunities
- Gender imbalance in the space sector
- Imbalance in representation of minority groups
- Most initiatives to increase inclusion of women are in NA/Europe
- Recent commercial human spaceflight examples are counterproductive
- **Role models are a powerful way to increase diversity**



Survey Results (2021)

- New missions are creating new global interest in space
- Space is still largely perceived as a closed industry
- People are mostly unaware of opportunities of 'new space'
- Most impactful outreach methods are mentorships and internships
- **De-emphasis on STEM element of the industry is needed**
- Role models are critically important



“The communication of opportunities in the space sector is still far from updated and inclusive around the world and around different communities in today’s society”

IAC-21-E1.6.4.x63522



What causes the gender gap in STEM?



- ❑ **Lack of role models** is making it difficult to picture themselves in STEM roles
- ❑ **Lack of encouragement** from peers, teachers and parents is holding women and girls back
- ❑ Girls have a **limited exposure** to the **creativity** and **contributions** that STEM fields make for a better world

- ❑ There is still **bias in the hiring process** with male candidates selected more often, regardless of their qualifications
- ❑ Portraying **STEM as 'male roles'** undermines confidence, interest and willingness to pursue STEM



**INTERNATIONAL PLATFORM FOR DIVERSITY
AND EQUALITY IN ASTRONAUTICS**

3G+ GEOGRAPHY • GENERATION • GENDER • +

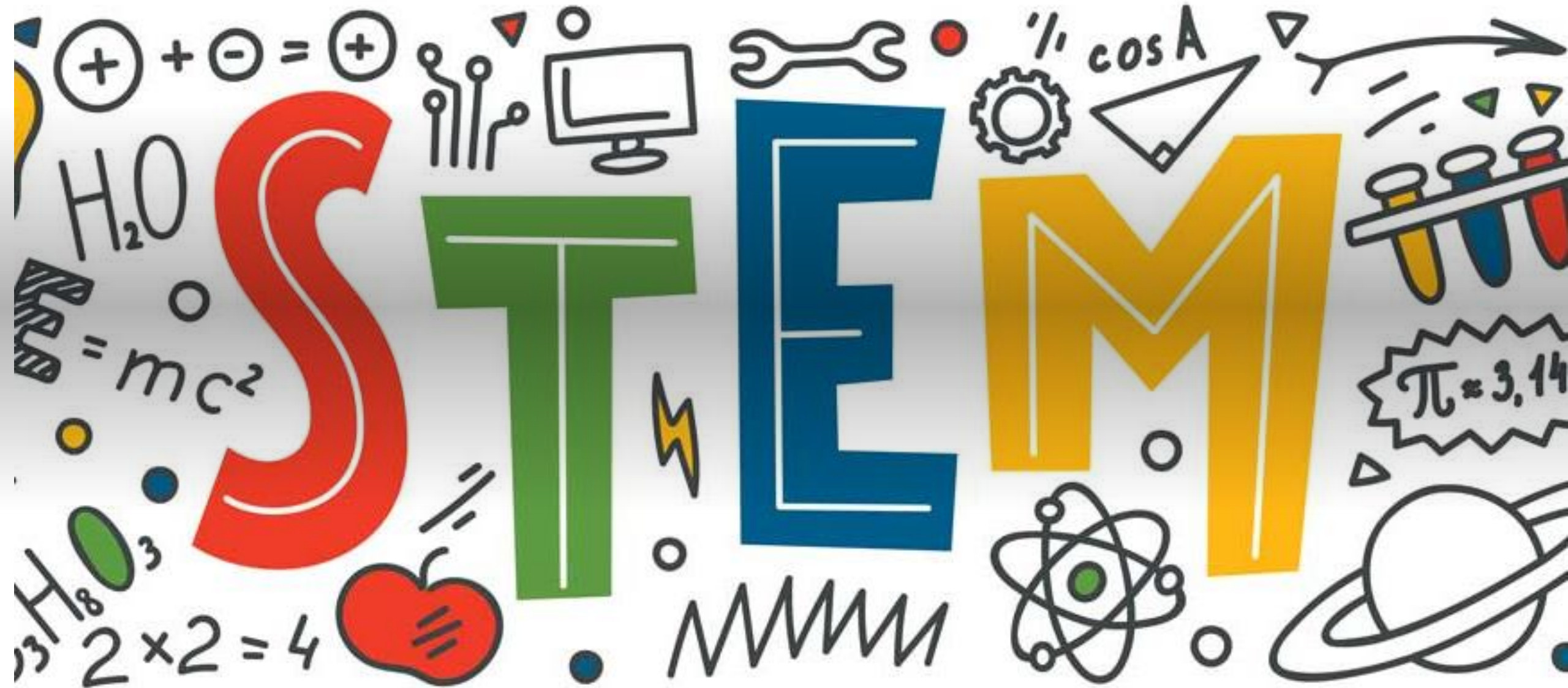


Not just space technology...

“Nichelle Nichols and Star Trek did more for diversity in the space sector than all space agencies combined”



The biggest buzzword in space outreach:



What is wrong
with modern
space
marketing and
outreach?



**DO YOU HAVE
WHAT IT TAKES TO
#BeAnAstronaut?**

- ✓ U.S. citizen
- ✓ Master's degree in STEM field
- ✓ Two years related, professional experience
- ✓ Pass NASA astronaut physical

The heroes of the space race: The Right Stuff



Mercury 7 Astronauts in 1959

The heroes of space in 2021: The Right Stuff?



Inspiration4 Astronauts in 2021



Space needs new
role models

JUMP INTO JOBS WORKING IN SPACE

THAT'S A JOB?

I Like
SPACE

... what jobs
are there?

Is space just STEM?

by Steve Martin





Space is much more
than STEM

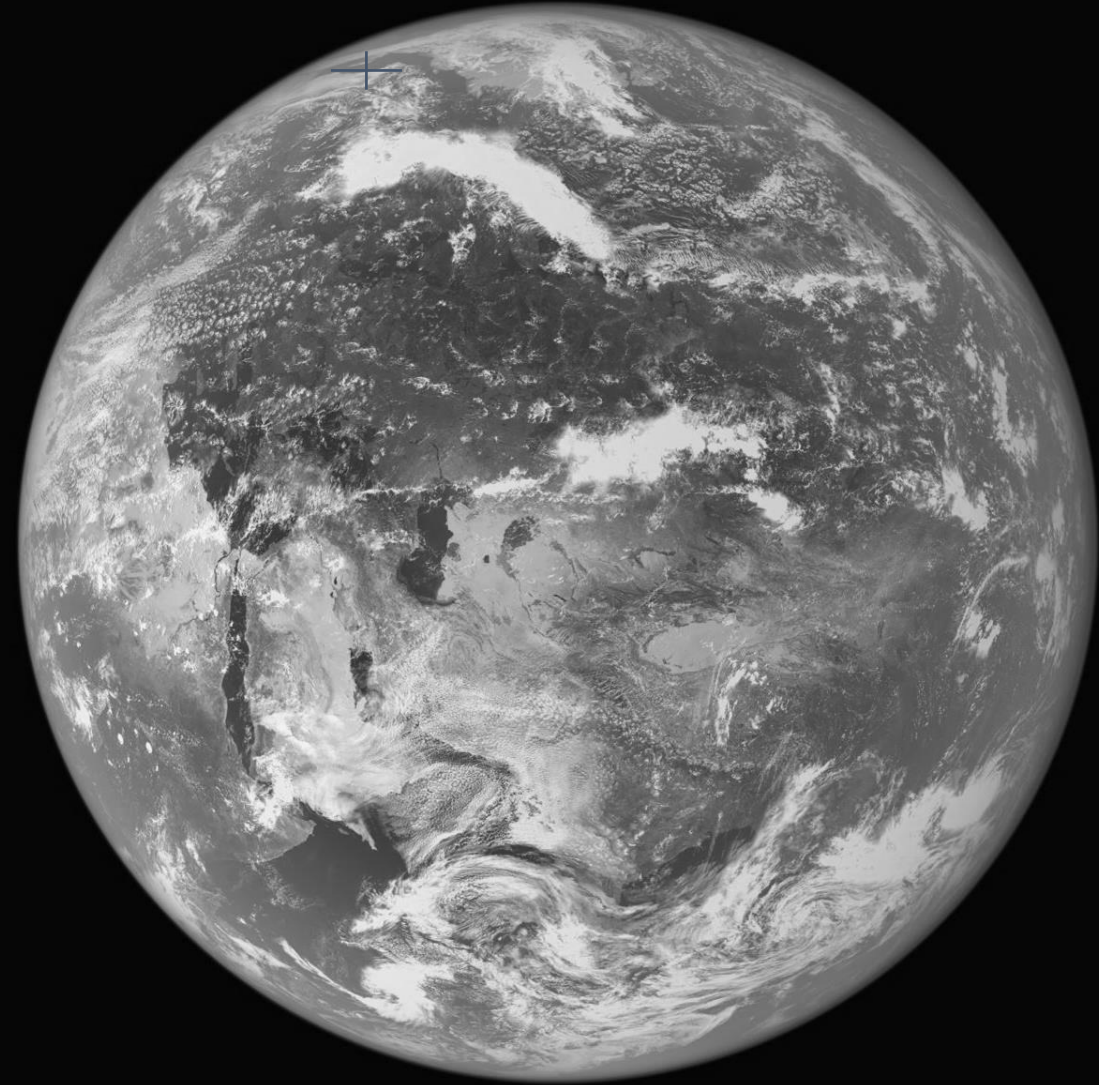
There is a place in space
for EVERYONE!



/

The new rolemodels of new space

- Gender – male, female, non-binary, other...
- Geography – country, language
- Generation – young and old professionals, including side entrants
- Education – STEM and non-STEM, vocational, undergrad, grad





About STEM and STEAM

- STEM stands for Science, Technology, Engineering, and Math
- STEAM adds 'Arts', which in US English means almost everything else
- 'Arts' in most other parts of the world means 'Art', in the creative definition
- **Stop using the terms STEM and STEAM**

ARTS - ACCOUNTING - AGRICULTURE

LINGUISTICS - LAW

QUANTUM - QUILTING

BUSINESS & MANAGEMENT

NEWS - NURSING
NUTRITION

RELIGION

CREATIVE ARTS - CATERING - CLASSICS

URBAN DEVELOPMENT

DESIGN - DIVERSITY

STEM

VETERINARY MEDICINE

FOOD - FINANCE

WATER MANAGEMENT
WELLNESS
WRITING

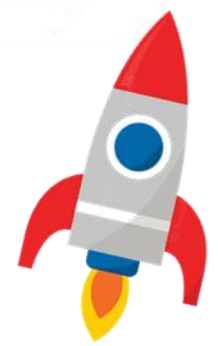
GEOLOGY - GOVERNANCE
- GAMING

XENOLOGY

HEALTH - HUMANITIES - HISTORY

YOUTH WORK - YOGA

INDUSTRIAL DESIGN - INNOVATION - INTERNATIONAL RELATIONS



ZOOLOGY

JOURNALISM

OCEANOGRAPHY - ONCOLOGY



KNOWLEDGE MANAGEMENT

PR - PHILOSOPHY - PSYCHOLOGY - PUBLISHING

WE WORK IN SPACE



Are you passionate about space and looking for a **non-technical role** in the sector? We help you find a **non tech space job** in law, marketing, design, business development, HR, finance and other **niche space jobs!**



—
Space needs
YOU

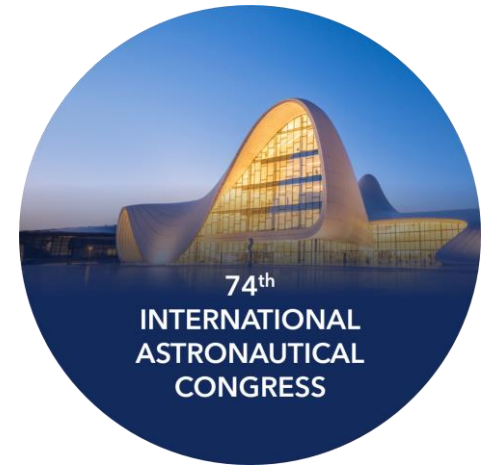
The space sector of
2023 needs people
from ALL educational
backgrounds

De-emphasise STEM



Role Models:

“If you can’t see it,
you can’t be it”



Space beyond STEM

Building a truly inclusive space industry

Remco Timmermans

International Space University
Space Communications Alliance
IAF Space Education and Outreach Committee
Spaceside OU