

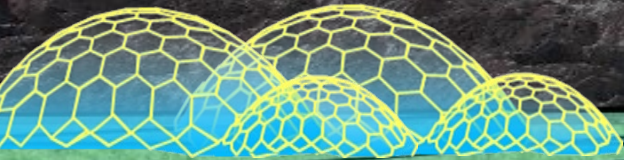
Space Settlement: Space Communities: The Difference Between Surviving and Living!

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4:00 PM PDT 24 May 2024

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Overview

- Difference between a Space Community and a simple space outpost...
- Results of AIAA ASCEND Session
- Space Community Dynamics: What makes people feel at home?
 - Living Space that is Alive
 - Dietary Diversity, Social Dining
 - Business Ecosystems
 - Recreation and Sociality, Groups and Churches
 - Security and Safety. Includes Medical, Legal, etc.

What is a Space Community?

Space communities are places where people:

1. Want to live long term
2. Want to visit as tourists, researchers, entrepreneurs.
3. Want to raise families
4. Can make a good living
5. Have a diverse population: by education, by age, gender, culture, etc.

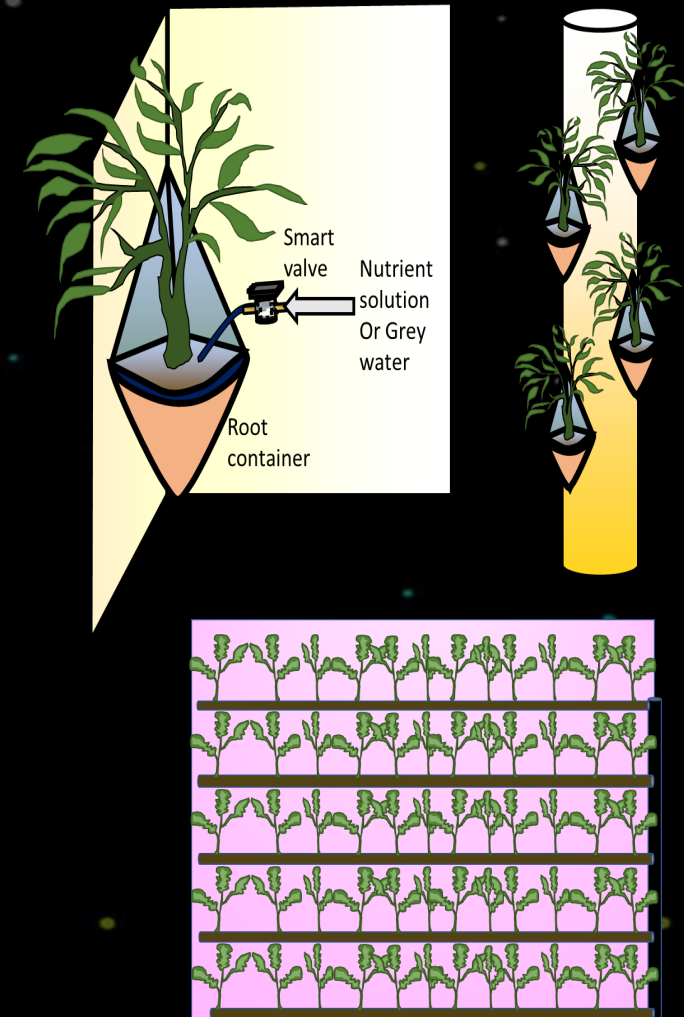
They are not just: outposts, factories, mines, research bases, etc. Beyond a simple frontier settlement!

Exploring what it means to have a space community?

- Hosted a session at AIAA ASCEND 2023 to explore the definition and dynamics of a space community, included: Steve Patmon, Anita Gale, Ron Kohl, and yours truly.
- CONCEPTS HEREIN ARE FROM THIS GROUP, not just me.
- Collected inputs from the panel and room.
- Arrived at several key areas that are needed for a space community:
 - Living Space that is Alive
 - Dietary Diversity, Social dining
 - Business Ecosystems
 - Recreation and Sociality, Groups and Churches
 - Security and Safety. Includes Medical, Legal, etc.

Living Space that is Alive!

- Communities will require a higher ratio of mass cycling and enclosed volume than just an outpost like the ISS.
- Privacy and space to be myself! So shared bunkrooms might be out... Maybe even private potties? Family spaces.
- People need to see and **smell** plants! Extensive use plants such as herbs, vine crops, salad greens (living walls), dwarf varieties of trees and shrubs (citrus, coffee, tea, etc.)
 - Benefits: fresh food additives, aromatherapy, air cleanings, grey water purification
 - Use corners, wall joins, columns, hallways
 - Given enough room and time: Greenspaces like parks, with brooks?
- Art! Interior colors and designs, wall art, well engineered lighting.
- Sounds are important too!



See: Bryan Versteeg art for examples: <https://1-bryan-versteeg.pixels.com/featured/kalpana-one-neighborhood-vertical-bryan-versteeg.html>

Dietary Diversity and Social Dining

- GLOP WILL NOT DO LONG TERM! Even if 3d printed, directly engineered, etc. Hard to undo eons of food-brain linkage. Bad food will lead to bad attitudes.
- People will want to work in the farm!
- Will need to import some spices for sure: Cinnamon, etc.
- Need at least a balanced diet for several cultures...so legumes, grains, greens, veggies, some fruits, fungi, etc. (See my past work here)
- Will need culinary technicians and dieticians to take what is available and create a variety of meals that look and taste good. Boring is lethal!
- Eating is usually a social activity! Allow for a variety of eating spaces, family style eating, etc. Also allow some snacks (esp. for kids!). Popcorn!
- So beyond simple cafeterias...think cafes, taverns, picnics, cozy restaurants, airy dining in green spaces, etc. Some place you want to meet friends, sit with family, or toss back a brew and watch media with friends.

Yes, you will need a bar!

- Beverage selections in addition to food is critical! A variety of drinks can be made even from limited crop options!
 - Fermented varieties like sake/beer, wines...
 - Distilled cocktails and mixes
 - Teas and Coffees
 - Other nonalcoholic drinks like juices, horchata, soft drinks, etc.
- Will need to have a substantial library of media, and some downloads from other locales
- Lots of games, including table, cards, etc.
- In short, you should not just leave layout and interior design to engineers....

Recreation and Sociality, Groups and Churches. So we have bars, and parks, what else?

- Gyms, and sports areas/playing volumes/fields...new sports will emerge in addition to the typical team sports. Dojos. Need places to play and work out, alone and together.
- Playgrounds for adults and kids
- Club meeting areas (where would the Martian NSS chapter meet?)
- Meditation and religious areas....chapels, meditation studios...these can be the same areas with swappable components and a schedule, though some areas may be dedicated too.

Earning a living: Business Ecosystems

- (see International Space Settlement Design Competition)
- Need business spaces, and infrastructure to support business development
- Will need investment and banking methods.
- Allow niches for subcontractors!
- Should develop and enable a wide variety of emerging businesses, so in addition to volumes, will need a solid bandwidth network, finance vehicles and banking, legal framework, property rules (including in situ, intellectual property), ways to exchange with other settlements, sales areas (virtual and physical....i.e. markets, etc.)
- Port areas, storage areas and methods, ways to expand and laws to allow work that should not be near people or crops...when do I need to dig a new tunnel?

Security and Safety: No one is perfect, and some people are just plain mean (1)

- **People will get sick!** So a variety of medical resources and people, dedicated areas, and mergers of automated medicine and human intervention. Extensive libraries and Augmented Reality to allow untrained people to perform in emergencies, or to allow specialist procedures. Enhanced with AI and robotics (think [Da Vinci robotic surgery](#), but better)
- Psychological help, including councilors (including formally trained, and peer/mentors, religious). Supplemented with AI. Therapy dogs and cats?
- Might need more than clinics and operating rooms...recovery areas, mental health isolation.

Security and Safety: No one is perfect, and some people are just plain mean (2)

- Sometime people just behave badly...likely tourists...
 - Laws and methods to investigate, have trials, and confinements (inc. jail cells, drunk tanks, isolation, etc.)
 - AI enhanced resources for professional (or acting) lawyers, judges, etc.
 - What behavior leads to exile? Execution? Jail time? Community service or cleaning duty?
- Will also need people who can confine and protect...i.e. police/constables, might be a rotated duty, or a professional task. Ability to call up others as needed.

Space businesses opportunities and employees you probably forgot....

- Teachers, babysitters, and child day care
- Space suit and vehicle maintainers, mechanics
- Social Directors, Entertainers, Musicians
- Morticians? Funeral Directors (what do we do with bodies?)
- Luxury items, food, electronics, genetics?
- Memory care, senior care and adult day care.

Space businesses opportunities and employees you probably forgot....

- Interior designers and decorators, furniture and décor crafts. Artists.
- Plumbers, Electricians, HVAC, Communications techs.
- Construction and Repair Technicians, teams.
- Housekeeping, Cleaners, general maintenance
- Many more yet to be discovered.
- Many positions like these will be secondary roles for others...or teenagers (as apprentices). Can be subcontractors too.

Conclusion

- Space Communities are settlements where: people WANT to live and have families, tourists want to visit, and people want to conduct business.
- Space Communities are needed if we want people to live long term (maybe for their whole lives) in space. Doubly so if we want them to be happy and have babies!
- Space Communities have a wide diversity of education levels, age groups, cultures, etc....a vibrant mosaic of humanity.

References

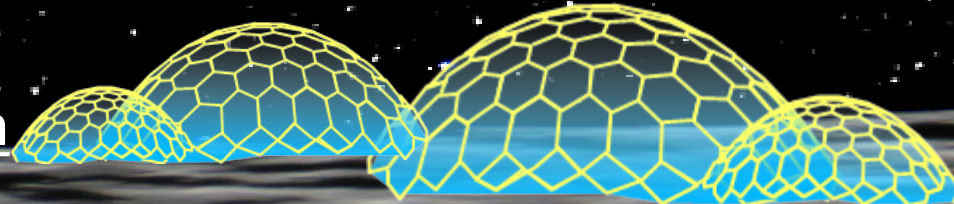
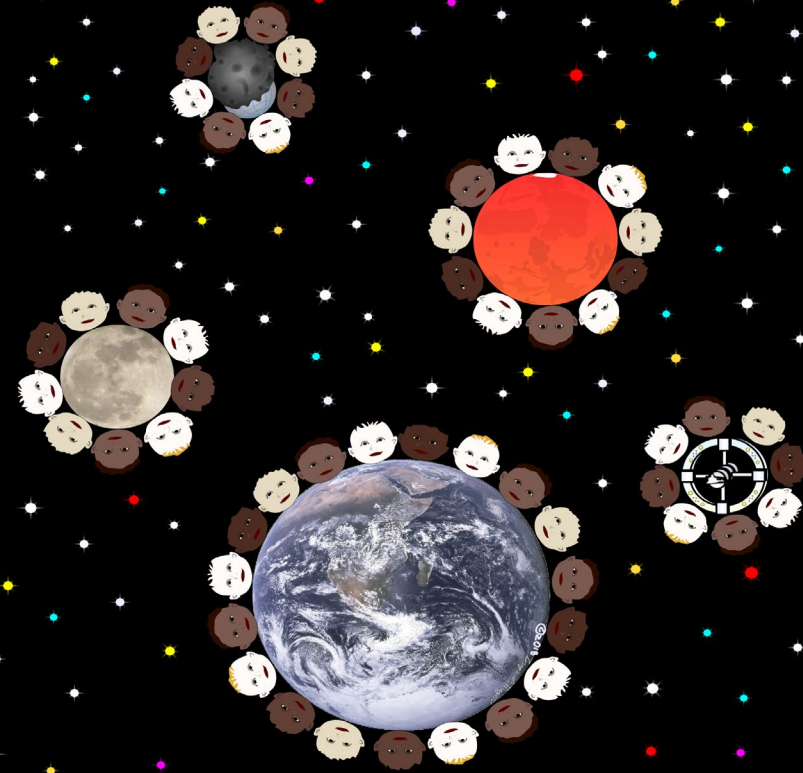
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Thank You for Coming!
And remember:
Why do we settle space?
Trillions of Happy, Smiling
Babies!

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More content: <https://www.space-farms.com>



BACKUP

Friday, May 24

Space Settlement

Hermosa

4:00 pm (to 4:25 PM)

Space Communities: The Difference Between Surviving and Living! Bryce Meyer (St. Louis Space Frontier)

"What principles and designs lead to something beyond simple tubes and cubes?"

Communities were defined as places where people want to live long term, want to raise a family, can make a good living, and in general enjoy life.

Communities are also places

tourists would want to visit. What makes a space community, what concerns need to be addressed to get a thriving space community?"

Top Level Framing Questions

- Basic Survival (Bryce)
- What elements are part of a thriving community? What spaces will we need besides apartments, rec rooms, and work areas? (Steve)
- What do we need to conduct business? What about business incubation and contractor areas? How do we handle and get materials and consumables? (Anita)
- How will we govern and handle social order? What about operations and critical functions versus day to day? (Ron)
- What designs include both the minimums for survival, but also the better parts that make life worth living for a diverse population? (Everyone)

Space communities are places where people:

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They are **not just**: outposts, factories, mines, research bases, etc.

“Future space settlements on the moon, Mars, and in free space need to be planned for life, both for humans and the organisms needed for food, recycling, and enjoyment. They will require intersection of practical space engineering, architecture, life support, and agriculture. What principles and designs lead to something beyond Habitrail tubes and cubes?”

Evolution of who goes to space

| # | Driver | Type | Roles | Fitness |
|---|--|---|------------------------------|---|
| 1 | Very difficult to control spacecraft, complex space ops, harsh conditions, high risk | Test Pilots/Engineers (Pilots or Aircrew with Graduate Engineering Background) | Pilot, Ops | High Athlete |
| 2 | Scientific Exploration, Medical, or Engineering in moderately austere conditions, risky | Scientists, Medical, and Engineers with PhD/MD and well known in field | Mission Specialists | Middle Athlete |
| 3 | Experimentation for pre-planned experiments, some space assembly less austere conditions | Scientists and Engineers with graduate degrees, but also process oriented | Mission Specialists, Factory | Fit |
| 4 | Need for crew to perform manual technical work or process work (Plumbers, Kitchen, Servers, Welders, etc.) | Technicians with experience in area, detail oriented, and ability to adapt to space conditions | Many crew roles, Factory | Fit enough to tolerate launch and work in space |
| 5 | Tourists/Dependents | Anyone who can tolerate space environment, can pay attention to notices and warnings (as on airplanes and cruise ships) | Tourist or none | Fit enough to tolerate launch and life in space |

Base or settlement types for spacefarers

