

ROBOTS



NATIONAL MUSEUM OF SCOTLAND

 National
Museum of
Scotland

Open daily 10:00 to 17:00
Admission free
www.nms.ac.uk

Tower Restaurant




THE ROYAL SCOTISH
THE ROYAL SCOTISH

School of
Innovation

Sense

Sensors

vision
audio
sonar
radar
lidar
touch
smell

Think

Processing

computers
gears and cogs
hydraulics and valves
chemical reactions

Act

Actuators

legs
wheels
tracks
push bars
ploughs
hands
fingers

Power Source

electricity and battery
steam
clockwork



ROBOTS

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≠

Autonomous

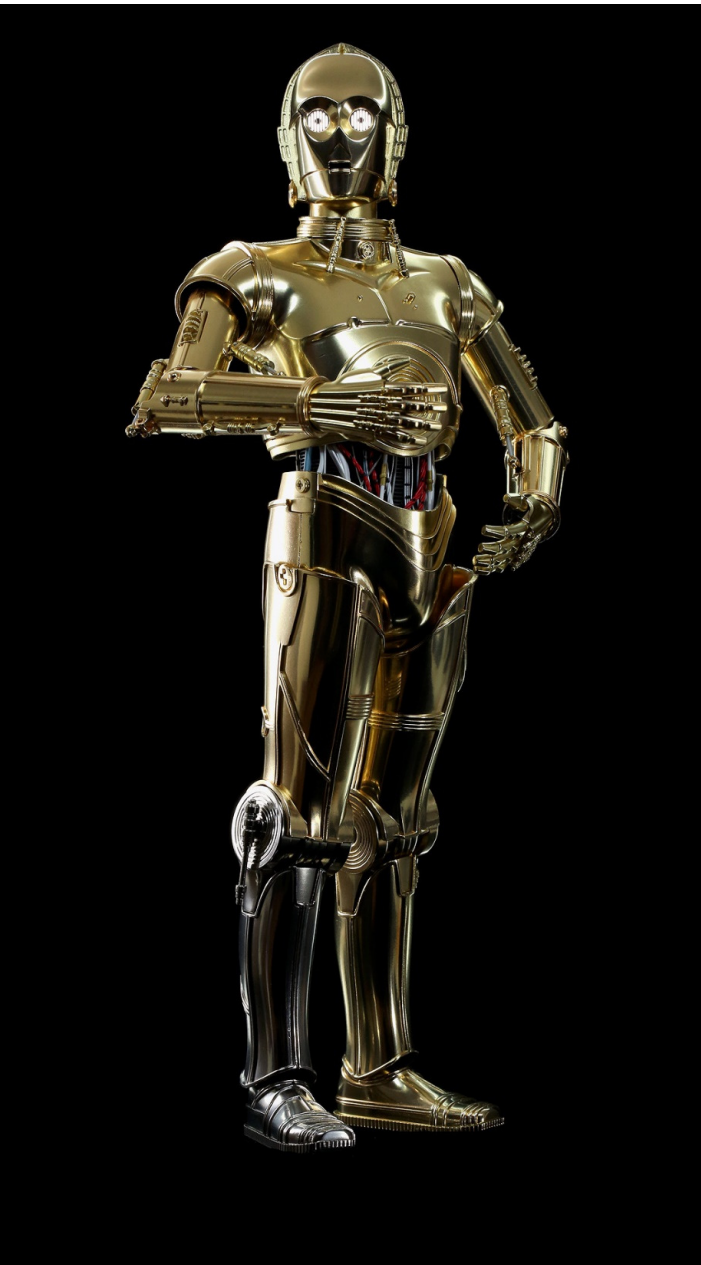
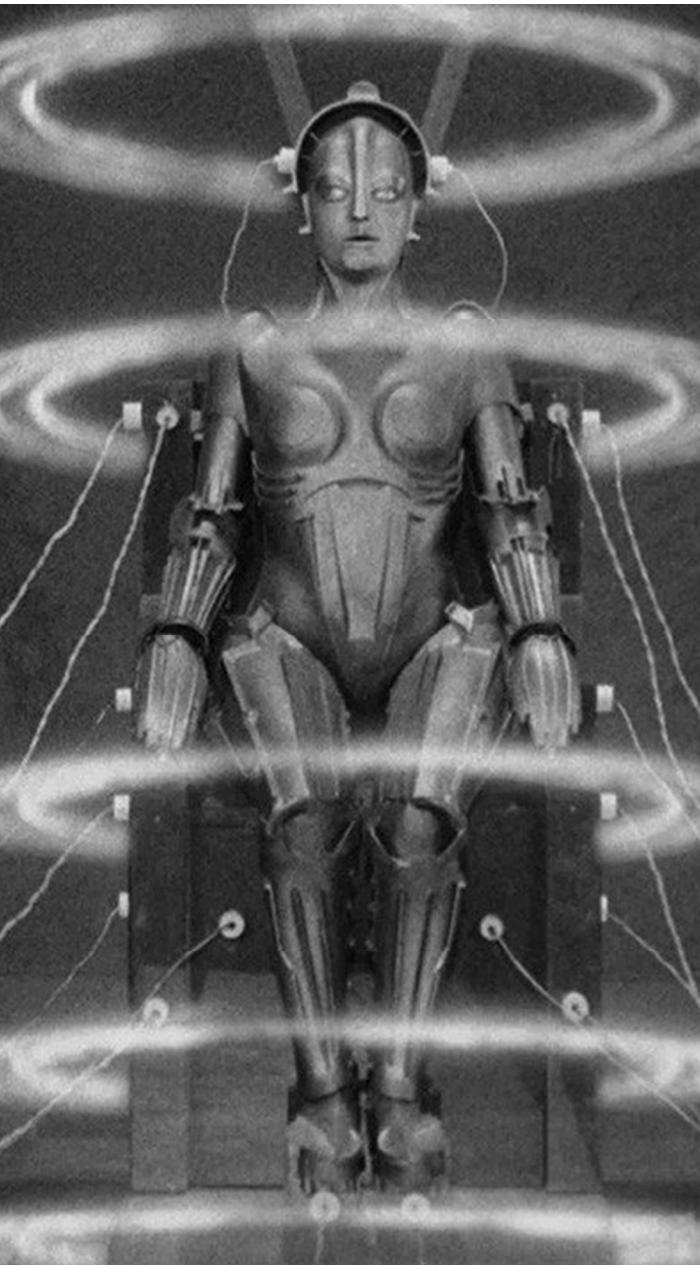
≠

Intelligent

Robots ≠ AI

Lower level "reactive" behaviours – becoming very effective due to rapid advances in machine learning and large scale data technologies.

Higher level cognitive capabilities – such as sense making, planning and decision making... often in cooperative situations with humans.

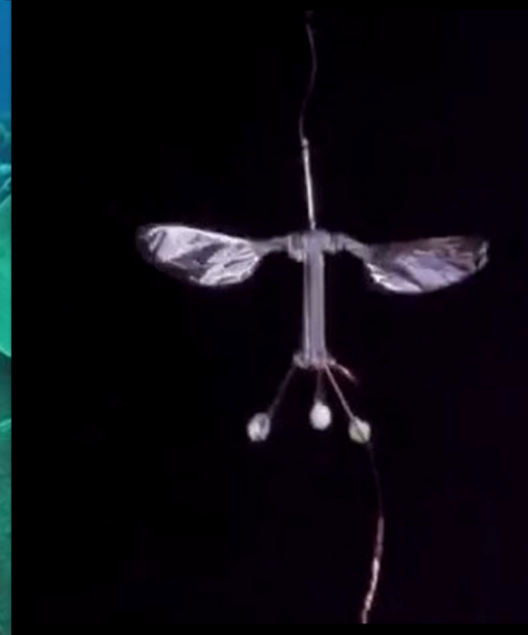
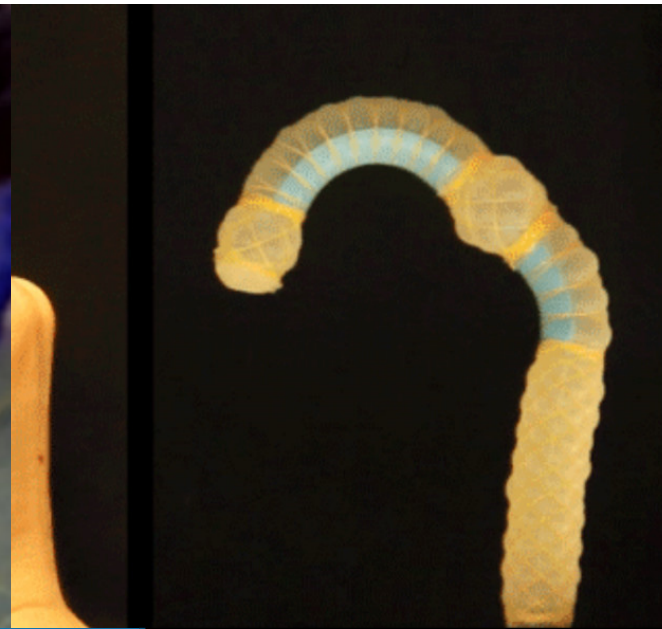
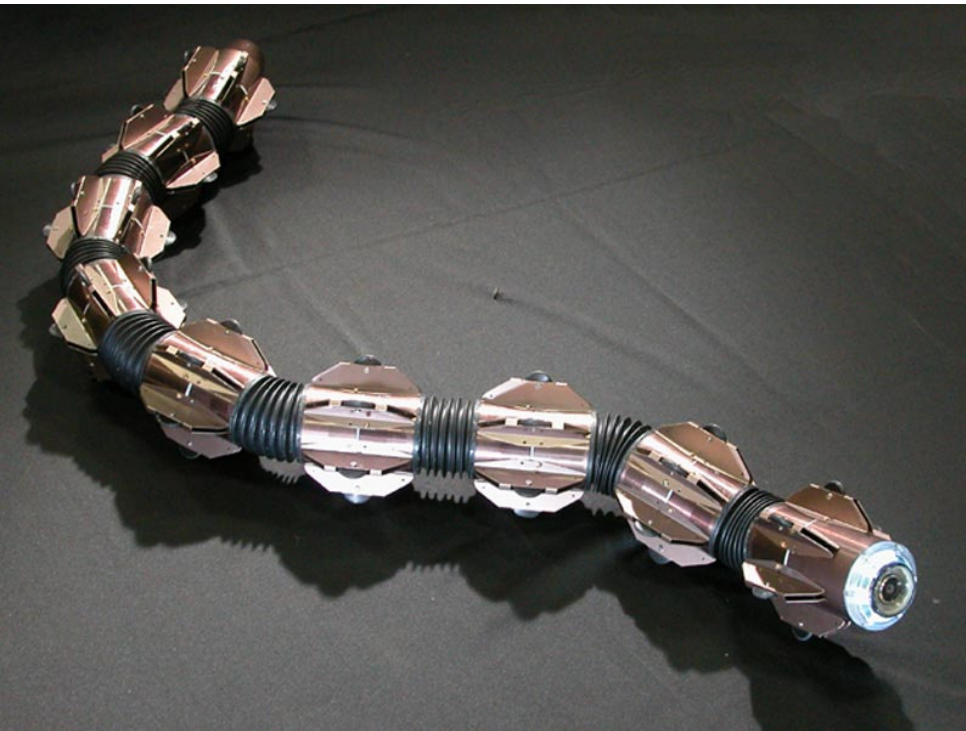




Boston Dynamics



ASIMO
<http://www.honda.co.jp/ASIMO/>
<http://www.honda.com/ASIMO/>

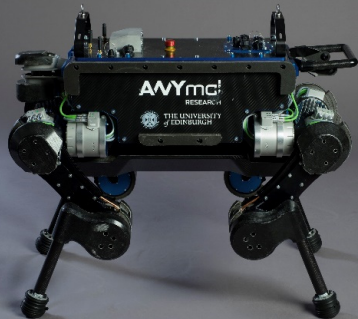




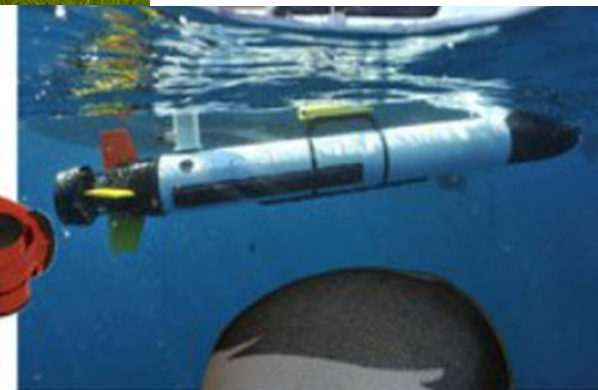
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ROBOTICS



robotstadium_nao_vs_nao.wbt - Webots PRO 6.4.4

File Edit View Simulation Build Robot Tools Wizard Help

Scene tree C:\Program Files (x86)\Webots\projects\contests\yobotstadium\worlds\yobotstadium_nao_vs_nao.wbt

C:\Program Files (x86)\Webots\projects\contests\yobotstadium\controllers\ nao_team_1\FieldPlayer.java

FieldPlayer.cpp FieldPlayer.java

```

1 // File:      FieldPlayer.java (to be used in a Webots java co
2 // Date:     April 30, 2008
3 // Description: Field player "2", "3" or "4" for "red" or "blue"
4 // Project:   Robotstadium, the online robot soccer competitio
5 // Author:    Yvan Bourquin - www.cyberbotics.com
6 // Changes:   November 4, 2008: Adapted to Webots6
7
8
9
10 import com.cyberbotics.webots.controller.*;
11
12 public class FieldPlayer extends Player {
13
14     private Motion backwardsMotion, forwardsMotion, forwards50Motion;
15     private Motion turnRight60Motion, turnLeft60Motion, turnLeft180M
16
17     private double goalDir = 0.0; // interpolated goal direction (wi
18
19     public FieldPlayer(int playerID, int teamID) {
20         super(playerID, teamID);
21         backwardsMotion = new Motion("../motions/Backwards.moti
22         forwardsMotion = new Motion("../motions/Forwards.moti
23         forwards50Motion = new Motion("../motions/Forwards50.mo
24         turnRight40Motion = new Motion("../motions/TurnRight40.m
25         turnLeft40Motion = new Motion("../motions/TurnLeft40.m
26         turnRight60Motion = new Motion("../motions/TurnRight60.m
27         turnLeft60Motion = new Motion("../motions/TurnLeft60.m
28         turnLeft180Motion = new Motion("../motions/TurnLeft180.m
29         sideStepRightMotion = new Motion("../motions/SideStepRight
30

```

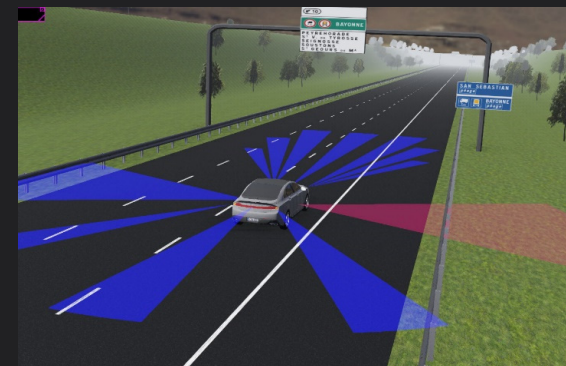
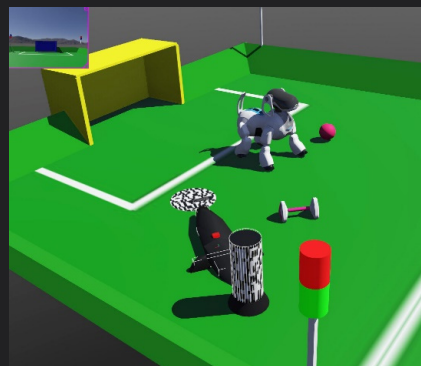
Team-0 - 0 READY 0 - Team-1

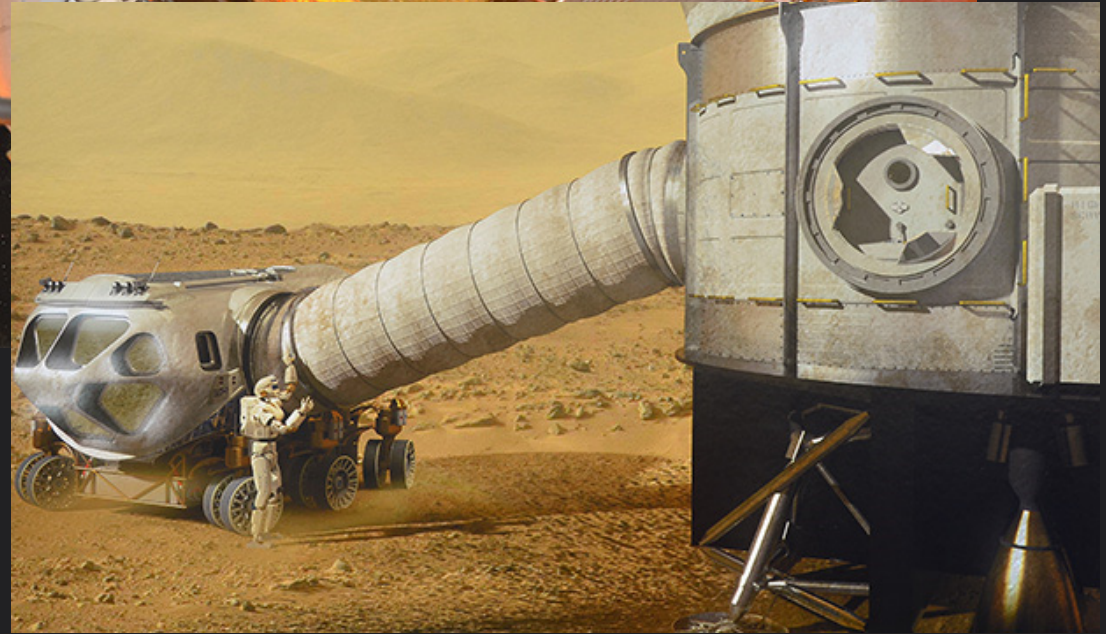
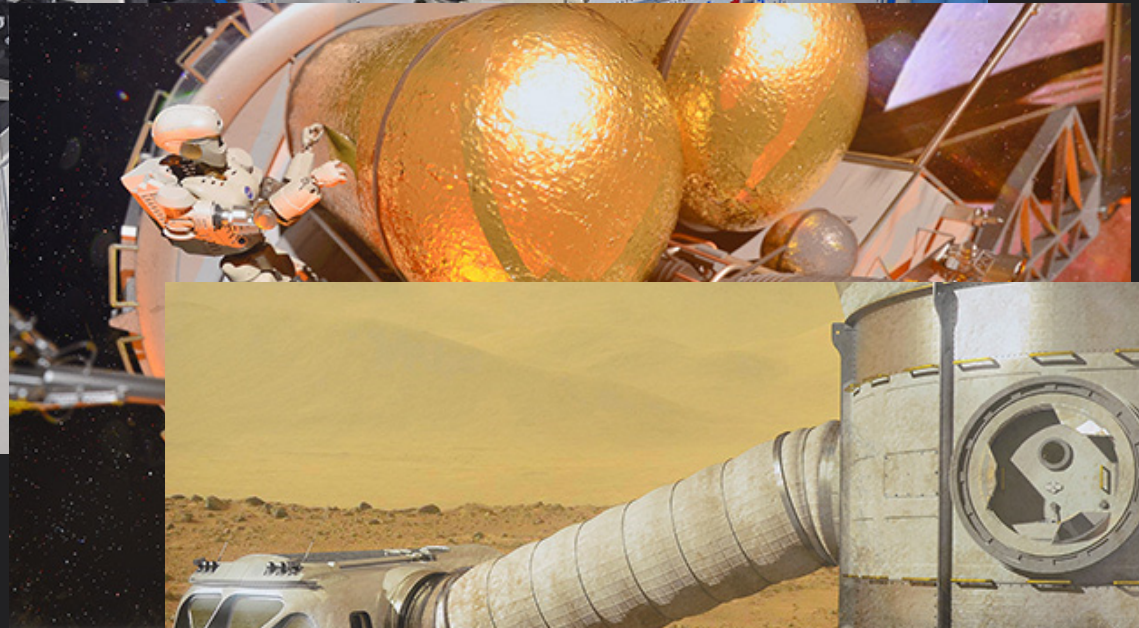
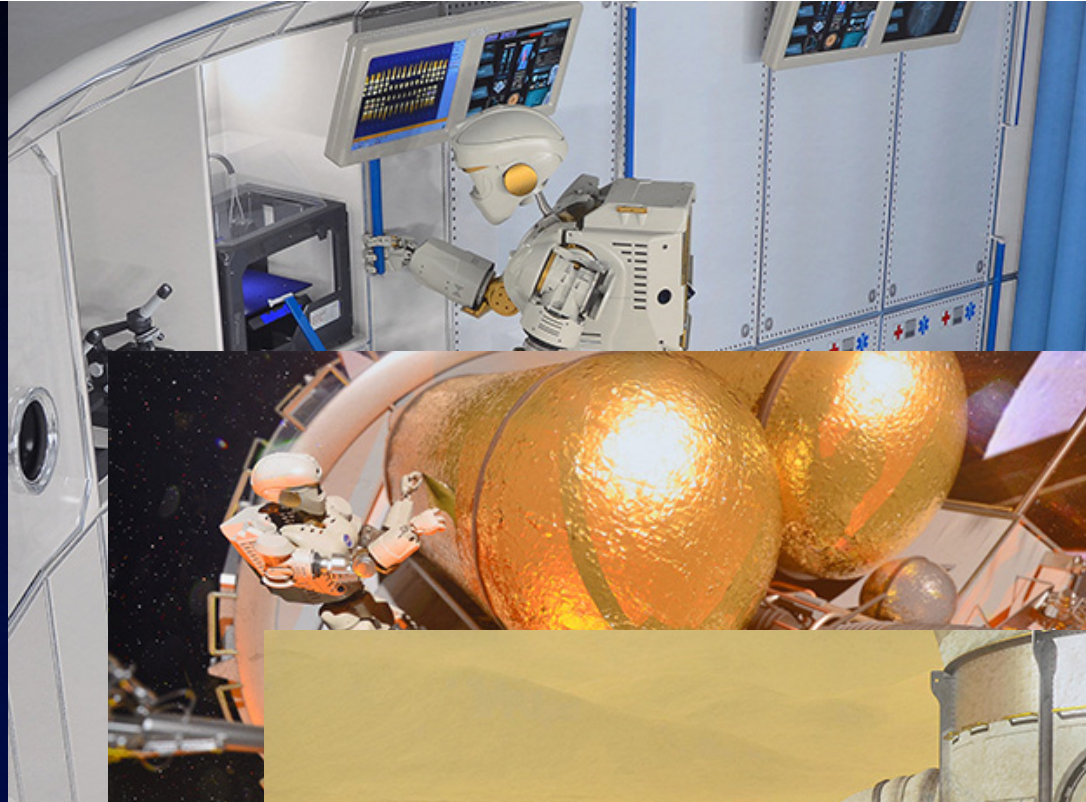
WorldInfo Viewpoint Background DirectionalLight DirectionalLight SoccerField Walls DEF YELLOW_GOAL Goal DEF BLUE_GOAL Goal DEF BALL Ball Supervisor DEF GOAL_KEEPER_0 Nao_H21_V40 DEF PLAYER_1_0 Nao_H21_V40 DEF PLAYER_2_0 Nao_H21_V40 DEF PLAYER_3_0 Nao_H21_V40 DEF GOAL_KEEPER_1 Nao_H21_V40 DEF PLAYER_1_1 Nao_H21_V40 DEF PLAYER_2_1 Nao_H21_V40 DEF PLAYER_3_1 Nao_H21_V40

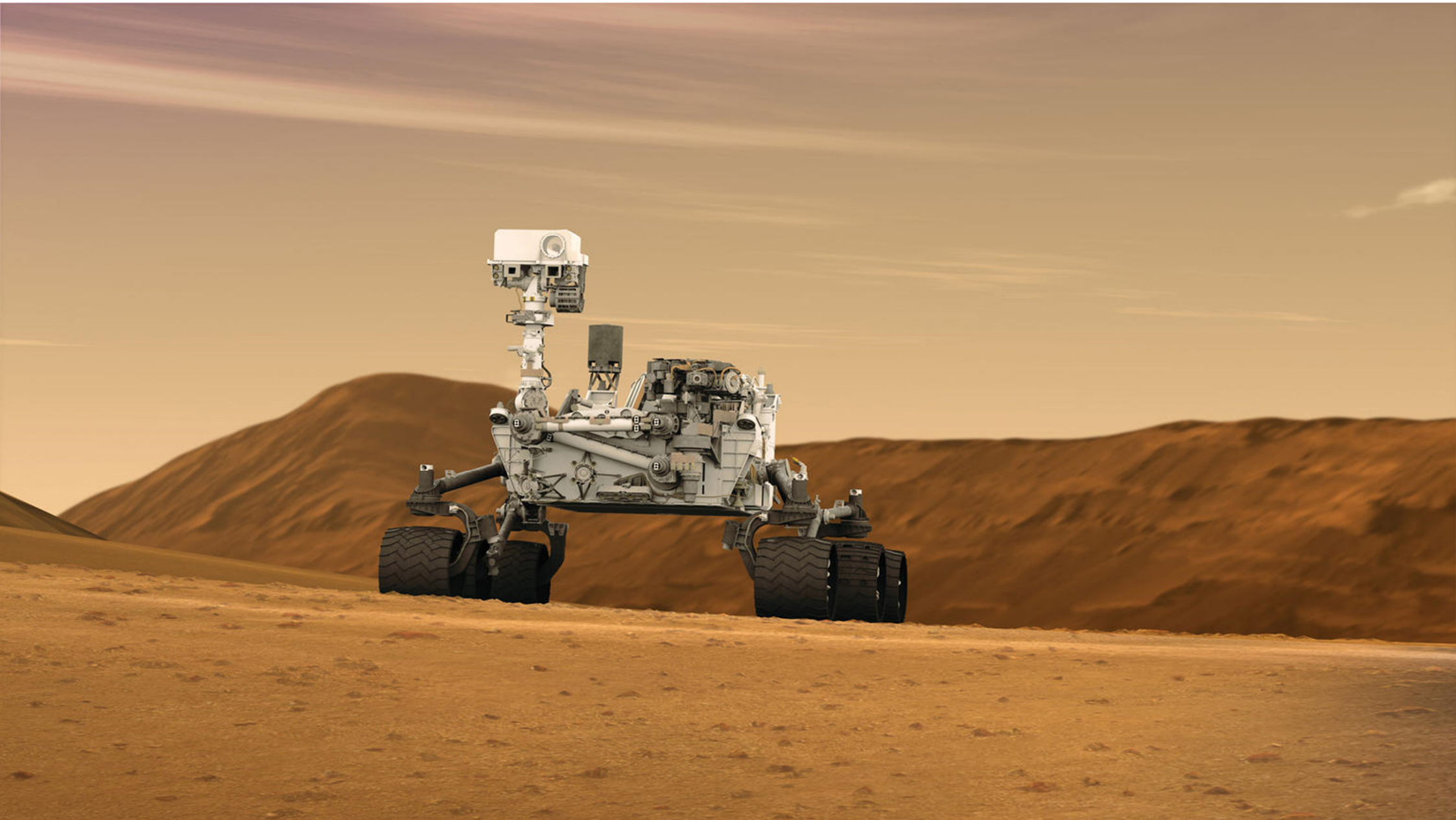
SoccerField (Solid) DEF

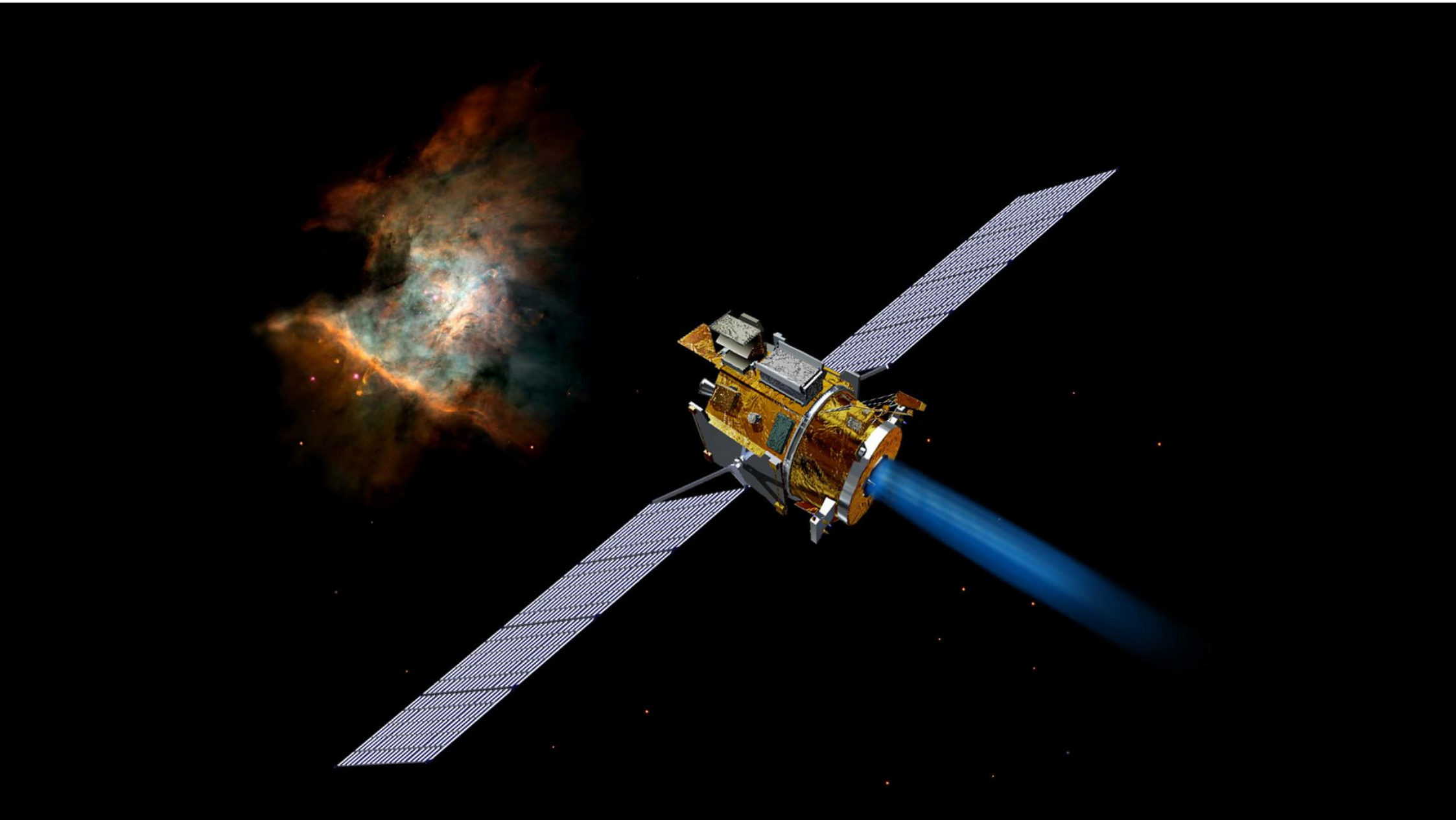
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ROBOTS

Credits

- ◇ Presentation available at <http://www.aiai.ed.ac.uk/~ai/resources/>
- ◇ National Museum of Scotland – Tayce Phillipson and Kirsty Tough
- ◇ Science Museum London
- ◇ Disney/LucasFilm, MGM – Sci-Fi Film Robots
- ◇ University of Edinburgh – Freddy Robot
- ◇ Edinburgh Centre for Robotics – Robotarium Robots
- ◇ Da-Vinci Surgical Robot – Sofmedica
- ◇ Soft Robots – Harvard Robotics Lab
- ◇ Webots – Cyberbotic
- ◇ Valkyrie, Curiosity Rover and Deep Space One – NASA Images