

Tecnologie di Frontiera
Moncrivelo, 1st April, 2006

The Economic and Cultural Importance of Space Tourism

Dr Patrick Collins

Azabu University & Space Future Consulting

- 1 The Most Important Fact about Space Activities
- 2 Real Possibilities
- 3 The “Invisible” Economic Costs of “Space Policy”
- 4 Heaven or Hell? The Space Tourism Movement
vs “21st Century Resource Wars”

500 years ago Niccolo Macchiavelli famously explained why innovation is so difficult:

“There is nothing more difficult to execute, nor more dubious of success, nor more dangerous to administer, than to introduce a new order of things. He who introduces it has as enemies all those who profit from the old order, and only lukewarm allies in those who might profit from the new.”

The most important thing to understand about space activities:

- *Space agencies are not trying to make space accessible to the general public:*
- They never have done
- They are not now
- They have no plans to do so in future
- Recent events have made this clear:



ITAH-TASS





Since Gagarin's flight, OECD space agencies have spent 1 TRILLION Euro-equivalents.

But the Soyuz-R7 system, *designed 50 years ago*, is still the cheapest way to travel to orbit.

Space agencies have not reduced the cost of space travel *at all* - and the industry is unhealthy:

	1999	2002
US launch vehicle jobs	28,617	4,828
US satellite manufacturing	57,372	31,262





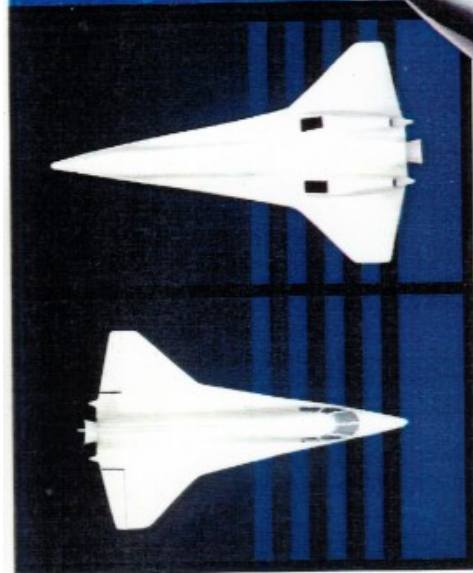
The “SpaceShipOne” project cost 20 million USD - less than Nasa spends every day *before lunch* - or what Esa spends *every 2 days*.

Sub-orbital passenger space flight services could have started during the Apollo project.

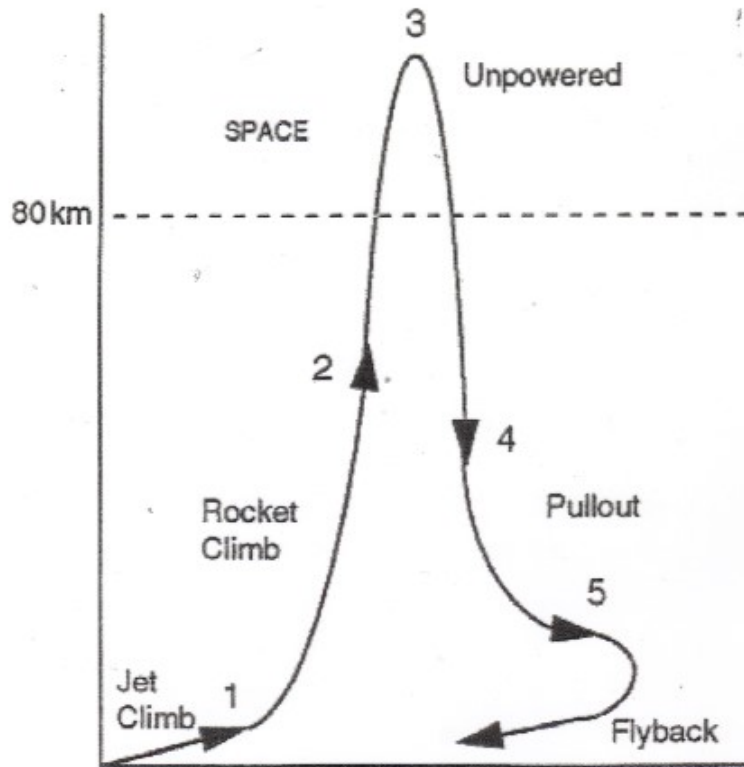
In that case, orbital travel could have started during the 1980s.

Ascender

Bristol Spaceplanes Limited



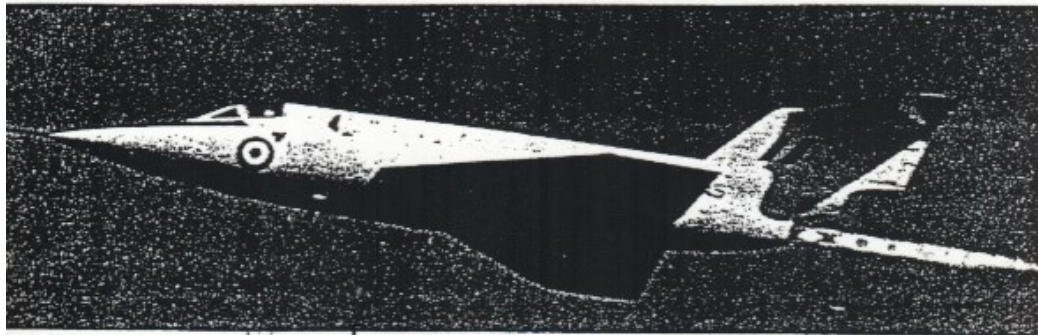
THE AVIATION WAY TO SPACE



Ascender flight-path

Propellant energy & re-entry heating $\sim 1/64$ of orbital flight

>> low technical risk, and low-cost flight operations.



"thin-wing Javelin," the fantastic F.155 Specification which could be met only with a fighter powered by about seven Gyrons and nine Spectres (or was it 19?), nor with the Vickers Type 888 Red Dean long-range radar-guided missile which the "thin-wing Javelin" and F.155 winner would have launched. These must wait for another time. Saro's achievement was to get contracts for hardware in a field totally new to them—and almost as new to everyone else, too. The SR.177 gradually supplanted the 53 as the obvious thing to buy in quantity.

A study was done for the Admiralty for a carrier-based version, a second study was then requested by the RAF, the concept of commonality (it was called "commonization" then) entered the corridors of power, and finally Saunders-Roe's cup was filled with a

Above, the first prototype SR.53 moving at high speed during its second flight. Right, the same aircraft undergoing flow tests with 10° nose-up attitude.

smashing 27-aircraft order for nine basic development SR.177s, nine SR.177RN and nine SR.177RAF. When, late in 1956, it was discovered the project was also of intense interest to the lately re-born Luftwaffe, it began to look as if the production run would easily beat that for the Hunter.

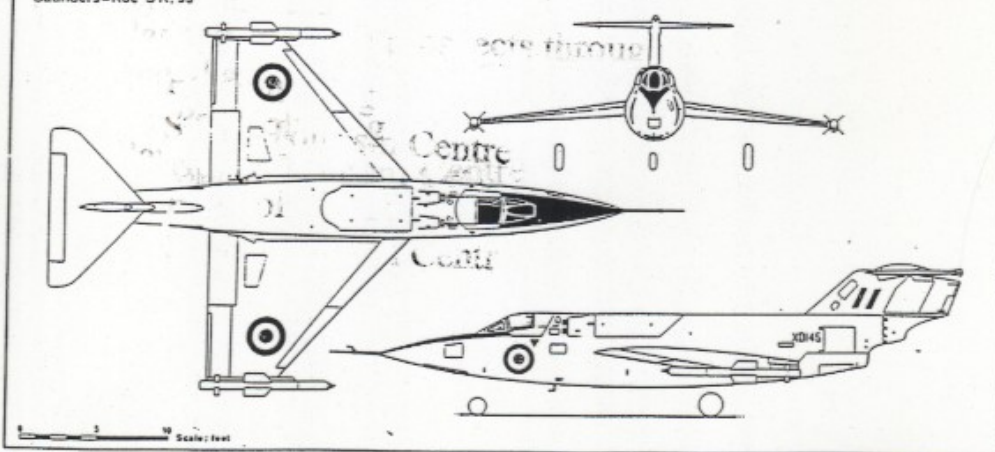
While the first SR.53 was being

readied for flight at the Aeroplane & Armament Experimental Establishment at Boscombe Down, the Defence Minister, Duncan Sandys, issued his classic White Paper sub-titled "An Outline of Future Policy". In it he explained that, as the RAF would be "unlikely to require" any fighter later than the M.C.1 Lightning, all such

Dick Strutton



Saunders-Roe SR.53



Ex-Nasa historian Roger Launius described SpaceShipOne in Nature as:

“..insignificant in the overall scheme of space flight.”

However, it appeared on the front page of nearly every newspaper in the world - and now hangs in the Smithsonian Museum.

Similar cost reductions are possible for orbital travel - because of high *demand*.



The Overview Effect

SPACE EXPLORATION AND HUMAN EVOLUTION

Second Edition



Frank White



AMERICA'S SPACE PRIZE



To be awarded...

\$50,000,000

Contest ends January 10, 2010.

Ten Primary Rules of Competition

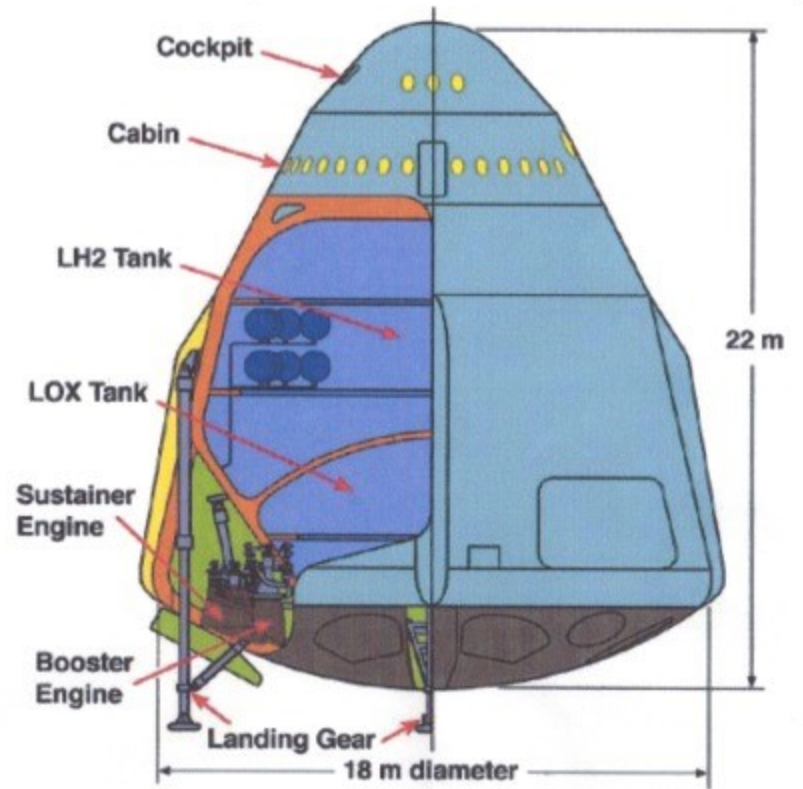
1. The Spacecraft must reach a minimum altitude of 400 km (approx. 250 miles).
2. The Spacecraft must reach a minimum velocity sufficient to complete two (2) full orbits at altitude before returning safely to earth.
3. The Spacecraft must carry no less than a crew of five (5) people.
4. The Spacecraft must dock or demonstrate its ability to dock with a Bigelow Aerospace inflatable space habitat and be capable of remaining on station for at least six (6) months.
5. The Spacecraft must perform two (2) consecutive, safe and successful orbital missions, within a period of sixty (60) calendar days, subject to Government regulations.
6. No more than twenty percent (20%) of the Spacecraft may be composed of expendable hardware.
7. The Contestant must be domiciled in the United States of America.
8. The Contestant must have its principal place of business in the United States of America.
9. The Competitor must not accept or utilize Government development funding related to this Contest of any kind, nor shall there be any Government ownership of the Competitor. Using Government test and launch facilities shall be permitted, and
10. The Spacecraft must complete its two (2) missions safely and successfully, with all five (5) crew members aboard for the second qualifying flight before the competition's deadline of January 10, 2010.

_____ and/or any affiliates as a competitor for the America's Space Prize, herein agrees to be fully bound and obligated to perform all efforts in strict adherence to all rules and regulations of the competition including but not limited to, the above required rules and regulations.

**For more information please contact:
America's Space Prize
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(702) 456-9404 Fax**







で宇宙観光ができる。成尾芳博



ブースターエンジン
高い高度で最も高い性能が出るように計画されたエンジン。ブースターエンジンと同様に高度0メートルから作動するが、高度約11キロメートルでノズルを伸縮して、ブースターエンジンを停止したためとも高度200キロの軌道に達するまで機体を支えつづける。打ち上げのときにだけ用いる。

サステイナーエンジン
高い高度で最も高い性能が出るように計画されたエンジン。ブースターエンジンと同様に高度0メートルから作動するが、高度約11キロメートルでノズルを伸縮して、ブースターエンジンを停止したためとも高度200キロの軌道に達するまで機体を支えつづける。打ち上げのときにだけ用いる。

「観光丸」の構造
客室は、乗客が地球の景観を堪能できるように、前後と窓が配置されている。また乗客が快適空間も用意されている。「観光丸」のような一段式の軌道ロケットは、多段式にくらべると1回に打ち上げられる搭載物の量が少ない。しかし運用コストを大幅に低減することが可能であり、宇宙旅行用の機体としては、最も早く実現できる形態と考えられている。宇宙旅行用の旅客機として、開発期間や製造コストまでくわしく検討されている機体は、世界でも観光丸が唯一である。



宇宙へ 行こう!

史上初、今世紀最大級のプレゼント!
「2001年宇宙への旅」に抽選で5名様を御優待!

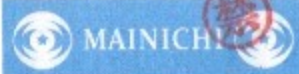
それは空想ではなく、現実の体験です。本物の宇宙旅行です。
2001年より出発予定の人類最初の民間宇宙航行プログラムに、
抽選で5名様をご優待いたします。プログラムはまず
地上での講義や実習に始まり、飛行士の訓練などの準備を経て
出発は6日め、高度5万フィートで切り離されたスペースクルーザーは
大気圏上層でロケットに点火し、100キロメートルの宇宙飛行士高度に達します。
正副操縦士の他は当選者と係員1名の貸切りフライトとなる予定です。
ヘプシが贈る世紀のプレゼント、カウントダウンは始まっています。



DESIGN FACTORY



MUNPA



新毎日

夕刊

発行所：東京千代田区一橋1-1-1 〒100-8001 電話：03-5521-3111
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愛されて、ロングセラー。



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NEWSLINE

- 米高官、中国の石油戦略を批判 **5**
- パキスタン地震 子供3人救出 **8**
- 「網野史学」とは **6**

歴史学者の網野善彦氏が亡くなり1年半余。劇的な歴史学は今も人気だが学界の批判も多い。「網野史学」とは何か。

15分 WORLD もてるって何だ **2**

スポーツ WORLD バルサ不振のスタート **3**

暮らし WORLD 食がすすむ一品 **4**

お天気

地域	18日	19日	20日	21日	22日	23日	24日	25日	26日	27日	28日	29日	30日	31日
東京	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴
横浜	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴
千葉	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴
水戸	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴
宇都宮	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴
東京湾	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴
東京湾	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴
東京湾	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴	晴

宇宙旅行 50万円

夢の宇宙旅行が現実味を帯びてきた。今月に入って旅行大手のJTBが月旅行を含む宇宙旅行の取組を開始。ライブドアの堀江貴文社長もこの分野への参入を表明した。果たなるお誘いは? 【赤山彰子】

企業参入続き 価格破壊必至

「宇宙旅行」は、これまで「夢」の域を越えてきた。今月に入って旅行大手のJTBが月旅行を含む宇宙旅行の取組を開始。ライブドアの堀江貴文社長もこの分野への参入を表明した。果たなるお誘いは? 【赤山彰子】

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「JTB丸の内支店」に開設された宇宙旅行専用の「スペースラウンジ」＝東京千代田区で14日午後、初々木一博写真

「宇宙旅行」は、これまで「夢」の域を越えてきた。今月に入って旅行大手のJTBが月旅行を含む宇宙旅行の取組を開始。ライブドアの堀江貴文社長もこの分野への参入を表明した。果たなるお誘いは? 【赤山彰子】

中国も商機探る

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知りたい! チャンネルYOU

Economic Costs of OECD Governments’ “Space Policy”

- “Visible” Cost: 1 Trillion Euro-equivalents
- “Invisible” Costs:
 - 1 30-year delay of space tourism industry
 - 2 Global unemployment
 - 3 “21st century resource wars”
 - 4 Cultural stagnation

POPULAR science

WHAT'S NEW
32 HOT
PRODUCTS

p. 13

A VEGAS MOGUL
HAS GRAND PLANS
FOR YOUR NEXT
BIG VACATION

SPACE HOTEL 2010

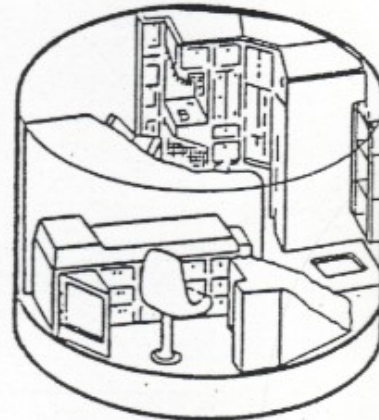
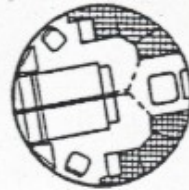
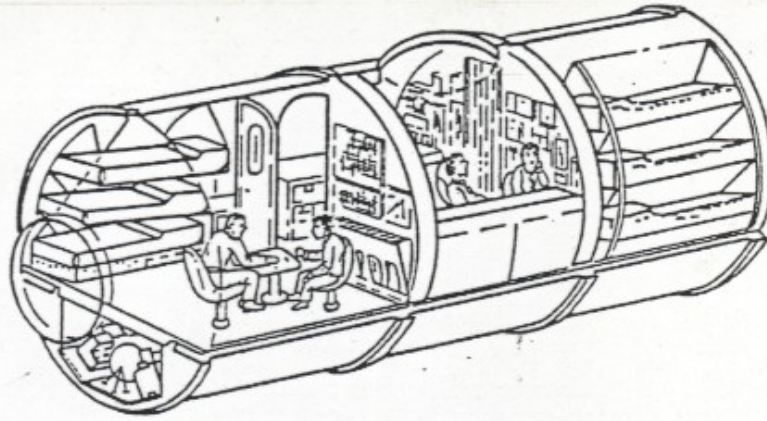


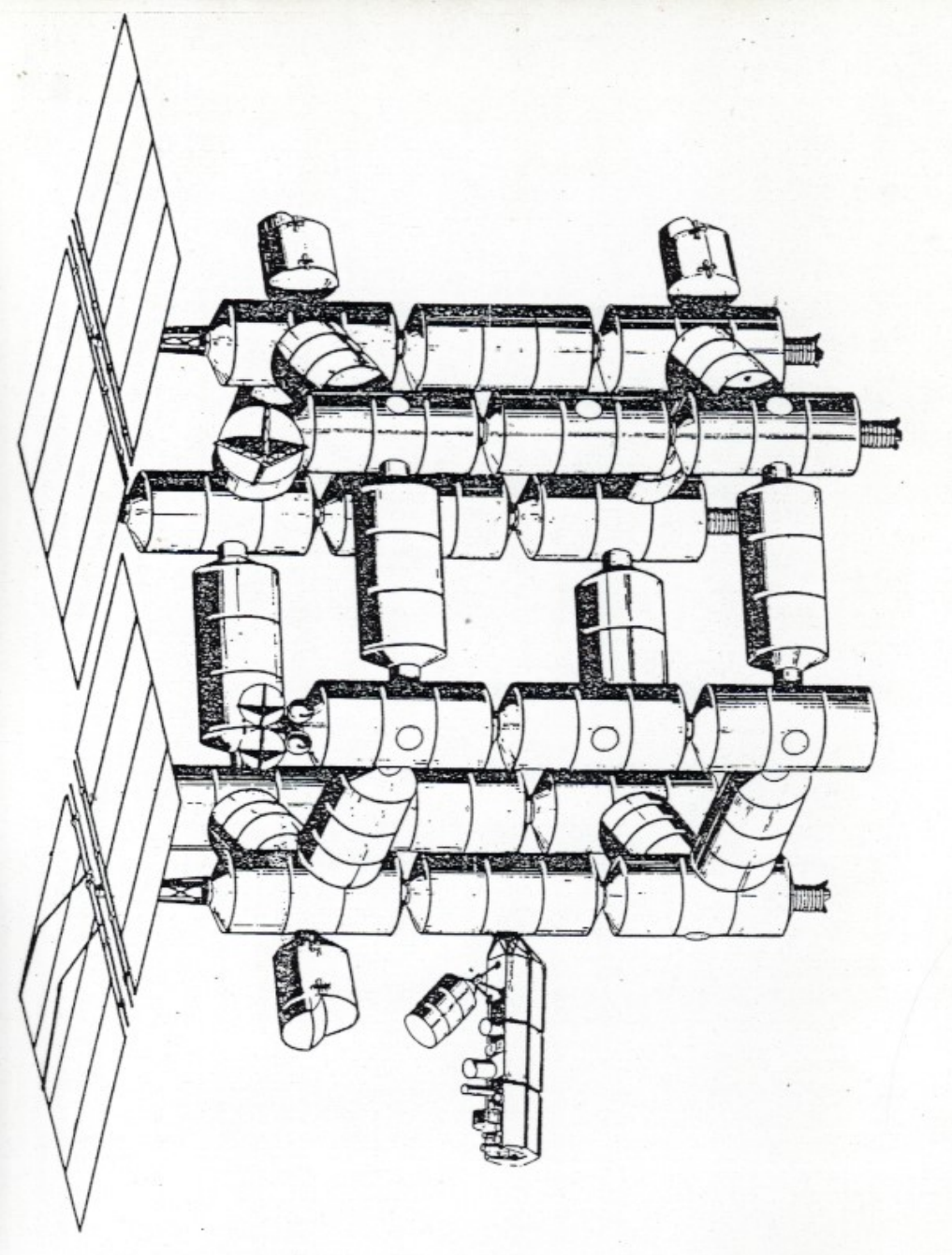
**+
GEEKS ON
THE RED CARPET
WE GO TO
THE OSCARS!**

**IS THERE A HOT
ZONE NEAR YOU?
THE IFFY BIODEFENSE BOOM**

US \$3.99 CAN \$4.99
MARCH 2005 POPSCLOM



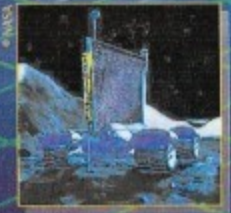




Future



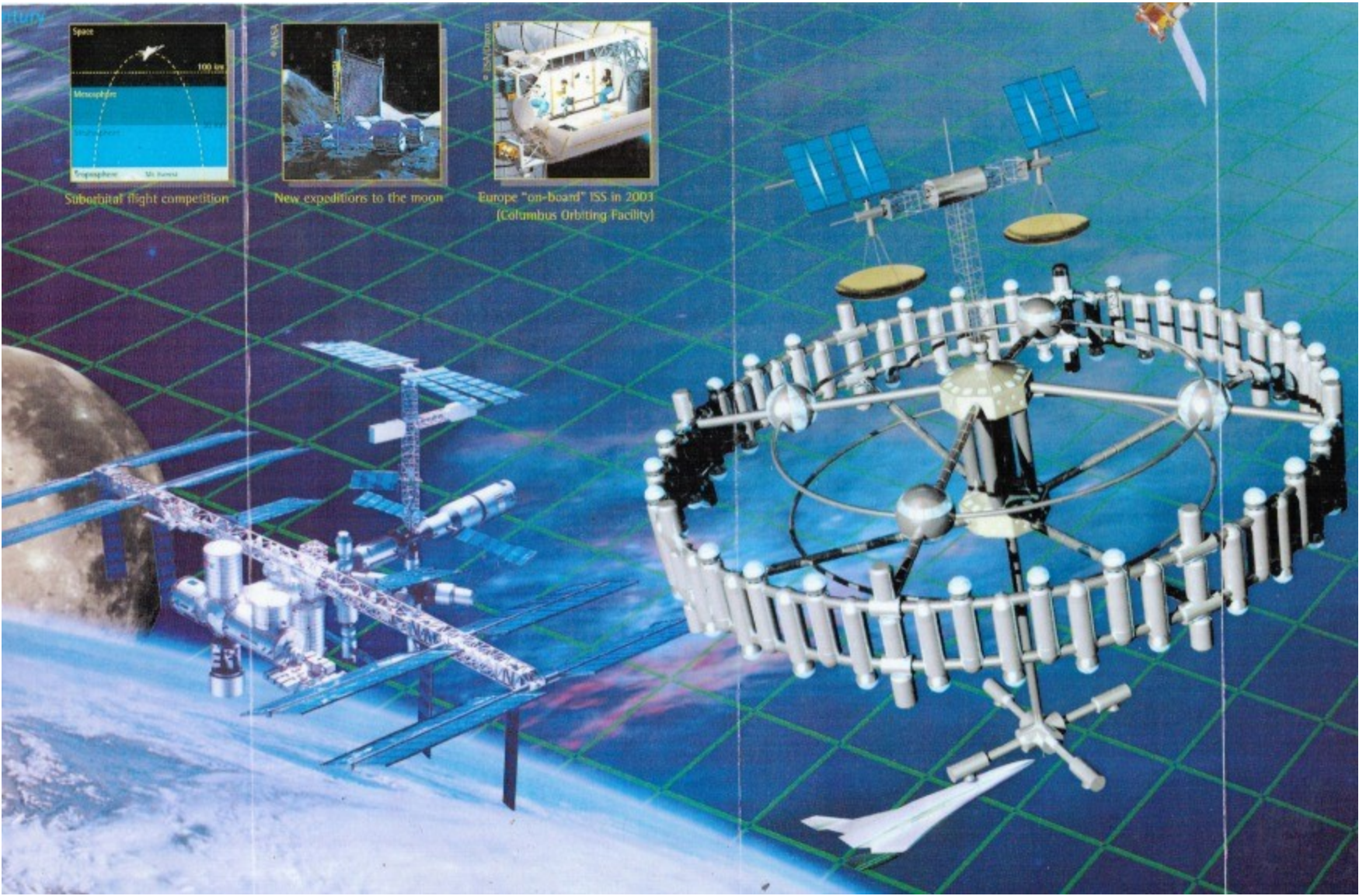
Suborbital flight competition



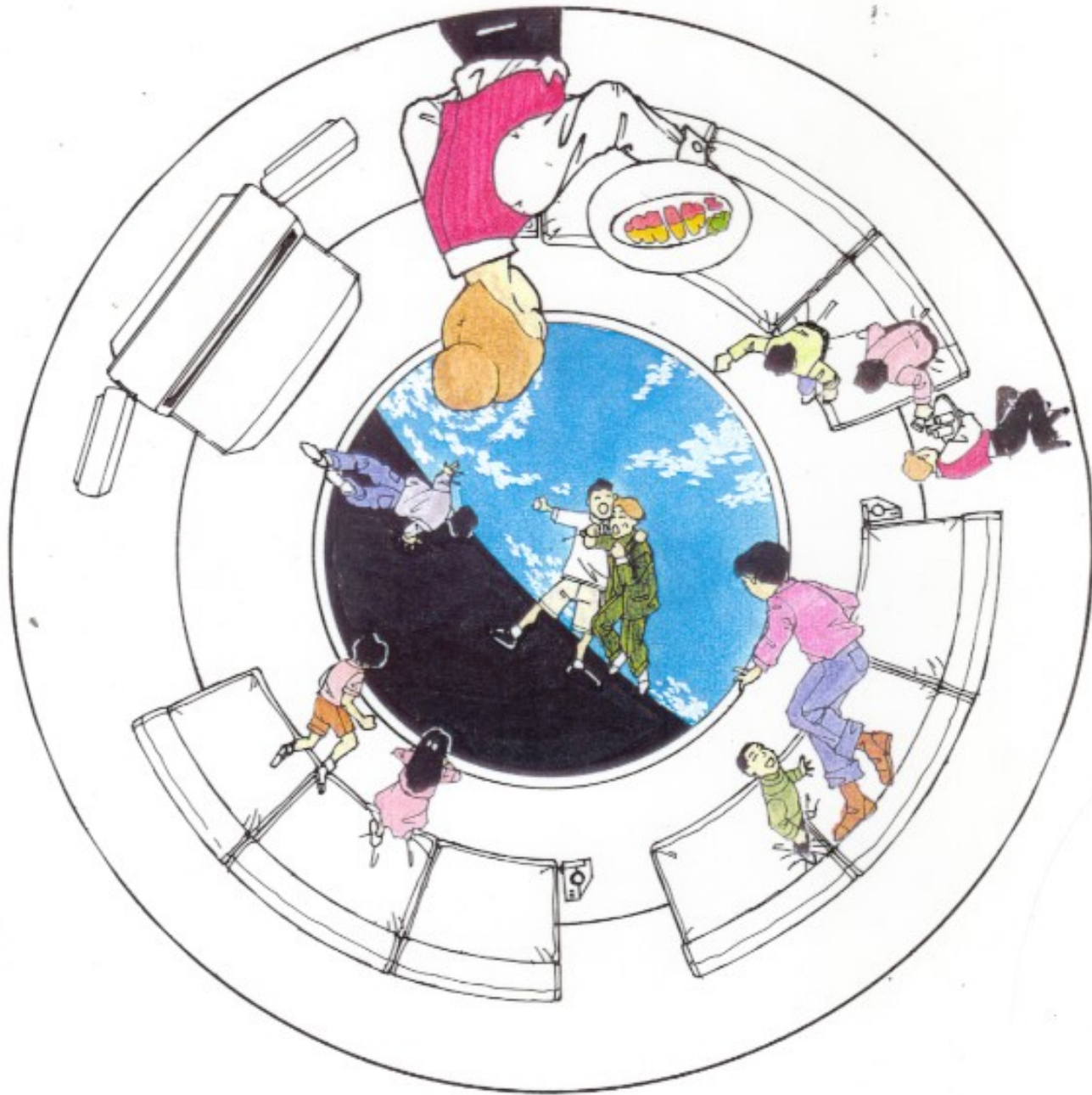
New expeditions to the moon



Europe "on-board" ISS in 2003
(Columbus Orbiting Facility)

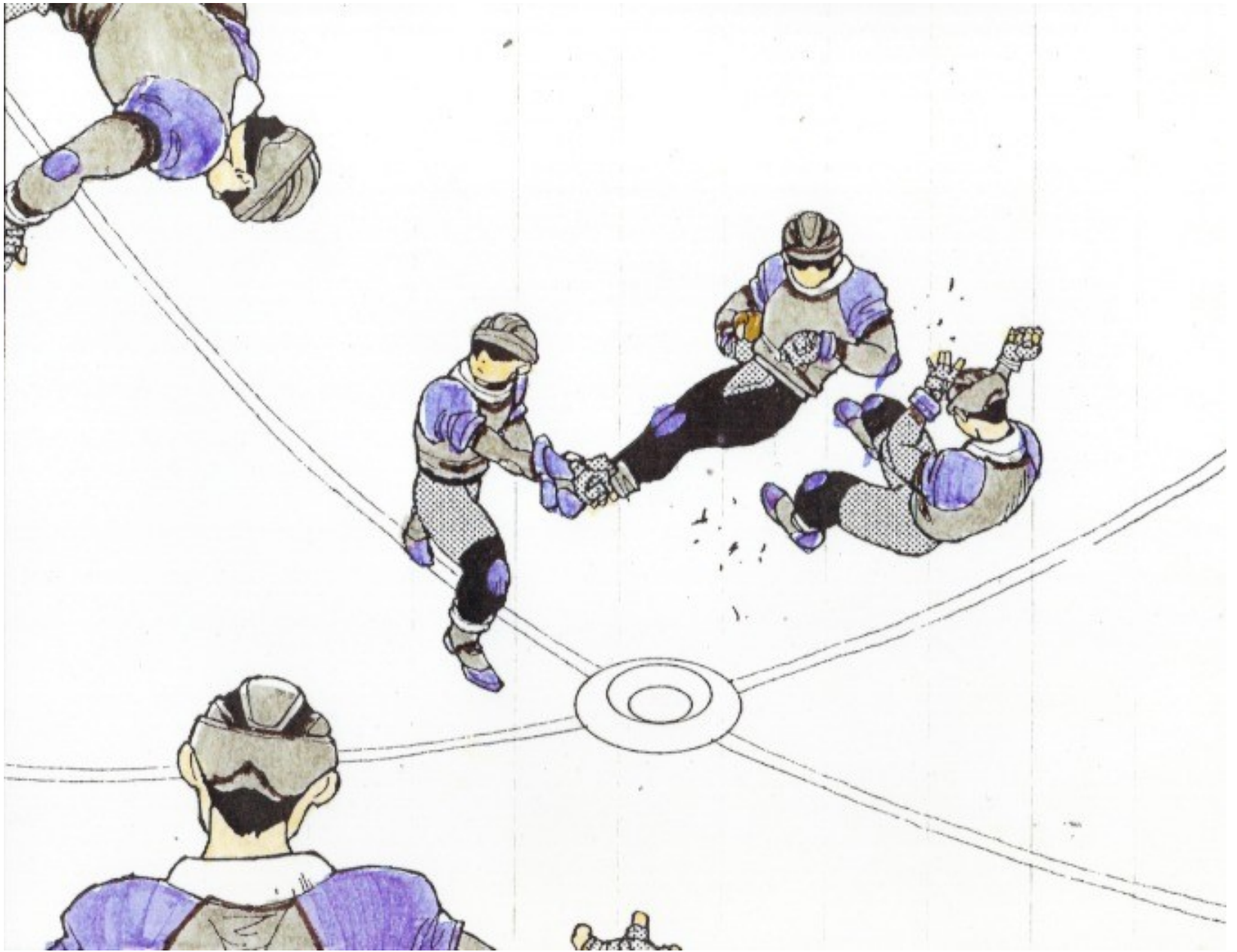




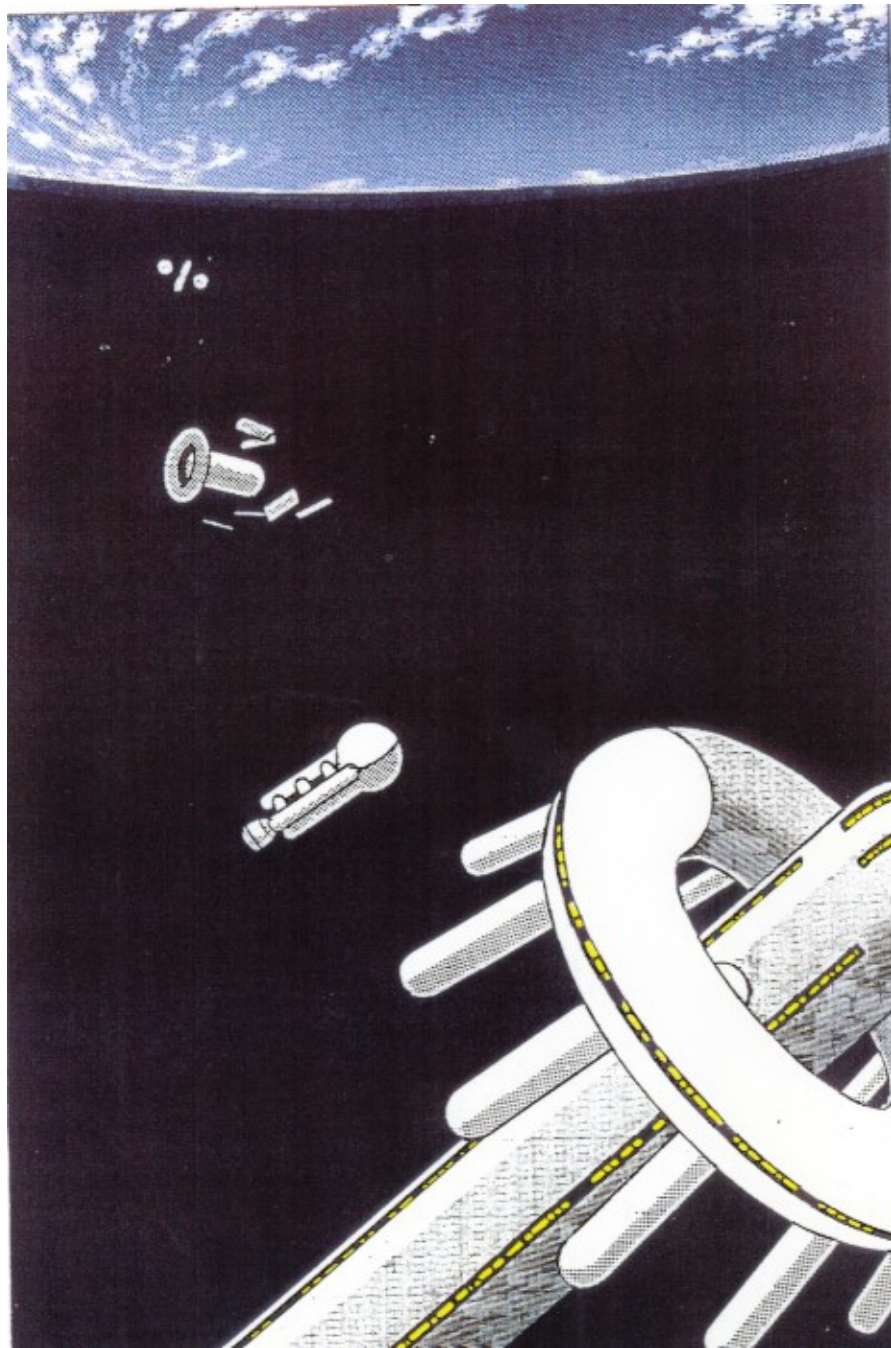


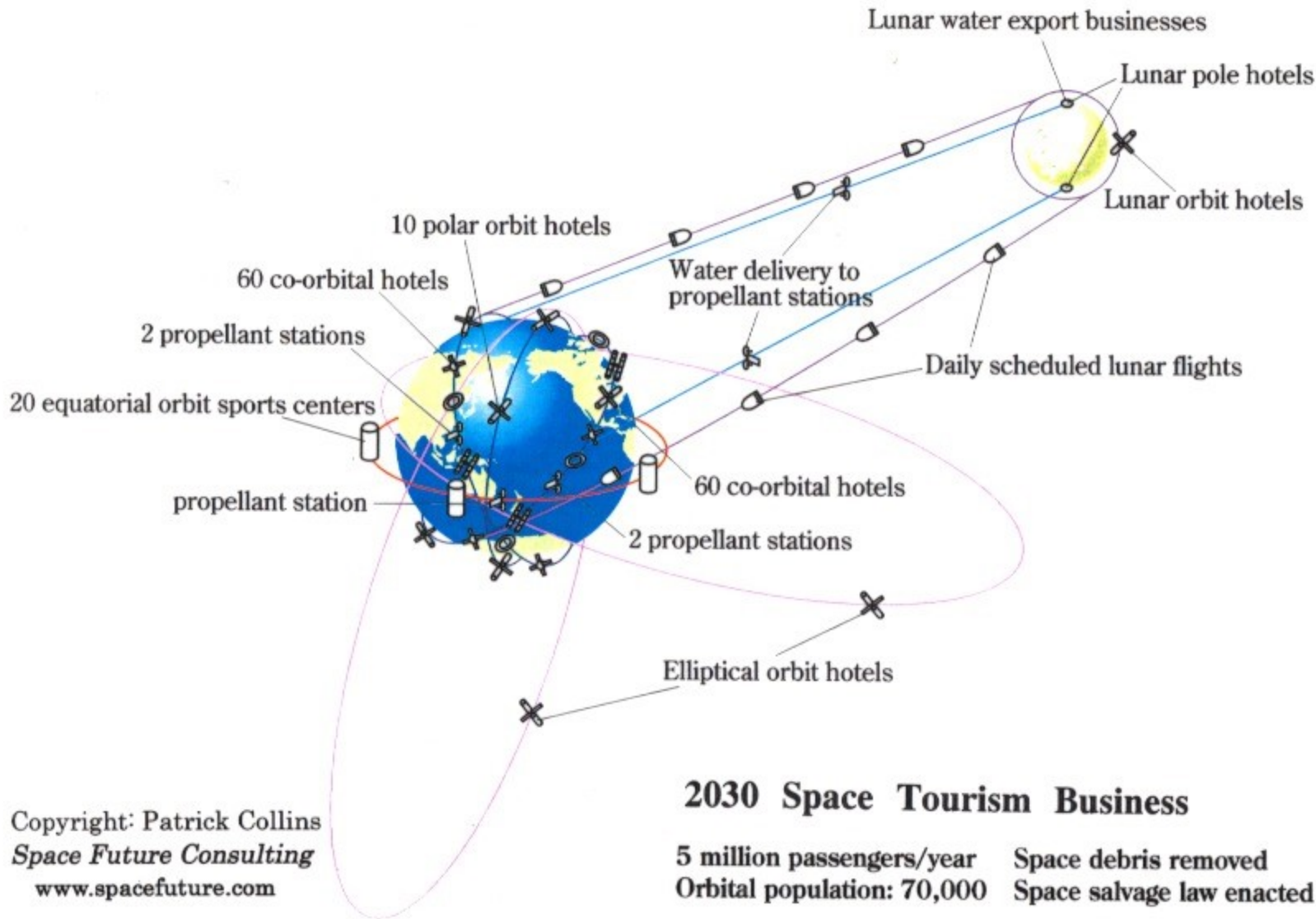










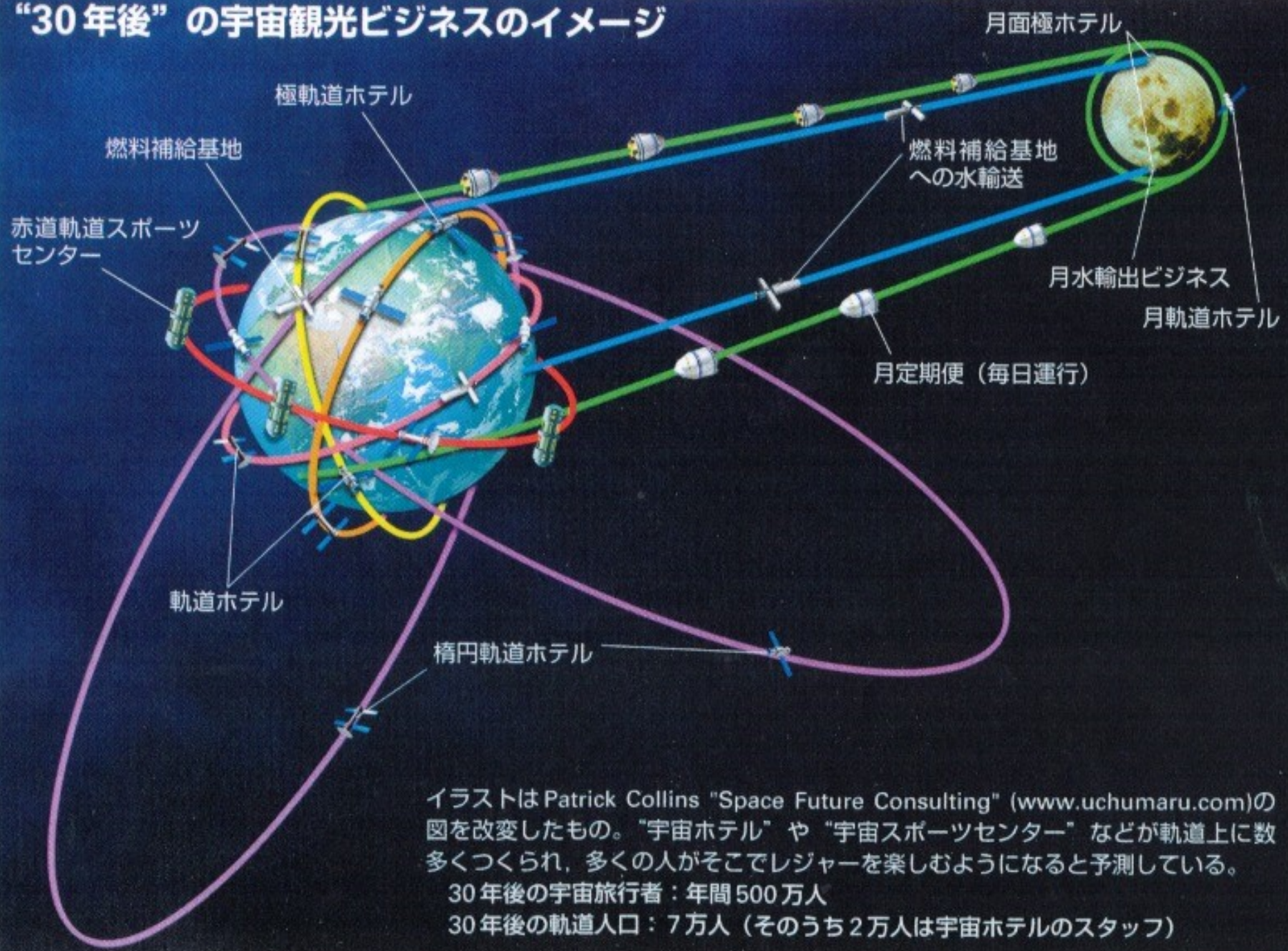


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Space Future Consulting
www.spacefuture.com

2030 Space Tourism Business

5 million passengers/year Space debris removed
 Orbital population: 70,000 Space salvage law enacted

“30年後”の宇宙観光ビジネスのイメージ



イラストは Patrick Collins "Space Future Consulting" (www.uchumaru.com)の図を改変したもの。“宇宙ホテル”や“宇宙スポーツセンター”などが軌道上に数多くつくられ、多くの人在那里でレジャーを楽しむようになると予測している。

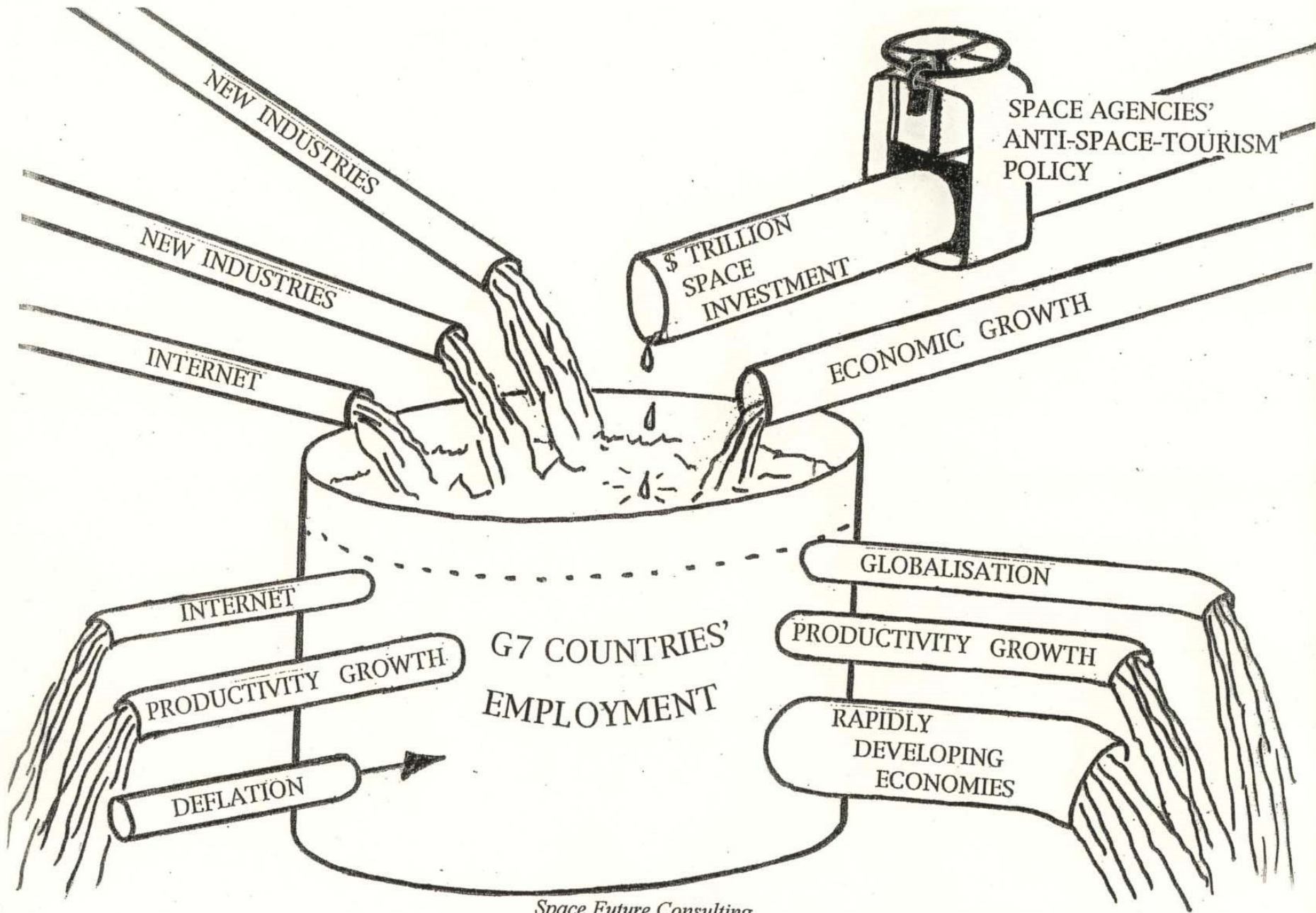
30年後の宇宙旅行者：年間500万人
30年後の軌道人口：7万人（そのうち2万人は宇宙ホテルのスタッフ）

2nd “Invisible Cost”: Unemployment

The world economy is in very poor condition, due to high unemployment - in USA, Europe, Japan - and everywhere else.

A major reason for this is *lack of new industries* - yet India's and China's growth has only just started

Governments' “anti-space tourism policy” is a very heavy “invisible cost”.



Europe's wasted opportunity

High unemployment has become the key problem for the EU:

“French children are being born into families whose parents have never worked. It is desperate.”

A booming space travel industry could help save “the European model” from “globalization”.

So why does the French government protect Ariane - rather than invest in developing a popular space travel industry?

3rd “Invisible” Cost of “Space Policy”:

Humans’ struggle between two very different futures:

“21st Century Resource Wars”

vs

“The Space Option”

The “cold war generation” of OECD political leaders is planning for “21st Century Resource Wars”:

Humans are trapped on planet Earth. With a growing population we have to fight for energy and other resources. Of course the rich will win, brutally, creating

“.. rich enclaves in a starving world.”

This process is clearly already under way.

Advocates of “The Space Option” disagree:

Humans live in a cornucopia.

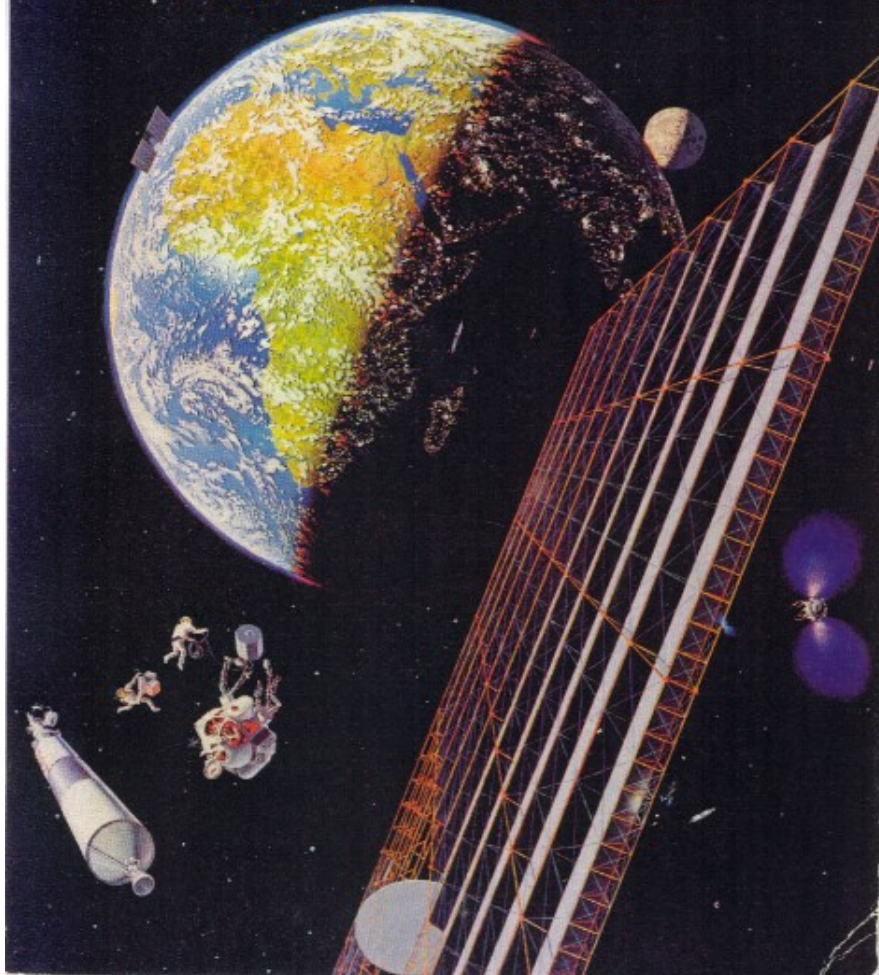
By developing space economically we can create unlimited new employment - and also access unlimited resources:

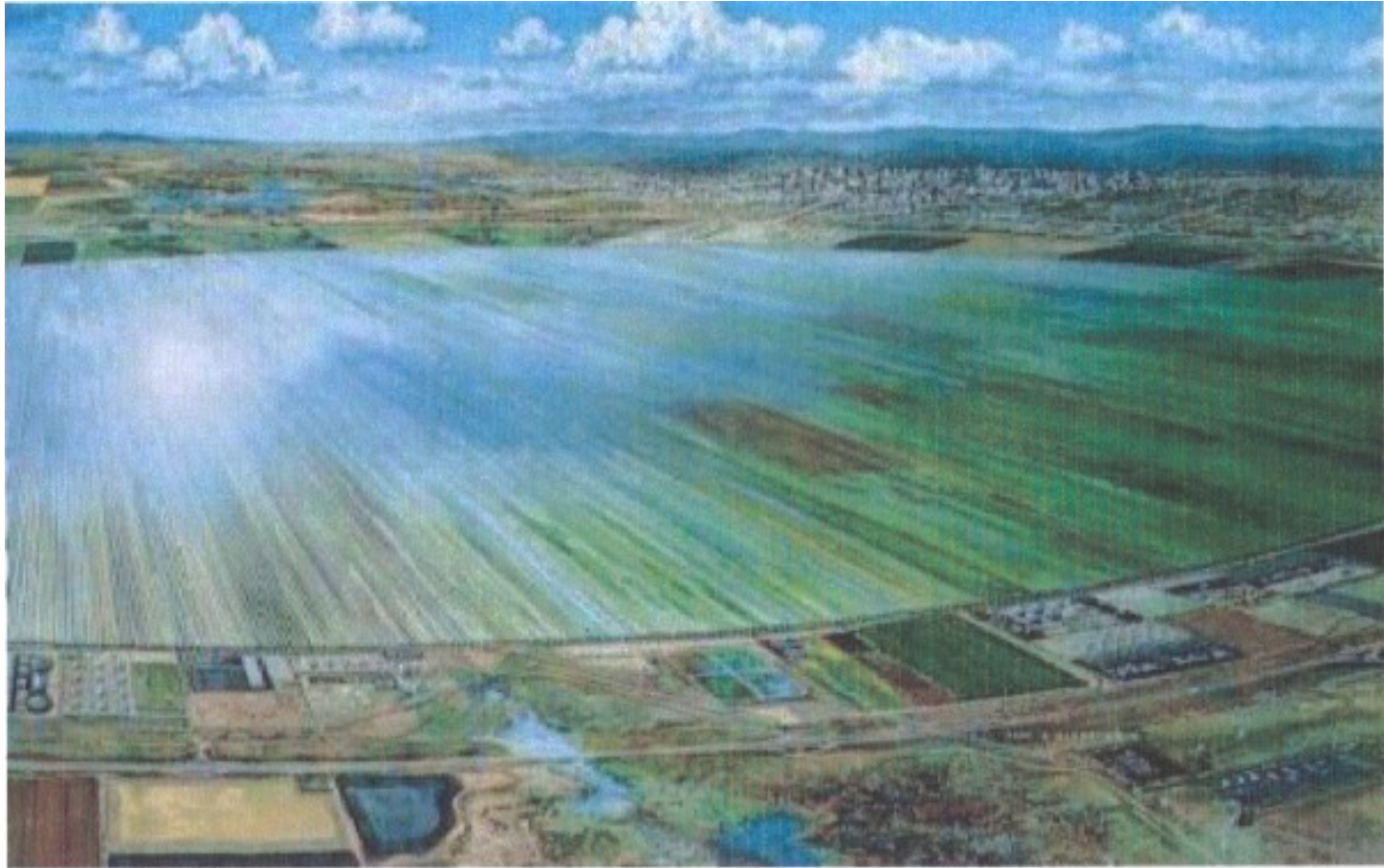
- clean energy, minerals, living space, waste sink and *open frontier*.

Doomsday Has Been Cancelled

J. Peter Vajk

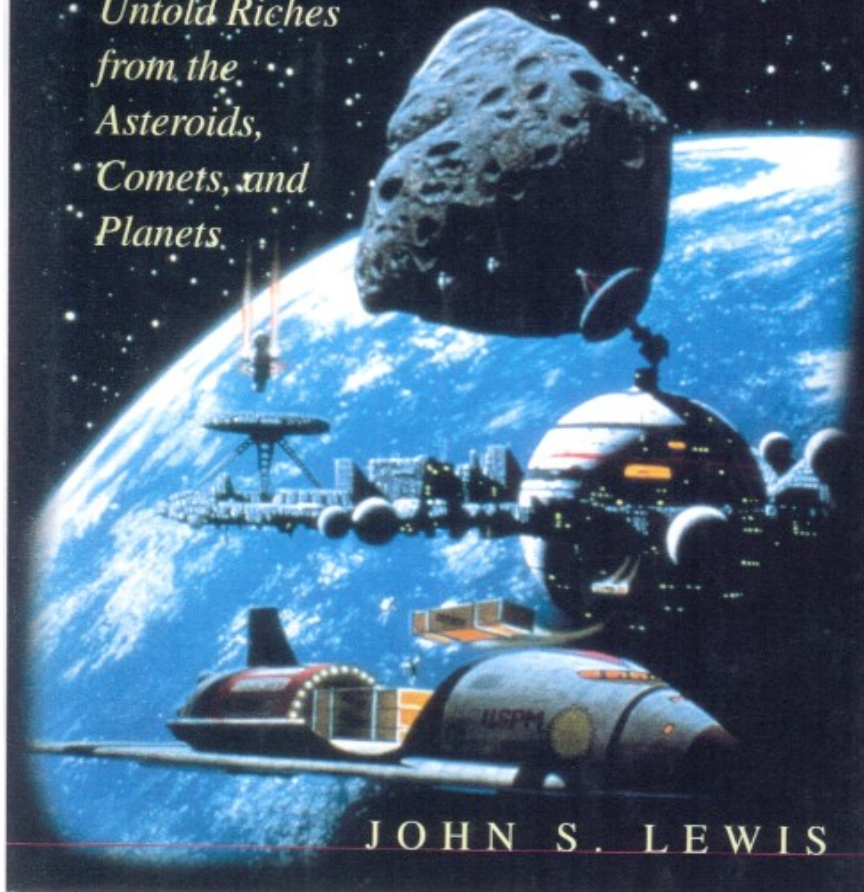
Foreword by Russell L. Schweickart





MINING THE SKY

*Untold Riches
from the
Asteroids,
Comets, and
Planets.*



JOHN S. LEWIS

CLOSED WORLD	SPACE OPTION
ELVs	Passenger space vehicles
Growing unemployment	New industries
Job insecurity	Spreading welfare
Dwindling resources	Unlimited resources
Zero-sum	Positive sum
Rich vs poor	Social peace
Fascism	Democracy
War	Peaceful growth

These world-views are *opposites* - but the difference between them is *a single number*: the assumed cost of reaching orbit.

Space agencies advise governments that this has been 20,000 Euros/kg for 50 years - and will be for decades. So humans are trapped.

The Space Tourism Movement claims it is easy to reduce the cost of space travel to just 1% of ELV costs.

These two views are not equally valid:

The “Closed World” argument is *wrong* - it is as absurd as the “Flat Earth” theory.

But OECD governments *refuse to even discuss* “The Space Option” ! - as advised by their monopoly space agencies.

Space agencies ignore tourism, which has unique potential to sharply reduce launch costs.

4th “Invisible Cost”: Cultural Stagnation

Much “post-modern” art has become nihilistic: Commercialisation driven by lack of new industries destroys much artistic motivation.

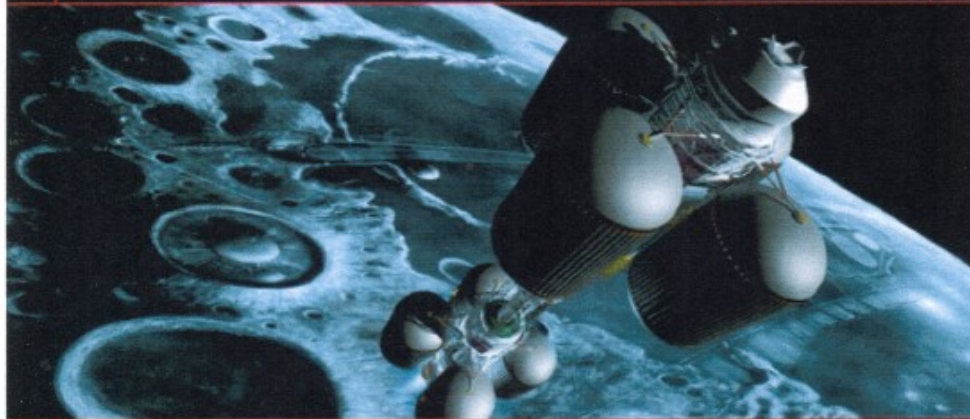
The change from a closed world to an open world will have major cultural benefits.

The *new human environment* of space will open unlimited new cultural horizons.

The Earth is “pregnant” with humans’ coming *space culture*.

"It is time to Return to the Moon." -Arthur C. Clarke

RETURN TO THE MOON



EDITED BY RICK N. TUMLINSON
WITH ERIN MEDLICOTT



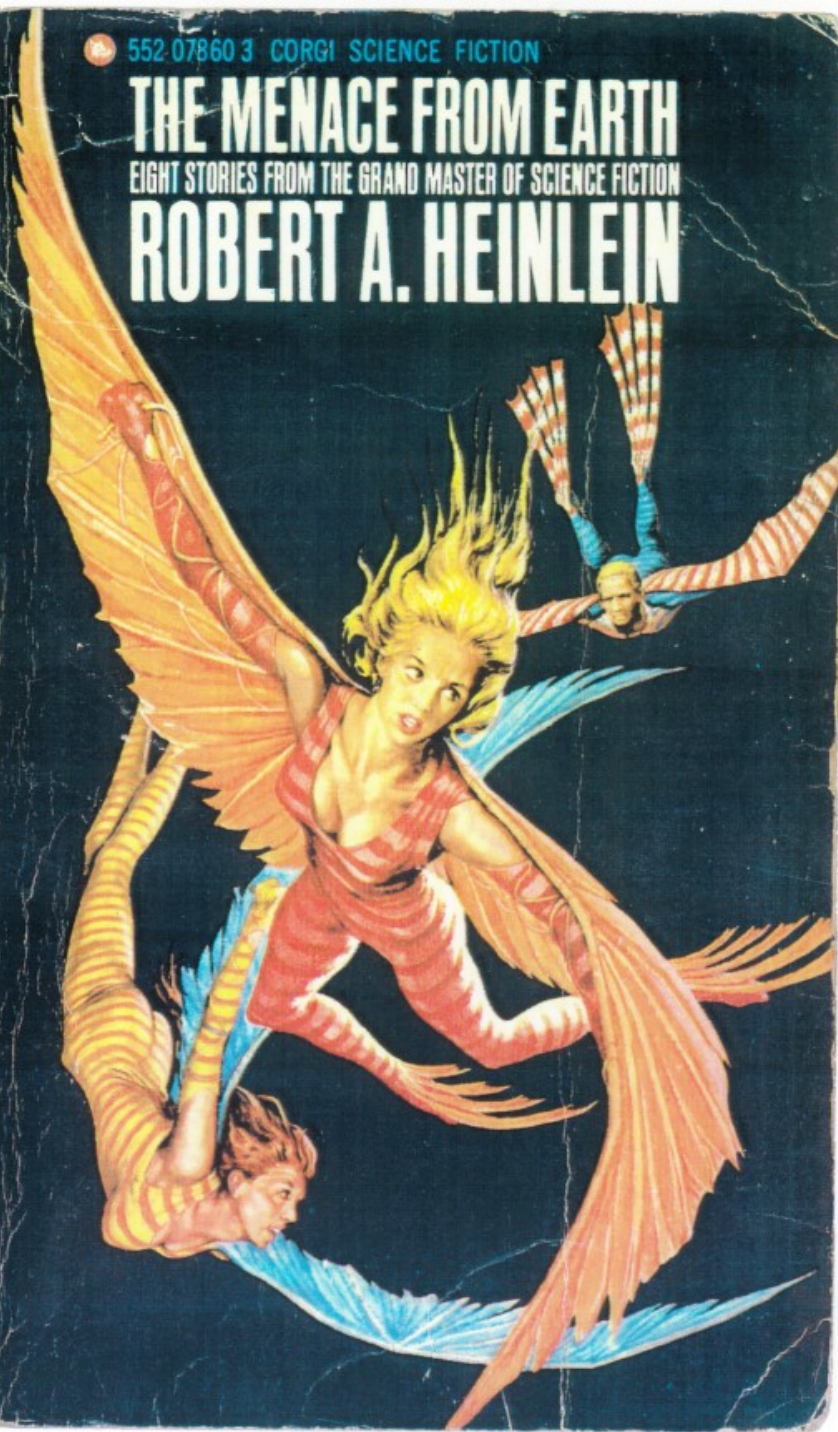
*Featuring Articles by Alan Binder, Andrew Chaikin,
Patrick Collins, Yoji Kondo, Howard McCurdy, Paul Spudis,
Courtney Stadd, Frank White and Many Other Lunar Experts*

552 07860 3 CORGI SCIENCE FICTION

THE MENACE FROM EARTH

EIGHT STORIES FROM THE GRAND MASTER OF SCIENCE FICTION

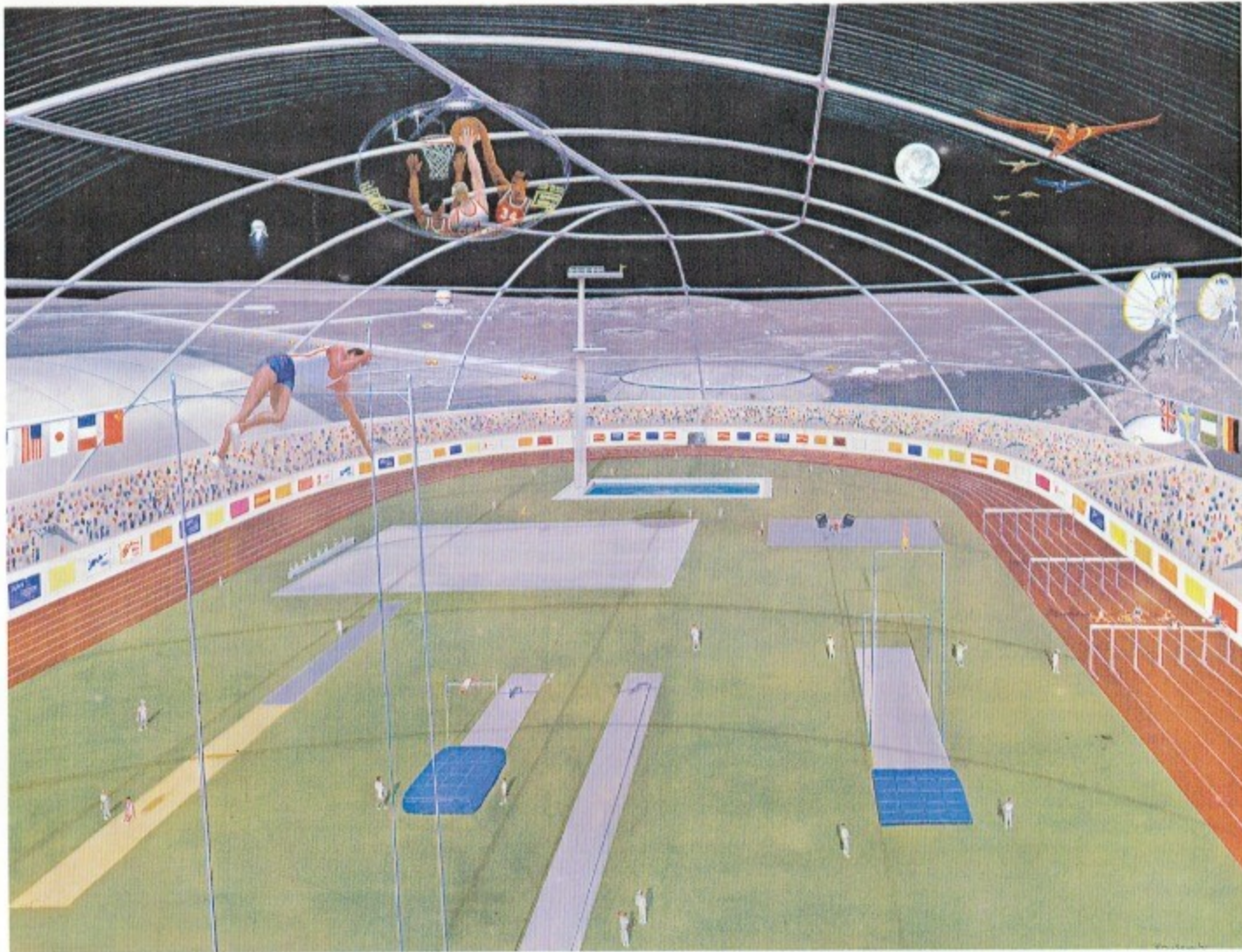
ROBERT A. HEINLEIN

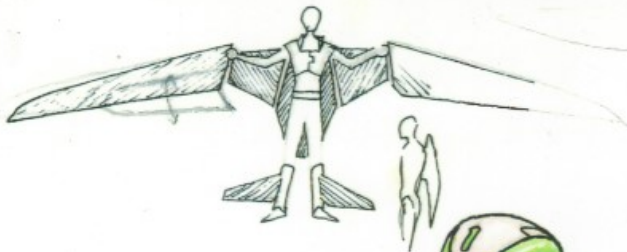




National Aeronautics and
Space Administration

The Lunar Games





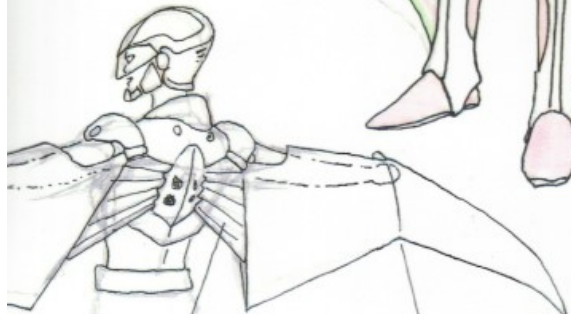
Harness covers for half of body, does up at hip



Race or aerodynamic sport outfit



Typical laid colors/stripes as on modern sky suits + wet suits



flexible bands, stretch material

Wings jointed at arms length.



'Joe Public' should
(presumably) keep their
street clothes + have
something that
can go over them
- or would they
divers specially for it
like skiing?





Costume for
Flying theatrical
production.

other possibilities—
theatrical productions
sports events—
racing
chasing
etc.

Lunar tourism project by 2010 - Russian Space Agency

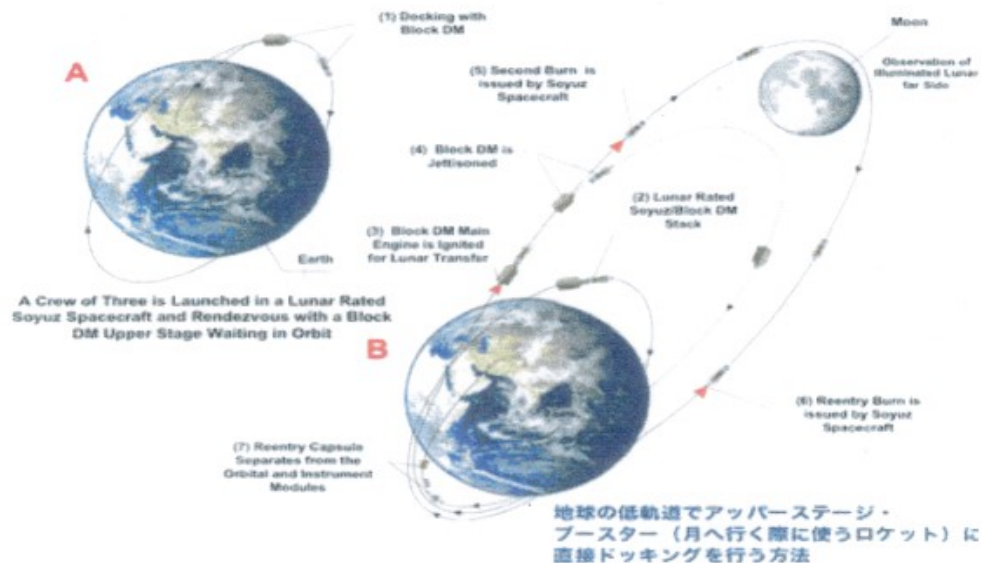
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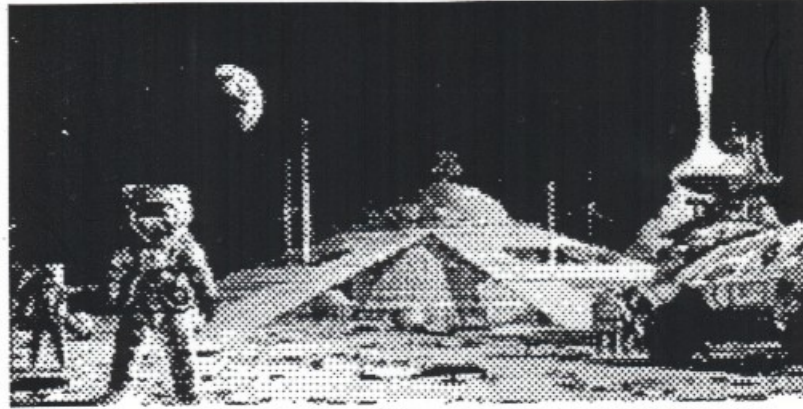
MOSCOW, August 11 (RIA Novosti) - A lunar tourism project proposed by Russia's Federal Space Agency and its leading spacecraft manufacturer, Energia, will be launched by 2010, the agency announced in a Web site posting Thursday.

It said the project, to be carried out in association with the U.S. company Space Adventures, would offer around-the-moon trips on board a Russian Soyuz spacecraft. Two tourists at a time will be able to go on such a trip, accompanied by a professional astronaut.

Space Adventures will have the exclusive right to market the project and search for potential tourists and investors, the agency said.

"We expect the project to be implemented within five years' time, with an appreciable positive marketing effect, and to show the capabilities of Russian-made space equipment and, importantly, Russia's consistent efforts to make space exploration accessible to non-professional astronauts," the agency posting said.





Hilton plans hotel on moon - with a beach

by Mark Austin

HILTON International, owner of many of the world's most prestigious hotels, has joined the race to build the first hotel on the moon, bringing a new meaning to the term five-star.

Called the Lunar Hilton, the huge complex would be more than twice the size of the Millennium Dome and would have 5,000 rooms. It would be powered by two huge solar panels and would have its own beach and sea as well as a working farm.

The company commissioned architects to design the building following the discovery of water on the moon last month.

Summary

We are in the last stage of humans' *Pre-Space Era*.

Political turbulence is inevitable at changes of era, as rich elites try not to lose their economic status.

Space advocates can win, through *public education*: most people do not understand the true potential - *and the young want space tourism*.

THE SPACE TOURISM MOVEMENT CAN IMPLEMENT THE SPACE OPTION.