Hochschule Bremen
City University of Applied Sciences

HSB

# Conference Programme

XXV International Symposium: Research – Education – Technology, 30.06.22
6th International Conference LTHU: Hydrogen Technology in Energy Supply Systems, 01.07.22

Conference-Venue: Haus des Wissenschaft, Sandstraße 5, 28195 Bremen

HOST Hochschule Stralsund
POLITECHNIKA GDAŃSKA
SAACKE
swb
ENGINIUS FALUN GROUP
WOLFGANG RITTER-STIFTUNG BREMEN
BORN ERMEL Ingenieure
CULTURE CONNECTS

conference-ret-lthu@hs-bremen.de

**www.hs-bremen.de/conference-ret-lthu**

# Conference Programme

## XXV Research – Education – Technology
## 6th International Conference LTHU 2022

## Hydrogen Technology in Energy Supply Systems

**Hochschule Bremen – City University of Applied Sciences**
**"Julius Robert Mayer" – Institute for Energy Engineering**

# XXV International Symposium RET

## Thursday, 30th of June 2022

08.15 - 09.15 h Arrival and Registration

09.15 - 09.40 h **Welcome of Guests and Conference Opening**
Prof. Dr.-Ing. Sławomir Smoleń
City University of Applied Sciences Bremen, Faculty Nature and Engineering

Prof. Dr. rer. pol. Karin Luckey, City University of Applied Sciences Bremen, Rector
Prof. Karl Potthast, City University of Applied Sciences Bremen

### 09.40 - 10.30 h Session 1

**Chairman:** Prof. Dr.-Ing. Sławomir Smoleń, City University of Applied Sciences Bremen

09.40 - 10.00 h **Fahrenheit Universities – a new entity in Tricity education system**
Dariusz Mikielewicz
Gdańsk University of Technology

10.00 - 10.30 h **Influence of the Salvinia effect on drag reduction in closed and open turbulent channel flows**
A. Köhnsen, N. Kampf, C. Wilms, L. Trumann, D. Matz, A. Kacwin, F. Hoffmann, A.B. Kesel, A. J. Baars
City University of Applied Sciences Bremen

### 10.30 - 10.50 h Coffee – Break

## 10.50 - 12.30 h Session 2

**Chairmen:** Prof. Dr.-Ing. habil. Albert Baars, City University of Applied Sciences Bremen
Prof. Dr.-Ing. habil. Dariusz Mikielewicz, Gdańsk University of Technology

10.50 - 11.05 h **Development of a test rig for measuring the performance characteristics of small wind turbines in a wind tunnel**
Heiko Meironke, Thomas Panten, Martin Hayduk, Frieder Strubel
University of Applied Sciences Stralsund

11.05 - 11.10 h Discussion

11.10 - 11.25 h **Visionary Ingenuity Boosting European Spacecraft**
Tim Gust, Enes Basata, Tim Gersting, Michal Deka, Sven Thiele, Mohammad Salah, Antonio García, Matias Bestard Koerner (DLR), Torben Runte (OHB System AG),
Institute of Aerospace Technology (IAT) City University of Applied Sciences Bremen

11.25 - 11.30 h Discussion

11.30 - 11.45 h **Numerical investigation of production-related characteristics regarding their influence on the fatigue strength of additively manufactured components**
Michaela Zeißig[1], Frank Jablonski[2]
[1] Bremen Institute for Mechanical Engineering, bime, University of Bremen
[2] City University of Applied Sciences Bremen

11.45 - 11.50 h Discussion

11.50 - 12.05 h **Improvement of Common Power Engineering Tasks with Black-box Optimization**
Lukas Peters, Rüdiger Kutzner, Marc Schäfer, Lutz Hofmann
University of Applied Sciences and Arts Hanover, Siemens Energy Gas and Power

12.05 - 12.10 h Discussion

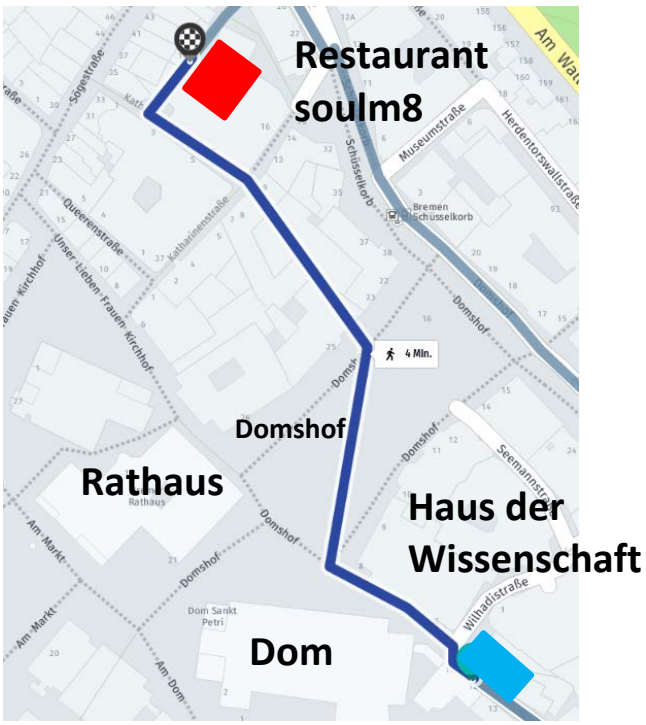
12.10 - 12.25 h **Forecasting biogas formation in landfills**
Zbigniew Kneba[1], Jacek Kropiwnicki[1], Jakub Hadrzynski[2] and Maciej Ziółkowski[3]
[1] Gdańsk University of Technology, [2] Eko Dolina Lezyce, [3] KO-Energia Gdansk

12.25 - 12.30 h Discussion

## 12.30 - 14.00 h Lunch in soulm8

The restaurant "soulm8" is located in the venerable brick walls of the former St. Catherine's Monastery of the Dominicans in Bremen in the Katharinen-Kloster Passage 400 m

soulm8
Katharinenklosterhof 7
28195 Bremen



## 14.00 - 16.00 h Session 3

**Chairmen:** Prof. Dr.-Ing. habil. Krzysztof Lipiński, Gdańsk University of Technology
Prof. Dr.-Ing. Janusz A. Szymczyk, The Jacob of Paradies University Gorzów

14.00 - 14.15 h **Negative CO2 power plant - a new direction in decarbonisation**
Dariusz Mikielewicz, Milad Amiri, Kamil Stasiak, Paweł Ziółkowski
Gdańsk University of Technology

14.15 - 14.20 h Discussion

14.20 - 14.35 h **Experimental of flow analysis for more efficient ejector design**
Arif Karabuga[1], Gamze Yakut[2], Hasan Ayarturk[3], Melik Ziya Yakut[2] and Zafer Utlu[1]
[1] Halic University Istanbul, [2] Isparta University of Applied Sciences Instanbul,
[3] RePG Energy Systems Inc.

14.35 - 14.40 h Discussion

14.40 - 14.55 h **The methodology of determining the theoretical and actual working volume of a hydraulic motor on the basis of characteristics of effective absorbency vs pressure drop in the motor**
Pawel Sliwinski
Gdańsk University of Technology

14.55 - 15.00 h Discussion

15.00 - 15.15 h **District heating solution from wastewater**
Frank Estler
swb Services AG & CO. KG

15.15 - 15.20 h Discussion

15.20 - 15.35 h **Validation of FEM models of an ultralight wing using distributed fibre optic measurement of the strain profile in a wind tunnel**
Lena Teubner, Jan-Christian Kuhr
University of Applied Sciences Stralsund

15.35 - 15.40 h Discussion

15.40 - 15.55 h **Machining of TiAl6V4 using lubricants containing renewable microalgae-born performance additives**
Ralf Gläbe, Thomas Koch, Dominik Wenzel
City University of Applied Sciences Bremen

15.55 - 16.00 h Discussion

## 16.00 – 17.00 h Coffee – Presentation of the posters

| | |
|---|---|
| **A learning factory - Industry 4.0** | Maximilian Bechly<br>University of Applied Sciences Stralsund |
| **Influence of Surfactant Type and Concentration on Stability of the PCM Nanocomposites** | Paulina Boroń, Maciej Fabrykiewicz, Janusz T. Cieśliński<br>Gdańsk University of Technology |
| **Viscosity measurement of selected organic PCM** | Janusz T. Cieśliński[1], Tomasz S. Wiśniewski[2], Michał Kubiś[2], Sławomir Smoleń[3], Albrecht Eicke[3], Krzysztof Dutkowski[4], Małgorzata Głuszek[5]<br>[1]Gdańsk University of Technology,<br>[2]Warsaw University of Technology,<br>[3]City University of Applied Sciences Bremen,<br>[4]Koszalin University of Technology,<br>[5]Smart Fluid Inc., Warsaw |
| **Development and implementation of a concept for the automated billing of a charging station, based on a private Ethereum Block chain** | Antonius David, Thorben Heitmann, Ingo Haug<br>City University of Applied Sciences Bremen |
| **3D printing technology as an innovative approach to the fabrication of abrasive tools** | Mariusz Deja, Dawid Zieliński<br>Gdańsk University of Technology, Poland |
| **Typical Meteorological Year and Climatic Database of Turkey for the Energy Analysis of Buildings** | Ismail Ekmekci<br>Istanbul Ticaret University |
| **The Use of Load-Duration Curves in Determing the maximum Heat Load of a region** | Ismail Ekmekci<br>Istanbul Ticaret University |
| **District heating solution from wastewater** | Frank Estler,<br>swb Services AG & Co. KG, Bremen |
| **Analysis of influence of type of material of pump elements on its operation during start-up in thermal shock conditions** | Ryszard Jasiński<br>Gdańsk University of Technology |
| **Distortions of laser-welded butt and T joints** | Wojciech Kielczyński<br>Gdańsk University of Technology |
| **Procedure for manufacturing an individual orthosis using additive manufacturing** | Sven Klimaschewski, Paul Büttner, Mark Vehse<br>University of Applied Sciences Stralsund |
| **Microbiology of metal working fluids: what we know and lessons to be learned** | Thomas Koch<br>City University of Applied Sciences Bremen |
| **Creation of an analysis and simulation tool for the German power plant park** | Mattis Krampe, Alina Reich, Niklas Kehlenbeck<br>City University of Applied Sciences Bremen |
| **Contr-rotating unbalanced rotors used as inductors of sinusoidal force excitations applied to elastically supported masses** | Krzysztof Lipiński, Mirosław Gerigk, Rafał Hain, Grzegorz Banaszek<br>Gdańsk University of Technology |
| **Multi-Layered Mineral Glass Units used as Viewport elements of Underwater Ship Structures** | Krzysztof Lipiński[1], Krzysztof Bobrowski[1], Edmund Wittbrodt[1], Bogusław Szarejko[2], Eugeniusz Ziółkowski[2]<br>[1] Gdańsk University of Technology<br>[2] Proteh Glass Deep Sp. z o.o. |
| **Impact of Temperature and Nanoparticle Concentration on Forced Convective Heat Transfer of Nanofluids** | Dawid Lubocki, Przemysław Kozak, Janusz T. Cieśliński<br>Gdańsk University of Technology |

| | |
|---|---|
| **Influence of Valve-Seat Angles to Operation Values and Emissions of Medium-speed Diesel-Engines** | Leander Marquardt<br>University of Applied Sciences Stralsund |
| **Development of a Tissue Infiltration Machine for Zoological Samples** | Alexander Roloff, Gerd J. Menken<br>City University of Applied Sciences Bremen |
| **Drag Reduction for Marine Vehicles: Drawing Inspiration from Dolphins** | Lars-Uve Schrader<br>City University of Applied Sciences Bremen |
| **Modelling of low calorific gas burning in a deficient oxygen environment and high temperature oxidizer** | Jan Stąsiek, Marcin Jewartowski, Jacek Baranski, Jan Wajs, Jacek Kropiwnicki<br>Gdańsk University of Technology |
| **Energy 4.0 - Hybrid control power plant** | Thorsten Völker<br>City University of Applied Sciences Bremen |
| **Aerodynamic investigation on the artifact "Bird of Saqqara"** | Michel Zierow, Leon Lesemann<br>City University of Applied Sciences Bremen |

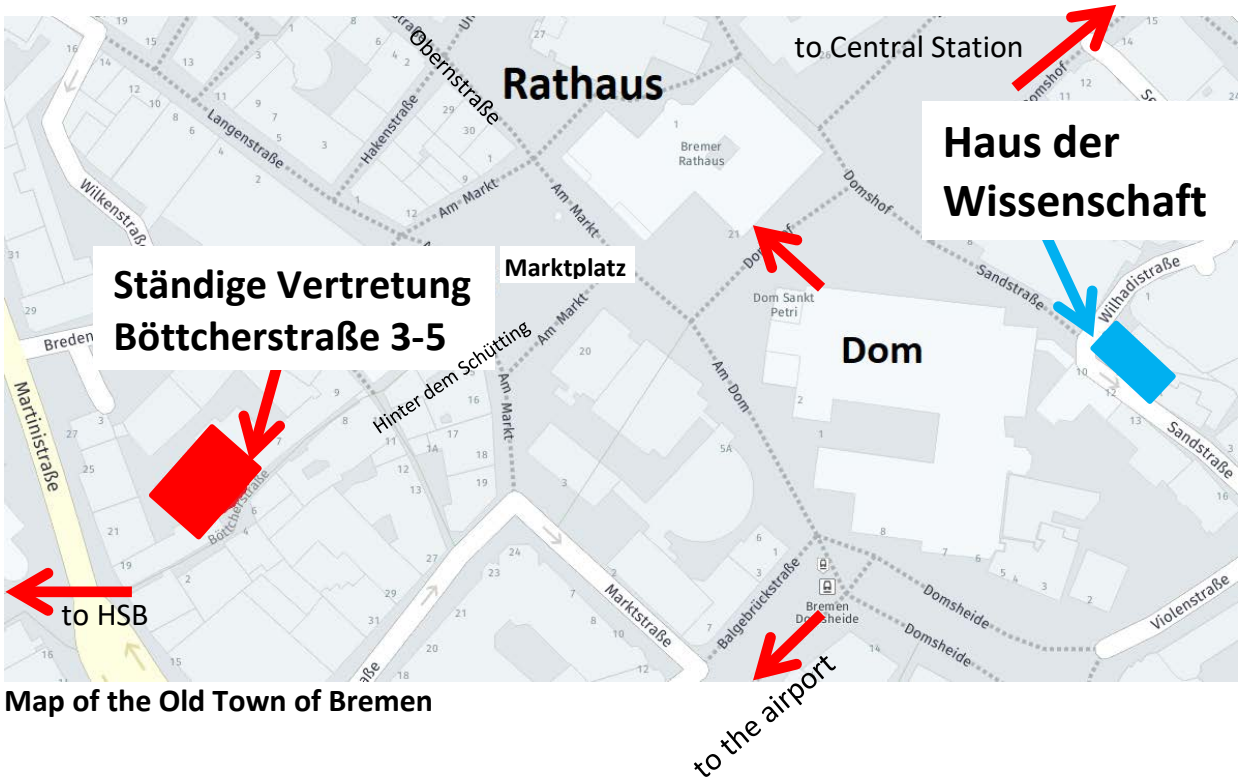
**18.30 h** **Welcome speech in the town hall**

**Dr. Maike Schaefer - Senator for Environment Protection, Mobility, Urban Development and Housebuilding**

**Concert Culture Connects**

**Dinner**

**Rathaus**
**Am Markt 21, 28195 Bremen**




**Map of the Old Town of Bremen**

## Friday, 1st of July 2022

### 09.00 - 10.40 h Session 4

**Chairmen:** Prof. Dr. Lars Jürgensen, City University of Applied Sciences Bremen
Prof. Dr.-Ing. Heiko Meironke, University of Applied Sciences Stralsund

09.00 - 09.15 h **Systemic integration of hydrogen technologies for an initial domestic hydrogen market**
Geert Tjarks
EWE Gasspeicher GmbH

09.15 - 09.20 h Discussion

09.20 - 09.35 h **Hydrogen Use Cases R&D Project "Hydrogen – Green Gas for Bremerhaven"**
Carsten Fichter, Uwe Werner, Sandra Peters-Erjawetz
University of Applied Sciences Bremerhaven

09.35 - 09.40 h Discussion

09.40 - 09.55 h **Modelling and simulation of operation strategies for local, large-scale hydrogen production in the context of Bremen's steel plant transformation**
David Fuhrländer, Christian Schnülle
University of Bremen

09.55 - 10.00 h Discussion

10.00 - 10.15 h **Demonstration of a hydrogen energy system integrated with solar energy, storages and heat pump**
Katharina Jansen, L. Meyer, U. Lüdersen, M. Hoyer and J. Robert
University of Applied Sciences and Arts Hanover

10.15 - 10.20 h Discussion

10.20 - 10.35 h **Hydrogen Lab Bremerhaven: example case of model-based system integration**
Aline Luxa
Fraunhofer Institute for Wind Energy Systems IWES

10.35 - 10.40 h Discussion

### 10.40 - 11.00 h Coffee – Break

## 11.00 - 12.40 h Session 5

**Chairmen:** Prof. Dr.-Ing. habil. Jacek Kropiwnicki, Gdańsk University of Technology
Prof. Dr.-Ing. Jürgen Westhof, City University of Applied Sciences Bremen

11.00 - 11.15 h **H2-ready – Langzeit Erfahrungen bei der thermischen Nutzung von Wasserstoff im industriellen Maßstab**
Max Krausnick, Sven Gose
SAACKE GmbH, Bremen

11.15 - 11.20 h Discussion

11.20 - 11.35 h **(Re)new(able) energies, new prospects - Combining municipal waste incineration and methanol synthesis utilizing carbon dioxide scrubbing and hydrogen production**
Sören Sander, Lutz Schröder
Dr. Born - Dr. Ermel GmbH

11.35 - 11.40 h Discussion

11.40 - 11.55 h **Design of an Electrolyser in Close Proximity to PV and Wind Turbines to Implement a Sector Coupling of Green Electricity with District Heating, Transport and Water Treatment**
Lukas Franzen[1], Ralf Bernhardt[1], Uwe Borchert[1], Janusz A. Szymczyk[2]
[1] SWS Energie GmbH, Stralsund, [2] The Jacob of Paradies University, Gorzów

11.55 - 12.00 h Discussion

12.00 - 12.15 h **Dynamic production of green methanol by controlling the co2 flow**
Johannes Gulden[1], A. Sklarow[1], R. Sommer[1], J. Kirchner[2], C. Schweizer[2]
[1] University of Applied Sciences Stralsund, [2] bse Engineering Leipzig GmbH, Leipzig

12.15 - 12.20 h Discussion

12.20 - 12.35 h **Developing and producing alternative drives for commercial vehicles**
Matilda Heidorn
ENGINIUS GmbH (FAUN Gruppe)

12.35 - 12.40 h Discussion

## 12.40 - 13.40 h Lunch

## 13.40 - 14.20 h Session 6

**Chairman:** Prof. Dr. Lars Jürgensen, City University of Applied Sciences Bremen

13.40 - 13.55 h **How to optimize oil-free High-pressure compression for Large H2 Volumes**
Hergen Renken
Burckhardt Compression (Deutschland) GmbH

13.55 - 14.00 h Discussion

14.00 - 14.15 h **Installation and commissioning of a PEM water electrolysis test stand followed by characterization of a stack using I-V performance curves**
Nicol Daniela Jaramillo Rodríguez[1,2], Lars Jürgensen[1], Aline Luxa[2]
[1] City University of Applied Sciences Bremen
[2] Fraunhofer Institute for Wind Energy Systems IWES

14.15 - 14.20 h Discussion

## Poster session :

| | |
|---|---|
| **A concept of a micro-polygeneration system for zero-energy building** | Bartosz Dawidowicz, Paula Krajewska, Janusz T. Cieśliński<br>Gdańsk University of Technology |
| **Prototype oxyhydrogen boiler** | Marek Gołębiewski[1], Sławomir Halbryt[1], Janusz T. Cieśliński[2]<br>[1] SESCOM S.A., Gdańsk<br>[2] Gdańsk University of Technology |
| **Effect of regenerative braking on energetic efficiency of electric vehicle in urban conditions** | Jacek Kropiwnicki[1], Tomasz Gawłas[2]<br>[1] Gdańsk University of Technology<br>[2] BMG Goworowski, Gdynia |
| **Concept development and construction of a PEM water electrolysis installation in the laboratory for thermal power** | Sławomir Smoleń, Albrecht Eicke, Nicol Jaramillo, Lars Jürgensen, Andreas Krüger<br>City University of Applied Sciences Bremen |

## 14.20 h Closing words

## 15.00 – 16.30 h Industrial visit of OHB Systems, Bremen

**Manfred-Fuchs-Platz 2-4**
**28359 Bremen**

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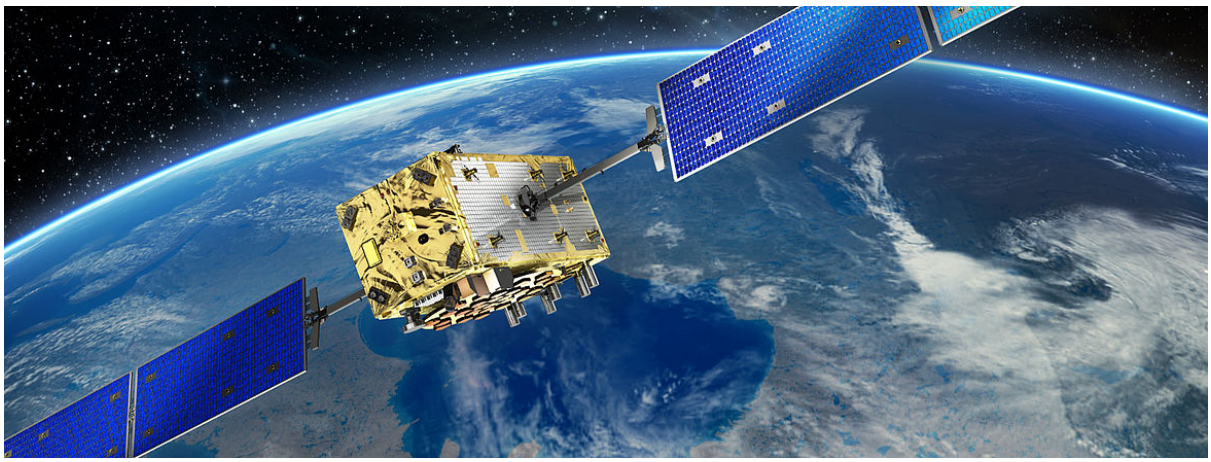
## 18.30 h Dinner “Ständige Vertretung“

**Böttcherstraße 3-5**
**28195 Bremen**



**OHB System AG**

## Brief portrait:

The systems specialist OHB System AG is one of the leading independent forces in European space. We have been making a name for ourselves on the market with our creative and business approach for a good 35 years particularly in our core business comprising low-orbiting and geostationary satellites. We are developing and executing some of the key projects of our times such as the Galileo navigation satellites, the SARah reconnaissance system, the MTG meteorological satellites, the EnMAP environment satellite, the TET-1 technology testing vehicle and the Hispasat H36W-1, ELECTRA and EDRS-C telecommunications satellites.

In human space flight, we are working intensively on humanity's most remote outpost, the International Space Station ISS. We were materially involved in assembling and equipping the Columbus research laboratory fitted to the ISS and the ATV space freighter as well as numerous experiment systems used on board the ISS.

Ideas and systems for studying our solar system form the core of our exploration activities. OHB System is working intensively on ESA’s two-part flagship mission ExoMars as well as on further studies for exploring and charting the moon, Mars, Jupiter and other celestial bodies.

Broadband wireless transmission of image data forms a core technology for security and reconnaissance. Our Process Control Systems segment is responsible for the successful transfer of space technology for use in industrial applications.

OHB System traditionally combines the technologies of leading national and international companies to develop new solutions. With these partnerships and the effective participation in syndicates, we have been a sought-after and reliable partner for the European Space Agency ESA, the German Aerospace Center DLR, the German Federal Ministry of Defense as well as for customers in the private and public sector for several decades.

Hochschule Bremen
City University of Applied Sciences

**Faculty of Nature & Engineering**
**J.R. Mayer - Institute for Energy Engineering**

Ansprechpartner
Prof. Dr.-Ing. Slawomir Smolen

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D-28199 Bremen

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