

# List of Publications

## Academic Publications (1)

- Detrell G.: Analysis and Simulation of a Synergetic Environmental Control and Life Support System for Long Duration Spaceflight, PhD Dissertation *Universität Stuttgart* and *Universitat Politècnica de Catalunya*, ISBN 978-3-8439-2658-4, Dr. Hut Verlag, **2015**

## Book Contributions (2)

- From Biofiltration to Promising Options in Gaseous Fluxes Biotreatment, Chapter 20 - Microalgae for combined air revitalization and biomass production for space applications. DOI: 10.1016/B978-0-12-819064-7.00020-0, **2020**
- Mars and the Earthlings: A Realistic View on Mars Exploration and Settlement, Chapters 6, 7 and 8. ISBN 978-3-031-66880-7, **2025**

## Journal Publications (6)

- Detrell G., Gríful Ponsati E., Messerschmid E.: Reliability versus Mass Optimization of CO<sub>2</sub> Extraction Technologies for Long Duration Missions, DOI: 10.1016/j.asr.2016.03.024 Advances in Space Research. Vol. 57, Issue 11 (2337-2346), **2016**
- Detrell G., Schwinning M., Ewald R.: An international and interdisciplinary approach on learning how to design a space station, DOI: 10.1016/j.actaastro.2018.12.009, Acta Astronautica, **2019**
- Helisch H., Keppler J., Detrell G., Belz S., Ewald R., Fasoulas S., Heyer A.G., High density long-term cultivation of *Chlorella vulgaris* SAG 211-12 in a novel microgravity-capable membrane raceway photobioreactor for future bioregenerative life support in SPACE, DOI: 10.1016/j.issr.2019.08.001, Life Sciences in Space Research, **2019**
- Detrell, G.: *Chlorella Vulgaris* Photobioreactor for Oxygen and Food Production on a Moon Base—Potential and Challenges, DOI: 10.3389/fspas.2021.700579, frontiers in Astronomy and Space Sciences, **2021**
- De Micco, Veronica, et al., Plant and microbial science and technology as cornerstones to Bioregenerative Life Support Systems in space, DOI: 10.1038/s41526-023-00317-9, npj Microgravity 9. Jg., Nr. 1, S. 69., **2023**
- Nadim Maraqten et al.: Paradigm Change in Space Utilization: Conceptual Design Study of a Lunar Space Station for In-Space Manufacturing, Journal of the British Interplanetary Society , Vol. 77 No.7, **2024**

## Conference Papers (47)

- Belz S., Ganzer B., Detrell G., Messerschmid E.: Synergetic Hybrid Life Support System for a Mars transfer Vehicle, IAC-10-A1.6.7, 61<sup>st</sup> International Astronautical Congress, Prague, Czech Republic, **2010**
- Detrell G., Ganzer B., Messerschmid E.: Adaptation of the ELISSA Simulation Tool for Reliability Analysis, AIAA-11-5279, 41<sup>st</sup> International Conference on Environmental Systems. Portland, Oregon, USA, **2011**
- Detrell G., Ta R., Baker S., Gray K.A., Dawson E., Vigneron A., Lüthen C., Ewald R. Eriksson K.: A Next Generation Space Station, IAC-12-B3.2.2, 63<sup>rd</sup> International Astronautical Congress, Naples, Italy, **2012**

- Belz S., Bretschneider J., Helisch H., Detrell G., Keppler J., Burger W., Yesil A., Binnig M., Fasoulas S., Henn N., Kern P., Hartstein H., Matthias C.: Preparatory Activities for a Photobioreactor Spaceflight Experiment Enabling Microalgae Cultivation for Supporting Humans in Space, IAC-15-A1.7.7, 66<sup>th</sup> International Astronautical Congress, Jerusalem, Israel, **2015**
- Bretschneider J., Belz S., Helisch H., Detrell G., Keppler J., Fasoulas S., Henn N., Kern P.: Functionality and setup of the algae based ISS experiment PBR@LSR, ICES-2016-203, 46<sup>th</sup> International Conference on Environmental Systems, Vienna, Austria, **2016**
- Detrell G., Gríful Ponsati E., Messerschmid E.: ECLSS reliability analysis tool for long duration spaceflight, ICES-2016-294, 46<sup>th</sup> International Conference on Environmental System, Vienna, Austria, **2016**
- Belz S., Bretschneider J., Detrell G., Helisch H., Keppler J., Nathanson E., Fasoulas S., Ewald R., Henn N., Kern P., Hartstein H., Adrian, A.: Microalgae cultivation in space for future exploration missions: Results of the preparatory activities for a spaceflight experiment on the International Space Station, IAC-16-A1.6.4, 67<sup>th</sup> International Astronautical Congress, Guadalajara, Mexico, **2016**
- Belz S., Keppler J., Helisch H., Bretschneider J., Detrell G.: Innovative biological and physico-chemical recycling of CO<sub>2</sub> in human spaceflight, ICES-2017-147, 47<sup>th</sup> International Conference on Environmental Systems, Charleston, USA, **2017**
- Detrell G., Belz S.: ELISSA – a comprehensive software package for ECLSS technology selection, modelling and simulation for human spaceflight missions, ICES-2017-190, 47<sup>th</sup> International Conference on Environmental Systems, Charleston, South Carolina, USA, **2017**
- Keppler J., Helisch H., Belz S., Bretschneider J., Detrell G., Henn N., Fasoulas S., Ewald R., Angerer O., Adrian A.: From breadboard to protoflight model - the ongoing development of the algae based ISS experiment PBR@LSR, ICES-2017-180, 47<sup>th</sup> International Conference on Environmental Systems, Charleston, USA, **2017**
- Belz S., Helisch H., Keppler J., Detrell G., Martin J., Ewald R., Henn N., Adrian A.; Hartstein H., Angerer, O.: Microalgae cultivation in space for future exploration missions: Results of the breadboard activities for a long-term photobioreactor spaceflight experiment on the International Space Station, IAC-17-A1.7.6, 68<sup>th</sup> International Astronautical Congress, Adelaide, Australia, **2017**
- Detrell G., Belz S., Bretschneider J., Ewald R., Fasoulas S.: A Hybrid Life Support System for a Moon Base, IAC-17-A5.1, 68<sup>th</sup> International Astronautical Congress, Adelaide, Australia, **2017**
- Schwinning M., Detrell G., Ewald R.: Conceptual design of a manned platform in the Martian system, IAC-17-A5.2, 68<sup>th</sup> International Astronautical Congress. Adelaide, Australia, **2017**
- Detrell G., Schwinning M., Ewald R.: An international and interdisciplinary approach on learning how to design a space station, IAC-17-E1.3, 68<sup>th</sup> International Astronautical Congress. Adelaide, Australia, **2017**
- Pardo Spiess M.J., Cowley A., Belz S., Lehner B., Hauslage J., Detrell G.: C.R.O.P.® Demonstrator for Human Space Exploration: Experiment Analysis and System Model Development, IAC-17-A1.IP, 68<sup>th</sup> International Astronautical Congress. Adelaide, Australia, **2017**
- Keppler J., Belz S., Detrell G., Helisch H., Martin J., Henn N., Fasoulas S., Ewald R., Angerer O., Hartstein, H., The final configuration of the algae-based ISS experiment PBR@LSR, ICES-2018-141, 48<sup>th</sup> International Conference on Environmental Systems, Albuquerque, USA, **2018**
- Detrell G., Keppler J., Helisch H., Fasoulas S., LSS hands-on research opportunities for students at the University of Stuttgart, ICES-2018-144, 48<sup>th</sup> International Conference on Environmental Systems, Albuquerque, USA, **2018**
- Detrell G., Belz S., Bretschneider J., Kittang Jost A., Mejell Jakobsen Ø., Design of a test platform for algae cultivation research at different gravitation levels, ICES-2018-145, 48<sup>th</sup> International Conference on Environmental Systems, Albuquerque, USA, **2018**
- Helisch H., Belz S., Keppler J., Detrell G., Henn N., Fasoulas S., Ewald R., Angerer O., Non-axenic microalgae cultivation in space – Challenges for the membrane µgPBR of the ISS experiment PBR@LSR, ICES-2018-186, 48<sup>th</sup> International Conference on Environmental Systems, Albuquerque, USA, **2018**

- Keppler J., Detrell G., Helisch H., Belz S., Martin J., Henn N., Ewald R., Fasoulas S., Hartstein H., Angerer O.: Microalgae cultivation in space for future exploration missions: a summary of the development progress of the spaceflight experiment PBR@LSR on the international space station ISS, IAC-18-A1.7.4, 69<sup>th</sup> International Astronautical Congress, Bremen, Germany, **2018**
- Detrell G., Keppler J., Helisch H., Martin J., Belz S., Henn N., Ewald R., Fasoulas S., Hartstein H., Angerer O.: PBR@LSR experiment – ready to fly, IAC-18-A1.7.6, 69<sup>th</sup> International Astronautical Congress, Bremen, Germany, **2018**
- Detrell G., Keppler J., Helisch H., Fasoulas S.: Getting students closer to university research – Life Support System training at the University of Stuttgart, IAC-18-E1.3.8, 69<sup>th</sup> International Astronautical Congress, Bremen, Germany, **2018**
- Detrell G., Helisch H., Keppler J., Martin J., Henn N., Fasoulas S., Ewald R., Angerer O., Adrian, A.: PBR@LSR: The Algae-based Photobioreactor Experiment at the ISS -Configuration and Operations, ICES2019-95, 49<sup>th</sup> International Conference on Environmental Systems, Boston, USA, **2019**
- Detrell G., Ewald R.: LSS design tool for the Space Station Design Workshop at the Institute of Space Systems - University of Stuttgart, ICES2019-96, 49<sup>th</sup> International Conference on Environmental Systems, Boston, USA, **2019**
- Martin J., Keppler J., Detrell G., Helisch H., Ewald R., Fasoulas S.: Microalgae-based Photobioreactors for a Life Support System of a Lunar Base, ICES2019-92, 49<sup>th</sup> International Conference on Environmental Systems, Boston, USA, **2019**
- Detrell G., Helisch H., Keppler J., Martin J., Henn N., Angerer O., Peters S., Ewald R., Fasoulas S.: PBR@LSR: The algae-based photobioreactor experiment at the ISS – Operations Phase, IAC-19-A1.7.3, 70<sup>th</sup> International Astronautical Congress, Washington D.C., United States, **2019**
- Martin J., Detrell G., Ewald R., Fasoulas S.: Scalable Microalgae-based Life Support System, IAC-19-A1.8.5, 70<sup>th</sup> International Astronautical Congress, Washington D.C., United States, **2019**
- Detrell G., Helisch H., Keppler J., Martin J., Henn N., Ewald R., Fasoulas S., Angerer O., Peters S.: PBR@LSR: the Algae-based Photobioreactor Experiment at the ISS - Operations and Results, ICES2020-25, International Conference on Environmental Systems, **2020**
- Martin J., Dannenberg A., Detrell G., Ewald R., Fasoulas S.: Noninvasive process control of a microalgae-based system for automated treatment of polluted agricultural ground water transferred from the development of a biological Life Support Systems, ICES2020-21, International Conference on Environmental Systems, **2020**
- Keppler J., Detrell G., Fasoulas S.: Hands-on Seminar on Electrolysis and Fuel Cells for Life Support System Applications for Students at the University of Stuttgart, ICES2020-48, International Conference on Environmental Systems, **2020**
- Detrell G., Microalgae-based Hybrid Life Support System from Simulations to Flight Experiment, ICES-2021-185, 50<sup>th</sup> International Conference on Environmental Systems, online congress, **2021**
- Detrell G., Muñoz, Banchs-Piqué M. Anglada G., Hartlieb, P., Sureda M., Nüwa, a self-sustainable city state on Mars–development concept, urban design and life support, ICES-2021-255, 50<sup>th</sup> International Conference on Environmental Systems, online congress, **2021**
- Martin J., Dannenberg A., Detrell G., Fasoulas S., Ewald, R., Development of a harvesting-unit for an automated photobioreactor system, ICES2021-105, 50<sup>th</sup> International Conference on Environmental Systems, online congress, **2021**
- Martin, J., Dannenberg A., Detrell G., Fasoulas, S. Ewald, R., Energy reduction by using direct sunlight for a microalgae photobioreactor for a Mars habitat, ICES-2021-107, , 50<sup>th</sup> International Conference on Environmental Systems, online congress, **2021**

- Detrell G., Martin J., Vogel M., Oxygen and food production using a microalgae photobioreactor for a Lunar base, IAC-2021-A1.7.3. 72<sup>nd</sup> International Astronautical Congress, Dubai, United Arab Emirates, **2021**
- Grass M., Maheswaran T., Detrell G., The space station design workshop goes digital - opportunities and challenges during pandemic-times, SSEA-2022-148, 4<sup>th</sup> Symposium on Space Educational Activities (SSEA), Barcelona, Spain, **2022**
- Detrell G. Wenzel S., Bosch Bruguera M., Maheswaran T., Grass M., Martin J., Vogel M., From Soyuz-docking manoeuvres to microalgae cultivation: hands-on training for Master's students, SSEA-2022-179, 4<sup>th</sup> Symposium on Space Educational Activities (SSEA), Barcelona, Spain, **2022**
- Detrell G., Martin J., Microalgae for Oxygen and food production on the Lunar or Martian surface - Impact of In-Situ Resources Utilization, ICES-2022-48, 51<sup>st</sup> International Conference on Environmental Systems, St. Paul, Minnesota, USA, **2022**
- Martin J., Detrell G., Development of an automated photobioreactor test system, ICES-2022-68, 51<sup>st</sup> International Conference on Environmental Systems, St. Paul, Minnesota, USA, **2022**
- Bosch Brugera M., Lopez Bermudez J.S., Detrell G., Ewald R., Development of a Virtual Reality space docking simulator for research and training - A case application in the space analogue SIRIUS-21, IAC-22-B3.5, 73<sup>rd</sup> International Astronautical Congress, Paris, France, **2022**
- Detrell G., Maheswaran T., The Stuttgart Space Station Design Workshop – Current Status, IAC-22-E1-EPB-11, 73<sup>rd</sup> International Astronautical Congress, Paris, France, **2022**
- Maraqtan N., Bari A., De Paor C., Ashford Z., Bobrov Y., Dietz A., Cantos Gálvez D., Inês Carriço, Friedrich D., Martinez Rossi J.M., Nigro M., Salman L., Schneider M., Pitz I., Maheswaran T., Detrell G., Paradigm Change in Space Utilization: Conceptual Design Study of a Lunar Space Station for In-Space Manufacturing,, 74th International Astronautical Congress, Baku Azerbaijan, **2023**
- Detrell G., Salman L., Santaeufemia S., Human Spaceflight Specialized Curriculum for Master in Aerospace at TUM, ICES-2024-279, 53<sup>rd</sup> International Conference on Environmental Systems, Louisville, Kentucky, USA, **2024**
- Santaeufemia S., Detrell G., Salman L., Research on Microalgae-based Life Support Systems at the Technical University of Munich: first steps, ICES-2024-272, 53<sup>rd</sup> International Conference on Environmental Systems, Louisville, Kentucky, USA, **2024**
- Salman L., Guerrero-Gonzalez F., Ubiennyh R., Detrell G., Reiss P., In-situ Manufacturing of Photobioreactors on the Moon Using Local Resources, 75<sup>th</sup> International Astronautical Congress, Milano, Italy, **2024**
- Detrell G., Olthoff C., Maheswaran T., Bonidis N., Salman L., Interuniversity Organization of the Space Station Desing Workshop, 75<sup>th</sup> International Astronautical Congress, Milano, Italy, **2024**
- Bosch Bruguera M., López Bermúdez S., Detrell G., Ewald R., Spacecraft docking piloting performance assessment by means of virtual reality and eye-tracking a the SIRIUS-21 space analog, 75<sup>th</sup> International Astronautical Congress, Milano, Italy, **2024**

### Presentations and Posters (17)

- Detrell G., Belz S., Schwinning M.: PBR@Moon: Research on Algae Photobioreactors for a Moon Base, Poster, 5<sup>th</sup> European Lunar Symposium, Münster, Germany, **2017**
- Schwinning, M., Detrell G., Belz S., Ewald R.: The Stuttgart Space Station Design Workshop – Conceptual Designs of a lunar exploration architecture, Poster, 5<sup>th</sup> European Lunar Symposium, Münster, Germany, **2017**
- Belz S., Helisch H., Keppler J., Detrell G., Fasoulas S., Ewald R., Henn N.: Photobioreactor Technology for Microalgae Cultivation to Support Humans in Space with Oxygen and Edible Biomass,

Presentation, 51<sup>st</sup> ESLAB Symposium: "Extreme Habitable Worlds". ESTEC, Noordwijk, Netherlands, **2017**.

- Detrell G.: Lebenserhaltungssysteme: Überleben im Weltall, 22<sup>nd</sup> Bad Honnefer Winterseminar, Bad Honnef, Germany, **2018**
- Detrell G., Keppler J., Helisch H., Belz S., Henn N., Hartstein H., Angerer O.: PBR@LSR – A Hybrid Life Support System Experiment and Technology Demonstrator at the ISS, Presentation, AgroSpace-MELiSSA Workshop Rome, Italy, **2018**
- Detrell G., Keppler J., Helisch H., Belz S., Henn N., Hartstein H., Angerer O., Ewald R., Fasoulas S.: PBR@LSR: A Hybrid Life Support System Experiment at the ISS, 42<sup>nd</sup> COSPAR Scientific Assembly, F4.2-0015-18, Pasadena, USA, **2018**
- Detrell G., Keppler J., Belz S.: ELISSA: A Life Support System (LSS) technology selection, modelling and simulation tool for human spaceflight missions, 42<sup>nd</sup> COSPAR Scientific Assembly, F4.3-0005-18, Pasadena, USA, **2018**
- Helisch H., Keppler J., Martin J., Detrell G., Ewald, R., Fasoulas, S., Heyer, A.G.: Advanced biotechnological life support systems – Development of microalgae cultivation processes for space applications, Presentation, 11. Bundesalgenstammtisch, Karlsruhe, Germany, **2018**
- Martin J., Detrell G., Ewald R., Fasoulas S.: Lightning system for microalgae cultivation on the Moon and possible applications on Earth, Poster, 11. Bundesalgenstammtisch, Karlsruhe, Germany, **2018**
- Fasoulas S., Ewald R., Detrell G., Helisch H., Keppler J., Martin J.: Future Life Support Systems, Poster, United Nations / Germany High Level Forum: The Way Forward after UNISPACE50+ and on Space 2030, Bonn, Germany, **2018**
- Detrell G., Keppler J., Helisch, H., Martin J., Ewald R., Fasoulas S.: Photobioreactor Technology for Microalgae Cultivation to Support Humans in Space, Space Travel: Adaptive Research and Technologies from Biological and Chemical Engineering, Houston, USA, **2018**
- Martin J., Detrell G., Ewald R., Fasoulas S., Automatisierung von Photobioreaktoren zur Grundwasseraufbereitung, 12. DECHEMA Bundesalgenstammtisch, Universität Kiel, **2019**
- Helisch, H. Schließung von Stoffkreisläufen - Technologietransfer zwischen Weltraum und Erde zur Einsparung von Ressourcen (Vortrag). 12. DECHEMA Bundesalgenstammtisch, Universität Kiel, **2019**
- Martin J., Detrell G., Ewald R., Fasoulas S., Technologietransfer: Photobioreaktoren zur Grundwasseraufbereitung, DLR INNOspace, Bonn, **2019**
- Detrell, G., Microalgae: from oxygen and food production in Space to groundwater processing on Earth, MELISSA Congress, O\_15, Digital Congress, **2020**
- Detrell, G., Microalgae for space applications: from microgravity to partial gravity scenarios, 43<sup>rd</sup> COSPAR Scientific Assembly, F4.1-0001-21, Digital Congress, **2021**
- Detrell, G., TUM Algentechnikum: Research on Microalgae-based Life Support Systems - facility and first steps, 45<sup>th</sup> COSPAR Scientific Assembly, F4.1-0007-24, Busan, South Corea, **2024**

### Public Outreach Presentations (51)

- Bad Honnefer Winterseminar „Weltraum Exploration & Kolonisation“, Überleben im Weltall, **2018**
- Startevent PAPELL, Algen auf der Raumstation, **2018**
- Von Böblingen in den Weltraum, ein kleiner Schritt, **2018**
- Raumfahrt aus Leidenschaft, Algen auf der Raumstation, **2019**
- Spaceport Norway, From Life Support Systems for Space to Improved Resource Utilization on Earth, **2019**
- Tag der Wissenschaft Universität Stuttgart, Algen auf der Raumstation, **2019**
- SpaceUp Stuttgart, Algae in Space?, <https://youtu.be/NZxpuSpjdWI>, **2019**
- Centre Cívic Vil·la Urània, 50 anys de l'arribada a la lluna, **2019**

- Volkshochschule Backnang & Kulturkreis Weissach am Tal, Überleben im Weltall, **2019**
- TEDxEixample, Let's learn from Mars, <https://youtu.be/NvuZJ5qCKLk>, **2020**
- HLRS, Nüwa, Design of a sustainable city on Mars, **2020**
- Culinary Institute of Barcelona, Survival in space: Air, Food and Water, **2021**
- Haus der Astronomie, Überleben auf dem Mars, <https://youtu.be/Lo-MJYn69yc>, **2021**
- SONet Talks, Surviving in Space, <https://youtu.be/6holJmF4cWI>, **2021**
- WIA-Europe #Women4Space, Surviving on Mars, [https://youtu.be/Gx6JC\\_CHVXs](https://youtu.be/Gx6JC_CHVXs), **2021**
- Col·legi Montserrat – Barcelona, Per què anem a l'espai?, **2021**
- Girl's Day at IRS, Astronautinnen und Lebenserhaltungssysteme, **2021**
- Fibracat TV, STEM Arreu, <https://youtu.be/p3m1bKUKbwk>, **2021**
- Inspired Workshop, Photobioreactor Technology for Microalgae Cultivation, **2021**
- House of Switzerland, Rethinking Living: the future of food and the food of the future, **2021**
- Next frontiers, <https://www.next-frontiers.de/de/2021/nachhaltig-bauen-auf-dem-mars-mit-dr-gisela-detrell-karlheinz-steinmueller/>, **2021**
- Science Slam Stuttgart, Leben auf dem Mars?, **2021**
- School of Talents, Surviving in Space, **2021**
- EETAC - Setmana de la ciència, Sobreviure a Mart, <https://youtu.be/fcfBY-kwPpk>, **2021**
- St. Peters School Barcelona, Surviving on Mars, **2021**
- STEM Women Congress, Sobrevivir en Marte, <https://youtu.be/ad0zSJI3TiY>, **2021**
- Nethunting, Diálogos de Futuro, <https://youtu.be/sG5PUxeQ2Cl>, **2021**
- Economia circular, Nüwa: Economía Circular en la Primera Ciudad Sostenible de Marte, <https://youtu.be/6REY0whLPYU>, **2022**
- Inner Wheel - Distrikt 86 Reutlingen Tübingen, Überleben auf dem Mars, **2022**
- Institut Torrent del Alous - Rubí, Sobreviure a Mart, **2022**
- Institut Escola Sant Jordi - Navàs, Sobreviure a Mart, **2022**
- UPC, talk to Bachelor Students, Working on Life Support Systems, **2022**
- Science Slam Event blackbox|55 live, **2022**
- Tag der Wissenschaft, Überleben auf dem Mars, **2022**
- Science Slam beim Stuttgarter Wissenschaftsfestival, **2022**
- Raumfahrt als Leidenschaft, Marstadt Nüwa, **2022**
- EASN Key note speaker, Surviving on Mars, **2022**
- NewSpaceEconomy congress, Networking & Speaker's corner, **2022**
- Haus der Astronomie Heidelberg, Wie wäre es eigentlich, auf dem Mars zu leben?, **2022**
- Planetarium Laupheim, Überleben auf dem Mars, **2023**
- Robert-Mayer-Sternwarte in Heilbronn, Überleben auf dem Mars, **2023**
- Escola Tecnos, Dia de la Ciencia, Sobreviure a l'espai, **2023**
- Forum Munich Aerospace, Surviving in Space, **2023**
- RLS-Sciences Explore Session: Space, Earth and Health, **2024**
- Festival der Zukunft, Roundtable „Luftschloss Monddorf – können, wollen und sollen wir dauerhaft außerhalb der Erde leben und arbeiten?“, **2024**
- Munich New Space Summit, moderation of the session Session „*Beyond Boundaries: New Space Missions and Earthly Applications – Fostering Science-Industry Collaboration*“, **2024**
- Uni der Generationen Göppingen, Lebenserhaltungssysteme: Wie können wir auf dem Mars überleben, **2024**
- Volksternwarte München, Leben auf dem Mars, **2024**
- Rotaract Munich International, Überleben auf dem Mars, **2025**
- Science Slam Marbach am Neckar, **2025**

- Bremen Human Space Exploration Seminar – Uni Bremen, Human Space Flight Technology at the TUM –Research on Photobioreactors for the Moon, Conceptual Design and Human Performance, **2025**