

# exogame.v1



NASA Space Apps Challenge:  
Galactic Games in a Micro-Gravity  
Environment



Moonwalking Misfits  
Karl & Celeste Lambert  
October 2024



# Impetus:

Environmental Factors	Constraints/Effects	How will exogame solve?
Microgravity effects.	Neuro-muscular and cardiovascular degeneration. Bone degradation. Disorientation, proprioception.	Recommend and track fun games and team-building activities that augment existing duties, exercise/eating regiments, and crewed routines.
Confined Geometry Limited Area.	Limited range, splay, active zone or area for game/activity. Shared interactions/interplay.	Suggest modified games/activities that efficiently utilize (or avoid) sensitive areas, cluttered surfaces and volumes.
Resource-Constrained Mission.	Limited time, payload weight, power draw, few props, minimal personal items and effects.	Shortlist several “back-to-basics” games/activities that work with minimal “overhead”.
Cognitive Effects.	Diminished mental acuity, sensitive moral/well-being, psychological triggers.	Morale-boosting, team-building vs. individualized progression. Uptime/downtime considerations. Complexity profile, cognitive-load intervals, difficulty, success rate).

# Exogame Recommends the best game for the moment.

## HOW IT WORKS:

- Crew members visit: < [exogame.com](http://exogame.com) > or run an offline compatible version.
- The [web-based app](#) takes as input several real-time sentiment profiles, biometric data feeds, and vehicle condition monitoring.
- Constructs an “[affinity score](#)” that represents how conducive the crew and vehicle are to various activities.
- [Respects the constraints](#) of time, location, number of players, difficulty, mission obligations, mood, compartment utilization, etc.
- Recommends the game which best [matches these criteria](#).

Exogame.v1 features games inspired by Girl Guides and Scouts, which require minimal adaptation to work in space...

...but deliver most of the same benefits!

Scout and Girl Guide Games Data Table							
Game Name	Description	Space/Room Required	Difficulty (1-10)	Duration (min)	Caloric Effort (1-10)	Cognitive Effort (1-10)	Players
Trust Fall	Players fall backward into the arms of their team, building trust and teamwork.	Outdoor or indoor space	4	10	3	5	7
Memory Circle	Players sit in a circle and try to remember and repeat items mentioned by others, adding to the list each time.	Indoor or outdoor space	3	10	2	9	6
Whisper Down the Lane	Players pass a whispered message around a circle, and the last player says it aloud to see how it has changed.	Indoor or outdoor space	2	10	1	6	8
Friendship Knot	Players practice tying a friendship knot in string, symbolizing teamwork and friendship.	Indoor or outdoor space	2	10	1	5	5
Would You Rather	Participants choose between two difficult scenarios.	Small Room	3	10	1	4	2
Tug of War	Two teams pull on opposite ends of a rope to bring the other team across a designated line.	Large outdoor or indoor space	5	15	8	2	8
Kim's Game	Players study a collection of objects for a short time and then recall them from memory.	Indoor space with a table	3	15	2	9	8
Human Knot	Players stand in a circle, hold hands with different people across the circle, and untangle themselves without letting go.	Outdoor or indoor space	5	15	3	8	8
Duck, Duck, Goose	Players sit in a circle, and one player walks around tapping heads saying "duck," until they choose a "goose" who must chase them.	Outdoor field or indoor room	3	15	4	3	8
Parachute Games	Players hold the edges of a large parachute, creating waves, tossing balls, or running underneath it.	Large outdoor or indoor space	3	15	4	4	9
Two Truths and a Lie	Players state two true facts and one lie; others guess.	Small Room	3	15	1	4	4
Guess Who	Participants ask yes/no questions to guess a person's identity.	Small Room	3	15	2	4	4
Story Chain	Each person adds a line to create a group story.	Quiet Space	3	15	2	6	4
Team Juggle	Team members juggle random objects back and forth in sequence.	Open Space	5	15	3	3	3
Relay Race	Teams race in succession, passing a baton from one runner to the next until the finish line.	Large outdoor track or field	5	20	7	4	6
Knot Relay	Teams race to complete various knots in succession, testing their knot-tying skills.	Indoor or outdoor space	6	20	4	6	7
Scout's Own	A reflective and spiritual gathering focused on scouting values.	Quiet indoor or outdoor space	1	20	1	8	9
Spud	Players toss a ball into the air, call out a player's number, and everyone else runs. The called player tries to tag someone with the ball.	Outdoor field	4	20	6	5	7

# Demo/Components:

Home Biometrics Sentiment Compartments Games About

## NASA Vehicle Missions - Crew Biometric Indicators

Select a NASA Mission: Apollo 11 (3 Crew)

Crew Member	Heart Rate (BPM)	Oxygen Saturation (%)	Body Temperature (deg C)	Respiration Rate (Breaths/Min)
Neil Armstrong	90	97	37.1	18
Buzz Aldrin	83	94	37.9	19
Michael Collins	100	100	36.8	13

Home Biometrics Sentiment Compartments Games About

## NASA Vehicle Missions - Crew Sentiment Data

Select a NASA Mission: Orion Artemis II (4 Crew)

Crew Member	Recent Exercise (Minutes)	Mood / Sentiment	Energy Level (%)	Affinity for Gaming (0-10)
Rod Wiseman	8	Tired	78	74.8
Victor Glover	31	Anxious	53	72.2
Christina Koch	30	Happy	56	25.2
Jeremy Hansen	41	Tired	65	69.8

Home Biometrics Sentiment Compartments Games About

## NASA Vehicle Missions - Compartment Data

Select a NASA Crewed Orbital Vehicle: International Space Station

Compartment/Module	Usable Volume (m3)	Current Temperature (deg C)	Utilization (%)	Affinity for Gaming
Zvezda Service Module	75	22.7	58	74
Harmony Module	75.5	27.1	51	62
Columbus Laboratory	75	22.9	6	84
Kibo Module	73	21.2	37	77
Destiny Laboratory	106	19.2	6	90

Home Biometrics Sentiment Compartments Games About

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Scout's Dawn	A reflective and spiritual gathering focused on scouting values.	Quiet indoor or outdoor space	1	20	1	8	9
Spit	Players toss a ball into the air, call out a player's number, and everyone else runs. The called player tries to hit someone with the ball.	Outdoor field	4	20	6	5	7

## EXOGAME.v1 Summary Dashboard

-- Select a Mission --

**Recommended Game**  
Select a mission to see the game recommendation.

**Mission Affinity Summary**

Data Component	Core Affinity Score
Biometrics	-
Crew Sentiment	-
Vehicle Readiness	-

**Effort Levels**

Effort Type	Level
Caloric	-
Cognitive	-

## EXOGAME.v1 Summary Dashboard

Orion Artemis II (4 Crew)

**Recommended Game**  
**Recommended Game: Tug of War**  
Two teams pull on opposite ends of a rope to bring the other team across a designated line.

**Mission Affinity Summary**

Data Component	Core Affinity Score
Biometrics	85
Crew Sentiment	49
Vehicle Readiness	30

**Effort Levels**

Effort Type	Level
Caloric	5.7
Cognitive	1.5

# Future Work

- Improvements to exogame recommender system will result in **updated versions**.
- Expand on the data analytics and ensure more efficient **real-time updates** with less memory overhead.
- Enhance the **scoring algorithms** through the use of machine learning.
- Add options for crew member **profiles**.
- Add options for data **export/save**.

# About/Motivation

- NASA SpaceApps Challenge 2024.
- Engage NCR youth in STEAM learning.
- Support DEI humanitarian STEM candidates and processes.
- Father/daughter team looking to Level-up hackathon skills and ship an MVP together.
- Shout-out to Girl Guides and Scouts Canada for their inspiration.

## For More Info:

<https://www.spaceappschallenge.org/nasa-space-apps-2024/find-a-team/moonwalk-misfits/?tab=project>