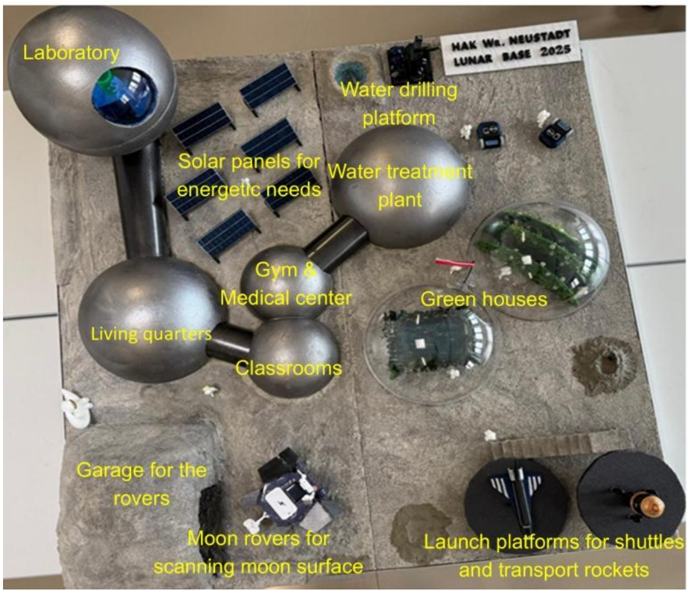
NASA Project HAK Wr. Neustadt 2025

Our lunar base

One of the great features offered by the College of Business Administration in Wr. Neustadt is the opportunity to take a semester off school in order to spend a term abroad – or, like in our case, on the Moon. In co-operation with NASA and our school team, consisting of very capable teachers, it is now possible to guarantee a marvelous experience on our lunar station.

We are proud to present the result of many hours of thorough planning and calculating: the ideal environment for such an endeavor. The following facilities are exhibited in our model:

- ✓ Laboratory for scientific discoveries, experiments
- ✓ Classroom for highly space- and astrologically focused educational purposes
- ✓ Living quarters
- ✓ Gym
- ✓ Medical center
- ✓ Water treatment plant
- ✓ Greenhouses
- ✓ Dolar panels for energetic needs
- ✓ Launch platforms for shuttles and transport rockets
- ✓ Water drilling platform
- ✓ Moon rovers for scanning the Moon's surface
- ✓ Garage for the rovers



The Research station

Our research station is preparing to welcome young people enthusiastic about research to our lunar station as we are introducing a research semester on the moon for business academy classes.

Our lunar base should operate autonomously, sourcing most materials directly from the moon's surface and recycling them there.

We will isolate and purify the water bound in the rock, and we will use dark craters on the moon for water storage.

The research station's task is to isolate these materials from moon dust and prepare them for use in 3D printers. We place particular emphasis on carbon, which, in the form of graphene, is considered the material of the future. Graphene consists of a single layer of carbon atoms arranged in a honeycomb structure. It is very thin, strong, flexible, and electrically conductive with unique properties.

Our facility will be built directly on the moon because transporting materials from Earth is costly and should be limited to what is absolutely necessary.

We are working on producing food and water at our moon base.

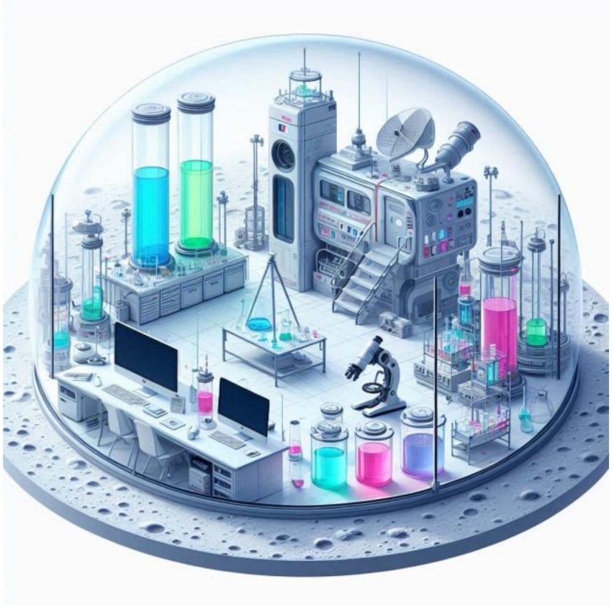
Equipment:

- Telescope
- Microscope
- 3D printer
- Seismometer
- Ground radar
- Dust detectors
- Drones
- Laboratory equipment

Operation and usage:

Our moon base is used as a research station for HAK Wr. Neustadt, where students will put the topics discussed in class into practice. Students will spend an entire semester on the moon. In addition to regular classes, such as math and English, the focus will be on science subjects to give students an understanding of the importance of modern research.

Photo-Album

The Moon accommodations

Purpose

The accommodations and living spaces on the Moon—such as bedrooms, kitchens, bathrooms, and living rooms—are designed to help astronauts live as normally and healthily as possible in extreme conditions. The sleeping area provides rest and recovery, which are essential for concentration and overall health. In the kitchen and dining area, astronauts can prepare and eat meals together, supporting both nutrition and team spirit. A sanitary area is crucial for hygiene, personal care, and health, even with limited water and low gravity. The living and recreation area helps reduce stress and maintain mental well-being. These spaces are essential to make longer stays on the Moon possible and bearable.

Equipment

To live on the Moon, the astronauts need specialized equipment adapted to extreme conditions. In the sleeping area, insulated sleeping pods, wall-mounted sleeping bags, and light controls for day-night rhythm are essential. The kitchen requires food preparation devices, water and storage systems, and special tables with restraints. The sanitary area uses vacuum-based space toilets, hygiene devices, and water recycling systems. The living area includes fixed furniture, screens for communication and entertainment, and lighting for mood regulation. Additionally, systems for life support, radiation protection, power supply, and communication are crucial to ensure the crew's survival and well-being.

Operation & Usage

Living accommodations on the Moon are carefully designed to support the daily needs of astronauts in an extreme and low-gravity environment. Their operation relies on automated systems and strict routines to ensure safety, health, and comfort during extended lunar missions.

The sleeping area provides a quiet, temperature-controlled space with adjustable lighting to mimic Earth’s day-night cycle. Astronauts sleep in secured sleeping bags inside small, insulated compartments that offer privacy and personal storage.

In the kitchen and dining area, food preparation devices are used to rehydrate and heat packaged space meals. Meals are eaten at fixed tables equipped with magnetic or Velcro fasteners to prevent items from floating away. Shared mealtimes support nutrition and team cohesion.

The sanitary facilities use vacuum-assisted toilets and water-efficient hygiene systems. Water is filtered and recycled to reduce waste. Astronauts clean themselves using rinseless wipes, no-rinse shampoo, or air showers designed for low-gravity use.

The living and recreation area is equipped with comfortable, fixed furniture, screens for communication and entertainment, and adjustable lighting for mood and relaxation. This space is crucial for stress relief and maintaining mental health. Astronauts use it to relax, read, communicate with Earth, or exercise.

All living spaces are connected to a central life support system that continuously monitors and adjusts air quality, temperature, water, and power usage. These accommodations are essential not just for survival, but for maintaining a functional and healthy life on the Moon.

Photo-Album

Greenhouses

Our greenhouses are designed to supply the lunar station with nearly everything it needs. Using aquaponics and vertical farming methods, we aim to produce all products in a closed cycle with no waste.

Aquaponics is a sustainable system that combines aquaculture (fish farming) and hydroponics (growing plants in water). The fish waste is converted into nutrients for the plants, which purify the water in turn, creating a closed cycle.

Procedure:

1. Fish Farming: Fish are kept in a tank and fed.
2. Faeces: The fish's feces and uneaten food are removed from the water.
3. Biofilter: Bacteria in a biofilter convert feces and other organic matter into nutrients that plants can use.
4. Plant Cultivation: Plants absorb nutrients from the water through their roots, purifying the water in the process.
5. Water Cycle: The purified water is then pumped back into the fish tank, beginning the cycle again.

Advantages of aquaponics

- ✓ Sustainability: reduces water consumption and the use of chemical fertilisers and pesticides.
- ✓ Space-saving
- ✓ Resource efficiency: makes optimum use of natural resources and enables high productivity in a small space

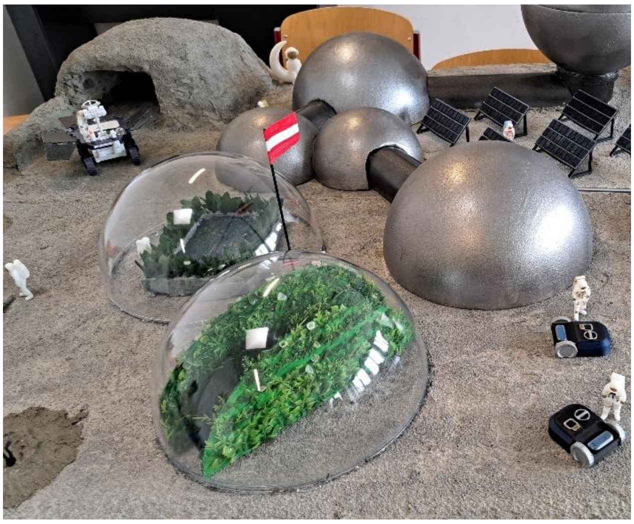
Vertical farming is an agricultural approach in which plants are grown vertically, often in enclosed spaces. This method uses space more efficiently, allowing us to grow all the plants we need on the lunar station. Water is used in a closed loop for the fish.

Advantages of vertical farming:

- ✓ Efficient land utilization: Plants can be grown on different levels above each other, making use of space much more efficiently.
- ✓ Independent of external factors: Vertical farming is less susceptible to weather conditions and soil characteristics.

- ✓ • Controlled environmental conditions: Artificial lighting and temperature can be used to create optimal growing conditions for plants.

Photo-Album



Moon-Gym & Medical Center

<u>Purpose</u>

The gym aboard a space station plays a crucial role in maintaining the health of the crew. In weightlessness, the human body quickly loses muscle strength and bone density due to the lack of gravity. Without regular exercise, serious health problems could arise that would not only impair performance during the mission, but also complicate the return to Earth. Exercise stabilizes the cardiovascular system, improves sleep quality, and combats psychological stressors such as stress, isolation, and sensory overload. Training brings structure to everyday life and is essential for maintaining physical and mental fitness in space.

<u>Equipment</u>

The Moongym uses specially adapted training equipment that eliminates the need for traditional weights. For muscle building, we use a strength training device with vacuum cylinders that enables exercises such as squats, deadlifts, and bench presses. A resistance band station provides a versatile workout for the arms, chest, back, and legs. Our treadmill with a harness strengthens core and leg muscles with artificial resistance. Additionally, we have a bicycle ergometer that helps with endurance training and maintains leg muscle strength. An electrical muscle stimulation system activates specific muscles even during rest periods. Lastly, our virtual training modules provide the crew with additional support in terms of coordination and motivation!

Operation & Usage

Training takes place daily and usually consists of individually tailored programs that last around two hours. These routines combine strength and endurance training with coordination and stabilization exercises. They are tailored to medical requirements and real-time data from biometric sensors. Integrated safety mechanisms ensure that no uncontrolled movements or vibrations endanger the environment during training. Meanwhile, ventilation and filtration systems regulate the temperature, humidity, and air quality to maintain a stable indoor climate. Motivational elements, such as immersive landscape simulations, personalized music, and group sessions in a virtual environment, transform the Moongym into a place not only for physical maintenance but also for mental retreat amidst the barren lunar landscape.

Medical Center

The medical center is designed to provide emergency medical care and ongoing health checkups for the residents of our lunar base. Attention is paid not only to the physical but also to the mental well-being of all astronauts. From the medical center, you can also contact our ground station 24/7 for a confidential consultation with a doctor.

Photo-Album