

Astrium Ambassadors

Lisa Peacocke and Ed Bean

9th December 2010

All the space you need



Agenda

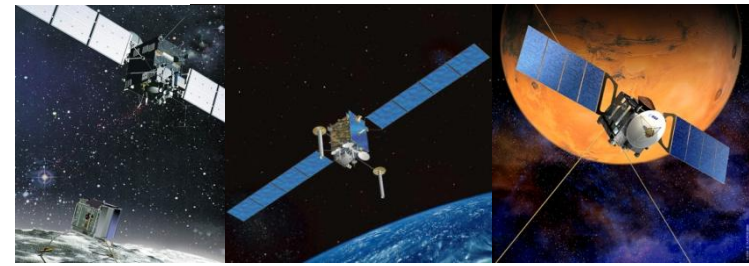
- Introduction
- STEM Ambassadors
- Outreach Activities

Introduction

All the space you need



The UK Space Industry



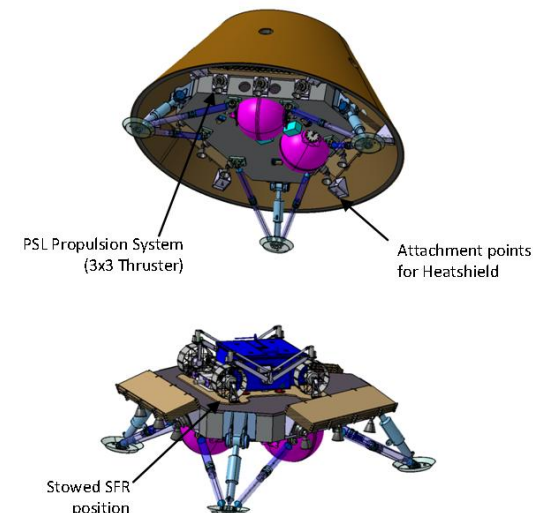
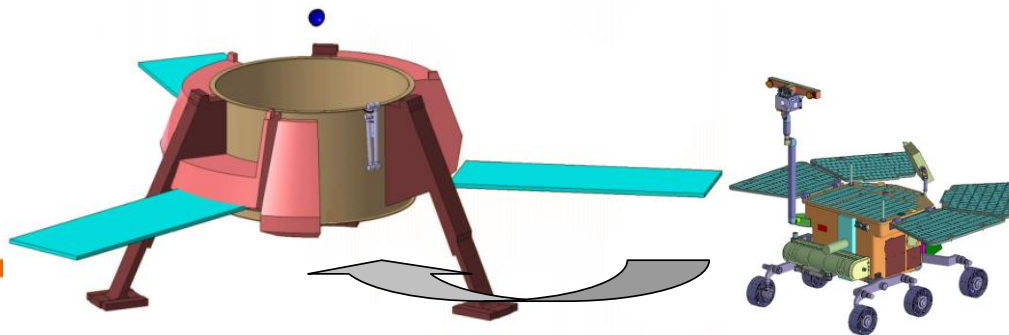
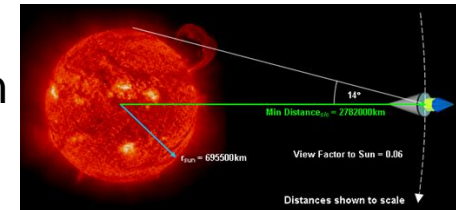
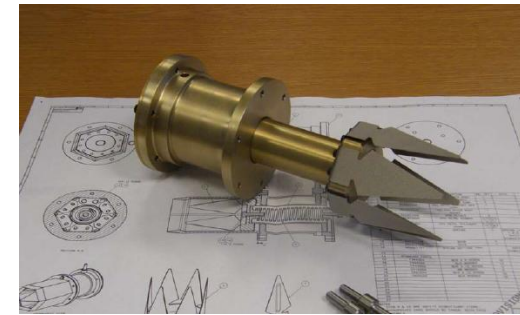
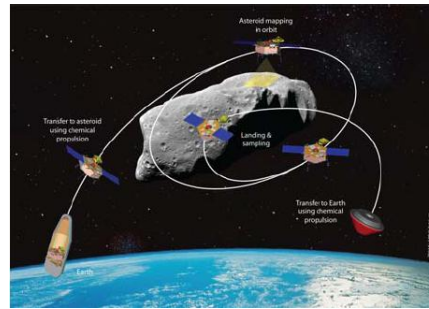
- We have many successful British high-tech space engineering companies
 - e.g. Astrium makes highly successful spacecraft for ESA, the UK MOD, Inmarsat, Avanti and many other customers
 - Mars Express, Venus Express, Skynet
 - BUT the UK public don't know who we are
- Engineering success is not often recognised in the UK
 - British engineering and science has a long and proud history:
 - Isaac Newton, Alexander Graham Bell, Isambard Kingdom Brunel, James Dyson
 - BUT most kids in the UK want to be celebrities or bankers
- We can do something about both problems
 - => STEM Ambassadors and Outreach



Who are we?

■ Lisa Peacocke

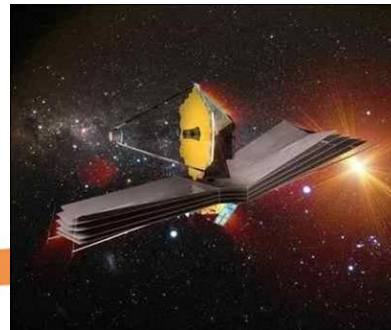
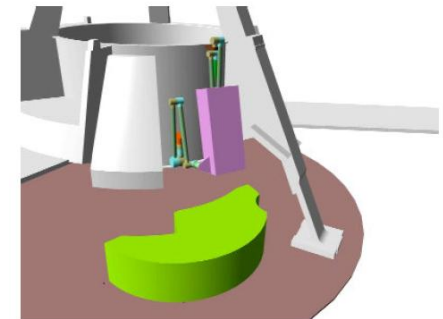
- BEng (Hons) in Mechanical Engineering – New Zealand
- MSc in Astronautics and Space Engineering – Cranfield
- Mission Systems Engineer in Future Projects
 - Marco Polo Assessment Study
 - Mars Surface Sample Transfer and Manipulation
 - Asteroid Sampling Mechanism breadboarding
 - Near-Sun Power Generation Study
 - Mars Precision Lander Assessment Study
- STEM Ambassador since joining Astrium



Who are we?

■ Ed Bean

- MPhys Physics With Space Science – Leicester University
- Graduate Development Programme:
 - MIRI – Systems Engineering (1 yr)
 - ExoMars - Rover Breadboarding and Navigation (6mths)
 - Mission Systems – MSSTM (6mths)
- ExoMars Rover GNC Analyst – Developing the autonomous Navigation Software for ExoMars
- STEM Ambassador



STEM Ambassadors

All the space you need



STEM



■ Science, Technology, Engineering and Maths

- Vital subjects for a successful Britain
- Recognised by the government – BIS and Education
- All kids love two subjects: space and dinosaurs

=> Space is an ideal way to motivate kids into STEM subjects

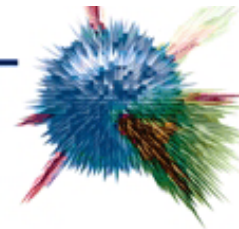
■ STEM Ambassador programme

- Originally Science and Engineering Ambassadors (SEA)
- Over 24,000 STEM Ambassadors in the UK
- Managed by STEMNET centres around the country



STEM
AMBASSADORS
ILLUMINATING
FUTURES

STEMNET
Science, Technology, Engineering
and Mathematics Network



All the space you need



Ambassador Activities

- Vary dependent on the ambassador
 - Aim is to talk to school children and students about your work in science, engineering, technology or maths
 - Inspiration and enthusiasm are key - if you love your job it will come through to the students
- Potential activities:
 - Visit school classrooms for presentations and activities
 - Workshops and student mentoring
 - Careers fairs - information and discussion
 - Space hardware demonstrations
 - Videos and display stands



Why Astrium Staff are Ambassadors

- Make a difference in the local community
- Gain a fresh perspective on day-to-day work when seen through the eyes of young people
- Develop communication, planning and people management skills
- Challenge stereotypes about STEM subjects
- Have fun!

Becoming a STEM Ambassador

- Be an enthusiastic professional in a STEM field
 - Should want to encourage and educate young people in STEM subjects
- Register with your local STEMNET
 - Astrium staff have an HR STEM co-ordinator to register with
- CRB check performed
 - Mandatory for any contact with children
 - Paid for by STEMNET
- Through the STEMNET organisation you have insurance cover for any unforeseen events
 - Re-assuring and important



STEM
AMBASSADORS
ILLUMINATING
FUTURES



Astrium Activities

■ Introductory presentation

- Who is Astrium
- What satellites and spacecraft do we make
- Introduce ourselves, the STEM Ambassadors

■ Space in Daily Life

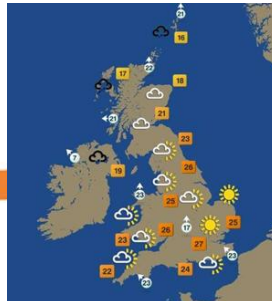
- Short story about a normal day in a child's life
- Students identify at what points in the story space may be involved
- Talk through answers and bring out all the effects that space has on our everyday life
- What on Earth has space got to do with me?

Astrium Activities



■ Space in Daily Life extract:

- I awake to the voice of the newsreader blaring from my clock radio, it must be time to get up and go to school.
- After I wash and dress, I head into the kitchen to have breakfast, on the television is sky news, today there is an interview with a person currently sailing across the Atlantic.
- I watch the weather forecast for the day wondering if I will need my coat or an umbrella for my journey to school.
- I grab my school bag and follow my mum out to the car. As I get in the car, she is programming her satnav for her journey today. Mum drops me at the train station so I can catch my train to school.



Astrium Activities

■ Satellite Engineering Workshop

- 10 stations of real space engineering hardware
 - Heat pipe experiment
 - Aluminium honeycomb structure
 - Gyroscopes
 - Cleanroom coats, hats and shoes
- Students complete exercises (appropriate educational level)
 - 3 mins at each station
 - Astrium Ambassadors on hand to help
 - Aligned with the national curriculum
- Answers discussed at end of workshop
 - Student contribution very important



Astrium Activities

■ Build-a-Satellite Workshop

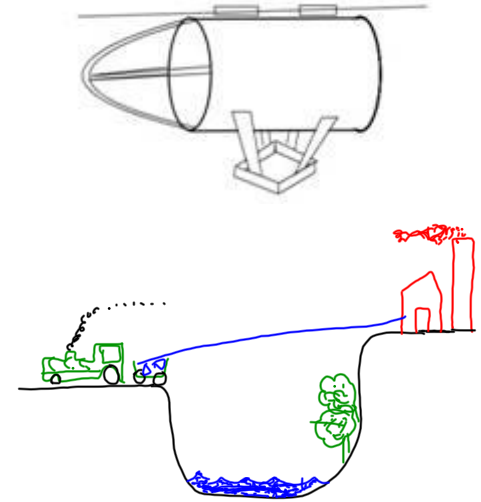
- Students given an egg payload and other useful items
 - Cardboard, pipe cleaner, tape etc.
- Design and build a satellite capable of protecting the payload
 - Students calculate the mass and cost of their satellite
- Satellites 'vibration tested' and eggs that survive win



Astrium Activities

■ Balloon Rocket Workshop

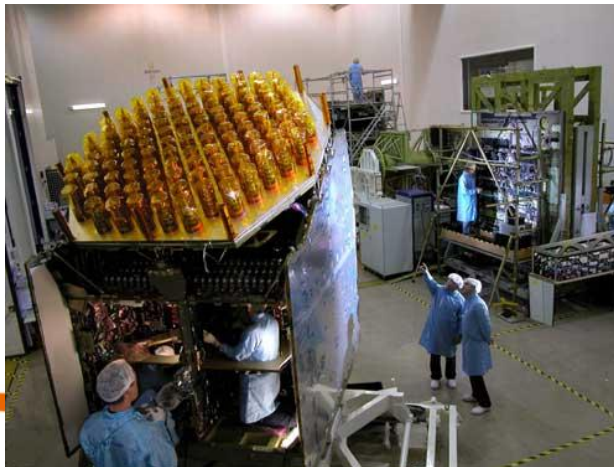
- Get a payload across a canyon
- Students design and build their own rocket
 - Powered by a balloon
 - Carrying a payload of 5 marbles
- Balloon Rockets launched along a piece of string
 - Rocket that travels the furthest wins



Astrium Activities

■ Site tour

- Show the students a real spacecraft manufacturing facility
 - Cleanrooms
 - Thermal vacuum chamber
 - Carbon fibre winding machines
 - Thermal insulation blanket workshop
 - Propulsion tanks and pipework
- See satellites being designed, built and tested right there



Outreach

All the space you need



Exhibitions, Conferences and Lectures

- We attend various exhibitions and careers events
 - Pop-up stands, models and presentations
 - Students find out about the company and career opportunities – how to get into the space industry
 - School science fairs also attended
- Our engineers also give lectures on a wide range of topics



ExoMars Outreach

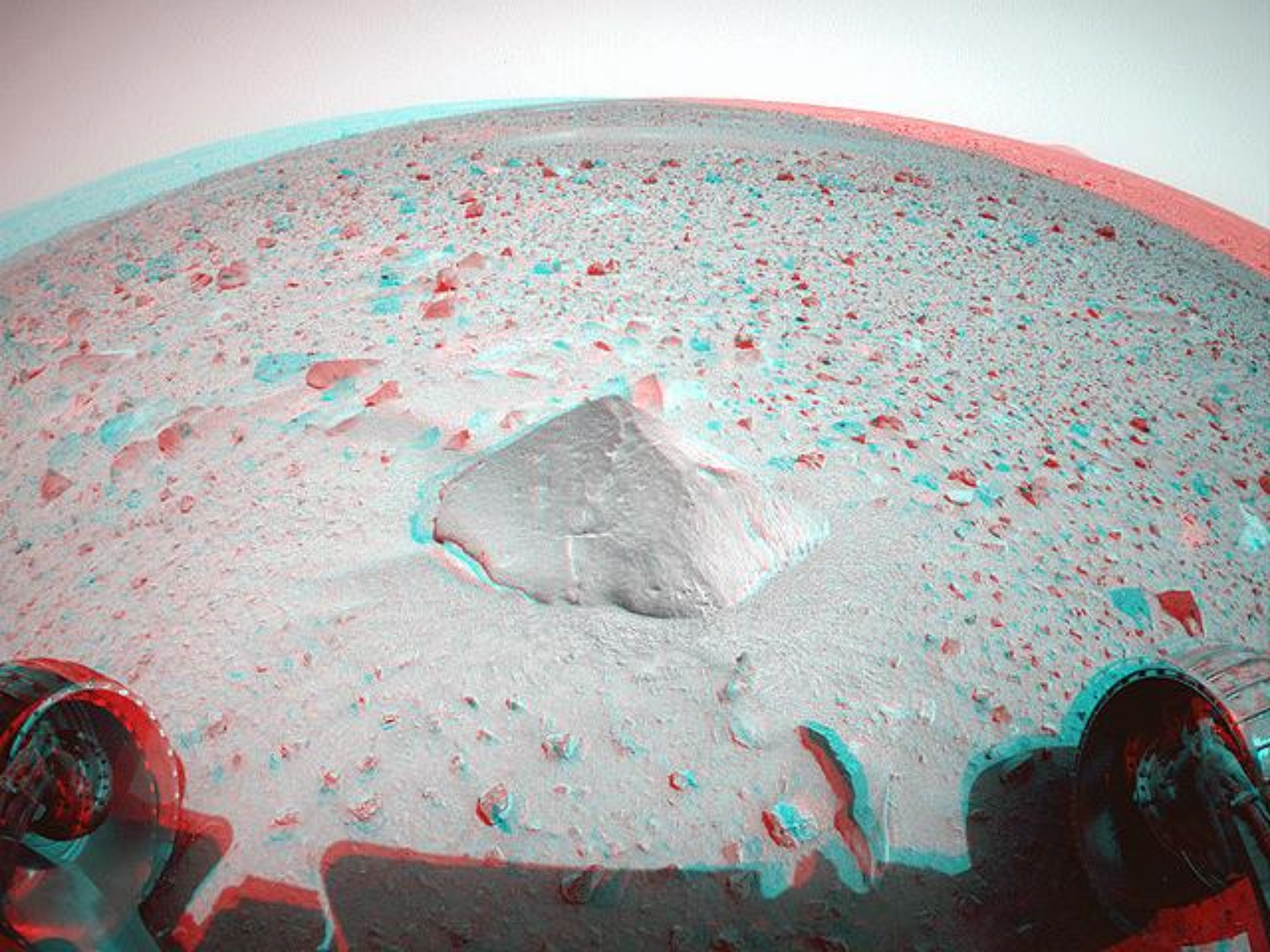
- ExoMars will be the first European Mars rover
 - Will launch in 2018 with a NASA rover
 - Ideal vehicle to excite and motivate kids and students
- Many outreach activities have focussed on ExoMars
 - Bridget, Bruno and Bradley Prototypes
 - Exhibitions, Conferences, Museums, Lectures

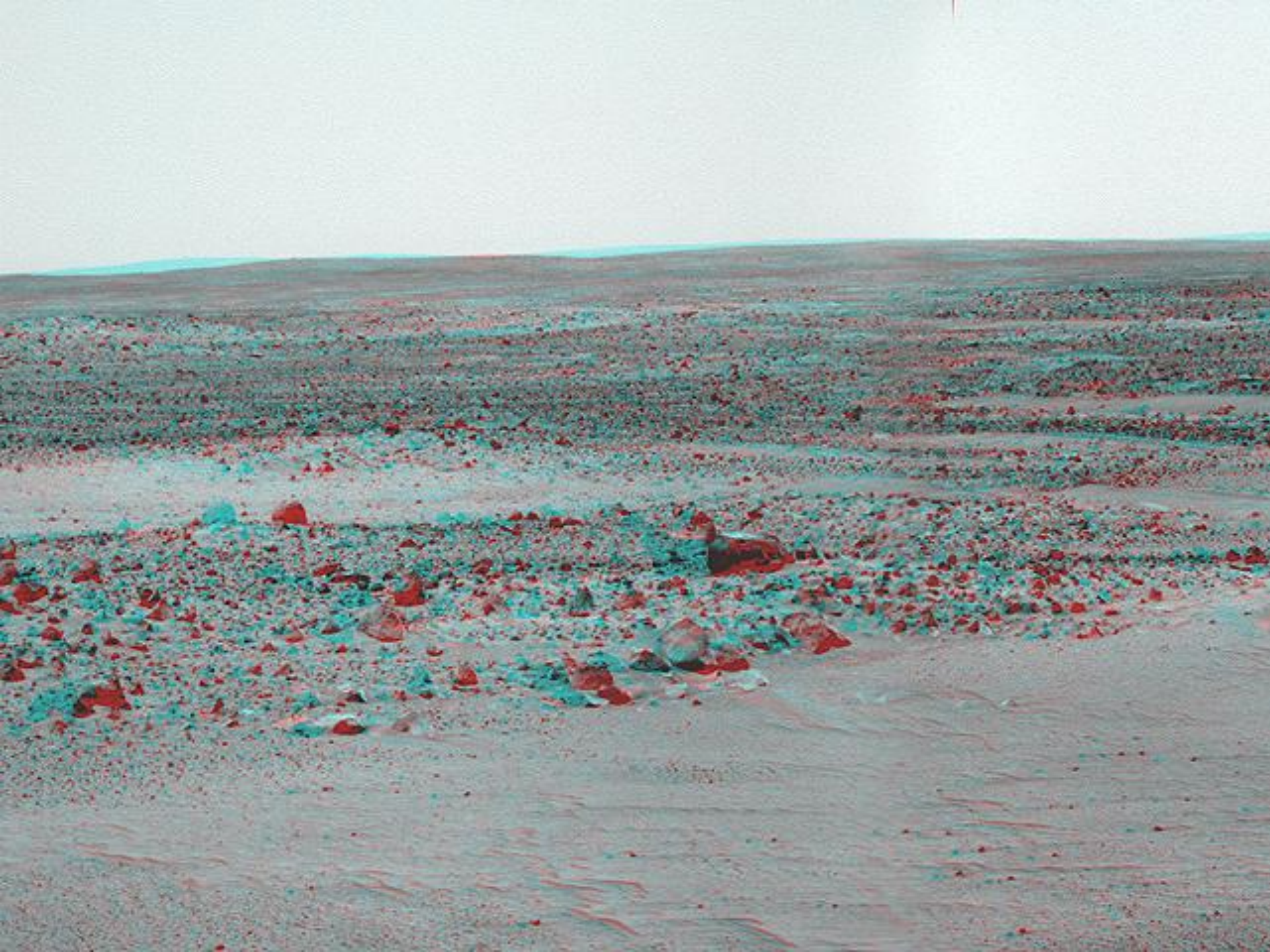


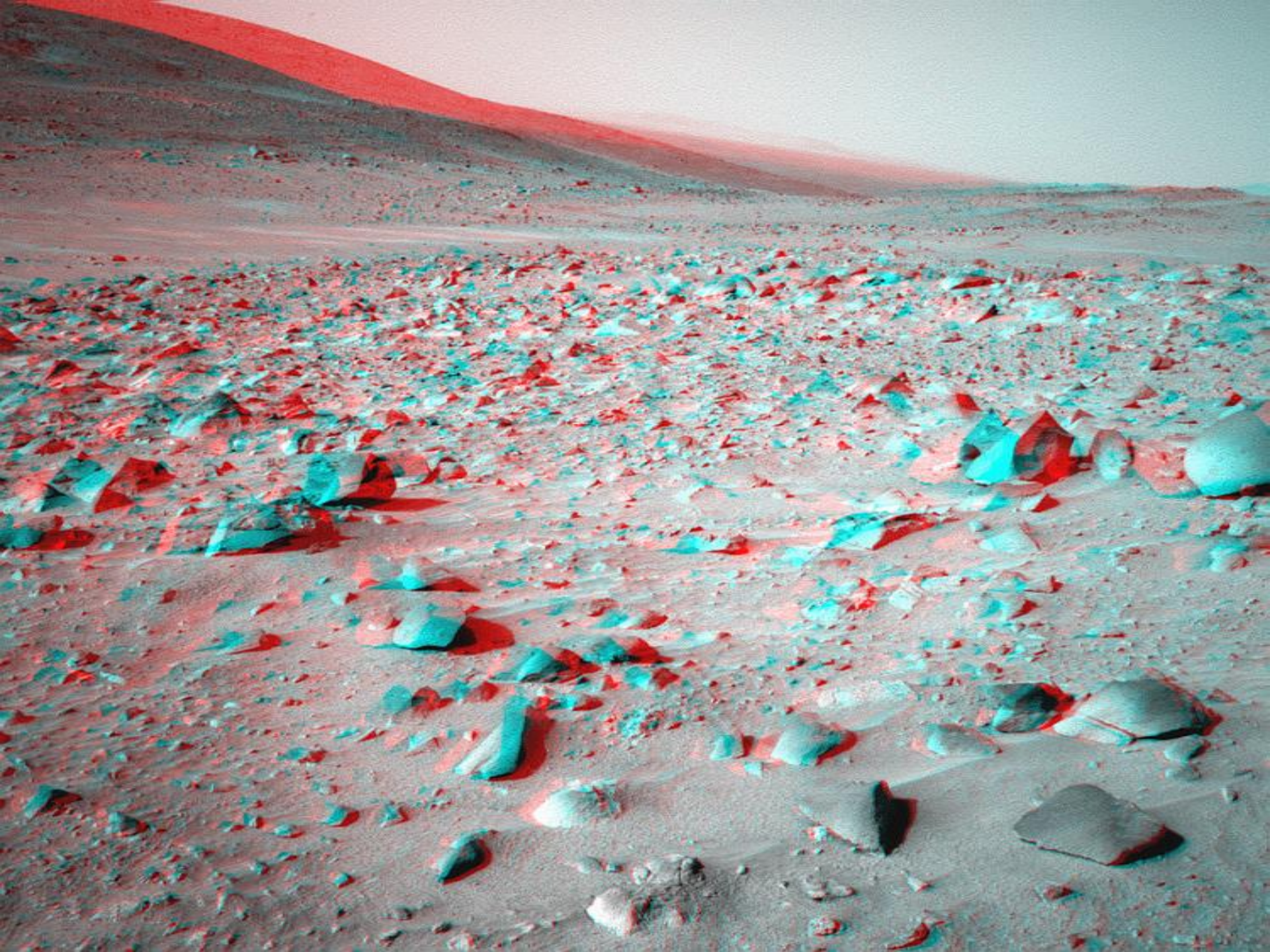
New Media and TV

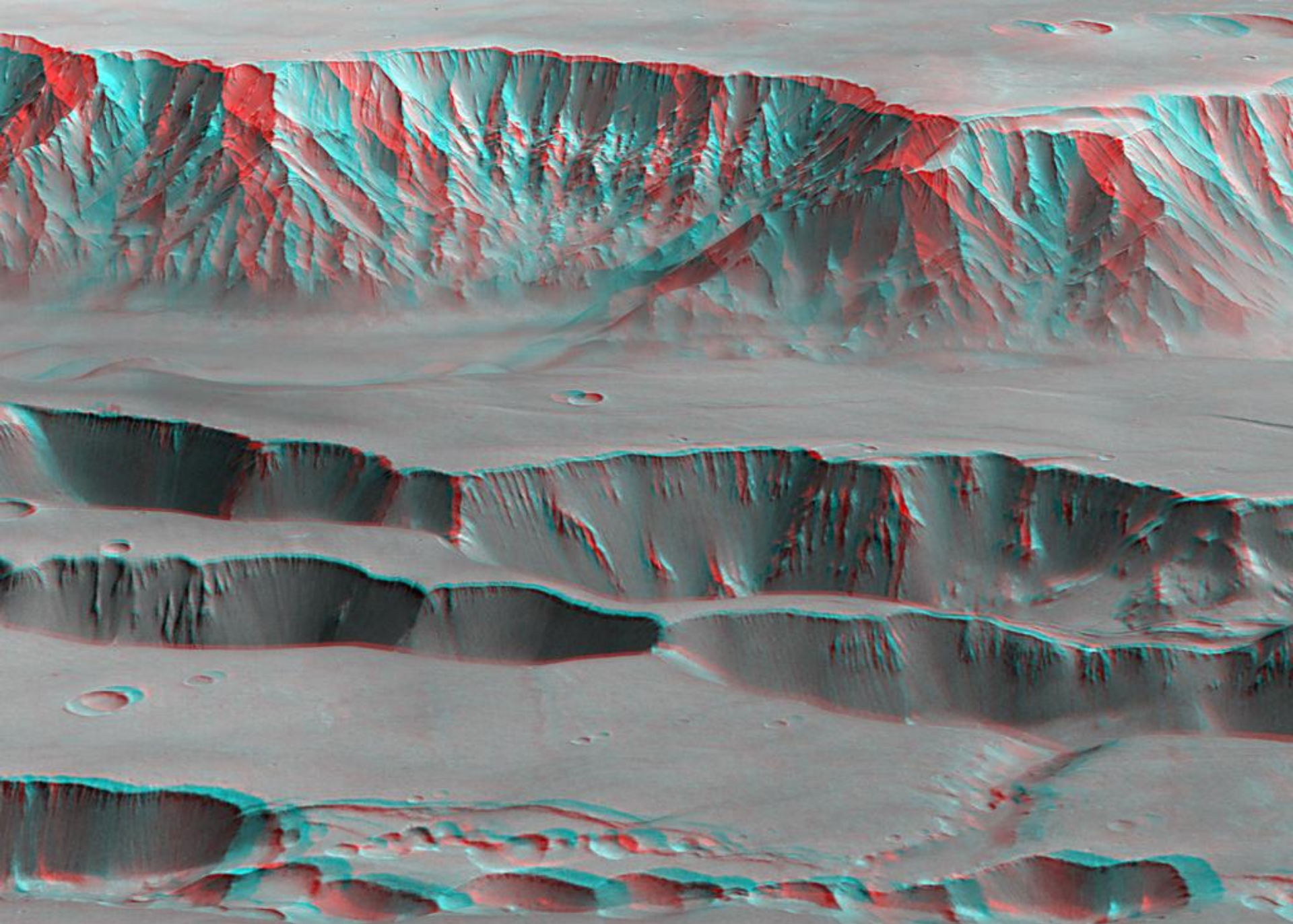
- Facebook
 - Bruno profile
 - ExoMars game (TBC!)
- YouTube and UStream
- BBC Blog and Blue Peter
- Teachers TV











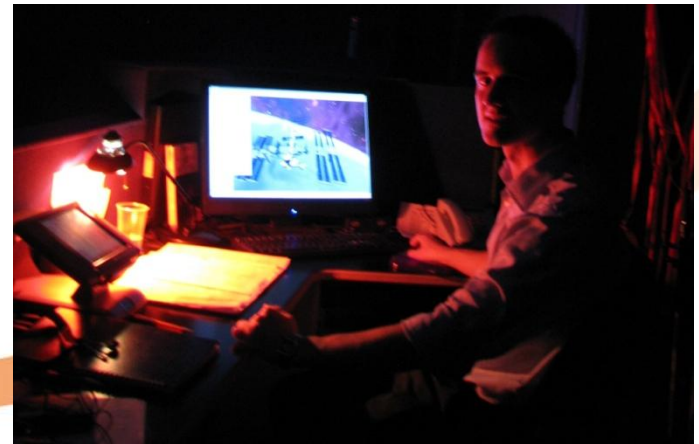
Engineering Education Scheme

- Small teams from local schools solve a real space engineering problem
 - 6 month project duration
 - Output is often a working model of the design solution
- Supervised and assessed by an Astrium engineer



Intech Planetarium

- Our graduates wrote a custom show for the UK's largest capacity planetarium
 - Presented to many audiences



Conclusion

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Awards and Recognition

- 2008: BP Education Partnership award at the IMechE MX Awards
- 2009: STEMNET Most Dedicated Company Award
- 2010: Sir Arthur Clarke Outreach Award



The Future?

- New 'Mars Yard'
- Bridget's Holiday
- ExoMars Rover game
- More New Media
- Constant improvement of our facilities and resources for school groups
- Any other ideas?

Summary

- STEM Ambassadors and outreach activities can have a profound effect
 - Generates excitement about space and thus enthusiasm for engineering and science
 - Space is a unique motivator for kids and young people
 - Renews staff motivation in their own careers
 - Educates the general public about a successful high-tech engineering company that is pushing the boundaries
- Helps the next generation become pioneers in science, engineering and exploration once again



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