

Space Craft



Stanley Kubrick. *2001: A Space Odyssey*. 1968.

Where do we begin? With the Orbiter Hilton or the Lunar Hilton? We need your assistance in answering that question. The method of getting a Hilton into orbit, or placed on the moon, though beyond our knowledge - is not beyond our imagination or ambition.

Perhaps we'd better learn to walk before we run, so let's begin with the Orbiter Hilton. My friend Don Douglas, Jr., has been telling me about his company's concept of a space laboratory which would be 14 stories high and could comfortably accommodate up to 24 people. Personnel would arrive in a six-man ferry craft. As developed and expanded why couldn't this be the first orbiter Hilton? Perhaps the two organizations - Hilton and Douglas - could get together on a deal. Mr. Douglas could provide the orbiter hotels and we would franchise the Hilton name and know-how to set up a chain of Hilton-Douglas orbiter hotels.

These might be like Hilton Inns for short trips in space. They could accommodate brief stop-overs on a continuing journey to the moon or other planets. I should advise you - and I guess I'd better tell Mr. Douglas too - that an Orbiter Hilton is already in existence. It's known as "Hilton Space Station Number Five" and you'll be seeing it next fall in a motion picture called "2001 - A Space Odyssey". So I guess it behooves Mr. Douglas and me to get busy with our orbiters before somebody beats us to it.

After the Orbiters are established, we can move on to a larger Hilton on the moon.

Barron Hilton, Chairman of the US company Hilton Hotels, AAS Conference, 1967.

Project	Space Craft
Level	5
Module	IR5101: Interior Context 1
Duration	Term 01 – weeks 01-12
Lecturers	Ersi Ioannidou, Daniele Bedini & Greg Epps

Introduction

Space travel is part of a very feasible future. Space has become the ultimate extraordinary experience; the final frontier for the intrepid traveler.

Today a cluster of private companies such as Virgin Galactic, XCOR, and Space Adventures compete to send the first commercial flight into space. These commercial endeavors are fuelled by the human fascination with the immensity of the sky and its innumerable stars and the wish to escape gravity. This wish is already expressed in ancient myths such as this of Icarus who wearing wings made of branches of osier, wax and feathers flew too close to the sun and met his demise as his wings melted. In antiquity, flying was a power reserved to the gods. Still today, flying into space is to defy and be liberated from the earth-bound human condition.

In the Western culture there is a rich poetic and scientific tradition of reaching for the sky and the stars. Leonardo Da Vinci's flying machines (1485), Francis Godwin's *The Man on the Moone* (late 1620s), Montgolfier brothers' first hot air balloon (1783), Jules Verne's *From Earth to the Moon* (1865), Brothers Wrights successful early flying experiments (1903), Lindbergh's first transatlantic flight (1927), Yuri Gagarin's journey into outer space on his *Vostok* space craft (12 April 1961), Stanley Kubrick's *2001: Space Odyssey* (1968), *Apollo 11*: the first manned mission to land on the Moon (20 July 1969) ... Space travel is not only defined by physical reality and scientific facts but also by multiple layers of imaginings and expectations. It is simultaneously real and unreal.

Today commercial space travel promises to fulfill the utopian dream to escape our earthbound existence and enter a territory where the familiar conditions that govern life are set aside. The fulfillment of this dream is based on hard science, sophisticated engineering and large amounts of money. The designer of commercial space ports, planes, and hotels faces the challenge of bringing together successfully both the real and unreal dimensions of space travel. Biological, engineering and financial limitations dictate the basic parameters of design such as size, shape and materials of basic structure and parts. Commercial realities demand a financially viable approach to design, which will propose solutions that meet the expectations of the space tourist. These expectations have been formed both by experiences of travel on earth as well as rich visual and textual references of how it would be to travel into space.

Brief

Space Craft asks you to imagine and develop a proposal for a space hotel. On Earth the hotel has evolved from a simple institution for overnight rest and nourishment to an elaborate cross-programmed narrative environment. Today, from primitive retreats in Tibet to luxury resorts in the Bahamas, hotels sell "experiences" that take tourists out of their everyday surroundings and habits and immerse them in the extra-ordinary. Space-travel is the ultimate extra-ordinary experience – and a very exclusive one at the moment. If the first space-tourists were happy to share the experience of the astronauts, as space travel is commercialized a higher degree of comfort, more elaborate facilities and a variety of leisure activities will be offered and expected. It is your job to construct this extra-terrestrial experience.

Your site is the interior of the Space Pressurized Module developed by *Thales Alenia Space* for NASA (Node 3). The module's interior is a microgravity environment with diameter of 4480 mm and length of 6706mm. The module is attached to the International Space Station (ISS) and shares part of its facilities. The ISS is a habitable artificial satellite currently constructed out of 16 modules and other components that orbits the Earth every 90 minutes in an altitude of 330 to 435 kilometers above sea level. The space tourists are transported to the ISS by a space shuttle and are expected to spend 7 days in space. Your space hotel should be able to accommodate 4 to 6 tourists at a time. *Space Craft* asks you to consider carefully

the physical and psychological conditions in such a restrictive extra-terrestrial interior. Your challenge is to develop a new spatial experience that takes into account the specific environmental conditions of your site; such as, microgravity, limited volume, forced dependability on life support systems, psychological and social constraints and risks. Also, you have to take into account the necessity to minimize weight, volume and energy consumption. These are the parameters of the project, which define an intimate high-performance interior.

This brief is topical as commercial space travel marks “the dawn of the second space age”, according to George Whitesides, CEO of Virgin Galactic. John Spencer, founder and president of the Space Tourism Society, describes some possibilities for the future of space tourism: “An imagined voyage into the future of space experiences includes high-class orbital super yachts, orbital cruise ships and lunar resorts and spas.” These design briefs are unexceptional but the conditions of the site – space – are novel. In this context, the space hotel could be seen as an exercise in minimum, optimal, transformable space, which can find application in a variety of projects such as yachts, planes, caravans, mini-dwellings and constructions for extreme environments. More broadly, the project is a means of testing space, or hypothesizing, about potential future directions of interior design and occupations of spaces within buildings and cities.

To respond to this brief successfully your proposal should be based on a good understanding of the particularities of a space-situated project, the ergonomics of a multifunctional yet restricted space, the experiences constructed in environments for hospitality and the market potential for space tourism without forgetting the numerous cultural imaginings of space travel.

Overview

This project consists of four phases. The first phase is a detailed investigation of the parameters of the brief. This research phase will provide you with all the information needed to record the characteristics of the site, further develop the brief and make fully informed decisions about your proposal.

The second phase focuses on formulating a concept based on a critical evaluation of your research material that will direct the development of your proposal. You are encouraged to consider your space-hotel interior as a commercial product communicating a particular ethos and identity and, at the same time, as a location of specific everyday activities, which due to the restricted volume of the site are in need of particular sequencings. Precedents of minimum spaces such as capsules, hotel rooms, yacht interiors, airplane interiors, tree houses, high-performance interiors such as the ones for bases on the poles, experimental projects inspired by space travel, and science fiction set design should be critically analysed and used as source of inspiration at this stage.

In the third phase of the project your concept will be translated and developed into a detailed proposition. The focus here is on the experience offered by your interior and how this experience is realised and constructed. Issues to be considered at this stage are: spatial organization and program sequencing; modularity, standardization and transformability of elements; materiality and technology.

The project will culminate in a design realisation exercise. You will be required to focus upon one significant area of your proposal and develop it to a comprehensive level of detailed resolution.

Phase 01 (weeks 1-2): research

In phase 01, a series of lectures will provide you with a wealth of information about the conditions of the site and the particularities of the brief. As a response, you are asked to put together a comprehensive A3 research document. This document will comprise six research areas:

1. **Facts:** the history of space travel and the realities of space travel experience
2. **Fiction:** cultural imaginings of space travel (films, books, comics, TV series etc)
3. **Mini-spaces:** design of minimum spaces for escapism: hotel rooms, yatches, caravans etc / ergonomics and transformability
4. **Systems:** the technological systems of a space module (construction, materiality and environmental services) and the environmental conditions they create

5. **Market research:** the market for space tourism and what's on offer today.
6. **Hotels:** program, sequence of spaces, branding, identity, experience (the experiences constructed in environments for hospitality)

You are free to choose which research group to join. Keep in mind that each research group will have 5-8 members and that these groups will be formed for Phase 01 only. So, please choose your group on the basis of your personal interests and strengths.

This research phase will allow you to acquire a solid base for your project and provide inspiration in terms of possible scenarios of spatial occupation and experience. This is an opportunity to re-think everyday activities such as sleeping and eating. At the same time, these simple activities should be considered in the context of a travel experience with its anticipated requirements for comfort, enjoyment and social interaction.

Interim Review 01, Thursday 08/10/15, at 9:30

Assessable element for phase 01 is:

- A3 research document: all research finds are to be formatted and presented in A3 sheets. The formatting of the pages should be clear and consistent. Each group will present their research topic. All groups are requested to submit digital files of their work to be uploaded on the VLE.

Phase 02 (weeks 3-5): Concept

Working individually, you will develop your own interpretation of the design brief and formulate a strategy and a concept, based on a critical evaluation of the research finds. You are encouraged to explore the potential for narrative to inform the design and communication of environments and on the basis of this exploration propose a scenario for space tourism. In this proposition you should take into consideration three key factors:

1. space: the particular conditions of the site and how they redefine spatial experience and everyday activities; factors such as restricted space and weightlessness call for a thoughtful and imaginative three dimensional planning to maximize the use of the site.
2. hotel: the identity and ethos of your brand which inform the operation and aesthetics of your space plane interior; the translation of the hotel environment with its careful orchestration of private and public spaces into a capsule.
3. travel: the aims and realities of travelling; the circular sequence of events of going away from home and coming back home and the space/time in between; the narrative and experience of the journey.

Interim Review 02, Thursday 29/10/15, at 9:30

For phase 02 the assessable elements are:

1. site:
 - set of orthographic drawings in 1:50 or 1:20 (plan & sections)
 - 3D digital model
2. visit:
 - 1-minute science fiction film your trip to Margate
 - Ergonomic studies of the hotel interior
 - Storyboard of your 12h stay: sequence of experiences & transformations of the interior
3. workshop
 - working model
 - good quality photos of your working model
4. concept
 - 2D drawings
 - 3D drawings
 - research: precedents, inspiration & sketches
 - working model
 - selection of good quality photos of your concept model
 - identity / character / sensibility
 - storyboard: 24h in the space hotel: sequence of experiences & transformations of the interior / a series of images that describe your scenario
5. log book

All drawings and research material should be in A2 format and beautifully drawn, set out and labeled.

Phase 03 (weeks 6-8): Design development

In Phase 03, you will develop your concept into a design proposal by defining all the necessary elements of the projects: from the general spatial arrangement to the appropriate materials and colors. In other words, you are asked to imagine, define and communicate the spatial experience of your proposed interior with precision and in detail. Please keep in mind that every design decision that you make should be consistent with the overall concept of your proposal.

Interim Review 03, Thursday 26/11/15, at 9:30

For phase 03 the assessable elements are:

1. final proposal
 - complete set of orthographic drawings in 1:20
 - 3D impressions of the interior (key features)
 - storyboard (24h in the space hotel: sequence of experiences & transformations of the interior)
 - final model
 - selection of good quality photos of your final model
 - identity / character / sensibility
2. record of the design development:
 - selected photos of working models
 - material and construction techniques investigations
 - precedents, inspiration & sketches
3. log book

Phase 04 (weeks 9-11): Design resolution

The final stage of this project will be dedicated to the material and technical realisation of a focus area from your design proposal. Regardless of the scale and complexity of the scheme it is critical that all propositions are brought to a level of realisation and interrogation in relation to materiality, construction, detailing, services, and a sense of meaningful inhabitation. This is a relatively short amount of time to accomplish a comprehensive package of description and specification. It is therefore critical that you keep to the project schedule regarding the research, concept and development phases to ensure you have the time and resources to complete this project on time. Please keep in mind that the visualizations that describe your final proposal should illustrate the impact of detail design decisions upon the experience of the spaces proposed.

Final Review 04, Thursday 10/12/15, at 9:00

The final review will have the format of a public exhibition, which will be viewed by a panel of guest critics. For your exhibition entry you should present: two A2 panels describing your proposal and your final model.

However, for your portfolio submission you should prepare:

1. detail:
 - detailed section at 1:10
 - detail drawing (at an appropriate scale / it could be a section or an axonometric)
2. proposal
 - updated final set of drawings
 - 3D drawings showing materiality and inhabitation (key features & moments)
3. updated log book

Assessment

Portfolio submission: formative assessment, TUESDAY 15/12/15, 12-4pm

Your portfolio submission will be assessed individually. Therefore, the contents of your portfolio need to be produced individually although you have developed part of the project in groups.

Your portfolio document will comprise an edited collection of work produced during Term 01. It should be composed of a coherent set of A2 sheets all laid out in the

same graphic/visual style. Together with your A2 document you are expected to submit an A3 research document, which will comprise the document produced in Phase 01 enriched further with information gathered and work produced during term 01, and a log book that describes the development of your project and shows the degree of your engagement with your course of study. A portfolio brief stating the submissions requirements in detail will be issued closer to the submission date.

Please note that this is a formative assessment. The summative assessment of this project will take place at the end of the academic year.

Schedule

W01	28/09/15	Brief and Timetable Introduction + Lecture
	01/10/15	Lecture + tutorials in research groups
	02/10/15	Visit: Science Museum Cosmonaut Exhibition
W02	05/10/15	Lecture + tutorials in research groups
	08/10/15	Interim Review 01: Research
W03	09/10/15	Study trip + Workshop: Margate (09/10 – 10/10)
	12/10/15	Lecture + Workshop results presentation
W04	15/10/15	Tutorials
	19/10/15	Workshop: model making
W05	22/10/15	Tutorials
	26/10/15	Tutorials
W06	29/10/15	Interim Review 02: Concept
	02/11/15	Symposium
W07	04/11/15	Workshop: The Joy of Sets
	05/11/15	Workshop: The Joy of Sets
	06/11/15	Workshop: The Joy of Sets
W08	09/11/15	Tutorials
	12/11/15	Tutorials
W09	16/11/15	Workshop
	19/11/15	Tutorials
W10	23/11/15	Interim Review 03: Design Development
	26/11/15	Tutorials
W11	30/11/15	Workshop
	03/12/15	Presentation + Tutorials
W12	07/12/15	Tutorials + preparation of exhibition material
	09/12/15	Exhibition set-up
	11/12/15	Final Review + Exhibition
W12	15/12/15	Formative Portfolio Submission
	18/12/15	Christmas Party

References

Recommended Reading:

- Thackara, J. (2005) *In the bubble: designing in a complex world*. Cambridge (Ma): London: MIT.
- Sudjic, D. (2009) *The Language of Things; Design Luxury, Fashion, Art: How we are seduced by the objects around us*. Penguin
- Williams, G. (2012) *21 Designers for 21st Century Britain*. V&A
- Dancher. (2011) *100 Manifestos: From the Futurists to the Stuckists*. Penguin Modern Classics
- Munari, B. (2008) *Design as Art*. Penguin Modern Classics
- Bachelard, G. (1992) *The Poetics of Space*. Beacon Press
- Braungart, M & McDonough, W. (2009) *Cradle to Cradle: Remaking the Way We Make Things*. Vintage
- Papanek, V. (1985) *Design for the Real World*, Thames & Hudson
- Mau, B. (2004) *Massive Change: A Manifesto for Future Global Design Culture*, Phaidon Press

Additional Reading

- Ambasz, E. (ed.) (1972), *Italy: The New Domestic Landscape* (exh.cat.), Museum of Modern Art
- Architecture d'aujourd'hui* 328 (January 2001): micro architecture
- Banham, R. (1984), *The Architecture of the Well-tempered Environment*. Chicago
- Boeskov, B. (2001) "Inflight Design", *Architectural Design* 71, no.5 (Sept. 2001)

Brayer, M.-A. (ed.) (2003), *Architectures Experimentales 1950-2000*, Paris
Bullivant, L (2007) *4dSocial: Interactive Design Environments: A+D*, John Wiley and Sons Ltd
Bullivant, L (2007) *Responsive Environments: Architecture, Art and Design* (V&A Contemporaries): V&A publications
Coates, N. (2012), *Narrative Architecture* (Architectural Design Primer)
Crowley, D. and Pavitt J. (eds.) (2008), *Cold War Modern: Design 1945-1970*. London, V&A publications
De Monchaux, N. (2012) *Spacesuit*.
Domus 819 (October 1999): *Compact: mini, midi, maxi*
Jencks, C & Kropf, K (2008) *Theories & Manifestoes of Contemporary Architecture*
Neder, F. (2008), *Fuller Houses: R. Buckminster Fuller's Dymaxion Dwellings and Other Domestic Adventures*.
Pawley, M. (1990), *Theory and Design in the Second Machine Age*, Oxford
Riley, T. (ed.) (2002), *The Changing of the Avant-garde: Visionary Architectural Drawings from the Howard Gilman Collection*, New York
Verne, J. (1865), *From the Earth to the Moon*

Films

Grand Hotel, Edmund Goulding, 1932
On the Threshold of Space, Robert D. Webb, 1956
Barbarella, Roger Vadim, 1968
2001: Space Odyssey, Stanley Kubrick, 1968
Solaris, Andrei Tarkovsky, 1972
The Man Who Fell to Earth, Nicolas Roeg, 1976
Alien, Ridley Scott, 1979
Blade Runner, Ridley Scott, 1982
Lost in Translation, Sofia Coppola, 2003
The Life Aquatic with Steve Zissou, Wes Anderson, 2004
Wall-E, Pixar, 2008
Moon, Duncan Jones, 2009
Gravity, Alfonso Cuarón, 2013
Hotel Grand Budapest, Wes Anderson, 2013
Interstellar, Christopher Nolan, 2014

On-line Resources

Design

<http://www.spatialagency.net/database/haus-rucker-co>
http://arqueologiadelfuturo.blogspot.co.uk/2009/11/01_archive.html
<http://www.n55.dk/>
<http://archigram.westminster.ac.uk/>
<http://scienceetfiction.tumblr.com/>
<http://www.ala.uk.com/>

Hotels

<http://ie-luxuryhotels.blogspot.co.uk/2009/09/top-10-worlds-futuristic-luxury-hotels.html>
<http://www.qbichotels.com/en/photos-qbic-hotels.html>

Space Tourism

<http://www.udel.edu/PR/UDaily/2008/feb/rockets022108.html>
http://www.spacefuture.com/archive/the_future_of_space_tourism.shtml
<http://www.nss.org/tourism/index.html>
<http://spacetourismsociety.org/>
http://www.spacefuture.com/archive/hotels_in_space.shtml
<http://www.spacefuture.com/tourism/timeline.shtml>
<http://overseas.com.au/blog/index.php/10-space-tourism-facts-you-need-to-know/>
<http://www.bediniepartners.it>
<http://www.cosmiclifestyle.com>
<http://virgingalactic.com/>

Space Travel

<http://www.nasa.gov>
<http://www.thalesonline.com/space>
<http://www.esa.int/esaCP/index.html>
<http://www.uncubemagazine.com/sixcms/detail.php?id=12190661&articleid=art-1393764962390-2ca94af2-4759-41b7-b069-c019a7bc9fd4#!/page1>

Aims	<p>To reinforce the practice of design process.</p> <p>To introduce a broad range of context interests and attitudes to inform interior design position and approach.</p> <p>To foster an understanding of the importance of designing in context and engaging critical commentary and debate.</p> <p>To develop students' understanding of their individual working method and personal position</p> <p>To develop presentation skills across a range of formats and media, enabling students to articulate and present their work effectively and creatively.</p>
Learning Outcomes	<ol style="list-style-type: none">1. Utilise research methods and analysis in the gathering and evaluation of contextual material.2. Inform design through context and understand its potential for effecting change and viewpoint.3. Implement an emerging critical approach to their work including awareness and understanding of contemporary industry concerns, debates and future directions4. Articulate their role and responsibilities as a contemporary design practitioner5. Communicate their work effectively – including refining, editing, selecting and production – across a range of platforms
Overall Assessment Criteria	<ul style="list-style-type: none">> Demonstrated ability to research and evaluate contextual material (LO1)> Whether there was an appropriate interrogation and synthesis of information from a variety of sources applied to the proposal (LO2)> Ability to create work that is informed by knowledge of precedents and contemporary debates (LO2)> Demonstrated continuous engagement in the process of understanding, exploring and articulating design intentions, ideas and proposals (LO2)> Demonstrated flexibility and adaptation of the proposal in response to issues, problems and opportunities which were identified in fulfilling the brief (LO3)> Ability to work independently and with initiative (LO4)> Ability to work with others, valuing collaboration and exchange (LO4)> Ability to manage time effectively and work to deadlines (LO4)> Whether the choice of materials and technologies applied to the project relate to the conceptual idea (LO4)> Whether the final proposal embodies a personal response to the brief and articulates a personal design philosophy (LO4)> Whether the design proposal demonstrates a coherency of approach to detail and its application (LO4)> Whether the design proposal and presentation communicates (through a full set of design drawings, visualizations and models at appropriate scales) the design intend. (LO5)> Whether design ideas are presented in a way that allows the spatial qualities and the design intentions to be clearly communicated to an audience previously unfamiliar with the design (LO5)