



Institute of Thermomechanics, Czech Academy of Sciences

invites you to a lecture within the lecture series **Institute of Thermomechanics Seminar**

From Point-to-Point Connections to Industrial CO₂-Transport Networks – Contributions from Thermodynamics

given by **Prof. Dr.-Ing. Roland Span**

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Concepts for Carbon Capture and Storage or Carbon Capture and Utilization (CCS/CCU) have always considered the transport of CO₂ as part of the process chain. However, in many cases transport was considered established technology, or at least little technical problems were seen in the development of transport infrastructure. However, CCS and CCU concepts are no longer restricted to point-to-point connection between large CO₂ sources (essentially power plants) and storage sites, but include CO₂-transport networks, in which multiple industrial emitters inject CO₂. The handling of fluctuating CO₂ flows with different origin and separated using different capture technologies results in new challenges for CO₂ transport. The talk will present a brief overview of these challenges, focusing on aspects relevant for research in the (wider) field of thermodynamics. With regard to the thermodynamic property basis required for the development of CO₂-transport networks, researchers both at Ruhr University and at IT CAS are part of an international network that experimentally and theoretically works on the development of accurate models for both scientific and industrial applications in this context for many years now. An overview of the results of this work will be presented.

References

- A. Jäger, V. Vinš, J. Gernert, R. Span, J. Hrubý: Phase equilibria with hydrate formation in H₂O + CO₂ mixtures modeled with reference equations of state, *Fluid Phase Equilib.* 338 (2013) 100-113
- J. Gernert, R. Span: EOS-CG: A Helmholtz energy mixture model for humid gases and CCS mixtures, *J. Chem. Thermodynamics* 93 (2016) 274-293
- A. Jäger, V. Vinš, R. Span, J. Hrubý: Model for gas hydrates applied to CCS systems part III. Results and implementation in TREND 2.0, *Fluid Phase Equilib.* 429 (2016) 55-66
- A. Jäger, I.H. Bell, C. Bretkopf: A theoretically based departure function for multi-fluid mixture models, *Fluid Phase Equilib.* 469 (2018) 56-69
- T. Neumann, J. Poplsteinova Jakobsen, M. Thol, R. Span: A new model combining Helmholtz energy equations of state with excess Gibbs energy models to describe reactive mixtures, *Chem. Eng. Sci.* (2021) in press

**The lecture will be held on Wednesday, February 9, 2022 at 10:30
in the building of the Institute of Thermomechanics (large lecture room),
Dolejškova 5, 182 00 Prague 8**

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