

Save the Date

What: 2nd Summer School of the Graduate Center MSE
in cooperation with Linde

When: July 19 to 23, 2021 | 8:30 am to 5:00 pm

Where: TUM Quantum
Parking 35
85748 Garching Hochbrück near Munich

Important Dates

Application Deadline: March 31, 2021

Notification Date: April 15, 2021

The **participation** is free of charge for PhD students and doctoral candidates. We are looking forward to receiving your application including your statement of purpose, degree certificate and a letter of recommendation.

Please send your application to:
graduierzentrum@mse.tum.de

More details can be found here: www.mse.tum.de



TUM Quantum in Garching Hochbrück

Technical University of Munich
Munich School of Engineering
Lichtenbergstr. 4a
85748 Garching
www.mse.tum.de

Linde GmbH, Linde Engineering
Dr.-Carl-von-Linde-Str. 6-14
82049 Pullach
www.linde-engineering.com

Applied Thermodynamics - a Powerful Enabler for Sustainable Gas Processing and Energy Solutions

2nd Summer School of the Graduate Center MSE in cooperation with Linde and the Carl-von-Linde Stiftung

July 19 to 23, 2021 at TUM Garching



About

With climate change becoming an increasing challenge, use of alternative sources of energy and adjustments in industrial processes are gaining substantial relevance. Approaches to limit and reduce CO₂ emissions as well as to utilize CO₂ as feedstock have hence shifted into our focus. The energy sector and industry globally intensify their strive for innovative approaches for sustainable and environmentally friendly energy generation and industrial processes. This includes concepts to replace conventional fossil fuels by energy carriers with lower or no CO₂ footprint such as natural gas and green hydrogen. Carbon capture processes are developed to decrease CO₂ emissions through sequestration or use as feedstock. Furthermore, innovative and integrated concepts for energy production, distribution, and use as well as smart operation of industrial plants will be an important contributor to successfully address climate change.

The upcoming Summer School 2021 presents approaches and methods how to convert sustainability into reality.



Munich School of Engineering at TUM in Garching

Methods

- Topic-oriented lectures
- Tutorials
- Discussions
- Excursions to Linde Gas, Linde Engineering and TUM facilities
- Science bar
- Poster presentations by doctoral candidates

Requirements

Professors from TUM and experts from Linde will give the lectures and supervise the tutorials. If you are interested in the theory on thermal and refrigeration engines, technical thermodynamics, cryogenic technology and thermal energy, we highly encourage you to apply. Successful participation implies permanent and active attendance. Certificates will be handed over at Linde Engineering the last day.



LION™ modular air separation plant at Rothenbach

Topics

Applied thermodynamics

- Industrial gas processing and industry
- Cryogenics plants and their contribution to the energy transition

Natural gas as environmental friendly energy source

- Process gas properties: methane, hydrogen, CO₂, natural gas
- LNG: Processing, use and value chain

Green hydrogen

- Sources and role in future energy supply
- Generation and processing
- Hydrogen as a building block in industrial processes
- Hydrogen as energy carrier and fuel

Carbon management

- CO₂ as a building block for sustainable processes
- Low CO₂ emission chemistry with dry reforming and direct DME
- Carbon capture processes

Flexibilization of industrial plants

- Demand side management
- Flexibilization of air separation units

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