

Concerns

Bill Joy, “Why the Future Doesn’t Need Us.” (<http://www.wired.com/wired/archive/8.04/joy.html>)

Ray Kurzweil, *The Age of Spiritual Machines* (Viking, New York, 1999)

Hans Moravec, *Robot: Mere Machine to Transcendent Mind* (Oxford University Press, New York, 1999)

Kevin Kelly, *Out of Control: The New Biology of Machines, Social Systems and the Economic World* (Addison-Wesley Publishing Company, Reading, Mass, 1994)

Bill Joy*

“Accustomed to living with almost routine scientific breakthroughs, we have yet to come to terms with the fact that the most compelling 21st Century technologies—robotics, genetic engineering, nanotechnology—pose a different threat than the technologies that have come before. Specifically, robots, engineered organisms, and nanobots share a dangerous amplifying factor: They can **self-replicate**. A bomb is blown up only once—but one bot can become many and quickly get out of control.”

*Chief Scientist, Sun Microsystems (inventor of Berkeley Unix and Java)

**B. Eng., U. Michigan, '67

Off we go ...

Perhaps we can get some ideas about possible technological threats (and opportunities) in the 21st Century by examining the futures imagined by science fiction writers ...

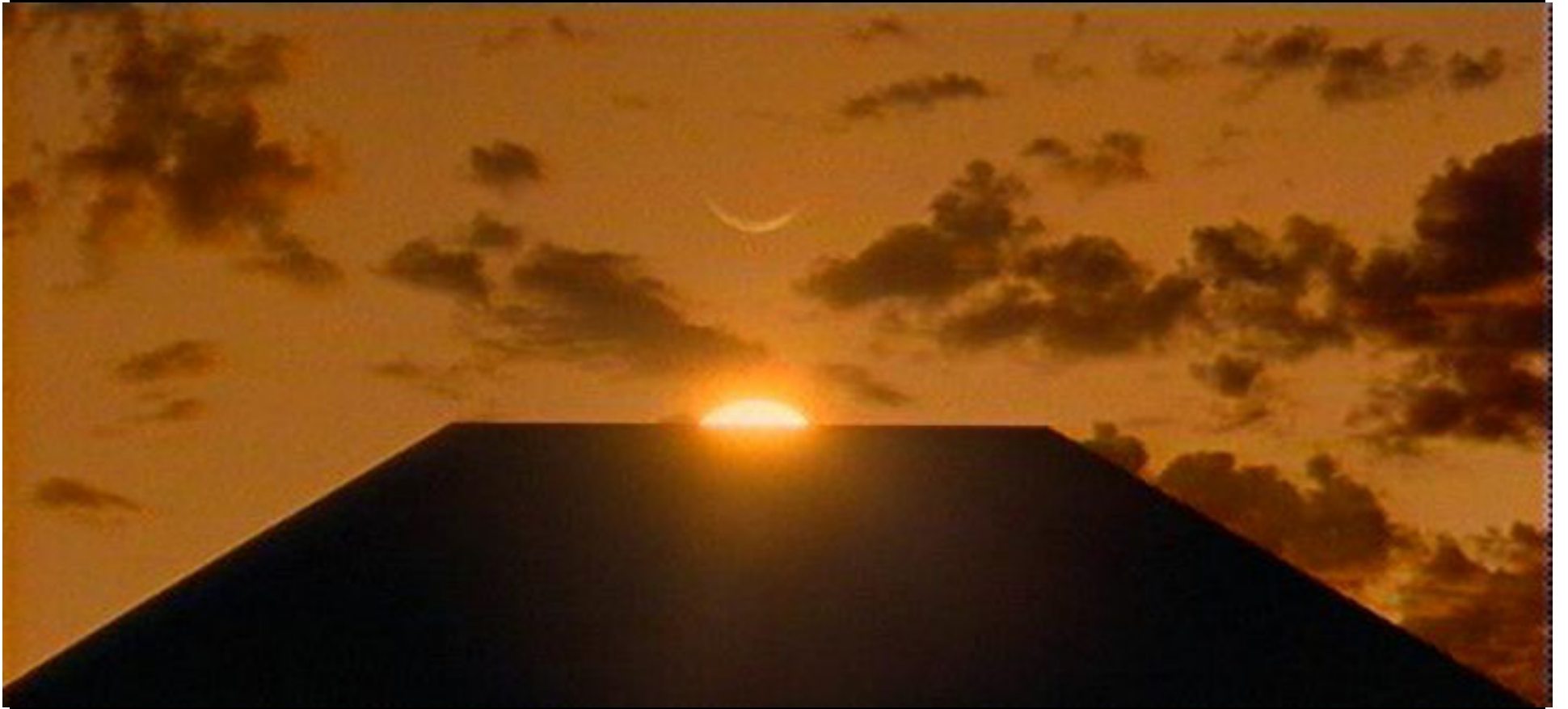


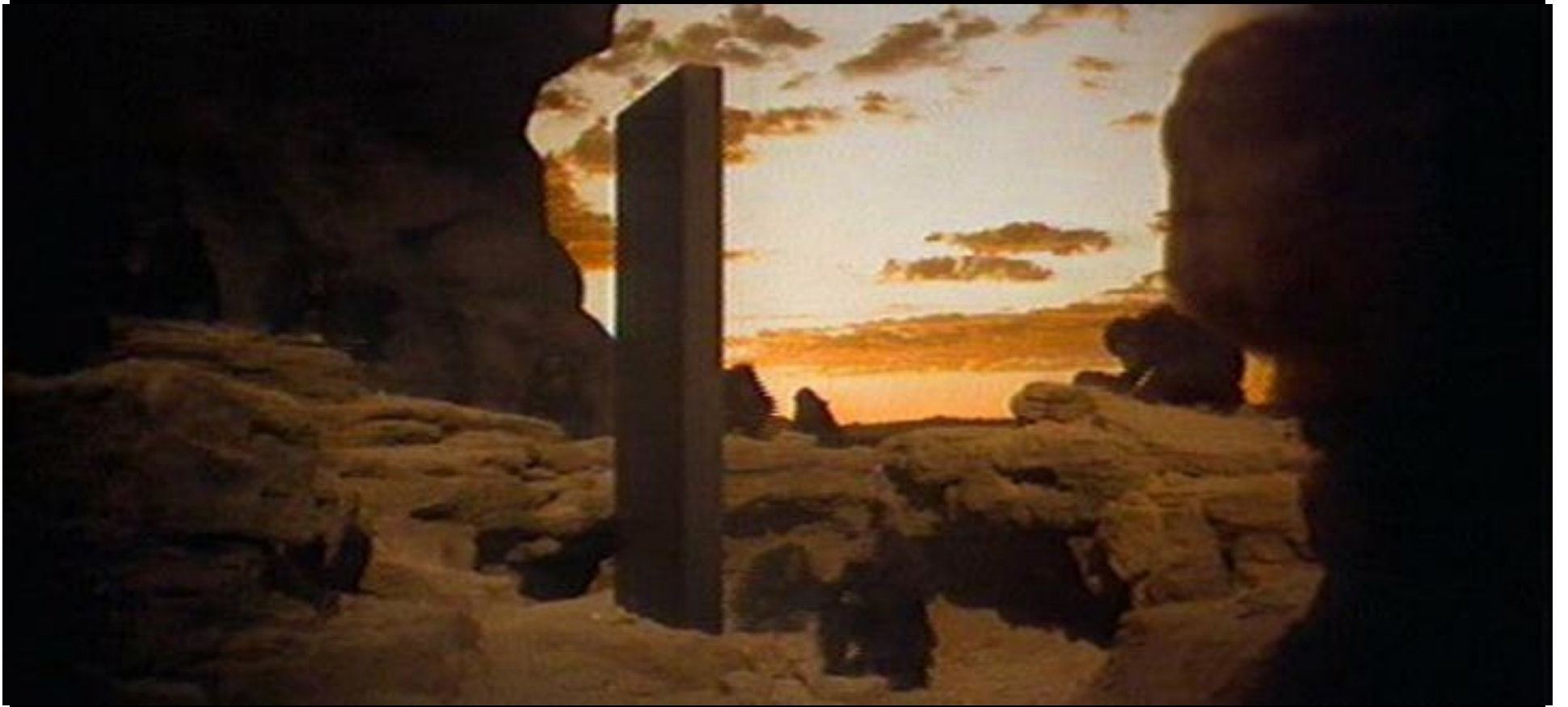
The Future

As seen through science fiction...

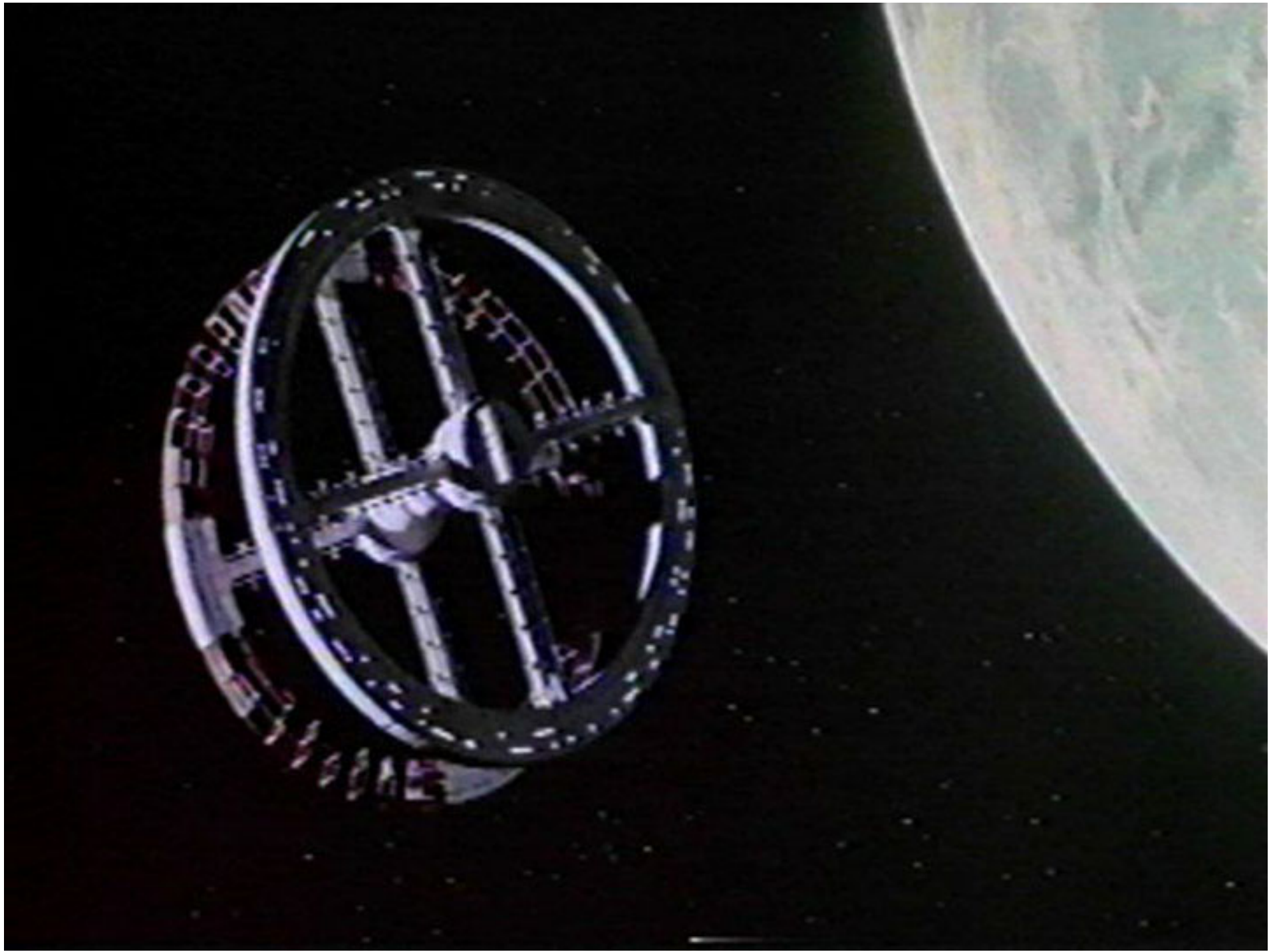


2001: A SPACE ODYSSEY

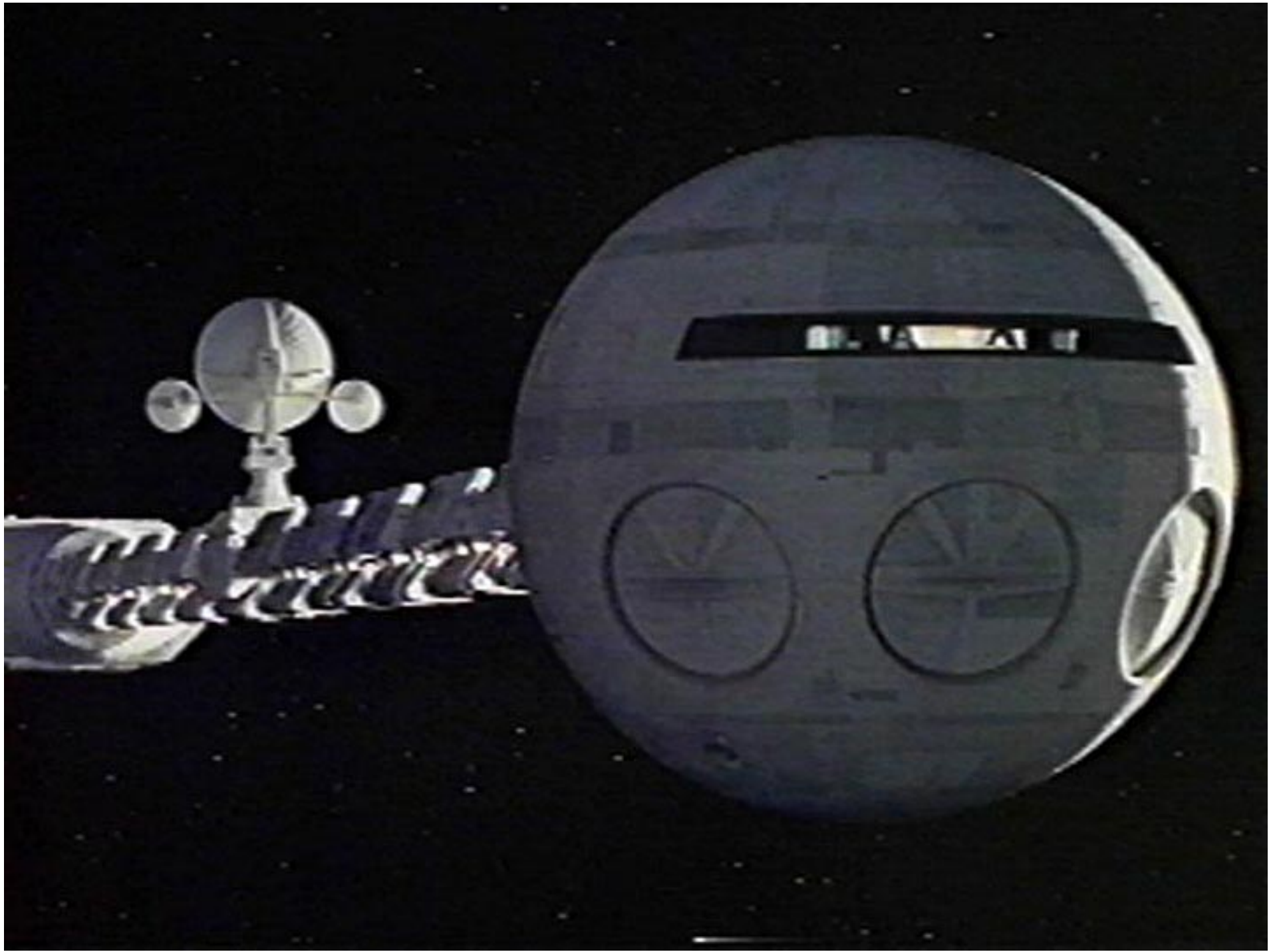






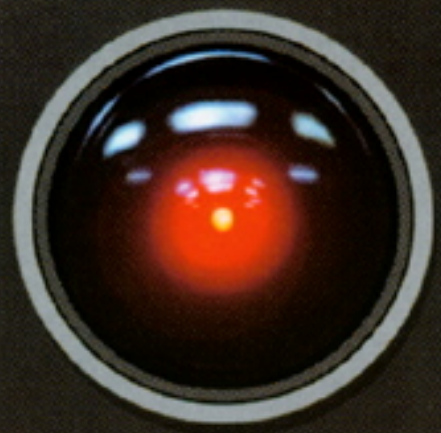




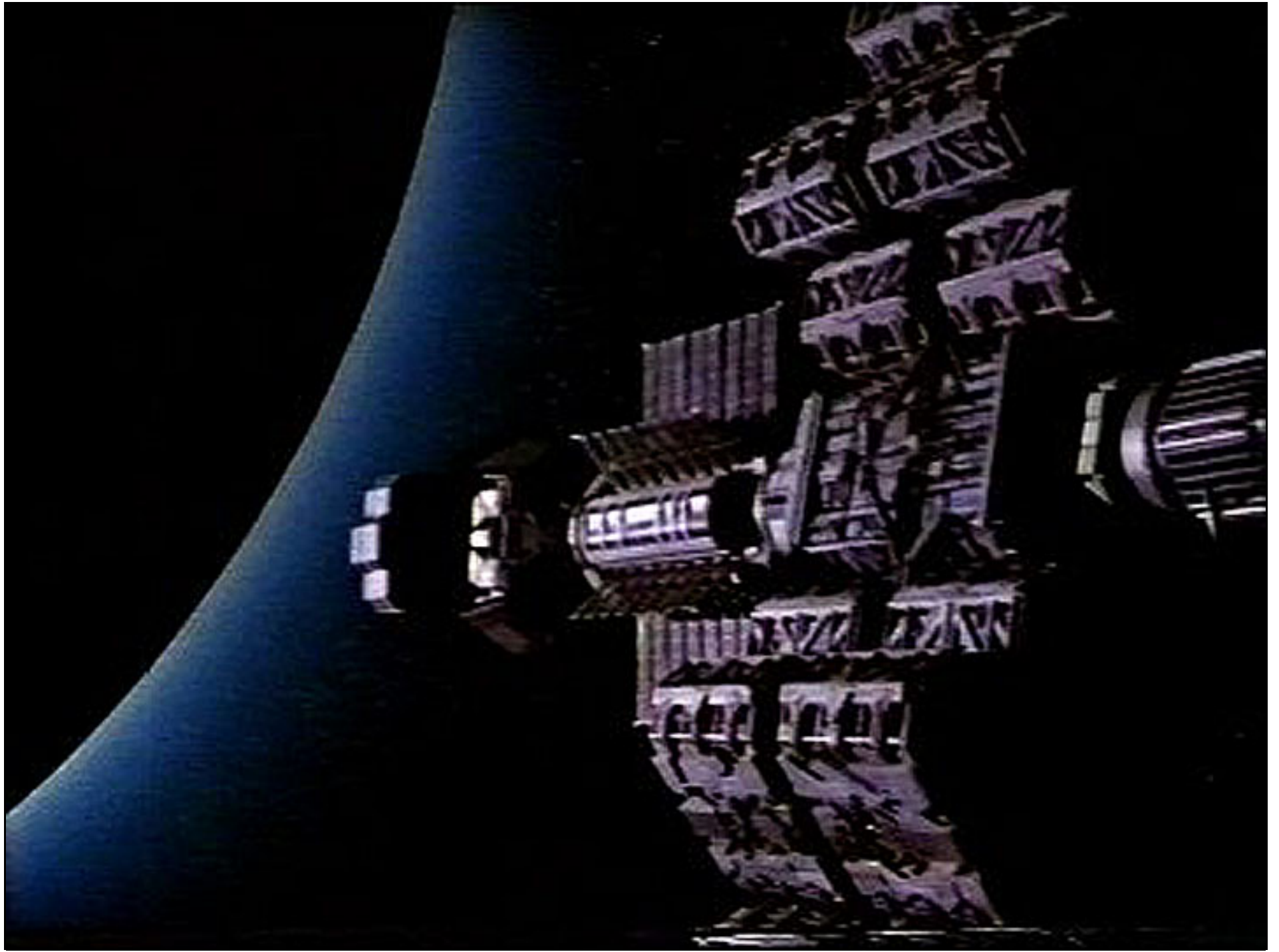


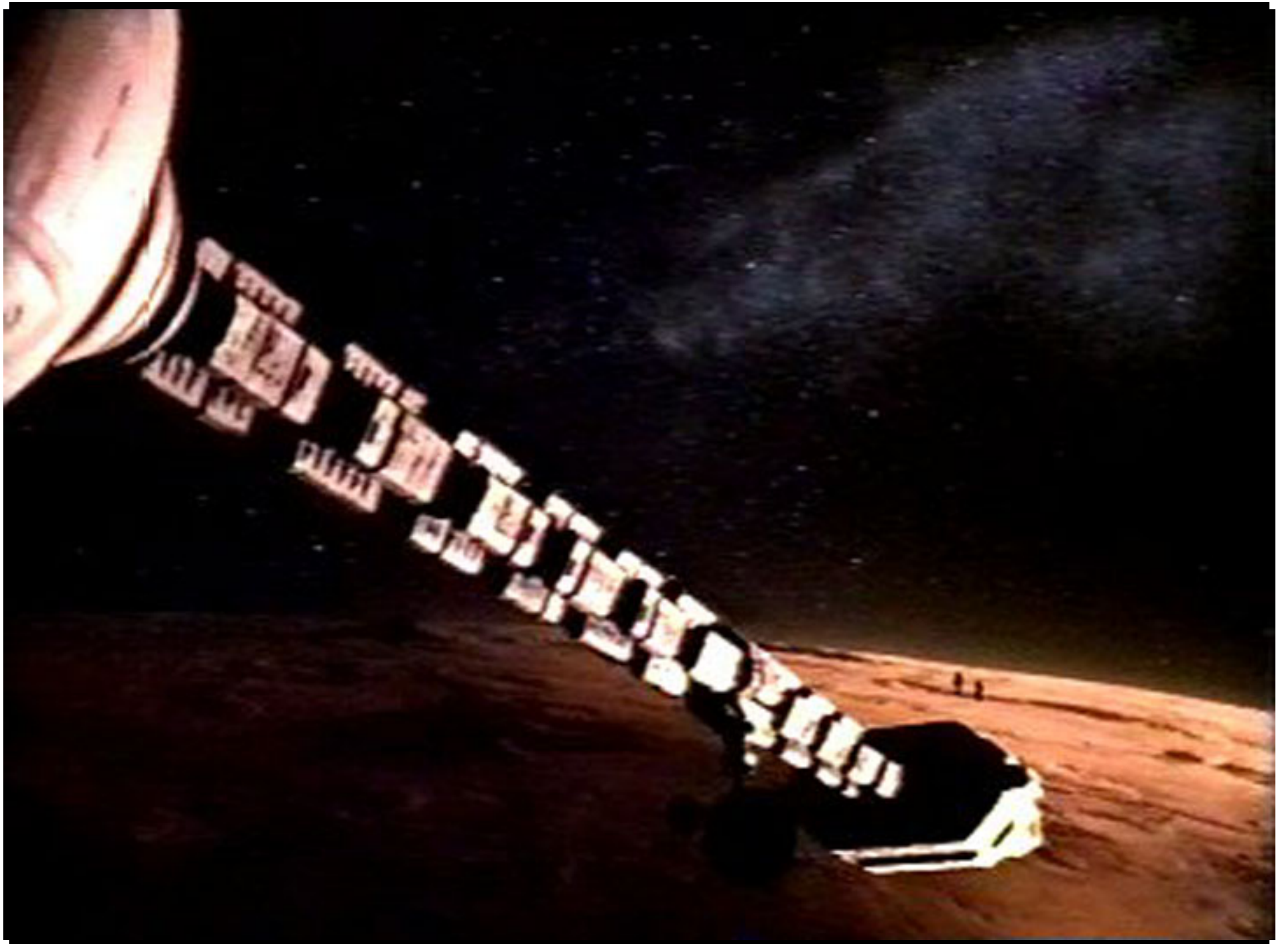


HAL 9000

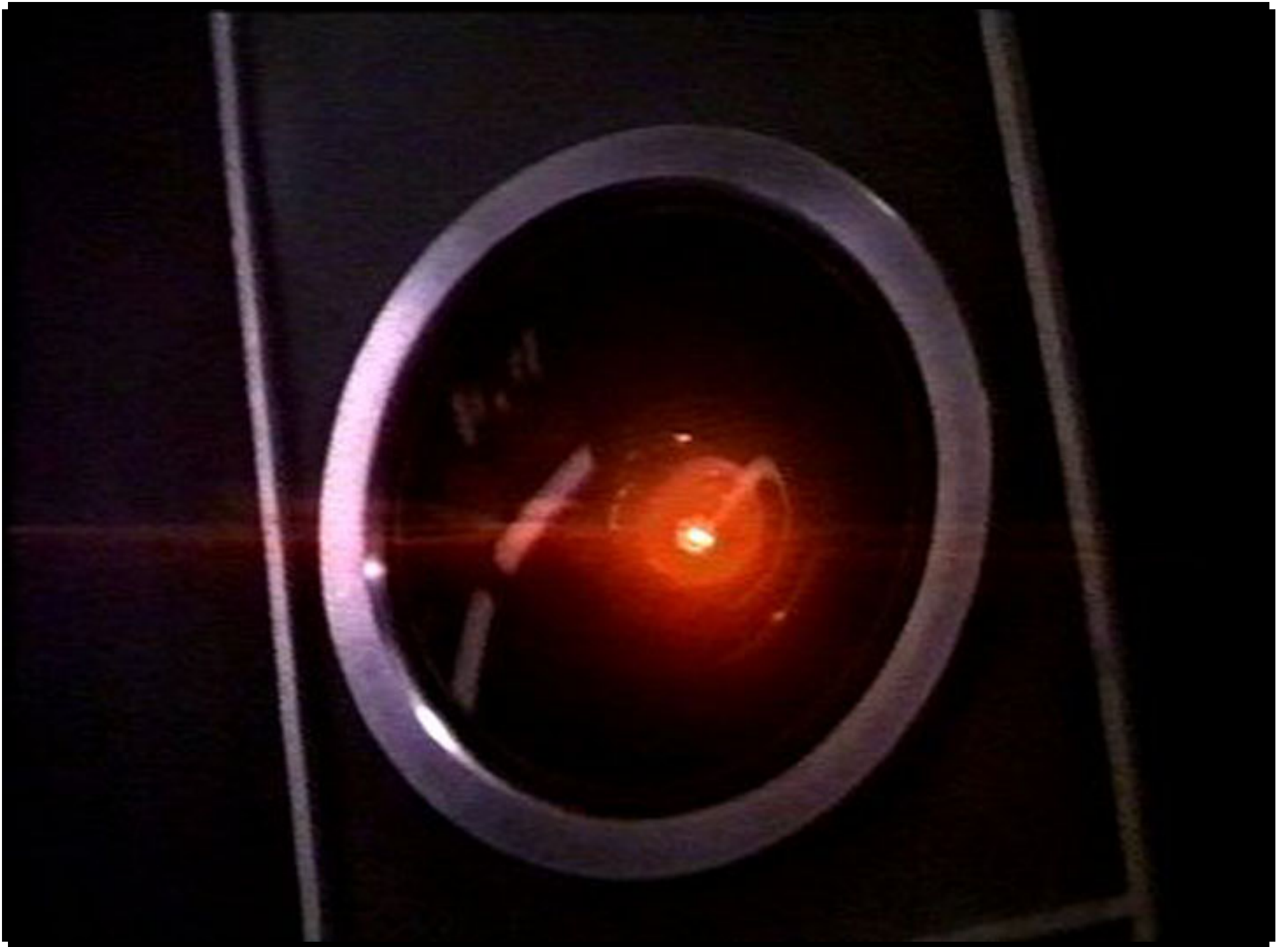












STRANGELOVE



OR
HOW
I
WANT
TO
BE
A
PART
OF
THE
ZONE





WARGAMES







THE ANDROMEDA STRAIN

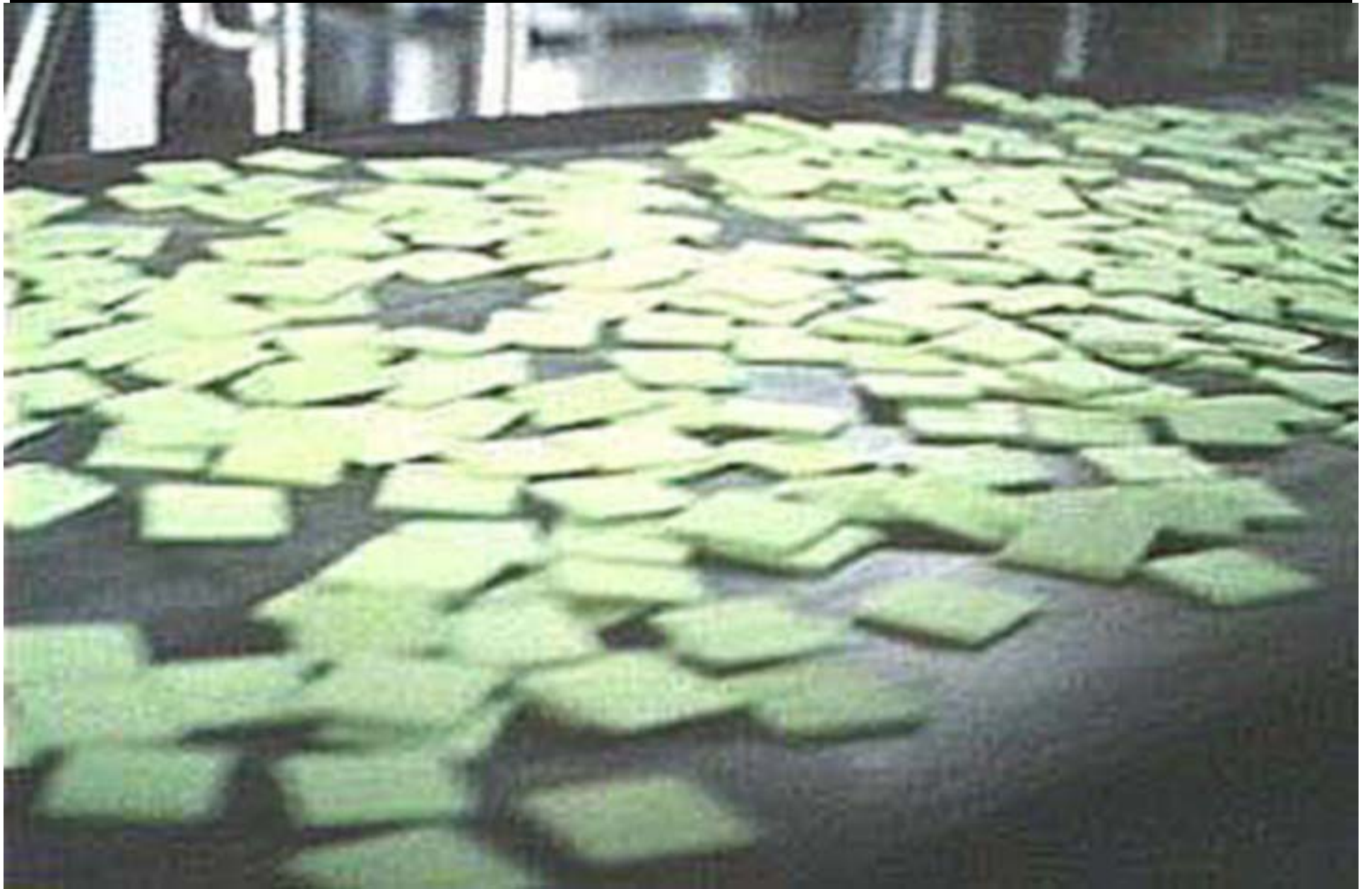




SOYLENT
GREEN



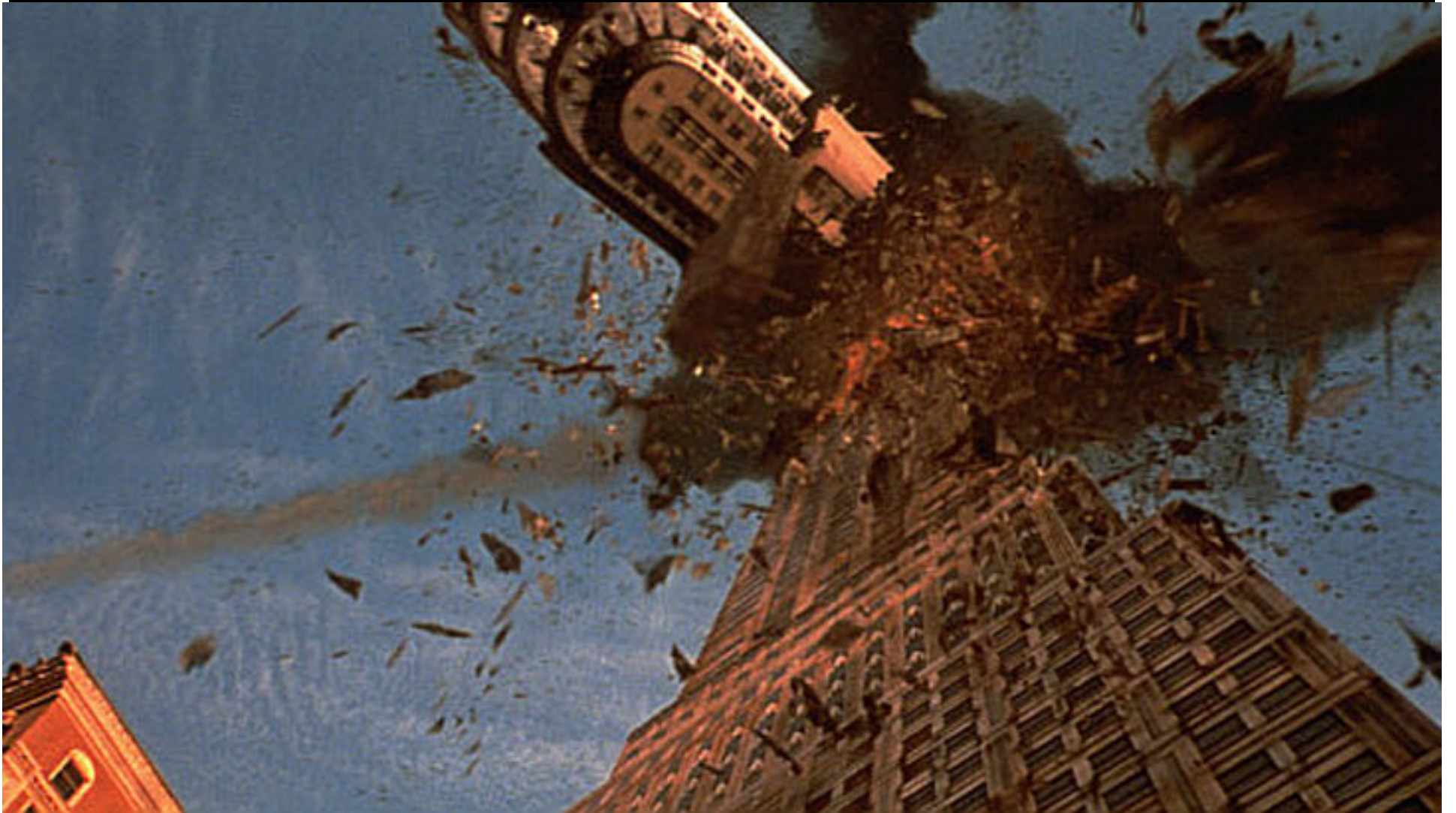




The image features the word "ARMAGEDDON" in a bold, serif font, centered horizontally. The text is superimposed on a horizontal band of bright orange and yellow flames that appear to be rising from the bottom. Above the flames, a blue and white globe of the Earth is visible, partially obscured by the top of the flame band. The entire scene is set against a solid black background.

ARMAGEDDON











STARGATE™

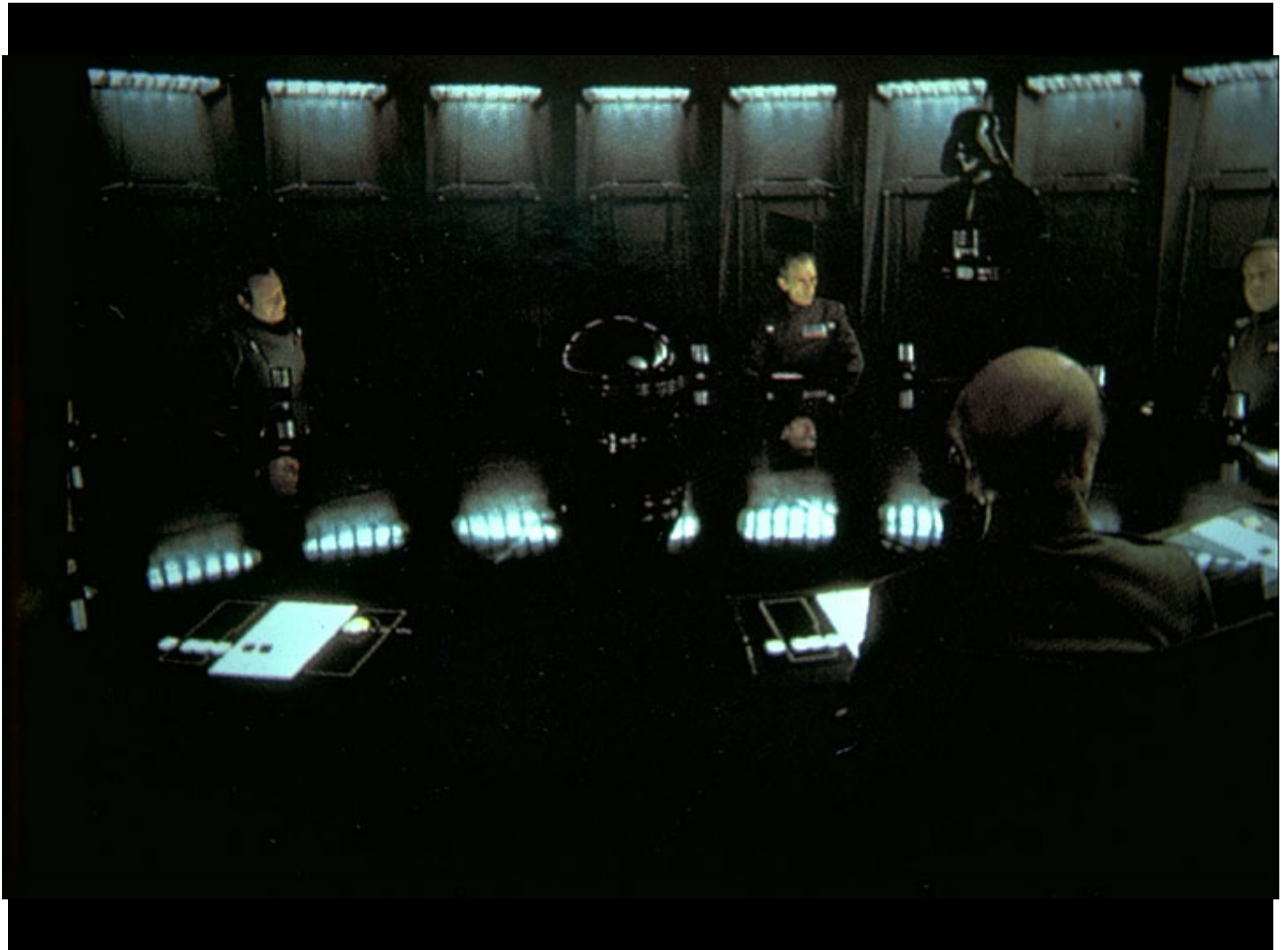






STAR WARS. _____
EPISODE I

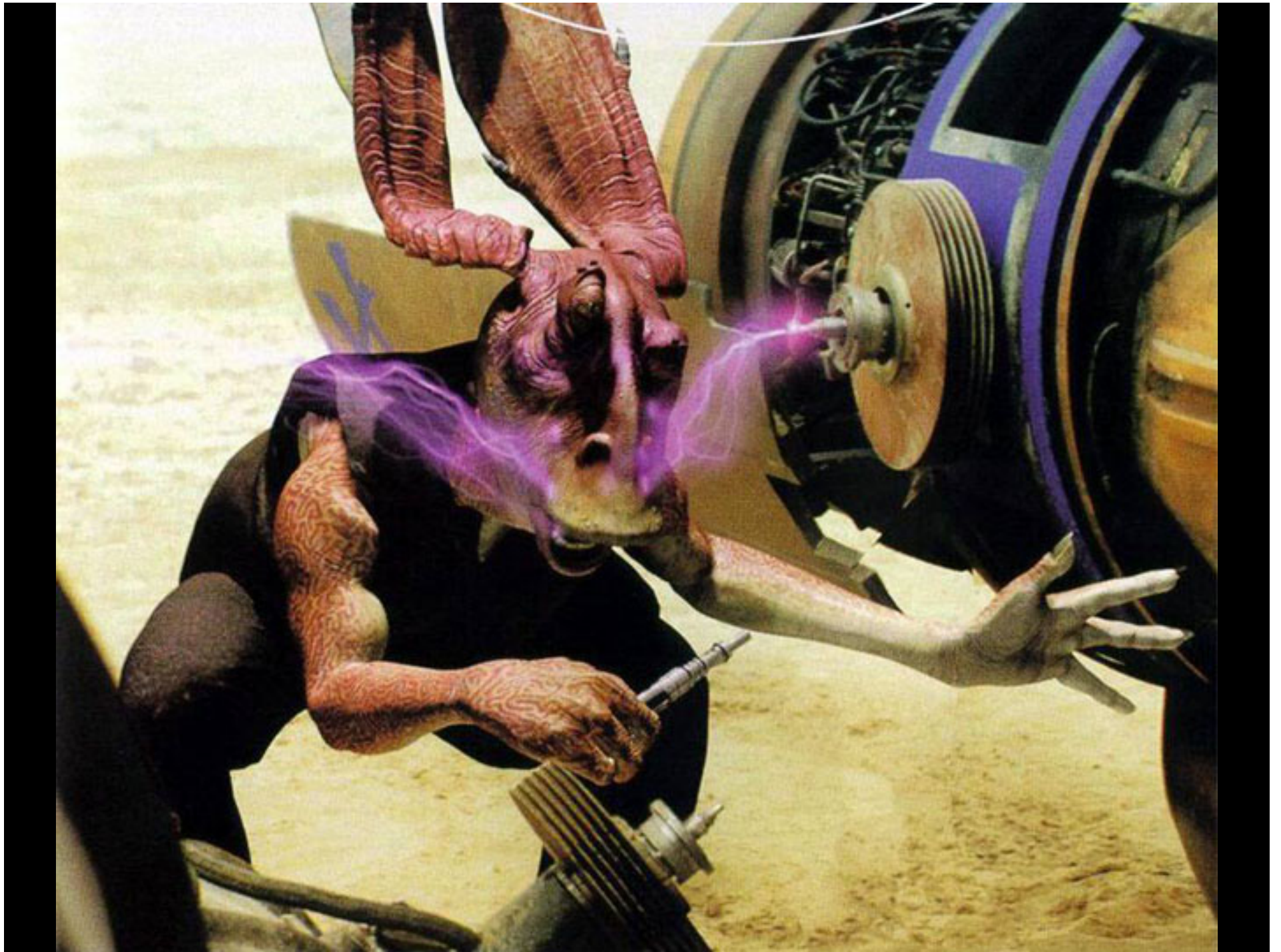
THE PHANTOM MENACE









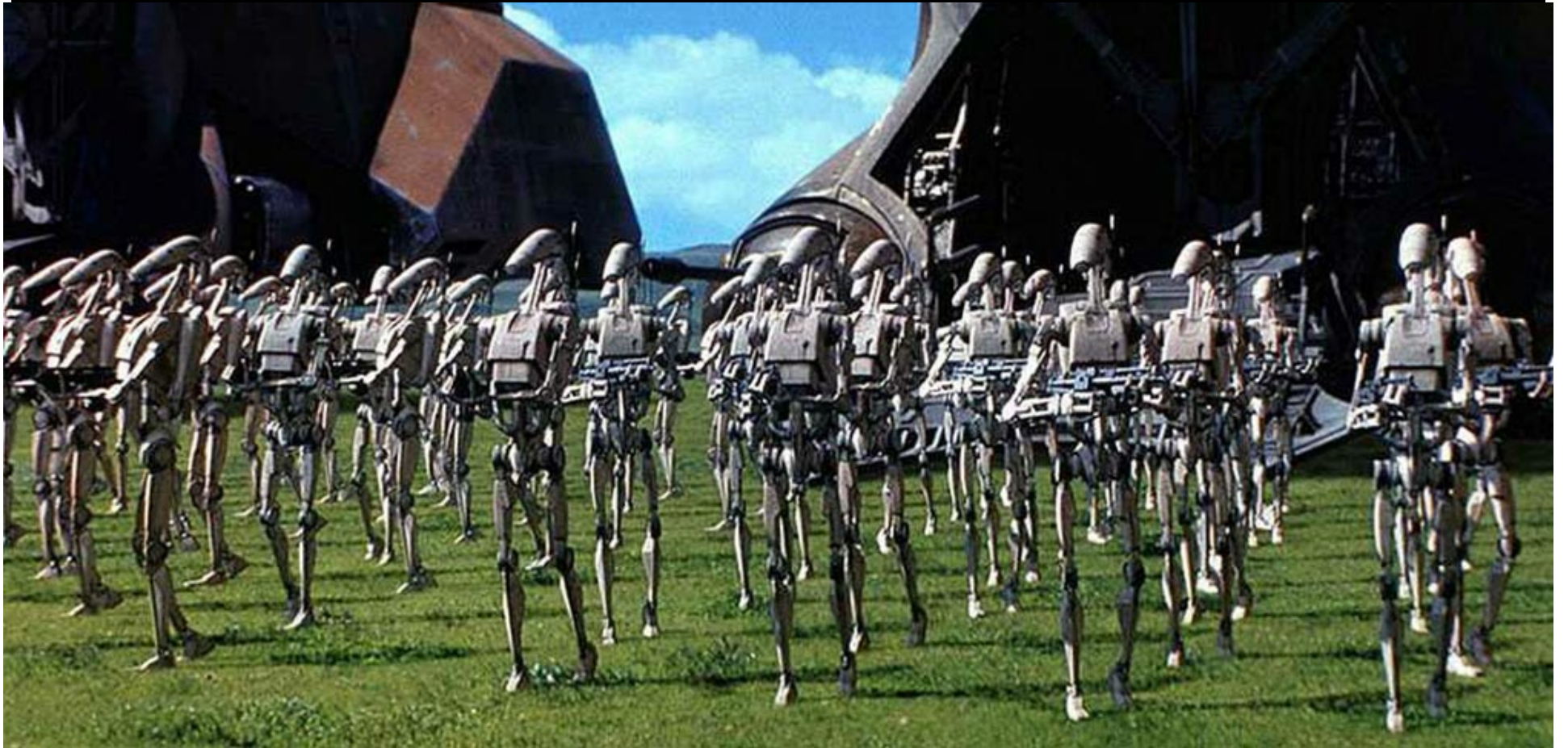










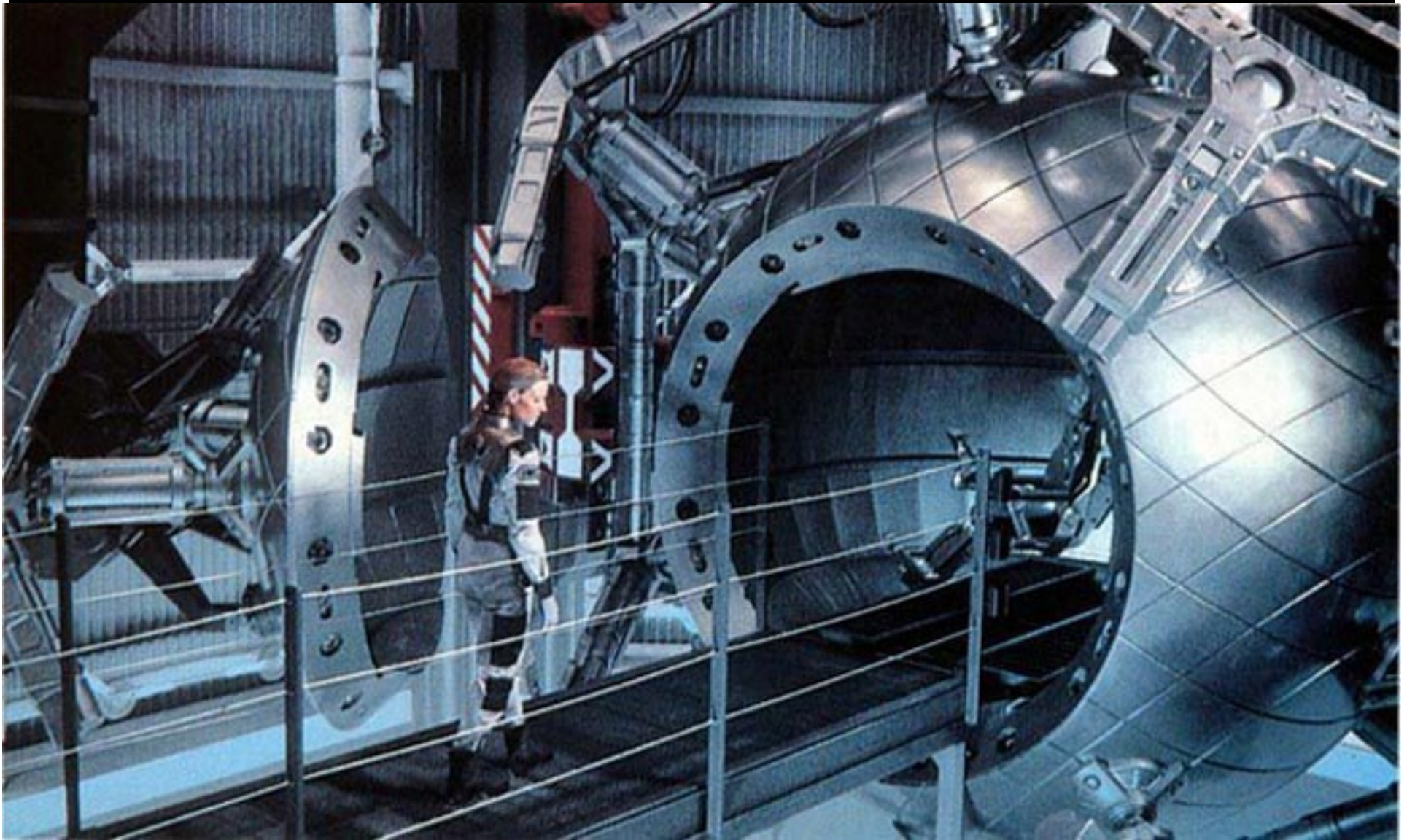






CONTACT





STARRING
STEVEN SPIELBERG FILM
CLOSE
ENCOUNTERS
OF THE THIRD KIND

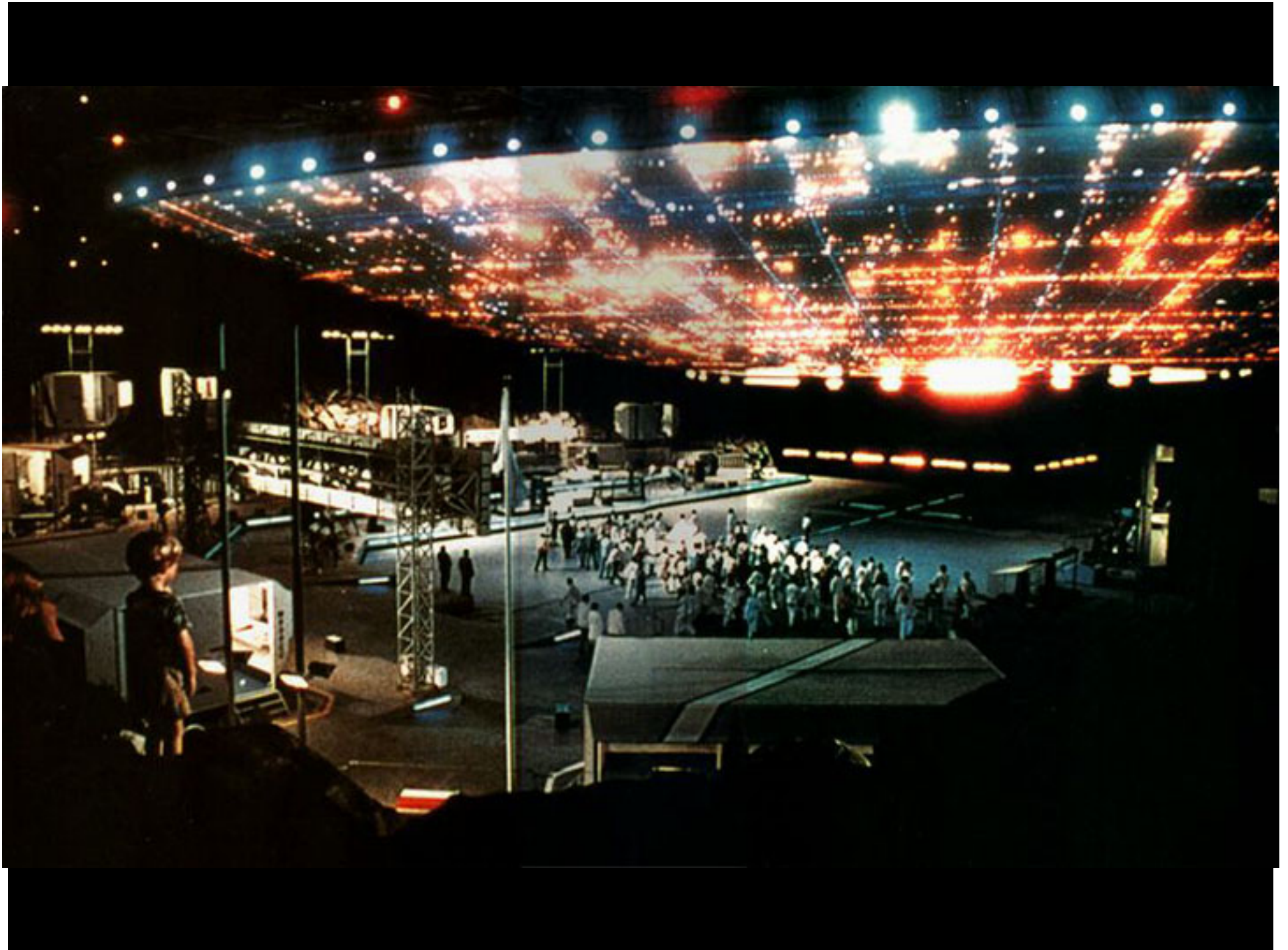


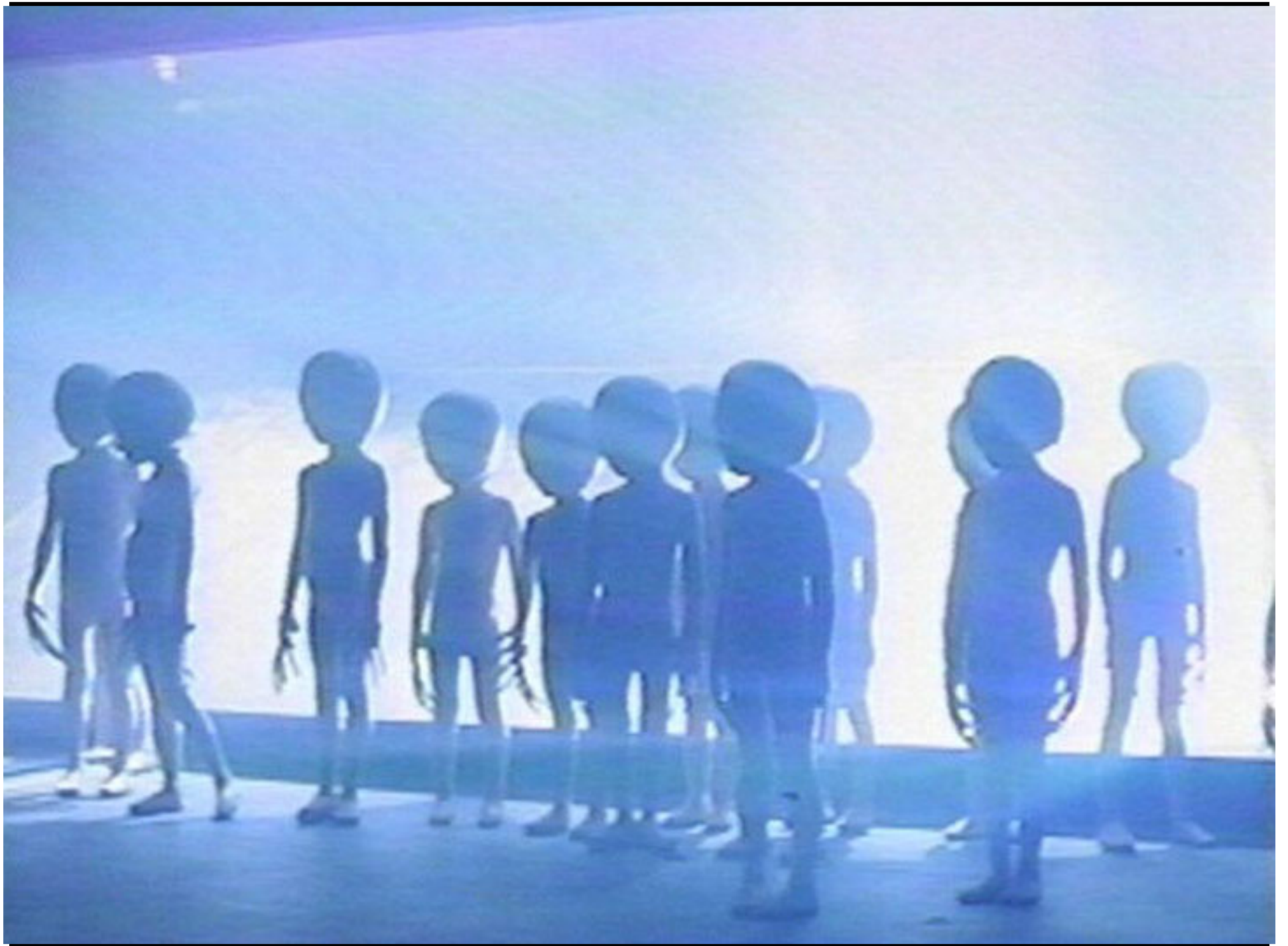














INDEPENDENCE DAY







**THE
WAR
OF THE
WORLDS**





MARS ATTACKS!

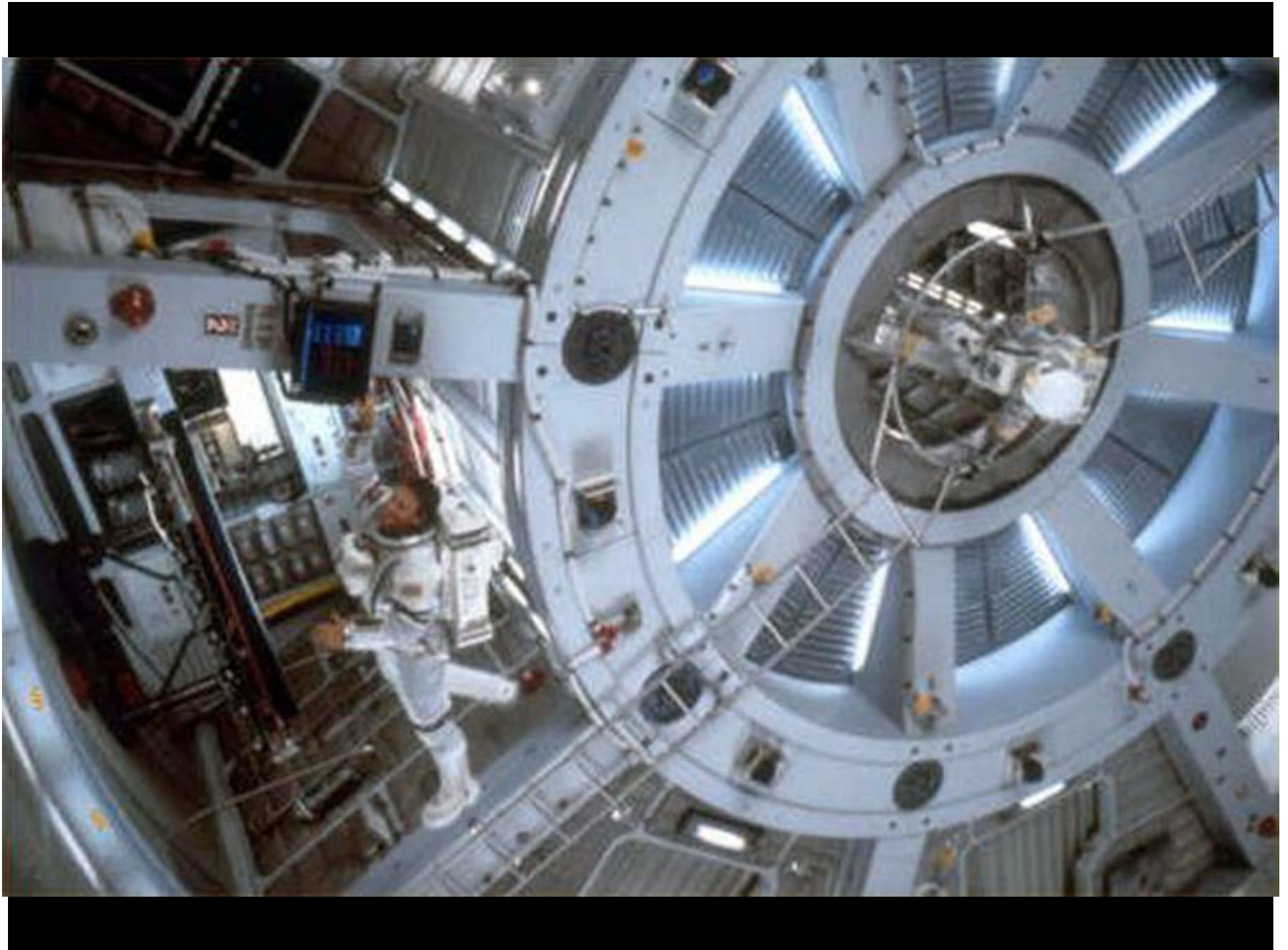


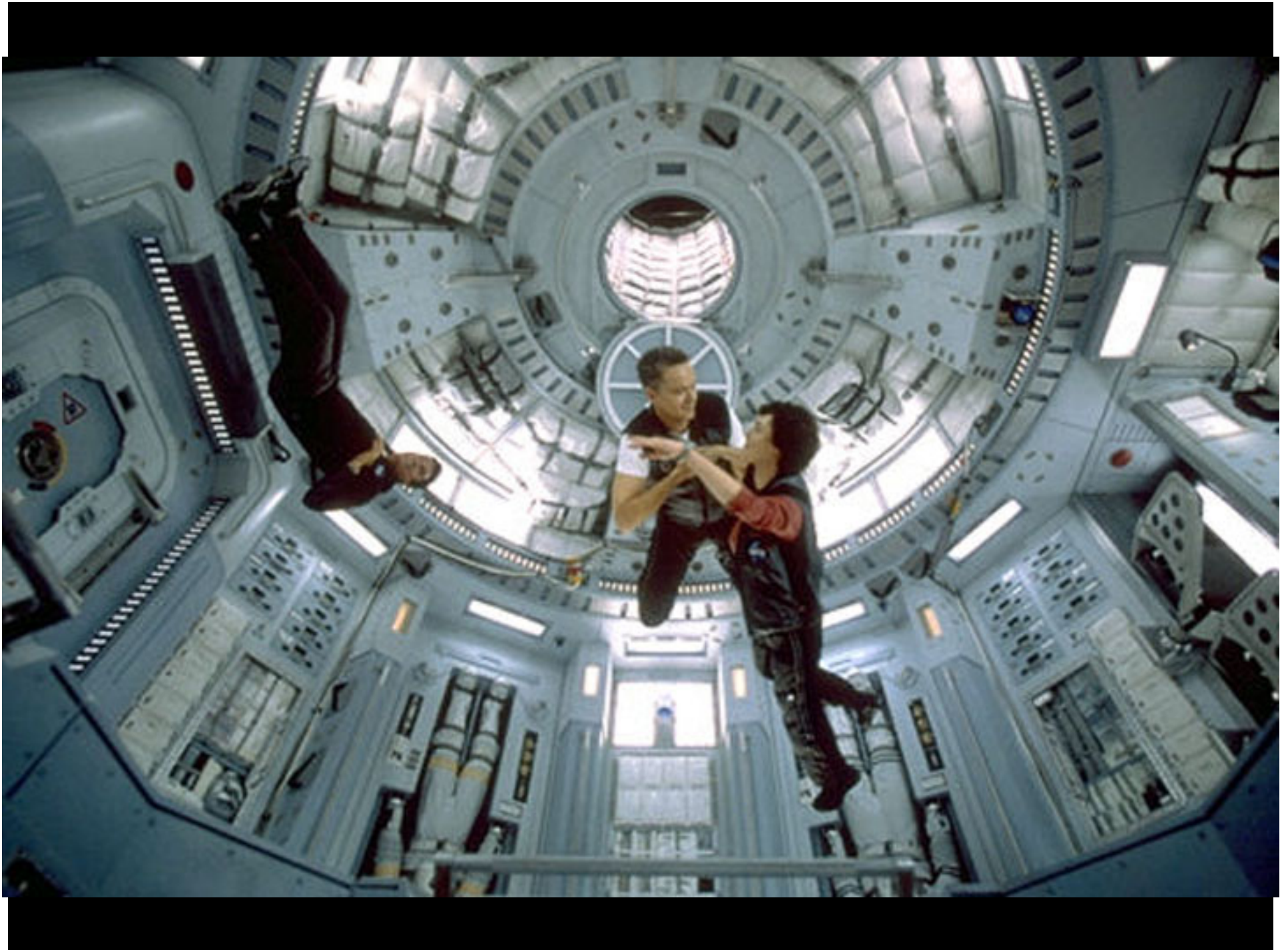
**MISSION TO
MARS**

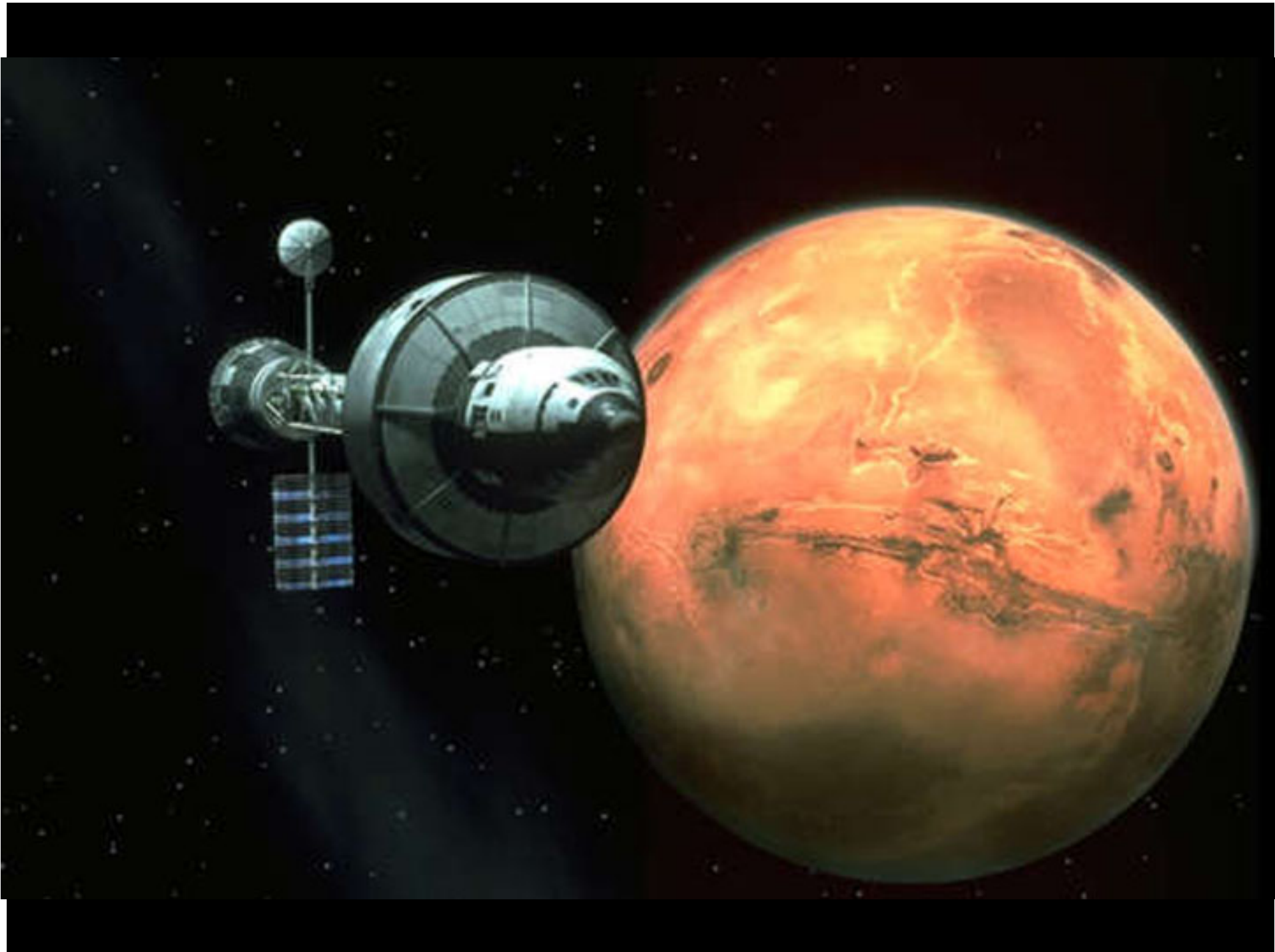


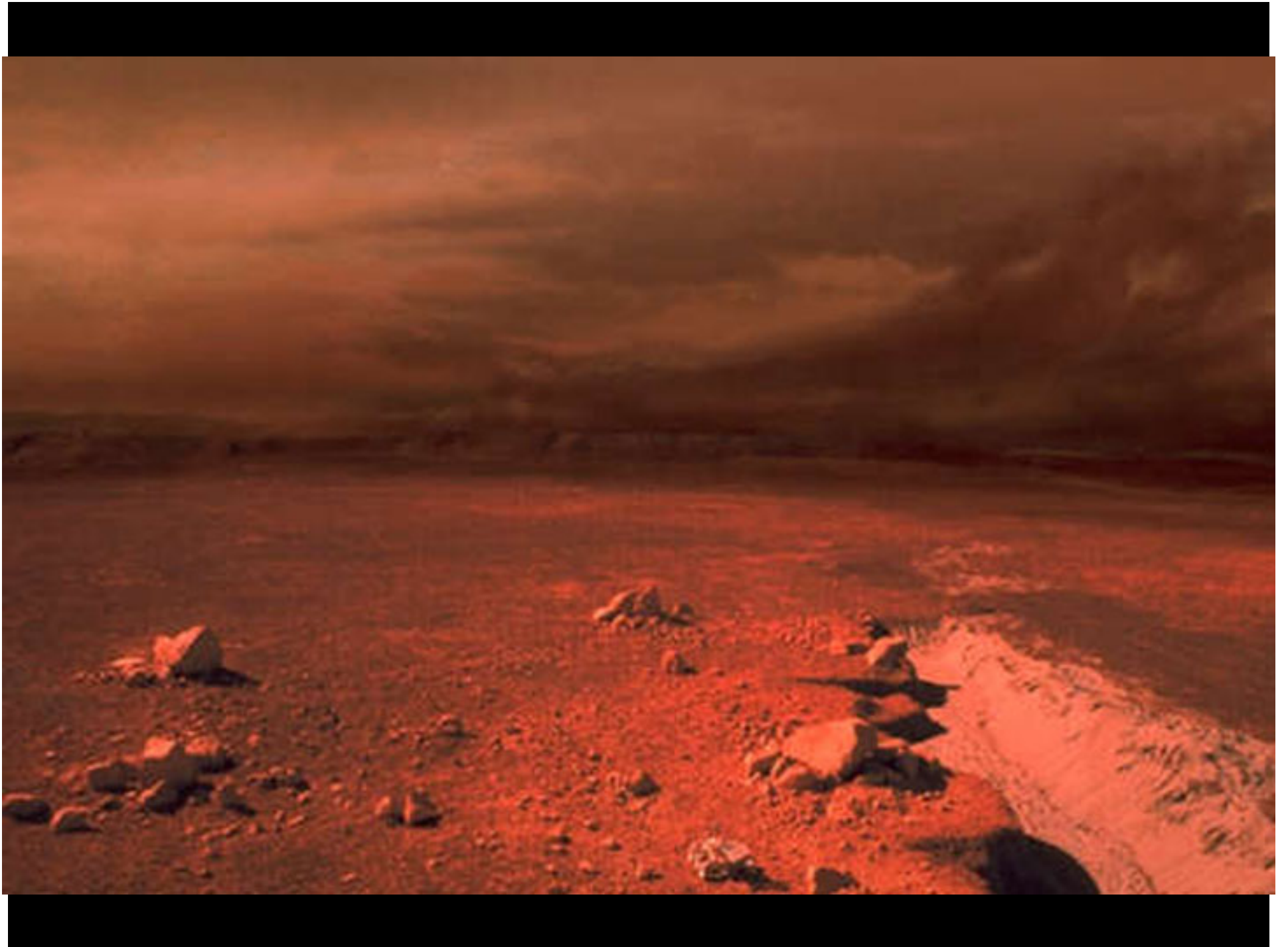


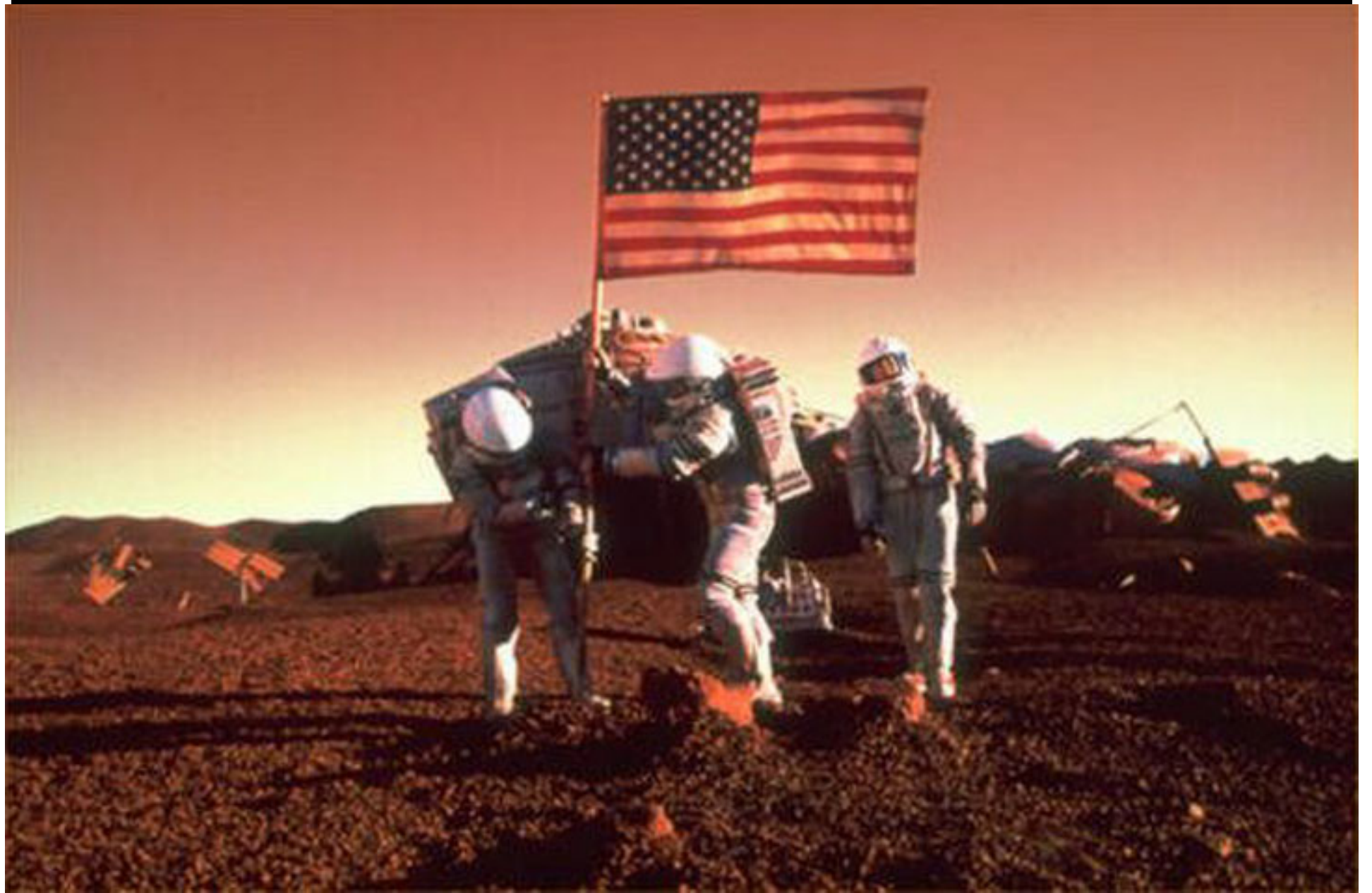
Mars
Science Laboratory
2012







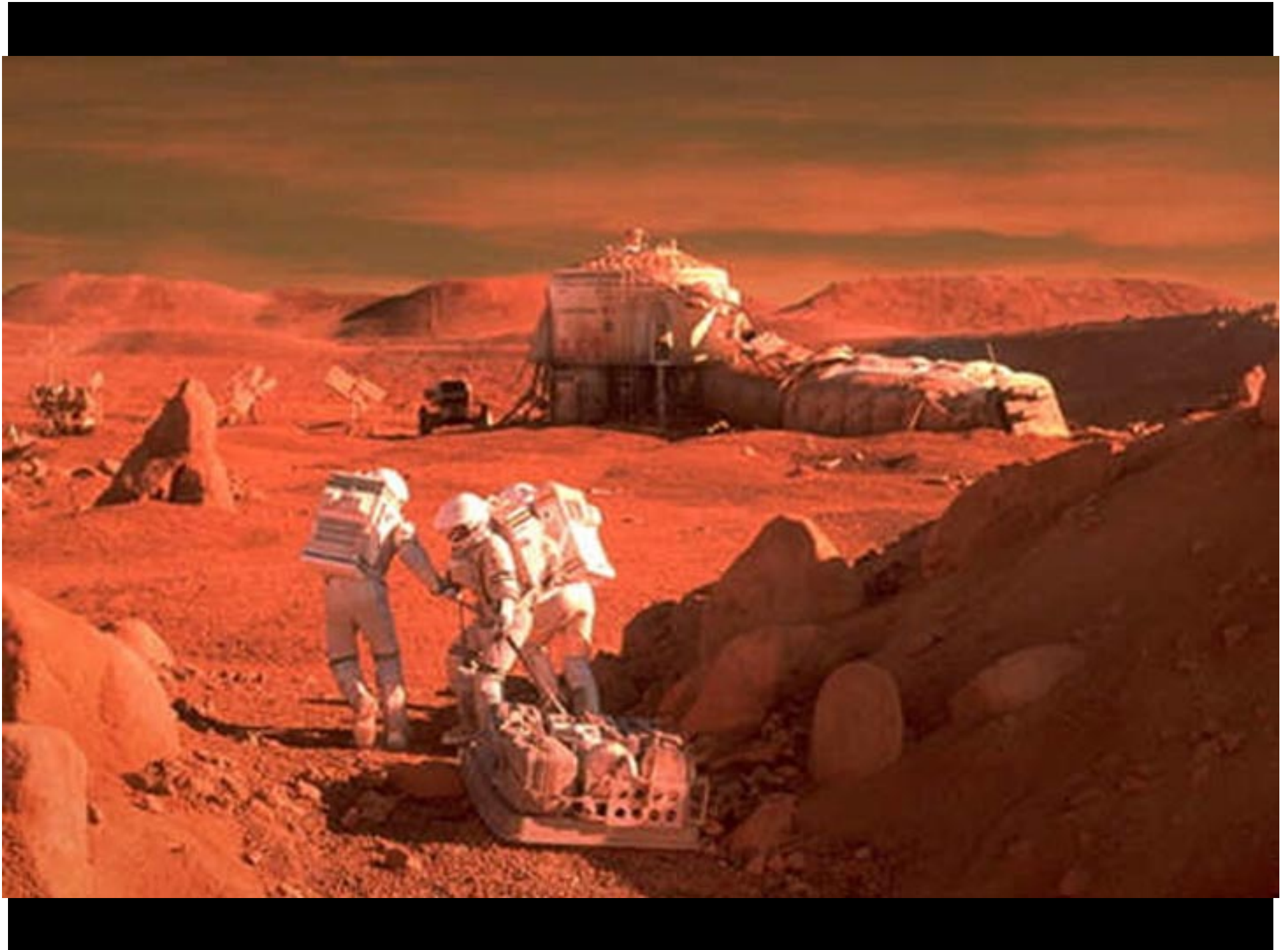












CLOCKWORK
ORANGE







G A T T A C A



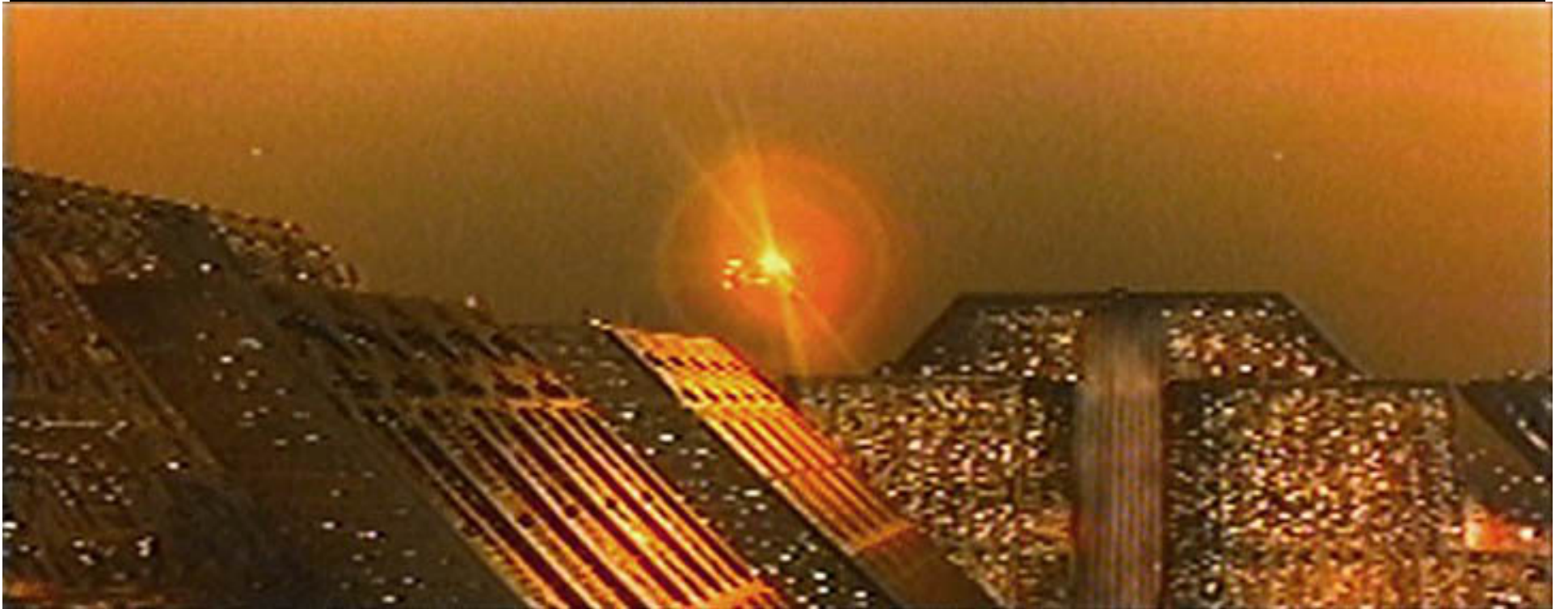
















THE
TERMINATOR



BUNKO SQUAD

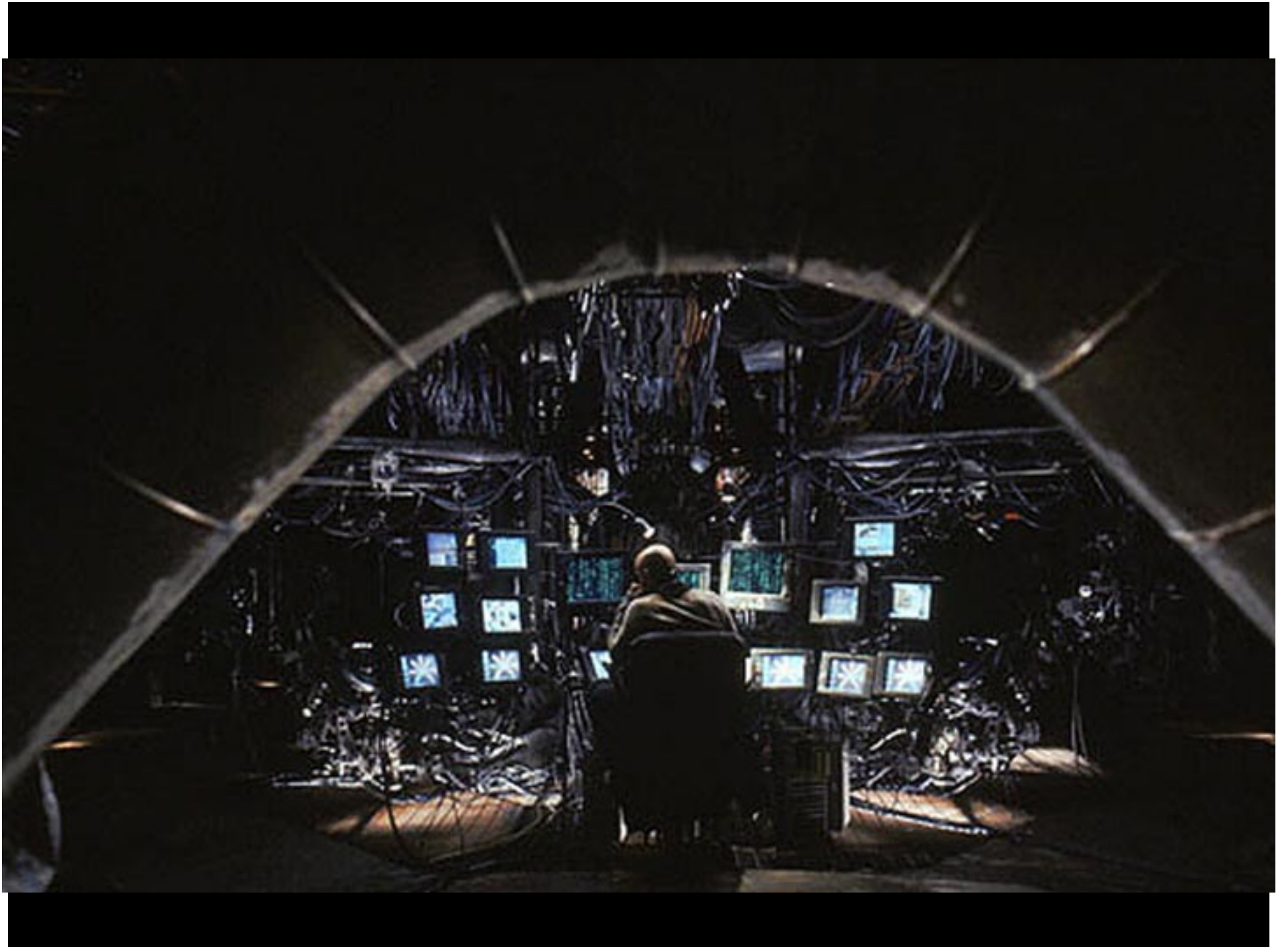






T H E
M A T R I X









Technological Threats

- 20th Century Threats
 - * Nuclear warfare
 - * Chemical weapons
 - * Biological weapons

Technological Threats (cont)

- Info Tech
 - * Robotics (Terminator)
 - * Superintelligent Machines (The Matrix)
- Bio Tech
 - * Genetic Engineering (Gattaca)
 - * Mutating Bioorganisms (Andromeda Strain)
- Nano Tech
 - * The Diamond Age
 - * Gray Goo

Other Threats

- Global Change
 - * Global Warming
 - * Population Explosion
 - * Global Systems Failure
- Cosmic Extinction
 - * Comet/meteor impact
 - * Cosmic collisions

Other Possibilities

- Contact
 - * SETI (Contact)
 - * Close Encounters of the Third Kind
 - * Invaders from Space
- Space Exploration and Colonization
 - * Planetary missions (Mars, etc.)
 - * Interstellar space flight (“new physics”)

Vinge's Singularity*

The acceleration of technological progress has been the central feature of the past century. Vinge argues that we are on the edge of change comparable to the rise of human life on Earth. The precise cause of this change is the imminent creation by technology of entities with greater than human intelligence. There are several possibilities:

- There may be developed computers that are “awake” and superhumanly intelligent.
- Large computer networks (and their associated users) may “wake up” as a superhumanly intelligent entity.
- Computer/human interfaces may become so intimate that users may reasonably be considered superhumanly intelligent.
- Biological science may provide means to improve natural human intellect.

*Vernor Vinge, “The Coming Technological Singularity: How to Survive in the Post-Human Era”

A Technological Singularity

When greater-than-human intelligence drives progress, that progress will be much more rapid. In fact there seems no reason why progress itself would not involve the creation of still more intelligent entities, on a still shorter timescale.

Vinge calls this a “singularity”, the point where our old models must be discarded and a new reality rules. As we move closer to this point, it will loom vaster and vaster over human affairs until the notion becomes common place. Yet when it finally happens, it may still be a great surprise and a greater unknown.

John von Neumann also speculated that “the ever accelerating progress of technology and changes in the mode of human life gives the appearance of approaching some **essential singularity** in the history of the race beyond which human affairs, as we know them, could not continue.”

Beyond the Singularity?

Perhaps it was the science-fiction writers who felt the first concrete impact. More and more these writers felt an opaque wall across the future. Once they could put such fantasies millions of years in the future. Now they saw that their most diligent extrapolations resulted in the unknowable...soon. Once, galactic empires might have seemed a post-human domain. Now, sadly, even interplanetary ones are.

Vinge argues that we cannot prevent the singularity, that its coming is an inevitable consequence of human's natural competitiveness and the possibilities inherent in technology. And yet we are the initiators. Even the largest avalanche is triggered by small things. We have the freedom to establish initial conditions, make things happen in ways that are less inimical than others. Of course, as with starting avalanches, it may not be clear what the right guiding nudge really is.