

黃3  
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黃7

S K Y V I E W

Company One: Lunar Express

## 幻灯片 1

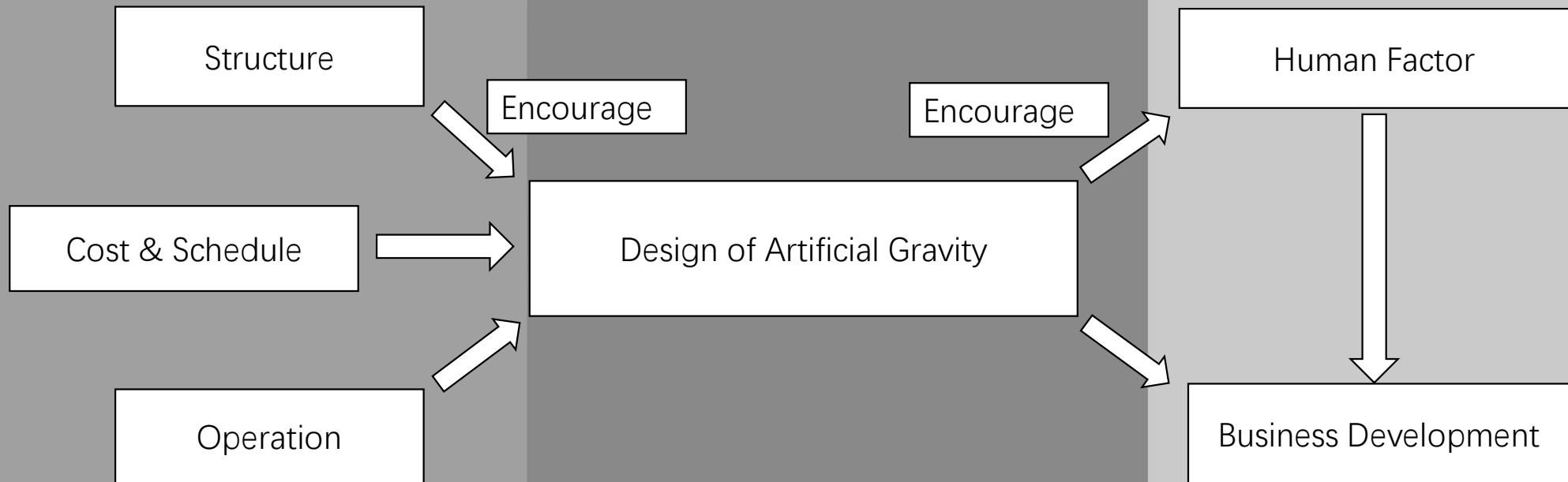
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黃3 幻灯片封面片尾由STR建模导出预览 + 陈飞宇ps 形成完整概念图  
黃 奎元, 2020/10/4

黃6 ppt考虑: 目录  
黃 奎元, 2020/10/4

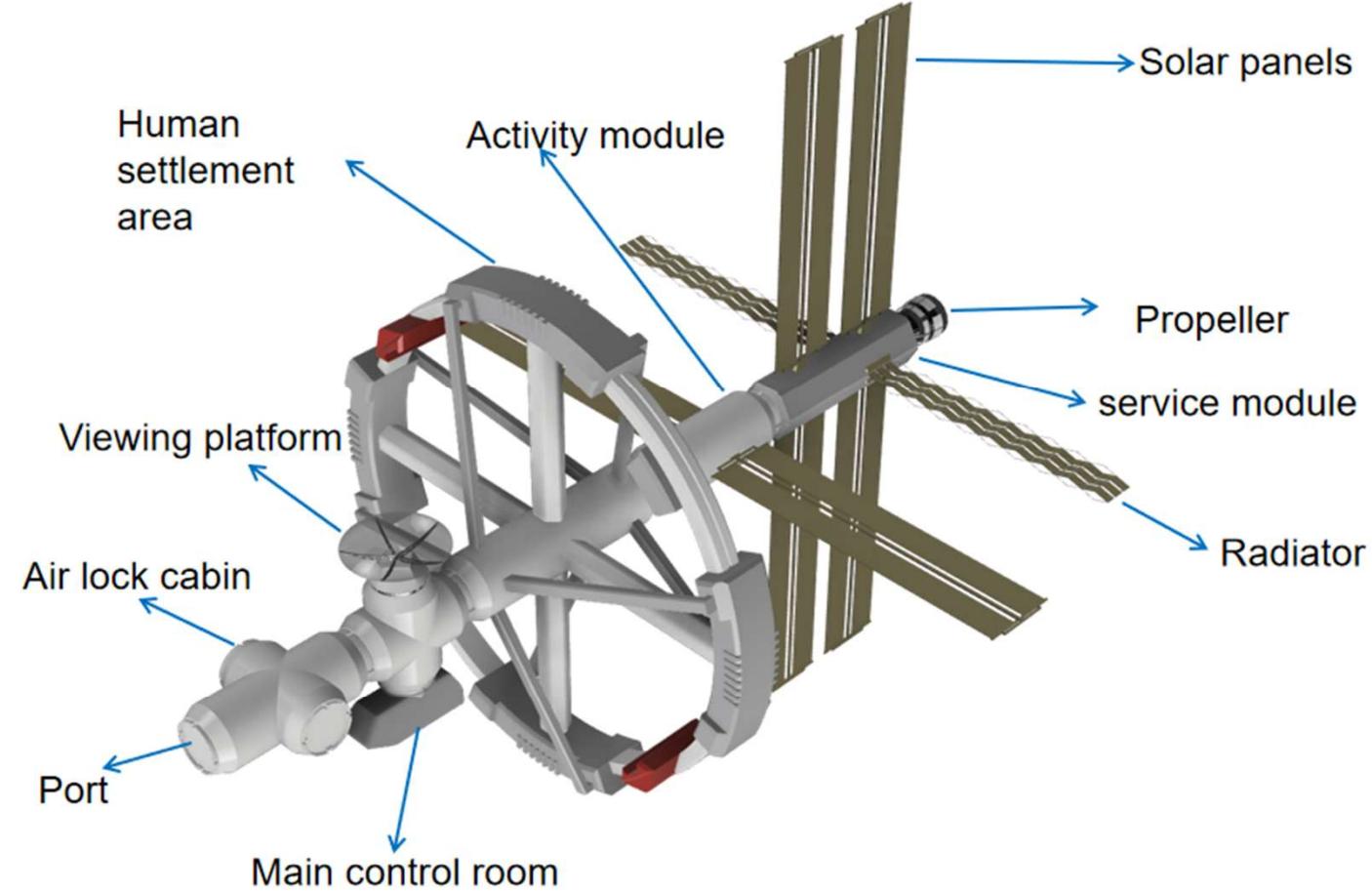
黃7 sec2 sec5.3 翻译 待完成  
黃 奎元, 2020/10/4

# 1.0 Executive Summary

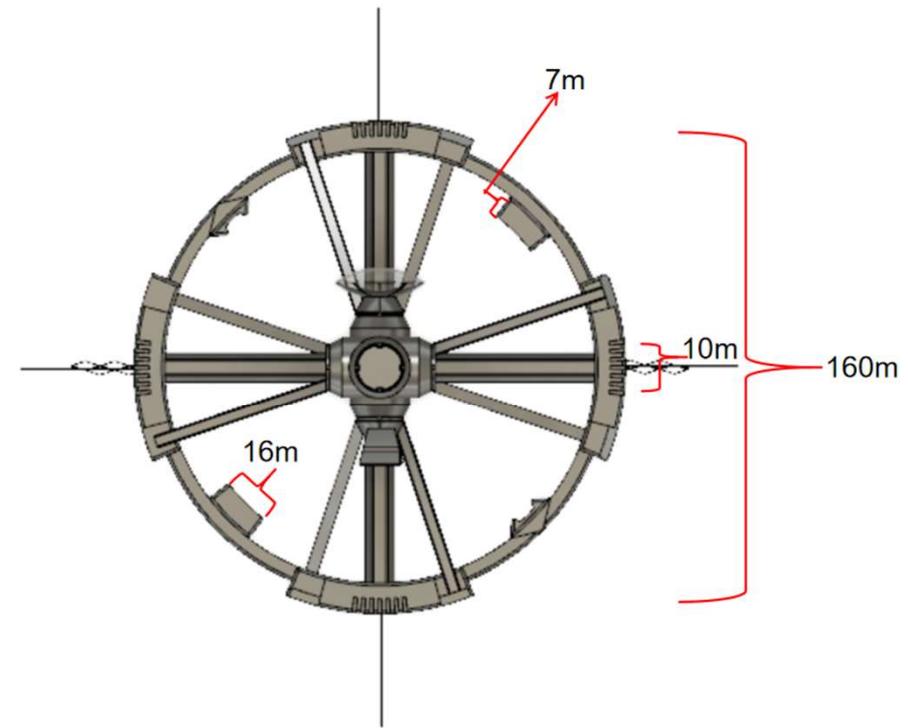
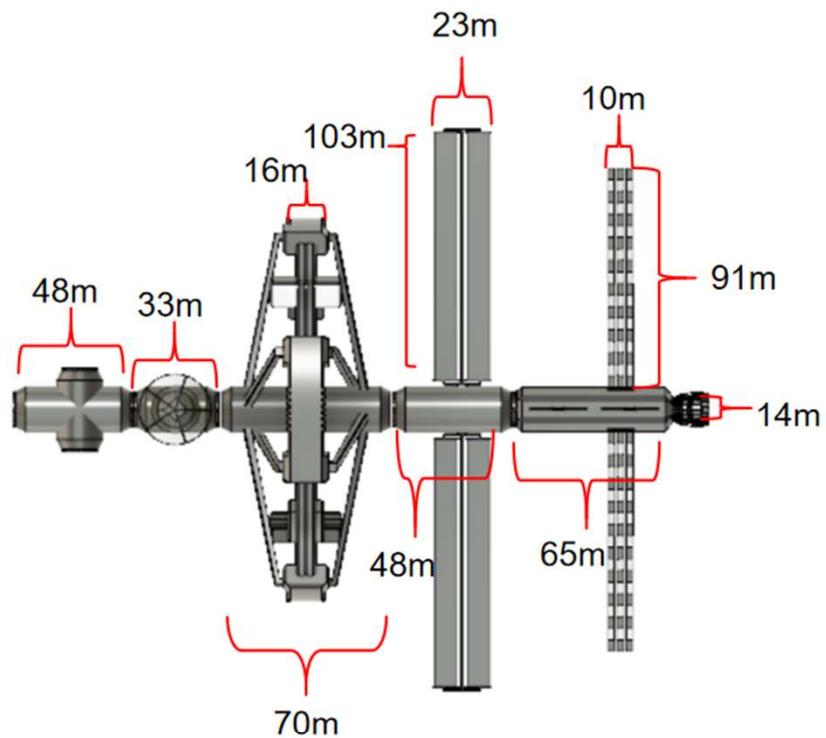


## 2 Structure and Material

## 2.1 Exterior Structural Design



## 2.1 Exterior Structural Design

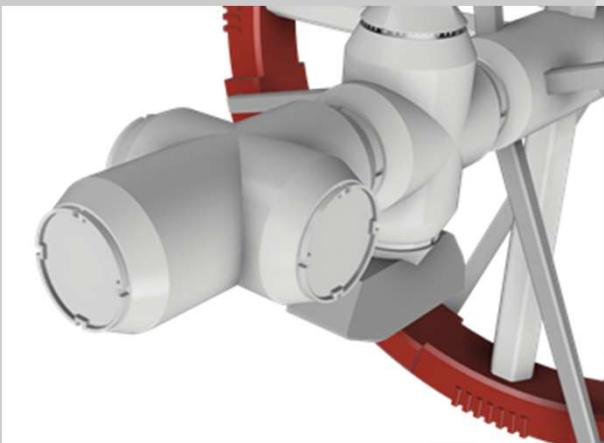


Rotational Speed: 1.05 rpm

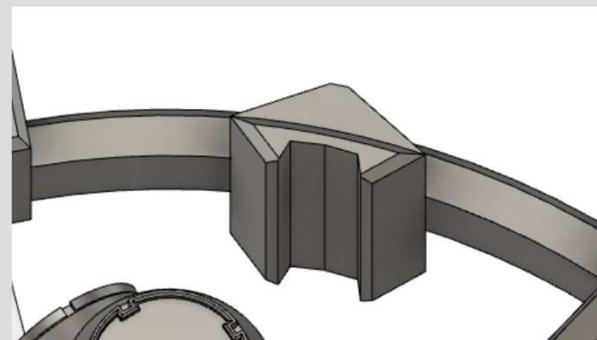
Gravitational Acceleration: 0.1 g

## 2.1 Exterior Structural Design

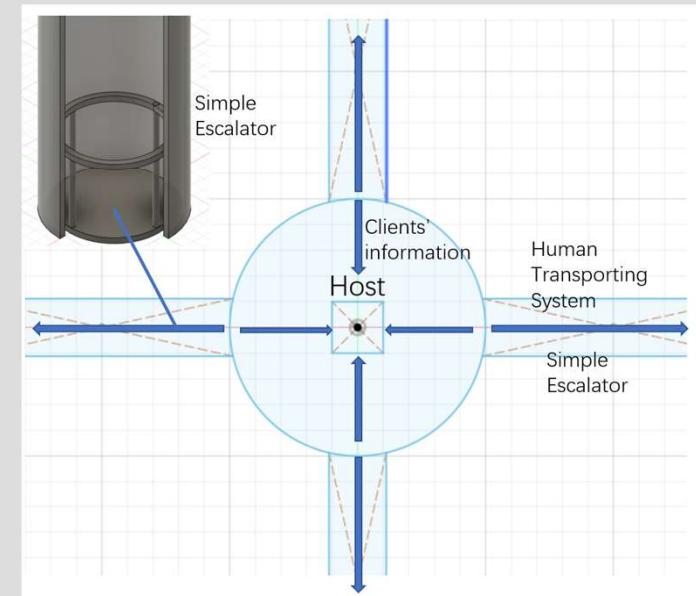
Regular used docking berths:  
Fully utilized space &  
rational designed dock



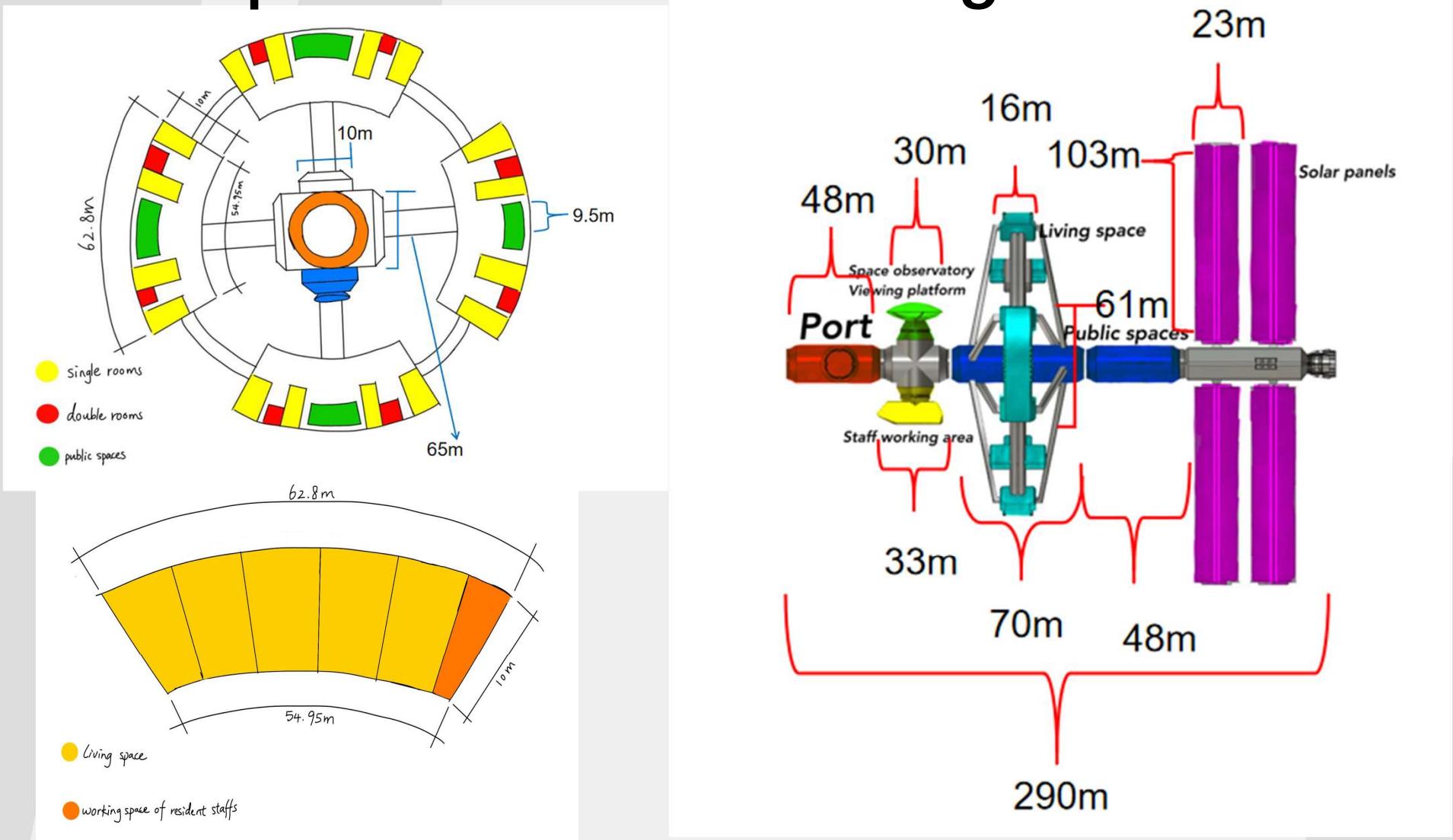
Regular used docking berths:  
Fully utilized space &  
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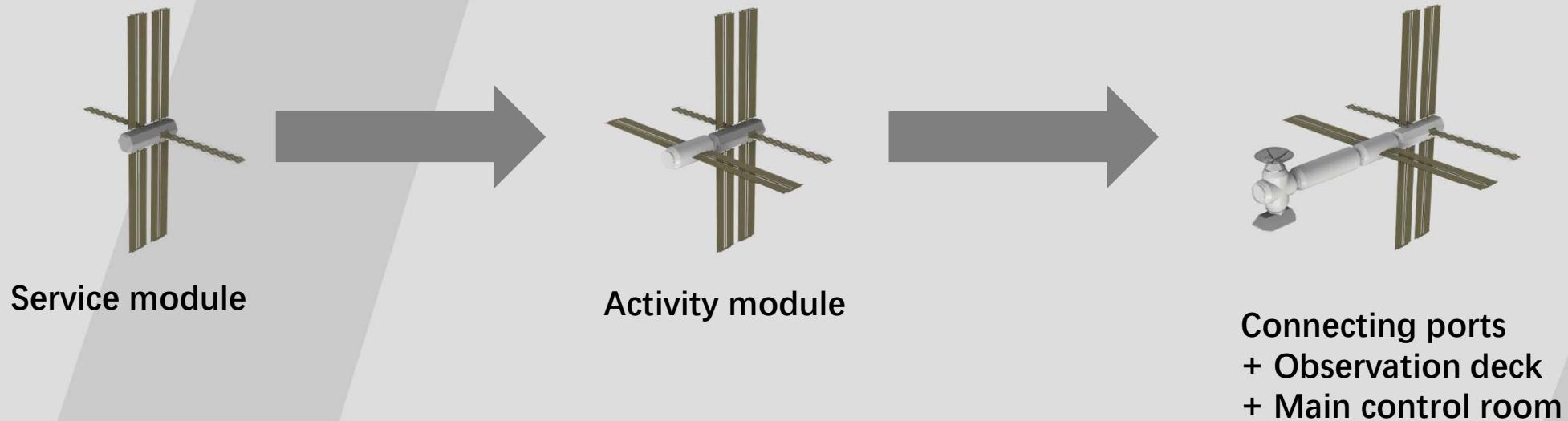
Other facilities that enhance  
check in and out experience



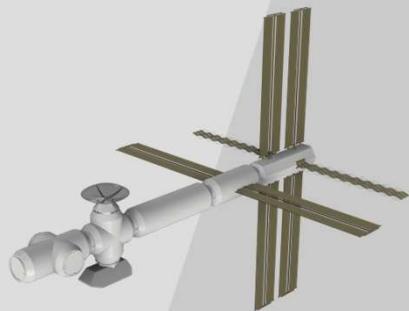
## 2.2 Interior Space Distribution Designs



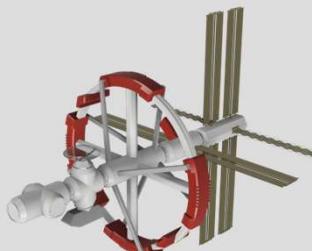
## 2.3 Construction Sequence



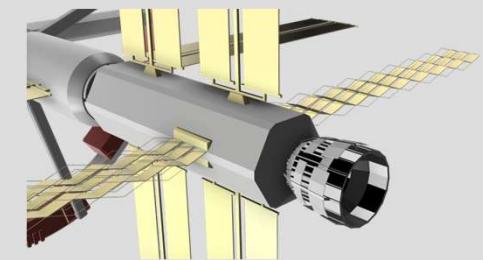
## 2.3 Construction Sequence



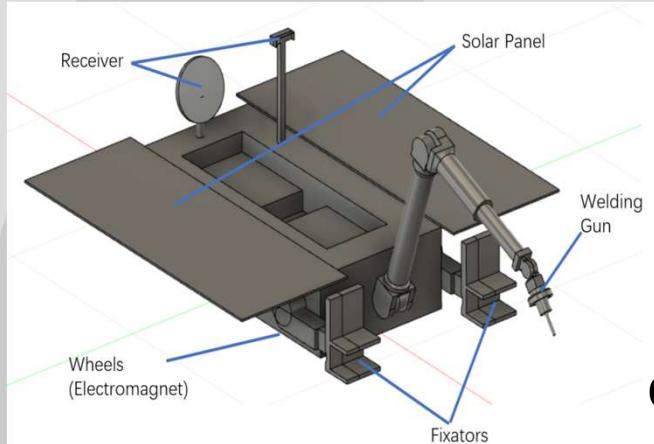
Ports



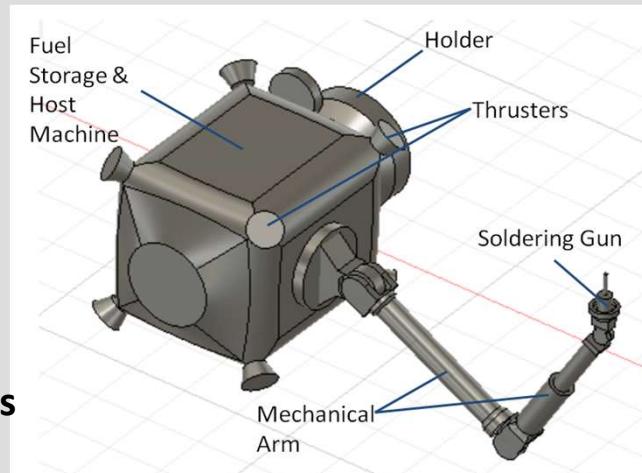
Human settlement area



Propeller



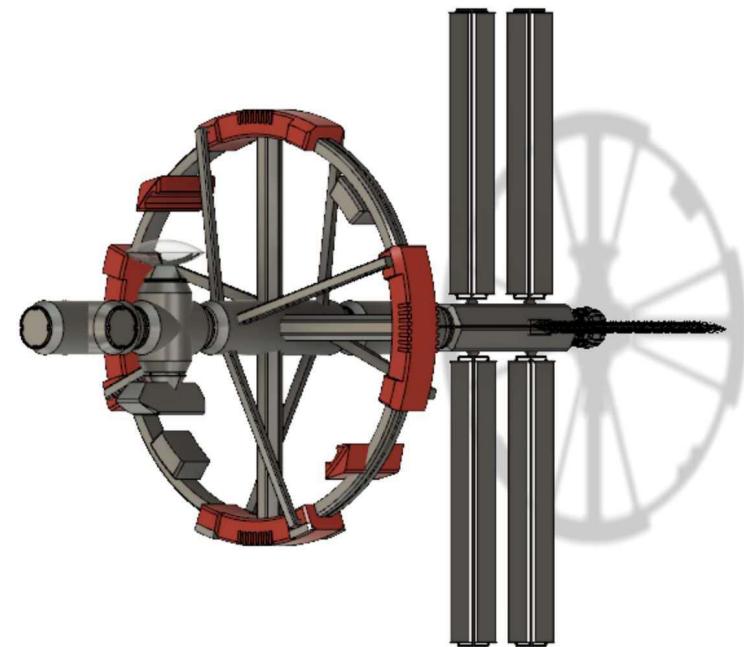
Construction robots



## 2.4 Radiation Protection

### Reinforced polyethylene

- Ballistic
- Fabric
- High hydrogen content
- Lowcost



Installation position (the red part):  
Human settlement area and Emergency part

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# 3 Operation and Safety

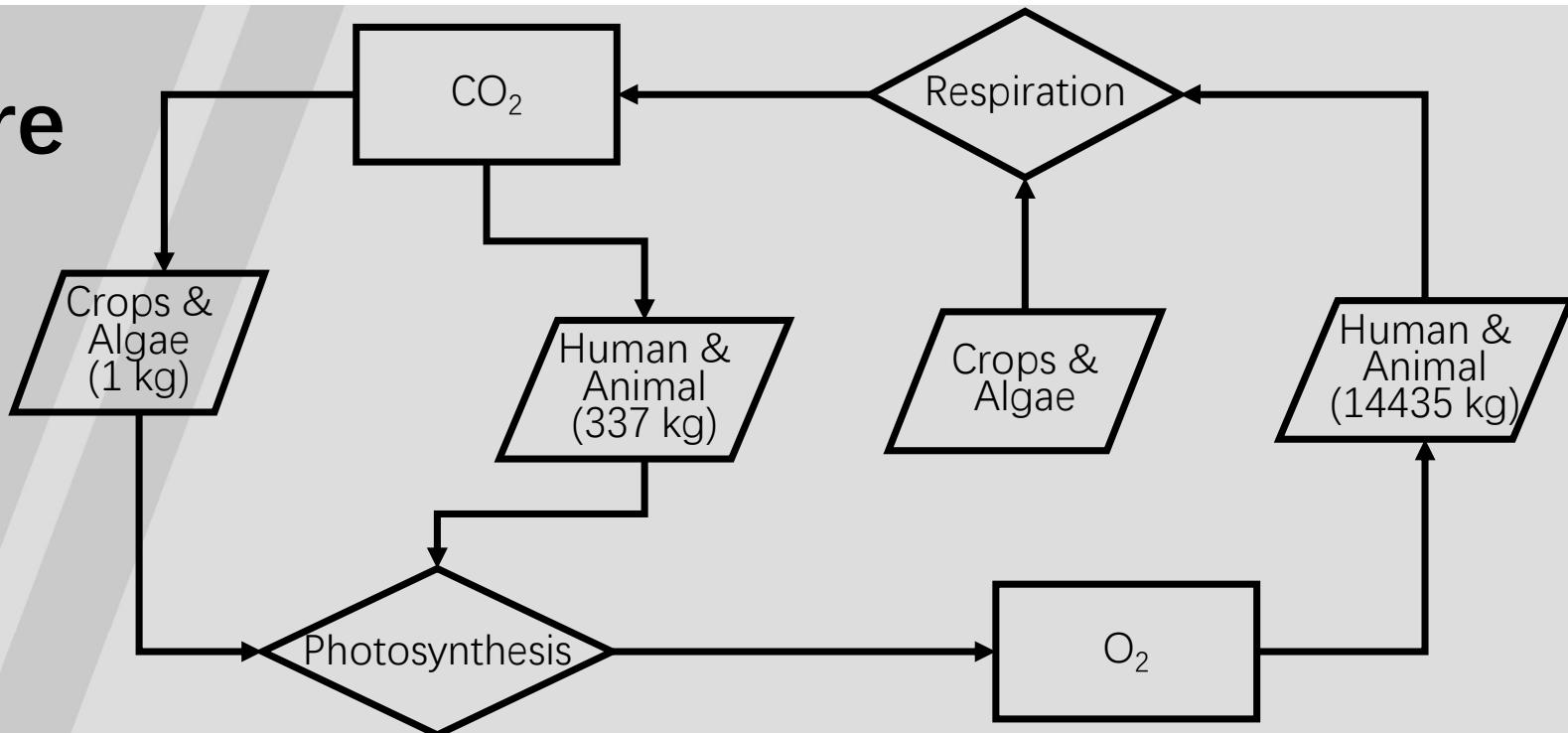
## 幻灯片 11

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黄4      3.1 3.3 表格和flowchart压成一张ppt  
3.4 文字压缩 图片合并 留一页给auto  
黄 奎元, 2020/10/4

黄5      v2: 重制3.1flowchart 已完成  
重制3.4关系图  
重制3.2数据 (微信)  
黄 奎元, 2020/10/4

# 3.1 Atmosphere



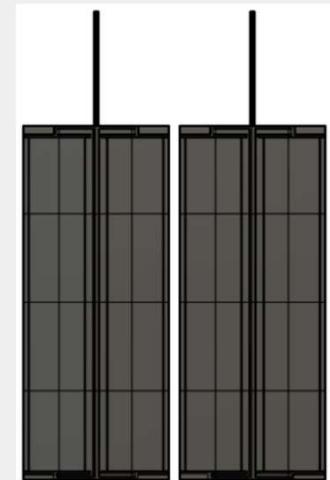
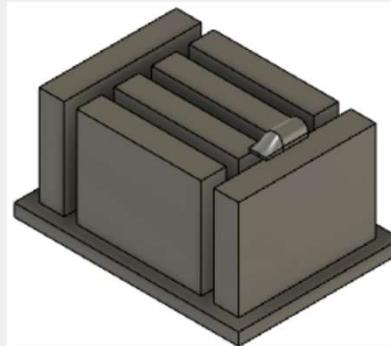
District	Air Partial Pressure	Mass	Composition
Residential area	0.624 atm N <sub>2</sub> 0.1714 atm O <sub>2</sub> 0.004 atm CO <sub>2</sub> 0.0006 atm water vapor	52552 kg liquid N <sub>2</sub> 14435 kg liquid O <sub>2</sub> 337 kg CO <sub>2</sub> 51 kg water vapor	78.0% N <sub>2</sub> 21.425% O <sub>2</sub> 0.5% CO <sub>2</sub> 0.075% water vapor
Agricultural area	0.624 atm N <sub>2</sub> 0.168 atm O <sub>2</sub> 0.008 atm CO <sub>2</sub>	81 kg liquid N <sub>2</sub> 22 kg liquid O <sub>2</sub> 1 kg CO <sub>2</sub>	78.0% N <sub>2</sub> 21% O <sub>2</sub> 1% CO <sub>2</sub>

→ No need for noble gases

→ Higher efficiency for photosynthesis

## 3.2 Electricity Power Management System

Section	Consumption (kW) (Generation)
Residential area	1303
Agricultural area	2526
Transportation	2708
Electricity consumption during recycling	249
Sum	6786



Power distribution per day in kW

Produce electricity **INSTANTLY** when need  
Graphene cell: Placed in residential area

Solar panels	8700 m <sup>2</sup>	\$ 13300000
Graphene cell	277 m <sup>3</sup>	\$ 38885
Emergency	1990 kW	-

## 幻灯片 13

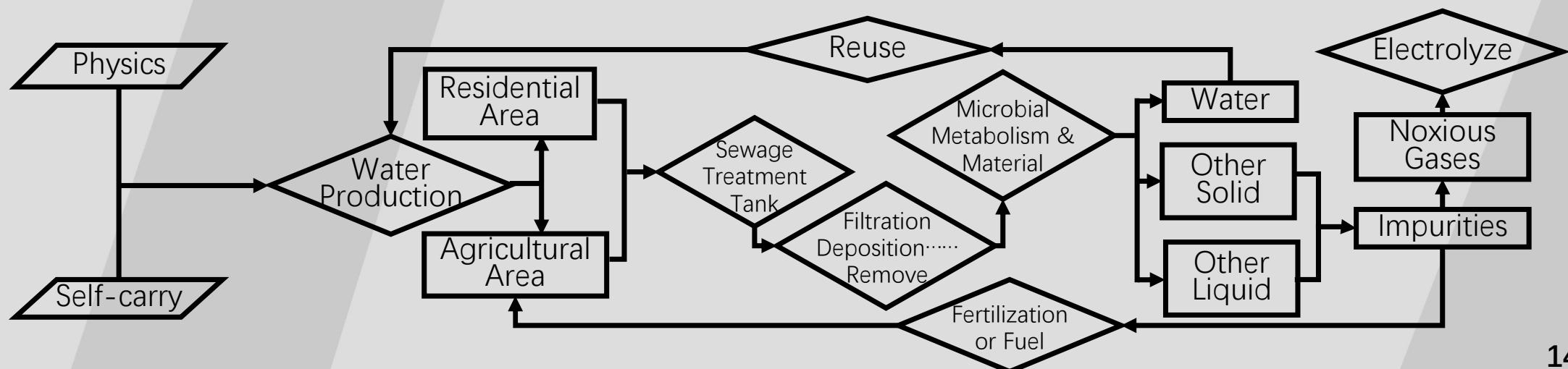
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王雨钊, 2020/10/4

### 3.3 Water Resources Management System

		Volume (L)		
		type	per day	part total
Residential		lavatory	120	
		kitchen	11.5	131.5
Agricultural Area (Land Crops)		chicken	720	
		potato	2097.6	3156
		tomato	1080	
		space pepper	2000	5897.6
(Water Crops)		fish	-	
		algae	-	30600
Park		fountain	-	20000

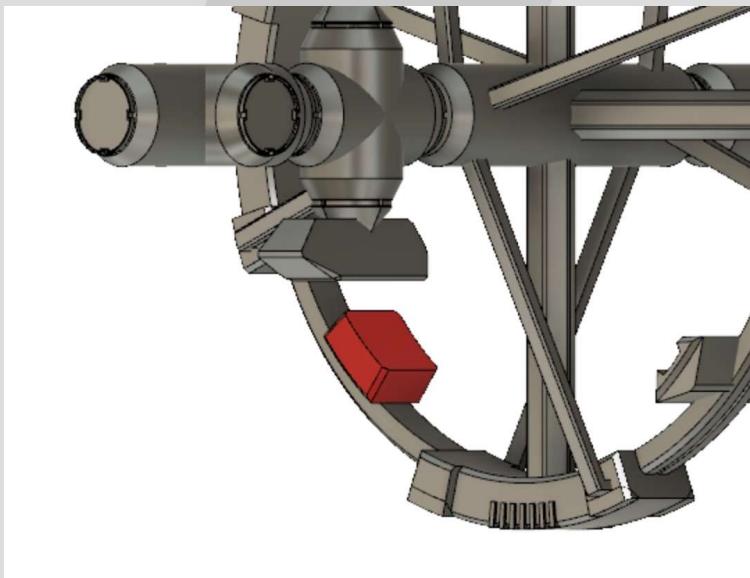


### 3.3 Water Resources Management System

Transportation media: PEX pipe  
(Crosslinked polyethylene pipe)

Periodically substitute 30% amount of water  
(Fresh water in, waste out)

Water Reserveoir



Advantages: good pressure resistance  
wide temperature resistance  
resistance to acid and alkali corrosion  
inner and outer walls are smooth

## 3.4 Agriculture

Plants and domestic livestock

1. Rich in nutrients
2. Efficient
3. Easy to grow and foster

Ecosystem

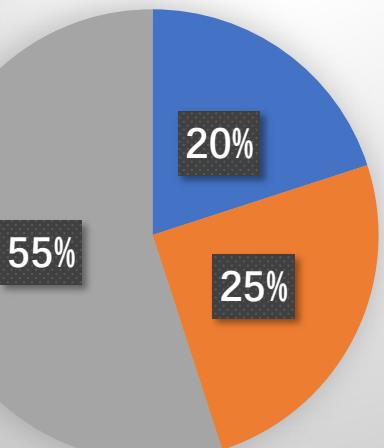
e.g.

Fish  $\longleftrightarrow$  algae  
chicken waste  $\longleftrightarrow$  plants

Name	Nutritive value	Yield	Growth cycle	Demand	Land for planting
Potato	Carbohydrate starches (sugars) are high in vitamins	43776kg/year	4months	40000kg/year	Nutrient solution
Algae	The body needs almost complete nutrient composition mineral etc	50kg/year	1months	50kg/year	Live pool
Space chili	Vitamin C calcium cellulose	76kg/year	3months	70kg/year	Nutrient solution
Tomato	Vitamin E carotene malic acid	2737kg/year	1months	2190kg/year	Nutrient solution
Chicken	Protein, vitamin C, fat	2160只/year	1months	1728per year	farms
Fish	Protein fat	850条/year	12months	834per year	Live pool

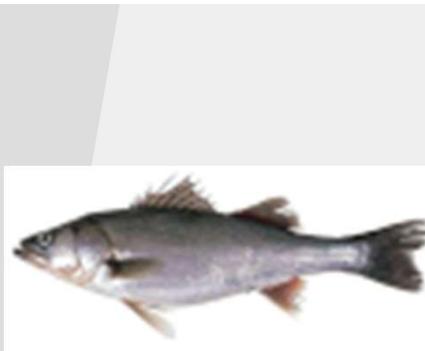
The table of planting and breeding plan

## 3.4 Agriculture



Product O<sub>2</sub> &  
nutrient the water

- protein
- fats
- carbohydrate



Product CO<sub>2</sub>  
→Photosynthesis

Foods  
Foods (human leftovers)

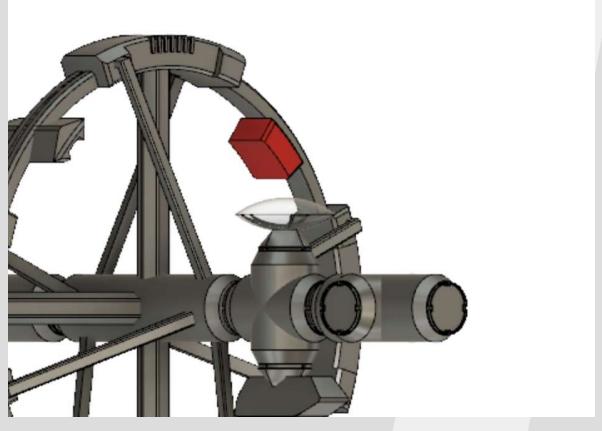
Foods & O<sub>2</sub>



Foods & O<sub>2</sub>

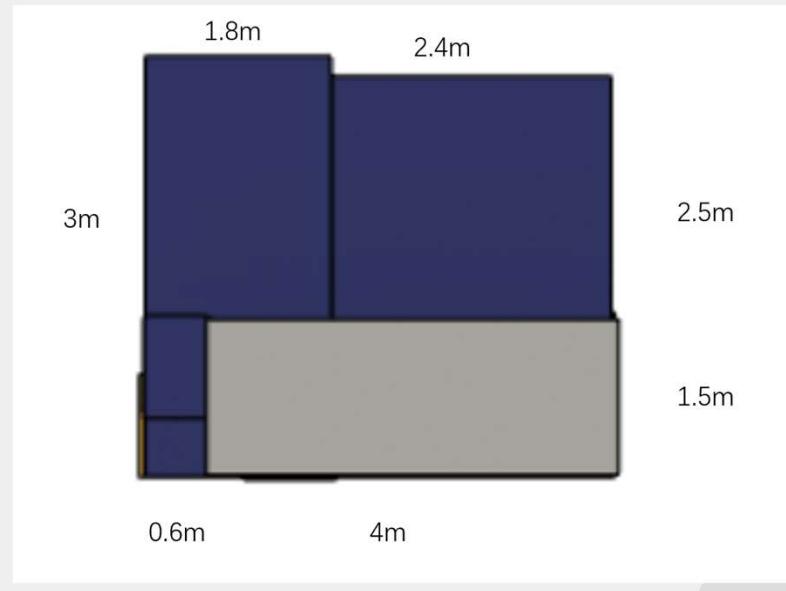
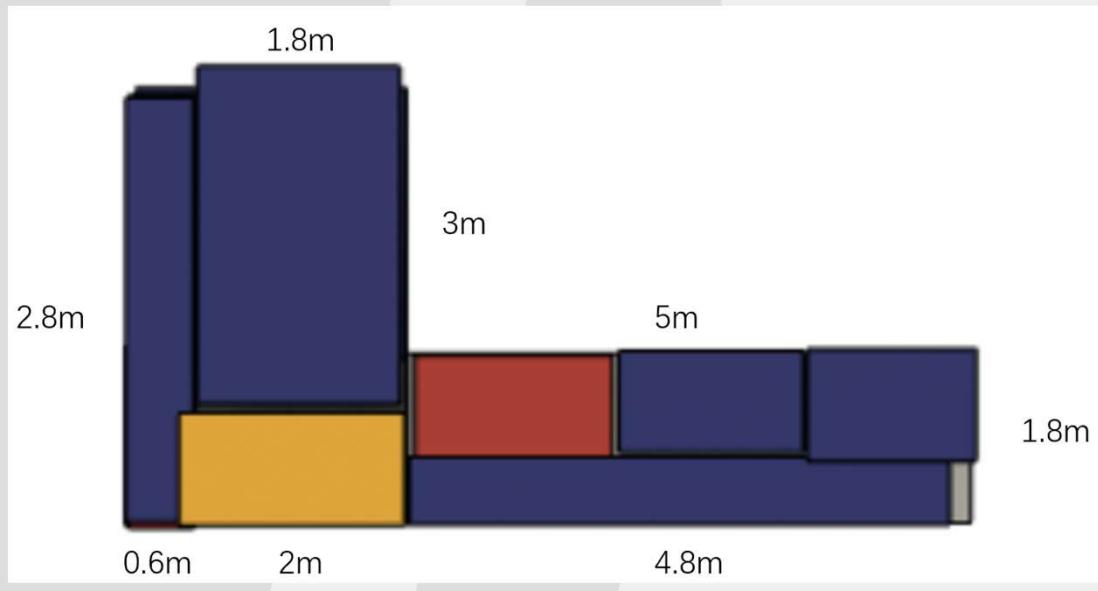
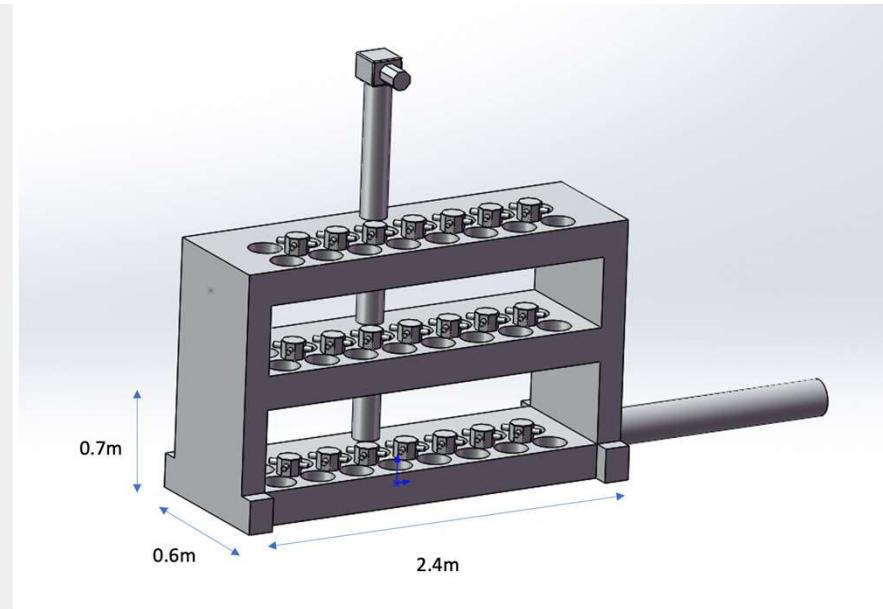


## 3.4 Agriculture

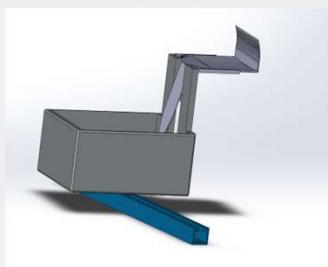
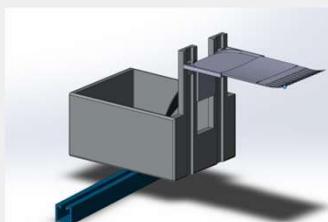
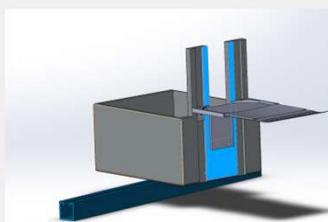
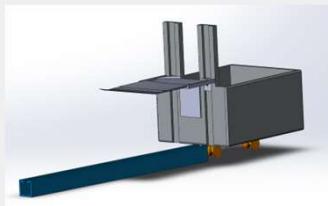
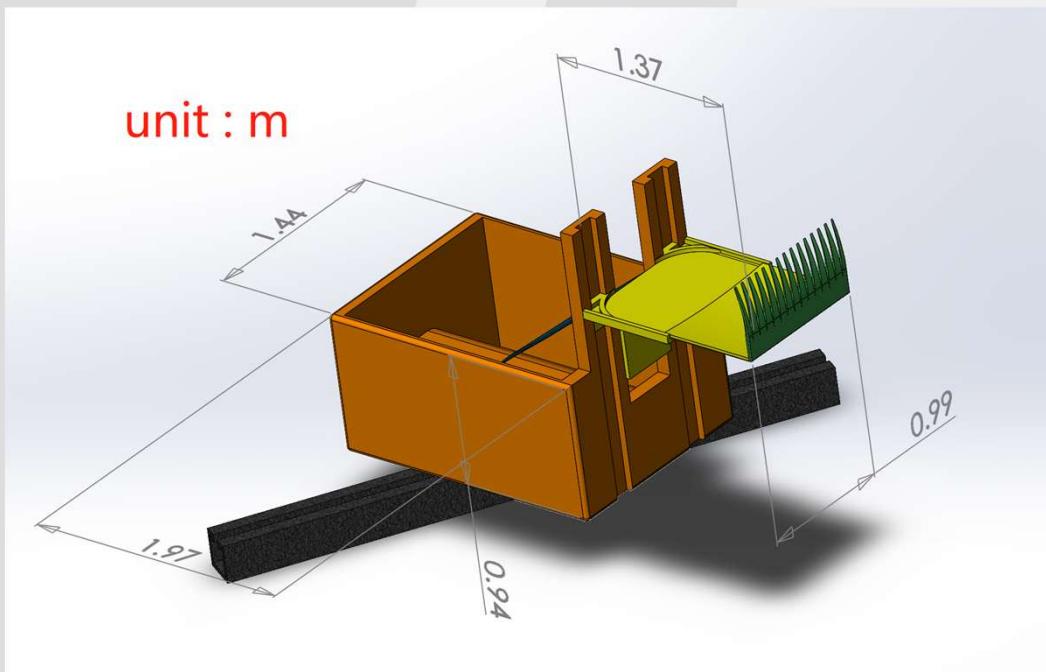


Agricultural Area

Planting Unit



## 3.4 Agriculture



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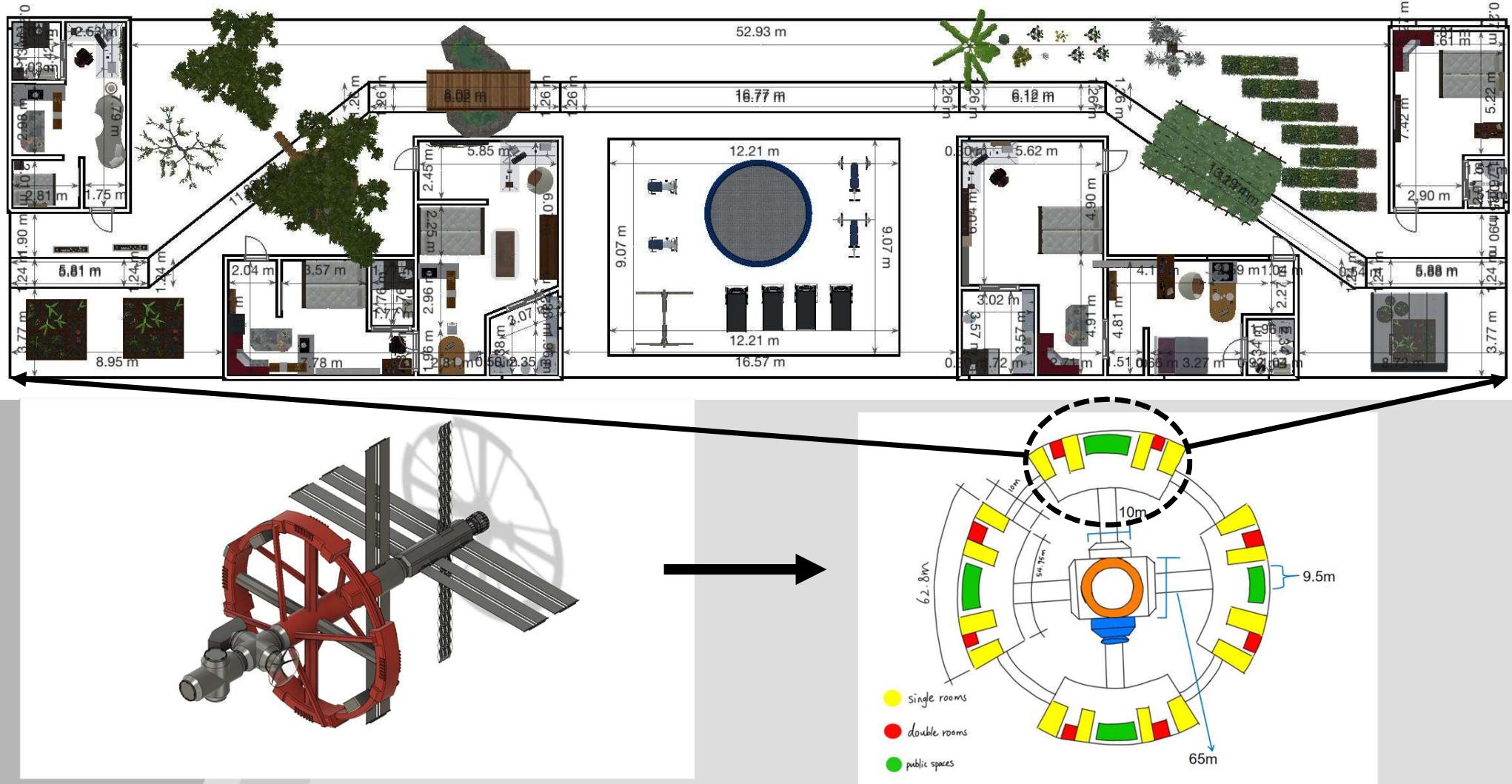
右侧流程图是否对应五幅图

黄 奎元, 2020/10/4

# 4 Human Factors and Health

# 4.1 Residential Space Design

the combination of element



## 4.1 Residential Space Design



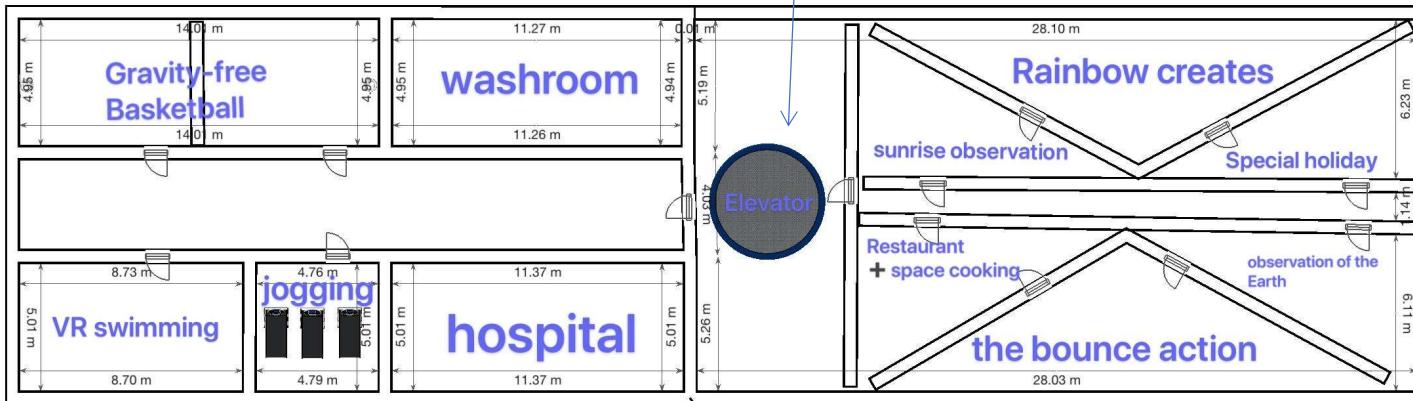
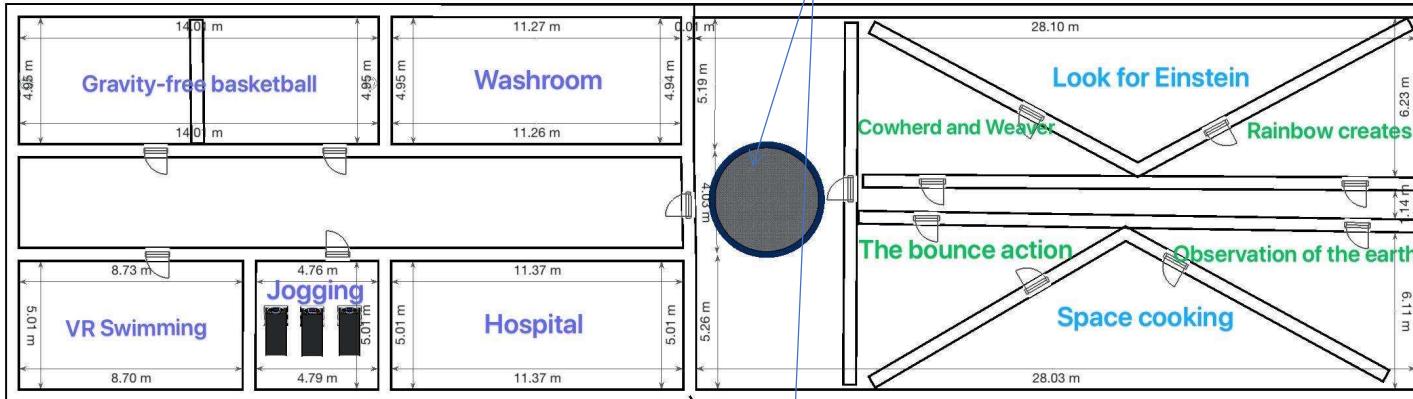
## 幻灯片 22

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黃10 PDF: 只放fig3 fig4  
黃 奎元, 2020/10/5

## 4.2 Public Space and Facilities

Elevators



Two kinds of design  
within one section

## 4.2 Public Space and Facilities



Gravity-free basketball  
multi-dimension baskets

### *Recreational activities*

Searching for Einstein	Sunrise observation	Special holiday
Space cooking	Hawking's world	Cowherd and Weaver
The bounce action	rainbow creates	observation of the Earth



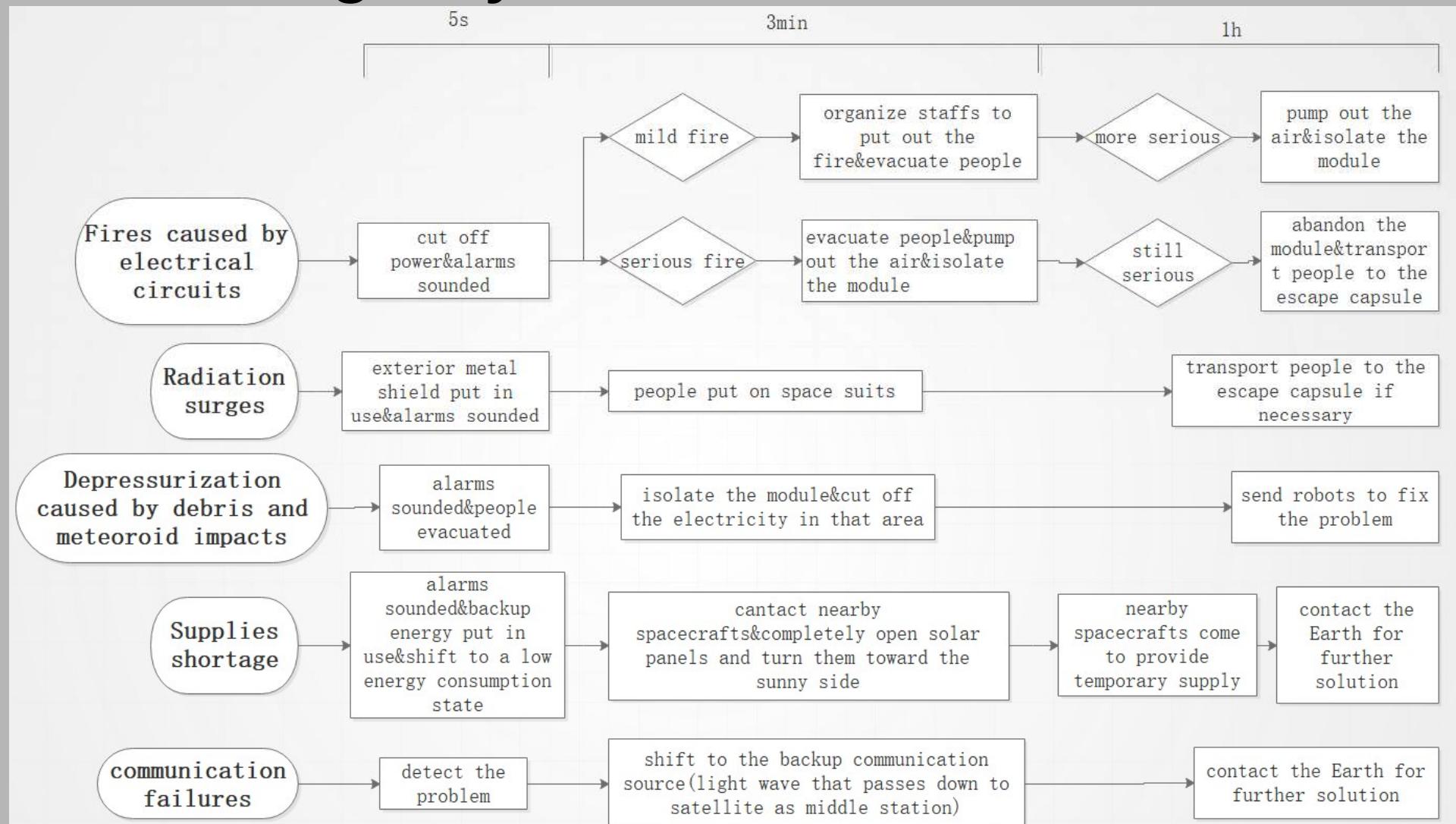
*Aerobic exercises*



VR swim  
simulate real swimming environment

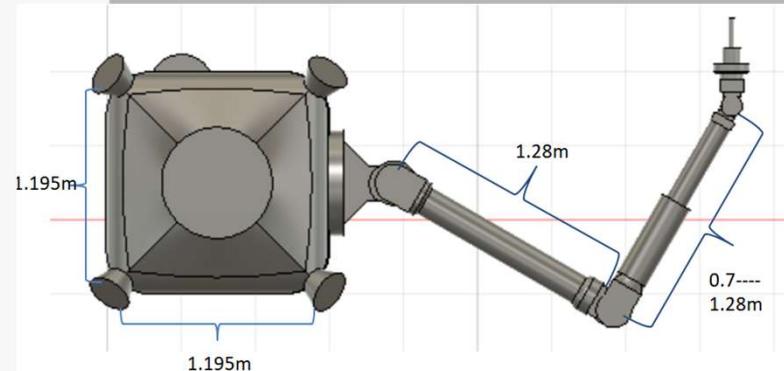


## 4.3 The Emergency Plans

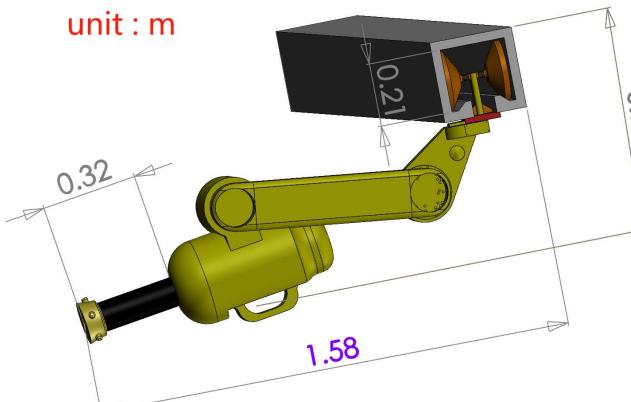
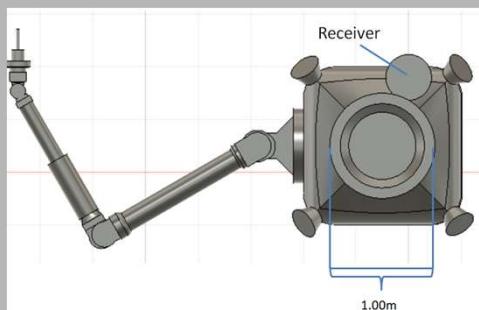
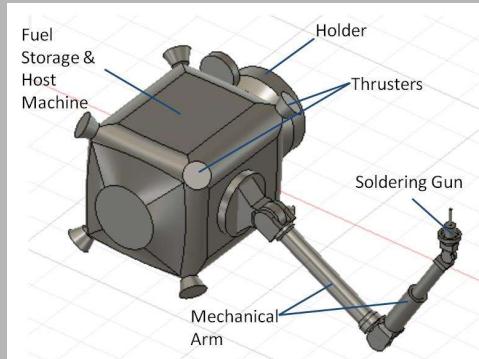


## 4.3 The Emergency Plans

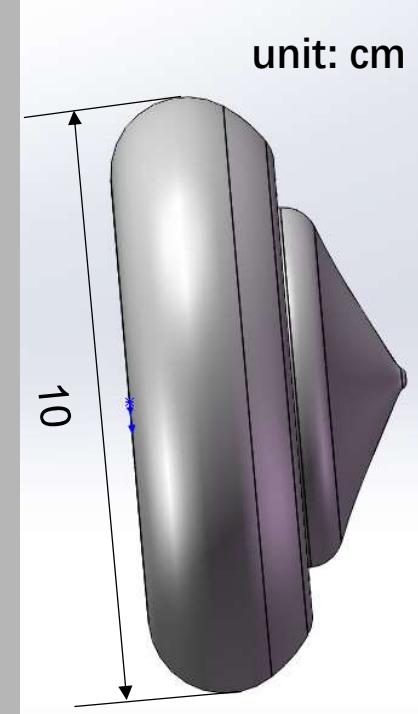
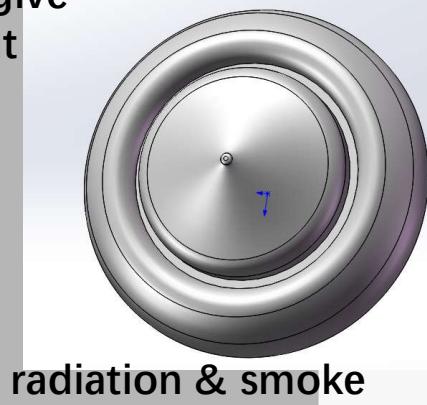
to detect and give  
warnings about  
fire&radiation



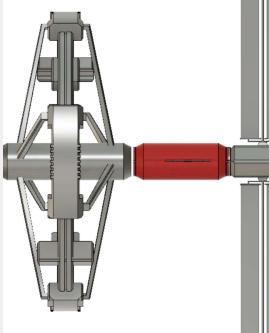
to repair and construct(outside)



robotic arm  
to repair and construct(inside)

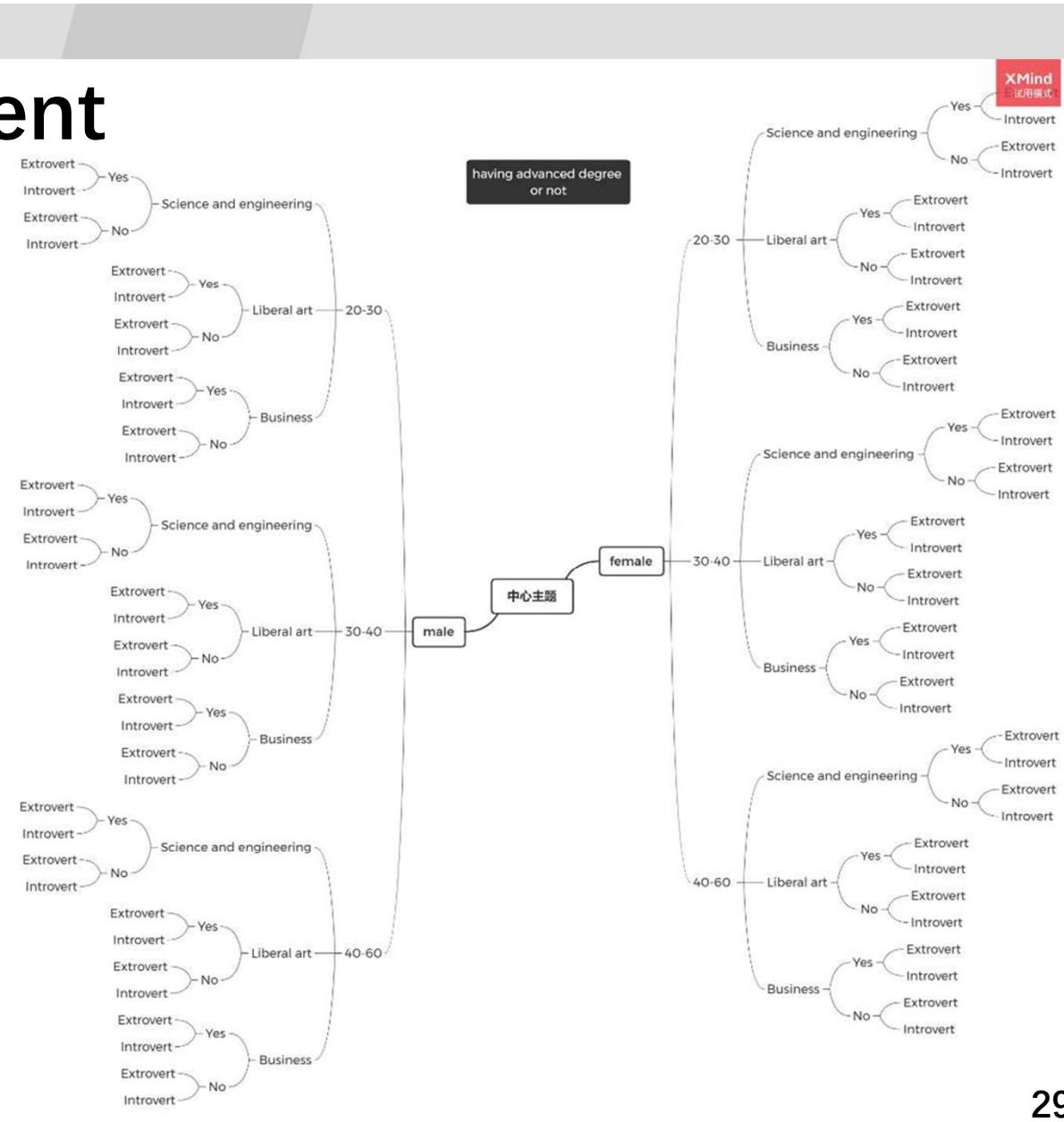
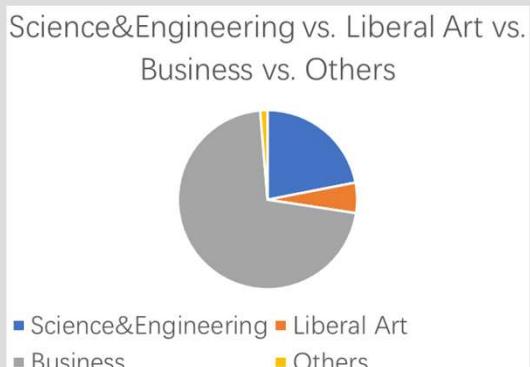
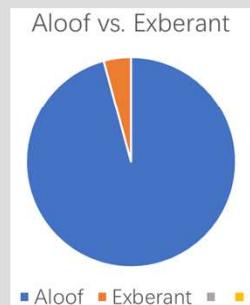
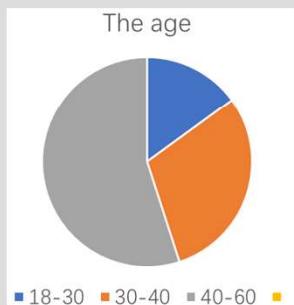
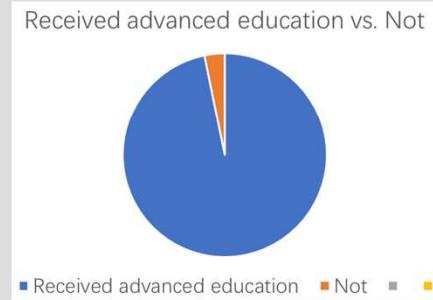


## 4.4 Tourist Activities

<p>Space Walking</p> 	<p>Lab</p> 	 <p>Museum</p> 
<p><b>Product Launch</b></p> <p>Global livestreaming Testing products in harsh environment Attracting customers</p>	<p><b>Planting</b></p> <p>For visitors For people on earth</p>	<p><b>Marriage Service</b></p> <p>External love Love is a collaborative work of art</p>

# 5 Business Development

# 5.0 Business Development



## 5.1 User Profile

User1	User2	User3
Male	Business Man	Influencer
Science & Engineering	Socializing	Age 20-30
Age 30-45	Age 45-60	Female
Space fan	Receive advanced education	Popularity
		*Couple

## 5.2 User Value

User1	User2	User3
Sense of experience in space	Interactive activities	Opportunity to earn fame
Space knowledge	Comfort & Enjoyment	Couple activities
Space industry development prospect	Commemorative Objects & Events	Novel Events
Excitement		

## 5.2 User Value

User Group1	User Group2	User Group3	
Space Walking	Museum	Museum	
Lab	Planting	Planting	
Museum	Product Launch	Marriage	
Planting	Space Walking	Sports	
Sports	Sports	Sightseeing	
Sightseeing	Sightseeing	Business Shot(vlog etc.)	
Potential Income/Person/Million Yuan	15-19.5	15-68.5	15-18

## 5.3 Pricing

Project	Price/Million Yuan
Accomodation	15
Space Walking	3
Lab	1
Museum	Free
Product Launch	50
Planting from travelers	Free
Planting from people on Earth	0.1
Marriage Service	2
Sightseeing Room	0.5
Sports	Free
Business Ad	20
Business Shot(vlog etc.)	2

## 5.4 Marketing Campaigns

- Short-term:
  1. **Social media** (penetrative-Brand Demonstration Effect)
  2. **Public relation** (*emphasize the core idea*)
  3. **Co-marketing** (short-term exposure burst)
  4. **Personalized Invitations**
  5. **Advertisement**
- Long-term:
  1. Co-marketing (long-lasting association)
  2. Social media (lighter emphasize)

## 5.4 Marketing Campaigns

User Group1	User Group2	User Group3
Male	Business Man	Influencer
Science & Engineering	Socializing	Age 20-30
Age 30-45	Age 45-60	Female
Space fan	Receive advanced education	Popularity
		*Couple

For all:

- Hunger marketing
- Core team member promotion (promote project development story, personal value, and keys to success)
- Public relation (press conference, TED Talk, talk shows etc.)
- Social media (Public discussion/comments/posts+experts debates)

· Cooperate with fashion industries, sports associations, and popular technology companies.

1. Social media-public discussions
2. advertisements

# 6 Schedule and Cost

# 6.1 Construction Schedule

项目	年份	2029				2030				2031				2032				2033	2034	2035	2036	2037	2038	2039	2040	
	月份	1~3	4~6	7~9	10~12	1~3	4~6	7~9	10~12	1~3	4~6	7~9	10~12	1~3	4~6	7~9	10~12									
Stage 1																										
Stage 2																										
Stage 3																										
Stage 4																										
Stage 5																										

Stage 1	Transportation	Year	2029				2030	
			Month	1~3	4~6	7~9	10~12	1~3
project								
Structure Design								
Automation Design								
Service Cabin Construction and Transportation	Earth-Leo							
Solar Panels Construction	Earth-Leo							
Activity Cabin Construction and Transportation	Earth-Leo							
Core Cabin Construction and Transportation	Earth-Leo							
Robots reproduction&transportation	Earth-Leo							

Stage 2	Transportation	year	2030				2031
			month	4~6	7~9	10~12	1~3
project							
Main Control Cabin Construction and Transportation	Earth-Leo						
Port Cabin Construction and Transportation	Earth-Leo						
Human Factors and Agriculture Cabin Construction and Transportation(external)	Earth-Leo						
Thruster Cabin Construction and Transportation	Earth-Leo						
Robots reproduction&transportation	Earth-Leo						

# 6.1 Construction Schedule

Stage 3	Transportation	year	2031		
project		month	4~6	7~9	10~12
Water, electricity, atmosphere cycle construction					
Agriculture Cabin Construction and Transportation (internal)				Yellow	
Human Factors Cabin Construction and Transportation(internal)					Green
Robots reproduction&transportation	Earth-Leo		Grey		

Stage 4	year	2032					
Project	month	1~3			4~6		
Security Check		Red		Red		Red	
Trial operation			Yellow		Yellow		Yellow
Robots reproduction&transportation	Earth-Leo		Grey	Grey	Grey		

Stage5	Transportation	year	2032	2033	2034	2035	2036	2037	2038	2039	2040
Project											
Overall Operation			Red	Red	Red	Red	Red	Red	Red	Red	Red
Security Check					Grey				Grey		
Robots reproduction & transportation	Earth-Leo			Green				Green			Black
Start to make profit											

## 6.2 Costs and Business Income

Forty-two months construction

Total cost of 151.5 billion

Achieve a profit balance in eight years

	Structure	Operation	Human Factors	Business	In Total
Cost (Billion RMB)	129.1	1.6	20.5	0.38	151.9

Project	Total/Billion
Accomodation	15
Space Walking	1.8
Lab	0.5
Product Launch	0.25
Planting from people on Earth	0.01
Marriage Service	0.02
Sightseeing Room	0.45
Business Ad	0.1
Business Shot(vlog)	0.1
<b>Annual total Income</b>	<b>18.23</b>

# Thanks for Listening